Appendix J Preliminary Hydrology Study

Appendix

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HYDROLOGY AND HYDRAULIC STUDY FOR TEMECULA VALLEY CHARTER SCHOOL

PUP 230001

COUNTY OF RIVERSIDE
CALIFORNIA

PREPARED FOR:

TEMECULA VALLEY CHARTER SCHOOL
35755 Abelia Street
Winchester, CA 92569
951.294.6775
grantbecklund@gmail.com

PREPARED BY:

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
(951) 304-9552 • FAX (951) 304-3568
JOE@JLCENGINEERING.COM

DATE PREPARED:
AUGUST 14, 2024

DATE REVISED:
JANUARY 21, 2025

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.



Joseph L. Castaneda RCE 59835 Registered Civil Engineer	01/21/25 Date	Seal

Table of Contents

I. INTRODUCTION **1**
II. PROJECT SITE AND DRAINAGE AREA OVERVIEW **1**
III. HYDROLOGY ANALYSIS **2**
IV. STORM DRAIN DESIGN **8**
V. CONCLUSIONS **10**
VI. REFERENCES **10**

FIGURES

FIGURE 1: VICINITY MAP
FIGURE 2: SUBSURFACE BASIN CROSS SECTION

APPENDICES

APPENDIX A: **PRE PROJECT CONDITION RATIONAL METHOD ANALYSIS**
APPENDIX A.1: AREA "A" – 2-YEAR STORM EVENT
APPENDIX A.2: AREA "A" – 10-YEAR STORM EVENT
APPENDIX A.3: AREA "A" – 100-YEAR STORM EVENT

APPENDIX B: **POST PROJECT CONDITION RATIONAL METHOD ANALYSIS**
APPENDIX B.1: AREA "A" – 10-YEAR STORM EVENT
APPENDIX B.2: AREA "A" – 100-YEAR STORM EVENT
APPENDIX B.3: AREA "B" – 10-YEAR STORM EVENT
APPENDIX B.4: AREA "B" – 100-YEAR STORM EVENT
APPENDIX B.5: AREA "AA" – 10-YEAR STORM EVENT
APPENDIX B.6: AREA "AA" – 100-YEAR STORM EVENT

APPENDIX C: **UNIT HYDROGRAPH CALCULATIONS (1 HR, 3 HR, 6 HR, 24 HR DURATIONS)**
APPENDIX C.1: Post Project Condition AREA A1 100-YEAR UNIT HYDROGRAPH CALCULATIONS
APPENDIX C.2: Post Project Condition AREA A2 100-YEAR UNIT HYDROGRAPH CALCULATIONS

APPENDIX D: PRELIMINARY STORM DRAIN SIZING

APPENDIX E: SUBSURFACE BASIN A STAGE-STORAGE TABLE

APPENDIX F: AREA A1 LOW POINT STAGE-STORAGE TABLE

APPENDIX G: CATCH BASIN ANALYSIS

EXCERPTS

EXCERPT 1: WASHINGTON STREET STORM DRAIN DRAWING NO. 7-0544

EXHIBITS

EXHIBIT A: PRE PROJECT CONDITION RATIONAL METHOD HYDROLOGY MAP
EXHIBIT B: POST PROJECT CONDITION RATIONAL METHOD HYDROLOGY MAP
EXHIBIT C1: Area A1POST PROJECT UNIT HYDROGRAPH
EXHIBIT C2: Area A2 POST PROJECT UNIT HYDROGRAPH
EXHIBIT D: LAND USE MAP & RUNOFF INDEX CALCULATIONS
EXHIBIT E: HYDROLOGIC SOILS MAP
EXHIBIT F: DRAINAGE FACILITIES MAP
EXHIBIT G: RAINFALL MAPS
EXHIBIT F: SLOPE OF INTENSITY DURATION CURVE

I. INTRODUCTION

APN 472-210-002 is a 12 acre property that was a rural residential property. The property will be used to obtain a Public Use Permit for the construction of a Charter School. The current condition of the property indicates that all buildings have been removed from the project site and vegetation has recovered in the disturbed areas. The site is bounded by Yates Road to the north, Washington Street to the west, a rural property to the south and the MWD Aqueduct to the east. Figure 1 is a vicinity map of the project area. The project area drains into storm drain infrastructure constructed as part of Tract Map 30837. The storm drain is defined as the Washington Street Storm Drain that is part of Project Number 7-0544, see Excerpt 1. The Washington Storm Drain system, defined on the plans as Line A, was constructed as part Tract Map 30837 and is a regional storm drain maintained and operated by RCFC&WCD. The allowable flow rate that can be discharged by the developed project will be based on the Line B and Lateral B-1 system designed to intercept flow rates tributary to the southwest corner of Washington Street and Yates Road.

The purpose of this study is to determine the required onsite storm drain improvements and infrastructure that will adequately convey the peak 100-year flows from the project site and treat the required water quality volume prior to discharging from the project site. Additionally, the study aims to demonstrate that project's peak outflow does not exceed the allowable inflow capacity of the existing Line B and Lateral B-1 storm drain infrastructure. The scope of work for this report includes:

- Determine the peak 100-year and 10-year flow rates for the post-project condition for the onsite areas using the Rational Method as outlined in the RCFC&WCD Hydrology Manual.
- Determine the required storage volume to mitigate increased runoff from the project area.
- Identify storm drain alignments to protect the project site and adequately convey the peak tributary flow rates.
- Preparation of a hydrology and hydraulics report supporting the design, which consists of hydrological and analytical results and exhibits.

II. PROJECT SITE AND DRAINAGE OVERVIEW

APN 472-210-002 will be used by Temecula Valley Charter School to construct a new charter school. The proposed site, previously an undeveloped rural residential property, will include storm drain systems, a subsurface water storage basin, and a Modular Wetland System for water quality treatment, all connecting to the Washington Street Storm Drain system. Runoff will be collected and attenuated in the subsurface basin to ensure flows do not exceed the Line B design flow rate of 8 ft^3/s and the Lateral B-12 design flow rate of 16 ft^3/s. Proposed street improvements include widening Washington

Street and Yates Road, and constructing a cul-de-sac at the intersection of Yates Road and Champagne Way.

The existing terrain currently slopes from east to west. The existing runoff flows into the adjacent streets and eventually surface flows into the existing Washington Street right-of-way. The Washington Street Storm Drain constructed Line B and Lateral B-1 to collect runoff from the southerly side of Yates Road.

III. HYDROLOGY ANALYSIS

The RCFC&WCD Hydrology Manual (Reference 1) was used to develop the hydrological parameters for the rational method. The calculations were performed using the computer program developed by Civil Cadd/Civil Design.

The existing soil classification for the area consists of Soil "B", "C" and "D" as shown in the soils map provided in Exhibit E. The soils information was obtained from the United States Department of Agriculture, Natural Resources Conservation Service (NRCS).

The following rainfall depths were obtained from RCFC&WCD Hydrology Manual which are included as Exhibit E.

Storm Event	1-hour (in)
2-Year	0.50
100-Year	1.20
Slope Intensity Curve	0.55

The rational method hydrology analyses for the project site and surrounding streets were based on a land cover (land use) breakdown shown in Exhibit D. Exhibit D provides the impervious percentages and runoff index used for the proposed project area.

The pre-project rational method hydrology was completed using eight drainage areas. The hydrology model for the pre-project are included in Appendix A. Exhibit A contains the boundaries for drainage areas and demonstrates that they are all tributary to Washington Street Storm Drain that is located along Washington Street. Please note that the pre-project flow rate at the intersection of Washington Street and Yates Road are 25.6 ft^3/s and 20.3 ft^3/s for the 100 year and 10 year storm frequencies. The Line B and Lateral B-1 design flow rates are 8 ft^3/s and 16 ft^3/s, respectively. The Line B and Lateral B-1 system total 24 ft^3/s, which is reasonable order to the 100 year pre-project flow rate of 25.6 ft^3/s.

A post-project hydrology rational method was prepared for the proposed charter school and the adjacent street improvements associated with Washington Street and Yates Road. The purpose of the study is to determine the watershed area for the proposed condition. The post-project hydrology map identified a total of three major drainage areas defined as Area A, AA, and B. The following is a description of the watershed areas:

1. Watershed A: Watershed A consists of fourteen drainage areas which accounts for 3.27 acres of offsite area and 9.9 acres of onsite area. Exhibit D provides a breakdown of the impervious % and runoff index.

2. Watershed AA: Watershed AA consists of two drainage areas AA1 and AA2. Area AA1 represents a driveway area that is within the charter school boundary. Area AA2 represents the proposed improvements along Washington Street and Yates Road. The total flow rate from Area AA1 is 0.60 ft^3/s and Area AA 2 is 5.7 ft^3/s.

3. Watershed B: Watershed B accounts for the runoff produced by Yates Road. Yates Road will convey flows towards Washington Street. A 14 foot catch basin is being proposed at the upstream limits of Line B to capture runoff from Yates Road east of Line B and the charter school driveway entrance. The total flow rate from Area B is 1.74 ft^3/s for the 100-year storm event.

The post-project rational method hydrology analyses are provided in Appendix B. The hydrology will be used to size the subsurface basin and storm drain systems. Flow rates from Area AA and Area B will not be mitigated. As a result, the proposed subsurface system within Area A will be required to detain runoff to ensure that the flows do not exceed the capacity of Line B and Lateral B-1. The total flow rate from Area AA and Area B is approximately 6.6 ft^3/s and 1.7 ft^3/s, respectively, with a combined flowrate of approximately 8.3 ft^3/s. The total capacity for the Line B and Lateral B-1 storm drain system is 24 ft^3/s; therefore, the allowable flow rate that can be released by the subsurface basin in Area A is 15.7 ft^3/s. The flowrate of 15.7 ft^3/s will be used to determine the storage volume required to mitigate project flows.

A summary of pre- and post-project rational method values are provided in Table 1, Table 2.1, Table 2.2, and Table 2.3 below.

Table 1: Pre-Project Rational Method Results Area A

NODE TO NODE	Q_{100} (CFS)	T_C (MIN.)	Q_{10} (CFS)	T_C (MIN.)
101-102	6.06	17.32	3.77	17.32
102-102	7.68	17.32	4.77	17.32
102-103	12.41	18.16	7.68	18.25
103-106	15.96	20.05	9.83	20.33
103-106	16.36	20.05	10.09	20.33
101-104	2.79	16.50	1.74	15.65
104-105	5.86	17.65	3.64	17.80
105-106	10.68	23.07	6.52	23.57
*105-106	25.64	20.04	15.72	20.33

*Denotes Confluence Point

Table 2.1: Post-Project Rational Method Results Area A

NODE TO NODE	Q_{100} (CFS)	T_C (MIN.)	Q_{10} (CFS)	T_C (MIN.)
101-103	7.76	11.97	4.85	11.97
102-103	8.03	10.33	5.00	10.33
*102-103	14.73	10.33	9.19	10.33
103-104	14.73	10.56	9.19	10.96
104-104	14.86	10.56	9.27	10.96
104-105	14.86	11.10	9.27	11.19
105-105	15.16	11.10	9.47	11.19
105-111	15.16	11.97	9.47	12.19
106-107	1.86	6.96	1.22	6.60
107-111	1.86	7.02	1.22	7.03
108-109	0.99	5.61	0.65	5.61
109-110	0.99	5.74	0.65	5.75
110-110	2.01	5.74	1.32	5.75
110-111	2.01	6.10	1.32	6.15
*110-111	17.94	11.97	11.27	12.19
111-114	17.94	12.21	11.27	12.46
112-113	1.72	6.08	1.12	6.08
113-114	1.72	6.09	1.12	6.09
*113-114	19.11	12.21	12.03	12.56
114-123	19.11	12.26	12.03	12.52
115-116	3.31	6.69	2.12	6.69
116-117	3.31	7.41	2.12	7.50
117-117	4.16	7.41	2.67	7.50
117-123	4.16	7.83	2.67	7.98
118-120	2.42	9.19	1.53	9.19
119-120	4.58	7.33	3.00	7.33
*119-120	6.51	7.33	4.22	7.33
120-123	6.51	7.48	4.22	7.50
121-122	3.24	9.23	2.11	9.23
122-123	3.24	9.23	2.11	9.23
*122-123	30.09	12.26	19.08	15.52
123-123	31.48	12.26	19.08	12.52

*Denotes Confluence Point

Table 2.2: Post-Project Rational Method Results Area AA

NODE TO NODE	Q100 (CFS)	TC (MIN.)	Q10 (CFS)	TC (MIN.)
1101-1102	0.60	5.00	0.39	5.00
1102-1103	0.60	5.26	0.39	5.30
123-123	31.48	12.26	31.48	12.26
123-1103	31.48	12.42	31.48	12.42
*123-1103	31.86	14.42	31.72	124.20
1103-1105	31.86	12.43	31.72	12.43
1105-1106	31.86	12.45	31.72	12.45
1104-1106	5.72	9.63	3.67	9.63
*1104-1106	36.82	12.45	34.91	12.45

*Denotes Confluence Point

Table 2.2: Post-Project Rational Method Results Area B

NODE TO NODE	Q_{100} (CFS)	T_C (MIN.)	Q_{10} (CFS)	T_C (MIN.)
201-202	1.74	8.98	1.10	8.98

Unit Hydrographs

Post-project Area A will be split into two different unit hydrographs. Area A1 will be shown on Exhibit C1 and Area A2 will be shown on Exhibit C2. The rainfall values for the unit hydrographs are shown below in Table 3:

Table 3: Rain Fall Values

Storm Event	1-hour (in)	3-hour (in)	6-hour (in)	24-hour (in)
2-Year	0.50	0.80	1.15	1.80
100-Year	1.20	1.80	2.50	4.50
Slope Intensity Curve	0.55			

The runoff index and the impervious percentages were obtained from the rational method model. Unit hydrographs were performed for the 100-year 1-hour, 3-hour, 6-hour, and 24-hour storm events based on the areas shown on Exhibit C1 Exhibit C2. Please note, the 2 year and 10 year storm events were not assessed. Based on communications with Benjie Cho, the project will only be required to mitigate the 100 year storm event. The RCFC&WCD interim design criteria will not be required for the project since the project drains into the following downstream systems:

1. The project will discharge into an existing storm drain defined as Warms Springs Valley Maddalena Road Storm Drain Line A which is designed for a 100 year peak flow rate. The system is owned and operated by RCFC&WCD.
2. The Maddalena Road Storm Drain Line A, discharges into the Warms Springs Valley Benton Creek Channel which is owned and operated by RCFC&WCD.
3. The Benton Creek Channel will discharge into the Benton Creek Regional Detention Basin located at the intersection of Pourroy Road and Genoa Street. The

RCFC&WCD ensures the lines and grades of the basin and Valley Wide maintains the landcape and park area.

The systems listed above are 100 year facilities, as a result, mitigation criteria based on the RCFC&WCD interim design is not required.

The model for Area A1 was developed to assess how much runoff flowrate can be mitigated by storing runoff volume on-site at inlet A1.5's localized low point, east of the proposed parking lot and soccer field. Inlet A1.5 (see Exhibit F) is designed to pond water and reduce runoff to the downstream subsurface basin. The localized low point at area A1 can store up to 0.63 ac-ft of water before overflowing into the parking lot. Therefore, inlet A1.5 will be sized to ensure ponding does not exceed 0.63 ac-ft. See Appendix F for the localized low point stage storage table.

The calculations for Area A1's unit hydrograph can be found in Appendix C.1. The unit hydrograph results for Area A1 are summarized below in Table 4.

Table 4: Area A1 Unit Hydrograph Results

100 YR STORM EVENT	PEAK FLOW RATE (CFS)	$TIME_1$ (MIN.)	Q_1 (CFS)	$VOLUME_1$ (AC-FT)	$TIME_2$ (MIN.)	Q_2 (CFS)	$VOLUME_2$ (AC-FT)	STORAGE VOLUME (AC-FT)	Q_{OUT} (CFS)
1 HOUR	17.84	0	0.00	0.00	0	0.00	0.54	0.54	0.00
3 HOUR	9.46	45	1.05	0.04	180	1.65	0.66	0.62	1.65
6 HOUR	8.29	215	1.09	0.11	350	1.12	0.74	0.63	1.12
24 HOUR	3.43	745	2.11	0.45	925	2.08	1.06	0.61	2.11

The unit hydrographs results show that the entire runoff volume produced by the 1-hour 100-year storm event can be contained within the localized low point because the total runoff volume is 0.54 ac-ft. The total runoff volume cannot be contained within the localized low point for the 3-hour, 6-hour, or 24-hour storm events. These three storm events must release 1.12 cfs to 2.11 cfs to not exceed the volume capacity of the low point. Therefore, inlet A1.5 will discharge 2.11 cfs into the Subsurface Basin A system.

Figure A Below illustrates how storage volume was determined using the unit hydrograph.

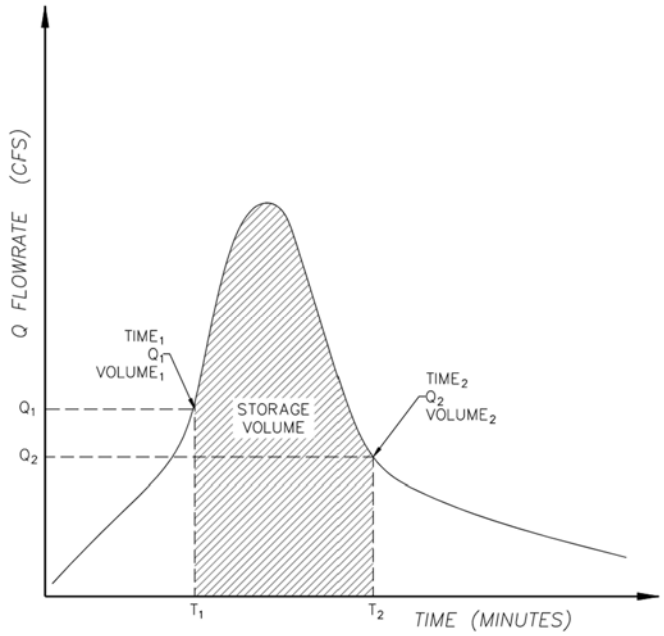


Figure A: The cumulated volumes V_2 at T_2 was subtracted from V_1 at T_1 which represents the volume under the curve as represented by the hatch area.

The model for Area A2 was developed to calculate the runoff storage volume needed to mitigate to the allowable peak flow rate. The allowable peak flow rate is determined by the remaining capacity in the existing Line B and Lateral B-1 storm drain system. Areas AA1, AA2, and B1 release a combined 8.3 cfs into the system. Runoff from Area A1 (2.11 cfs) will pass through Subsurface Basin A1 into Lateral B-1 without additional mitigation. Therefore, the storm drain system approximately receives 10.5 cfs (2.11 cfs + 8.3 cfs), reducing its capacity from 24 cfs to 13.5 cfs. As a result, the peak runoff flowrate from Area A2 must be mitigated to 13.5 cfs.

The calculations for Area A2's unit hydrograph can be found in Appendix C.2. The unit hydrograph results for Area A2 are summarized below in Table 5.

Table 5: Area A2 Unit Hydrograph Results

100 YR STORM EVENT	PEAK FLOW RATE (CFS)	$TIME_1$ (MIN.)	Q_1 (CFS)	$VOLUME_1$ (AC-FT)	$TIME_2$ (MIN.)	Q_2 (CFS)	$VOLUME_2$ (AC-FT)	STORAGE VOLUME (AC-FT)	Q_{OUT} (CFS)
1 HOUR	24.80	45	11.56	0.33	60	5.14	0.64	0.31	11.56
3 HOUR	12.13	Detention is Not Required							
6 HOUR	11.11	Detention is Not Required							
24 HOUR	4.49	Detention is Not Required							

The unit hydrograph results show that the peak flow rates for the 3-hour, 6-hour, and 24-hour storm events are all below the allowable flowrate of 13.5 cfs, therefore these storm events do not require mitigation. However, the 1-hour storm event peak flow rate exceeds 13.5 cfs, thus requiring mitigation. To mitigate the 1-hour storm event to the allowable peak flow, Subsurface Basin A must store 0.31 ac-ft of runoff volume.

Note that Lateral B-1 has a capacity of 16 cfs but may experience a combined peak flow of approximately 22 cfs. However, Areas AA1, AA2, and B1 all have a combined peak flow of 8.3 cfs and a time of concentration under 10 minutes. In contrast, Area A2's mitigated peak flow of 11.6 cfs occurs at 45 minutes as shown in Table 5 above. Therefore, the peak flows are not expected to overlap, and Lateral B-1's capacity will not be exceeded. This will be further studied during final engineering.

IV. STORM DRAIN DESIGN

The preliminary storm drains and catch basin design for the project has been identified in Exhibit F. The project is providing onsite storm drain systems required to provide flood protection for the project area. The inflows at each inlet were used to characterize the flow throughout the proposed storm drain system. Storm drain was sized using Manning's equation, assuming a 75% full flow condition. All calculations were done on a spreadsheet. Strom drain sizing has been included in Appendix D. Please note that the catch basins have been defined at the downstream end of subareas and only critical catch basins have been analyzed for the preliminary phase of this analysis. The computer program FlowMaster was used to analyze the catch basins. Catch basin calculations can be found in Appendix G. The following is a description of primary storm drain systems:

Line A

Line A will be the system that controls the outflow leaving Subsurface Basin A. The flow will be regulated to approximately 15.6 ft^3/s. All flows leaving Subsurface Basin A will pass through Modular Wetland System (MWS) Unit A which has a water quality flow capacity of 0.346. MWS Unit A will contain an overflow weir to allow the 100-year flow to pass. Line A will discharge flows into Catch Basin AA and the existing Lateral B-1.

Line A1

The Line A1 system collects runoff from post-project condition Area A1 and Area A2 shown in the Exhibits C1 and C2. All collected flows will be directed into Subsurface Basin A. At the upstream end of the system grate inlet A1.5 can be found. Grate inlet A1.5 will pond runoff produced by Area A2 and release a maximum flow rate of 2.11 cfs into the storm drain system.

Line C, D, & E

Lines C, D, and E will collect onsite runoff produce in post-project Area A1 and direct these flows into Subsurface Basin A. All flows will be captured with Caltrans standard D72B Type G1 Inlets

Catch Basin B2

Catch Basin B2 is being proposed to capture surface flows from Yates Road, east of the existing Line B (Area B1). The catch basin will be a 14-foot catch basin with 100% efficiency and a total intercepted flow rate of 1.74 ft^3/s. The catch basin will be equipped with a catch basin diversion device to send low flows into the MWS Unit A for water quality treatment and the reaming flows will be directed into existing Line B.

Catch Basin AA

Catch Basin AA is being proposed to capture surface flows from Washington Street and Yates Road (Area AA1). The catch basin will be a 10-foot catch basin. The total intercepted flow rate will be 5.72 ft^3/s. The catch basin will be equipped with a catch basin diversion device to send low flows into the MWS Unit A for water quality treatment and the reaming flows will be directed into existing Lateral B-1.

Grate Inlet A3 & Lateral A3

The Grate Inlet A3 and Lateral A3 system collects runoff from Area AA2 and runoff bypass produced by Grate Inlet A2 and Grate Inlet A1.2. The project will use a curb opening/grate inlet structure per RCTD Standard 302, 1-grate, to intercept 0.85 ft^3/s surface flows with 100% efficiency. All captured flows will be directed through Lateral A3 and confluence with Line A where it will then be directed into MWS Unit A for water quality treatment and finally discharged into existing lateral B-1.

Subsurface Basin A

Subsurface Basin A and MWS Unit A will treat onsite runoff in conformance with the WQMP protocol for the Santa Margarita Region of Riverside County. Subsurface Basin A will be composed of a single 96” CMP enclosed in gravel, with 1’ of gravel above and below the CMP and 2’ of gravel on both sides of the CMP. A cross section of the proposed subsurface basin has been included as Figure 2. The total basin volume is 0.84 ac-ft which is sufficient capacity to simultaneously store the hydromod volume (0.53 ac-ft) and the runoff storage volume (0.31 ac-ft) required for mitigation. The basin is sized to store the hydromod volume because it exceeds the 0.30 ac-ft of WQ volume. The stage-storage calculations for the proposed Subsurface Basin A can be found in Appendix E.

V. CONCLUSIONS

Hydrology and Hydraulic analyses were prepared for the project site to determine the drainage patterns and storm drain systems. The following conclusions were determined from the analysis:

1. The project site will discharge into the existing Washington Street Storm Drain System Line B and Lateral B-1.
    a. Line B (8 cfs) and Lateral B-1 (16 cfs) have a combined capacity of 24 cfs
    b. The post-project 100-year peak flow rate into the Washington Street Storm Drain system will not exceed the approved capacity of 24 cfs.

2. Subsurface Basin A is demonstrated to have adequate storage volume to satisfy increased runoff mitigation and water quality standards.

3. The proposed storm drain alignment will provide flood protection to the project site for the 100-year storm event.

4. The project will ensure that water quality standards per the MS4 Permit are met by implementing MWS system.

5. The project will be required to mitigate the 100 year storm event to ensure that the discharge does not exceed the allowable flow rate of 24 ft^3/s defined in the existing Line B and Lateral B1 Storm Drain. Mitigation for smaller storm drains are not required since the project drains into the Line A Storm Drain and the Benton Creek Channel which ultimately discharge into the existing Benton Creek Channel Regional Basin.

VI. REFERENCES

1. Riverside County Flood Control and Water Conservation District Hydrology Manual, April 1978.
2. Washington Street Storm Drain System, Project Number 7-0544

FIGURES

FIGURE 1: VICINITY MAP

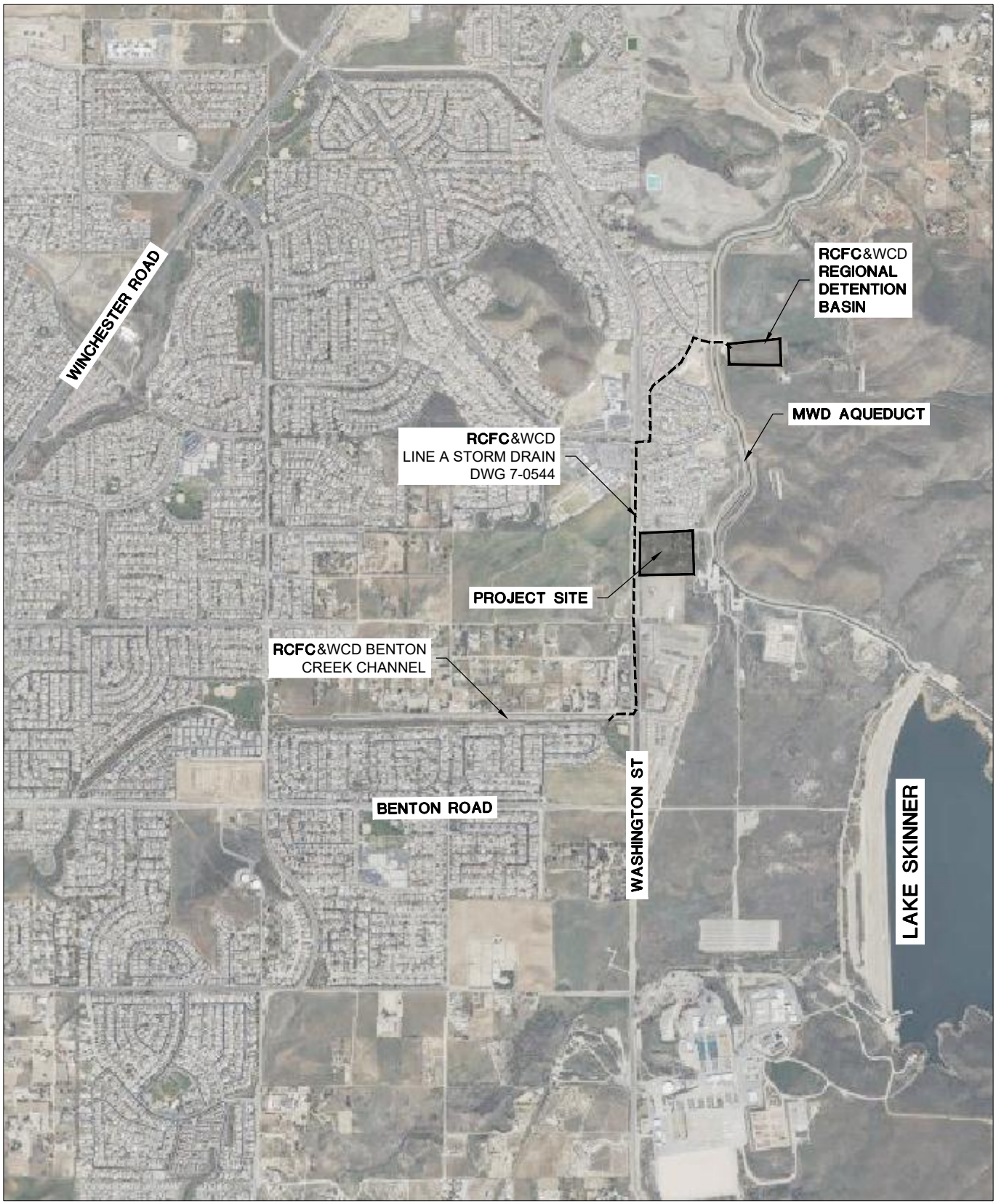


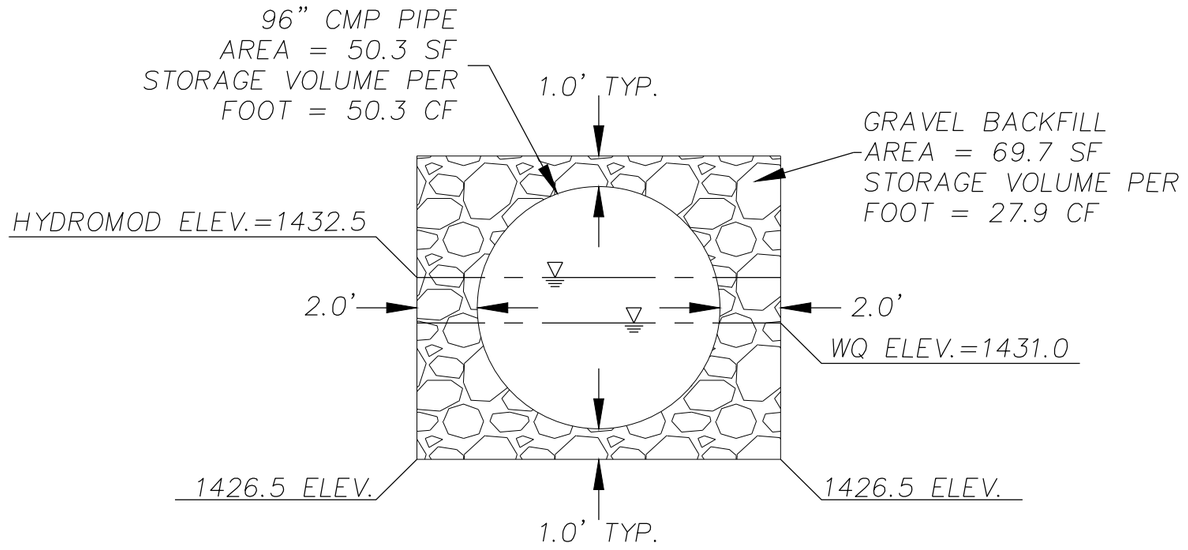
FIGURE 1 – VICINITY MAP

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

Drawing Name: O:\277.02.24\Engineering\WQMP\Appendix 1 – Maps & Site Plan\Vicinity_Map.dwg
Last Opened: Aug 15, 2024 – 6:47am by joe

FIGURE 2: SUBSURFACE BASIN CROSS SECTION

SUBSURFACE BASIN - CROSS SECTION



96" CMP UNDERGROUND CHAMBER

SCALE: 1"=5'

DESIGN NOTES:

1. *GRAVEL BACKFILL, n=0.4*
2. *LENGTH OF SUBSURFACE SYSTEM = 470 FT*
3. *WATER QUALITY VOLUME = 12,876 CF*
4. *HYDROMOD VOLUME = 22,901 CF*
5. *PROPOSED STORAGE VOLUME = 36,735 CF*

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

FIGURE 2

Drawing Name: O:\277.02.24\Engineering\Hydrology_Plan\Exhibits\FIGURE_2_BMP_X-SECTION.dwg
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APPENDICES

APPENDIX A: PRE PROJECT CONDITION RATIONAL METHOD ANALYSIS

APPENDIX A.1: AREA "A" – 2-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/11/24 File:ara2.out

277.02.24
2-YEAR RATIONAL TABLING METHOD FOR AREA A
PRE-PROJECT CONDITION
FN: ARA10.RRV

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

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

Program License Serial Number 6279

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

Storm event (year) = 2.00 Antecedent Moisture Condition = 1

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 2.0
Calculated rainfall intensity data:
1 hour intensity = 0.500(In/Hr)
Slope of intensity duration curve = 0.5500

++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 719.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1447.000(Ft.)
Difference in elevation = 43.000(Ft.)
Slope = 0.05981 s(percent)= 5.98
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.322 min.
Rainfall intensity = 0.990(In/Hr) for a 2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.542
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.220
Decimal fraction soil group D = 0.780
RI index for soil(AMC 1) = 67.06
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.695(CFS)

```
Total initial stream area =        3.160(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.509
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.710
Decimal fraction soil group D = 0.290
RI index for soil(AMC 1)  =  63.63
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    17.32 min.
Rainfall intensity =      0.990(In/Hr) for a     2.0 year storm
Subarea runoff =      0.433(CFS) for      0.860(Ac.)
Total runoff =      2.128(CFS)      Total area =       4.020(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      2.779(CFS)
Depth of flow =   0.518(Ft.), Average velocity =   3.193(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      2.779(CFS)
  '     '    flow top width =      3.364(Ft.)
  '     '    velocity=    3.193(Ft/s)
  '     '    area =      0.870(Sq.Ft)
  '     '    Froude number =     1.106

Upstream point elevation =  1447.000(Ft.)
Downstream point elevation =  1439.000(Ft.)
Flow length =   219.000(Ft.)
Travel time  =    1.14 min.
Time of concentration =   18.47 min.
Depth of flow =   0.518(Ft.)
Average velocity =   3.193(Ft/s)
Total irregular channel flow =     2.779(CFS)
Irregular channel normal depth above invert elev. =   0.518(Ft.)
Average velocity of channel(s) =   3.193(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.494
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 0.820
Decimal fraction soil group D = 0.180
RI index for soil(AMC 1)  =  62.88
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.956(In/Hr) for a     2.0 year storm
Subarea runoff =      1.227(CFS) for      2.600(Ac.)
Total runoff =      3.355(CFS)      Total area =       6.620(Ac.)
Depth of flow =   0.555(Ft.), Average velocity =   3.347(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      3.837(CFS)
Depth of flow =   0.631(Ft.), Average velocity =   2.970(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      3.837(CFS)
  '     '    flow top width =      4.098(Ft.)
  '     '    velocity=    2.970(Ft/s)
  '     '    area =      1.292(Sq.Ft)
  '     '    Froude number =     0.932

Upstream point elevation =  1439.000(Ft.)
Downstream point elevation =  1427.900(Ft.)
Flow length =   457.000(Ft.)
Travel time  =    2.56 min.
Time of concentration =   21.03 min.
Depth of flow =   0.631(Ft.)
Average velocity =   2.970(Ft/s)
Total irregular channel flow =     3.837(CFS)
Irregular channel normal depth above invert elev. =   0.631(Ft.)
Average velocity of channel(s) =   2.970(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.466
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.010
Decimal fraction soil group C = 0.990
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1)  =  61.68
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.890(In/Hr) for a     2.0 year storm
Subarea runoff =      0.867(CFS) for      2.090(Ac.)
Total runoff =      4.222(CFS)      Total area =       8.710(Ac.)
Depth of flow =   0.654(Ft.), Average velocity =   3.041(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
```

**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.842
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.290
Decimal fraction soil group C = 0.710
Decimal fraction soil group D = 0.000
RI index for soil(AMC 1) = 45.28
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 21.03 min.
Rainfall intensity = 0.890(In/Hr) for a 2.0 year storm
Subarea runoff = 0.157(CFS) for 0.210(Ac.)
Total runoff = 4.379(CFS) Total area = 8.920(Ac.)

++
Process from Point/Station 103.000 to Point/Station 106.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 8.920(Ac.)
Runoff from this stream = 4.379(CFS)
Time of concentration = 21.03 min.
Rainfall intensity = 0.890(In/Hr)
Program is now starting with Main Stream No. 2

++
Process from Point/Station 101.000 to Point/Station 104.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 697.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1440.000(Ft.)
Difference in elevation = 50.000(Ft.)
Slope = 0.07174 s(percent)= 7.17
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.497 min.
Rainfall intensity = 1.017(In/Hr) for a 2.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.562
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 1) = 68.60
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.801(CFS)
Total initial stream area = 1.400(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 104.000 to Point/Station 105.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 1.239(CFS)
Depth of flow = 0.372(Ft.), Average velocity = 2.749(Ft/s)

```
      ******* Irregular Channel Data ***********
--------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
--------------------------------------------------------------------
Sub-Channel flow  =      1.239(CFS)
  '     '    flow top width =      2.421(Ft.)
  '     '    velocity=    2.749(Ft/s)
  '     '    area =      0.451(Sq.Ft)
  '     '    Froude number =     1.122

Upstream point elevation =  1440.000(Ft.)
Downstream point elevation =  1429.000(Ft.)
Flow length =   262.000(Ft.)
Travel time  =    1.59 min.
Time of concentration =   18.09 min.
Depth of flow =   0.372(Ft.)
Average velocity =   2.749(Ft/s)
Total irregular channel flow =     1.239(CFS)
Irregular channel normal depth above invert elev. =   0.372(Ft.)
Average velocity of channel(s) =   2.749(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.507
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.660
Decimal fraction soil group D = 0.340
RI index for soil(AMC 1)  =  63.98
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.967(In/Hr) for a     2.0 year storm
Subarea runoff =      0.808(CFS) for      1.650(Ac.)
Total runoff =      1.609(CFS)      Total area =       3.050(Ac.)
Depth of flow =   0.411(Ft.), Average velocity =   2.934(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
____________________________________________________________________
Estimated mean flow rate at midpoint of channel =      2.202(CFS)
Depth of flow =   0.786(Ft.), Average velocity =   1.096(Ft/s)
      ******* Irregular Channel Data ***********
--------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
--------------------------------------------------------------------
Sub-Channel flow  =      2.202(CFS)
```

```
  '     '    flow top width =      5.110(Ft.)
  '     '    velocity=    1.096(Ft/s)
  '     '    area =      2.008(Sq.Ft)
  '     '    Froude number =     0.308

Upstream point elevation =  1429.000(Ft.)
Downstream point elevation =  1427.900(Ft.)
Flow length =   446.000(Ft.)
Travel time  =    6.78 min.
Time of concentration =   24.87 min.
Depth of flow =   0.786(Ft.)
Average velocity =   1.096(Ft/s)
Total irregular channel flow =     2.202(CFS)
Irregular channel normal depth above invert elev. =   0.786(Ft.)
Average velocity of channel(s) =   1.096(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.444
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.890
Decimal fraction soil group D = 0.060
RI index for soil(AMC 1)  =  61.56
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      0.812(In/Hr) for a     2.0 year storm
Subarea runoff =      1.118(CFS) for      3.100(Ac.)
Total runoff =      2.727(CFS)      Total area =       6.150(Ac.)
Depth of flow =   0.852(Ft.), Average velocity =   1.156(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.150(Ac.)
Runoff from this stream =      2.727(CFS)
Time of concentration =   24.87 min.
Rainfall intensity =     0.812(In/Hr)
Summary of stream data:

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


1        4.379     21.03               0.890
2        2.727     24.87               0.812
Largest stream flow has longer or shorter time of concentration
Qp =      4.379 + sum of
        Qa          Tb/Ta
         2.727 *    0.846 =      2.306
Qp =      6.686

Total of 2 main streams to confluence:
Flow rates before confluence point:
       4.379       2.727
Area of streams before confluence:
        8.920        6.150
```

Results of confluence:
Total flow rate = 6.686(CFS)
Time of concentration = 21.030 min.
Effective stream area after confluence = 15.070(Ac.)
End of computations, total study area = 15.07 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.987
Area averaged RI index number = 80.5

APPENDIX A.2: AREA "A" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/11/24 File:ara10.out

277.02.24
10-YEAR RATIONAL TABLING METHOD FOR AREA A
PRE-PROJECT CONDITION
FN: ARA10.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.788(In/Hr)
Slope of intensity duration curve = 0.5500

++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 719.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1447.000(Ft.)
Difference in elevation = 43.000(Ft.)
Slope = 0.05981 s(percent)= 5.98
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.322 min.
Rainfall intensity = 1.561(In/Hr) for a 10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.765
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.220
Decimal fraction soil group D = 0.780
RI index for soil(AMC 2) = 82.90
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 3.773(CFS)

```
Total initial stream area =        3.160(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.745
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.710
Decimal fraction soil group D = 0.290
RI index for soil(AMC 2)  =  80.45
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    17.32 min.
Rainfall intensity =      1.561(In/Hr) for a    10.0 year storm
Subarea runoff =      1.000(CFS) for      0.860(Ac.)
Total runoff =      4.773(CFS)      Total area =       4.020(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      6.271(CFS)
Depth of flow =   0.702(Ft.), Average velocity =   3.913(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      6.271(CFS)
  '     '    flow top width =      4.565(Ft.)
  '     '    velocity=    3.913(Ft/s)
  '     '    area =      1.603(Sq.Ft)
  '     '    Froude number =     1.164

Upstream point elevation =  1447.000(Ft.)
Downstream point elevation =  1439.000(Ft.)
Flow length =   219.000(Ft.)
Travel time  =    0.93 min.
Time of concentration =   18.25 min.
Depth of flow =   0.702(Ft.)
Average velocity =   3.913(Ft/s)
Total irregular channel flow =     6.271(CFS)
Irregular channel normal depth above invert elev. =   0.702(Ft.)
Average velocity of channel(s) =   3.913(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.737
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 0.820
Decimal fraction soil group D = 0.180
RI index for soil(AMC 2)  =  79.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.516(In/Hr) for a    10.0 year storm
Subarea runoff =      2.905(CFS) for      2.600(Ac.)
Total runoff =      7.678(CFS)      Total area =       6.620(Ac.)
Depth of flow =   0.758(Ft.), Average velocity =   4.116(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      8.788(CFS)
Depth of flow =   0.860(Ft.), Average velocity =   3.653(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      8.788(CFS)
  '     '    flow top width =      5.592(Ft.)
  '     '    velocity=    3.653(Ft/s)
  '     '    area =      2.406(Sq.Ft)
  '     '    Froude number =     0.982

Upstream point elevation =  1439.000(Ft.)
Downstream point elevation =  1427.900(Ft.)
Flow length =   457.000(Ft.)
Travel time  =    2.08 min.
Time of concentration =   20.34 min.
Depth of flow =   0.860(Ft.)
Average velocity =   3.653(Ft/s)
Total irregular channel flow =     8.788(CFS)
Irregular channel normal depth above invert elev. =   0.860(Ft.)
Average velocity of channel(s) =   3.653(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.720
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.010
Decimal fraction soil group C = 0.990
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.429(In/Hr) for a    10.0 year storm
Subarea runoff =      2.150(CFS) for      2.090(Ac.)
Total runoff =      9.829(CFS)      Total area =       8.710(Ac.)
Depth of flow =   0.897(Ft.), Average velocity =   3.757(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
```

**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.290
Decimal fraction soil group C = 0.710
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 65.23
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 20.34 min.
Rainfall intensity = 1.429(In/Hr) for a 10.0 year storm
Subarea runoff = 0.261(CFS) for 0.210(Ac.)
Total runoff = 10.090(CFS) Total area = 8.920(Ac.)

++
Process from Point/Station 103.000 to Point/Station 106.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 8.920(Ac.)
Runoff from this stream = 10.090(CFS)
Time of concentration = 20.34 min.
Rainfall intensity = 1.429(In/Hr)
Program is now starting with Main Stream No. 2

++
Process from Point/Station 101.000 to Point/Station 104.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 697.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1440.000(Ft.)
Difference in elevation = 50.000(Ft.)
Slope = 0.07174 s(percent)= 7.17
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.497 min.
Rainfall intensity = 1.603(In/Hr) for a 10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.777
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 84.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.744(CFS)
Total initial stream area = 1.400(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 104.000 to Point/Station 105.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 2.730(CFS)
Depth of flow = 0.501(Ft.), Average velocity = 3.349(Ft/s)

```
      ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
-----------------------------------------------------------------
Sub-Channel flow  =      2.730(CFS)
  '     '    flow top width =      3.255(Ft.)
  '     '    velocity=    3.349(Ft/s)
  '     '    area =      0.815(Sq.Ft)
  '     '    Froude number =     1.179

Upstream point elevation =  1440.000(Ft.)
Downstream point elevation =  1429.000(Ft.)
Flow length =   262.000(Ft.)
Travel time  =    1.30 min.
Time of concentration =   17.80 min.
Depth of flow =   0.501(Ft.)
Average velocity =   3.349(Ft/s)
Total irregular channel flow =     2.730(CFS)
Irregular channel normal depth above invert elev. =   0.501(Ft.)
Average velocity of channel(s) =   3.349(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.745
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.660
Decimal fraction soil group D = 0.340
RI index for soil(AMC 2)  =  80.70
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.537(In/Hr) for a    10.0 year storm
Subarea runoff =      1.891(CFS) for      1.650(Ac.)
Total runoff =      3.634(CFS)      Total area =       3.050(Ac.)
Depth of flow =   0.558(Ft.), Average velocity =   3.597(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
_________________________________________________________________
Estimated mean flow rate at midpoint of channel =      5.103(CFS)
Depth of flow =   1.100(Ft.), Average velocity =   1.283(Ft/s)
      ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
-----------------------------------------------------------------
Sub-Channel flow  =      5.103(CFS)
```

```
  '     '    flow top width =      8.052(Ft.)
  '     '    velocity=    1.283(Ft/s)
  '     '    area =      3.979(Sq.Ft)
  '     '    Froude number =     0.322

Upstream point elevation =  1429.000(Ft.)
Downstream point elevation =  1427.900(Ft.)
Flow length =   446.000(Ft.)
Travel time  =    5.80 min.
Time of concentration =   23.60 min.
Depth of flow =   1.100(Ft.)
Average velocity =   1.283(Ft/s)
Total irregular channel flow =     5.103(CFS)
Irregular channel normal depth above invert elev. =   1.100(Ft.)
Average velocity of channel(s) =   1.283(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.707
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.890
Decimal fraction soil group D = 0.060
RI index for soil(AMC 2)  =  78.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      1.317(In/Hr) for a    10.0 year storm
Subarea runoff =      2.887(CFS) for      3.100(Ac.)
Total runoff =      6.521(CFS)      Total area =       6.150(Ac.)
Depth of flow =   1.211(Ft.), Average velocity =   1.312(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.150(Ac.)
Runoff from this stream =      6.521(CFS)
Time of concentration =   23.60 min.
Rainfall intensity =     1.317(In/Hr)
Summary of stream data:

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


1       10.090     20.34               1.429
2        6.521     23.60               1.317
Largest stream flow has longer or shorter time of concentration
Qp =     10.090 + sum of
        Qa          Tb/Ta
         6.521 *    0.862 =      5.621
Qp =     15.711

Total of 2 main streams to confluence:
Flow rates before confluence point:
      10.090       6.521
Area of streams before confluence:
        8.920        6.150
```

Results of confluence:
Total flow rate = 15.711(CFS)
Time of concentration = 20.340 min.
Effective stream area after confluence = 15.070(Ac.)
End of computations, total study area = 15.07 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.987
Area averaged RI index number = 80.5

APPENDIX A.3: AREA "A" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 08/11/24 File:ara100.out

277.02.24
100-YEAR RATIONAL TABLING METHOD FOR AREA A
PRE-PROJECT CONDITION
FN: ARA100.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5500

++
Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 719.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1447.000(Ft.)
Difference in elevation = 43.000(Ft.)
Slope = 0.05981 s(percent)= 5.98
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.322 min.
Rainfall intensity = 2.376(In/Hr) for a 100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.807
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.220
Decimal fraction soil group D = 0.780
RI index for soil(AMC 2) = 82.90
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 6.058(CFS)

```
Total initial stream area =        3.160(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.792
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.710
Decimal fraction soil group D = 0.290
RI index for soil(AMC 2)  =  80.45
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    17.32 min.
Rainfall intensity =      2.376(In/Hr) for a   100.0 year storm
Subarea runoff =      1.619(CFS) for      0.860(Ac.)
Total runoff =      7.676(CFS)      Total area =       4.020(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =     10.072(CFS)
Depth of flow =   0.839(Ft.), Average velocity =   4.405(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =     10.072(CFS)
  '     '    flow top width =      5.452(Ft.)
  '     '    velocity=    4.405(Ft/s)
  '     '    area =      2.287(Sq.Ft)
  '     '    Froude number =     1.199

Upstream point elevation =  1447.000(Ft.)
Downstream point elevation =  1439.000(Ft.)
Flow length =   219.000(Ft.)
Travel time  =    0.83 min.
Time of concentration =   18.15 min.
Depth of flow =   0.839(Ft.)
Average velocity =   4.405(Ft/s)
Total irregular channel flow =    10.072(CFS)
Irregular channel normal depth above invert elev. =   0.839(Ft.)
Average velocity of channel(s) =   4.405(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.786
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 0.820
Decimal fraction soil group D = 0.180
RI index for soil(AMC 2)  =  79.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.316(In/Hr) for a   100.0 year storm
Subarea runoff =      4.734(CFS) for      2.600(Ac.)
Total runoff =     12.411(CFS)      Total area =       6.620(Ac.)
Depth of flow =   0.907(Ft.), Average velocity =   4.641(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =     14.231(CFS)
Depth of flow =   1.043(Ft.), Average velocity =   4.018(Ft/s)
      ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
----------------------------------------------------------------
Sub-Channel flow  =     14.231(CFS)
  '     '    flow top width =      7.162(Ft.)
  '     '    velocity=    4.018(Ft/s)
  '     '    area =      3.542(Sq.Ft)
  '     '    Froude number =     1.007

Upstream point elevation =  1439.000(Ft.)
Downstream point elevation =  1427.900(Ft.)
Flow length =   457.000(Ft.)
Travel time  =    1.90 min.
Time of concentration =   20.05 min.
Depth of flow =   1.043(Ft.)
Average velocity =   4.018(Ft/s)
Total irregular channel flow =    14.231(CFS)
Irregular channel normal depth above invert elev. =   1.043(Ft.)
Average velocity of channel(s) =   4.018(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.774
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.010
Decimal fraction soil group C = 0.990
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.90
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.193(In/Hr) for a   100.0 year storm
Subarea runoff =      3.548(CFS) for      2.090(Ac.)
Total runoff =     15.959(CFS)      Total area =       8.710(Ac.)
Depth of flow =   1.099(Ft.), Average velocity =   4.024(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      106.000
```

**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.878
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.290
Decimal fraction soil group C = 0.710
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 65.23
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 20.05 min.
Rainfall intensity = 2.193(In/Hr) for a 100.0 year storm
Subarea runoff = 0.404(CFS) for 0.210(Ac.)
Total runoff = 16.363(CFS) Total area = 8.920(Ac.)

++

Process from Point/Station 103.000 to Point/Station 106.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area = 8.920(Ac.)
Runoff from this stream = 16.363(CFS)
Time of concentration = 20.05 min.
Rainfall intensity = 2.193(In/Hr)
Program is now starting with Main Stream No. 2

++

Process from Point/Station 101.000 to Point/Station 104.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 697.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1440.000(Ft.)
Difference in elevation = 50.000(Ft.)
Slope = 0.07174 s(percent)= 7.17
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 16.497 min.
Rainfall intensity = 2.441(In/Hr) for a 100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.815
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 84.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.786(CFS)
Total initial stream area = 1.400(Ac.)
Pervious area fraction = 1.000

++

Process from Point/Station 104.000 to Point/Station 105.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 4.350(CFS)
Depth of flow = 0.596(Ft.), Average velocity = 3.762(Ft/s)

```
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      4.350(CFS)
  '     '    flow top width =      3.877(Ft.)
  '     '    velocity=    3.762(Ft/s)
  '     '    area =      1.156(Sq.Ft)
  '     '    Froude number =     1.214

Upstream point elevation =  1440.000(Ft.)
Downstream point elevation =  1429.000(Ft.)
Flow length =   262.000(Ft.)
Travel time  =    1.16 min.
Time of concentration =   17.66 min.
Depth of flow =   0.596(Ft.)
Average velocity =   3.762(Ft/s)
Total irregular channel flow =     4.350(CFS)
Irregular channel normal depth above invert elev. =   0.596(Ft.)
Average velocity of channel(s) =   3.762(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.793
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.660
Decimal fraction soil group D = 0.340
RI index for soil(AMC 2)  =  80.70
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.352(In/Hr) for a   100.0 year storm
Subarea runoff =      3.075(CFS) for      1.650(Ac.)
Total runoff =      5.861(CFS)      Total area =       3.050(Ac.)
Depth of flow =   0.667(Ft.), Average velocity =   4.054(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
Estimated mean flow rate at midpoint of channel =      8.300(CFS)
Depth of flow =   1.319(Ft.), Average velocity =   1.358(Ft/s)
      ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
      1              0.00              2.00
      2              3.50              1.00
      3              6.00              0.00
      4             10.00              1.00
      5             22.00              2.00
Manning's 'N' friction factor =   0.035
------------------------------------------------------------------
Sub-Channel flow  =      8.300(CFS)
```

```
  '     '    flow top width =     11.442(Ft.)
  '     '    velocity=    1.358(Ft/s)
  '     '    area =      6.110(Sq.Ft)
  '     '    Froude number =     0.328

Upstream point elevation =  1429.000(Ft.)
Downstream point elevation =  1427.900(Ft.)
Flow length =   446.000(Ft.)
Travel time  =    5.47 min.
Time of concentration =   23.13 min.
Depth of flow =   1.319(Ft.)
Average velocity =   1.358(Ft/s)
Total irregular channel flow =     8.300(CFS)
Irregular channel normal depth above invert elev. =   1.319(Ft.)
Average velocity of channel(s) =   1.358(Ft/s)
 Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.765
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.890
Decimal fraction soil group D = 0.060
RI index for soil(AMC 2)  =  78.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Rainfall intensity =      2.027(In/Hr) for a   100.0 year storm
Subarea runoff =      4.805(CFS) for      3.100(Ac.)
Total runoff =     10.666(CFS)      Total area =       6.150(Ac.)
Depth of flow =   1.433(Ft.), Average velocity =   1.420(Ft/s)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      106.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.150(Ac.)
Runoff from this stream =     10.666(CFS)
Time of concentration =   23.13 min.
Rainfall intensity =     2.027(In/Hr)
Summary of stream data:

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


1       16.363     20.05               2.193
2       10.666     23.13               2.027
Largest stream flow has longer or shorter time of concentration
Qp =     16.363 + sum of
        Qa          Tb/Ta
        10.666 *    0.867 =      9.245
Qp =     25.608

Total of 2 main streams to confluence:
Flow rates before confluence point:
      16.363      10.666
Area of streams before confluence:
        8.920        6.150
```

Results of confluence:
Total flow rate = 25.608(CFS)
Time of concentration = 20.046 min.
Effective stream area after confluence = 15.070(Ac.)
End of computations, total study area = 15.07 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.987
Area averaged RI index number = 80.5

APPENDIX B: POST PROJECT CONDITION RATIONAL METHOD ANALYSIS

APPENDIX B.1: AREA "A" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 01/21/25 File:ARA10.out

277.02.24
10YR RATIONAL TABLING METHOD FOR AREA A
POST-PROJECT CONDITION
FN: ARA10.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.788(In/Hr)
Slope of intensity duration curve = 0.5500

++

Process from Point/Station 101.000 to Point/Station 103.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 572.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1443.000(Ft.)
Difference in elevation = 47.000(Ft.)
Slope = 0.08217 s(percent)= 8.22
TC = k(0.573)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.967 min.
Rainfall intensity = 1.913(In/Hr) for a 10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.776

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.257
Decimal fraction soil group D = 0.743
RI index for soil(AMC 2)  =  81.31
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.851(CFS)
Total initial stream area =        3.270(Ac.)
Pervious area fraction = 1.000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.270(Ac.)
Runoff from this stream =      4.851(CFS)
Time of concentration =   11.97 min.
Rainfall intensity =     1.913(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   618.000(Ft.)
Top (of initial area) elevation =  1490.000(Ft.)
Bottom (of initial area) elevation =  1443.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.07605  s(percent)=       7.61
TC = k(0.480)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.505 min.
Rainfall intensity =      2.055(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.760
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.640
Decimal fraction soil group D = 0.360
RI index for soil(AMC 2)  =  72.88
Pervious area fraction =  0.800; Impervious fraction =  0.200
Initial subarea runoff =      4.950(CFS)
Total initial stream area =        3.170(Ac.)
Pervious area fraction = 0.800


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.170(Ac.)
```

```
Runoff from this stream =      4.950(CFS)
Time of concentration =   10.51 min.
Rainfall intensity =     2.055(In/Hr)
Summary of stream data:

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


1        4.851     11.97                 1.913
2        4.950     10.51                 2.055
Largest stream flow has longer or shorter time of concentration
Qp =      4.950 + sum of
        Qa          Tb/Ta
         4.851 *    0.878 =      4.259
Qp =      9.208

Total of 2 streams to confluence:
Flow rates before confluence point:
       4.851       4.950
Area of streams before confluence:
        3.270        3.170
Results of confluence:
Total flow rate =      9.208(CFS)
Time of concentration =    10.505 min.
Effective stream area after confluence =      6.440(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1438.000(Ft.)
Pipe length  =   198.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.208(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     9.208(CFS)
Normal flow depth in pipe =   14.44(In.)
Flow top width inside pipe =   19.47(In.)
Critical Depth =   13.54(In.)
Pipe flow velocity =      5.22(Ft/s)
Travel time through pipe =    0.63 min.
Time of concentration (TC) =    11.14 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.696
Decimal fraction soil group A = 0.000
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.167
Decimal fraction soil group D = 0.833
RI index for soil(AMC 2)  =  69.54
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.14 min.
Rainfall intensity =      1.990(In/Hr) for a    10.0 year storm
Subarea runoff =      0.083(CFS) for      0.060(Ac.)
Total runoff =      9.291(CFS)      Total area =       6.500(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1438.000(Ft.)
Downstream point/station elevation =  1437.000(Ft.)
Pipe length  =    95.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.291(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.291(CFS)
Normal flow depth in pipe =   12.89(In.)
Flow top width inside pipe =   16.23(In.)
Critical Depth =   14.13(In.)
Pipe flow velocity =      6.86(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =    11.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.55
Pervious area fraction =  0.070; Impervious fraction =  0.930
Time of concentration =    11.37 min.
Rainfall intensity =      1.967(In/Hr) for a    10.0 year storm
Subarea runoff =      0.192(CFS) for      0.110(Ac.)
Total runoff =      9.483(CFS)      Total area =       6.610(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      111.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1437.000(Ft.)
Downstream point/station elevation =  1436.000(Ft.)
```

```
Pipe length  =   273.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.483(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     9.483(CFS)
Normal flow depth in pipe =   17.02(In.)
Flow top width inside pipe =   16.47(In.)
Critical Depth =   13.75(In.)
Pipe flow velocity =      4.55(Ft/s)
Travel time through pipe =    1.00 min.
Time of concentration (TC) =    12.37 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      105.000 to Point/Station      111.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      6.610(Ac.)
Runoff from this stream =      9.483(CFS)
Time of concentration =   12.37 min.
Rainfall intensity =     1.878(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      106.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   338.000(Ft.)
Top (of initial area) elevation =  1446.400(Ft.)
Bottom (of initial area) elevation =  1442.000(Ft.)
Difference in elevation =     4.400(Ft.)
Slope =    0.01302  s(percent)=       1.30
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.341 min.
Rainfall intensity =      2.502(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.893
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.040; Impervious fraction =  0.960
Initial subarea runoff =      1.184(CFS)
Total initial stream area =        0.530(Ac.)
Pervious area fraction = 0.040


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      111.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
```

```
Upstream point/station elevation =  1438.000(Ft.)
Downstream point/station elevation =  1436.000(Ft.)
Pipe length  =    33.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.184(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.184(CFS)
Normal flow depth in pipe =    4.28(In.)
Flow top width inside pipe =    5.43(In.)
Critical depth could not be calculated.
Pipe flow velocity =      7.91(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     7.41 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      107.000 to Point/Station      111.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.530(Ac.)
Runoff from this stream =      1.184(CFS)
Time of concentration =    7.41 min.
Rainfall intensity =     2.489(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      108.000 to Point/Station      109.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   222.000(Ft.)
Top (of initial area) elevation =  1447.200(Ft.)
Bottom (of initial area) elevation =  1444.000(Ft.)
Difference in elevation =     3.200(Ft.)
Slope =    0.01441  s(percent)=       1.44
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.080 min.
Rainfall intensity =      2.776(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.898
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.010; Impervious fraction =  0.990
Initial subarea runoff =      0.623(CFS)
Total initial stream area =        0.250(Ac.)
Pervious area fraction = 0.010
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      109.000 to Point/Station      110.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1440.000(Ft.)
Downstream point/station elevation =  1439.000(Ft.)
Pipe length  =    41.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.623(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.623(CFS)
Normal flow depth in pipe =    3.74(In.)
Flow top width inside pipe =    5.82(In.)
Critical Depth =    4.81(In.)
Pipe flow velocity =      4.84(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =     6.22 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      110.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.898
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.010; Impervious fraction =  0.990
Time of concentration =     6.22 min.
Rainfall intensity =      2.741(In/Hr) for a    10.0 year storm
Subarea runoff =      0.640(CFS) for      0.260(Ac.)
Total runoff =      1.264(CFS)      Total area =       0.510(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1436.000(Ft.)
Pipe length  =   135.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.264(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.264(CFS)
Normal flow depth in pipe =    4.56(In.)
Flow top width inside pipe =    9.00(In.)
Critical Depth =    6.21(In.)
Pipe flow velocity =      5.62(Ft/s)
Travel time through pipe =    0.40 min.
Time of concentration (TC) =     6.62 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      110.000 to Point/Station      111.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      0.510(Ac.)
Runoff from this stream =      1.264(CFS)
Time of concentration =    6.62 min.
Rainfall intensity =     2.648(In/Hr)
Summary of stream data:

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


1        9.483     12.37               1.878
2        1.184      7.41               2.489
3        1.264      6.62               2.648
Largest stream flow has longer time of concentration
Qp =      9.483 + sum of
        Qb         Ia/Ib
         1.184 *    0.754 =      0.894
        Qb         Ia/Ib
         1.264 *    0.709 =      0.896
Qp =     11.272

Total of 3 main streams to confluence:
Flow rates before confluence point:
       9.483       1.184       1.264
Area of streams before confluence:
        6.610        0.530        0.510


Results of confluence:
Total flow rate =     11.272(CFS)
Time of concentration =    12.369 min.
Effective stream area after confluence  =      7.650(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1436.000(Ft.)
Downstream point/station elevation =  1435.000(Ft.)
Pipe length  =   111.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.272(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    11.272(CFS)
Normal flow depth in pipe =   13.57(In.)
Flow top width inside pipe =   20.08(In.)
```

```
Critical Depth =   15.01(In.)
Pipe flow velocity =      6.86(Ft/s)
Travel time through pipe =    0.27 min.
Time of concentration (TC) =    12.64 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      111.000 to Point/Station      114.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      7.650(Ac.)
Runoff from this stream =     11.272(CFS)
Time of concentration =   12.64 min.
Rainfall intensity =     1.856(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      112.000 to Point/Station      113.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   240.000(Ft.)
Top (of initial area) elevation =  1444.300(Ft.)
Bottom (of initial area) elevation =  1439.600(Ft.)
Difference in elevation =     4.700(Ft.)
Slope =    0.01958  s(percent)=       1.96
TC = k(0.309)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.081 min.
Rainfall intensity =      2.775(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.878
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.140; Impervious fraction =  0.860
Initial subarea runoff =      1.120(CFS)
Total initial stream area =        0.460(Ac.)
Pervious area fraction = 0.140


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1435.600(Ft.)
Downstream point/station elevation =  1435.000(Ft.)
Pipe length  =     6.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.120(CFS)
Nearest computed pipe diameter  =      6.00(In.)
```

```
Calculated individual pipe flow  =     1.120(CFS)
Normal flow depth in pipe =    3.46(In.)
Flow top width inside pipe =    5.93(In.)
Critical depth could not be calculated.
Pipe flow velocity =      9.56(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     6.09 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      113.000 to Point/Station      114.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.460(Ac.)
Runoff from this stream =      1.120(CFS)
Time of concentration =    6.09 min.
Rainfall intensity =     2.773(In/Hr)
Summary of stream data:

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


1       11.272     12.64               1.856
2        1.120      6.09               2.773
Largest stream flow has longer time of concentration
Qp =     11.272 + sum of
        Qb         Ia/Ib
         1.120 *    0.669 =      0.750
Qp =     12.022

Total of 2 main streams to confluence:
Flow rates before confluence point:
      11.272       1.120
Area of streams before confluence:
        7.650        0.460


Results of confluence:
Total flow rate =     12.022(CFS)
Time of concentration =    12.639 min.
Effective stream area after confluence  =      8.110(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1435.000(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
```

```
No. of pipes = 1  Required pipe flow  =    12.022(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    12.022(CFS)
Normal flow depth in pipe =    9.11(In.)
Flow top width inside pipe =   14.65(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.42(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    12.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      114.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      8.110(Ac.)
Runoff from this stream =     12.022(CFS)
Time of concentration =   12.70 min.
Rainfall intensity =     1.851(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      115.000 to Point/Station      116.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   170.000(Ft.)
Top (of initial area) elevation =  1447.120(Ft.)
Bottom (of initial area) elevation =  1444.000(Ft.)
Difference in elevation =     3.120(Ft.)
Slope =    0.01835  s(percent)=       1.84
TC = k(0.383)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.653 min.
Rainfall intensity =      2.641(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.829
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  70.36
Pervious area fraction =  0.450; Impervious fraction =  0.550
Initial subarea runoff =      2.124(CFS)
Total initial stream area =        0.970(Ac.)
Pervious area fraction = 0.450


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Process from Point/Station      116.000 to Point/Station      117.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
```

```
Upstream point/station elevation =  1440.000(Ft.)
Downstream point/station elevation =  1439.000(Ft.)
Pipe length  =   181.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.124(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.124(CFS)
Normal flow depth in pipe =    8.13(In.)
Flow top width inside pipe =   11.22(In.)
Critical Depth =    7.47(In.)
Pipe flow velocity =      3.75(Ft/s)
Travel time through pipe =    0.80 min.
Time of concentration (TC) =     7.46 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      117.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.898
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.560
Decimal fraction soil group D = 0.440
RI index for soil(AMC 2)  =  71.61
Pervious area fraction =  0.010; Impervious fraction =  0.990
Time of concentration =     7.46 min.
Rainfall intensity =      2.481(In/Hr) for a    10.0 year storm
Subarea runoff =      0.557(CFS) for      0.250(Ac.)
Total runoff =      2.681(CFS)      Total area =       1.220(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =   228.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.681(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.681(CFS)
Normal flow depth in pipe =    6.46(In.)
Flow top width inside pipe =    8.10(In.)
Critical Depth =    8.46(In.)
Pipe flow velocity =      7.89(Ft/s)
Travel time through pipe =    0.48 min.
Time of concentration (TC) =     7.94 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      117.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
```

```
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.220(Ac.)
Runoff from this stream =      2.681(CFS)
Time of concentration =    7.94 min.
Rainfall intensity =     2.397(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      118.000 to Point/Station      120.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   575.000(Ft.)
Top (of initial area) elevation =  1490.000(Ft.)
Bottom (of initial area) elevation =  1442.200(Ft.)
Difference in elevation =    47.800(Ft.)
Slope =    0.08313  s(percent)=       8.31
TC = k(0.441)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.212 min.
Rainfall intensity =      2.209(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.806
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.081
Decimal fraction soil group D = 0.919
RI index for soil(AMC 2)  =  76.62
Pervious area fraction =  0.670; Impervious fraction =  0.330
Initial subarea runoff =      1.531(CFS)
Total initial stream area =        0.860(Ac.)
Pervious area fraction = 0.670


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      118.000 to Point/Station      120.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =      0.860(Ac.)
Runoff from this stream =      1.531(CFS)
Time of concentration =    9.21 min.
Rainfall intensity =     2.209(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      120.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   398.000(Ft.)
Top (of initial area) elevation =  1448.000(Ft.)
Bottom (of initial area) elevation =  1442.200(Ft.)
```

```
Difference in elevation =     5.800(Ft.)
Slope =    0.01457  s(percent)=       1.46
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.662 min.
Rainfall intensity =      2.444(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.893
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.052
Decimal fraction soil group D = 0.948
RI index for soil(AMC 2)  =  74.70
Pervious area fraction =  0.050; Impervious fraction =  0.950
Initial subarea runoff =      2.924(CFS)
Total initial stream area =        1.340(Ac.)
Pervious area fraction = 0.050


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      120.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      1.340(Ac.)
Runoff from this stream =      2.924(CFS)
Time of concentration =    7.66 min.
Rainfall intensity =     2.444(In/Hr)
Summary of stream data:

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


1        1.531      9.21                2.209
2        2.924      7.66                2.444
Largest stream flow has longer or shorter time of concentration
Qp =      2.924 + sum of
        Qa          Tb/Ta
         1.531 *    0.832 =      1.274
Qp =      4.198

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.531       2.924
Area of streams before confluence:
        0.860        1.340
Results of confluence:
Total flow rate =      4.198(CFS)
Time of concentration =     7.662 min.
Effective stream area after confluence =      2.200(Ac.)


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

```
Process from Point/Station      120.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1438.200(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =   115.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.198(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.198(CFS)
Normal flow depth in pipe =    5.79(In.)
Flow top width inside pipe =   11.99(In.)
Critical Depth =   10.37(In.)
Pipe flow velocity =     11.18(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     7.83 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      2.200(Ac.)
Runoff from this stream =      4.198(CFS)
Time of concentration =    7.83 min.
Rainfall intensity =     2.414(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      121.000 to Point/Station      122.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   474.000(Ft.)
Top (of initial area) elevation =  1444.300(Ft.)
Bottom (of initial area) elevation =  1440.000(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.00907  s(percent)=       0.91
TC = k(0.307)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.242 min.
Rainfall intensity =      2.205(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.706
Decimal fraction soil group D = 0.294
RI index for soil(AMC 2)  =  70.73
Pervious area fraction =  0.130; Impervious fraction =  0.870
Initial subarea runoff =      2.106(CFS)
Total initial stream area =        1.090(Ac.)
Pervious area fraction = 0.130
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      122.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1436.000(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =     4.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.106(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     2.106(CFS)
Normal flow depth in pipe =    2.40(In.)
Flow top width inside pipe =    5.88(In.)
Critical depth could not be calculated.
Pipe flow velocity =     28.80(Ft/s)
Travel time through pipe =    0.00 min.
Time of concentration (TC) =     9.24 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      122.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      1.090(Ac.)
Runoff from this stream =      2.106(CFS)
Time of concentration =    9.24 min.
Rainfall intensity =     2.204(In/Hr)
Summary of stream data:

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


1       12.022     12.70               1.851
2        2.681      7.94               2.397
3        4.198      7.83               2.414
4        2.106      9.24               2.204
Largest stream flow has longer time of concentration
Qp =     12.022 + sum of
        Qb         Ia/Ib
         2.681 *    0.772 =      2.071
        Qb         Ia/Ib
         4.198 *    0.767 =      3.219
        Qb         Ia/Ib
         2.106 *    0.840 =      1.769
Qp =     19.081

Total of 4 main streams to confluence:
Flow rates before confluence point:
      12.022       2.681       4.198       2.106
```

```
Area of streams before confluence:
        8.110        1.220        2.200        1.090


Results of confluence:
Total flow rate =     19.081(CFS)
Time of concentration =    12.697 min.
Effective stream area after confluence  =     12.620(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station      123.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.120; Impervious fraction =  0.880
Time of concentration =    12.70 min.
Rainfall intensity =      1.851(In/Hr) for a    10.0 year storm
Subarea runoff =      0.889(CFS) for      0.550(Ac.)
Total runoff =     19.971(CFS)      Total area =      13.170(Ac.)
End of computations, total study area =           13.17 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.551
Area averaged RI index number =  74.4
```

APPENDIX B.2: AREA "A" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 01/21/25 File:ARA100.out

277.02.24
100YR RATIONAL TABLING METHOD FOR AREA A
POST-PROJECT CONDITION
FN: ARA100.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5500

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Process from Point/Station 101.000 to Point/Station 103.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 572.000(Ft.)
Top (of initial area) elevation = 1490.000(Ft.)
Bottom (of initial area) elevation = 1443.000(Ft.)
Difference in elevation = 47.000(Ft.)
Slope = 0.08217 s(percent)= 8.22
TC = k(0.573)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.967 min.
Rainfall intensity = 2.913(In/Hr) for a 100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.814

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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.257
Decimal fraction soil group D = 0.743
RI index for soil(AMC 2)  =  81.31
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      7.755(CFS)
Total initial stream area =        3.270(Ac.)
Pervious area fraction = 1.000


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Process from Point/Station      101.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      3.270(Ac.)
Runoff from this stream =      7.755(CFS)
Time of concentration =   11.97 min.
Rainfall intensity =     2.913(In/Hr)


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Process from Point/Station      102.000 to Point/Station      103.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   618.000(Ft.)
Top (of initial area) elevation =  1490.000(Ft.)
Bottom (of initial area) elevation =  1443.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.07605  s(percent)=       7.61
TC = k(0.480)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.505 min.
Rainfall intensity =      3.129(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.801
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.640
Decimal fraction soil group D = 0.360
RI index for soil(AMC 2)  =  72.88
Pervious area fraction =  0.800; Impervious fraction =  0.200
Initial subarea runoff =      7.949(CFS)
Total initial stream area =        3.170(Ac.)
Pervious area fraction = 0.800


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Process from Point/Station      102.000 to Point/Station      103.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      3.170(Ac.)
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Runoff from this stream =      7.949(CFS)
Time of concentration =   10.51 min.
Rainfall intensity =     3.129(In/Hr)
Summary of stream data:

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


1        7.755     11.97                2.913
2        7.949     10.51                3.129
Largest stream flow has longer or shorter time of concentration
Qp =      7.949 + sum of
        Qa          Tb/Ta
         7.755 *    0.878 =      6.808
Qp =     14.757

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.755       7.949
Area of streams before confluence:
        3.270        3.170
Results of confluence:
Total flow rate =     14.757(CFS)
Time of concentration =    10.505 min.
Effective stream area after confluence =      6.440(Ac.)


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Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1438.000(Ft.)
Pipe length  =   198.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.757(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    14.757(CFS)
Normal flow depth in pipe =   18.09(In.)
Flow top width inside pipe =   20.68(In.)
Critical Depth =   16.61(In.)
Pipe flow velocity =      5.80(Ft/s)
Travel time through pipe =    0.57 min.
Time of concentration (TC) =    11.07 min.


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Process from Point/Station      104.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.755
Decimal fraction soil group A = 0.000
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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.167
Decimal fraction soil group D = 0.833
RI index for soil(AMC 2)  =  69.54
Pervious area fraction =  1.000; Impervious fraction =  0.000
Time of concentration =    11.07 min.
Rainfall intensity =      3.039(In/Hr) for a   100.0 year storm
Subarea runoff =      0.138(CFS) for      0.060(Ac.)
Total runoff =     14.895(CFS)      Total area =       6.500(Ac.)


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Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1438.000(Ft.)
Downstream point/station elevation =  1437.000(Ft.)
Pipe length  =    95.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.895(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    14.895(CFS)
Normal flow depth in pipe =   15.82(In.)
Flow top width inside pipe =   18.10(In.)
Critical Depth =   17.16(In.)
Pipe flow velocity =      7.67(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    11.28 min.


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Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.890
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.55
Pervious area fraction =  0.070; Impervious fraction =  0.930
Time of concentration =    11.28 min.
Rainfall intensity =      3.009(In/Hr) for a   100.0 year storm
Subarea runoff =      0.294(CFS) for      0.110(Ac.)
Total runoff =     15.189(CFS)      Total area =       6.610(Ac.)


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Process from Point/Station      105.000 to Point/Station      111.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1437.000(Ft.)
Downstream point/station elevation =  1436.000(Ft.)
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Pipe length  =   273.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.189(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    15.189(CFS)
Normal flow depth in pipe =   18.45(In.)
Flow top width inside pipe =   25.12(In.)
Critical Depth =   16.31(In.)
Pipe flow velocity =      5.25(Ft/s)
Travel time through pipe =    0.87 min.
Time of concentration (TC) =    12.15 min.


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Process from Point/Station      105.000 to Point/Station      111.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      6.610(Ac.)
Runoff from this stream =     15.189(CFS)
Time of concentration =   12.15 min.
Rainfall intensity =     2.889(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      106.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   338.000(Ft.)
Top (of initial area) elevation =  1446.400(Ft.)
Bottom (of initial area) elevation =  1442.000(Ft.)
Difference in elevation =     4.400(Ft.)
Slope =    0.01302  s(percent)=       1.30
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.341 min.
Rainfall intensity =      3.811(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.895
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.040; Impervious fraction =  0.960
Initial subarea runoff =      1.808(CFS)
Total initial stream area =        0.530(Ac.)
Pervious area fraction = 0.040


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Process from Point/Station      107.000 to Point/Station      111.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
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Upstream point/station elevation =  1438.000(Ft.)
Downstream point/station elevation =  1436.000(Ft.)
Pipe length  =    33.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.808(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.808(CFS)
Normal flow depth in pipe =    4.20(In.)
Flow top width inside pipe =    8.98(In.)
Critical Depth =    7.39(In.)
Pipe flow velocity =      8.95(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =     7.40 min.


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Process from Point/Station      107.000 to Point/Station      111.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.530(Ac.)
Runoff from this stream =      1.808(CFS)
Time of concentration =    7.40 min.
Rainfall intensity =     3.793(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      108.000 to Point/Station      109.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   222.000(Ft.)
Top (of initial area) elevation =  1447.200(Ft.)
Bottom (of initial area) elevation =  1444.000(Ft.)
Difference in elevation =     3.200(Ft.)
Slope =    0.01441  s(percent)=       1.44
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.080 min.
Rainfall intensity =      4.227(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.899
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.010; Impervious fraction =  0.990
Initial subarea runoff =      0.950(CFS)
Total initial stream area =        0.250(Ac.)
Pervious area fraction = 0.010
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Process from Point/Station      109.000 to Point/Station      110.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1440.000(Ft.)
Downstream point/station elevation =  1439.000(Ft.)
Pipe length  =    41.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.950(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.950(CFS)
Normal flow depth in pipe =    3.78(In.)
Flow top width inside pipe =    8.88(In.)
Critical Depth =    5.36(In.)
Pipe flow velocity =      5.40(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =     6.21 min.


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Process from Point/Station      110.000 to Point/Station      110.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.899
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.010; Impervious fraction =  0.990
Time of concentration =     6.21 min.
Rainfall intensity =      4.179(In/Hr) for a   100.0 year storm
Subarea runoff =      0.977(CFS) for      0.260(Ac.)
Total runoff =      1.927(CFS)      Total area =       0.510(Ac.)


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Process from Point/Station      110.000 to Point/Station      111.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1436.000(Ft.)
Pipe length  =   135.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.927(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.927(CFS)
Normal flow depth in pipe =    5.99(In.)
Flow top width inside pipe =    8.49(In.)
Critical Depth =    7.59(In.)
Pipe flow velocity =      6.18(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =     6.57 min.
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Process from Point/Station      110.000 to Point/Station      111.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      0.510(Ac.)
Runoff from this stream =      1.927(CFS)
Time of concentration =    6.57 min.
Rainfall intensity =     4.050(In/Hr)
Summary of stream data:

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


1       15.189     12.15               2.889
2        1.808      7.40               3.793
3        1.927      6.57               4.050
Largest stream flow has longer time of concentration
Qp =     15.189 + sum of
        Qb         Ia/Ib
         1.808 *    0.762 =      1.377
        Qb         Ia/Ib
         1.927 *    0.713 =      1.374
Qp =     17.940

Total of 3 main streams to confluence:
Flow rates before confluence point:
      15.189       1.808       1.927
Area of streams before confluence:
        6.610        0.530        0.510


Results of confluence:
Total flow rate =     17.940(CFS)
Time of concentration =    12.147 min.
Effective stream area after confluence  =      7.650(Ac.)


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Process from Point/Station      111.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1436.000(Ft.)
Downstream point/station elevation =  1435.000(Ft.)
Pipe length  =   111.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.940(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    17.940(CFS)
Normal flow depth in pipe =   16.78(In.)
Flow top width inside pipe =   22.01(In.)
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Critical Depth =   18.32(In.)
Pipe flow velocity =      7.65(Ft/s)
Travel time through pipe =    0.24 min.
Time of concentration (TC) =    12.39 min.


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Process from Point/Station      111.000 to Point/Station      114.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      7.650(Ac.)
Runoff from this stream =     17.940(CFS)
Time of concentration =   12.39 min.
Rainfall intensity =     2.858(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      112.000 to Point/Station      113.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   240.000(Ft.)
Top (of initial area) elevation =  1444.300(Ft.)
Bottom (of initial area) elevation =  1439.600(Ft.)
Difference in elevation =     4.700(Ft.)
Slope =    0.01958  s(percent)=       1.96
TC = k(0.309)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.081 min.
Rainfall intensity =      4.227(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.140; Impervious fraction =  0.860
Initial subarea runoff =      1.719(CFS)
Total initial stream area =        0.460(Ac.)
Pervious area fraction = 0.140


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Process from Point/Station      113.000 to Point/Station      114.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1435.600(Ft.)
Downstream point/station elevation =  1435.000(Ft.)
Pipe length  =     6.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.719(CFS)
Nearest computed pipe diameter  =      6.00(In.)
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Calculated individual pipe flow  =     1.719(CFS)
Normal flow depth in pipe =    4.76(In.)
Flow top width inside pipe =    4.86(In.)
Critical depth could not be calculated.
Pipe flow velocity =     10.30(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     6.09 min.


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Process from Point/Station      113.000 to Point/Station      114.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.460(Ac.)
Runoff from this stream =      1.719(CFS)
Time of concentration =    6.09 min.
Rainfall intensity =     4.223(In/Hr)
Summary of stream data:

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


1       17.940     12.39               2.858
2        1.719      6.09               4.223
Largest stream flow has longer time of concentration
Qp =     17.940 + sum of
        Qb         Ia/Ib
         1.719 *    0.677 =      1.163
Qp =     19.104

Total of 2 main streams to confluence:
Flow rates before confluence point:
      17.940       1.719
Area of streams before confluence:
        7.650        0.460


Results of confluence:
Total flow rate =     19.104(CFS)
Time of concentration =    12.389 min.
Effective stream area after confluence  =      8.110(Ac.)


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Process from Point/Station      114.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1435.000(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
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No. of pipes = 1  Required pipe flow  =    19.104(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    19.104(CFS)
Normal flow depth in pipe =   10.76(In.)
Flow top width inside pipe =   17.65(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.33(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    12.44 min.


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Process from Point/Station      114.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      8.110(Ac.)
Runoff from this stream =     19.104(CFS)
Time of concentration =   12.44 min.
Rainfall intensity =     2.851(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      115.000 to Point/Station      116.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   170.000(Ft.)
Top (of initial area) elevation =  1447.120(Ft.)
Bottom (of initial area) elevation =  1444.000(Ft.)
Difference in elevation =     3.120(Ft.)
Slope =    0.01835  s(percent)=       1.84
TC = k(0.383)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.653 min.
Rainfall intensity =      4.023(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.850
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  70.36
Pervious area fraction =  0.450; Impervious fraction =  0.550
Initial subarea runoff =      3.318(CFS)
Total initial stream area =        0.970(Ac.)
Pervious area fraction = 0.450


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Process from Point/Station      116.000 to Point/Station      117.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
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Upstream point/station elevation =  1440.000(Ft.)
Downstream point/station elevation =  1439.000(Ft.)
Pipe length  =   181.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.318(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.318(CFS)
Normal flow depth in pipe =    9.16(In.)
Flow top width inside pipe =   14.63(In.)
Critical Depth =    8.81(In.)
Pipe flow velocity =      4.22(Ft/s)
Travel time through pipe =    0.71 min.
Time of concentration (TC) =     7.37 min.


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Process from Point/Station      117.000 to Point/Station      117.000
**** SUBAREA FLOW ADDITION ****
------------------------------------------------------------------------------
USER INPUT of soil data for subarea
Runoff Coefficient = 0.899
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.560
Decimal fraction soil group D = 0.440
RI index for soil(AMC 2)  =  71.61
Pervious area fraction =  0.010; Impervious fraction =  0.990
Time of concentration =     7.37 min.
Rainfall intensity =      3.803(In/Hr) for a   100.0 year storm
Subarea runoff =      0.855(CFS) for      0.250(Ac.)
Total runoff =      4.173(CFS)      Total area =       1.220(Ac.)


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Process from Point/Station      117.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------------
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =   228.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.173(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.173(CFS)
Normal flow depth in pipe =    6.88(In.)
Flow top width inside pipe =   11.87(In.)
Critical Depth =   10.34(In.)
Pipe flow velocity =      8.97(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =     7.79 min.


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Process from Point/Station      117.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
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The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.220(Ac.)
Runoff from this stream =      4.173(CFS)
Time of concentration =    7.79 min.
Rainfall intensity =     3.688(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      118.000 to Point/Station      120.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   575.000(Ft.)
Top (of initial area) elevation =  1490.000(Ft.)
Bottom (of initial area) elevation =  1442.200(Ft.)
Difference in elevation =    47.800(Ft.)
Slope =    0.08313  s(percent)=       8.31
TC = k(0.441)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.212 min.
Rainfall intensity =      3.363(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.835
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.081
Decimal fraction soil group D = 0.919
RI index for soil(AMC 2)  =  76.62
Pervious area fraction =  0.670; Impervious fraction =  0.330
Initial subarea runoff =      2.415(CFS)
Total initial stream area =        0.860(Ac.)
Pervious area fraction = 0.670


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      118.000 to Point/Station      120.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 1
Stream flow area =      0.860(Ac.)
Runoff from this stream =      2.415(CFS)
Time of concentration =    9.21 min.
Rainfall intensity =     3.363(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      120.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   398.000(Ft.)
Top (of initial area) elevation =  1448.000(Ft.)
Bottom (of initial area) elevation =  1442.200(Ft.)
```

```
Difference in elevation =     5.800(Ft.)
Slope =    0.01457  s(percent)=       1.46
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.662 min.
Rainfall intensity =      3.722(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.895
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.052
Decimal fraction soil group D = 0.948
RI index for soil(AMC 2)  =  74.70
Pervious area fraction =  0.050; Impervious fraction =  0.950
Initial subarea runoff =      4.464(CFS)
Total initial stream area =        1.340(Ac.)
Pervious area fraction = 0.050


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      119.000 to Point/Station      120.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      1.340(Ac.)
Runoff from this stream =      4.464(CFS)
Time of concentration =    7.66 min.
Rainfall intensity =     3.722(In/Hr)
Summary of stream data:

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


1        2.415      9.21                3.363
2        4.464      7.66                3.722
Largest stream flow has longer or shorter time of concentration
Qp =      4.464 + sum of
        Qa          Tb/Ta
         2.415 *    0.832 =      2.009
Qp =      6.473

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.415       4.464
Area of streams before confluence:
        0.860        1.340
Results of confluence:
Total flow rate =      6.473(CFS)
Time of concentration =     7.662 min.
Effective stream area after confluence =      2.200(Ac.)


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

```
Process from Point/Station      120.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1438.200(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =   115.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.473(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     6.473(CFS)
Normal flow depth in pipe =    7.58(In.)
Flow top width inside pipe =   11.58(In.)
Critical depth could not be calculated.
Pipe flow velocity =     12.38(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =     7.82 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      120.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      2.200(Ac.)
Runoff from this stream =      6.473(CFS)
Time of concentration =    7.82 min.
Rainfall intensity =     3.681(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      121.000 to Point/Station      122.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   474.000(Ft.)
Top (of initial area) elevation =  1444.300(Ft.)
Bottom (of initial area) elevation =  1440.000(Ft.)
Difference in elevation =     4.300(Ft.)
Slope =    0.00907  s(percent)=       0.91
TC = k(0.307)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.242 min.
Rainfall intensity =      3.357(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.706
Decimal fraction soil group D = 0.294
RI index for soil(AMC 2)  =  70.73
Pervious area fraction =  0.130; Impervious fraction =  0.870
Initial subarea runoff =      3.233(CFS)
Total initial stream area =        1.090(Ac.)
Pervious area fraction = 0.130
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      122.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1436.000(Ft.)
Downstream point/station elevation =  1431.000(Ft.)
Pipe length  =     4.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.233(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     3.233(CFS)
Normal flow depth in pipe =    3.05(In.)
Flow top width inside pipe =    6.00(In.)
Critical depth could not be calculated.
Pipe flow velocity =     32.19(Ft/s)
Travel time through pipe =    0.00 min.
Time of concentration (TC) =     9.24 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      122.000 to Point/Station      123.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      1.090(Ac.)
Runoff from this stream =      3.233(CFS)
Time of concentration =    9.24 min.
Rainfall intensity =     3.357(In/Hr)
Summary of stream data:

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


1       19.104     12.44               2.851
2        4.173      7.79               3.688
3        6.473      7.82               3.681
4        3.233      9.24               3.357
Largest stream flow has longer time of concentration
Qp =     19.104 + sum of
        Qb         Ia/Ib
         4.173 *    0.773 =      3.226
        Qb         Ia/Ib
         6.473 *    0.774 =      5.013
        Qb         Ia/Ib
         3.233 *    0.849 =      2.746
Qp =     30.089

Total of 4 main streams to confluence:
Flow rates before confluence point:
      19.104       4.173       6.473       3.233
```

```
Area of streams before confluence:
        8.110        1.220        2.200        1.090


Results of confluence:
Total flow rate =     30.089(CFS)
Time of concentration =    12.441 min.
Effective stream area after confluence  =     12.620(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station      123.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
USER INPUT of soil data for subarea
Runoff Coefficient = 0.881
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.120; Impervious fraction =  0.880
Time of concentration =    12.44 min.
Rainfall intensity =      2.851(In/Hr) for a   100.0 year storm
Subarea runoff =      1.382(CFS) for      0.550(Ac.)
Total runoff =     31.470(CFS)      Total area =      13.170(Ac.)
End of computations, total study area =           13.17 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.551
Area averaged RI index number =  74.4
```

APPENDIX B.3: AREA "B" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 01/21/25 File:ARB10.out

277.02.24
10YR RATIONAL TABLING METHOD FOR AREA B
POST-PROJECT CONDITION
FN: ARB10.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.788(In/Hr)
Slope of intensity duration curve = 0.5500

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 468.000(Ft.)
Top (of initial area) elevation = 1448.000(Ft.)
Bottom (of initial area) elevation = 1430.000(Ft.)
Difference in elevation = 18.000(Ft.)
Slope = 0.03846 s(percent)= 3.85
TC = k(0.393)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.820 min.
Rainfall intensity = 2.262(In/Hr) for a 10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.809

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.852
Decimal fraction soil group D = 0.148
RI index for soil(AMC 2)  =  70.38
Pervious area fraction =  0.510; Impervious fraction =  0.490
Initial subarea runoff =      1.116(CFS)
Total initial stream area =        0.610(Ac.)
Pervious area fraction = 0.510
End of computations, total study area =            0.61 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.510
Area averaged RI index number =  70.4
```

APPENDIX B.4: AREA "B" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 01/21/25 File:ARB100.out

277.02.24
100YR RATIONAL TABLING METHOD FOR AREA B
POST-PROJECT CONDITION
FN: ARB100.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5500

++

Process from Point/Station 201.000 to Point/Station 202.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 468.000(Ft.)
Top (of initial area) elevation = 1448.000(Ft.)
Bottom (of initial area) elevation = 1430.000(Ft.)
Difference in elevation = 18.000(Ft.)
Slope = 0.03846 s(percent)= 3.85
TC = k(0.393)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.820 min.
Rainfall intensity = 3.445(In/Hr) for a 100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.836

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.852
Decimal fraction soil group D = 0.148
RI index for soil(AMC 2)  =  70.38
Pervious area fraction =  0.510; Impervious fraction =  0.490
Initial subarea runoff =      1.756(CFS)
Total initial stream area =        0.610(Ac.)
Pervious area fraction = 0.510
End of computations, total study area =            0.61 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.510
Area averaged RI index number =  70.4
```

APPENDIX B.5: AREA "AA" – 10-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 01/21/25 File:ARAA10.out

277.02.24
10YR RATIONAL TABLING METHOD FOR AREA AA
POST-PROJECT CONDITION
FN: ARAB10.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.788(In/Hr)
Slope of intensity duration curve = 0.5500

++

Process from Point/Station 1101.000 to Point/Station 1102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 79.000(Ft.)
Top (of initial area) elevation = 1438.000(Ft.)
Bottom (of initial area) elevation = 1430.200(Ft.)
Difference in elevation = 7.800(Ft.)
Slope = 0.09873 s(percent)= 9.87
TC = k(0.385)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration = 5.000 min.
Rainfall intensity = 3.091(In/Hr) for a 10.0 year storm

```
USER INPUT of soil data for subarea
Runoff Coefficient = 0.833
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.460; Impervious fraction =  0.540
Initial subarea runoff =      0.386(CFS)
Total initial stream area =        0.150(Ac.)
Pervious area fraction = 0.460


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1102.000 to Point/Station     1103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1426.200(Ft.)
Downstream point/station elevation =  1425.900(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.386(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     0.386(CFS)
Normal flow depth in pipe =    4.27(In.)
Flow top width inside pipe =    5.44(In.)
Critical Depth =    3.79(In.)
Pipe flow velocity =      2.59(Ft/s)
Travel time through pipe =    0.30 min.
Time of concentration (TC) =     5.30 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1102.000 to Point/Station     1103.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      0.150(Ac.)
Runoff from this stream =      0.386(CFS)
Time of concentration =    5.30 min.
Rainfall intensity =     2.995(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station      123.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
________________________________________________________________________
Rainfall intensity =      1.887(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.803
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  74.40
Pervious area fraction =  0.551; Impervious fraction =  0.449
User specified values are as follows:
TC =  12.26 min.  Rain intensity =       1.89(In/Hr)
Total area =         0.00(Ac.)  Total runoff =     31.48(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station     1103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1431.000(Ft.)
Downstream point/station elevation =  1425.900(Ft.)
Pipe length  =   145.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.480(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    31.480(CFS)
Normal flow depth in pipe =   15.40(In.)
Flow top width inside pipe =   23.02(In.)
Critical Depth =   22.59(In.)
Pipe flow velocity =     14.79(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    12.42 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station     1103.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.000(Ac.)
Runoff from this stream =     31.480(CFS)
Time of concentration =   12.42 min.
Rainfall intensity =     1.874(In/Hr)
Summary of stream data:

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


1        0.386      5.30               2.995
2       31.480     12.42               1.874
Largest stream flow has longer time of concentration
Qp =     31.480 + sum of
        Qb         Ia/Ib
         0.386 *    0.626 =      0.242
Qp =     31.722

Total of 2 main streams to confluence:
Flow rates before confluence point:
```

```
       0.386      31.480
Area of streams before confluence:
        0.150        0.000


Results of confluence:
Total flow rate =     31.722(CFS)
Time of concentration =    12.423 min.
Effective stream area after confluence  =      0.150(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1103.000 to Point/Station     1105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1425.900(Ft.)
Downstream point/station elevation =  1422.400(Ft.)
Pipe length  =    18.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.722(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    31.722(CFS)
Normal flow depth in pipe =   10.93(In.)
Flow top width inside pipe =   17.58(In.)
Critical depth could not be calculated.
Pipe flow velocity =     28.22(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =    12.43 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1105.000 to Point/Station     1106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1422.400(Ft.)
Downstream point/station elevation =  1420.000(Ft.)
Pipe length  =    19.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.722(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    31.722(CFS)
Normal flow depth in pipe =   12.75(In.)
Flow top width inside pipe =   16.36(In.)
Critical depth could not be calculated.
Pipe flow velocity =     23.72(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =    12.45 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1105.000 to Point/Station     1106.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
```

```
Stream flow area =      0.150(Ac.)
Runoff from this stream =     31.722(CFS)
Time of concentration =   12.45 min.
Rainfall intensity =     1.872(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1104.000 to Point/Station     1106.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   660.000(Ft.)
Top (of initial area) elevation =  1440.500(Ft.)
Bottom (of initial area) elevation =  1420.000(Ft.)
Difference in elevation =    20.500(Ft.)
Slope =    0.03106  s(percent)=       3.11
TC = k(0.367)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.853 min.
Rainfall intensity =      2.128(In/Hr) for a    10.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.829
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.117
Decimal fraction soil group C = 0.883
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  67.46
Pervious area fraction =  0.340; Impervious fraction =  0.660
Initial subarea runoff =      3.617(CFS)
Total initial stream area =        2.050(Ac.)
Pervious area fraction = 0.340


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1104.000 to Point/Station     1106.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.050(Ac.)
Runoff from this stream =      3.617(CFS)
Time of concentration =    9.85 min.
Rainfall intensity =     2.128(In/Hr)
Summary of stream data:

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


1       31.722     12.45               1.872
2        3.617      9.85               2.128
Largest stream flow has longer time of concentration
Qp =     31.722 + sum of
        Qb         Ia/Ib
```

```
         3.617 *    0.879 =      3.181
Qp =     34.902

Total of 2 main streams to confluence:
Flow rates before confluence point:
      31.722       3.617
Area of streams before confluence:
        0.150        2.050


Results of confluence:
Total flow rate =     34.902(CFS)
Time of concentration =    12.447 min.
Effective stream area after confluence  =      2.200(Ac.)
End of computations, total study area =            2.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.348
Area averaged RI index number =  67.6
```

APPENDIX B.6: AREA "AA" – 100-YEAR STORM EVENT

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2014 Version 9.0
Rational Hydrology Study Date: 01/21/25 File:ARAA100.out

277.02.24
100YR RATIONAL TABLING METHOD FOR ARE AA
POST-PROJECT CONDITION
FN: ARAA100.RRV

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

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

Program License Serial Number 6279

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

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

2 year, 1 hour precipitation = 0.500(In.)
100 year, 1 hour precipitation = 1.200(In.)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5500

++

Process from Point/Station 1101.000 to Point/Station 1102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 79.000(Ft.)
Top (of initial area) elevation = 1438.000(Ft.)
Bottom (of initial area) elevation = 1430.200(Ft.)
Difference in elevation = 7.800(Ft.)
Slope = 0.09873 s(percent)= 9.87
TC = k(0.385)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration = 5.000 min.
Rainfall intensity = 4.707(In/Hr) for a 100.0 year storm

```
USER INPUT of soil data for subarea
Runoff Coefficient = 0.853
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  69.00
Pervious area fraction =  0.460; Impervious fraction =  0.540
Initial subarea runoff =      0.602(CFS)
Total initial stream area =        0.150(Ac.)
Pervious area fraction = 0.460


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1102.000 to Point/Station     1103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1426.200(Ft.)
Downstream point/station elevation =  1425.900(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.602(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.602(CFS)
Normal flow depth in pipe =    4.24(In.)
Flow top width inside pipe =    8.98(In.)
Critical Depth =    4.23(In.)
Pipe flow velocity =      2.95(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =     5.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1102.000 to Point/Station     1103.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      0.150(Ac.)
Runoff from this stream =      0.602(CFS)
Time of concentration =    5.26 min.
Rainfall intensity =     4.577(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station      123.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
----------------------------------------------------------------------
Rainfall intensity =      2.874(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.832
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  74.40
Pervious area fraction =  0.551; Impervious fraction =  0.449
User specified values are as follows:
TC =  12.26 min.  Rain intensity =       2.87(In/Hr)
Total area =         0.00(Ac.)  Total runoff =     31.48(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station     1103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1431.000(Ft.)
Downstream point/station elevation =  1425.900(Ft.)
Pipe length  =   145.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.480(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    31.480(CFS)
Normal flow depth in pipe =   15.40(In.)
Flow top width inside pipe =   23.02(In.)
Critical Depth =   22.59(In.)
Pipe flow velocity =     14.79(Ft/s)
Travel time through pipe =    0.16 min.
Time of concentration (TC) =    12.42 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      123.000 to Point/Station     1103.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      0.000(Ac.)
Runoff from this stream =     31.480(CFS)
Time of concentration =   12.42 min.
Rainfall intensity =     2.853(In/Hr)
Summary of stream data:

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


1        0.602      5.26               4.577
2       31.480     12.42               2.853
Largest stream flow has longer time of concentration
Qp =     31.480 + sum of
        Qb         Ia/Ib
         0.602 *    0.623 =      0.376
Qp =     31.856

Total of 2 main streams to confluence:
Flow rates before confluence point:
```

```
       0.602      31.480
Area of streams before confluence:
        0.150        0.000


Results of confluence:
Total flow rate =     31.856(CFS)
Time of concentration =    12.423 min.
Effective stream area after confluence  =      0.150(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1103.000 to Point/Station     1105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1425.900(Ft.)
Downstream point/station elevation =  1422.400(Ft.)
Pipe length  =    18.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.856(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    31.856(CFS)
Normal flow depth in pipe =   10.97(In.)
Flow top width inside pipe =   17.56(In.)
Critical depth could not be calculated.
Pipe flow velocity =     28.25(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =    12.43 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1105.000 to Point/Station     1106.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1422.400(Ft.)
Downstream point/station elevation =  1420.000(Ft.)
Pipe length  =    19.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.856(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    31.856(CFS)
Normal flow depth in pipe =   12.79(In.)
Flow top width inside pipe =   16.33(In.)
Critical depth could not be calculated.
Pipe flow velocity =     23.73(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =    12.45 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1105.000 to Point/Station     1106.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 1
```

```
Stream flow area =      0.150(Ac.)
Runoff from this stream =     31.856(CFS)
Time of concentration =   12.45 min.
Rainfall intensity =     2.850(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1104.000 to Point/Station     1106.000
**** INITIAL AREA EVALUATION ****
------------------------------------------------------------------------
Initial area flow distance =   660.000(Ft.)
Top (of initial area) elevation =  1440.500(Ft.)
Bottom (of initial area) elevation =  1420.000(Ft.)
Difference in elevation =    20.500(Ft.)
Slope =    0.03106  s(percent)=       3.11
TC = k(0.367)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.853 min.
Rainfall intensity =      3.241(In/Hr) for a   100.0 year storm
USER INPUT of soil data for subarea
Runoff Coefficient = 0.849
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.117
Decimal fraction soil group C = 0.883
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  67.46
Pervious area fraction =  0.340; Impervious fraction =  0.660
Initial subarea runoff =      5.643(CFS)
Total initial stream area =        2.050(Ac.)
Pervious area fraction = 0.340


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1104.000 to Point/Station     1106.000
**** CONFLUENCE OF MAIN STREAMS ****
------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.050(Ac.)
Runoff from this stream =      5.643(CFS)
Time of concentration =    9.85 min.
Rainfall intensity =     3.241(In/Hr)
Summary of stream data:

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


1       31.856     12.45               2.850
2        5.643      9.85               3.241
Largest stream flow has longer time of concentration
Qp =     31.856 + sum of
        Qb         Ia/Ib
```

```
         5.643 *    0.879 =      4.963
Qp =     36.818

Total of 2 main streams to confluence:
Flow rates before confluence point:
      31.856       5.643
Area of streams before confluence:
        0.150        2.050


Results of confluence:
Total flow rate =     36.818(CFS)
Time of concentration =    12.447 min.
Effective stream area after confluence  =      2.200(Ac.)
End of computations, total study area =            2.20 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.348
Area averaged RI index number =  67.6
```

APPENDIX C: UNIT HYDROGRAPH CALCULATIONS

(1 HR, 3 HR, 6 HR, 24 HR DURATIONS)

APPENDIX C.1: POST PROJECT CONDITION AREA A1 100-YEAR UNIT HYDROGRAPH CALCULATIONS

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

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Study date 01/21/25 File: ARA11100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A1 & A2
POST-PROJECT CONDITION
FN: ARA1

Drainage Area = 6.44(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.44(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 5712.00(Ft.)
Length along longest watercourse measured to centroid = 282.00(Ft.)
Length along longest watercourse = 1.082 Mi.
Length along longest watercourse measured to centroid = 0.053 Mi.
Difference in elevation = 52.00(Ft.)
Slope along watercourse = 48.0672 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.078 Hr.
Lag time = 4.67 Min.
25% of lag time = 1.17 Min.
40% of lag time = 1.87 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]
6.44	0.55	3.54

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.44	1.25	8.05

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.250(In)

Point rain (area averaged) = 1.250(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.250(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.440	77.20	0.098

Total Area Entered = 6.44(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
77.2	77.2	0.277	0.098	0.253	1.000	0.253
					Sum (F) =	0.253

Area averaged mean soil loss (F) (In/Hr) = 0.253
Minimum soil loss rate ((In/Hr)) = 0.126
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.820

Slope of intensity-duration curve for a 1 hour storm =0.5500

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	107.067	21.356	1.386
2	0.167	214.134	48.770	3.165
3	0.250	321.202	14.661	0.952
4	0.333	428.269	6.695	0.435
5	0.417	535.336	3.721	0.242
6	0.500	642.403	2.359	0.153
7	0.583	749.470	1.396	0.091
8	0.667	856.538	1.042	0.068
		Sum =	100.000 Sum=	6.490

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	3.30	0.495	0.253	(0.406)	0.242
2	0.17	4.20	0.630	0.253	(0.517)	0.377
3	0.25	4.40	0.660	0.253	(0.541)	0.407
4	0.33	4.80	0.720	0.253	(0.590)	0.467
5	0.42	5.20	0.780	0.253	(0.640)	0.527
6	0.50	6.20	0.930	0.253	(0.763)	0.677
7	0.58	6.80	1.020	0.253	(0.836)	0.767
8	0.67	8.80	1.320	0.253	(1.082)	1.067
9	0.75	13.90	2.085	0.253	(1.710)	1.832
10	0.83	31.40	4.710	0.253	(3.862)	4.457
11	0.92	7.20	1.080	0.253	(0.886)	0.827
12	1.00	3.80	0.570	0.253	(0.467)	0.317
	(Loss Rate Not Used)					
Sum =		100.0			Sum =	12.0

Flood volume = Effective rainfall 1.00(In)
times area 6.4(Ac.)/[(In)/(Ft.)] = 0.5(Ac.Ft)
Total soil loss = 0.25(In)
Total soil loss = 0.136(Ac.Ft)
Total rainfall = 1.25(In)
Flood volume = 23314.6 Cubic Feet
Total soil loss = 5905.2 Cubic Feet

Peak flow rate of this hydrograph = 17.840(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	0.0023	0.34	Q
0+10	0.0112	1.29	V Q
0+15	0.0249	1.99	|V Q
0+20	0.0415	2.40	| VQ
0+25	0.0609	2.82	| VQ
0+30	0.0840	3.36	| Q
0+35	0.1122	4.09	| Q |
0+40	0.1467	5.01	| Q
0+45	0.1964	7.21	| | Q
0+50	0.2904	13.65	| | |V Q |
0+55	0.4132	17.84	| | | V Q
1+ 0	0.4723	8.57	| | Q | | V |
1+ 5	0.5029	4.45	| Q | | | V |
1+10	0.5179	2.17	| Q | | | V |
1+15	0.5265	1.26	| Q | | | V|

```
    1+20       0.5316      0.73  |Q        |         |         |        V|
    1+25       0.5345      0.43  Q         |         |         |        V|
    1+30       0.5351      0.08  Q         |         |         |        V|
    1+35       0.5352      0.02  Q         |         |         |        V|
-------------------------------------------------------------------------
```

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

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Study date 01/21/25 File: ARA13100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A1 & A2
POST-PROJECT CONDITION
FN: ARA1

Drainage Area = 6.44(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.44(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 5712.00(Ft.)
Length along longest watercourse measured to centroid = 282.00(Ft.)
Length along longest watercourse = 1.082 Mi.
Length along longest watercourse measured to centroid = 0.053 Mi.
Difference in elevation = 52.00(Ft.)
Slope along watercourse = 48.0672 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.078 Hr.
Lag time = 4.67 Min.
25% of lag time = 1.17 Min.
40% of lag time = 1.87 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]
6.44	0.90	5.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.44	2.00	12.88

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.900(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.440	77.20	0.098

Total Area Entered = 6.44(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
77.2	77.2	0.277	0.098	0.253	1.000	0.253
					Sum (F) =	0.253

Area averaged mean soil loss (F) (In/Hr) = 0.253
Minimum soil loss rate ((In/Hr)) = 0.126
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.820

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	107.067	21.356	1.386
2	0.167	214.134	48.770	3.165
3	0.250	321.202	14.661	0.952
4	0.333	428.269	6.695	0.435
5	0.417	535.336	3.721	0.242
6	0.500	642.403	2.359	0.153
7	0.583	749.470	1.396	0.091
8	0.667	856.538	1.042	0.068
		Sum =	100.000 Sum=	6.490

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	1.30	0.312	0.253	(	0.256)	0.059
2	0.17	1.30	0.312	0.253	(	0.256)	0.059
3	0.25	1.10	0.264	(0.253)		0.216	0.048
4	0.33	1.50	0.360	0.253	(	0.295)	0.107
5	0.42	1.50	0.360	0.253	(	0.295)	0.107
6	0.50	1.80	0.432	0.253	(	0.354)	0.179
7	0.58	1.50	0.360	0.253	(	0.295)	0.107
8	0.67	1.80	0.432	0.253	(	0.354)	0.179
9	0.75	1.80	0.432	0.253	(	0.354)	0.179
10	0.83	1.50	0.360	0.253	(	0.295)	0.107
11	0.92	1.60	0.384	0.253	(	0.315)	0.131
12	1.00	1.80	0.432	0.253	(	0.354)	0.179
13	1.08	2.20	0.528	0.253	(	0.433)	0.275
14	1.17	2.20	0.528	0.253	(	0.433)	0.275
15	1.25	2.20	0.528	0.253	(	0.433)	0.275
16	1.33	2.00	0.480	0.253	(	0.394)	0.227
17	1.42	2.60	0.624	0.253	(	0.512)	0.371
18	1.50	2.70	0.648	0.253	(	0.531)	0.395
19	1.58	2.40	0.576	0.253	(	0.472)	0.323
20	1.67	2.70	0.648	0.253	(	0.531)	0.395
21	1.75	3.30	0.792	0.253	(	0.649)	0.539
22	1.83	3.10	0.744	0.253	(	0.610)	0.491
23	1.92	2.90	0.696	0.253	(	0.571)	0.443
24	2.00	3.00	0.720	0.253	(	0.590)	0.467
25	2.08	3.10	0.744	0.253	(	0.610)	0.491
26	2.17	4.20	1.008	0.253	(	0.827)	0.755
27	2.25	5.00	1.200	0.253	(	0.984)	0.947
28	2.33	3.50	0.840	0.253	(	0.689)	0.587
29	2.42	6.80	1.632	0.253	(	1.338)	1.379
30	2.50	7.30	1.752	0.253	(	1.437)	1.499
31	2.58	8.20	1.968	0.253	(	1.614)	1.715
32	2.67	5.90	1.416	0.253	(	1.161)	1.163
33	2.75	2.00	0.480	0.253	(	0.394)	0.227
34	2.83	1.80	0.432	0.253	(	0.354)	0.179
35	2.92	1.80	0.432	0.253	(	0.354)	0.179
36	3.00	0.60	0.144	(0.253)		0.118	0.026

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.1

Flood volume = Effective rainfall 1.26(In)
times area 6.4(Ac.)/[(In)/(Ft.)] = 0.7(Ac.Ft)
Total soil loss = 0.74(In)
Total soil loss = 0.399(Ac.Ft)
Total rainfall = 2.00(In)
Flood volume = 29369.9 Cubic Feet
Total soil loss = 17383.1 Cubic Feet

Peak flow rate of this hydrograph = 9.462(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	0.0006	0.08	Q | | | |
0+10	0.0024	0.27	VQ | | | |
0+15	0.0046	0.31	VQ | | | |
0+20	0.0072	0.38	VQ | | | |
0+25	0.0112	0.57	V Q | | | |
0+30	0.0162	0.74	V Q | | | |
0+35	0.0224	0.89	|V Q | | | |
0+40	0.0282	0.85	|V Q | | | |
0+45	0.0354	1.05	| V Q | | | |
0+50	0.0424	1.01	| V Q | | | |
0+55	0.0482	0.84	| VQ | | | |
1+ 0	0.0545	0.93	| Q | | | |
1+ 5	0.0629	1.21	| VQ | | | |
1+10	0.0736	1.56	| V Q | | | |
1+15	0.0852	1.67	| VQ | | | |
1+20	0.0966	1.65	| VQ | | | |
1+25	0.1085	1.73	| Q | | | |
1+30	0.1236	2.19	| VQ | | | |
1+35	0.1394	2.30	| VQ| | | |
1+40	0.1549	2.25	| Q| | | |
1+45	0.1732	2.65	| Q | | |
1+50	0.1945	3.10	| |VQ | | |
1+55	0.2155	3.04	| | Q | | |
2+ 0	0.2358	2.96	| |Q V | | |
2+ 5	0.2568	3.04	| | Q V | | |
2+10	0.2809	3.50	| | Q V | | |
2+15	0.3128	4.64	| | Q | | |
2+20	0.3473	5.01	| | Q | |
2+25	0.3836	5.27	| | |QV | |
2+30	0.4370	7.75	| | | V Q |
2+35	0.4998	9.12	| | | V| Q |
2+40	0.5649	9.46	| | | | V Q |
2+45	0.6121	6.84	| | | Q | V |
2+50	0.6363	3.51	| | Q | | V |
2+55	0.6524	2.35	| |Q| | | V |
3+ 0	0.6638	1.65	| Q | | | V|
3+ 5	0.6694	0.82	| Q | | | V|
3+10	0.6722	0.40	|Q | | | V|
3+15	0.6735	0.18	Q | | | V|
3+20	0.6739	0.07	Q | | | V|
3+25	0.6741	0.03	Q | | | V|
3+30	0.6742	0.01	Q | | | V|
3+35	0.6742	0.00	Q | | | V|

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

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Study date 01/21/25 File: ARA16100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A1 & A2
POST-PROJECT CONDITION
FN: ARA1

Drainage Area = 6.44(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.44(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 5712.00(Ft.)
Length along longest watercourse measured to centroid = 282.00(Ft.)
Length along longest watercourse = 1.082 Mi.
Length along longest watercourse measured to centroid = 0.053 Mi.
Difference in elevation = 52.00(Ft.)
Slope along watercourse = 48.0672 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.078 Hr.
Lag time = 4.67 Min.
25% of lag time = 1.17 Min.
40% of lag time = 1.87 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]
6.44	1.30	8.37

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.44	2.75	17.71

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.300(In)
Area Averaged 100-Year Rainfall = 2.750(In)

Point rain (area averaged) = 2.750(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.750(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.440	77.20	0.098

Total Area Entered = 6.44(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
77.2	77.2	0.277	0.098	0.253	1.000	0.253
					Sum (F) =	0.253

Area averaged mean soil loss (F) (In/Hr) = 0.253
Minimum soil loss rate ((In/Hr)) = 0.126
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.820

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	107.067	21.356	1.386
2	0.167	214.134	48.770	3.165
3	0.250	321.202	14.661	0.952
4	0.333	428.269	6.695	0.435
5	0.417	535.336	3.721	0.242
6	0.500	642.403	2.359	0.153
7	0.583	749.470	1.396	0.091
8	0.667	856.538	1.042	0.068
		Sum =	100.000 Sum=	6.490

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.165	(0.253)		0.135	0.030
2	0.17	0.60	0.198	(0.253)		0.162	0.036
3	0.25	0.60	0.198	(0.253)		0.162	0.036
4	0.33	0.60	0.198	(0.253)		0.162	0.036
5	0.42	0.60	0.198	(0.253)		0.162	0.036
6	0.50	0.70	0.231	(0.253)		0.189	0.042
7	0.58	0.70	0.231	(0.253)		0.189	0.042
8	0.67	0.70	0.231	(0.253)		0.189	0.042
9	0.75	0.70	0.231	(0.253)		0.189	0.042
10	0.83	0.70	0.231	(0.253)		0.189	0.042
11	0.92	0.70	0.231	(0.253)		0.189	0.042
12	1.00	0.80	0.264	(0.253)		0.216	0.048
13	1.08	0.80	0.264	(0.253)		0.216	0.048
14	1.17	0.80	0.264	(0.253)		0.216	0.048
15	1.25	0.80	0.264	(0.253)		0.216	0.048
16	1.33	0.80	0.264	(0.253)		0.216	0.048
17	1.42	0.80	0.264	(0.253)		0.216	0.048
18	1.50	0.80	0.264	(0.253)		0.216	0.048
19	1.58	0.80	0.264	(0.253)		0.216	0.048
20	1.67	0.80	0.264	(0.253)		0.216	0.048
21	1.75	0.80	0.264	(0.253)		0.216	0.048
22	1.83	0.80	0.264	(0.253)		0.216	0.048
23	1.92	0.80	0.264	(0.253)		0.216	0.048
24	2.00	0.90	0.297	(0.253)		0.244	0.053
25	2.08	0.80	0.264	(0.253)		0.216	0.048
26	2.17	0.90	0.297	(0.253)		0.244	0.053
27	2.25	0.90	0.297	(0.253)		0.244	0.053
28	2.33	0.90	0.297	(0.253)		0.244	0.053
29	2.42	0.90	0.297	(0.253)		0.244	0.053
30	2.50	0.90	0.297	(0.253)		0.244	0.053
31	2.58	0.90	0.297	(0.253)		0.244	0.053
32	2.67	0.90	0.297	(0.253)		0.244	0.053
33	2.75	1.00	0.330	0.253	(	0.271)	0.077
34	2.83	1.00	0.330	0.253	(	0.271)	0.077
35	2.92	1.00	0.330	0.253	(	0.271)	0.077
36	3.00	1.00	0.330	0.253	(	0.271)	0.077
37	3.08	1.00	0.330	0.253	(	0.271)	0.077
38	3.17	1.10	0.363	0.253	(	0.298)	0.110
39	3.25	1.10	0.363	0.253	(	0.298)	0.110
40	3.33	1.10	0.363	0.253	(	0.298)	0.110
41	3.42	1.20	0.396	0.253	(	0.325)	0.143
42	3.50	1.30	0.429	0.253	(	0.352)	0.176
43	3.58	1.40	0.462	0.253	(	0.379)	0.209
44	3.67	1.40	0.462	0.253	(	0.379)	0.209
45	3.75	1.50	0.495	0.253	(	0.406)	0.242
46	3.83	1.50	0.495	0.253	(	0.406)	0.242
47	3.92	1.60	0.528	0.253	(	0.433)	0.275
48	4.00	1.60	0.528	0.253	(	0.433)	0.275
49	4.08	1.70	0.561	0.253	(	0.460)	0.308
50	4.17	1.80	0.594	0.253	(	0.487)	0.341

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51   4.25     1.90      0.627          0.253    (  0.514)        0.374
52   4.33     2.00      0.660          0.253    (  0.541)        0.407
53   4.42     2.10      0.693          0.253    (  0.568)        0.440
54   4.50     2.10      0.693          0.253    (  0.568)        0.440
55   4.58     2.20      0.726          0.253    (  0.595)        0.473
56   4.67     2.30      0.759          0.253    (  0.622)        0.506
57   4.75     2.40      0.792          0.253    (  0.649)        0.539
58   4.83     2.40      0.792          0.253    (  0.649)        0.539
59   4.92     2.50      0.825          0.253    (  0.676)        0.572
60   5.00     2.60      0.858          0.253    (  0.704)        0.605
61   5.08     3.10      1.023          0.253    (  0.839)        0.770
62   5.17     3.60      1.188          0.253    (  0.974)        0.935
63   5.25     3.90      1.287          0.253    (  1.055)        1.034
64   5.33     4.20      1.386          0.253    (  1.136)        1.133
65   5.42     4.70      1.551          0.253    (  1.272)        1.298
66   5.50     5.60      1.848          0.253    (  1.515)        1.595
67   5.58     1.90      0.627          0.253    (  0.514)        0.374
68   5.67     0.90      0.297       (  0.253)       0.244        0.053
69   5.75     0.60      0.198       (  0.253)       0.162        0.036
70   5.83     0.50      0.165       (  0.253)       0.135        0.030
71   5.92     0.30      0.099       (  0.253)       0.081        0.018
72   6.00     0.20      0.066       (  0.253)       0.054        0.012
           (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    16.8
    Flood volume = Effective rainfall      1.40(In)
     times area       6.4(Ac.)/[(In)/(Ft.)] =       0.8(Ac.Ft)
    Total soil loss =      1.35(In)
    Total soil loss =     0.725(Ac.Ft)
    Total rainfall =      2.75(In)
    Flood volume =       32724.1 Cubic Feet
    Total soil loss =       31561.8 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =      8.291(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        6 - H O U R    S T O R M
                   R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-------------------------------------------------------------------------
  0+ 5       0.0003      0.04  Q         |         |         |         |
  0+10       0.0013      0.14  Q         |         |         |         |
  0+15       0.0026      0.19  Q         |         |         |         |
  0+20       0.0040      0.21  Q         |         |         |         |
  0+25       0.0055      0.22  Q         |         |         |         |
  0+30       0.0071      0.23  Q         |         |         |         |
  0+35       0.0089      0.26  VQ        |         |         |         |
  0+40       0.0107      0.26  VQ        |         |         |         |
  0+45       0.0126      0.27  VQ        |         |         |         |
  0+50       0.0144      0.27  VQ        |         |         |         |
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0+55       0.0163      0.27  VQ        |         |         |         |
1+ 0       0.0182      0.28  VQ        |         |         |         |
1+ 5       0.0202      0.30  |Q        |         |         |         |
1+10       0.0223      0.30  |Q        |         |         |         |
1+15       0.0244      0.31  |Q        |         |         |         |
1+20       0.0265      0.31  |Q        |         |         |         |
1+25       0.0286      0.31  |Q        |         |         |         |
1+30       0.0308      0.31  |Q        |         |         |         |
1+35       0.0329      0.31  |Q        |         |         |         |
1+40       0.0350      0.31  |Q        |         |         |         |
1+45       0.0371      0.31  |Q        |         |         |         |
1+50       0.0393      0.31  |QV       |         |         |         |
1+55       0.0414      0.31  |QV       |         |         |         |
2+ 0       0.0436      0.32  |QV       |         |         |         |
2+ 5       0.0458      0.33  |QV       |         |         |         |
2+10       0.0480      0.32  |QV       |         |         |         |
2+15       0.0504      0.34  |QV       |         |         |         |
2+20       0.0527      0.34  |QV       |         |         |         |
2+25       0.0551      0.34  |QV       |         |         |         |
2+30       0.0575      0.35  |Q V      |         |         |         |
2+35       0.0599      0.35  |Q V      |         |         |         |
2+40       0.0623      0.35  |Q V      |         |         |         |
2+45       0.0649      0.38  |Q V      |         |         |         |
2+50       0.0680      0.46  |Q V      |         |         |         |
2+55       0.0713      0.48  |Q V      |         |         |         |
3+ 0       0.0747      0.49  |Q V      |         |         |         |
3+ 5       0.0781      0.50  |Q  V     |         |         |         |
3+10       0.0818      0.54  | Q V     |         |         |         |
3+15       0.0863      0.65  | Q V     |         |         |         |
3+20       0.0910      0.68  | Q V     |         |         |         |
3+25       0.0962      0.74  | Q  V    |         |         |         |
3+30       0.1024      0.90  |  Q V    |         |         |         |
3+35       0.1099      1.09  |   QV    |         |         |         |
3+40       0.1184      1.24  |   Q V   |         |         |         |
3+45       0.1277      1.34  |    QV   |         |         |         |
3+50       0.1379      1.48  |    Q V  |         |         |         |
3+55       0.1487      1.57  |     QV  |         |         |         |
4+ 0       0.1604      1.70  |     Q V |         |         |         |
4+ 5       0.1727      1.79  |      Q V|         |         |         |
4+10       0.1862      1.96  |      Q V|         |         |         |
4+15       0.2010      2.15  |       Q V         |         |         |
4+20       0.2173      2.36  |        Q|V        |         |         |
4+25       0.2349      2.56  |         Q V       |         |         |
4+30       0.2537      2.73  |         Q  V      |         |         |
4+35       0.2733      2.84  |         |Q  V     |         |         |
4+40       0.2940      3.02  |         | Q  V    |         |         |
4+45       0.3162      3.22  |         | Q   V   |         |         |
4+50       0.3395      3.38  |         |  Q    V |         |         |
4+55       0.3635      3.48  |         |  Q     V|         |         |
5+ 0       0.3887      3.66  |         |   Q     V         |         |
5+ 5       0.4166      4.05  |         |     Q   | V       |         |
5+10       0.4500      4.85  |         |        Q|  V      |         |
5+15       0.4893      5.70  |         |         | Q   V   |         |
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    5+20       0.5333      6.39  |          |          |    Q  V |          |
    5+25       0.5825      7.15  |          |          |       Q |V         |
    5+30       0.6396      8.29  |          |          |         |  QV      |
    5+35       0.6934      7.80  |          |          |         |Q    V    |
    5+40       0.7203      3.91  |          |    Q     |         |       V  |
    5+45       0.7335      1.91  |      Q   |          |         |         V|
    5+50       0.7412      1.12  |   Q      |          |         |         V|
    5+55       0.7461      0.71  | Q        |          |         |         V|
    6+ 0       0.7490      0.42  |Q         |          |         |         V|
    6+ 5       0.7505      0.23  Q          |          |         |         V|
    6+10       0.7510      0.06  Q          |          |         |         V|
    6+15       0.7511      0.02  Q          |          |         |         V|
    6+20       0.7512      0.01  Q          |          |         |         V|
    6+25       0.7512      0.01  Q          |          |         |         V|
    6+30       0.7512      0.00  Q          |          |         |         V|
    6+35       0.7512      0.00  Q          |          |         |          V
-------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/21/25 File: ARA124100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A1 & A2
POST-PROJECT CONDITION
FN: ARA1

Drainage Area = 6.44(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.44(Ac.) = 0.010 Sq. Mi.
Length along longest watercourse = 5712.00(Ft.)
Length along longest watercourse measured to centroid = 282.00(Ft.)
Length along longest watercourse = 1.082 Mi.
Length along longest watercourse measured to centroid = 0.053 Mi.
Difference in elevation = 52.00(Ft.)
Slope along watercourse = 48.0672 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.078 Hr.
Lag time = 4.67 Min.
25% of lag time = 1.17 Min.
40% of lag time = 1.87 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]
6.44	2.25	14.49

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.44	5.50	35.42

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.250(In)
Area Averaged 100-Year Rainfall = 5.500(In)

Point rain (area averaged) = 5.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 5.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.440	77.20	0.098

Total Area Entered = 6.44(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
77.2	77.2	0.277	0.098	0.253	1.000	0.253
					Sum (F) =	0.253

Area averaged mean soil loss (F) (In/Hr) = 0.253
Minimum soil loss rate ((In/Hr)) = 0.126
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.820

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	107.067	21.356	1.386
2	0.167	214.134	48.770	3.165
3	0.250	321.202	14.661	0.952
4	0.333	428.269	6.695	0.435
5	0.417	535.336	3.721	0.242
6	0.500	642.403	2.359	0.153
7	0.583	749.470	1.396	0.091
8	0.667	856.538	1.042	0.068
		Sum =	100.000 Sum=	6.490

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

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.044	(0.448)		0.036	0.008
2	0.17	0.07	0.044	(0.446)		0.036	0.008
3	0.25	0.07	0.044	(0.444)		0.036	0.008
4	0.33	0.10	0.066	(0.443)		0.054	0.012
5	0.42	0.10	0.066	(0.441)		0.054	0.012
6	0.50	0.10	0.066	(0.439)		0.054	0.012
7	0.58	0.10	0.066	(0.437)		0.054	0.012
8	0.67	0.10	0.066	(0.436)		0.054	0.012
9	0.75	0.10	0.066	(0.434)		0.054	0.012
10	0.83	0.13	0.088	(0.432)		0.072	0.016
11	0.92	0.13	0.088	(0.431)		0.072	0.016
12	1.00	0.13	0.088	(0.429)		0.072	0.016
13	1.08	0.10	0.066	(0.427)		0.054	0.012
14	1.17	0.10	0.066	(0.426)		0.054	0.012
15	1.25	0.10	0.066	(0.424)		0.054	0.012
16	1.33	0.10	0.066	(0.422)		0.054	0.012
17	1.42	0.10	0.066	(0.420)		0.054	0.012
18	1.50	0.10	0.066	(0.419)		0.054	0.012
19	1.58	0.10	0.066	(0.417)		0.054	0.012
20	1.67	0.10	0.066	(0.415)		0.054	0.012
21	1.75	0.10	0.066	(0.414)		0.054	0.012
22	1.83	0.13	0.088	(0.412)		0.072	0.016
23	1.92	0.13	0.088	(0.410)		0.072	0.016
24	2.00	0.13	0.088	(0.409)		0.072	0.016
25	2.08	0.13	0.088	(0.407)		0.072	0.016
26	2.17	0.13	0.088	(0.406)		0.072	0.016
27	2.25	0.13	0.088	(0.404)		0.072	0.016
28	2.33	0.13	0.088	(0.402)		0.072	0.016
29	2.42	0.13	0.088	(0.401)		0.072	0.016
30	2.50	0.13	0.088	(0.399)		0.072	0.016
31	2.58	0.17	0.110	(0.397)		0.090	0.020
32	2.67	0.17	0.110	(0.396)		0.090	0.020
33	2.75	0.17	0.110	(0.394)		0.090	0.020
34	2.83	0.17	0.110	(0.392)		0.090	0.020
35	2.92	0.17	0.110	(0.391)		0.090	0.020
36	3.00	0.17	0.110	(0.389)		0.090	0.020
37	3.08	0.17	0.110	(0.388)		0.090	0.020
38	3.17	0.17	0.110	(0.386)		0.090	0.020
39	3.25	0.17	0.110	(0.384)		0.090	0.020
40	3.33	0.17	0.110	(0.383)		0.090	0.020
41	3.42	0.17	0.110	(0.381)		0.090	0.020
42	3.50	0.17	0.110	(0.380)		0.090	0.020
43	3.58	0.17	0.110	(0.378)		0.090	0.020
44	3.67	0.17	0.110	(0.376)		0.090	0.020
45	3.75	0.17	0.110	(0.375)		0.090	0.020
46	3.83	0.20	0.132	(0.373)		0.108	0.024
47	3.92	0.20	0.132	(0.372)		0.108	0.024
48	4.00	0.20	0.132	(0.370)		0.108	0.024
49	4.08	0.20	0.132	(0.369)		0.108	0.024
50	4.17	0.20	0.132	(0.367)		0.108	0.024

51	4.25	0.20	0.132	(0.365)	0.108	0.024
52	4.33	0.23	0.154	(0.364)	0.126	0.028
53	4.42	0.23	0.154	(0.362)	0.126	0.028
54	4.50	0.23	0.154	(0.361)	0.126	0.028
55	4.58	0.23	0.154	(0.359)	0.126	0.028
56	4.67	0.23	0.154	(0.358)	0.126	0.028
57	4.75	0.23	0.154	(0.356)	0.126	0.028
58	4.83	0.27	0.176	(0.355)	0.144	0.032
59	4.92	0.27	0.176	(0.353)	0.144	0.032
60	5.00	0.27	0.176	(0.351)	0.144	0.032
61	5.08	0.20	0.132	(0.350)	0.108	0.024
62	5.17	0.20	0.132	(0.348)	0.108	0.024
63	5.25	0.20	0.132	(0.347)	0.108	0.024
64	5.33	0.23	0.154	(0.345)	0.126	0.028
65	5.42	0.23	0.154	(0.344)	0.126	0.028
66	5.50	0.23	0.154	(0.342)	0.126	0.028
67	5.58	0.27	0.176	(0.341)	0.144	0.032
68	5.67	0.27	0.176	(0.339)	0.144	0.032
69	5.75	0.27	0.176	(0.338)	0.144	0.032
70	5.83	0.27	0.176	(0.336)	0.144	0.032
71	5.92	0.27	0.176	(0.335)	0.144	0.032
72	6.00	0.27	0.176	(0.333)	0.144	0.032
73	6.08	0.30	0.198	(0.332)	0.162	0.036
74	6.17	0.30	0.198	(0.330)	0.162	0.036
75	6.25	0.30	0.198	(0.329)	0.162	0.036
76	6.33	0.30	0.198	(0.328)	0.162	0.036
77	6.42	0.30	0.198	(0.326)	0.162	0.036
78	6.50	0.30	0.198	(0.325)	0.162	0.036
79	6.58	0.33	0.220	(0.323)	0.180	0.040
80	6.67	0.33	0.220	(0.322)	0.180	0.040
81	6.75	0.33	0.220	(0.320)	0.180	0.040
82	6.83	0.33	0.220	(0.319)	0.180	0.040
83	6.92	0.33	0.220	(0.317)	0.180	0.040
84	7.00	0.33	0.220	(0.316)	0.180	0.040
85	7.08	0.33	0.220	(0.314)	0.180	0.040
86	7.17	0.33	0.220	(0.313)	0.180	0.040
87	7.25	0.33	0.220	(0.312)	0.180	0.040
88	7.33	0.37	0.242	(0.310)	0.198	0.044
89	7.42	0.37	0.242	(0.309)	0.198	0.044
90	7.50	0.37	0.242	(0.307)	0.198	0.044
91	7.58	0.40	0.264	(0.306)	0.216	0.048
92	7.67	0.40	0.264	(0.305)	0.216	0.048
93	7.75	0.40	0.264	(0.303)	0.216	0.048
94	7.83	0.43	0.286	(0.302)	0.235	0.051
95	7.92	0.43	0.286	(0.300)	0.235	0.051
96	8.00	0.43	0.286	(0.299)	0.235	0.051
97	8.08	0.50	0.330	(0.298)	0.271	0.059
98	8.17	0.50	0.330	(0.296)	0.271	0.059
99	8.25	0.50	0.330	(0.295)	0.271	0.059
100	8.33	0.50	0.330	(0.293)	0.271	0.059
101	8.42	0.50	0.330	(0.292)	0.271	0.059
102	8.50	0.50	0.330	(0.291)	0.271	0.059
103	8.58	0.53	0.352	(0.289)	0.289	0.063

104	8.67	0.53	0.352	0.288	(	0.289)	0.064
105	8.75	0.53	0.352	0.287	(	0.289)	0.065
106	8.83	0.57	0.374	0.285	(	0.307)	0.089
107	8.92	0.57	0.374	0.284	(	0.307)	0.090
108	9.00	0.57	0.374	0.283	(	0.307)	0.091
109	9.08	0.63	0.418	0.281	(	0.343)	0.137
110	9.17	0.63	0.418	0.280	(	0.343)	0.138
111	9.25	0.63	0.418	0.279	(	0.343)	0.139
112	9.33	0.67	0.440	0.277	(	0.361)	0.163
113	9.42	0.67	0.440	0.276	(	0.361)	0.164
114	9.50	0.67	0.440	0.275	(	0.361)	0.165
115	9.58	0.70	0.462	0.273	(	0.379)	0.189
116	9.67	0.70	0.462	0.272	(	0.379)	0.190
117	9.75	0.70	0.462	0.271	(	0.379)	0.191
118	9.83	0.73	0.484	0.269	(	0.397)	0.215
119	9.92	0.73	0.484	0.268	(	0.397)	0.216
120	10.00	0.73	0.484	0.267	(	0.397)	0.217
121	10.08	0.50	0.330	0.265	(	0.271)	0.065
122	10.17	0.50	0.330	0.264	(	0.271)	0.066
123	10.25	0.50	0.330	0.263	(	0.271)	0.067
124	10.33	0.50	0.330	0.262	(	0.271)	0.068
125	10.42	0.50	0.330	0.260	(	0.271)	0.070
126	10.50	0.50	0.330	0.259	(	0.271)	0.071
127	10.58	0.67	0.440	0.258	(	0.361)	0.182
128	10.67	0.67	0.440	0.257	(	0.361)	0.183
129	10.75	0.67	0.440	0.255	(	0.361)	0.185
130	10.83	0.67	0.440	0.254	(	0.361)	0.186
131	10.92	0.67	0.440	0.253	(	0.361)	0.187
132	11.00	0.67	0.440	0.252	(	0.361)	0.188
133	11.08	0.63	0.418	0.250	(	0.343)	0.168
134	11.17	0.63	0.418	0.249	(	0.343)	0.169
135	11.25	0.63	0.418	0.248	(	0.343)	0.170
136	11.33	0.63	0.418	0.247	(	0.343)	0.171
137	11.42	0.63	0.418	0.245	(	0.343)	0.173
138	11.50	0.63	0.418	0.244	(	0.343)	0.174
139	11.58	0.57	0.374	0.243	(	0.307)	0.131
140	11.67	0.57	0.374	0.242	(	0.307)	0.132
141	11.75	0.57	0.374	0.241	(	0.307)	0.133
142	11.83	0.60	0.396	0.239	(	0.325)	0.157
143	11.92	0.60	0.396	0.238	(	0.325)	0.158
144	12.00	0.60	0.396	0.237	(	0.325)	0.159
145	12.08	0.83	0.550	0.236	(	0.451)	0.314
146	12.17	0.83	0.550	0.235	(	0.451)	0.315
147	12.25	0.83	0.550	0.233	(	0.451)	0.317
148	12.33	0.87	0.572	0.232	(	0.469)	0.340
149	12.42	0.87	0.572	0.231	(	0.469)	0.341
150	12.50	0.87	0.572	0.230	(	0.469)	0.342
151	12.58	0.93	0.616	0.229	(	0.505)	0.387
152	12.67	0.93	0.616	0.228	(	0.505)	0.388
153	12.75	0.93	0.616	0.226	(	0.505)	0.390
154	12.83	0.97	0.638	0.225	(	0.523)	0.413
155	12.92	0.97	0.638	0.224	(	0.523)	0.414
156	13.00	0.97	0.638	0.223	(	0.523)	0.415

157	13.08	1.13	0.748	0.222	(0.613)	0.526
158	13.17	1.13	0.748	0.221	(0.613)	0.527
159	13.25	1.13	0.748	0.220	(0.613)	0.528
160	13.33	1.13	0.748	0.219	(0.613)	0.529
161	13.42	1.13	0.748	0.217	(0.613)	0.531
162	13.50	1.13	0.748	0.216	(0.613)	0.532
163	13.58	0.77	0.506	0.215	(0.415)	0.291
164	13.67	0.77	0.506	0.214	(0.415)	0.292
165	13.75	0.77	0.506	0.213	(0.415)	0.293
166	13.83	0.77	0.506	0.212	(0.415)	0.294
167	13.92	0.77	0.506	0.211	(0.415)	0.295
168	14.00	0.77	0.506	0.210	(0.415)	0.296
169	14.08	0.90	0.594	0.209	(0.487)	0.385
170	14.17	0.90	0.594	0.208	(0.487)	0.386
171	14.25	0.90	0.594	0.207	(0.487)	0.387
172	14.33	0.87	0.572	0.206	(0.469)	0.366
173	14.42	0.87	0.572	0.205	(0.469)	0.367
174	14.50	0.87	0.572	0.203	(0.469)	0.369
175	14.58	0.87	0.572	0.202	(0.469)	0.370
176	14.67	0.87	0.572	0.201	(0.469)	0.371
177	14.75	0.87	0.572	0.200	(0.469)	0.372
178	14.83	0.83	0.550	0.199	(0.451)	0.351
179	14.92	0.83	0.550	0.198	(0.451)	0.352
180	15.00	0.83	0.550	0.197	(0.451)	0.353
181	15.08	0.80	0.528	0.196	(0.433)	0.332
182	15.17	0.80	0.528	0.195	(0.433)	0.333
183	15.25	0.80	0.528	0.194	(0.433)	0.334
184	15.33	0.77	0.506	0.193	(0.415)	0.313
185	15.42	0.77	0.506	0.192	(0.415)	0.314
186	15.50	0.77	0.506	0.191	(0.415)	0.315
187	15.58	0.63	0.418	0.190	(0.343)	0.228
188	15.67	0.63	0.418	0.189	(0.343)	0.229
189	15.75	0.63	0.418	0.188	(0.343)	0.230
190	15.83	0.63	0.418	0.187	(0.343)	0.231
191	15.92	0.63	0.418	0.186	(0.343)	0.232
192	16.00	0.63	0.418	0.186	(0.343)	0.232
193	16.08	0.13	0.088	(0.185)	0.072	0.016
194	16.17	0.13	0.088	(0.184)	0.072	0.016
195	16.25	0.13	0.088	(0.183)	0.072	0.016
196	16.33	0.13	0.088	(0.182)	0.072	0.016
197	16.42	0.13	0.088	(0.181)	0.072	0.016
198	16.50	0.13	0.088	(0.180)	0.072	0.016
199	16.58	0.10	0.066	(0.179)	0.054	0.012
200	16.67	0.10	0.066	(0.178)	0.054	0.012
201	16.75	0.10	0.066	(0.177)	0.054	0.012
202	16.83	0.10	0.066	(0.176)	0.054	0.012
203	16.92	0.10	0.066	(0.175)	0.054	0.012
204	17.00	0.10	0.066	(0.174)	0.054	0.012
205	17.08	0.17	0.110	(0.174)	0.090	0.020
206	17.17	0.17	0.110	(0.173)	0.090	0.020
207	17.25	0.17	0.110	(0.172)	0.090	0.020
208	17.33	0.17	0.110	(0.171)	0.090	0.020
209	17.42	0.17	0.110	(0.170)	0.090	0.020

210	17.50	0.17	0.110	(0.169)	0.090	0.020
211	17.58	0.17	0.110	(0.168)	0.090	0.020
212	17.67	0.17	0.110	(0.168)	0.090	0.020
213	17.75	0.17	0.110	(0.167)	0.090	0.020
214	17.83	0.13	0.088	(0.166)	0.072	0.016
215	17.92	0.13	0.088	(0.165)	0.072	0.016
216	18.00	0.13	0.088	(0.164)	0.072	0.016
217	18.08	0.13	0.088	(0.163)	0.072	0.016
218	18.17	0.13	0.088	(0.163)	0.072	0.016
219	18.25	0.13	0.088	(0.162)	0.072	0.016
220	18.33	0.13	0.088	(0.161)	0.072	0.016
221	18.42	0.13	0.088	(0.160)	0.072	0.016
222	18.50	0.13	0.088	(0.160)	0.072	0.016
223	18.58	0.10	0.066	(0.159)	0.054	0.012
224	18.67	0.10	0.066	(0.158)	0.054	0.012
225	18.75	0.10	0.066	(0.157)	0.054	0.012
226	18.83	0.07	0.044	(0.156)	0.036	0.008
227	18.92	0.07	0.044	(0.156)	0.036	0.008
228	19.00	0.07	0.044	(0.155)	0.036	0.008
229	19.08	0.10	0.066	(0.154)	0.054	0.012
230	19.17	0.10	0.066	(0.154)	0.054	0.012
231	19.25	0.10	0.066	(0.153)	0.054	0.012
232	19.33	0.13	0.088	(0.152)	0.072	0.016
233	19.42	0.13	0.088	(0.151)	0.072	0.016
234	19.50	0.13	0.088	(0.151)	0.072	0.016
235	19.58	0.10	0.066	(0.150)	0.054	0.012
236	19.67	0.10	0.066	(0.149)	0.054	0.012
237	19.75	0.10	0.066	(0.149)	0.054	0.012
238	19.83	0.07	0.044	(0.148)	0.036	0.008
239	19.92	0.07	0.044	(0.147)	0.036	0.008
240	20.00	0.07	0.044	(0.147)	0.036	0.008
241	20.08	0.10	0.066	(0.146)	0.054	0.012
242	20.17	0.10	0.066	(0.145)	0.054	0.012
243	20.25	0.10	0.066	(0.145)	0.054	0.012
244	20.33	0.10	0.066	(0.144)	0.054	0.012
245	20.42	0.10	0.066	(0.144)	0.054	0.012
246	20.50	0.10	0.066	(0.143)	0.054	0.012
247	20.58	0.10	0.066	(0.142)	0.054	0.012
248	20.67	0.10	0.066	(0.142)	0.054	0.012
249	20.75	0.10	0.066	(0.141)	0.054	0.012
250	20.83	0.07	0.044	(0.141)	0.036	0.008
251	20.92	0.07	0.044	(0.140)	0.036	0.008
252	21.00	0.07	0.044	(0.139)	0.036	0.008
253	21.08	0.10	0.066	(0.139)	0.054	0.012
254	21.17	0.10	0.066	(0.138)	0.054	0.012
255	21.25	0.10	0.066	(0.138)	0.054	0.012
256	21.33	0.07	0.044	(0.137)	0.036	0.008
257	21.42	0.07	0.044	(0.137)	0.036	0.008
258	21.50	0.07	0.044	(0.136)	0.036	0.008
259	21.58	0.10	0.066	(0.136)	0.054	0.012
260	21.67	0.10	0.066	(0.135)	0.054	0.012
261	21.75	0.10	0.066	(0.135)	0.054	0.012
262	21.83	0.07	0.044	(0.134)	0.036	0.008

263	21.92	0.07	0.044	(0.134)	0.036	0.008
264	22.00	0.07	0.044	(0.133)	0.036	0.008
265	22.08	0.10	0.066	(0.133)	0.054	0.012
266	22.17	0.10	0.066	(0.132)	0.054	0.012
267	22.25	0.10	0.066	(0.132)	0.054	0.012
268	22.33	0.07	0.044	(0.132)	0.036	0.008
269	22.42	0.07	0.044	(0.131)	0.036	0.008
270	22.50	0.07	0.044	(0.131)	0.036	0.008
271	22.58	0.07	0.044	(0.131)	0.036	0.008
272	22.67	0.07	0.044	(0.130)	0.036	0.008
273	22.75	0.07	0.044	(0.130)	0.036	0.008
274	22.83	0.07	0.044	(0.129)	0.036	0.008
275	22.92	0.07	0.044	(0.129)	0.036	0.008
276	23.00	0.07	0.044	(0.129)	0.036	0.008
277	23.08	0.07	0.044	(0.128)	0.036	0.008
278	23.17	0.07	0.044	(0.128)	0.036	0.008
279	23.25	0.07	0.044	(0.128)	0.036	0.008
280	23.33	0.07	0.044	(0.128)	0.036	0.008
281	23.42	0.07	0.044	(0.127)	0.036	0.008
282	23.50	0.07	0.044	(0.127)	0.036	0.008
283	23.58	0.07	0.044	(0.127)	0.036	0.008
284	23.67	0.07	0.044	(0.127)	0.036	0.008
285	23.75	0.07	0.044	(0.127)	0.036	0.008
286	23.83	0.07	0.044	(0.127)	0.036	0.008
287	23.92	0.07	0.044	(0.126)	0.036	0.008
288	24.00	0.07	0.044	(0.126)	0.036	0.008

(Loss Rate Not Used)

Sum = 100.0 Sum = 27.0

Flood volume = Effective rainfall 2.25(In)
times area 6.4(Ac.)/[(In)/(Ft.)] = 1.2(Ac.Ft)
Total soil loss = 3.25(In)
Total soil loss = 1.745(Ac.Ft)
Total rainfall = 5.50(In)
Flood volume = 52579.0 Cubic Feet
Total soil loss = 75994.0 Cubic Feet

Peak flow rate of this hydrograph = 3.425(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	0.0001	0.01	Q	|	|	|	|
0+10	0.0003	0.04	Q	|	|	|	|
0+15	0.0006	0.04	Q	|	|	|	|
0+20	0.0010	0.05	Q	|	|	|	|
0+25	0.0014	0.07	Q	|	|	|	|
0+30	0.0019	0.07	Q	|	|	|	|

0+35	0.0025	0.07	Q				
0+40	0.0030	0.08	Q				
0+45	0.0035	0.08	Q				
0+50	0.0041	0.08	Q				
0+55	0.0047	0.10	Q				
1+ 0	0.0054	0.10	Q				
1+ 5	0.0061	0.10	Q				
1+10	0.0066	0.08	Q				
1+15	0.0072	0.08	Q				
1+20	0.0077	0.08	Q				
1+25	0.0083	0.08	Q				
1+30	0.0088	0.08	Q				
1+35	0.0093	0.08	Q				
1+40	0.0099	0.08	Q				
1+45	0.0104	0.08	Q				
1+50	0.0110	0.08	Q				
1+55	0.0116	0.10	Q				
2+ 0	0.0123	0.10	Q				
2+ 5	0.0130	0.10	Q				
2+10	0.0137	0.10	Q				
2+15	0.0144	0.10	Q				
2+20	0.0151	0.10	Q				
2+25	0.0158	0.10	Q				
2+30	0.0165	0.10	Q				
2+35	0.0173	0.11	Q				
2+40	0.0181	0.12	Q				
2+45	0.0190	0.12	Q				
2+50	0.0198	0.13	Q				
2+55	0.0207	0.13	Q				
3+ 0	0.0216	0.13	Q				
3+ 5	0.0225	0.13	Q				
3+10	0.0234	0.13	Q				
3+15	0.0243	0.13	Q				
3+20	0.0251	0.13	Q				
3+25	0.0260	0.13	Q				
3+30	0.0269	0.13	Q				
3+35	0.0278	0.13	Q				
3+40	0.0287	0.13	Q				
3+45	0.0296	0.13	Q				
3+50	0.0305	0.13	QV				
3+55	0.0315	0.15	QV				
4+ 0	0.0325	0.15	QV				
4+ 5	0.0336	0.15	QV				
4+10	0.0346	0.15	QV				
4+15	0.0357	0.15	QV				
4+20	0.0368	0.16	QV				
4+25	0.0380	0.17	QV				
4+30	0.0392	0.18	QV				
4+35	0.0404	0.18	QV				
4+40	0.0417	0.18	QV				
4+45	0.0429	0.18	QV				
4+50	0.0442	0.19	QV				
4+55	0.0455	0.20	QV				

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5+ 0       0.0469      0.20  QV        |         |         |         |
5+ 5       0.0482      0.19  QV        |         |         |         |
5+10       0.0494      0.17  QV        |         |         |         |
5+15       0.0505      0.16  QV        |         |         |         |
5+20       0.0516      0.16  QV        |         |         |         |
5+25       0.0528      0.17  QV        |         |         |         |
5+30       0.0541      0.18  QV        |         |         |         |
5+35       0.0553      0.18  QV        |         |         |         |
5+40       0.0567      0.20  QV        |         |         |         |
5+45       0.0581      0.20  QV        |         |         |         |
5+50       0.0595      0.20  QV        |         |         |         |
5+55       0.0609      0.20  Q V       |         |         |         |
6+ 0       0.0623      0.21  Q V       |         |         |         |
6+ 5       0.0638      0.21  Q V       |         |         |         |
6+10       0.0653      0.22  Q V       |         |         |         |
6+15       0.0669      0.23  Q V       |         |         |         |
6+20       0.0684      0.23  Q V       |         |         |         |
6+25       0.0700      0.23  Q V       |         |         |         |
6+30       0.0716      0.23  Q V       |         |         |         |
6+35       0.0732      0.24  Q V       |         |         |         |
6+40       0.0750      0.25  Q V       |         |         |         |
6+45       0.0767      0.25  |QV       |         |         |         |
6+50       0.0785      0.25  |QV       |         |         |         |
6+55       0.0802      0.26  |QV       |         |         |         |
7+ 0       0.0820      0.26  |QV       |         |         |         |
7+ 5       0.0838      0.26  |QV       |         |         |         |
7+10       0.0855      0.26  |QV       |         |         |         |
7+15       0.0873      0.26  |QV       |         |         |         |
7+20       0.0891      0.26  |QV       |         |         |         |
7+25       0.0910      0.28  |Q V      |         |         |         |
7+30       0.0929      0.28  |Q V      |         |         |         |
7+35       0.0949      0.29  |Q V      |         |         |         |
7+40       0.0970      0.30  |Q V      |         |         |         |
7+45       0.0991      0.30  |Q V      |         |         |         |
7+50       0.1012      0.31  |Q V      |         |         |         |
7+55       0.1034      0.33  |Q V      |         |         |         |
8+ 0       0.1057      0.33  |Q V      |         |         |         |
8+ 5       0.1081      0.34  |Q V      |         |         |         |
8+10       0.1106      0.37  |Q V      |         |         |         |
8+15       0.1132      0.38  |Q V      |         |         |         |
8+20       0.1158      0.38  |Q V      |         |         |         |
8+25       0.1185      0.38  |Q V      |         |         |         |
8+30       0.1211      0.38  |Q  V     |         |         |         |
8+35       0.1238      0.39  |Q  V     |         |         |         |
8+40       0.1266      0.40  |Q  V     |         |         |         |
8+45       0.1294      0.41  |Q  V     |         |         |         |
8+50       0.1326      0.45  |Q  V     |         |         |         |
8+55       0.1362      0.53  | Q V     |         |         |         |
9+ 0       0.1401      0.56  | Q V     |         |         |         |
9+ 5       0.1445      0.64  | Q V     |         |         |         |
9+10       0.1499      0.79  |  QV     |         |         |         |
9+15       0.1557      0.85  |  Q V    |         |         |         |
9+20       0.1620      0.91  |  Q V    |         |         |         |
```

9+25	0.1689	1.00	| Q V |				
9+30	0.1760	1.03	| QV |				
9+35	0.1835	1.09	| Q V |				
9+40	0.1915	1.17	| Q V |				
9+45	0.1998	1.21	| Q V |				
9+50	0.2085	1.26	| QV |				
9+55	0.2177	1.34	| Q V |				
10+ 0	0.2272	1.37	| Q V |				
10+ 5	0.2353	1.18	| Q V |				
10+10	0.2402	0.71	| Q V |				
10+15	0.2441	0.57	| Q V |				
10+20	0.2477	0.52	| Q V |				
10+25	0.2510	0.49	|Q V |				
10+30	0.2543	0.47	|Q V |				
10+35	0.2586	0.62	| Q V |				
10+40	0.2652	0.97	| Q V |				
10+45	0.2727	1.08	| Q V|				
10+50	0.2805	1.14	| Q V|				
10+55	0.2885	1.17	| Q V|				
11+ 0	0.2968	1.19	| Q V|				
11+ 5	0.3049	1.18	| Q V |				
11+10	0.3127	1.13	| Q V |				
11+15	0.3204	1.12	| Q V |				
11+20	0.3280	1.11	| Q V |				
11+25	0.3357	1.12	| Q |V |				
11+30	0.3434	1.12	| Q |V |				
11+35	0.3508	1.07	| Q |V |				
11+40	0.3572	0.93	| Q |V |				
11+45	0.3634	0.90	| Q | V |				
11+50	0.3697	0.92	| Q | V |				
11+55	0.3765	0.98	| Q | V |				
12+ 0	0.3834	1.01	| Q | V |				
12+ 5	0.3919	1.23	| Q | V |				
12+10	0.4039	1.73	| Q | V |				
12+15	0.4169	1.89	| Q | V |				
12+20	0.4306	2.00	| Q | V |				
12+25	0.4452	2.11	| Q | V |				
12+30	0.4601	2.16	| Q | V |				
12+35	0.4756	2.26	| Q| V |				
12+40	0.4923	2.42	| Q| V |				
12+45	0.5093	2.47	| Q| V |				
12+50	0.5267	2.53	| Q V |				
12+55	0.5448	2.62	| Q V |				
13+ 0	0.5631	2.66	| Q V |				
13+ 5	0.5825	2.83	| |Q V|				
13+10	0.6045	3.19	| | Q V |				
13+15	0.6273	3.31	| | Q V |				
13+20	0.6505	3.37	| | Q |V |				
13+25	0.6739	3.40	| | Q | V |				
13+30	0.6975	3.42	| | Q | V |				
13+35	0.7189	3.11	| | Q | V |				
13+40	0.7351	2.35	| | Q| | V |				
13+45	0.7498	2.13	| | Q | | V |				

13+50	0.7638	2.03	| Q |	|	V |	|
13+55	0.7774	1.98	| Q |	|	V |	|
14+ 0	0.7909	1.95	| Q |	|	V |	|
14+ 5	0.8050	2.06	| Q |	|	V |	|
14+10	0.8211	2.33	| Q|	|	V |	|
14+15	0.8377	2.42	| Q|	|	V |	|
14+20	0.8545	2.43	| Q|	|	V |	|
14+25	0.8710	2.39	| Q|	|	V |	|
14+30	0.8874	2.39	| Q|	|	V|	|
14+35	0.9039	2.40	| Q|	|	V|	|
14+40	0.9205	2.40	| Q|	|	V	|
14+45	0.9371	2.41	| Q|	|	|V	|
14+50	0.9535	2.38	| Q|	|	|V	|
14+55	0.9694	2.32	| Q|	|	| V	|
15+ 0	0.9853	2.30	| Q|	|	| V	|
15+ 5	1.0009	2.27	| Q|	|	| V	|
15+10	1.0161	2.20	| Q |	|	| V	|
15+15	1.0311	2.18	| Q |	|	| V	|
15+20	1.0459	2.15	| Q |	|	| V	|
15+25	1.0602	2.08	| Q |	|	| V	|
15+30	1.0744	2.06	| Q |	|	| V	|
15+35	1.0877	1.93	| Q |	|	| V	|
15+40	1.0991	1.65	| Q |	|	| V	|
15+45	1.1099	1.57	| Q |	|	| V	|
15+50	1.1205	1.54	| Q |	|	| V	|
15+55	1.1310	1.52	| Q |	|	| V	|
16+ 0	1.1414	1.51	| Q |	|	| V	|
16+ 5	1.1498	1.21	| Q |	|	| V	|
16+10	1.1534	0.52	| Q |	|	| V	|
16+15	1.1556	0.32	|Q |	|	| V	|
16+20	1.1571	0.22	Q |	|	| V	|
16+25	1.1583	0.17	Q |	|	| V	|
16+30	1.1592	0.14	Q |	|	| V	|
16+35	1.1600	0.11	Q |	|	| V	|
16+40	1.1606	0.08	Q |	|	| V	|
16+45	1.1611	0.08	Q |	|	| V	|
16+50	1.1617	0.08	Q |	|	| V	|
16+55	1.1622	0.08	Q |	|	| V	|
17+ 0	1.1627	0.08	Q |	|	| V	|
17+ 5	1.1633	0.09	Q |	|	| V	|
17+10	1.1641	0.11	Q |	|	| V	|
17+15	1.1650	0.12	Q |	|	| V	|
17+20	1.1658	0.12	Q |	|	| V	|
17+25	1.1667	0.13	Q |	|	| V	|
17+30	1.1676	0.13	Q |	|	| V	|
17+35	1.1684	0.13	Q |	|	| V	|
17+40	1.1693	0.13	Q |	|	| V	|
17+45	1.1702	0.13	Q |	|	| V	|
17+50	1.1711	0.12	Q |	|	| V	|
17+55	1.1718	0.11	Q |	|	| V	|
18+ 0	1.1726	0.11	Q |	|	| V	|
18+ 5	1.1733	0.11	Q |	|	| V	|
18+10	1.1740	0.10	Q |	|	| V	|

18+15	1.1747	0.10	Q	|	|	|	V |
18+20	1.1754	0.10	Q	|	|	|	V |
18+25	1.1761	0.10	Q	|	|	|	V |
18+30	1.1768	0.10	Q	|	|	|	V |
18+35	1.1775	0.10	Q	|	|	|	V|
18+40	1.1781	0.08	Q	|	|	|	V|
18+45	1.1786	0.08	Q	|	|	|	V|
18+50	1.1792	0.07	Q	|	|	|	V|
18+55	1.1796	0.06	Q	|	|	|	V|
19+ 0	1.1800	0.06	Q	|	|	|	V|
19+ 5	1.1804	0.06	Q	|	|	|	V|
19+10	1.1808	0.07	Q	|	|	|	V|
19+15	1.1814	0.07	Q	|	|	|	V|
19+20	1.1819	0.08	Q	|	|	|	V|
19+25	1.1826	0.09	Q	|	|	|	V|
19+30	1.1832	0.10	Q	|	|	|	V|
19+35	1.1839	0.09	Q	|	|	|	V|
19+40	1.1845	0.08	Q	|	|	|	V|
19+45	1.1850	0.08	Q	|	|	|	V|
19+50	1.1855	0.07	Q	|	|	|	V|
19+55	1.1859	0.06	Q	|	|	|	V|
20+ 0	1.1863	0.06	Q	|	|	|	V|
20+ 5	1.1867	0.06	Q	|	|	|	V|
20+10	1.1872	0.07	Q	|	|	|	V|
20+15	1.1877	0.07	Q	|	|	|	V|
20+20	1.1883	0.08	Q	|	|	|	V|
20+25	1.1888	0.08	Q	|	|	|	V|
20+30	1.1893	0.08	Q	|	|	|	V|
20+35	1.1898	0.08	Q	|	|	|	V|
20+40	1.1904	0.08	Q	|	|	|	V|
20+45	1.1909	0.08	Q	|	|	|	V|
20+50	1.1914	0.07	Q	|	|	|	V|
20+55	1.1918	0.06	Q	|	|	|	V|
21+ 0	1.1922	0.06	Q	|	|	|	V|
21+ 5	1.1926	0.06	Q	|	|	|	V|
21+10	1.1931	0.07	Q	|	|	|	V|
21+15	1.1936	0.07	Q	|	|	|	V|
21+20	1.1941	0.07	Q	|	|	|	V|
21+25	1.1945	0.06	Q	|	|	|	V|
21+30	1.1948	0.05	Q	|	|	|	V|
21+35	1.1952	0.06	Q	|	|	|	V|
21+40	1.1957	0.07	Q	|	|	|	V|
21+45	1.1962	0.07	Q	|	|	|	V|
21+50	1.1967	0.07	Q	|	|	|	V|
21+55	1.1971	0.06	Q	|	|	|	V|
22+ 0	1.1975	0.05	Q	|	|	|	V|
22+ 5	1.1979	0.06	Q	|	|	|	V|
22+10	1.1984	0.07	Q	|	|	|	V|
22+15	1.1989	0.07	Q	|	|	|	V|
22+20	1.1994	0.07	Q	|	|	|	V|
22+25	1.1998	0.06	Q	|	|	|	V|
22+30	1.2001	0.05	Q	|	|	|	V|
22+35	1.2005	0.05	Q	|	|	|	V|

22+40	1.2009	0.05	Q	|	|	|	V|
22+45	1.2012	0.05	Q	|	|	|	V|
22+50	1.2016	0.05	Q	|	|	|	V|
22+55	1.2019	0.05	Q	|	|	|	V|
23+ 0	1.2023	0.05	Q	|	|	|	V|
23+ 5	1.2027	0.05	Q	|	|	|	V|
23+10	1.2030	0.05	Q	|	|	|	V|
23+15	1.2034	0.05	Q	|	|	|	V|
23+20	1.2037	0.05	Q	|	|	|	V|
23+25	1.2041	0.05	Q	|	|	|	V|
23+30	1.2044	0.05	Q	|	|	|	V|
23+35	1.2048	0.05	Q	|	|	|	V|
23+40	1.2051	0.05	Q	|	|	|	V|
23+45	1.2055	0.05	Q	|	|	|	V|
23+50	1.2058	0.05	Q	|	|	|	V|
23+55	1.2062	0.05	Q	|	|	|	V|
24+ 0	1.2065	0.05	Q	|	|	|	V|
24+ 5	1.2068	0.04	Q	|	|	|	V|
24+10	1.2069	0.02	Q	|	|	|	V|
24+15	1.2070	0.01	Q	|	|	|	V|
24+20	1.2070	0.00	Q	|	|	|	V|
24+25	1.2070	0.00	Q	|	|	|	V|
24+30	1.2070	0.00	Q	|	|	|	V|
24+35	1.2070	0.00	Q	|	|	|	V|

APPENDIX C.2: POST PROJECT CONDITION AREA A2 100-YEAR UNIT HYDROGRAPH CALCULATIONS

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

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Study date 01/21/25 File: ARA21100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A3-A14
POST-PROJECT CONDITION
FN: ARA2

Drainage Area = 6.73(Ac.) = 0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.73(Ac.) = 0.011 Sq. Mi.
Length along longest watercourse = 690.00(Ft.)
Length along longest watercourse measured to centroid = 236.00(Ft.)
Length along longest watercourse = 0.131 Mi.
Length along longest watercourse measured to centroid = 0.045 Mi.
Difference in elevation = 59.00(Ft.)
Slope along watercourse = 451.4783 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 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]
6.73	0.55	3.70

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.73	1.25	8.41

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.550(In)
Area Averaged 100-Year Rainfall = 1.250(In)

Point rain (area averaged) = 1.250(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.250(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.730	71.70	0.785

Total Area Entered = 6.73(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.7	71.7	0.342	0.785	0.100	1.000	0.100
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.272

Slope of intensity-duration curve for a 1 hour storm =0.5500

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	391.463	64.487	4.374
2	0.167	782.927	32.563	2.209
3	0.250	1174.390	2.950	0.200
		Sum = 100.000	Sum=	6.783

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)

1	0.08	3.30	0.495	0.100	(	0.135)	0.395
2	0.17	4.20	0.630	0.100	(	0.171)	0.530
3	0.25	4.40	0.660	0.100	(	0.180)	0.560
4	0.33	4.80	0.720	0.100	(	0.196)	0.620
5	0.42	5.20	0.780	0.100	(	0.212)	0.680
6	0.50	6.20	0.930	0.100	(	0.253)	0.830
7	0.58	6.80	1.020	0.100	(	0.277)	0.920
8	0.67	8.80	1.320	0.100	(	0.359)	1.220
9	0.75	13.90	2.085	0.100	(	0.567)	1.985
10	0.83	31.40	4.710	0.100	(	1.281)	4.609
11	0.92	7.20	1.080	0.100	(	0.294)	0.980
12	1.00	3.80	0.570	0.100	(	0.155)	0.470

(Loss Rate Not Used)

Sum = 100.0 Sum = 13.8

Flood volume = Effective rainfall 1.15(In)
times area 6.7(Ac.)/[(In)/(Ft.)] = 0.6(Ac.Ft)
Total soil loss = 0.10(In)
Total soil loss = 0.056(Ac.Ft)
Total rainfall = 1.25(In)
Flood volume = 28083.7 Cubic Feet
Total soil loss = 2451.8 Cubic Feet

Peak flow rate of this hydrograph = 24.801(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	7.5	15.0	22.5	30.0
0+ 5	0.0119	1.73	V Q				
0+10	0.0339	3.19	| V Q				
0+15	0.0593	3.70	| VQ				
0+20	0.0872	4.05	| Q				
0+25	0.1179	4.46	| Q V				
0+30	0.1541	5.26	| Q V|				
0+35	0.1954	5.99	| Q | V				
0+40	0.2473	7.54	| Q V				
0+45	0.3269	11.56	| | Q V				
0+50	0.4977	24.80	| | | V Q				
0+55	0.6002	14.87	| | Q| | V |				
1+ 0	0.6356	5.14	| Q | | V|				
1+ 5	0.6441	1.23	|Q | | V|				
1+10	0.6447	0.09	Q | | V|				

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

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Study date 01/21/25 File: ARA23100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A3-A14
POST-PROJECT CONDITION
FN: ARA2

Drainage Area = 6.73(Ac.) = 0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.73(Ac.) = 0.011 Sq. Mi.
Length along longest watercourse = 690.00(Ft.)
Length along longest watercourse measured to centroid = 236.00(Ft.)
Length along longest watercourse = 0.131 Mi.
Length along longest watercourse measured to centroid = 0.045 Mi.
Difference in elevation = 59.00(Ft.)
Slope along watercourse = 451.4783 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 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]
6.73	0.90	6.06

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.73	2.00	13.46

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.900(In)
Area Averaged 100-Year Rainfall = 2.000(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.730	71.70	0.785

Total Area Entered = 6.73(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.7	71.7	0.342	0.785	0.100	1.000	0.100
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.272

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	391.463	64.487	4.374
2	0.167	782.927	32.563	2.209
3	0.250	1174.390	2.950	0.200
		Sum = 100.000	Sum=	6.783

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.312	(0.100)	0.085	0.227
2	0.17	1.30	0.312	(0.100)	0.085	0.227

3	0.25	1.10	0.264	(	0.100)	0.072		0.192
4	0.33	1.50	0.360	(	0.100)	0.098		0.262
5	0.42	1.50	0.360	(	0.100)	0.098		0.262
6	0.50	1.80	0.432		0.100	(0.118)		0.332
7	0.58	1.50	0.360	(	0.100)	0.098		0.262
8	0.67	1.80	0.432		0.100	(0.118)		0.332
9	0.75	1.80	0.432		0.100	(0.118)		0.332
10	0.83	1.50	0.360	(	0.100)	0.098		0.262
11	0.92	1.60	0.384		0.100	(0.104)		0.284
12	1.00	1.80	0.432		0.100	(0.118)		0.332
13	1.08	2.20	0.528		0.100	(0.144)		0.428
14	1.17	2.20	0.528		0.100	(0.144)		0.428
15	1.25	2.20	0.528		0.100	(0.144)		0.428
16	1.33	2.00	0.480		0.100	(0.131)		0.380
17	1.42	2.60	0.624		0.100	(0.170)		0.524
18	1.50	2.70	0.648		0.100	(0.176)		0.548
19	1.58	2.40	0.576		0.100	(0.157)		0.476
20	1.67	2.70	0.648		0.100	(0.176)		0.548
21	1.75	3.30	0.792		0.100	(0.215)		0.692
22	1.83	3.10	0.744		0.100	(0.202)		0.644
23	1.92	2.90	0.696		0.100	(0.189)		0.596
24	2.00	3.00	0.720		0.100	(0.196)		0.620
25	2.08	3.10	0.744		0.100	(0.202)		0.644
26	2.17	4.20	1.008		0.100	(0.274)		0.908
27	2.25	5.00	1.200		0.100	(0.326)		1.100
28	2.33	3.50	0.840		0.100	(0.228)		0.740
29	2.42	6.80	1.632		0.100	(0.444)		1.532
30	2.50	7.30	1.752		0.100	(0.477)		1.652
31	2.58	8.20	1.968		0.100	(0.535)		1.868
32	2.67	5.90	1.416		0.100	(0.385)		1.316
33	2.75	2.00	0.480		0.100	(0.131)		0.380
34	2.83	1.80	0.432		0.100	(0.118)		0.332
35	2.92	1.80	0.432		0.100	(0.118)		0.332
36	3.00	0.60	0.144	(	0.100)	0.039		0.105

(Loss Rate Not Used)

Sum = 100.0 Sum = 20.5

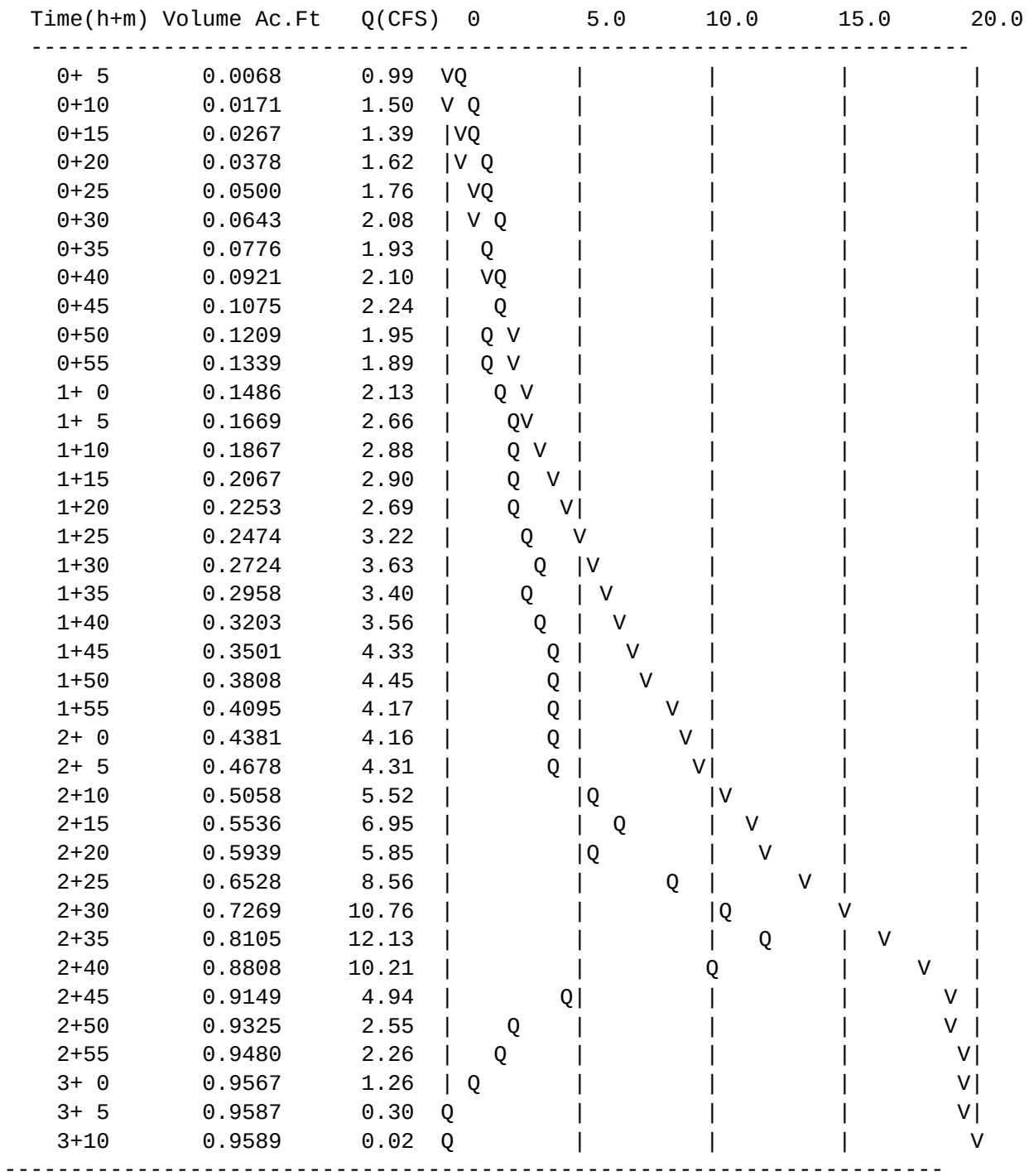
Flood volume = Effective rainfall 1.71(In)
times area 6.7(Ac.)/[(In)/(Ft.)] = 1.0(Ac.Ft)
Total soil loss = 0.29(In)
Total soil loss = 0.163(Ac.Ft)
Total rainfall = 2.00(In)
Flood volume = 41768.7 Cubic Feet
Total soil loss = 7089.6 Cubic Feet

Peak flow rate of this hydrograph = 12.129(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 5.0 10.0 15.0 20.0
0+ 5 0.0068 0.99
0+10 0.0171 1.50
0+15 0.0267 1.39
0+20 0.0378 1.62
0+25 0.0500 1.76
0+30 0.0643 2.08
0+35 0.0776 1.93
0+40 0.0921 2.10
0+45 0.1075 2.24
0+50 0.1209 1.95
0+55 0.1339 1.89
1+ 0 0.1486 2.13
1+ 5 0.1669 2.66
1+10 0.1867 2.88
1+15 0.2067 2.90
1+20 0.2253 2.69
1+25 0.2474 3.22
1+30 0.2724 3.63
1+35 0.2958 3.40
1+40 0.3203 3.56
1+45 0.3501 4.33
1+50 0.3808 4.45
1+55 0.4095 4.17
2+ 0 0.4381 4.16
2+ 5 0.4678 4.31
2+10 0.5058 5.52
2+15 0.5536 6.95
2+20 0.5939 5.85
2+25 0.6528 8.56
2+30 0.7269 10.76
2+35 0.8105 12.13
2+40 0.8808 10.21
2+45 0.9149 4.94
2+50 0.9325 2.55
2+55 0.9480 2.26
3+ 0 0.9567 1.26
3+ 5 0.9587 0.30
3+10 0.9589 0.02

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

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Study date 01/21/25 File: ARA26100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A3-A14
POST-PROJECT CONDITION
FN: ARA2

Drainage Area = 6.73(Ac.) = 0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.73(Ac.) = 0.011 Sq. Mi.
Length along longest watercourse = 690.00(Ft.)
Length along longest watercourse measured to centroid = 236.00(Ft.)
Length along longest watercourse = 0.131 Mi.
Length along longest watercourse measured to centroid = 0.045 Mi.
Difference in elevation = 59.00(Ft.)
Slope along watercourse = 451.4783 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 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]
6.73	1.30	8.75

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.73	2.75	18.51

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.300(In)
Area Averaged 100-Year Rainfall = 2.750(In)

Point rain (area averaged) = 2.750(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.750(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.730	71.70	0.785

Total Area Entered = 6.73(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.7	71.7	0.342	0.785	0.100	1.000	0.100
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.272

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	391.463	64.487	4.374
2	0.167	782.927	32.563	2.209
3	0.250	1174.390	2.950	0.200
		Sum = 100.000	Sum=	6.783

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.165	(0.100)	0.045	0.120
2	0.17	0.60	0.198	(0.100)	0.054	0.144

3	0.25	0.60	0.198	(0.100)	0.054	0.144
4	0.33	0.60	0.198	(0.100)	0.054	0.144
5	0.42	0.60	0.198	(0.100)	0.054	0.144
6	0.50	0.70	0.231	(0.100)	0.063	0.168
7	0.58	0.70	0.231	(0.100)	0.063	0.168
8	0.67	0.70	0.231	(0.100)	0.063	0.168
9	0.75	0.70	0.231	(0.100)	0.063	0.168
10	0.83	0.70	0.231	(0.100)	0.063	0.168
11	0.92	0.70	0.231	(0.100)	0.063	0.168
12	1.00	0.80	0.264	(0.100)	0.072	0.192
13	1.08	0.80	0.264	(0.100)	0.072	0.192
14	1.17	0.80	0.264	(0.100)	0.072	0.192
15	1.25	0.80	0.264	(0.100)	0.072	0.192
16	1.33	0.80	0.264	(0.100)	0.072	0.192
17	1.42	0.80	0.264	(0.100)	0.072	0.192
18	1.50	0.80	0.264	(0.100)	0.072	0.192
19	1.58	0.80	0.264	(0.100)	0.072	0.192
20	1.67	0.80	0.264	(0.100)	0.072	0.192
21	1.75	0.80	0.264	(0.100)	0.072	0.192
22	1.83	0.80	0.264	(0.100)	0.072	0.192
23	1.92	0.80	0.264	(0.100)	0.072	0.192
24	2.00	0.90	0.297	(0.100)	0.081	0.216
25	2.08	0.80	0.264	(0.100)	0.072	0.192
26	2.17	0.90	0.297	(0.100)	0.081	0.216
27	2.25	0.90	0.297	(0.100)	0.081	0.216
28	2.33	0.90	0.297	(0.100)	0.081	0.216
29	2.42	0.90	0.297	(0.100)	0.081	0.216
30	2.50	0.90	0.297	(0.100)	0.081	0.216
31	2.58	0.90	0.297	(0.100)	0.081	0.216
32	2.67	0.90	0.297	(0.100)	0.081	0.216
33	2.75	1.00	0.330	(0.100)	0.090	0.240
34	2.83	1.00	0.330	(0.100)	0.090	0.240
35	2.92	1.00	0.330	(0.100)	0.090	0.240
36	3.00	1.00	0.330	(0.100)	0.090	0.240
37	3.08	1.00	0.330	(0.100)	0.090	0.240
38	3.17	1.10	0.363	(0.100)	0.099	0.264
39	3.25	1.10	0.363	(0.100)	0.099	0.264
40	3.33	1.10	0.363	(0.100)	0.099	0.264
41	3.42	1.20	0.396	0.100	(0.108)	0.296
42	3.50	1.30	0.429	0.100	(0.117)	0.329
43	3.58	1.40	0.462	0.100	(0.126)	0.362
44	3.67	1.40	0.462	0.100	(0.126)	0.362
45	3.75	1.50	0.495	0.100	(0.135)	0.395
46	3.83	1.50	0.495	0.100	(0.135)	0.395
47	3.92	1.60	0.528	0.100	(0.144)	0.428
48	4.00	1.60	0.528	0.100	(0.144)	0.428
49	4.08	1.70	0.561	0.100	(0.153)	0.461
50	4.17	1.80	0.594	0.100	(0.162)	0.494
51	4.25	1.90	0.627	0.100	(0.171)	0.527
52	4.33	2.00	0.660	0.100	(0.180)	0.560
53	4.42	2.10	0.693	0.100	(0.188)	0.593
54	4.50	2.10	0.693	0.100	(0.188)	0.593
55	4.58	2.20	0.726	0.100	(0.197)	0.626

```
56   4.67     2.30      0.759          0.100    (  0.206)        0.659
57   4.75     2.40      0.792          0.100    (  0.215)        0.692
58   4.83     2.40      0.792          0.100    (  0.215)        0.692
59   4.92     2.50      0.825          0.100    (  0.224)        0.725
60   5.00     2.60      0.858          0.100    (  0.233)        0.758
61   5.08     3.10      1.023          0.100    (  0.278)        0.923
62   5.17     3.60      1.188          0.100    (  0.323)        1.088
63   5.25     3.90      1.287          0.100    (  0.350)        1.187
64   5.33     4.20      1.386          0.100    (  0.377)        1.286
65   5.42     4.70      1.551          0.100    (  0.422)        1.451
66   5.50     5.60      1.848          0.100    (  0.503)        1.748
67   5.58     1.90      0.627          0.100    (  0.171)        0.527
68   5.67     0.90      0.297       (  0.100)       0.081        0.216
69   5.75     0.60      0.198       (  0.100)       0.054        0.144
70   5.83     0.50      0.165       (  0.100)       0.045        0.120
71   5.92     0.30      0.099       (  0.100)       0.027        0.072
72   6.00     0.20      0.066       (  0.100)       0.018        0.048
          (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    27.1
    Flood volume = Effective rainfall      2.26(In)
     times area       6.7(Ac.)/[(In)/(Ft.)] =       1.3(Ac.Ft)
    Total soil loss =      0.49(In)
    Total soil loss =     0.276(Ac.Ft)
    Total rainfall =      2.75(In)
    Flood volume =       55177.2 Cubic Feet
    Total soil loss =       12003.4 Cubic Feet
    ---------------------------------------------------------------------
     Peak flow rate of this hydrograph =     11.111(CFS)
    ---------------------------------------------------------------------
    +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                        6 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
    ---------------------------------------------------------------------
                Hydrograph in   5   Minute intervals ((CFS))

    ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0        5.0      10.0      15.0      20.0
-------------------------------------------------------------------------
  0+ 5       0.0036      0.53  VQ        |         |         |         |
  0+10       0.0098      0.90  VQ        |         |         |         |
  0+15       0.0165      0.97  VQ        |         |         |         |
  0+20       0.0232      0.98  VQ        |         |         |         |
  0+25       0.0300      0.98  VQ        |         |         |         |
  0+30       0.0374      1.08  |VQ       |         |         |         |
  0+35       0.0453      1.14  |VQ       |         |         |         |
  0+40       0.0531      1.14  |VQ       |         |         |         |
  0+45       0.0610      1.14  |VQ       |         |         |         |
  0+50       0.0688      1.14  | Q       |         |         |         |
  0+55       0.0767      1.14  | Q       |         |         |         |
  1+ 0       0.0853      1.25  | Q       |         |         |         |
  1+ 5       0.0942      1.30  | Q       |         |         |         |
  1+10       0.1032      1.30  | QV      |         |         |         |
  1+15       0.1122      1.30  | QV      |         |         |         |
```

1+20	0.1212	1.30	QV				
1+25	0.1302	1.30	Q V				
1+30	0.1391	1.30	Q V				
1+35	0.1481	1.30	Q V				
1+40	0.1571	1.30	Q V				
1+45	0.1661	1.30	Q V				
1+50	0.1751	1.30	Q V				
1+55	0.1840	1.30	Q V				
2+ 0	0.1938	1.41	Q V				
2+ 5	0.2031	1.36	Q V				
2+10	0.2128	1.41	Q V				
2+15	0.2229	1.46	Q V				
2+20	0.2330	1.47	Q V				
2+25	0.2431	1.47	Q V				
2+30	0.2532	1.47	Q V				
2+35	0.2633	1.47	Q V				
2+40	0.2734	1.47	Q V				
2+45	0.2843	1.57	Q V				
2+50	0.2955	1.63	Q V				
2+55	0.3067	1.63	Q V				
3+ 0	0.3179	1.63	Q V				
3+ 5	0.3291	1.63	Q V				
3+10	0.3411	1.74	Q V				
3+15	0.3534	1.79	Q V				
3+20	0.3658	1.79	Q V				
3+25	0.3791	1.93	Q V				
3+30	0.3938	2.14	Q V				
3+35	0.4101	2.37	Q V				
3+40	0.4270	2.45	Q V				
3+45	0.4449	2.60	Q V				
3+50	0.4633	2.67	Q V				
3+55	0.4827	2.82	Q V				
4+ 0	0.5027	2.90	Q V				
4+ 5	0.5236	3.05	Q V				
4+10	0.5461	3.26	Q V				
4+15	0.5701	3.49	Q V				
4+20	0.5957	3.71	Q V				
4+25	0.6228	3.94	Q V				
4+30	0.6505	4.01	Q V				
4+35	0.6791	4.17	Q V				
4+40	0.7093	4.38	Q V				
4+45	0.7411	4.61	Q V				
4+50	0.7733	4.69	Q V				
4+55	0.8067	4.84	Q V				
5+ 0	0.8415	5.06	Q V				
5+ 5	0.8818	5.86	Q V				
5+10	0.9297	6.95	Q V				
5+15	0.9833	7.78	Q V				
5+20	1.0416	8.47	Q V				
5+25	1.1065	9.43	Q V				
5+30	1.1830	11.11	Q V				
5+35	1.2275	6.46	Q V				
5+40	1.2444	2.46	Q V				

```
    5+45       1.2528      1.21  | Q       |         |         |        V|
    5+50       1.2589      0.89  |Q        |         |         |        V|
    5+55       1.2631      0.61  |Q        |         |         |        V|
    6+ 0       1.2658      0.39  Q         |         |         |        V|
    6+ 5       1.2666      0.12  Q         |         |         |        V|
    6+10       1.2667      0.01  Q         |         |         |         V
---------------------------------------------------------------------------
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U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/21/25 File: ARA224100.out

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

Program License Serial Number 6279

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

English Units used in output format

277.02.24
UNIT HYDROGRAPH FOR AREA A3-A14
POST-PROJECT CONDITION
FN: ARA2

Drainage Area = 6.73(Ac.) = 0.011 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.73(Ac.) = 0.011 Sq. Mi.
Length along longest watercourse = 690.00(Ft.)
Length along longest watercourse measured to centroid = 236.00(Ft.)
Length along longest watercourse = 0.131 Mi.
Length along longest watercourse measured to centroid = 0.045 Mi.
Difference in elevation = 59.00(Ft.)
Slope along watercourse = 451.4783 Ft./Mi.
Average Manning's 'N' = 0.020
Lag time = 0.021 Hr.
Lag time = 1.28 Min.
25% of lag time = 0.32 Min.
40% of lag time = 0.51 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]
6.73	2.25	15.14

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
6.73	5.50	37.02

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 2.250(In)
Area Averaged 100-Year Rainfall = 5.500(In)

Point rain (area averaged) = 5.500(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 5.500(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.730	71.70	0.785

Total Area Entered = 6.73(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
71.7	71.7	0.342	0.785	0.100	1.000	0.100
					Sum (F) =	0.100

Area averaged mean soil loss (F) (In/Hr) = 0.100
Minimum soil loss rate ((In/Hr)) = 0.050
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.272

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	391.463	64.487	4.374
2	0.167	782.927	32.563	2.209
3	0.250	1174.390	2.950	0.200
		Sum = 100.000	Sum=	6.783

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

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.07	0.044	(0.178)	0.012	0.032
2	0.17	0.07	0.044	(0.177)	0.012	0.032

3	0.25	0.07	0.044	(0.177)	0.012	0.032
4	0.33	0.10	0.066	(0.176)	0.018	0.048
5	0.42	0.10	0.066	(0.175)	0.018	0.048
6	0.50	0.10	0.066	(0.174)	0.018	0.048
7	0.58	0.10	0.066	(0.174)	0.018	0.048
8	0.67	0.10	0.066	(0.173)	0.018	0.048
9	0.75	0.10	0.066	(0.172)	0.018	0.048
10	0.83	0.13	0.088	(0.172)	0.024	0.064
11	0.92	0.13	0.088	(0.171)	0.024	0.064
12	1.00	0.13	0.088	(0.170)	0.024	0.064
13	1.08	0.10	0.066	(0.170)	0.018	0.048
14	1.17	0.10	0.066	(0.169)	0.018	0.048
15	1.25	0.10	0.066	(0.168)	0.018	0.048
16	1.33	0.10	0.066	(0.168)	0.018	0.048
17	1.42	0.10	0.066	(0.167)	0.018	0.048
18	1.50	0.10	0.066	(0.166)	0.018	0.048
19	1.58	0.10	0.066	(0.166)	0.018	0.048
20	1.67	0.10	0.066	(0.165)	0.018	0.048
21	1.75	0.10	0.066	(0.164)	0.018	0.048
22	1.83	0.13	0.088	(0.164)	0.024	0.064
23	1.92	0.13	0.088	(0.163)	0.024	0.064
24	2.00	0.13	0.088	(0.162)	0.024	0.064
25	2.08	0.13	0.088	(0.162)	0.024	0.064
26	2.17	0.13	0.088	(0.161)	0.024	0.064
27	2.25	0.13	0.088	(0.160)	0.024	0.064
28	2.33	0.13	0.088	(0.160)	0.024	0.064
29	2.42	0.13	0.088	(0.159)	0.024	0.064
30	2.50	0.13	0.088	(0.159)	0.024	0.064
31	2.58	0.17	0.110	(0.158)	0.030	0.080
32	2.67	0.17	0.110	(0.157)	0.030	0.080
33	2.75	0.17	0.110	(0.157)	0.030	0.080
34	2.83	0.17	0.110	(0.156)	0.030	0.080
35	2.92	0.17	0.110	(0.155)	0.030	0.080
36	3.00	0.17	0.110	(0.155)	0.030	0.080
37	3.08	0.17	0.110	(0.154)	0.030	0.080
38	3.17	0.17	0.110	(0.153)	0.030	0.080
39	3.25	0.17	0.110	(0.153)	0.030	0.080
40	3.33	0.17	0.110	(0.152)	0.030	0.080
41	3.42	0.17	0.110	(0.151)	0.030	0.080
42	3.50	0.17	0.110	(0.151)	0.030	0.080
43	3.58	0.17	0.110	(0.150)	0.030	0.080
44	3.67	0.17	0.110	(0.150)	0.030	0.080
45	3.75	0.17	0.110	(0.149)	0.030	0.080
46	3.83	0.20	0.132	(0.148)	0.036	0.096
47	3.92	0.20	0.132	(0.148)	0.036	0.096
48	4.00	0.20	0.132	(0.147)	0.036	0.096
49	4.08	0.20	0.132	(0.146)	0.036	0.096
50	4.17	0.20	0.132	(0.146)	0.036	0.096
51	4.25	0.20	0.132	(0.145)	0.036	0.096
52	4.33	0.23	0.154	(0.145)	0.042	0.112
53	4.42	0.23	0.154	(0.144)	0.042	0.112
54	4.50	0.23	0.154	(0.143)	0.042	0.112
55	4.58	0.23	0.154	(0.143)	0.042	0.112

56	4.67	0.23	0.154	(0.142)	0.042	0.112
57	4.75	0.23	0.154	(0.141)	0.042	0.112
58	4.83	0.27	0.176	(0.141)	0.048	0.128
59	4.92	0.27	0.176	(0.140)	0.048	0.128
60	5.00	0.27	0.176	(0.140)	0.048	0.128
61	5.08	0.20	0.132	(0.139)	0.036	0.096
62	5.17	0.20	0.132	(0.138)	0.036	0.096
63	5.25	0.20	0.132	(0.138)	0.036	0.096
64	5.33	0.23	0.154	(0.137)	0.042	0.112
65	5.42	0.23	0.154	(0.137)	0.042	0.112
66	5.50	0.23	0.154	(0.136)	0.042	0.112
67	5.58	0.27	0.176	(0.135)	0.048	0.128
68	5.67	0.27	0.176	(0.135)	0.048	0.128
69	5.75	0.27	0.176	(0.134)	0.048	0.128
70	5.83	0.27	0.176	(0.134)	0.048	0.128
71	5.92	0.27	0.176	(0.133)	0.048	0.128
72	6.00	0.27	0.176	(0.132)	0.048	0.128
73	6.08	0.30	0.198	(0.132)	0.054	0.144
74	6.17	0.30	0.198	(0.131)	0.054	0.144
75	6.25	0.30	0.198	(0.131)	0.054	0.144
76	6.33	0.30	0.198	(0.130)	0.054	0.144
77	6.42	0.30	0.198	(0.130)	0.054	0.144
78	6.50	0.30	0.198	(0.129)	0.054	0.144
79	6.58	0.33	0.220	(0.128)	0.060	0.160
80	6.67	0.33	0.220	(0.128)	0.060	0.160
81	6.75	0.33	0.220	(0.127)	0.060	0.160
82	6.83	0.33	0.220	(0.127)	0.060	0.160
83	6.92	0.33	0.220	(0.126)	0.060	0.160
84	7.00	0.33	0.220	(0.126)	0.060	0.160
85	7.08	0.33	0.220	(0.125)	0.060	0.160
86	7.17	0.33	0.220	(0.124)	0.060	0.160
87	7.25	0.33	0.220	(0.124)	0.060	0.160
88	7.33	0.37	0.242	(0.123)	0.066	0.176
89	7.42	0.37	0.242	(0.123)	0.066	0.176
90	7.50	0.37	0.242	(0.122)	0.066	0.176
91	7.58	0.40	0.264	(0.122)	0.072	0.192
92	7.67	0.40	0.264	(0.121)	0.072	0.192
93	7.75	0.40	0.264	(0.120)	0.072	0.192
94	7.83	0.43	0.286	(0.120)	0.078	0.208
95	7.92	0.43	0.286	(0.119)	0.078	0.208
96	8.00	0.43	0.286	(0.119)	0.078	0.208
97	8.08	0.50	0.330	(0.118)	0.090	0.240
98	8.17	0.50	0.330	(0.118)	0.090	0.240
99	8.25	0.50	0.330	(0.117)	0.090	0.240
100	8.33	0.50	0.330	(0.117)	0.090	0.240
101	8.42	0.50	0.330	(0.116)	0.090	0.240
102	8.50	0.50	0.330	(0.115)	0.090	0.240
103	8.58	0.53	0.352	(0.115)	0.096	0.256
104	8.67	0.53	0.352	(0.114)	0.096	0.256
105	8.75	0.53	0.352	(0.114)	0.096	0.256
106	8.83	0.57	0.374	(0.113)	0.102	0.272
107	8.92	0.57	0.374	(0.113)	0.102	0.272
108	9.00	0.57	0.374	(0.112)	0.102	0.272

109	9.08	0.63	0.418	0.112	(0.114)	0.306
110	9.17	0.63	0.418	0.111	(0.114)	0.307
111	9.25	0.63	0.418	0.111	(0.114)	0.307
112	9.33	0.67	0.440	0.110	(0.120)	0.330
113	9.42	0.67	0.440	0.110	(0.120)	0.330
114	9.50	0.67	0.440	0.109	(0.120)	0.331
115	9.58	0.70	0.462	0.109	(0.126)	0.353
116	9.67	0.70	0.462	0.108	(0.126)	0.354
117	9.75	0.70	0.462	0.108	(0.126)	0.354
118	9.83	0.73	0.484	0.107	(0.132)	0.377
119	9.92	0.73	0.484	0.106	(0.132)	0.377
120	10.00	0.73	0.484	0.106	(0.132)	0.378
121	10.08	0.50	0.330	(0.105)	0.090	0.240
122	10.17	0.50	0.330	(0.105)	0.090	0.240
123	10.25	0.50	0.330	(0.104)	0.090	0.240
124	10.33	0.50	0.330	(0.104)	0.090	0.240
125	10.42	0.50	0.330	(0.103)	0.090	0.240
126	10.50	0.50	0.330	(0.103)	0.090	0.240
127	10.58	0.67	0.440	0.102	(0.120)	0.338
128	10.67	0.67	0.440	0.102	(0.120)	0.338
129	10.75	0.67	0.440	0.101	(0.120)	0.339
130	10.83	0.67	0.440	0.101	(0.120)	0.339
131	10.92	0.67	0.440	0.100	(0.120)	0.340
132	11.00	0.67	0.440	0.100	(0.120)	0.340
133	11.08	0.63	0.418	0.099	(0.114)	0.319
134	11.17	0.63	0.418	0.099	(0.114)	0.319
135	11.25	0.63	0.418	0.098	(0.114)	0.320
136	11.33	0.63	0.418	0.098	(0.114)	0.320
137	11.42	0.63	0.418	0.097	(0.114)	0.320
138	11.50	0.63	0.418	0.097	(0.114)	0.321
139	11.58	0.57	0.374	0.097	(0.102)	0.277
140	11.67	0.57	0.374	0.096	(0.102)	0.278
141	11.75	0.57	0.374	0.096	(0.102)	0.278
142	11.83	0.60	0.396	0.095	(0.108)	0.301
143	11.92	0.60	0.396	0.095	(0.108)	0.301
144	12.00	0.60	0.396	0.094	(0.108)	0.302
145	12.08	0.83	0.550	0.094	(0.150)	0.456
146	12.17	0.83	0.550	0.093	(0.150)	0.457
147	12.25	0.83	0.550	0.093	(0.150)	0.457
148	12.33	0.87	0.572	0.092	(0.156)	0.480
149	12.42	0.87	0.572	0.092	(0.156)	0.480
150	12.50	0.87	0.572	0.091	(0.156)	0.481
151	12.58	0.93	0.616	0.091	(0.168)	0.525
152	12.67	0.93	0.616	0.090	(0.168)	0.526
153	12.75	0.93	0.616	0.090	(0.168)	0.526
154	12.83	0.97	0.638	0.090	(0.174)	0.548
155	12.92	0.97	0.638	0.089	(0.174)	0.549
156	13.00	0.97	0.638	0.089	(0.174)	0.549
157	13.08	1.13	0.748	0.088	(0.203)	0.660
158	13.17	1.13	0.748	0.088	(0.203)	0.660
159	13.25	1.13	0.748	0.087	(0.203)	0.661
160	13.33	1.13	0.748	0.087	(0.203)	0.661
161	13.42	1.13	0.748	0.086	(0.203)	0.662

162	13.50	1.13	0.748	0.086	(0.203)	0.662
163	13.58	0.77	0.506	0.086	(0.138)	0.420
164	13.67	0.77	0.506	0.085	(0.138)	0.421
165	13.75	0.77	0.506	0.085	(0.138)	0.421
166	13.83	0.77	0.506	0.084	(0.138)	0.422
167	13.92	0.77	0.506	0.084	(0.138)	0.422
168	14.00	0.77	0.506	0.083	(0.138)	0.423
169	14.08	0.90	0.594	0.083	(0.162)	0.511
170	14.17	0.90	0.594	0.083	(0.162)	0.511
171	14.25	0.90	0.594	0.082	(0.162)	0.512
172	14.33	0.87	0.572	0.082	(0.156)	0.490
173	14.42	0.87	0.572	0.081	(0.156)	0.491
174	14.50	0.87	0.572	0.081	(0.156)	0.491
175	14.58	0.87	0.572	0.080	(0.156)	0.492
176	14.67	0.87	0.572	0.080	(0.156)	0.492
177	14.75	0.87	0.572	0.080	(0.156)	0.492
178	14.83	0.83	0.550	0.079	(0.150)	0.471
179	14.92	0.83	0.550	0.079	(0.150)	0.471
180	15.00	0.83	0.550	0.078	(0.150)	0.472
181	15.08	0.80	0.528	0.078	(0.144)	0.450
182	15.17	0.80	0.528	0.078	(0.144)	0.450
183	15.25	0.80	0.528	0.077	(0.144)	0.451
184	15.33	0.77	0.506	0.077	(0.138)	0.429
185	15.42	0.77	0.506	0.076	(0.138)	0.430
186	15.50	0.77	0.506	0.076	(0.138)	0.430
187	15.58	0.63	0.418	0.076	(0.114)	0.342
188	15.67	0.63	0.418	0.075	(0.114)	0.343
189	15.75	0.63	0.418	0.075	(0.114)	0.343
190	15.83	0.63	0.418	0.074	(0.114)	0.344
191	15.92	0.63	0.418	0.074	(0.114)	0.344
192	16.00	0.63	0.418	0.074	(0.114)	0.344
193	16.08	0.13	0.088	(0.073)	0.024	0.064
194	16.17	0.13	0.088	(0.073)	0.024	0.064
195	16.25	0.13	0.088	(0.073)	0.024	0.064
196	16.33	0.13	0.088	(0.072)	0.024	0.064
197	16.42	0.13	0.088	(0.072)	0.024	0.064
198	16.50	0.13	0.088	(0.071)	0.024	0.064
199	16.58	0.10	0.066	(0.071)	0.018	0.048
200	16.67	0.10	0.066	(0.071)	0.018	0.048
201	16.75	0.10	0.066	(0.070)	0.018	0.048
202	16.83	0.10	0.066	(0.070)	0.018	0.048
203	16.92	0.10	0.066	(0.070)	0.018	0.048
204	17.00	0.10	0.066	(0.069)	0.018	0.048
205	17.08	0.17	0.110	(0.069)	0.030	0.080
206	17.17	0.17	0.110	(0.069)	0.030	0.080
207	17.25	0.17	0.110	(0.068)	0.030	0.080
208	17.33	0.17	0.110	(0.068)	0.030	0.080
209	17.42	0.17	0.110	(0.068)	0.030	0.080
210	17.50	0.17	0.110	(0.067)	0.030	0.080
211	17.58	0.17	0.110	(0.067)	0.030	0.080
212	17.67	0.17	0.110	(0.067)	0.030	0.080
213	17.75	0.17	0.110	(0.066)	0.030	0.080
214	17.83	0.13	0.088	(0.066)	0.024	0.064

215	17.92	0.13	0.088	(0.066)	0.024	0.064
216	18.00	0.13	0.088	(0.065)	0.024	0.064
217	18.08	0.13	0.088	(0.065)	0.024	0.064
218	18.17	0.13	0.088	(0.065)	0.024	0.064
219	18.25	0.13	0.088	(0.064)	0.024	0.064
220	18.33	0.13	0.088	(0.064)	0.024	0.064
221	18.42	0.13	0.088	(0.064)	0.024	0.064
222	18.50	0.13	0.088	(0.063)	0.024	0.064
223	18.58	0.10	0.066	(0.063)	0.018	0.048
224	18.67	0.10	0.066	(0.063)	0.018	0.048
225	18.75	0.10	0.066	(0.062)	0.018	0.048
226	18.83	0.07	0.044	(0.062)	0.012	0.032
227	18.92	0.07	0.044	(0.062)	0.012	0.032
228	19.00	0.07	0.044	(0.062)	0.012	0.032
229	19.08	0.10	0.066	(0.061)	0.018	0.048
230	19.17	0.10	0.066	(0.061)	0.018	0.048
231	19.25	0.10	0.066	(0.061)	0.018	0.048
232	19.33	0.13	0.088	(0.060)	0.024	0.064
233	19.42	0.13	0.088	(0.060)	0.024	0.064
234	19.50	0.13	0.088	(0.060)	0.024	0.064
235	19.58	0.10	0.066	(0.060)	0.018	0.048
236	19.67	0.10	0.066	(0.059)	0.018	0.048
237	19.75	0.10	0.066	(0.059)	0.018	0.048
238	19.83	0.07	0.044	(0.059)	0.012	0.032
239	19.92	0.07	0.044	(0.059)	0.012	0.032
240	20.00	0.07	0.044	(0.058)	0.012	0.032
241	20.08	0.10	0.066	(0.058)	0.018	0.048
242	20.17	0.10	0.066	(0.058)	0.018	0.048
243	20.25	0.10	0.066	(0.058)	0.018	0.048
244	20.33	0.10	0.066	(0.057)	0.018	0.048
245	20.42	0.10	0.066	(0.057)	0.018	0.048
246	20.50	0.10	0.066	(0.057)	0.018	0.048
247	20.58	0.10	0.066	(0.057)	0.018	0.048
248	20.67	0.10	0.066	(0.056)	0.018	0.048
249	20.75	0.10	0.066	(0.056)	0.018	0.048
250	20.83	0.07	0.044	(0.056)	0.012	0.032
251	20.92	0.07	0.044	(0.056)	0.012	0.032
252	21.00	0.07	0.044	(0.055)	0.012	0.032
253	21.08	0.10	0.066	(0.055)	0.018	0.048
254	21.17	0.10	0.066	(0.055)	0.018	0.048
255	21.25	0.10	0.066	(0.055)	0.018	0.048
256	21.33	0.07	0.044	(0.055)	0.012	0.032
257	21.42	0.07	0.044	(0.054)	0.012	0.032
258	21.50	0.07	0.044	(0.054)	0.012	0.032
259	21.58	0.10	0.066	(0.054)	0.018	0.048
260	21.67	0.10	0.066	(0.054)	0.018	0.048
261	21.75	0.10	0.066	(0.054)	0.018	0.048
262	21.83	0.07	0.044	(0.053)	0.012	0.032
263	21.92	0.07	0.044	(0.053)	0.012	0.032
264	22.00	0.07	0.044	(0.053)	0.012	0.032
265	22.08	0.10	0.066	(0.053)	0.018	0.048
266	22.17	0.10	0.066	(0.053)	0.018	0.048
267	22.25	0.10	0.066	(0.052)	0.018	0.048

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268  22.33     0.07      0.044       (  0.052)       0.012        0.032
269  22.42     0.07      0.044       (  0.052)       0.012        0.032
270  22.50     0.07      0.044       (  0.052)       0.012        0.032
271  22.58     0.07      0.044       (  0.052)       0.012        0.032
272  22.67     0.07      0.044       (  0.052)       0.012        0.032
273  22.75     0.07      0.044       (  0.052)       0.012        0.032
274  22.83     0.07      0.044       (  0.051)       0.012        0.032
275  22.92     0.07      0.044       (  0.051)       0.012        0.032
276  23.00     0.07      0.044       (  0.051)       0.012        0.032
277  23.08     0.07      0.044       (  0.051)       0.012        0.032
278  23.17     0.07      0.044       (  0.051)       0.012        0.032
279  23.25     0.07      0.044       (  0.051)       0.012        0.032
280  23.33     0.07      0.044       (  0.051)       0.012        0.032
281  23.42     0.07      0.044       (  0.051)       0.012        0.032
282  23.50     0.07      0.044       (  0.051)       0.012        0.032
283  23.58     0.07      0.044       (  0.050)       0.012        0.032
284  23.67     0.07      0.044       (  0.050)       0.012        0.032
285  23.75     0.07      0.044       (  0.050)       0.012        0.032
286  23.83     0.07      0.044       (  0.050)       0.012        0.032
287  23.92     0.07      0.044       (  0.050)       0.012        0.032
288  24.00     0.07      0.044       (  0.050)       0.012        0.032
            (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    51.9
     Flood volume = Effective rainfall      4.32(In)
      times area       6.7(Ac.)/[(In)/(Ft.)] =       2.4(Ac.Ft)
     Total soil loss =      1.18(In)
     Total soil loss =     0.661(Ac.Ft)
     Total rainfall =      5.50(In)
     Flood volume =      105560.2 Cubic Feet
     Total soil loss =       28802.5 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =      4.491(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         24 - H O U R    S T O R M
                    R u n o f f      H y d r o g r a p h
     ---------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
 ------------------------------------------------------------------------
   0+ 5       0.0010      0.14  Q         |         |         |         |
   0+10       0.0024      0.21  Q         |         |         |         |
   0+15       0.0039      0.22  Q         |         |         |         |
   0+20       0.0059      0.29  VQ        |         |         |         |
   0+25       0.0081      0.32  VQ        |         |         |         |
   0+30       0.0104      0.33  VQ        |         |         |         |
   0+35       0.0126      0.33  VQ        |         |         |         |
   0+40       0.0149      0.33  VQ        |         |         |         |
   0+45       0.0171      0.33  VQ        |         |         |         |
   0+50       0.0198      0.40  VQ        |         |         |         |
   0+55       0.0228      0.43  VQ        |         |         |         |
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1+ 0       0.0258      0.43  VQ        |          |          |          |
1+ 5       0.0283      0.36  VQ        |          |          |          |
1+10       0.0306      0.33  VQ        |          |          |          |
1+15       0.0328      0.33  VQ        |          |          |          |
1+20       0.0351      0.33  VQ        |          |          |          |
1+25       0.0373      0.33  VQ        |          |          |          |
1+30       0.0396      0.33  VQ        |          |          |          |
1+35       0.0418      0.33  VQ        |          |          |          |
1+40       0.0440      0.33  VQ        |          |          |          |
1+45       0.0463      0.33  VQ        |          |          |          |
1+50       0.0490      0.40  VQ        |          |          |          |
1+55       0.0520      0.43  VQ        |          |          |          |
2+ 0       0.0550      0.43  VQ        |          |          |          |
2+ 5       0.0580      0.43  VQ        |          |          |          |
2+10       0.0610      0.43  |Q        |          |          |          |
2+15       0.0640      0.43  |Q        |          |          |          |
2+20       0.0670      0.43  |Q        |          |          |          |
2+25       0.0700      0.43  |Q        |          |          |          |
2+30       0.0730      0.43  |Q        |          |          |          |
2+35       0.0764      0.50  |VQ       |          |          |          |
2+40       0.0801      0.54  |VQ       |          |          |          |
2+45       0.0839      0.54  |VQ       |          |          |          |
2+50       0.0876      0.54  |VQ       |          |          |          |
2+55       0.0914      0.54  |VQ       |          |          |          |
3+ 0       0.0951      0.54  |VQ       |          |          |          |
3+ 5       0.0989      0.54  |VQ       |          |          |          |
3+10       0.1026      0.54  |VQ       |          |          |          |
3+15       0.1063      0.54  |VQ       |          |          |          |
3+20       0.1101      0.54  |VQ       |          |          |          |
3+25       0.1138      0.54  |VQ       |          |          |          |
3+30       0.1176      0.54  |VQ       |          |          |          |
3+35       0.1213      0.54  | Q       |          |          |          |
3+40       0.1251      0.54  | Q       |          |          |          |
3+45       0.1288      0.54  | Q       |          |          |          |
3+50       0.1330      0.61  | Q       |          |          |          |
3+55       0.1375      0.65  | Q       |          |          |          |
4+ 0       0.1420      0.65  | Q       |          |          |          |
4+ 5       0.1465      0.65  | Q       |          |          |          |
4+10       0.1510      0.65  | Q       |          |          |          |
4+15       0.1555      0.65  | Q       |          |          |          |
4+20       0.1604      0.72  | Q       |          |          |          |
4+25       0.1657      0.76  | VQ      |          |          |          |
4+30       0.1709      0.76  | VQ      |          |          |          |
4+35       0.1761      0.76  | VQ      |          |          |          |
4+40       0.1814      0.76  | VQ      |          |          |          |
4+45       0.1866      0.76  |  Q      |          |          |          |
4+50       0.1923      0.83  |  Q      |          |          |          |
4+55       0.1983      0.87  |  Q      |          |          |          |
5+ 0       0.2043      0.87  |  Q      |          |          |          |
5+ 5       0.2093      0.73  | QV      |          |          |          |
5+10       0.2138      0.66  | QV      |          |          |          |
5+15       0.2183      0.65  | QV      |          |          |          |
5+20       0.2233      0.72  | QV      |          |          |          |
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5+25	0.2285	0.76	Q				
5+30	0.2338	0.76	Q				
5+35	0.2395	0.83	Q				
5+40	0.2455	0.87	QV				
5+45	0.2514	0.87	QV				
5+50	0.2574	0.87	QV				
5+55	0.2634	0.87	QV				
6+ 0	0.2694	0.87	QV				
6+ 5	0.2759	0.94	QV				
6+10	0.2826	0.97	QV				
6+15	0.2893	0.98	QV				
6+20	0.2961	0.98	QV				
6+25	0.3028	0.98	QV				
6+30	0.3095	0.98	Q V				
6+35	0.3168	1.05	QV				
6+40	0.3242	1.08	QV				
6+45	0.3317	1.09	QV				
6+50	0.3392	1.09	QV				
6+55	0.3467	1.09	QV				
7+ 0	0.3542	1.09	QV				
7+ 5	0.3616	1.09	QV				
7+10	0.3691	1.09	Q V				
7+15	0.3766	1.09	Q V				
7+20	0.3846	1.16	Q V				
7+25	0.3928	1.19	Q V				
7+30	0.4010	1.20	Q V				
7+35	0.4097	1.27	QV				
7+40	0.4187	1.30	QV				
7+45	0.4277	1.30	Q V				
7+50	0.4372	1.37	Q V				
7+55	0.4469	1.41	Q V				
8+ 0	0.4566	1.41	Q V				
8+ 5	0.4673	1.55	QV				
8+10	0.4785	1.62	QV				
8+15	0.4897	1.63	Q V				
8+20	0.5009	1.63	Q V				
8+25	0.5122	1.63	Q V				
8+30	0.5234	1.63	Q V				
8+35	0.5351	1.70	Q V				
8+40	0.5470	1.74	Q V				
8+45	0.5590	1.74	Q V				
8+50	0.5715	1.81	Q V				
8+55	0.5842	1.84	Q V				
9+ 0	0.5969	1.85	Q V				
9+ 5	0.6107	2.00	Q V				
9+10	0.6249	2.07	Q V				
9+15	0.6393	2.08	Q V				
9+20	0.6543	2.18	Q V				
9+25	0.6697	2.24	Q V				
9+30	0.6852	2.24	Q V				
9+35	0.7013	2.34	Q V				
9+40	0.7178	2.40	Q V				
9+45	0.7344	2.40	Q V				

9+50	0.7516	2.50	|	Q V	|	|	|
9+55	0.7692	2.56	|	Q V	|	|	|
10+ 0	0.7869	2.56	|	Q V	|	|	|
10+ 5	0.8004	1.96	|	Q | V	|	|	|
10+10	0.8118	1.66	|	Q | V	|	|	|
10+15	0.8231	1.63	|	Q | V	|	|	|
10+20	0.8343	1.63	|	Q | V	|	|	|
10+25	0.8455	1.63	|	Q | V	|	|	|
10+30	0.8567	1.63	|	Q | V	|	|	|
10+35	0.8709	2.06	|	Q | V	|	|	|
10+40	0.8866	2.27	|	Q| V	|	|	|
10+45	0.9024	2.30	|	Q| V	|	|	|
10+50	0.9182	2.30	|	Q| V	|	|	|
10+55	0.9341	2.30	|	Q| V	|	|	|
11+ 0	0.9500	2.31	|	Q| V	|	|	|
11+ 5	0.9652	2.21	|	Q | V	|	|	|
11+10	0.9801	2.17	|	Q | V	|	|	|
11+15	0.9951	2.17	|	Q | V	|	|	|
11+20	1.0100	2.17	|	Q | V	|	|	|
11+25	1.0250	2.17	|	Q | V	|	|	|
11+30	1.0400	2.18	|	Q | V	|	|	|
11+35	1.0537	1.99	|	Q | V	|	|	|
11+40	1.0667	1.89	|	Q | V	|	|	|
11+45	1.0797	1.89	|	Q | V	|	|	|
11+50	1.0934	1.99	|	Q | V	|	|	|
11+55	1.1074	2.04	|	Q | V	|	|	|
12+ 0	1.1215	2.05	|	Q | V	|	|	|
12+ 5	1.1403	2.72	|	Q V	|	|	|
12+10	1.1614	3.07	|	| Q V|	|	|	|
12+15	1.1828	3.10	|	| Q V|	|	|	|
12+20	1.2048	3.20	|	| Q V|	|	|	|
12+25	1.2272	3.25	|	| Q V	|	|	|
12+30	1.2497	3.26	|	| Q V	|	|	|
12+35	1.2735	3.46	|	| Q |V	|	|	|
12+40	1.2980	3.56	|	| Q |V	|	|	|
12+45	1.3226	3.57	|	| Q |V	|	|	|
12+50	1.3478	3.67	|	| Q | V	|	|	|
12+55	1.3734	3.72	|	| Q | V	|	|	|
13+ 0	1.3991	3.73	|	| Q | V	|	|	|
13+ 5	1.4281	4.21	|	| Q | V	|	|	|
13+10	1.4588	4.46	|	| Q | V	|	|	|
13+15	1.4897	4.48	|	| Q | V	|	|	|
13+20	1.5206	4.49	|	| Q | V	|	|	|
13+25	1.5515	4.49	|	| Q | V	|	|	|
13+30	1.5824	4.49	|	| Q | V	|	|	|
13+35	1.6061	3.44	|	| Q | V	|	|	|
13+40	1.6261	2.90	|	|Q | V	|	|	|
13+45	1.6458	2.86	|	|Q | V	|	|	|
13+50	1.6655	2.86	|	|Q | V	|	|	|
13+55	1.6852	2.86	|	|Q | V	|	|	|
14+ 0	1.7049	2.87	|	|Q | V	|	|	|
14+ 5	1.7273	3.25	|	| Q | V	|	|	|
14+10	1.7511	3.45	|	| Q | V	|	|	|

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14+15       1.7750      3.47  |          |  Q       |         V|          |
14+20       1.7983      3.38  |          |  Q       |         V|          |
14+25       1.8213      3.33  |          |  Q       |          V          |
14+30       1.8442      3.33  |          |  Q       |          V          |
14+35       1.8672      3.33  |          |  Q       |          V          |
14+40       1.8902      3.34  |          |  Q       |          |V         |
14+45       1.9132      3.34  |          |  Q       |          |V         |
14+50       1.9355      3.25  |          | Q        |          |V         |
14+55       1.9576      3.20  |          | Q        |          | V        |
15+ 0       1.9796      3.20  |          | Q        |          | V        |
15+ 5       2.0010      3.11  |          | Q        |          |  V       |
15+10       2.0221      3.06  |          | Q        |          |  V       |
15+15       2.0431      3.06  |          | Q        |          |  V       |
15+20       2.0636      2.96  |          |Q         |          |   V      |
15+25       2.0837      2.92  |          |Q         |          |   V      |
15+30       2.1037      2.92  |          |Q         |          |   V      |
15+35       2.1212      2.53  |          Q          |          |    V     |
15+40       2.1373      2.34  |         Q|          |          |    V     |
15+45       2.1534      2.33  |         Q|          |          |    V     |
15+50       2.1694      2.33  |         Q|          |          |    V     |
15+55       2.1855      2.33  |         Q|          |          |     V    |
16+ 0       2.2016      2.34  |         Q|          |          |     V    |
16+ 5       2.2092      1.11  |    Q     |          |          |     V    |
16+10       2.2126      0.49  |Q         |          |          |     V    |
16+15       2.2156      0.43  |Q         |          |          |     V    |
16+20       2.2186      0.43  |Q         |          |          |     V    |
16+25       2.2216      0.43  |Q         |          |          |     V    |
16+30       2.2246      0.43  |Q         |          |          |     V    |
16+35       2.2271      0.36  |Q         |          |          |     V    |
16+40       2.2293      0.33  |Q         |          |          |     V    |
16+45       2.2316      0.33  |Q         |          |          |     V    |
16+50       2.2338      0.33  |Q         |          |          |     V    |
16+55       2.2361      0.33  |Q         |          |          |     V    |
17+ 0       2.2383      0.33  |Q         |          |          |     V    |
17+ 5       2.2415      0.47  |Q         |          |          |     V    |
17+10       2.2452      0.54  | Q        |          |          |      V   |
17+15       2.2490      0.54  | Q        |          |          |      V   |
17+20       2.2527      0.54  | Q        |          |          |      V   |
17+25       2.2565      0.54  | Q        |          |          |      V   |
17+30       2.2602      0.54  | Q        |          |          |      V   |
17+35       2.2640      0.54  | Q        |          |          |      V   |
17+40       2.2677      0.54  | Q        |          |          |      V   |
17+45       2.2714      0.54  | Q        |          |          |      V   |
17+50       2.2747      0.47  |Q         |          |          |      V   |
17+55       2.2777      0.44  |Q         |          |          |      V   |
18+ 0       2.2807      0.43  |Q         |          |          |      V   |
18+ 5       2.2837      0.43  |Q         |          |          |      V   |
18+10       2.2867      0.43  |Q         |          |          |      V   |
18+15       2.2897      0.43  |Q         |          |          |      V   |
18+20       2.2927      0.43  |Q         |          |          |      V   |
18+25       2.2957      0.43  |Q         |          |          |      V   |
18+30       2.2987      0.43  |Q         |          |          |      V   |
18+35       2.3012      0.36  |Q         |          |          |      V   |
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18+40       2.3035      0.33  |Q        |         |         |       V |
18+45       2.3057      0.33  |Q        |         |         |       V |
18+50       2.3075      0.26  |Q        |         |         |       V |
18+55       2.3090      0.22  Q        |         |         |       V |
19+ 0       2.3105      0.22  Q        |         |         |       V |
19+ 5       2.3125      0.29  |Q        |         |         |       V |
19+10       2.3147      0.32  |Q        |         |         |       V |
19+15       2.3169      0.33  |Q        |         |         |       V |
19+20       2.3197      0.40  |Q        |         |         |       V |
19+25       2.3226      0.43  |Q        |         |         |       V |
19+30       2.3256      0.43  |Q        |         |         |       V |
19+35       2.3281      0.36  |Q        |         |         |       V |
19+40       2.3304      0.33  |Q        |         |         |       V |
19+45       2.3326      0.33  |Q        |         |         |       V |
19+50       2.3344      0.26  |Q        |         |         |       V |
19+55       2.3359      0.22  Q        |         |         |       V |
20+ 0       2.3374      0.22  Q        |         |         |       V |
20+ 5       2.3394      0.29  |Q        |         |         |       V |
20+10       2.3416      0.32  |Q        |         |         |       V |
20+15       2.3439      0.33  |Q        |         |         |       V |
20+20       2.3461      0.33  |Q        |         |         |       V |
20+25       2.3484      0.33  |Q        |         |         |       V |
20+30       2.3506      0.33  |Q        |         |         |       V |
20+35       2.3529      0.33  |Q        |         |         |       V |
20+40       2.3551      0.33  |Q        |         |         |       V |
20+45       2.3573      0.33  |Q        |         |         |       V |
20+50       2.3591      0.26  |Q        |         |         |       V |
20+55       2.3606      0.22  Q        |         |         |       V |
21+ 0       2.3621      0.22  Q        |         |         |       V |
21+ 5       2.3641      0.29  |Q        |         |         |        V|
21+10       2.3663      0.32  |Q        |         |         |        V|
21+15       2.3686      0.33  |Q        |         |         |        V|
21+20       2.3703      0.26  |Q        |         |         |        V|
21+25       2.3719      0.22  Q        |         |         |        V|
21+30       2.3734      0.22  Q        |         |         |        V|
21+35       2.3753      0.29  |Q        |         |         |        V|
21+40       2.3776      0.32  |Q        |         |         |        V|
21+45       2.3798      0.33  |Q        |         |         |        V|
21+50       2.3816      0.26  |Q        |         |         |        V|
21+55       2.3831      0.22  Q        |         |         |        V|
22+ 0       2.3846      0.22  Q        |         |         |        V|
22+ 5       2.3866      0.29  |Q        |         |         |        V|
22+10       2.3888      0.32  |Q        |         |         |        V|
22+15       2.3910      0.33  |Q        |         |         |        V|
22+20       2.3928      0.26  |Q        |         |         |        V|
22+25       2.3943      0.22  Q        |         |         |        V|
22+30       2.3958      0.22  Q        |         |         |        V|
22+35       2.3973      0.22  Q        |         |         |        V|
22+40       2.3988      0.22  Q        |         |         |        V|
22+45       2.4003      0.22  Q        |         |         |        V|
22+50       2.4018      0.22  Q        |         |         |        V|
22+55       2.4033      0.22  Q        |         |         |        V|
23+ 0       2.4048      0.22  Q        |         |         |        V|
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23+ 5	2.4063	0.22	Q	|	|	|	V|
23+10	2.4078	0.22	Q	|	|	|	V|
23+15	2.4093	0.22	Q	|	|	|	V|
23+20	2.4108	0.22	Q	|	|	|	V|
23+25	2.4123	0.22	Q	|	|	|	V|
23+30	2.4138	0.22	Q	|	|	|	V|
23+35	2.4153	0.22	Q	|	|	|	V|
23+40	2.4168	0.22	Q	|	|	|	V|
23+45	2.4183	0.22	Q	|	|	|	V|
23+50	2.4198	0.22	Q	|	|	|	V|
23+55	2.4213	0.22	Q	|	|	|	V|
24+ 0	2.4228	0.22	Q	|	|	|	V|
24+ 5	2.4233	0.08	Q	|	|	|	V|
24+10	2.4233	0.01	Q	|	|	|	V|

APPENDIX D: PRELIMINARY STORM DRAIN SIZING

STORM DRAIN SIZING USING MANNING'S EQUATION AND FLOW CONDITION AT +/- 75% OF DIAMETER			
STORM DRAIN SYSTEM	Q100 (ft^3/s)	STORM DRAIN DIAMETER (IN)	ASSUME MINIMUM PIPE SLOPE
LINE A (R1)	22	30	0.005
LINE A (R2)	15.1	30	0.005
LINE A (R3)	14.2	30	0.005
LATERAL A3	0.9	15	0.005
LINE A1 (R1)	7.9	24	0.005
LINE A1 (R2)	6.4	24	0.005
LINE A1 (R3)	2.5	15	0.005
LINE A1 (R4)	2.2	15	0.005
LINE A1 (R5)	2.1	15	0.005
LATERAL A-1	1.9	12	0.005
LATERAL A-2	1.5	12	0.005
LATERAL A-4 (R1)	2	12	0.005
LATERAL A-4 (R2)	1	12	0.005
LATERAL A-5	0.3	12	0.005
LATERAL A-6	0.1	12	0.005
LINE B	1.4	12	0.005
LINE C	3.2	15	0.005
LINE D	6.5	18	0.005
LINE E (R1)	4.2	15	0.005
LINE E (R2)	3.3	15	0.005
LATERAL E-1	0.85	12	0.005
DESIGN NOTES: STORM DRAIN SIZING IS BASED ON MANNING'S EQUATION WITH A MANNING'S n VALUE OF 0.013 TO ACCOUNT FOR THE USE OF RCP OR HDPE. THE CALCULATIONS IS BASED ON A DEPTH TO BE APPROXIMATELY 75% OF THE DIAMETER .			

Pipe Based on Manning Equation Using +/- 75% Full Flow Condition

$$Q = \frac{1.486\, AR^{2/3}S^{1/2}}{n}$$

Solve for Pipe Diameter, where

Q: Pipe Flow Rate

A: Area of Pipe based on +/-75% of Diameter

R: Hydraulic Radius

S Slope of Pipe

n Manning's n Value 0.013

APPENDIX E: SUBSURFACE BASIN A STAGE-STORAGE TABLE

BASIN A SUBSURFACE SYSTEM

1 Barrel 96-Inch Subsurface Infiltration Basin Volume Calculations

LENGTH OF SUBSURFACE SYSTEM (FT) = 470 **NUMBER OF CELLS 1**

Elevation	Depth	Pipe Depth	Pipe Area Each (ft^2)	Pipe Area Total (ft^2)	Pipe Total Gross Volume at Elev. (ft^3)	Gross Cross Sectional Area of System (ft^2)	Net Gravel Area (ft^2)	Gravel Volume (ft^3)	Cumulative Subsurface System Volume (ft^3)	Cumulative Subsurface System Volume (ac-ft)	Incremental Increase in Subsurface System Volume (ac-ft)	Q100 Effective Storage
26.5	0	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	-	-
27	0.5	0	0.00	0.00	0.00	6	6.00	1128.00	1128.00	0.026	0.026	-
27.5	1	0	0.00	0.00	0.00	12	12.00	2256.00	2256.00	0.052	0.026	-
28	1.5	0.5	1.31	1.31	614.78	18	16.69	3138.09	3752.87	0.086	0.034	-
28.5	2	1	3.63	3.63	1704.45	24	20.37	3830.22	5534.67	0.127	0.041	-
29	2.5	1.5	6.52	6.52	3066.46	30	23.48	4413.41	7479.88	0.172	0.045	-
29.5	3	2	9.83	9.83	4618.67	36	26.17	4920.53	9539.20	0.219	0.047	-
30	3.5	2.5	13.42	13.42	6307.51	42	28.58	5372.99	11680.51	0.268	0.049	0.000
30.5	4	3	17.22	17.22	8091.93	48	30.78	5787.23	13879.16	0.319	0.050	0.050
31	4.5	3.5	21.14	21.14	9937.30	54	32.86	6177.08	16114.38	0.370	0.051	0.102
31.5	5	4	25.13	25.13	11812.39	60	34.87	6555.04	18367.43	0.422	0.052	0.154
32	5.5	4.5	29.12	29.12	13687.48	66	36.88	6933.01	20620.49	0.473	0.052	0.205
32.5	6	5	33.05	33.05	15532.85	72	38.95	7322.86	22855.71	0.525	0.051	0.257
33	6.5	5.5	36.85	36.85	17317.26	78	41.15	7737.10	25054.36	0.575	0.050	0.307
33.5	7	6	40.44	40.44	19006.11	84	43.56	8189.56	27195.66	0.624	0.049	0.356
34	7.5	6.5	43.74	43.74	20558.31	90	46.26	8696.67	29254.99	0.672	0.047	0.403
34.5	8	7	46.64	46.64	21920.32	96	49.36	9279.87	31200.19	0.716	0.045	0.448
35	8.5	7.5	48.96	48.96	23009.99	102	53.04	9972.00	32982.00	0.757	0.041	0.489
35.5	9	8	50.27	50.27	23624.78	108	57.73	10854.09	34478.87	0.792	0.034	0.523
36	9.5	8	50.27	50.27	23624.78	114	63.73	11982.09	35606.87	0.817	0.026	0.549
36.5	10	8	50.27	50.27	23624.78	120	69.73	13110.09	36734.87	0.843	0.026	0.575

wq volume

INPUT DATA

SUBSURFACE SYSTEM NAME	A	-
DIAMETER OF SUBSURFACE SYSTEM	8	FT
NUMBER OF BARRELS	1	EA
LENGTH OF SUBSURFACE SYSTEM	470	FT
BOTTOM INVERT OF GRAVEL BED	27	FT
EFFECTIVE STORAGE ELEVATION	30	FT
PIPE SPACING	2	FT
EDGE THICKNESS	2	FT
TOP CLEARANCE, THICKNESS	1	FT
BOTTOM CLEARANCE, THICKNESS	1	FT
GRAVEL POROSITY, N	0.4	-
FT^2 -> AC	43560	FT^2/AC

OPTIONAL INPUT DATA

WATER QUALITY VOLUME TO RETAIN	22901	FT^3

NOTE: WQ VOLUME IS 12,660 BUT HYDROMODS VOLUME IS 22,901 SO HYDROMOD VOLUME CONTROLS

COMPUTED DATA

WIDTH	12	
MAX_HEIGHT	10	
PIPE INVERT	1	FT
NEAREST SUBSURFACE VOLUME TO WQ VOLUME	25054.36	FT^3
WSE FOR WQ VOLUME (INTERPOLATED)	32.51	FT

APPENDIX F: AREA A1 LOW POINT STAGE-STORAGE TABLE

TEMECULA VALLEY CHARTER SCHOOL
AREA A1 LOW POINT STAGE STORAGE TABLE

Contour Elevation	Contour Area (sf)	Contour Area (ac)	Contour Interval Volume (ac-ft)	Total Basin Volume (ac-ft)	Outflow (cfs)
1442.5	0.0	0.000		0	0
			0.006		
1443	1539.4	0.035		0.006	0.02
			0.150		
1444	13547.1	0.311		0.156	0.3
			0.478		
1445	29033.2	0.667		0.634	9.8

APPENDIX G: CATCH BASIN ANALYSIS

Worksheet for CATCH BASIN A1

Project Description	
Solve For	Spread

Input Data	
Discharge	8.80 cfs
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.020 ft/ft
Curb Opening Length	10.00 ft
Opening Height	0.83 ft
Curb Throat Type	Horizontal
Local Depression	0.25 ft
Local Depression Width	4.00 ft
Throat Incline Angle	90.00 degrees

Results	
Spread	18.36 ft
Depth	5.4 in
Gutter Depression	0.09 ft
Total Depression	0.34 ft

Worksheet for CATCH BASIN AA

Project Description	
Solve For	Spread

Input Data	
Discharge	5.72 cfs
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.020 ft/ft
Curb Opening Length	10.00 ft
Opening Height	0.83 ft
Curb Throat Type	Horizontal
Local Depression	0.25 ft
Local Depression Width	0.33 ft
Throat Incline Angle	90.00 degrees

Results	
Spread	16.11 ft
Depth	4.9 in
Gutter Depression	0.09 ft
Total Depression	0.34 ft

Worksheet for CATCH BASIN B2

Project Description	
Solve For	Efficiency

Input Data	
Discharge	1.74 cfs
Slope	0.027 ft/ft
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.020 ft/ft
Roughness Coefficient	0.015
Curb Opening Length	14.00 ft
Local Depression	0.25 ft
Local Depression Width	4.00 ft

Results	
Efficiency	100.00 %
Intercepted Flow	1.74 cfs
Bypass Flow	0.00 cfs
Spread	6.12 ft
Depth	2.5 in
Flow Area	0.5 ft²
Gutter Depression	0.09 ft
Total Depression	0.34 ft
Velocity	3.78 ft/s
Equivalent Cross Slope	0.085 ft/ft
Length Factor	1.001
Total Interception Length	13.99 ft

Worksheet for GRATE INLET A1.2

Project Description	
Solve For	Efficiency

Input Data	
Discharge	1.72 cfs
Slope	0.028 ft/ft
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.035 ft/ft
Roughness Coefficient	0.015
Local Depression	0.25 ft
Local Depression Width	4.00 ft
Grate Width	2.00 ft
Grate Length	2.95 ft
Grate Type	P-50 mm (P-1 -7/8")
Clogging	0.0 %
Curb Opening Length	0.83 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	87.10 %
Intercepted Flow	1.50 cfs
Bypass Flow	0.22 cfs
Spread	4.50 ft
Depth	2.6 in
Flow Area	0.4 ft²
Gutter Depression	0.06 ft
Total Depression	0.31 ft
Velocity	4.19 ft/s
Splash Over Velocity	9.89 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.175
Grate Flow Ratio	0.844
Equivalent Cross Slope	0.099 ft/ft
Active Grate Length	2.95 ft
Length Factor	0.000
Total Interception Length	12.80 ft

Worksheet for GRATE INLET A1.2

Messages:

Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Notes:

TOTAL FLOW RATE Q100 =1.72
BY-PASS FLOW 0.22 CFS TO GRATE INLET A3.

Worksheet for GRATE INLET A1.3

Project Description	
Solve For	Efficiency

Input Data		
Discharge	0.30	cfs
Slope	0.030	ft/ft
Gutter Width	2.00	ft
Gutter Cross Slope	0.063	ft/ft
Road Cross Slope	0.035	ft/ft
Roughness Coefficient	0.015	
Local Depression	0.25	ft
Local Depression Width	4.00	ft
Grate Width	2.00	ft
Grate Length	2.95	ft
Grate Type	P-50 mm (P-1 -7/8")	
Clogging	0.0	%
Curb Opening Length	0.83	ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	100.00	%
Intercepted Flow	0.30	cfs
Bypass Flow	0.00	cfs
Spread	1.79	ft
Depth	1.3	in
Flow Area	0.1	ft^2
Gutter Depression	0.06	ft
Total Depression	0.31	ft
Velocity	2.98	ft/s
Splash Over Velocity	9.89	ft/s
Frontal Flow Factor	1.000	
Side Flow Factor	0.282	
Grate Flow Ratio	1.000	
Equivalent Cross Slope	0.111	ft/ft
Active Grate Length	2.95	ft
Length Factor	0.000	
Total Interception Length	5.86	ft

Worksheet for GRATE INLET A1.3

Messages:

Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Notes:

TOTAL FLOW RATE Q100 =1.72
BY-PASS FLOW 0.22 CFS TO GRATE INLET A3.

Worksheet for GRATE INLET A1.4

Project Description	
Solve For	Spread

Input Data	
Discharge	3.24 cfs
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.020 ft/ft
Grate Width	2.00 ft
Grate Length	3.00 ft
Local Depression	0.00 ft
Local Depression Width	0.00 ft
Grate Type	P-50 mm (P-1 -7/8")
Clogging	50.0 %

Results	
Spread	18.72 ft
Depth	5.5 in
Gutter Depression	0.09 ft
Total Depression	0.09 ft
Open Grate Area	2.7 ft²
Active Grate Weir Length	5.00 ft

Worksheet for GRATE INLET A1.4

Notes:

GRATE INLET PER CALTRANS G1

Worksheet for GRATE INLET A1.5

Project Description	
Solve For	Spread

Input Data	
Discharge	6.51 cfs
Left Side Slope	16.670 H:V
Right Side Slope	16.670 H:V
Bottom Width	2.00 ft
Grate Width	2.00 ft
Grate Length	3.00 ft
Local Depression	0.00 ft
Local Depression Width	0.00 ft
Grate Type	P-50 mm (P-1 -7/8")
Clogging	50.0 %

Results	
Spread	15.97 ft
Depth	5.0 in
Wetted Perimeter	16.00 ft
Top Width	15.97 ft
Open Grate Area	2.7 ft²
Active Grate Weir Length	8.00 ft

Worksheet for GRATE INLET A1.5

Notes:

CALTRANS STANDARD G1

Worksheet for GRATE INLET A2

Project Description	
Solve For	Efficiency

Input Data	
Discharge	1.39 cfs
Slope	0.077 ft/ft
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.035 ft/ft
Roughness Coefficient	0.015
Local Depression	0.25 ft
Local Depression Width	4.00 ft
Grate Width	2.00 ft
Grate Length	6.40 ft
Grate Type	P-50 mm (P-1 -7/8")
Clogging	0.0 %
Curb Opening Length	0.83 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	97.49 %
Intercepted Flow	1.36 cfs
Bypass Flow	0.03 cfs
Spread	3.16 ft
Depth	2.0 in
Flow Area	0.2 ft²
Gutter Depression	0.06 ft
Total Depression	0.31 ft
Velocity	6.04 ft/s
Splash Over Velocity	16.00 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.396
Grate Flow Ratio	0.959
Equivalent Cross Slope	0.108 ft/ft
Active Grate Length	6.40 ft
Length Factor	0.000
Total Interception Length	15.07 ft

Worksheet for GRATE INLET A2

Messages:

Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Worksheet for GRATE INLET A3

Project Description	
Solve For	Efficiency

Input Data	
Discharge	0.82 cfs
Slope	0.077 ft/ft
Gutter Width	2.00 ft
Gutter Cross Slope	0.063 ft/ft
Road Cross Slope	0.035 ft/ft
Roughness Coefficient	0.015
Local Depression	0.25 ft
Local Depression Width	4.00 ft
Grate Width	2.00 ft
Grate Length	2.95 ft
Grate Type	P-50 mm (P-1 -7/8")
Clogging	0.0 %
Curb Opening Length	0.83 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results	
Efficiency	99.77 %
Intercepted Flow	0.82 cfs
Bypass Flow	0.00 cfs
Spread	2.34 ft
Depth	1.6 in
Flow Area	0.2 ft²
Gutter Depression	0.06 ft
Total Depression	0.31 ft
Velocity	5.44 ft/s
Splash Over Velocity	9.89 ft/s
Frontal Flow Factor	1.000
Side Flow Factor	0.118
Grate Flow Ratio	0.997
Equivalent Cross Slope	0.111 ft/ft
Active Grate Length	2.95 ft
Length Factor	0.000
Total Interception Length	11.88 ft

Worksheet for GRATE INLET A3

Messages:

Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

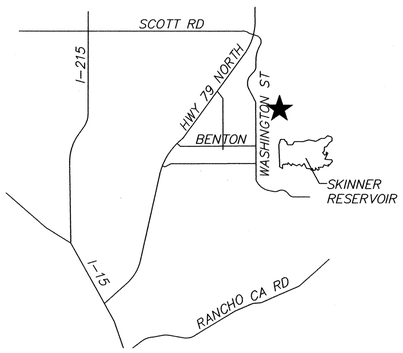
Notes:

TOTAL FLOW= 0.82 CFS (Q= 0.6 + 0.22 BY PASS)

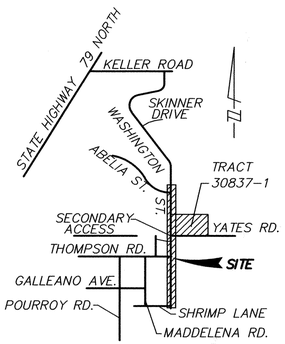
EXCERPTS

EXCERPT 1: WASHINGTON STREET STORM DRAIN DRAWING NO. 7-0544

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
TRACT 30837-1 STORM DRAIN FACILITIES



VICINITY MAP
NTS



LOCATION MAP
SECTION 33 & 34, TOWNSHIP 6 SOUTH, RANGE 2 WEST
NOT TO SCALE

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 NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON PROJECT SPECIFIC HORIZONTAL CONTROL. THE BASIS OF BEARINGS IS THE NORTHERLY LINE OF SEC. 34, T.6S., R.2W. AS SHOWN ON RECORD OF SURVEY IN BOOK 45, PAGE 43, RECORDS OF RIVERSIDE COUNTY, CA, BEING N89°30'12"W. THE COORDINATES ARE:
   NE CORNER – N 35254.61, E 62658.25
   NW CORNER – N 35277.86, 59975.90
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.

ENGINEERS ESTIMATE OF QUANTITIES

	CONSTRUCTION NOTE	TOTAL QTY.	CFD QTY.
(1)	CONSTRUCT 18" RCP (CLASS IV)	452 L.F.	238 L.F.
(2)	CONSTRUCT 24" RCP (CLASS IV)	2,493 L.F.	33 L.F.
(3)	CONSTRUCT 30" RCP ('D' PER PROFILE)	160 L.F.	–
(4)	CONSTRUCT 36" RCP ('D' PER PROFILE)	280 L.F.	–
(5)	CONSTRUCT 42" RCP ('D' PER PROFILE)	392 L.F.	–
(6)	CONSTRUCT 48" RCP ('D' PER PROFILE)	474 L.F.	–
(7)	CONSTRUCT 54" RCP ('D' PER PROFILE)	2,844 L.F.	57 L.F.
(8)	CONSTRUCT 60" RCP ('D' PER PROFILE)	916 L.F.	–
(9)	CONSTRUCT CATCH BASIN PER RCTD STD No. 300	9 EA.	–
(10)	CONSTRUCT MH No. 2 PER RCFCWCD STD MH252	9 EA.	–
(11)	CONSTRUCT MH No. 4 PER RCFCWCD STD MH254	5 EA.	–
(12)	CONSTRUCT JS No. 2 PER RCFCWCD STD JS227	6 EA.	–
(13)	CONSTRUCT MODIFIED GRATED INLET PER SPPWC STD 303-3 AND PER DETAIL ON SHT 18	1 EA.	1 EA.
(14)	CONSTRUCT MH No. 1 PER RCFCWCD STD MH251	11 EA.	–
(16)	CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING	9 EA.	–
(17)	CONSTRUCT JS No. 4 PER RCFCWCD STD JS229 AND 6" SCH. 40 PVC LATERAL.	4 EA.	–
(18)	CONSTRUCT TYPE 'A' OUTLET STRUCTURE PER CALTRANS STD. D90 AND PER DETAIL ON SHT 4	1 EA.	–
(19)	CONSTRUCT CONCRETE ACCESS RAMP PER DETAIL ON SHEET 4	1 EA.	–
(20)	CONSTRUCT OUTLET STRUCTURE PER CALTRANS STD D89	1 EA.	1 EA.
(21)	CONSTRUCT TYPE B RIP RAP PER DETAIL ON SHT 4 AND PER CALTRANS S PECIFICATIONS.	1 EA.	–

	CONSTRUCTION NOTE	TOTAL QTY.	CFD QTY.
(22)	CONSTRUCT TRANSITION STRUCTURE PER DETAIL 22 ON SHT 18 AND RCFCWCD STD CB110	1 EA.	1 EA.
(24)	CONSTRUCT WEIR/ORIFICIE OUTLET STRUCTURE PER DETAIL ON SHEET 19.	1 EA.	1 EA.
(25)	CONSTRUCT JENSEN PRECAST DRAINAGE INLET MODEL DI2436 (OR APPROVED EQUAL)	3 EA.	3 EA.
(31)	CONSTRUCT TYPE 'A' OUTLET STRUCTURE PER CALTRANS STD. D90 AND PER DETAIL ON SHT 18	1 EA.	1 EA.
(32)	CONSTRUCT RIP RAP VELOCITY DISSIPATOR PER CALTRANS SPECIFICATIONS AND PER DETAIL ON SHT 18	1 EA.	1 EA.
(33)	CONSTRUCT CONCRETE DRAINAGE APRON PER DETAIL ON SHT 18	1 EA.	1 EA.
(34)	CONSTRUCT CABLE FENCE PER RCFCWCD STD M826	244 L.F.	–
(35)	CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER RCFCWCD STD. NO. MH261.	4 EA.	–
(36)	CONSTRUCT TS No. 3 PER RCFCWCD STD TS303	2 EA.	–
(37)	CONSTRUCT 6'X6'X6" CONCRETE PAD W/ #4 BARS AT 18" O.C.,E.W. CENTERED ON MH COVER PER DETAILS ON SHEET 6	9 EA.	–
(39)	CONSTRUCT HINGED OUTLET PROTECTION BARRIER PER SSPWC STD 360-2	1 EA.	–
(40)	CONSTRUCT CONCRETE COLLAR PER RCFCWCD STD. NO. M803	1 EA.	–
(41)	CONSTRUCT TYPE A OUTLET STRUCTURE PER CALTRANS STD D90 AND DETAILS ON SHEET 19.	1 EA.	–
(42)	CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD NO. M816.	6 EA.	–

GENERAL NOTES (CONT'D)

15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED 10/08/2012. 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.

INDEX

	SHEET NO.:
TITLE SHEET	1
KEY MAPS AND STD DETAILS	2-3
PLAN AND PROFILE	4-16
LATERAL PROFILE	17
DETAILS	18-19

RCFC&WCD STANDARD DRAWINGS

MH251	MANHOLE NO. 1	9-15
MH252	MANHOLE NO. 2	5-10,14
MH254	MANHOLE NO. 4	4,8-10,13
JS227	JUNCTION STRUCTURE NO. 2	9-10,12-14
JS229	JUNCTION STRUCTURE NO. 4	8-10,16
CB110	CONCRETE DROP INLET	16
M803	CONCRETE COLLAR	10-12
M826	CABLE FENCE	4
TS303	TRANSITION STRUCTURE NO. 3	10,13

RCTD STANDARD PLANS

300	CURB INLET CATCH BASIN	8-14
311	GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN	8-14

CALTRANS STANDARDS

D90	PIPE CULVERT HEADWALL-TYPE A	4,16
D89	PIPE CULVERT HEADWALL	16

SPPWC STANDARDS

303-3	PIPE CULVERT HEADWALL-TYPE A	16
360-2	HINGED OUTLET PROTECTION	4

GENERAL NOTES (CONT'D)

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.

ENGINEERS NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE BASED ON 1929 DATUM (SEE BENCHMARK) TIE-IN ELEVATIONS WITH TR. 30069 IP 040241 AND MS4006 IP 040073 HAVE BEEN ADJUSTED. ADJUSTMENT IS 2.45' SUBTRACTED FROM MS4006 AND TR. 30069 STREET IMPROVEMENTS PLANS TIE-IN ELEVATIONS FOR OPEN CHANNEL.

MAINTENANCE RESPONSIBILITY:

PIPES HAVING A INSIDE DIAMETER OVER 36 INCHES, INCLUDING APPURTENANT STRUCTURES, ARE TO BE INSPECTED AND MAINTAINED BY RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (CATCH BASINS AND CONNECTOR PIPES SHALL BE MAINTAINED BY RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT UNLESS OTHERWISE NOTED ON THE PLANS HEREIN). ALL OTHER STORM DRAIN PIPES AND APPURTENANT STRUCTURES ARE TO BE INSPECTED AND MAINTAINED BY THE RIVERSIDE COUNTY DEPARTMENT OF TRANSPORTATION. LIMITS OF EACH JURISDICTIONS RESPONSIBILITY ARE SHOWN ON THESE PLANS. WATER QUALITY BASIN PIPES AND APPURTENANT STRUCTURES ARE TO BE MAINTAINED BY THE COUNTY CFD AS SHOWN ON THE MS 4132 ROUGH GRADING PLAN.

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD COUNTY OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES:
35765 | 2-14-19

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311 1935 ELEV. 1431.13

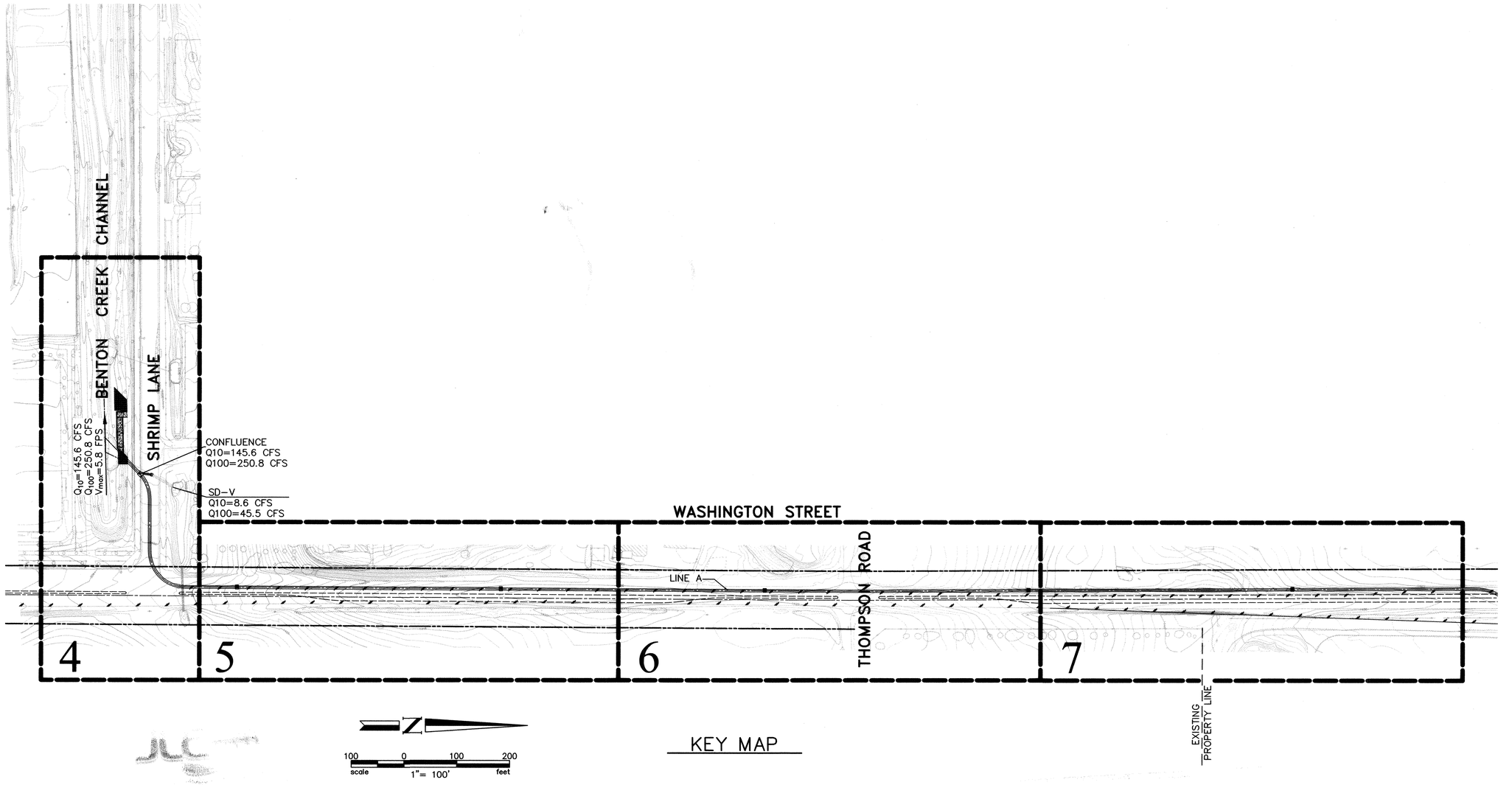
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

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

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
WARM SPRINGS VALLEY
YATES ROAD STORM DRAIN
TITLE SHEET 966-PP

PROJECT NO. 7-0-00197 7-0-00198
DRAWING NO. 7-0544
SHEET NO. 1 OF 20

Drawing Name: Q:\171.06.16 Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_01.dwg
Last Opened: Aug 22, 2017 - 9:35am by bwilson



KEY MAP

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED
✓		35165	2-19-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

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PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL: DATE:

APPROVED BY: DATE:

TR 30837-1 MS 4132 I.P. 070012 & 120044

WARM SPRINGS VALLEY WASHINGTON STREET STORM DRAIN

WARM SPRINGS VALLEY YATES ROAD STORM DRAIN

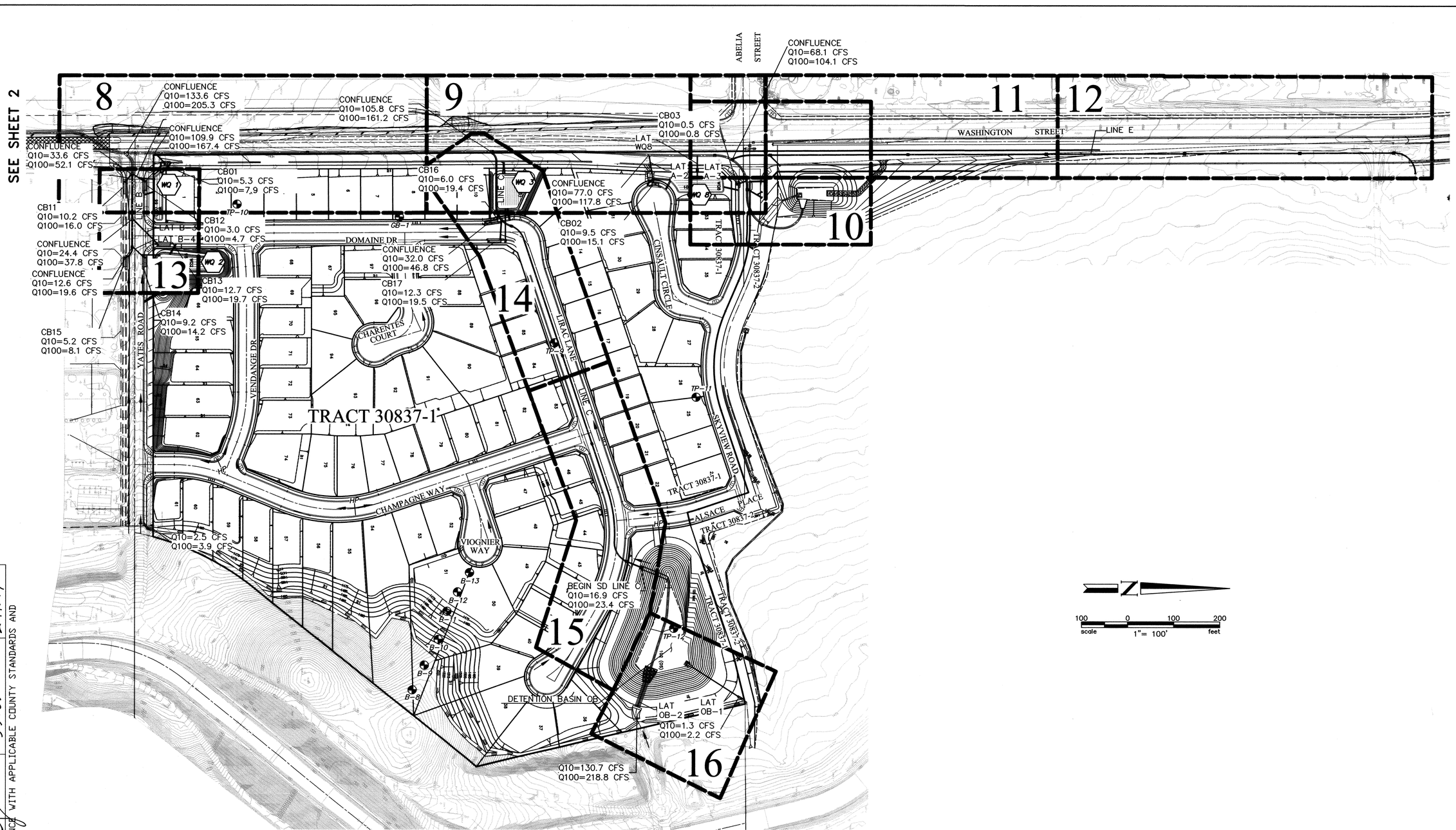
KEY MAP 966-PP

PROJECT NO. 7-0-00197 7-0-00198

DRAWING NO. 7-0544

SHEET NO. 2 OF 20

Drawing Name: O:\17\08\18\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_02.dwg
Last Opened: Apr 06, 2017 - 8:25am by bwitzen



KEY MAP

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED
RC	Mark Mc	35765	2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

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PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: DATE:

APPROVED BY: DATE:

TR 30837-1 MS 4132 I.P. 070012 & 120044

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN

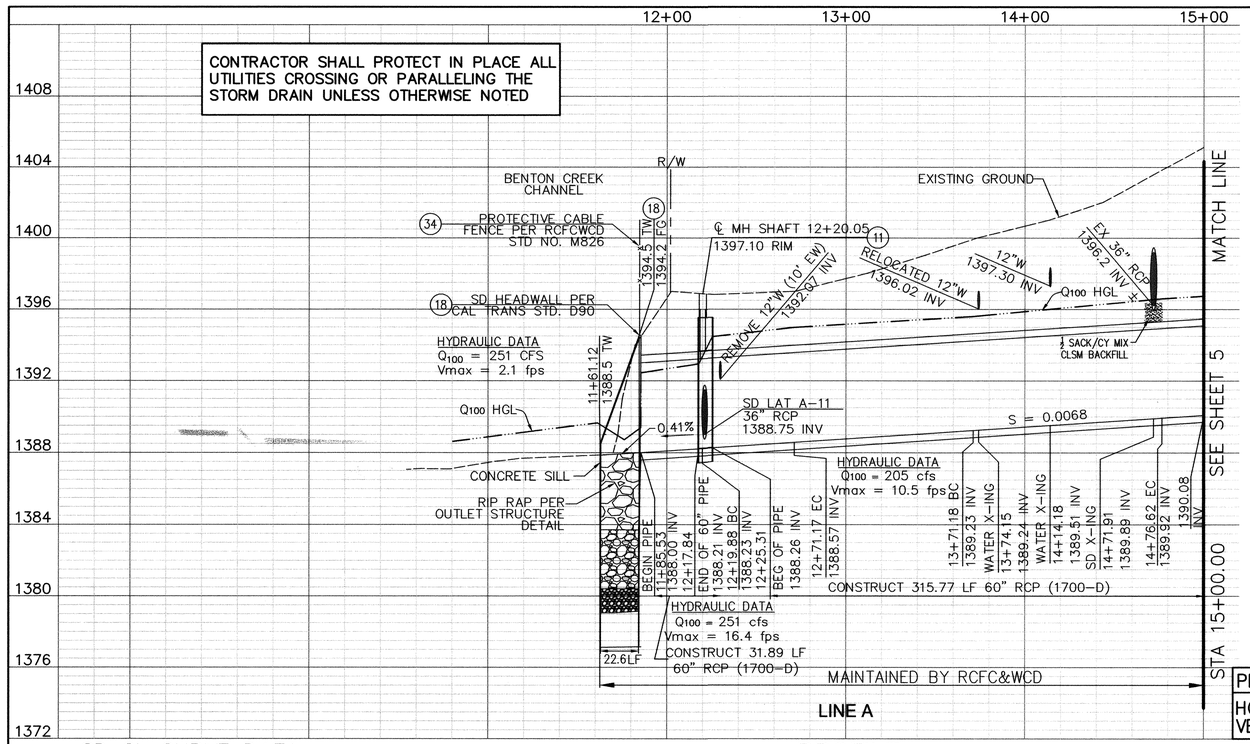
WARM SPRINGS VALLEY
YATES ROAD STORM DRAIN

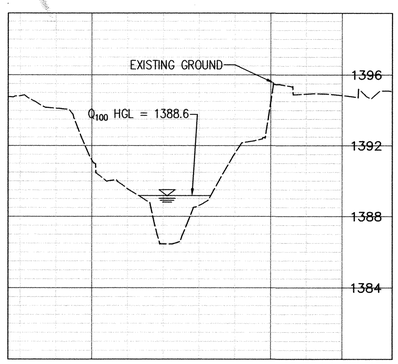
KEY MAP 966-PP

PROJECT NO. 7-0-00197 7-0-00198
DRAWING NO. 7-0544
SHEET NO. 3 OF 20

Drawing Name: G:\TR 30818\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_03.dwg
Last Updated: Apr 06, 2017 - 8:26am by switzen

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



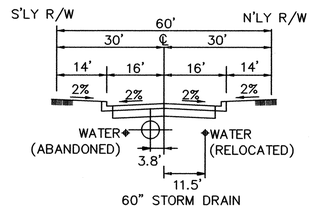


EXISTING DRAINAGE CHANNEL

(A/1) SECTION A1 AT STATION 10+80.34

SCALE: HORIZ. 1"=40'
VERT. 1"=4'

INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM



SECTION AT STATION 13+50.00

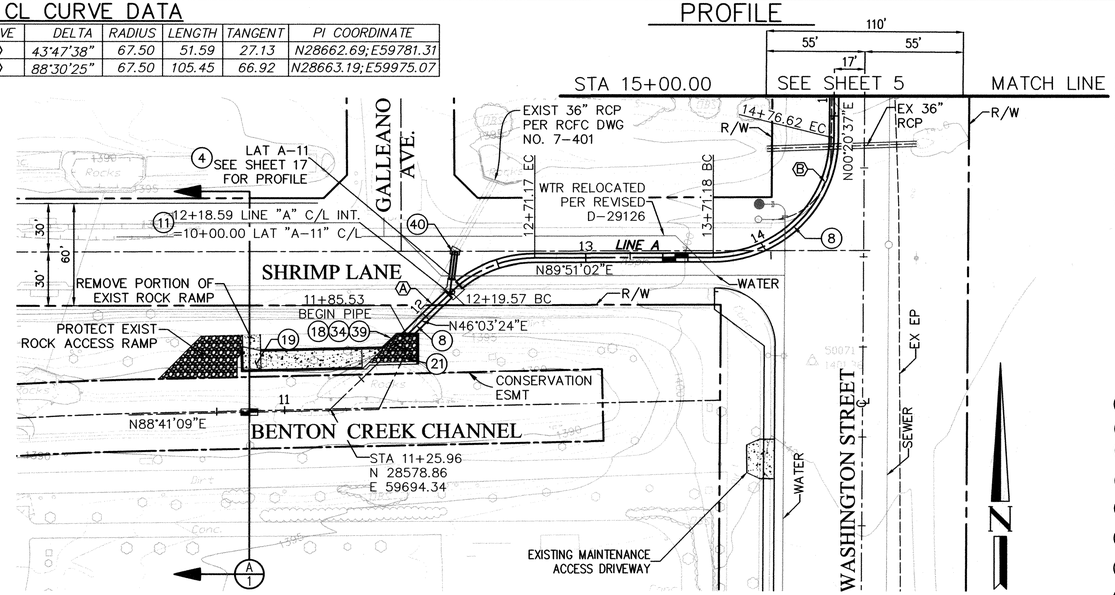
TYPICAL FROM STA 12+71.17 EC TO STA 13+71.18 BC

20 0 20 40
scale 1"= 20' feet

SD CL CURVE DATA

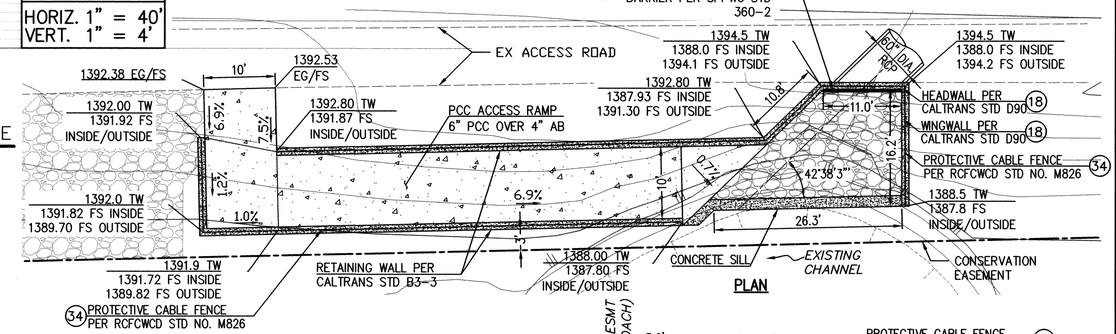
CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
(A)	43°47'38"	67.50	51.59	27.13	N28662.69;E59781.31
(B)	88°30'25"	67.50	105.45	66.92	N28663.19;E59975.07

PROFILE

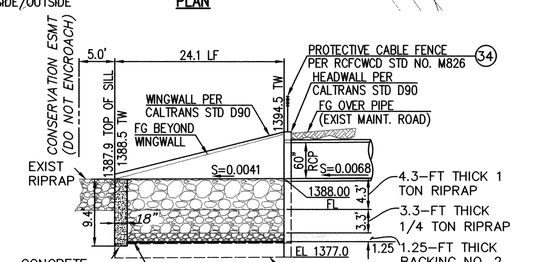


PLAN

40 0 40 80
scale 1"= 40' feet



PLAN



ELEVATION

(19)(21)(34) SD LINE A OUTLET STRUCTURE & ACCESS DETAIL

SCALE: 1"=10'

CONSTRUCTION NOTES

(4) CONSTRUCT 36" RCP
(8) CONSTRUCT 60" RCP ('D' PER PROFILE)
(11) CONSTRUCT MH NO. 4 PER RCFCWCD STD NO. MH254 A=45.0', B=36", C=7.50', D1=60", D2=60", EL R=1388.95, EL S=1388.80
(18) CONSTRUCT TYPE 'A' OUTLET STRUCTURE PER CALTRANS STD. D90 AND PER DETAIL THIS SHEET.
(19) CONSTRUCT CONCRETE ACCESS RAMP PER DETAIL THIS SHEET.
(21) CONSTRUCT TYPE B RIP RAP PER DETAIL AND PER CALTRANS SPECIFICATIONS.
(34) CONSTRUCT PROTECTIVE CABLE FENCE ON HEADWALL PER RCFCWCD STD. NO. M826.
(39) CONSTRUCT HINGED OUTLET PROTECTION BARRIER PER SPPWC STD 360-2
(40) CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803.

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

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD — COUNTY OVERSIGHT ENGINEER — REGISTRATION NUMBER 35165 — DATE SIGNED 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835 DATE 9/1/17

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APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

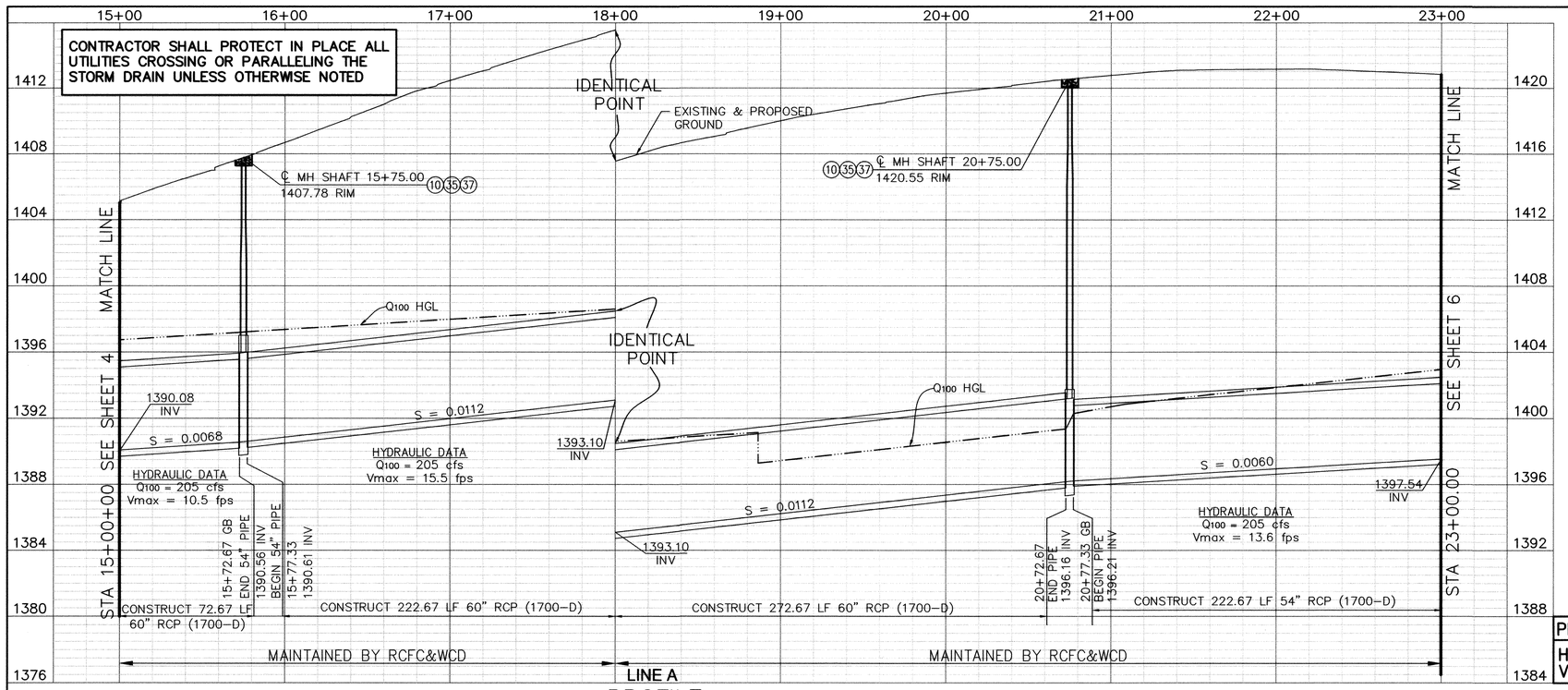
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
LINE "A"
STA 10+00 TO STA 15+00

966-PP

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 4 OF 20

Drawing Name: D:\17\06.16\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_04.dwg
Last Opened: May 19, 2017 - 10:23am by bwitzen

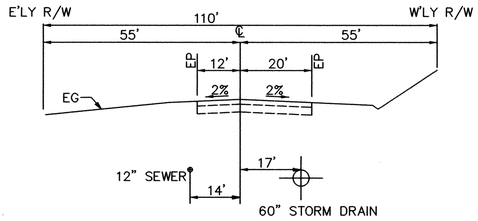


PROFILE

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

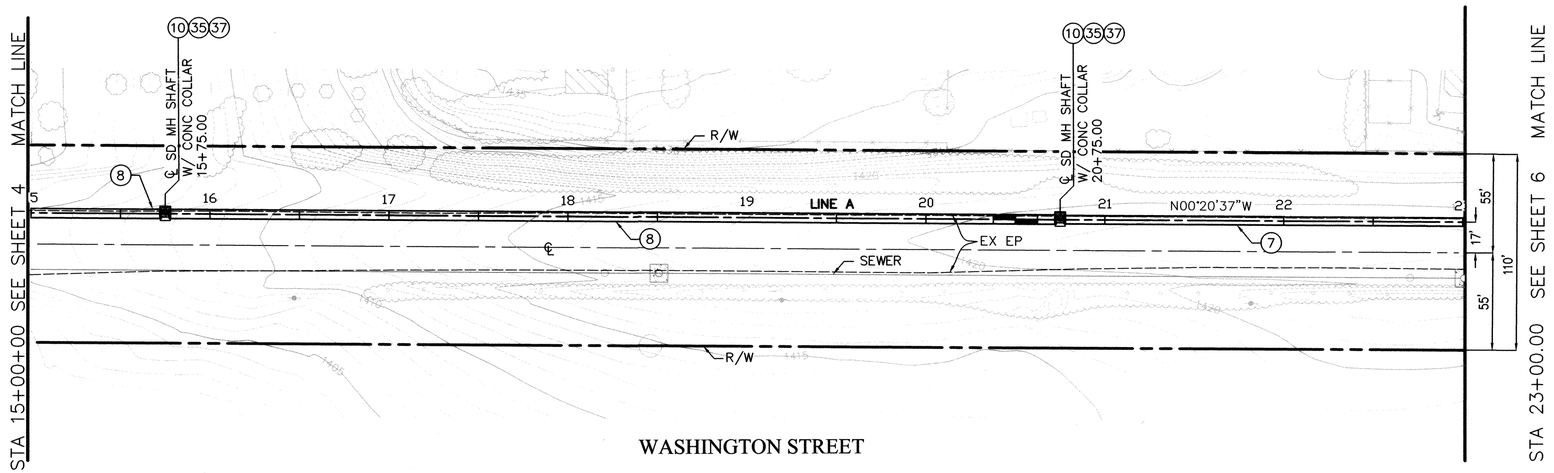
INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 20+50.00
TYPICAL FROM STA 15+00.00 TO STA 23+00.00

scale 20 0 20 40 feet
1"= 20'



PLAN

CONSTRUCTION NOTES

(7) CONSTRUCT 54" RCP ('D' PER PROFILE)
(8) CONSTRUCT 60" RCP ('D' PER PROFILE)
(10) CONSTRUCT MH NO. 2 PER RCFCWCD STD NO. MH252
(35) CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER RCFCWCD STD. NO. MH261.
(37) CONSTRUCT 6'X6'X6" CONCRETE PAD W/ #4 BARS AT 18" O.C.,E.W. CENTERED ON MH COVER PER DETAILS ON SHEET 6.

N

scale 40 0 40 80 feet
1"= 40'

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED
	APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.	35765	2-14-17

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568
PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/11/17

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APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
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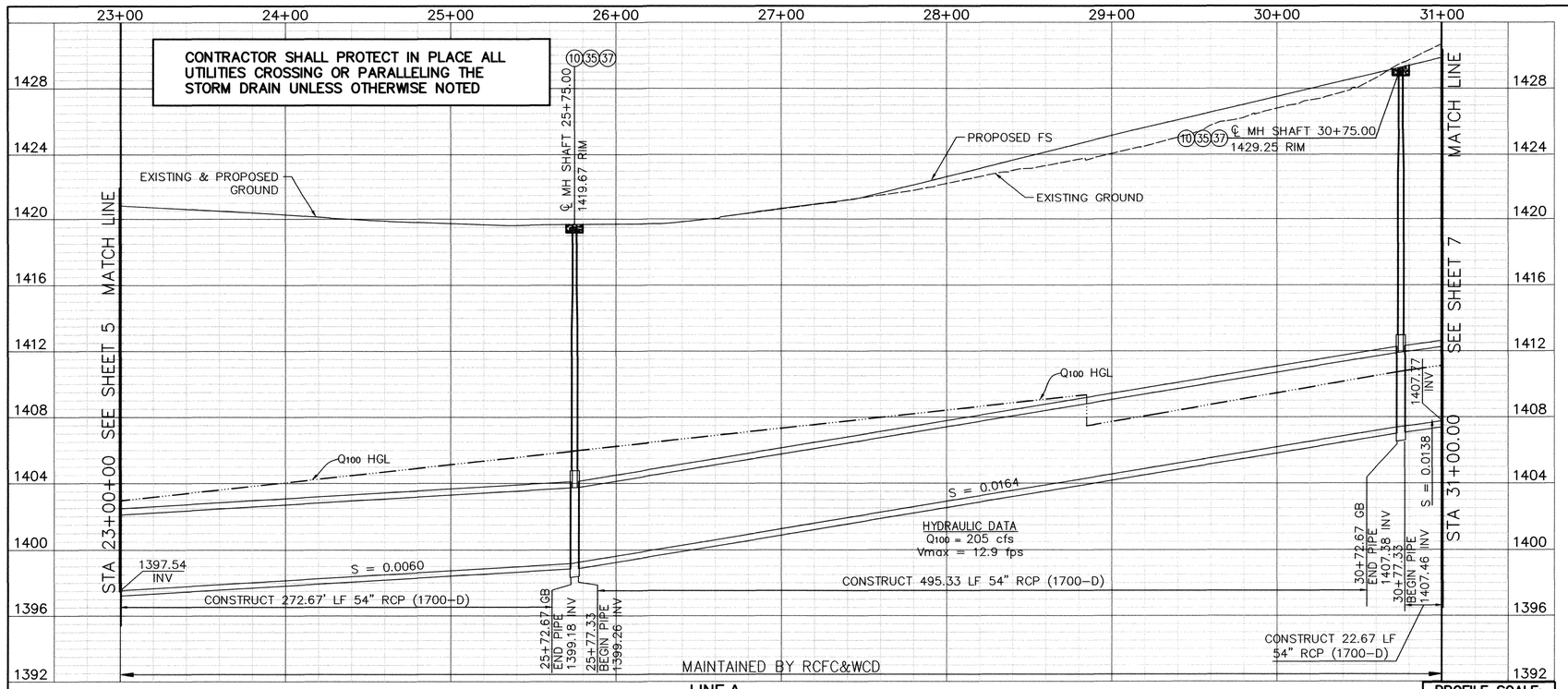
WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
LINE "A"
STA 15+00 TO STA 23+00

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 5 OF 20

966-PP

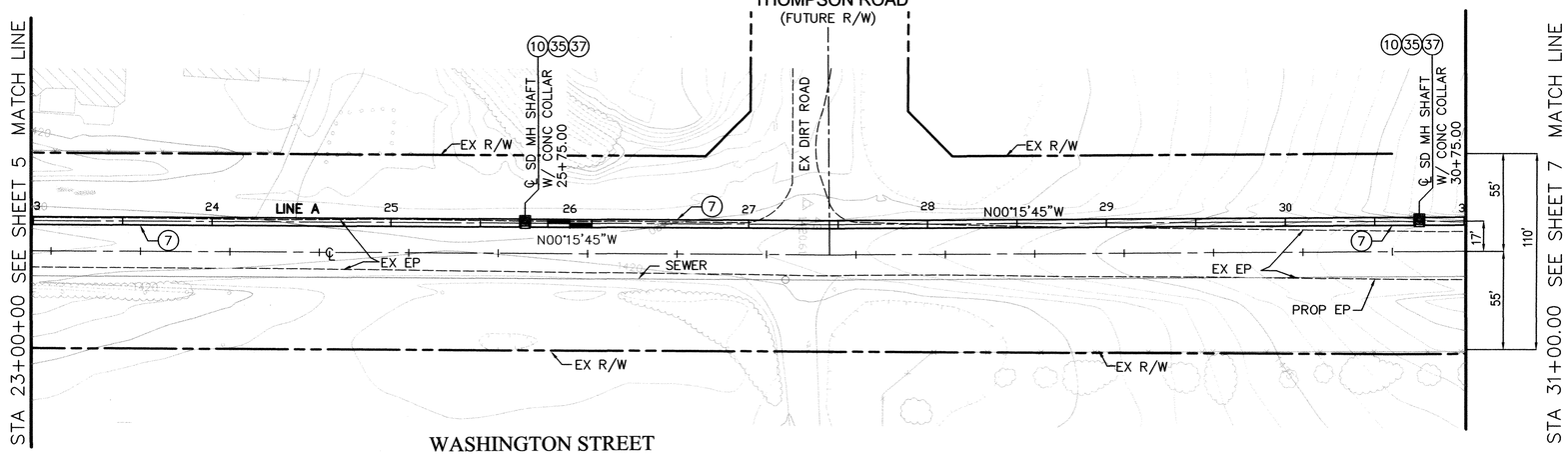
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Last Opened: Jun 09, 2017 - 9:45am by bwirtzen

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



LINE A
PROFILE

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

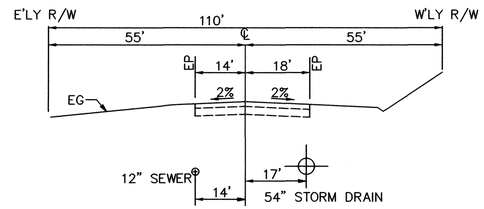


PLAN

40 0 40 80
scale 1"= 40' feet

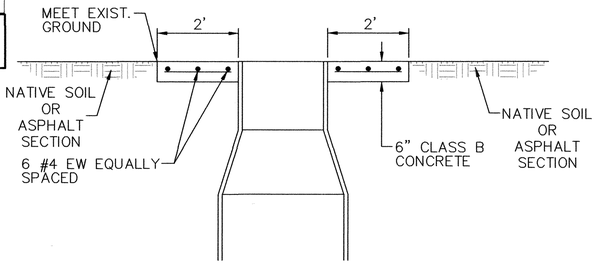
INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 26+00.00
TYPICAL FROM STA 23+00.00 TO STA 31+00.00

20 0 20 40
scale 1"= 20' feet



MANHOLE NO. 2 WITH CONCRETE PAD – DETAIL
SCALE: 1"=2'

CONSTRUCTION NOTES

(7) CONSTRUCT 54" RCP ('D' PER PROFILE)
(10) CONSTRUCT MH NO. 2 PER RCFCWCD STD NO. MH252. WITH CONCRETE PAD PER DETAIL HEREON.
(35) CONSTRUCT MANHOLE SHAFT SAFETY LEDGE PER RCFCWCD STD. NO. MH261.
(37) CONSTRUCT 6'X6'X6" CONCRETE PAD W/ #4 BARS AT 18" O.C.,E.W. CENTERED ON MH COVER AND PER DETAILS HEREON..

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
8 | Mell Mag | 35165 | 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568
PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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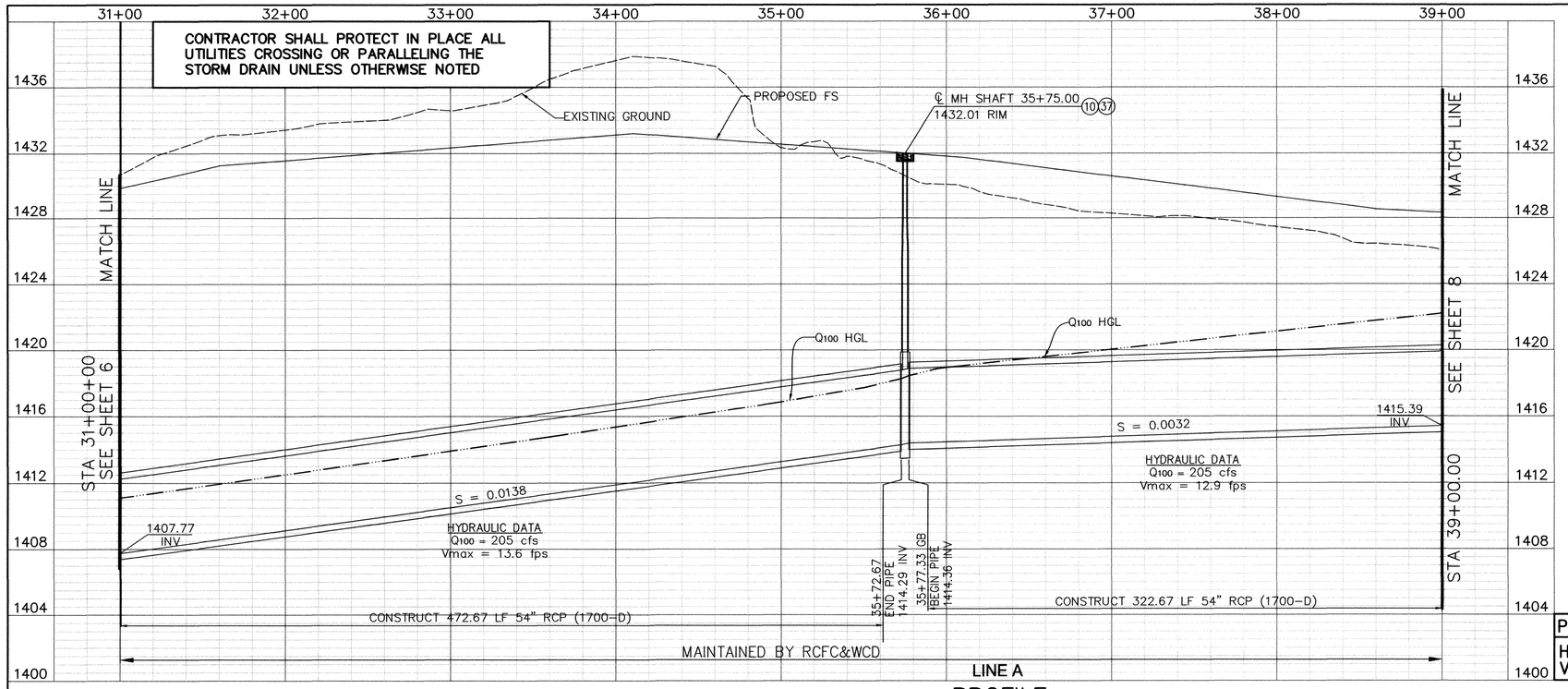
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
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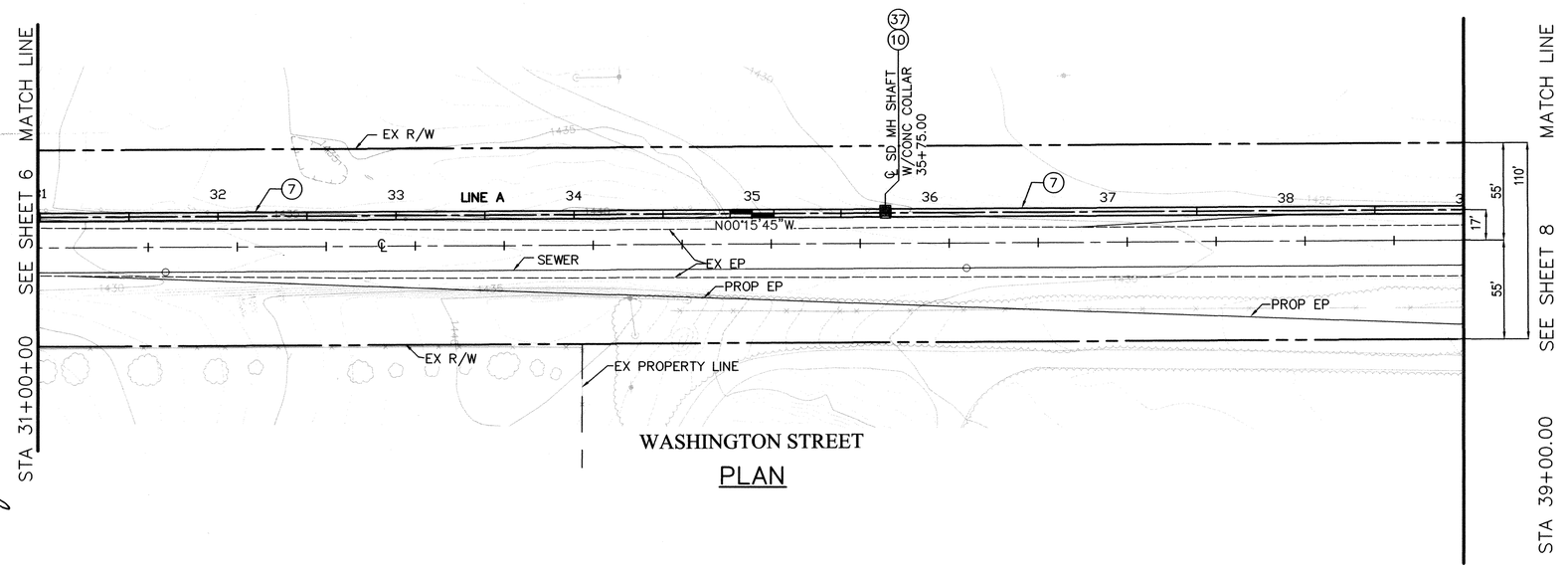
WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
LINE "A"
STA 23+00 TO STA 31+00 966-PP

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 6 OF 20

Drawing Name: D:\17\06.16\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_06.dwg
Last Opened: Jun 09, 2017 - 10:09am by bwitzen



PROFILE

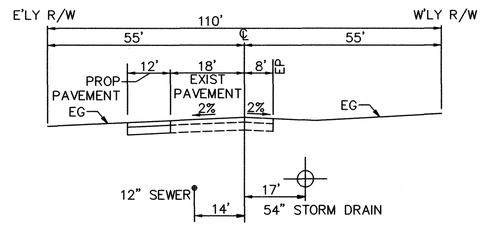


PLAN

INFORMATIONAL NOTE

ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 35+00.00

TYPICAL FROM STA 31+00.00 TO STA 39+00.00

scale 1"= 20' feet (20 0 20 40)

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

CONSTRUCTION NOTES

(7) CONSTRUCT 54" RCP ('D' PER PROFILE)
(10) CONSTRUCT MH NO. 2 PER RCFCWCD STD NO. MH252
(37) CONSTRUCT 6'X6'X6" CONCRETE PAD W/ #4 BARS AT 18" O.C.,E.W. CENTERED ON MH COVER AND PER DETAIL ON SHEET 6.

scale 1"= 40' feet (40 0 40 80)

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD — COUNTY OVERSIGHT ENGINEER — DATE SIGNED

REGISTRATION NUMBER 35765 — 2-4-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568
PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311 1935 ELEV. 1431.13

APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

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

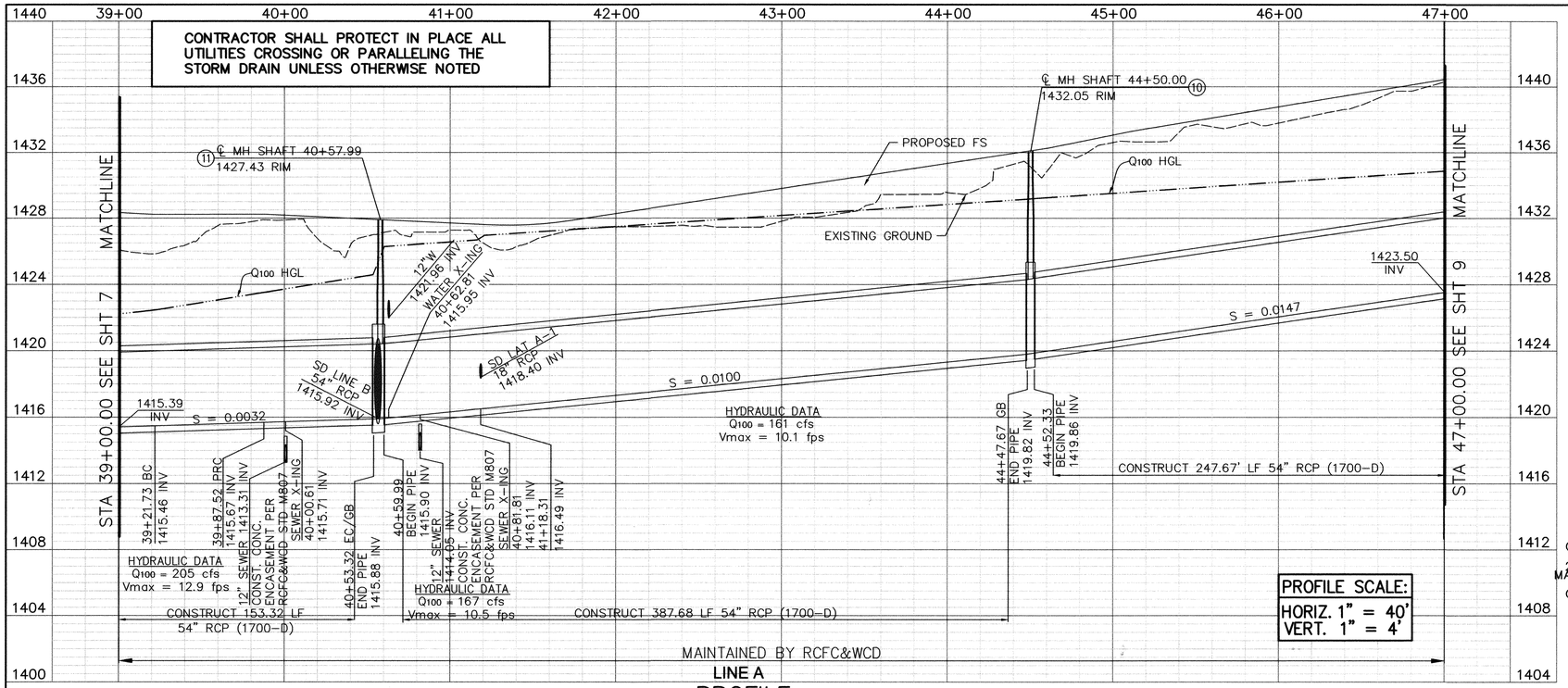
WARM SPRINGS VALLEY WASHINGTON STREET STORM DRAIN STAGE 1

LINE "A"
STA 31+00 TO STA 39+00

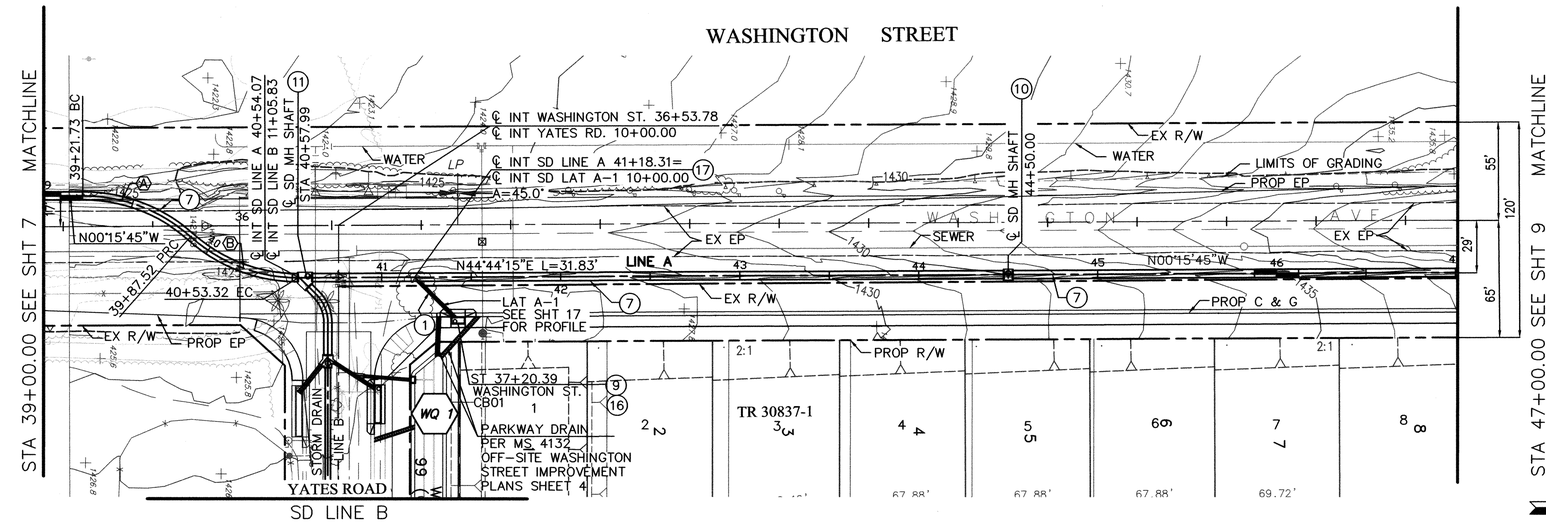
966-PP

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 7 OF 20

Drawing Name: Q:\171.05.15\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_07.dwg
Last Opened: Jun 09, 2017 - 10:17am by bwirzen



PROFILE

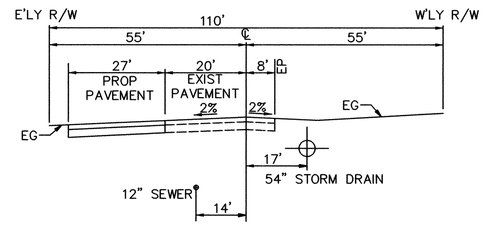


PLAN

INFORMATIONAL NOTE

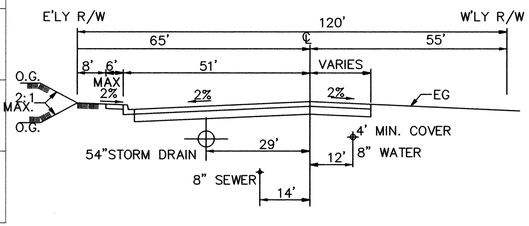
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 39+00.00

TYPICAL FROM STA 39+00.00 EC TO STA 39+21.73 BC



SECTION AT STATION 46+00.00

TYPICAL FROM STA 40+59.99 TO STA 47+00.00

20 0 20 40 scale 1"= 20' feet

CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (CLASS IV)
7. CONSTRUCT 54" RCP ('D' PER PROFILE)
9. CONSTRUCT CATCH BASIN PER RCTD STD 300
10. CONSTRUCT MH NO. 2 PER RCFCWCD STD NO. MH252
11. CONSTRUCT MH NO. 4 PER RCFCWCD STD NO. MH254 A=45.0°, B=42", C=7.50', D1=54", D2=54", EL R=1416.43, EL S=1416.41
16. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RCTD STD 311
17. CONSTRUCT JS NO. 4 PER RCFC WCD STD JS229 AND 6" SCH 40 PVC LATERAL

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓐ	41°53'19"	90.00	65.80	34.45'	N31209.63;E59977.53
Ⓑ	41°53'19"	90.00	65.80	34.45'	N31261.13;E60023.30

40 0 40 80 scale 1"= 40' feet

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD: 8

COUNTY OVERSIGHT ENGINEER: APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTRATION NUMBER: 35165

DATE SIGNED: 2-14-19

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835 DATE 9/11/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 9" CONC. POST UP 14" ABOVE GROUND MARKED X 311
1935 ELEV. 1431.13

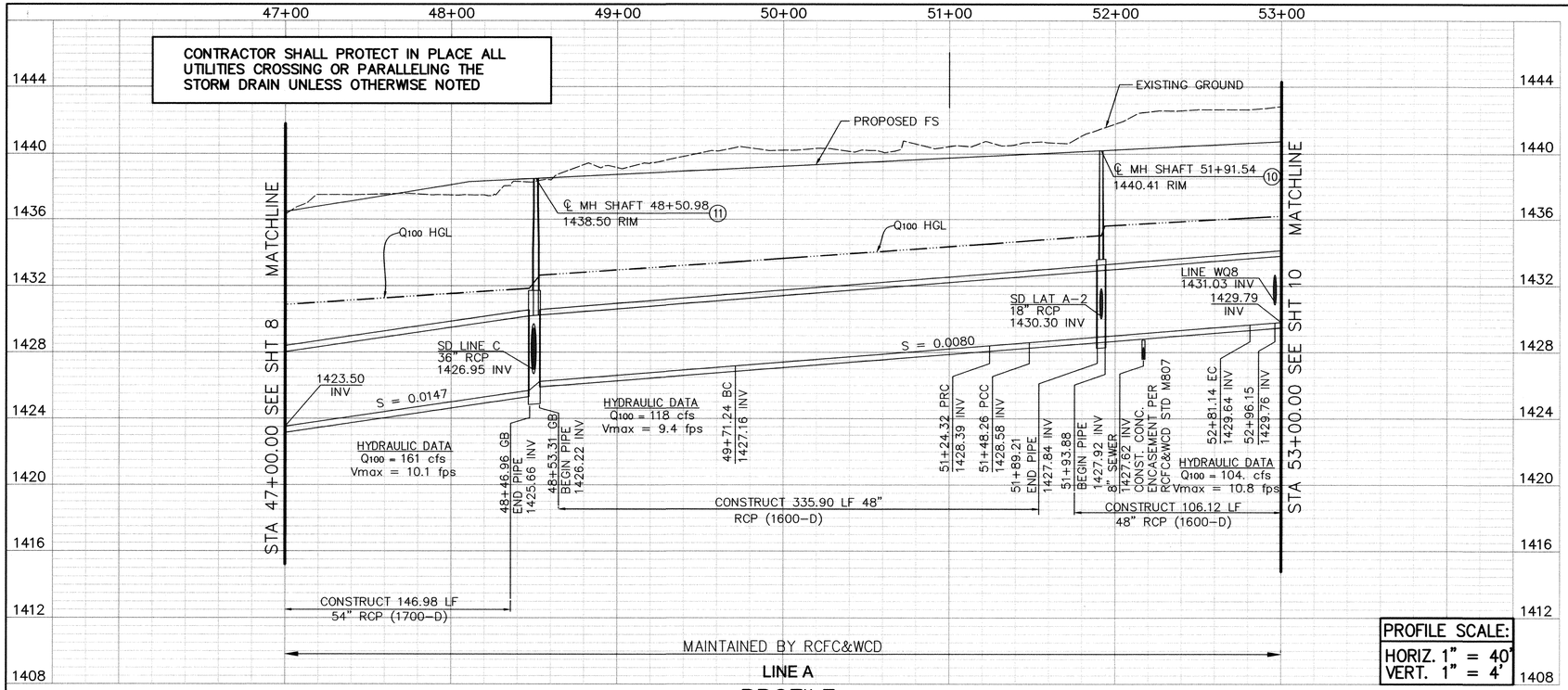
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

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

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
LINE "A"
STA 39+00 TO STA 47+00 966-PP

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 8 OF 20

Drawing Name: O:\17.06.18\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_08.dwg
Last Opened: May 19, 2017 - 10:44am by bwitten

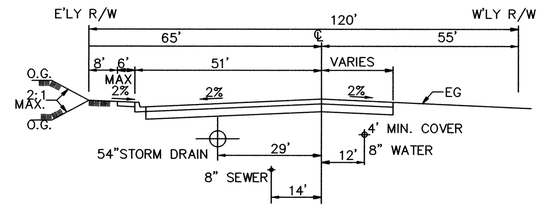


PROFILE

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

INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

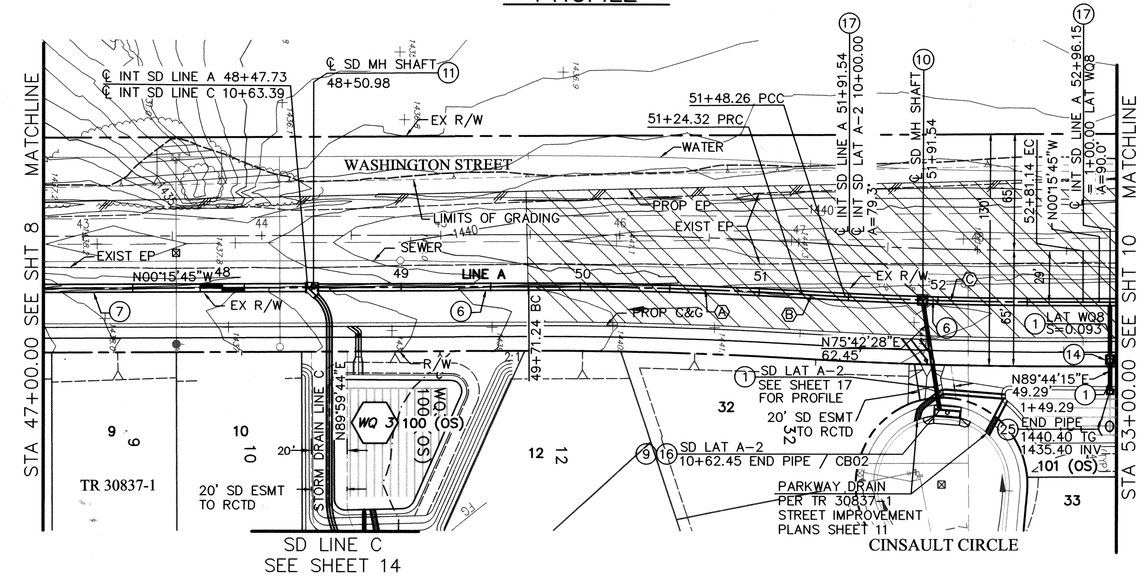
STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 48+00.00

TYPICAL FROM STA 47+00.00 TO STA 49+71.24

20 0 20 40
scale 1"= 20' feet



PLAN

CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (CLASS IV)
6. CONSTRUCT 48" RCP ('D' PER PROFILE)
7. CONSTRUCT 54" RCP ('D' PER PROFILE)
9. CONSTRUCT CATCH BASIN PER RCTD STD 300
10. CONSTRUCT MH NO. 2 PER RCFCWCD STD NO. MH252
11. CONSTRUCT MH NO. 4 PER RCFCWCD STD NO. MH254 A=45°, B=36", C=7.03', D1=48", D2=54", EL R=1427.05, EL S=1426.95
14. CONSTRUCT MH No. 1 PER RCFCWCD STD MH251
16. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RCTD STD 311
17. CONSTRUCT JS NO. 4 PER RCFC WCD STD JS229 AND 6" SCH. 40 PVC LATERAL
25. CONSTRUCT JENSEN PRECAST DRAINAGE INLET MODEL DI2436 (OR APPROVED EQUAL)

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓐ	3°41'57"	2371.00	153.08	76.57'	N32290.05;E60018.58
Ⓑ	0°33'53"	2429.00	23.94	11.97'	N32378.42;E60023.89
Ⓒ	3°08'04"	2429.00	132.89	66.46'	N32456.75;E60027.82

40 0 40 80
scale 1"= 40' feet

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD COUNTY OVERSIGHT ENGINEER — REGISTRATION NUMBER 35165 — DATE SIGNED 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311 1935 ELEV. 1431.13

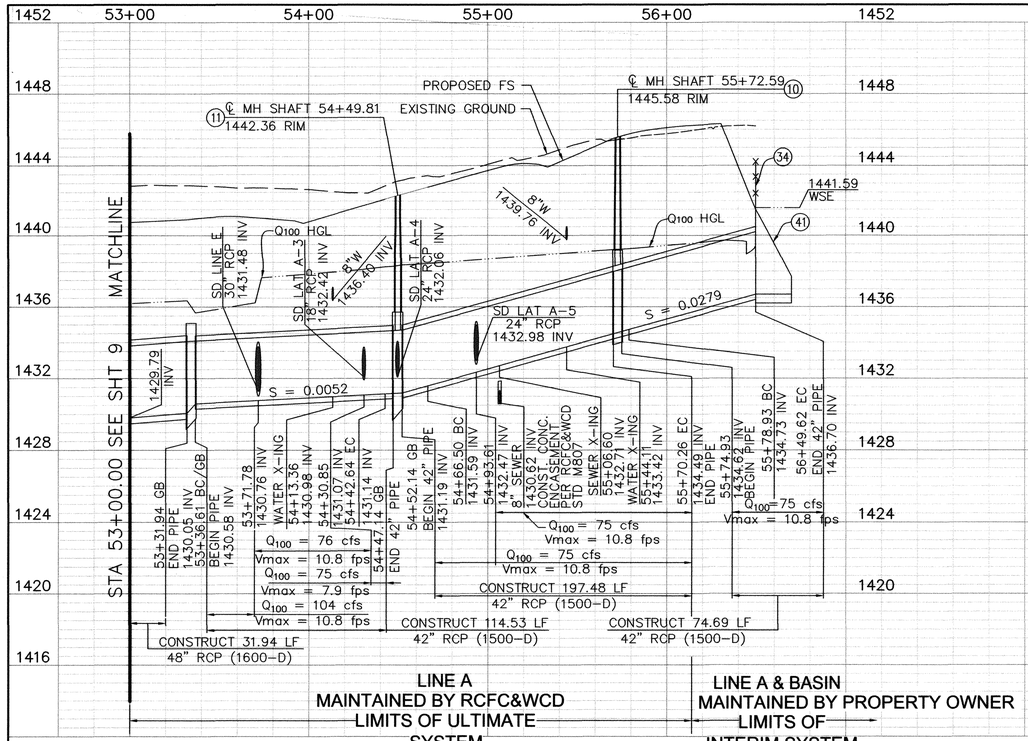
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

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

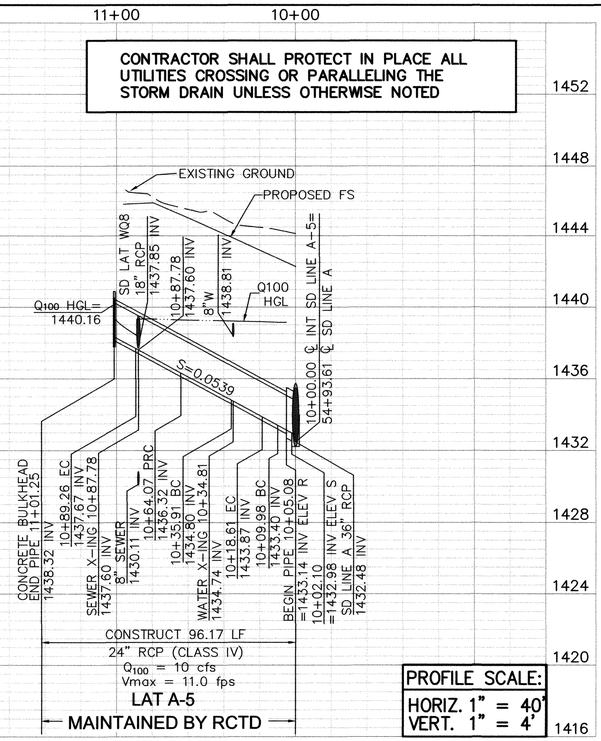
WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
LINE "A"
STA 47+00 TO STA 53+00

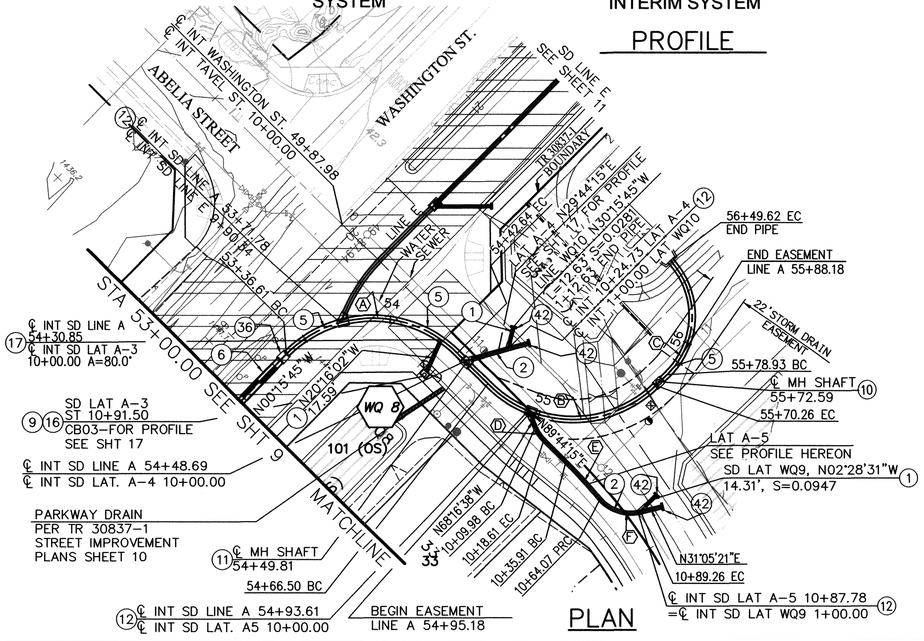
PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 9 OF 20
966-PP

Drawing Name: D:\17.06.18\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_09.dwg
Last Opened: Jun 09, 2017 - 11:08am by bwitzen



PROFILE





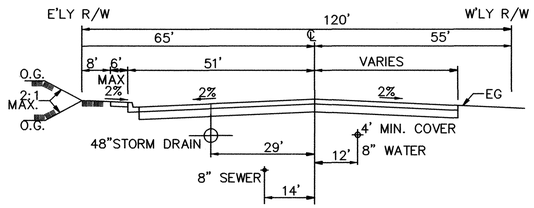
PLAN

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓐ	90°00'00"	67.50	106.03	67.50'	N32646.18;E60026.95
Ⓑ	88°04'13"	67.50	103.76	65.26'	N32646.89;E60183.58
Ⓒ	90°00'00"	45.00	70.69	45.00	N32765.78;E60187.04
Ⓓ	21°59'07"	22.50	8.63	4.37	N32646.78;E60158.01
Ⓔ	5°29'18"	294.00	28.16	14.09	N32646.94;E60193.77
Ⓕ	64°08'13"	22.50	25.19	14.09	N32644.37;E60221.84

INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



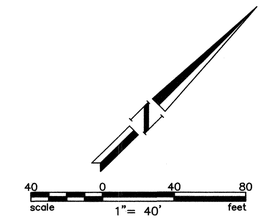
SECTION AT STATION 53+15.00

TYPICAL FROM STA 52+81.14 TO STA 53+38.61

20 0 20 40
scale 1"= 20' feet

CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (CLASS IV)
2. CONSTRUCT 24" RCP (CLASS IV)
5. CONSTRUCT 42" RCP ('D' PER PROFILE)
6. CONSTRUCT 48" RCP ('D' PER PROFILE)
9. CONSTRUCT CATCH BASIN PER RCTD STD 300
10. CONSTRUCT MH NO. 2 PER RCFCWCD STD NO. MH252
11. CONSTRUCT MH NO. 4 PER RCFCWCD STD NO. MH254
    A=45°, B=36", C=7.03', D1=48", D2=54", EL R=1427.05, EL S=1426.95
12. CONSTRUCT JS NO. 2 PER RCFCWCD STD JS227
    LINE E: (A=50°, B=30", C=6.0', D=42", E=3.85', F=0.98', G=1.42', L=4.41', EL R=1431.48, EL S=1431.35)
    LAT WQ-9: (A=29°47'34, B=18", C=6.0', D=24", E=4.27', F=0.62', G=0.68', L=4.49', EL R=1438.42, EL S=1437.92)
    LAT WQ-10: (A=60', B=18", C=3.5', D=24", E=2.00', F=0.71', G=0.60', L=2.60', EL R=1435.24, EL S=1435.16)
    LAT A-5: (A=45', B=24", C=5.8', D=42", E=3.64', F=1.15', G=1.04', L=3.97', EL R=1433.14, EL S=1432.98)
16. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RCTD STD 311
17. CONSTRUCT JS NO. 4 PER RCFC WCD STD JS229 AND 6" SCH. 40 PVC LATERAL
34. CONSTRUCT CABLE FENCE PER RCFCWCD STD M826
36. CONSTRUCT TS NO. 3 PER RCFCWCD STD TS303
41. CONSTRUCT TYPE A OUTLET STRUCTURE PER CALTRANS STD. D90 AND DETAILS ON SHEET 19.
42. CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD. NO. M816.



TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.
2-14-19 | 35765

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835 DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311
1935 ELEV. 1431.13

APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: DATE:

APPROVED BY: DATE:

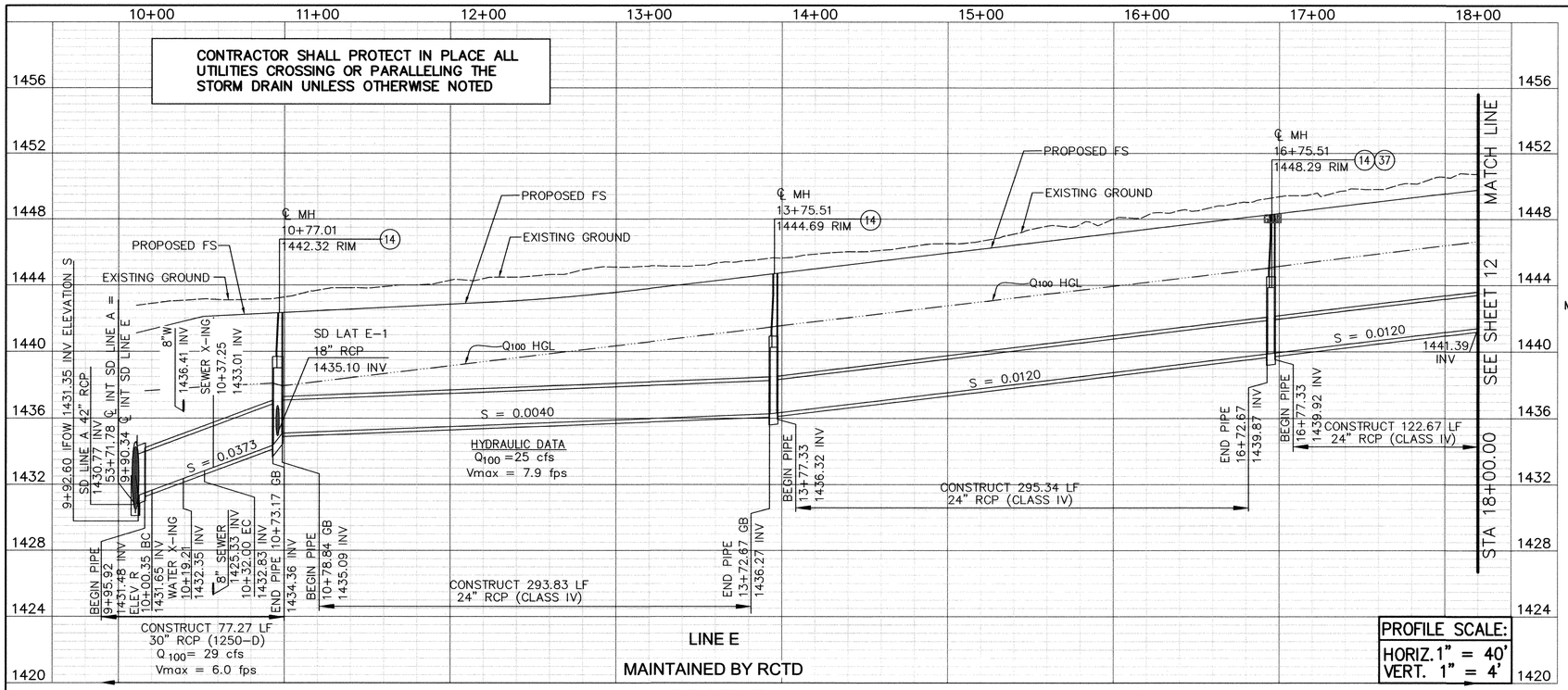
WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1

LINE "A"
STA 53+00 TO STA 56+49.62 966-PP

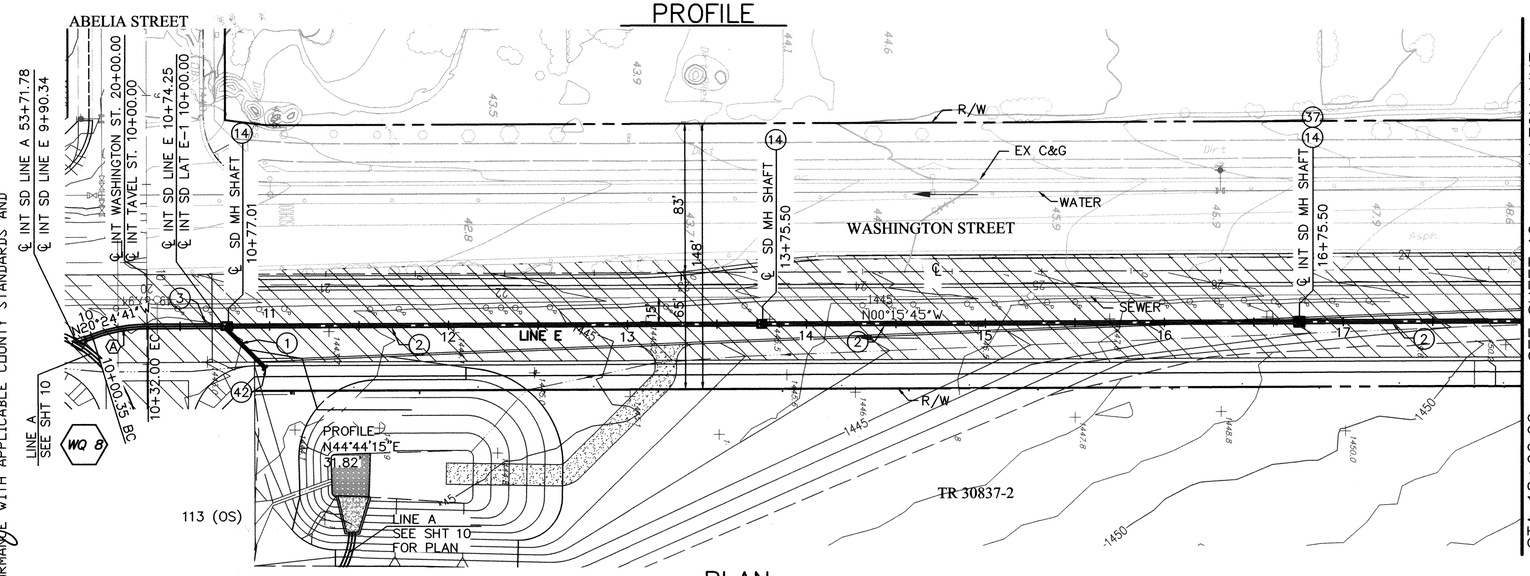
PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 10 OF 20

Drawing Name: D:\171.05.15\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_10.dwg
Last Opened: Jul 06, 2017 - 1:38pm by bwitzen

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



PROFILE

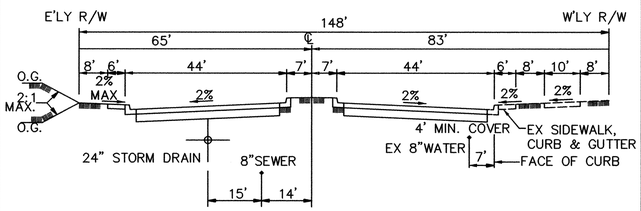


PLAN

INFORMATIONAL NOTE

ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 14+50.00

TYPICAL FROM STA 10+00.00 TO STA 18+00.00

20 0 20 40
scale 1"= 20' feet

CONSTRUCTION NOTES

(1) CONSTRUCT 18" RCP (CLASS IV)
(2) CONSTRUCT 24" RCP (CLASS IV)
(3) CONSTRUCT 30" RCP ('D' PER PROFILE)
(14) CONSTRUCT MH NO. 1 PER RCFCWCD STD No. MH251
(37) CONSTRUCT 6'X6'X6' CONCRETE PAD W/ #4 BARS AT 18" O.C.,E.W. CENTERED ON MH COVER PER DETAILS ON SHEET 6.
(42) CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD NO. M816.

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
(A)	20°08'56"	90.00'	31.65'	15.99'	N32636.70;E60026.99

40 0 40 80
scale 1"= 40' feet

RECMD COUNTY OVERSIGHT ENGINEER — REGISTRATION NUMBER 35765 — DATE SIGNED 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA ND. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311 1935 ELEV. 1431.13

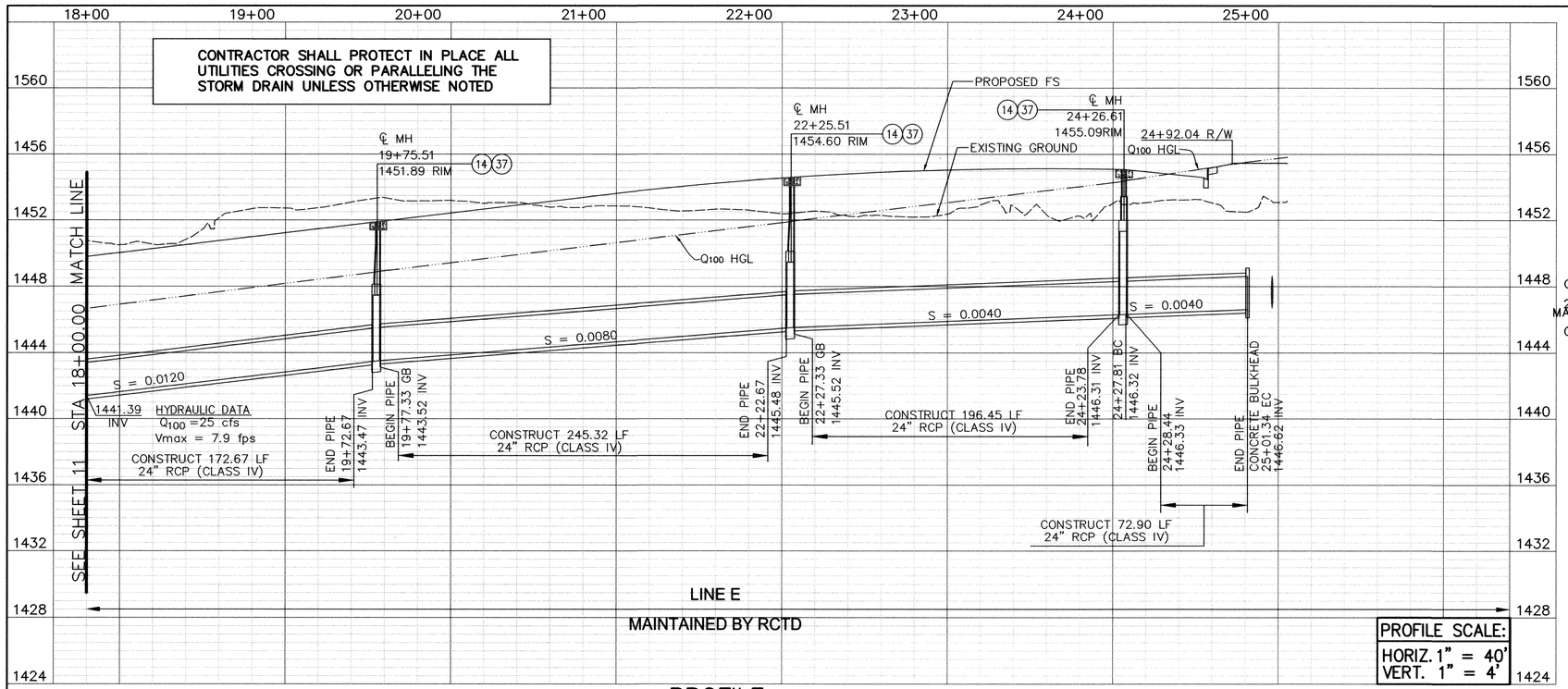
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

TR 30837-1 MS 4132 I.P. 070012 & 120044

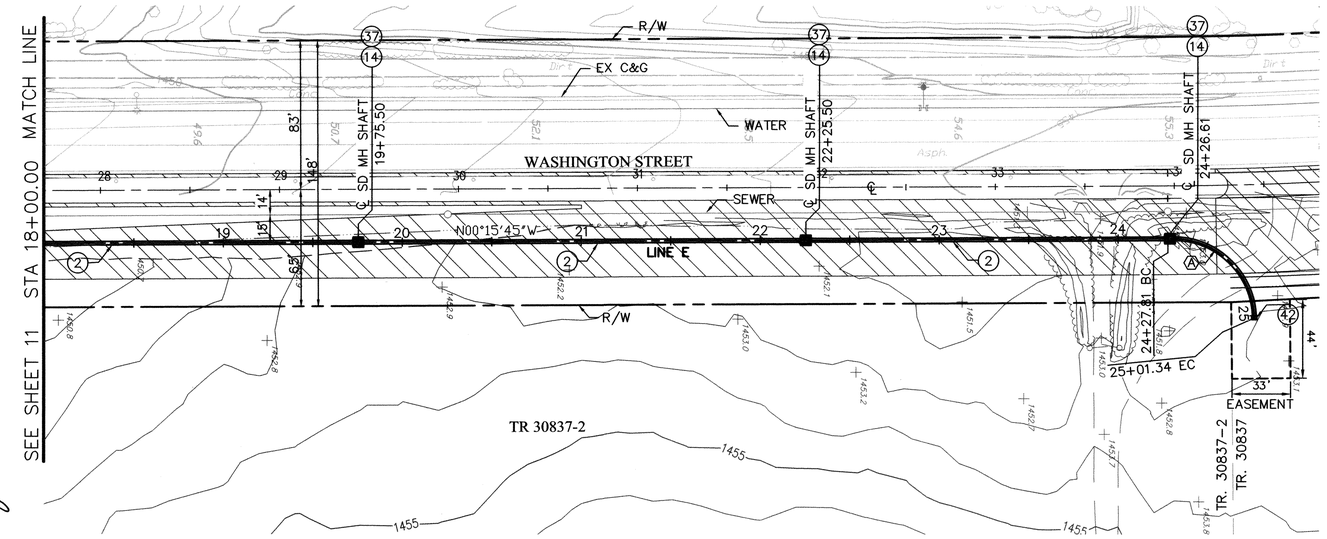
WARM SPRINGS VALLEY
NORTH WASHINGTON STREET
STORM DRAIN
LINE "E"
STA 9+90.34 TO STA 18+00 966-PP

PROJECT NO.
DRAWING NO. 7-0544
SHEET NO. 11 OF 20

Drawing Name: G:\171.06.15\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1_SHT_11.dwg
Last Opened: Jul 06, 2017 - 1:48pm by bwitzen



PROFILE

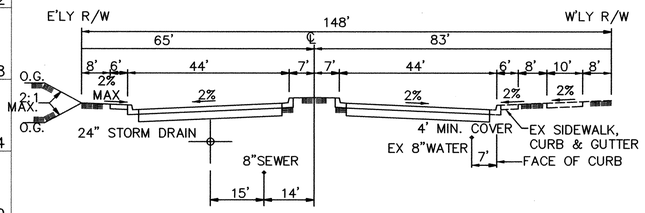


PLAN

INFORMATIONAL NOTE

ALL X-SECTIONS TAKEN LOOKING DOWN STREAM

STORM DRAIN ALIGNMENT WITHIN WASHINGTON STREET MODIFIED FROM COUNTY STANDARD #817 IN ORDER TO AVOID CONFLICT WITH RAISED MEDIAN



SECTION AT STATION 20+50.00

TYPICAL FROM STA 18+00.00 TO STA 24+27.81 BC

20 0 20 40
scale 1"= 20' feet

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓐ	92°48'01"	45.00	72.89	47.26	N34096.28;E60017.72
Ⓑ	69°07'25"	22.50	27.14	15.50	N34088.96;E60135.59

CONSTRUCTION NOTES

(2) CONSTRUCT 24" RCP (CLASS IV)
(14) CONSTRUCT MH No. 1
(37) CONSTRUCT 6'X6'X6' CONCRETE PAD W/ #4 BARS AT 18" O.C.,E.W. CENTERED ON MH COVER PER DETAILS ON SHEET 6.
(42) CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD. NO. M816.

40 0 40 80
scale 1"= 40' feet

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD COUNTY OVERSIGHT ENGINEER — REGISTRATION NUMBER — DATE SIGNED
8/ Mell Mahy — 35165 — 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311 1935 ELEV. 1431.13

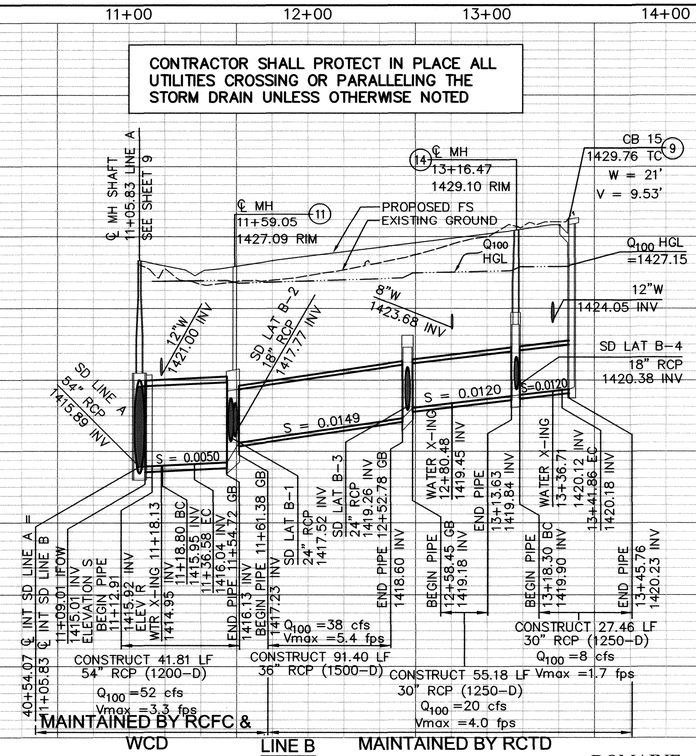
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

WARM SPRINGS VALLEY
NORTH WASHINGTON STREET
STORM DRAIN
LINE "E"
STA 18+00 TO STA 26+58.63 966-PP

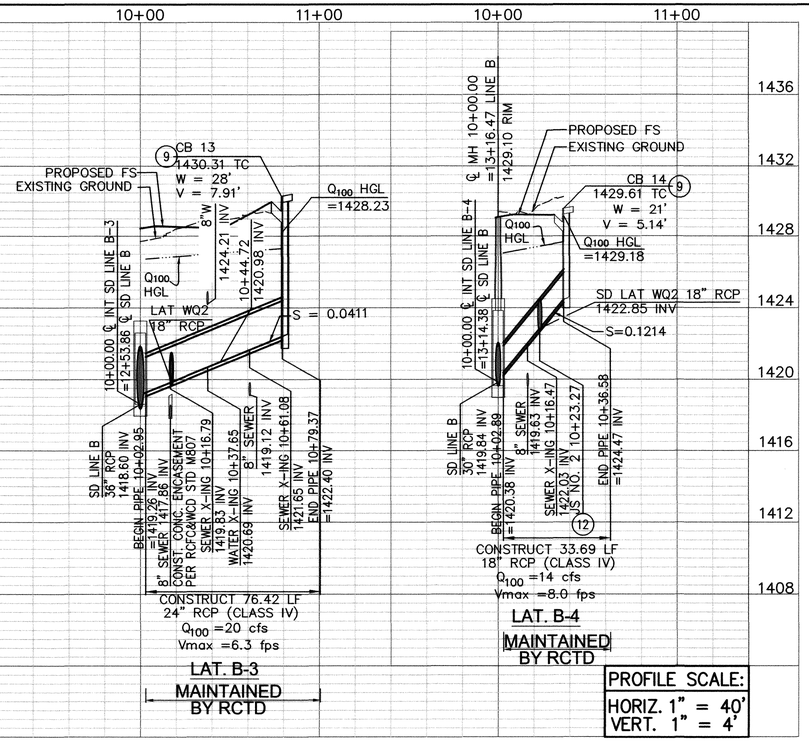
PROJECT NO.
DRAWING NO. 7-0544
SHEET NO. 12 OF 20

Drawing Name: C:\17.06.15\Engineering\Storm_Drain\Phase 1\TRACT_30837-1-SHT_12.dwg
Last Opened: Jul 06, 2017 - 1:58pm by bwilliam

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



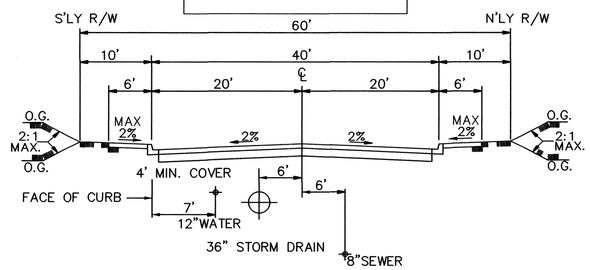
PROFILE



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

INFORMATIONAL NOTE

ALL X-SECTIONS TAKEN LOOKING DOWN STREAM



SECTION AT STATION 12+50.00 IN LINE "B"

TYPICAL FROM STA 11+57.08 TO STA 13+11.02 BC

scale 10 5 0 10 20 feet
1"= 10'

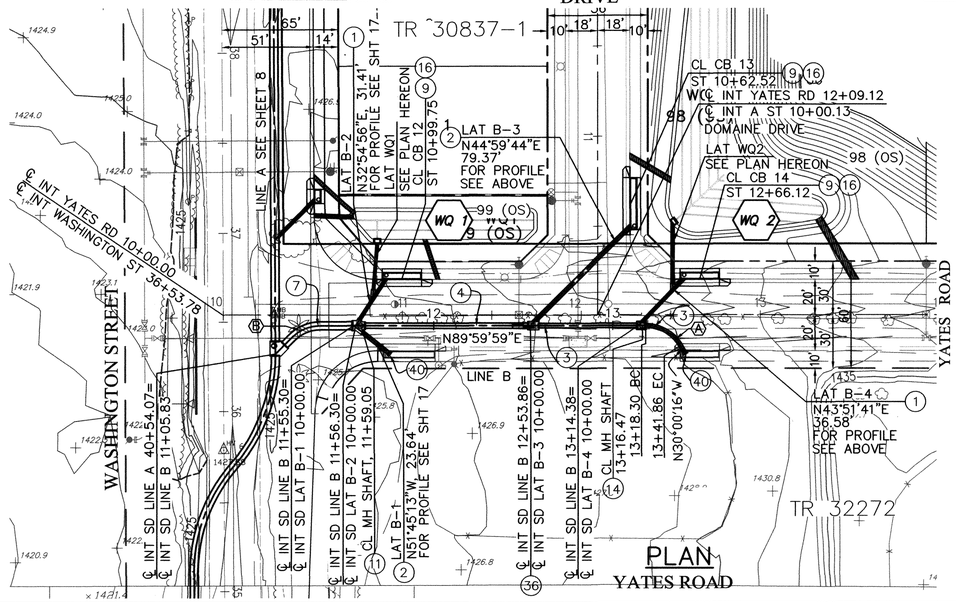
SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓐ	59°59'45"	22.50'	23.56'	9.38'	N31312.20;E60242.96
Ⓑ	45°15'44"	22.50'	17.77'	12.99'	N31312.20;E60038.87

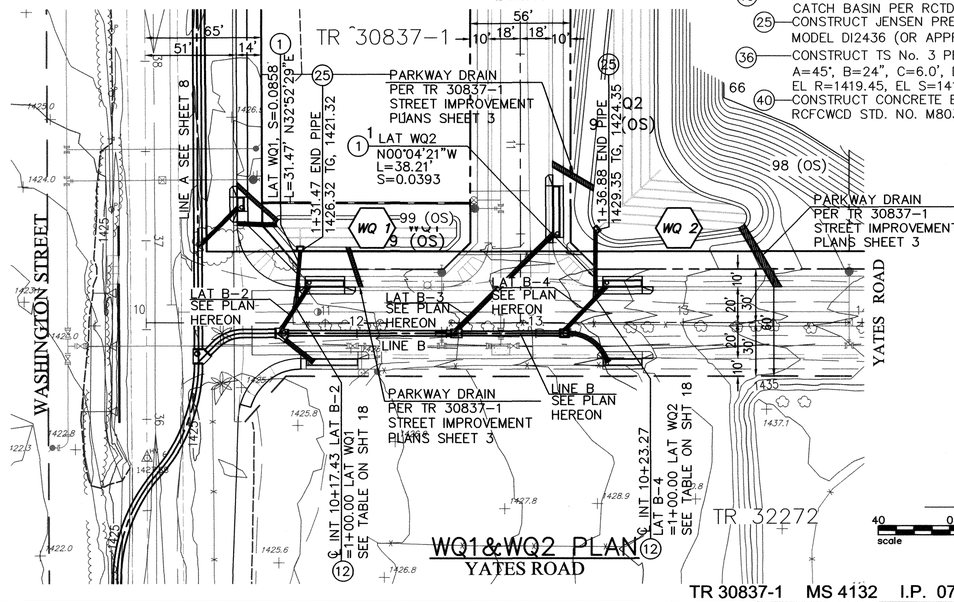
CONSTRUCTION NOTES

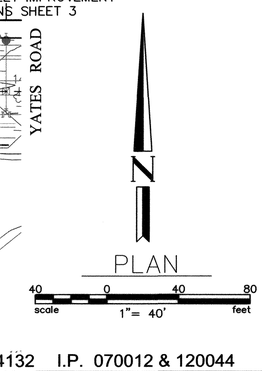
1. CONSTRUCT 18" RCP (CLASS IV)
2. CONSTRUCT 24" RCP (CLASS IV)
3. CONSTRUCT 30" RCP ('D' PER PROFILE)
4. CONSTRUCT 36" RCP ('D' PER PROFILE)
7. CONSTRUCT 54" RCP ('D' PER PROFILE)
9. CONSTRUCT CATCH BASIN PER RCTD STD 300
11. CONSTRUCT MH No. 4 PER RCFCWCD STD MH254
    LAT B-1: A=38.8', B=24", C=6.5', D1=36", D2=42", EL R=1417.89, EL S=1417.77
    LAT B-2: A=57.1', B=18", C=4.5', D1=36", D2=42", EL R=1417.85, EL S=1417.52
12. CONSTRUCT JS No. 2 PER RCFCWCD STD JS227 & DIMENSIONS IN TABLE ON SHT 15
14. CONSTRUCT MH No. 1 PER RCFCWCD STD MH251
16. CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RCTD STD 311
25. CONSTRUCT JENSEN PRECAST DRAINAGE INLET MODEL DI2436 (OR APPROVED EQUAL)
36. CONSTRUCT TS No. 3 PER RCFCWCD STD TS303 A=45', B=24", C=6.0', D1=30", D2=36", EL R=1419.45, EL S=1419.20
40. CONSTRUCT CONCRETE BULKHEAD PER RCFCWCD STD. NO. M803.

PROFILE



PROFILE





TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD | COUNTY DIVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
℄ | | 35165 | 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/11/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD, 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311
1935 ELEV. 1431.13

APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

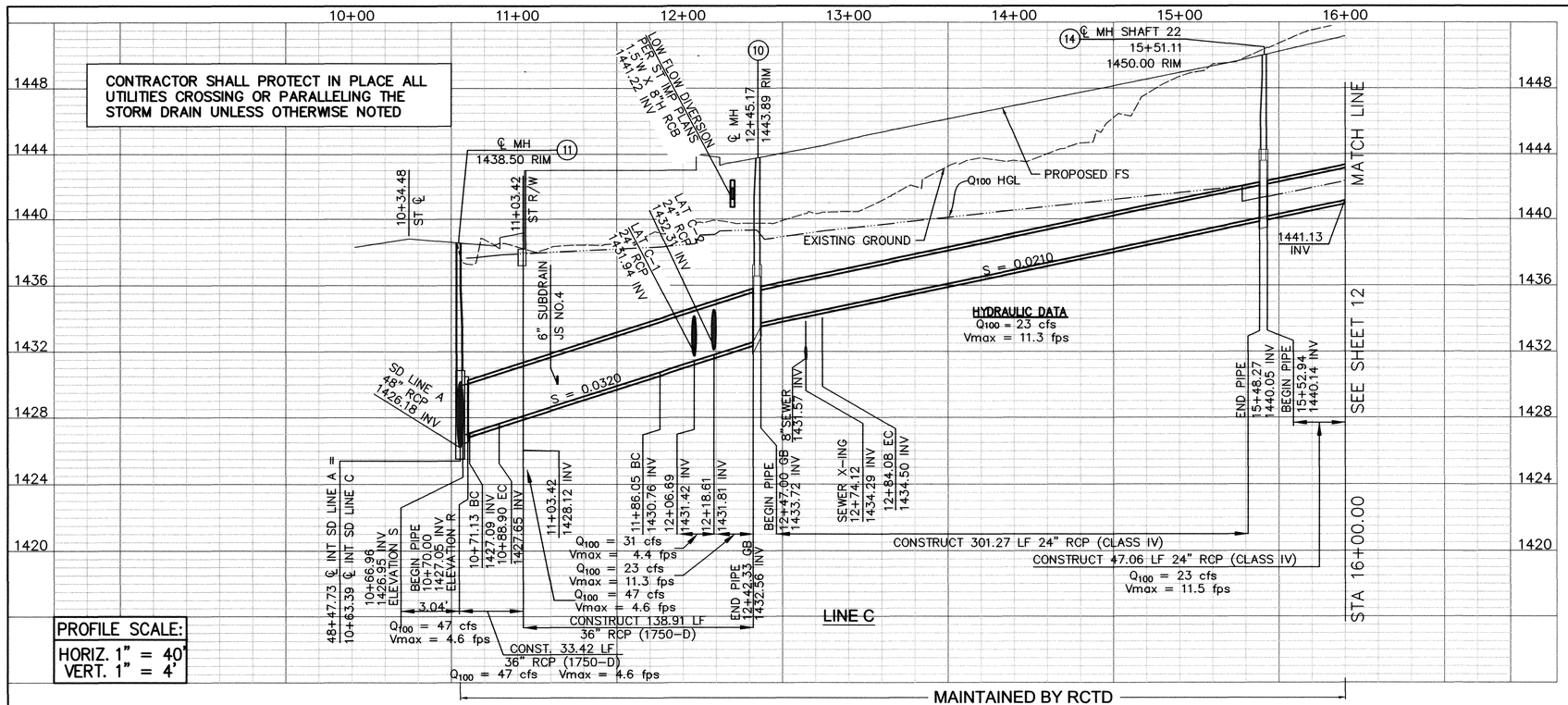
WARM SPRINGS VALLEY
YATES ROAD STORM DRAIN
STAGE 1

LINE "B"
STA 11+05.83 TO STA 13+45.75 966-PP

PROJECT NO. 7-0-00198
DRAWING NO. 7-0544
SHEET NO. 13 OF 20

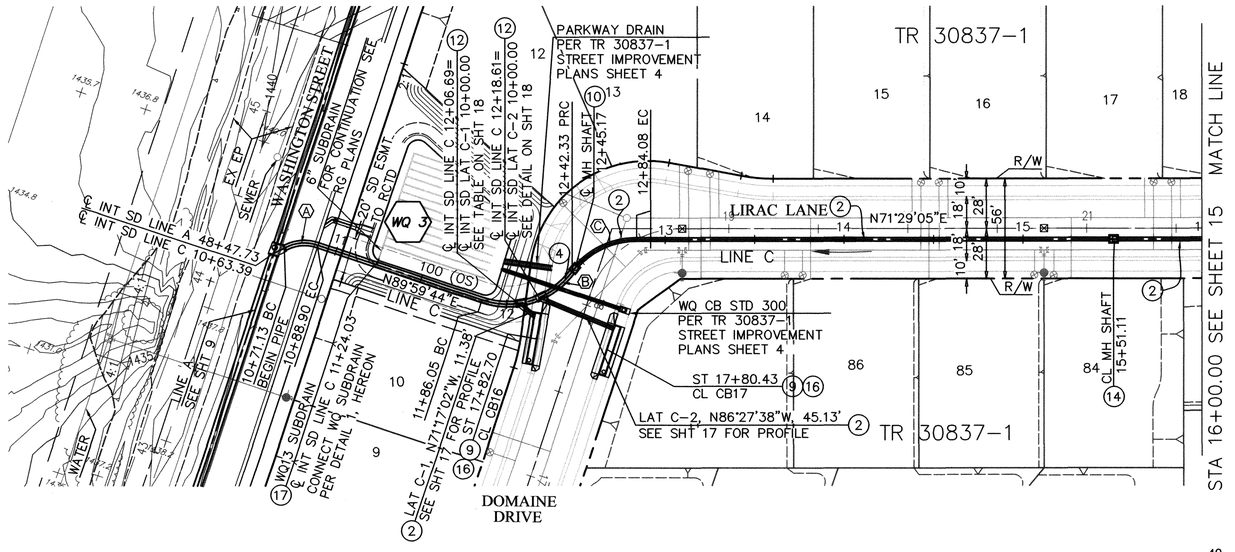
Drawing Name: C:\171.06.16\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_13.dwg
Last Opened: Apr 06, 2017 - 12:06am by bwirzen

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



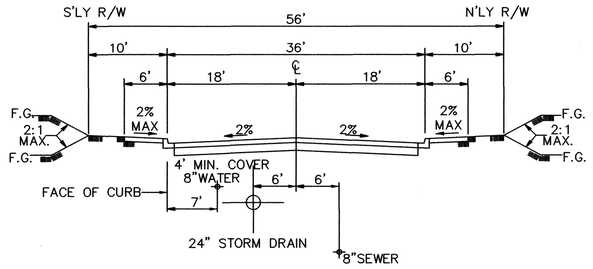
PROFILE SCALE:
HORIZ. 1" = 40'
VERT. 1" = 4'

PROFILE



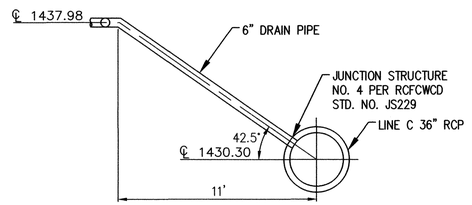
PLAN

INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN LOOKING DOWN STREAM



SECTION AT STATION 14+00.00
TYPICAL FROM STA 12+84.08 EC TO STA 16+00.00

10 5 0 10 20
scale 1"= 10' feet



DETAIL 1 – SUBDRAIN CONNECTION
N.T.S.

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
A	45°15'29"	22.50	17.77	9.38'	N32102.13;E600315.55
B	71°39'43"	45.00'	56.28'	12.14'	N32102.14;E60170.57
C	53°09'04"	45.00'	41.74'	22.51'	N32154.35;E60187.87

CONSTRUCTION NOTES

(2) CONSTRUCT 24" RCP (CLASS IV)
(4) CONSTRUCT 36" RCP ('D' PER PROFILE)
(9) CONSTRUCT CATCH BASIN PER RCTD STD 300
(10) CONSTRUCT MH NO. 2 PER RCFCWCD STD. MH252.
(12) CONSTRUCT JS No. 2 PER RCFCWCD STD JS227 & DIMENSIONS IN TABLE ON SHT 15
(14) CONSTRUCT MH NO.1 PER RCFCWCD STD. MH251.
(16) CONSTRUCT GUTTER DEPRESSION FOR CURB OPENING CATCH BASIN PER RCTD 311
(17) CONSTRUCT JS No. 4 PER RCFCWCD STD JS229 AND 6" SCH. 40 PVC LATERAL. SEE DETAIL 1 HEREON.

40 0 40 80
scale 1"= 40' feet

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
8/1/17 | 35165 | 2-14-19
APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568
PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK: 1929 DATUM
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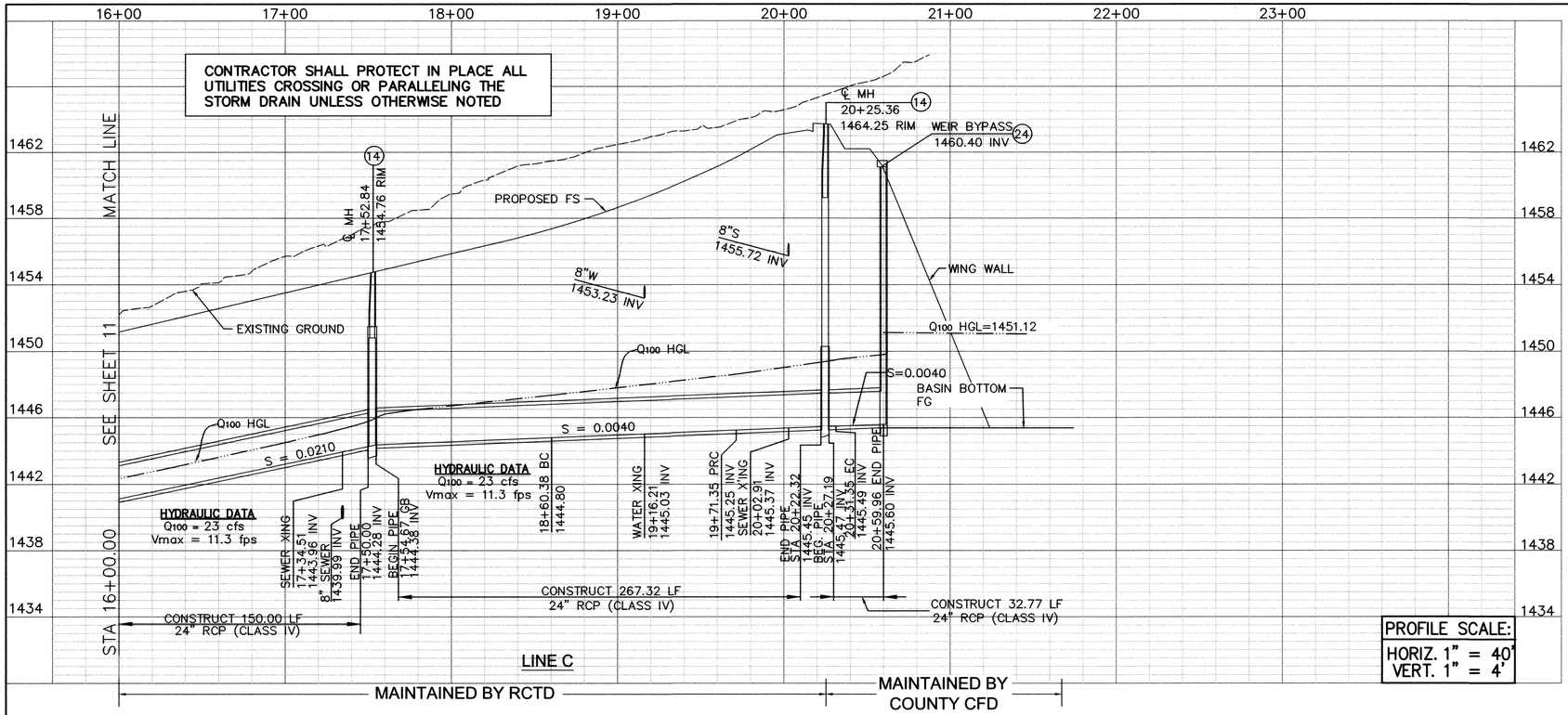
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

WARM SPRINGS VALLEY
LIRAC LANE STORM DRAIN

LINE "C"
STA 10+63.39 TO STA 16+00 966-PP

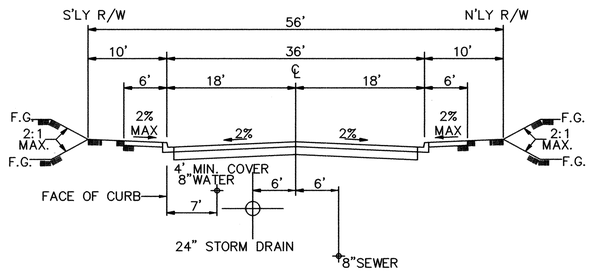
PROJECT NO.
DRAWING NO. 7-0544
SHEET NO. 14 OF 20

Drawing Name: C:\17\06.16\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_14.dwg
Last Opened: May 19, 2017 - 11:15pm by bwitten



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

INFORMATIONAL NOTE
ALL X-SECTIONS TAKEN
LOOKING DOWN STREAM



SECTION AT STATION 17+00.00
TYPICAL FROM STA 16+00.00 TO STA 18+62.45 BC

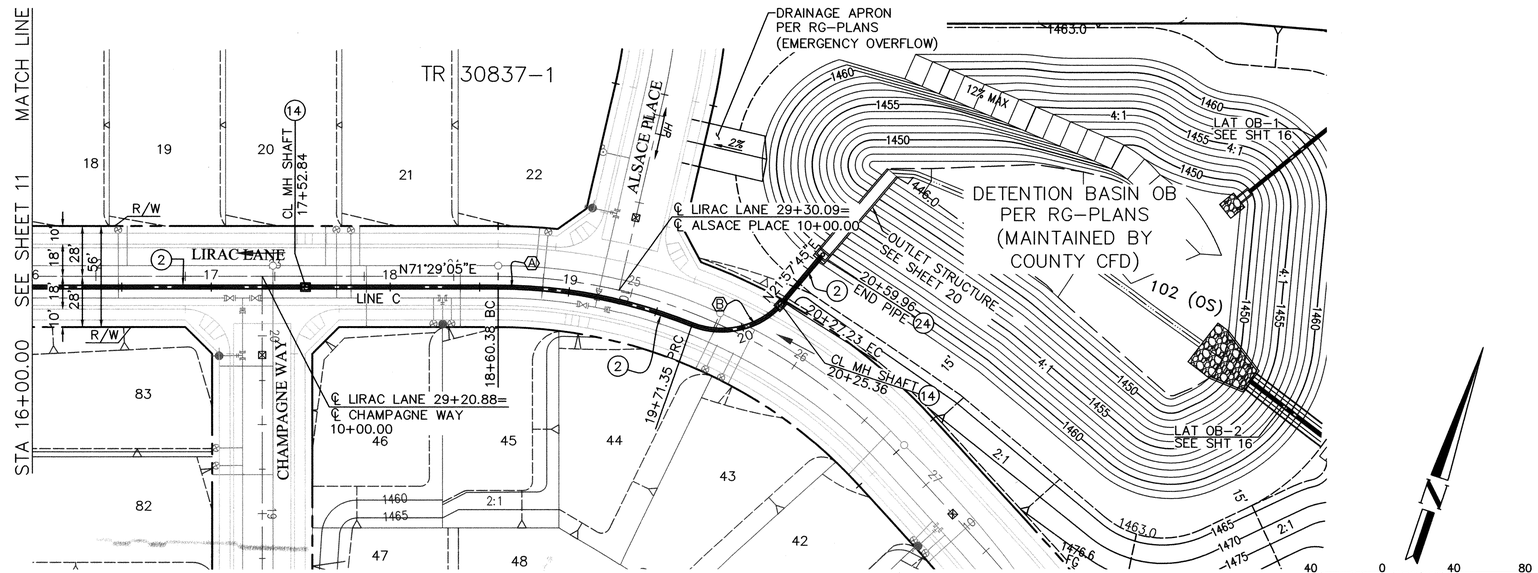
10 5 0 10 20
scale 1"= 10' feet

SD CL CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓐ	21°33'40"	294.00'	110.97'	55.98'	N32362.33;E60809.11
Ⓑ	71°23'04"	45.00'	55.88'	32.24'	N32357.47;E60897.18

CONSTRUCTION NOTES

(2) CONSTRUCT 24" RCP (CLASS IV)
(14) CONSTRUCT MH NO. 1 PER RCFCWCD STD MH 251
(24) CONSTRUCT MODIFIED CATCH BASIN PER DETAIL ON SHEET 20



40 0 40 80
scale 1"= 40' feet

TR 30837-1 MS 4132 I.P. 070012 & 120044

WARM SPRINGS VALLEY
LIRAC LANE STORM DRAIN

LINE "C"
STA 16+00 TO STA 20+59.96 966-PP

PROJECT NO.
DRAWING NO. 7-0544
SHEET NO. 15 OF 20

RECMD COUNTY OVERSIGHT ENGINEER — REGISTRATION NUMBER 35165 — DATE SIGNED 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

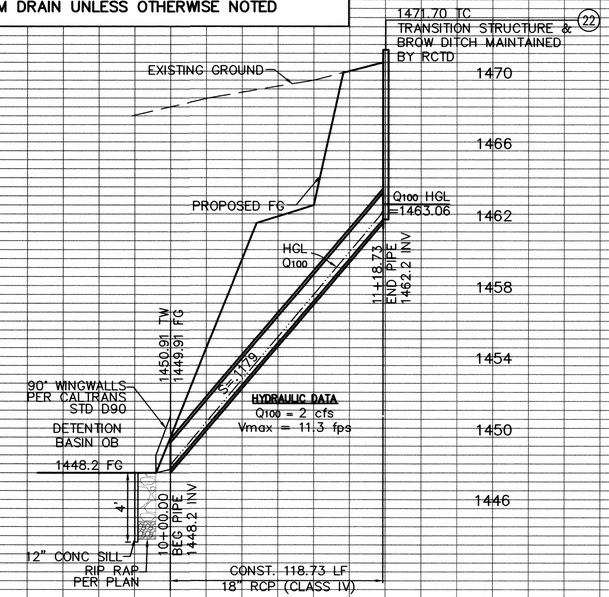
Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

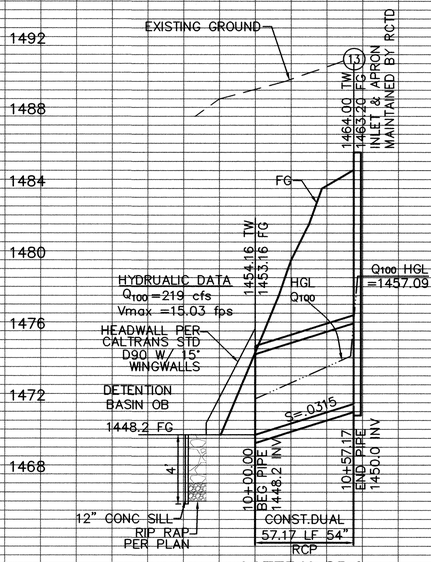
BENCH MARK: 1929 DATUM
3¼" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311 1935
ELEV. 1431.13

APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

Drawing Name: D:\171.06.16\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_15.dwg
Last Opened: Jan 08, 2017 - 1:17pm by swilliam

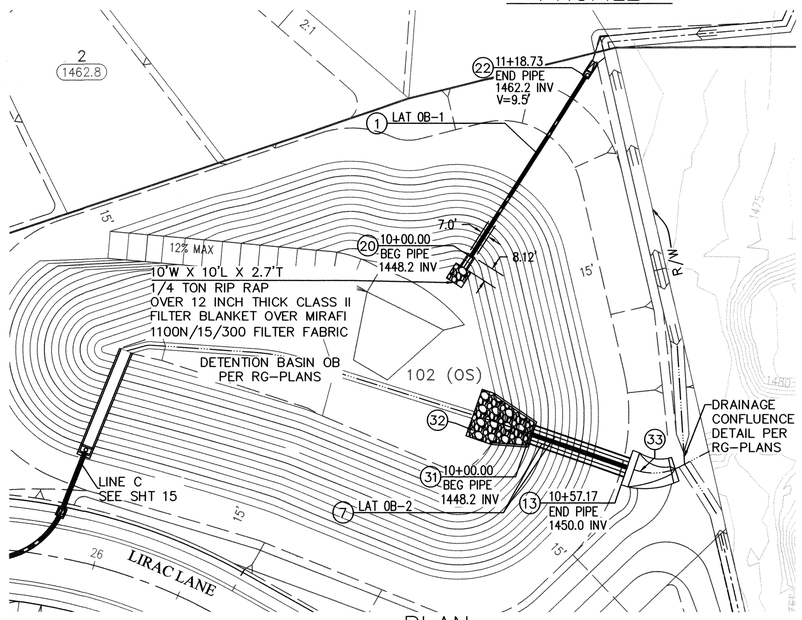
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED





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

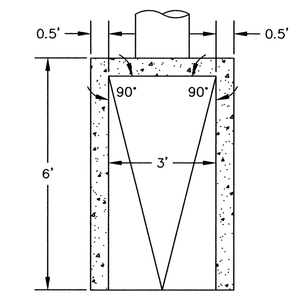
PROFILE



PLAN

SD CL CURVE DATA

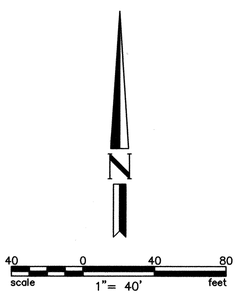
CURVE	DELTA	RADIUS	LENGTH	TANGENT	PI COORDINATE
Ⓔ	91°30'25"	90.00	143.74	92.40	N34056.55;E61324.31
Ⓕ	81°36'02"	90.00	128.18	77.69	N33873.41;E61181.82



22 MODIFIED D89 HEADWALL

CONSTRUCTION NOTES

1. INSTALL 18" RCP (CLASS IV)
7. INSTALL 54" RCP ('D' PER PROFILE)
13. CONSTRUCT MODIFIED GRATED INLET PER SPPWC STD 303-3 AND PER DETAIL ON SHT 18
17. CONSTRUCT JS No. 4 PER RCFCWCD STD JS229 AND 6" SCH. 40 PVC LATERAL
20. CONSTRUCT MODIFIED HEADWALL PER CALTRANS STD D89. D=18", H=3'-2", SEE DETAIL HEREON.
22. CONSTRUCT TRANSITION STRUCTURE PER DETAIL ON SHT 18 AND RCFCWCD STD CB110.
31. CONSTRUCT TYPE 'A' OUTLET STRUCTURE PER CALTRANS STD. D90 AND PER DETAIL ON SHT 18
32. CONSTRUCT RIP RAP VELOCITY DISSIPATOR PER CALTRANS SPECIFICATIONS AND PER DETAIL ON SHT 18
33. CONSTRUCT CONCRETE DRAINAGE APRON PER DETAIL ON SHT 18



RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
& | [signature] | 35165 | 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
[signature] DATE 9/1/17

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

BENCH MARK: 1929 DATUM
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APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

TR 30837-1 MS 4132 I.P. 070012 & 120044

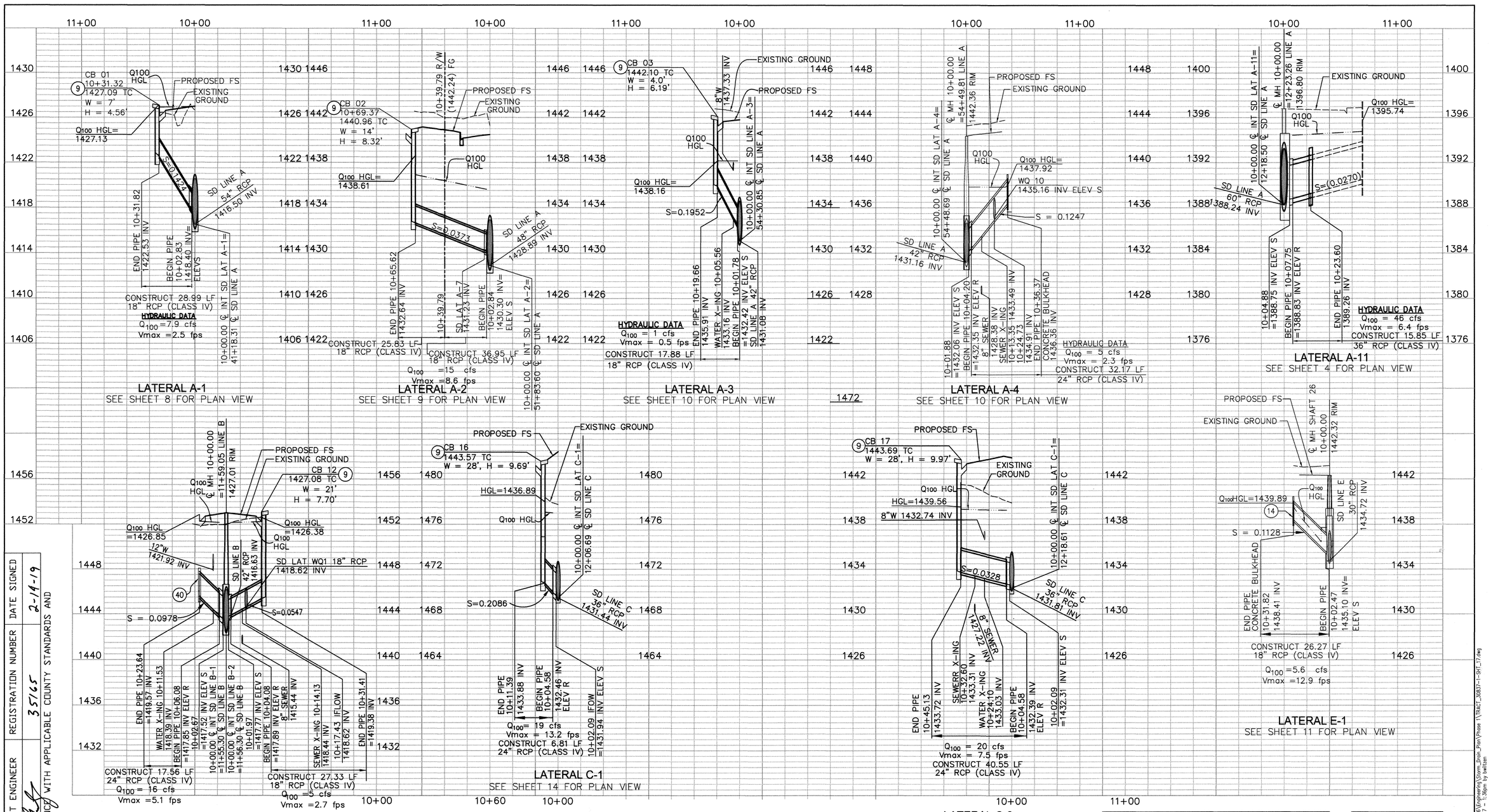
WARM SPRINGS VALLEY
STORM DRAIN IMPROVEMENT PLANS

LATERALS FOR
DETENTION BASINS OA & OB

PROJECT NO.
DRAWING NO. 7-0544
SHEET NO. 16 OF 20

966-PP

Drawing Name: G:\171.06.16\Engineering\Storm_Drain_Plan\Phase 1\TR4627_30837-1-SHT_16.dwg
Last Opened: May 19, 2017 - 1:29pm by bwilliam



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

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

STORM DRAIN LINES AND LATERALS 36" AND UNDER ALONG WITH CATCH BASINS AND LOCAL DEPRESSIONS SHOWN HEREON ARE MAINTAINED BY RCTD
ALL LATERALS DRAWN LOOKING DOWNSTREAM

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD — COUNTY OVERSIGHT ENGINEER — REGISTRATION NUMBER 35765 — DATE SIGNED 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER — JOSEPH L. CASTANEDA — NO. 59835 EXP. 12/31/17 — CIVIL — STATE OF CALIFORNIA

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PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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

BENCH MARK: 1929 DATUM
3½" BRASS DISK SET FLUSH ON TOP OF CONC. POST AT INTERSECTION OF WASHINGTON AVE. AND KELLER RD., 29' WEST OF CENTERLINE OF WASHINGTON AVE., 25' NORTH OF KELLER RD., 10' NORTH OF A FENCE CORNER, 1' EAST OF FENCE, BRASS DISK SET IN TOP OF 8" CONC. POST UP 14" ABOVE GROUND MARKED X 311
1935 ELEV. 1431.13

APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

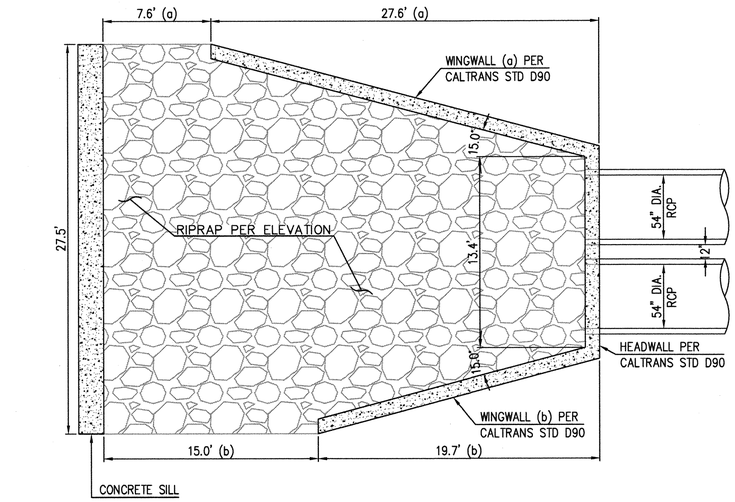
WARM SPRINGS VALLEY
STORM DRAIN IMPROVEMENT PLANS

SD LATERALS A-1 THRU A-4
AND LATERALS A-7 THRU A-11

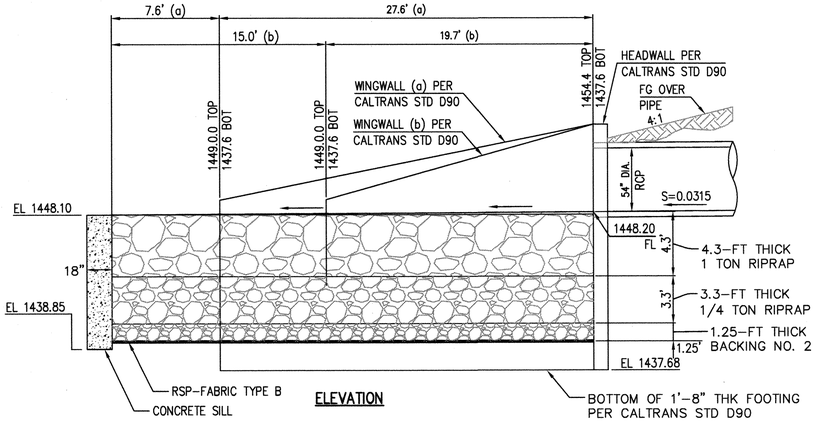
PROJECT NO. 7-0544
DRAWING NO.
SHEET NO. 17 OF 20

966-PP

Drawing Name: Q:\17-06-16\Engineering\Storm Drain Plan\Phase 1\TR4C7_30837-1-SHT_17.dwg
Last Opened: May 19, 2017 - 1:36pm by bwilcox

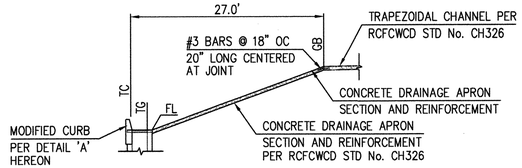


PLAN

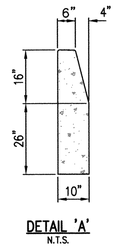


ELEVATION

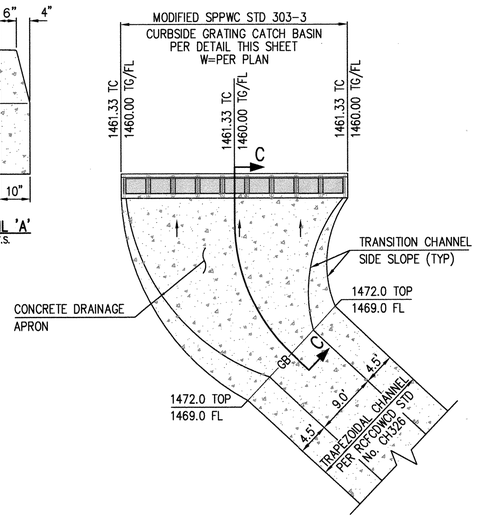
31 32 SD LAT OB-2 OUTLET STRUCTURE DETAIL
SEE PLAN SHEET 16
SCALE: 1"=5'



SECTION C-C

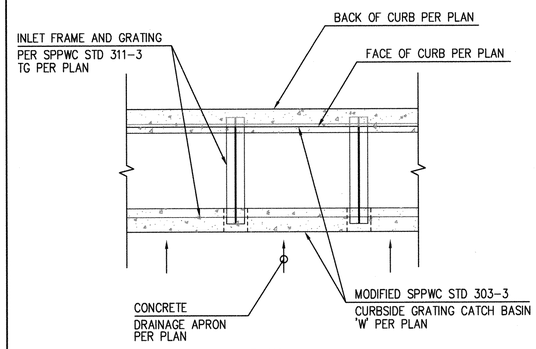


DETAIL 'A'
N.T.S.

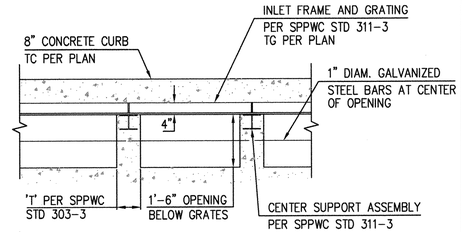


PLAN

33 CONSTRUCT CONCRETE DRAINAGE APRON
SEE PLAN SHEET 16
SCALE: 1"=10'



PLAN



ELEVATION

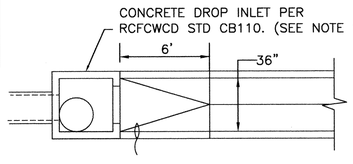
13 MODIFIED SPPWC STD 303-3 DETAIL
SEE PLAN SHEET 16
SCALE: 1"=2'

JS NO. 2 PER RCFCWCD STD JS227*

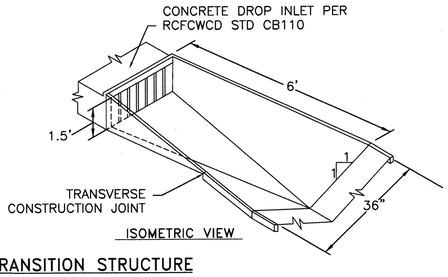
SHEET	SD LINE	STATION	A	B	C	D	E	F	G	L	ELEV R	ELEV S
10	LINE A	54+93.61	45.0°	24"	5.50'	36"	3.64'	1.21'	1.10'	3.97'	1433.25	1432.98
10	LINE A	55+63.62	20.0°	24"	4.00'	36"	2.12'	1.42'	1.27'	3.02'	1434.82	1434.53
10	LAT A-4	10+24.73	60.0°	18"	3.50'	24"	2.00'	0.40'	0.40'	2.60'	1435.22	1435.16
13	LAT B-2	10+17.43	28.3°	18"	5.75'	18"	4.08'	0.00'	0.00'	4.75'	1418.06	1417.86
13	LINE B	12+53.86	45.0°	24"	6.00'	36"	4.29'	1.35'	1.20'	4.43'	1419.45	1419.20
13	LAT B-4	10+23.27	46.1°	18"	4.00'	18"	2.57'	0.00'	0.00'	3.24'	1420.25	1420.00
14	LINE C	12+06.69	47.77°	24"	5.00'	36"	3.35'	1.12'	0.87'	3.95'	1432.46	1431.94
14	LINE C	12+18.61	42.4°	24"	5.00'	36"	3.35'	1.12'	0.87'	3.95'	1432.39	1432.31

*STRUCTURES SHOWN ON DATA TABLE ARE THOSE MAINTAINED BY RCTD. FOR STRUCTURES MAINTAINED BY RCFC&WCD, DATA IS SHOWN ON PLAN SHEET.

CB110 DIMENSIONS
A & W=3.58'
D=18"
T=10"
H=1.5'



PLAN VIEW



ISOMETRIC VIEW

22 BROW DITCH TRANSITION STRUCTURE
SEE PLAN ON SHEET 16
N.T.S.

NOTE 1: CONTRACTOR SHALL USE A MINIMUM WALL THICKNESS OF 10 INCHES. FOR REINFORCEMENT. CONTRACTOR TO IMPLEMENT REBAR CONFIGURATION PER RCFCWCD STD CB106.

MH NO. 4 PER RCFCWCD STD MH254*

SHEET	SD LINE	STATION	A	B	C	D1	D2	ELEV R	ELEV S
3	LINE A	54+48.69	60.0°	24"	4.62'	36"	42"	1432.35	1432.06

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION NUMBER | DATE SIGNED
RECMD | Mull. Mgs | 35765 | 2-19-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
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ELEV. 1431.13

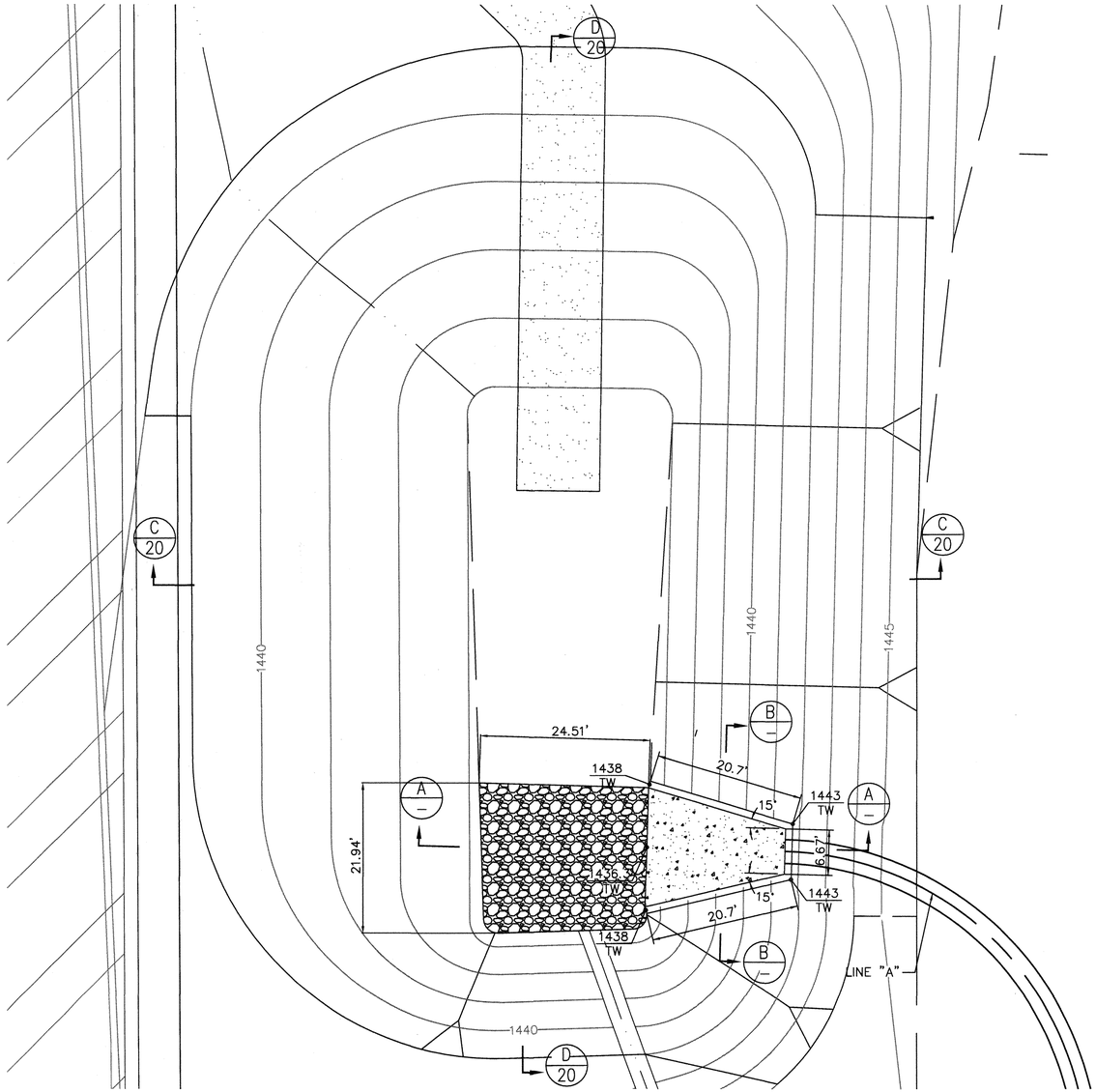
APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

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

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
DETAILS
966-PP

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 18 OF 20

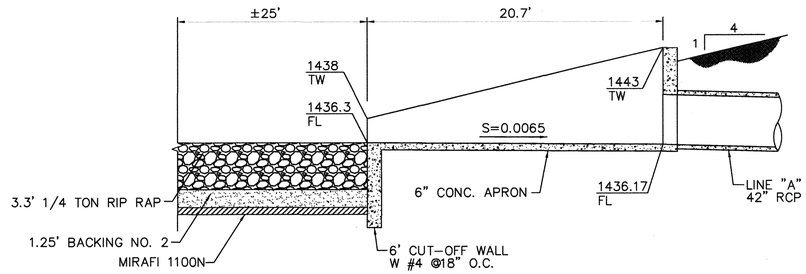
Drawing Name: © \171.08.18\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-SHT_18.dwg
Last Opened: May 19, 2017 – 1:42pm by bwitzen



LINE "A" WINGWALL & BASIN DETAIL

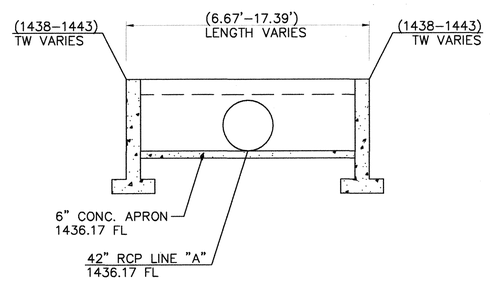
SEE PLAN ON SHEET 10

SCALE: 1"=10'



SECTION "A"-"A"

SCALE: 1"=5'



SECTION "B"-"B"

SCALE: 1"=5'

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD

COUNTY OVERSIGHT ENGINEER

REGISTRATION NUMBER 35165

DATE SIGNED 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER JOSEPH L. CASTANEDA NO. 59835 EXP. 12/31/17 CIVIL STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835 DATE 9/1/17

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

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APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
DETAILS

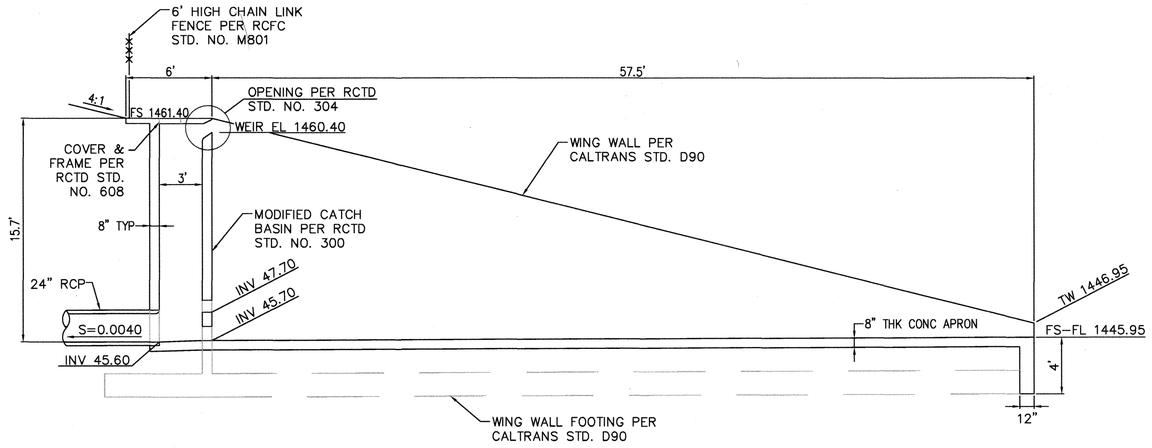
PROJECT NO. 966-PP

DRAWING NO. 7-0544

SHEET NO. 19 OF 20

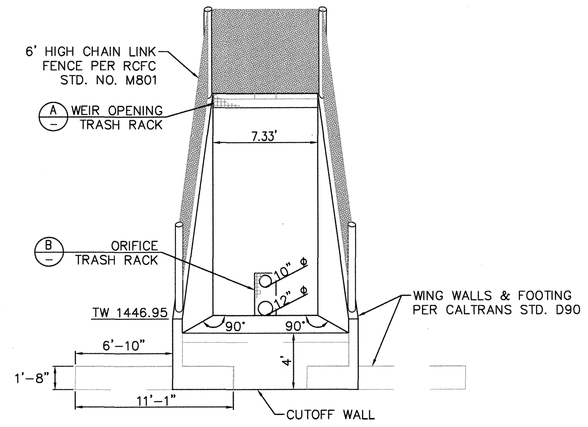
Drawing Name: D:\17\06.15\Engineering\Storm_Drain\Phase 1\TRACT_30837-1-SHT_19.dwg
Last Opened: Jun 22, 2017 - 4:28pm by bwitten

PROFILE VIEW



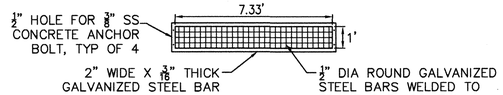
ISOMETRIC VIEW

(N.T.S.)



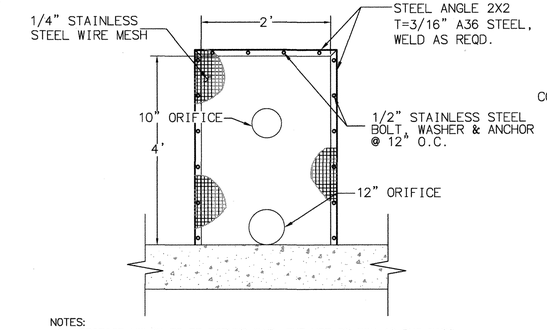
24 WEIR / ORIFICE OUTLET STRUCTURE

MODIFIED RC STD. NO. CB300
DETENTION BASIN OB
SEE PLAN ON SHEET 15
SCALE: 1"=5'



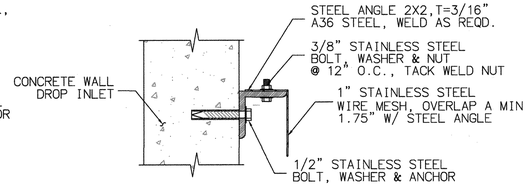
A WEIR OPENING TRASH RACK

N.T.S



NOTES:
1. ORIFICE HOLES TO BE FORMED WITH THE USE OF SCH 40 PVC PIPE.
2. SEE DETAIL FOR ANCHORING OF FRAME AND SCREEN.

FRAME AND SCREEN DETAIL

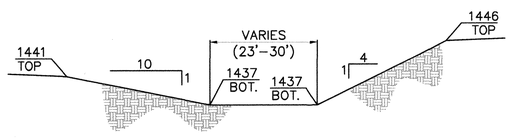


FRAME AND SCREEN ANCHORING

B ORIFICE TRASH RACK

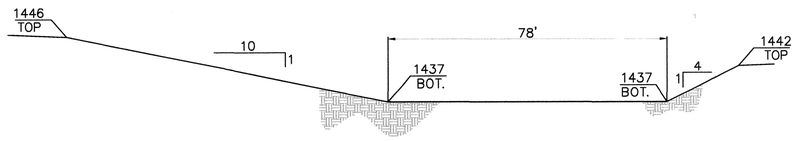
N.T.S

NOTES:
1. SEE REFERENCED STANDARD DETAILS FOR REINFORCING REQUIREMENTS.
2. INSTALL GALVANIZED STEEL STEPS PER RCTD STD. NO. 300.
3. ORIFICE TRASH RACK 18" X 36" GALVANIZED STEEL ANCHOR BOLT TO CONCRETE



SECTION "C"-"C"

BASIN DETAIL
SEE PLAN ON SHEET 19
SCALE: HORIZ.: 1"=20'
VERT.: 1"=2'



SECTION "D"-"D"

BASIN DETAIL
SEE PLAN ON SHEET 19
SCALE: HORIZ.: 1"=20'
VERT.: 1"=2'

TR 30837-1 MS 4132 I.P. 070012 & 120044

RECMD: 8
COUNTY OVERSIGHT ENGINEER: Mull Mufty
REGISTRATION NUMBER: 35165
DATE SIGNED: 2-14-19

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER — JOSEPH L. CASTANEDA — NO. 59835 EXP. 12/31/17 — CIVIL — STATE OF CALIFORNIA

JLC Engineering & Consulting, Inc.
36263 CALLE DE LOBO, MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PREPARED BY: JOSEPH L. CASTANEDA R.C.E. NO. 59835
DATE 9/1/17

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1935 ELEV. 1431.13

APPR.	DATE	REVISIONS	APPR.	DATE
ENGINEER			COUNTY	

WARM SPRINGS VALLEY
WASHINGTON STREET STORM DRAIN
STAGE 1
DETAILS
966-PP

PROJECT NO. 7-0-00197
DRAWING NO. 7-0544
SHEET NO. 20 OF 20

Drawing Name: Q:\171.06.16\Engineering\Storm_Drain_Plan\Phase 1\TRACT_30837-1-1-SHT_20.dwg
Last Opened: Jul 05, 2017 - 2:10pm by Switzen

EXHIBITS

EXHIBIT A: PRE PROJECT CONDITION RATIONAL METHOD HYDROLOGY MAP

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

PRE-PROJECT CONDITION SITE HYDROLOGY MAP



RATIONAL METHOD RESULTS - AREA A				
NODE TO NODE	Q_{100} (CFS)	T_C (MIN)	Q_{10} (CFS)	T_C (MIN)
101-102	6.06	17.32	3.77	17.32
102-102	7.68	17.32	4.77	17.32
102-103	12.41	18.16	7.68	18.25
103-106	15.96	20.05	9.83	20.33
103-106	16.36	20.05	10.09	20.33
101-104	2.79	16.50	1.74	16.50
104-105	5.86	17.65	3.64	17.80
105-106	10.68	23.07	6.52	23.57
*105-106	25.64	20.04	15.72	20.33

* DENOTES CONFLUENCE POINT

N

GRAPHIC SCALE
50' 0 25' 50' 100'
1" = 50'

EXHIBIT "A"

PUBLIC USE PERMIT 230001

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

PRE-PROJECT HYDROLOGY

TEMECULA VALLEY CHARTER SCHOOL

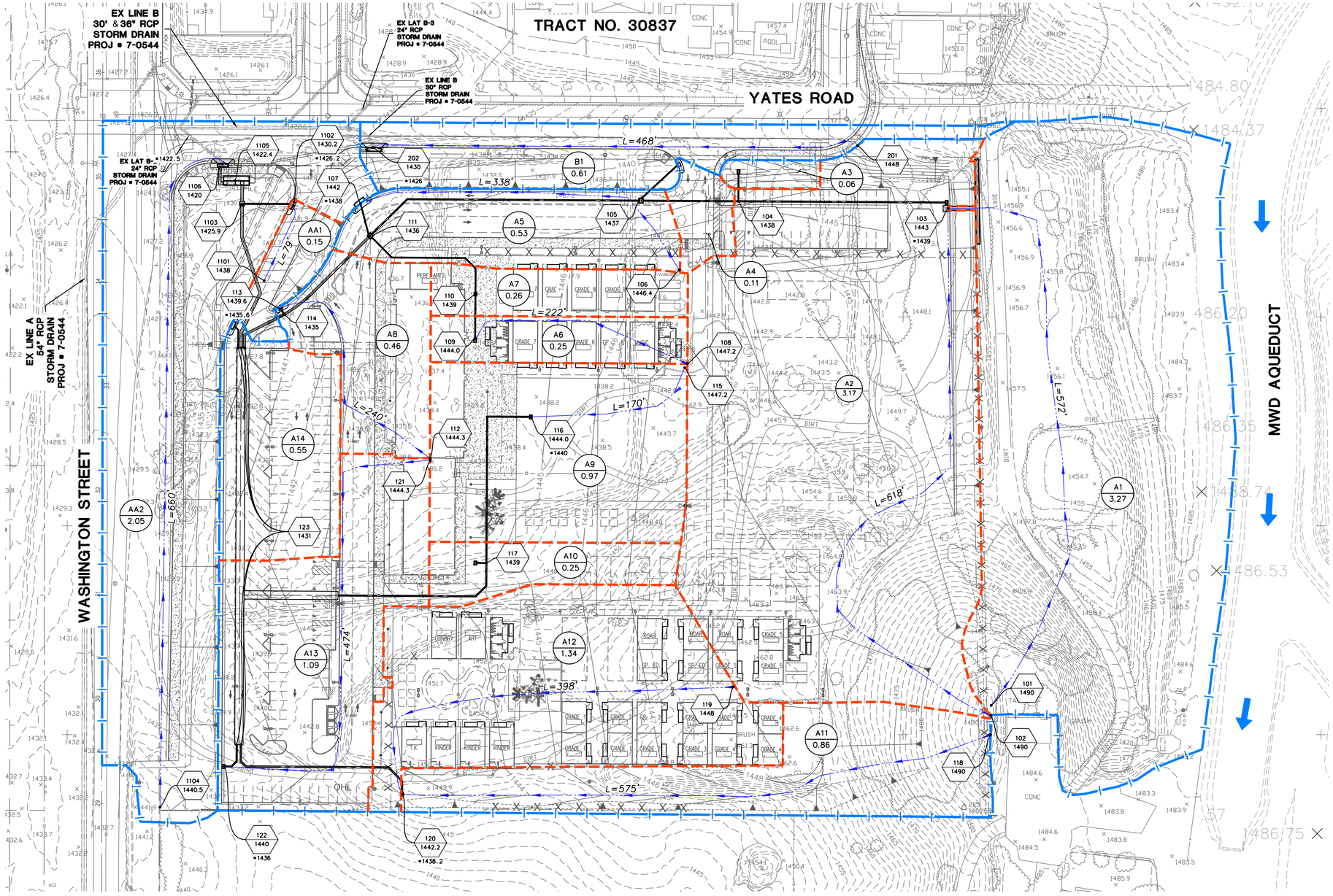
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Last Opened: Aug 15, 2024 - 6:19pm by joe

EXHIBIT B: **POST PROJECT CONDITION RATIONAL METHOD HYDROLOGY MAP**

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

POST-PROJECT CONDITION SITE HYDROLOGY MAP



RATIONAL METHOD RESULTS - AREA A				
NODE TO NODE	Q_{100} (CFS)	T_C (MIN)	Q_{10} (CFS)	T_C (MIN)
101–103	7.76	11.97	4.85	11.97
102–103	8.03	10.33	5.00	10.33
*102–103	14.73	10.33	9.19	10.33
103–104	14.73	10.89	9.19	10.96
104–104	14.86	10.89	9.27	10.96
104–105	14.86	11.10	9.27	11.19
105–105	15.16	11.10	9.47	11.19
105–111	15.16	11.97	9.47	12.19
106–107	1.86	6.96	1.22	6.60
107–111	1.86	7.02	1.22	7.03
108–109	0.99	5.61	0.65	5.61
109–110	0.99	5.74	0.65	5.75
110–110	2.01	5.74	1.32	5.75
110–111	2.01	6.10	1.32	6.15
*110–111	17.94	11.97	11.27	12.19
111–114	17.94	12.21	11.27	12.46
112–113	1.72	6.08	1.12	6.08
113–114	1.72	6.09	1.12	6.09
*113–114	19.11	12.21	12.03	12.46
114–123	19.11	12.26	12.03	12.52
115–116	3.31	6.69	2.12	6.69
116–117	3.31	7.41	2.12	7.50
117–117	4.16	7.41	2.67	7.50
117–123	4.16	7.83	2.67	7.98
118–120	2.42	9.19	1.53	9.19
119–120	4.58	7.33	3.00	7.33
*119–120	6.51	7.33	4.22	7.33
120–123	6.51	7.48	4.22	7.50
121–122	3.24	9.23	2.11	9.23
122–123	3.24	9.23	2.11	9.23
*122–123	30.09	12.26	19.08	12.26
123–123	31.48	12.26	19.98	12.26

* DENOTES CONFLUENCE POINT

RATIONAL METHOD RESULTS - AREA AA				
NODE TO NODE	Q_{100} (CFS)	T_C (MIN)	Q_{10} (CFS)	T_C (MIN)
1101–1102	0.60	5.00	0.39	5.00
1102–1103	0.60	5.26	0.39	5.30
123–123	31.48	12.26	31.48	12.26
123–1103	31.48	12.42	31.48	12.42
*123–1103	31.86	12.42	31.72	12.42
1103–1105	31.86	12.43	31.72	12.43
1105–1106	31.86	12.45	31.72	12.45
1104–1106	5.72	9.63	3.67	9.63
*1104–1106	36.82	12.45	34.91	12.45

* DENOTES CONFLUENCE POINT

RATIONAL METHOD RESULTS - AREA B				
NODE TO NODE	Q_{100} (CFS)	T_C (MIN)	Q_{10} (CFS)	T_C (MIN)
201–202	1.74	8.98	1.10	8.98

PUBLIC USE PERMIT 230001

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "B"

POST-PROJECT HYDROLOGY

TEMECULA VALLEY CHARTER SCHOOL

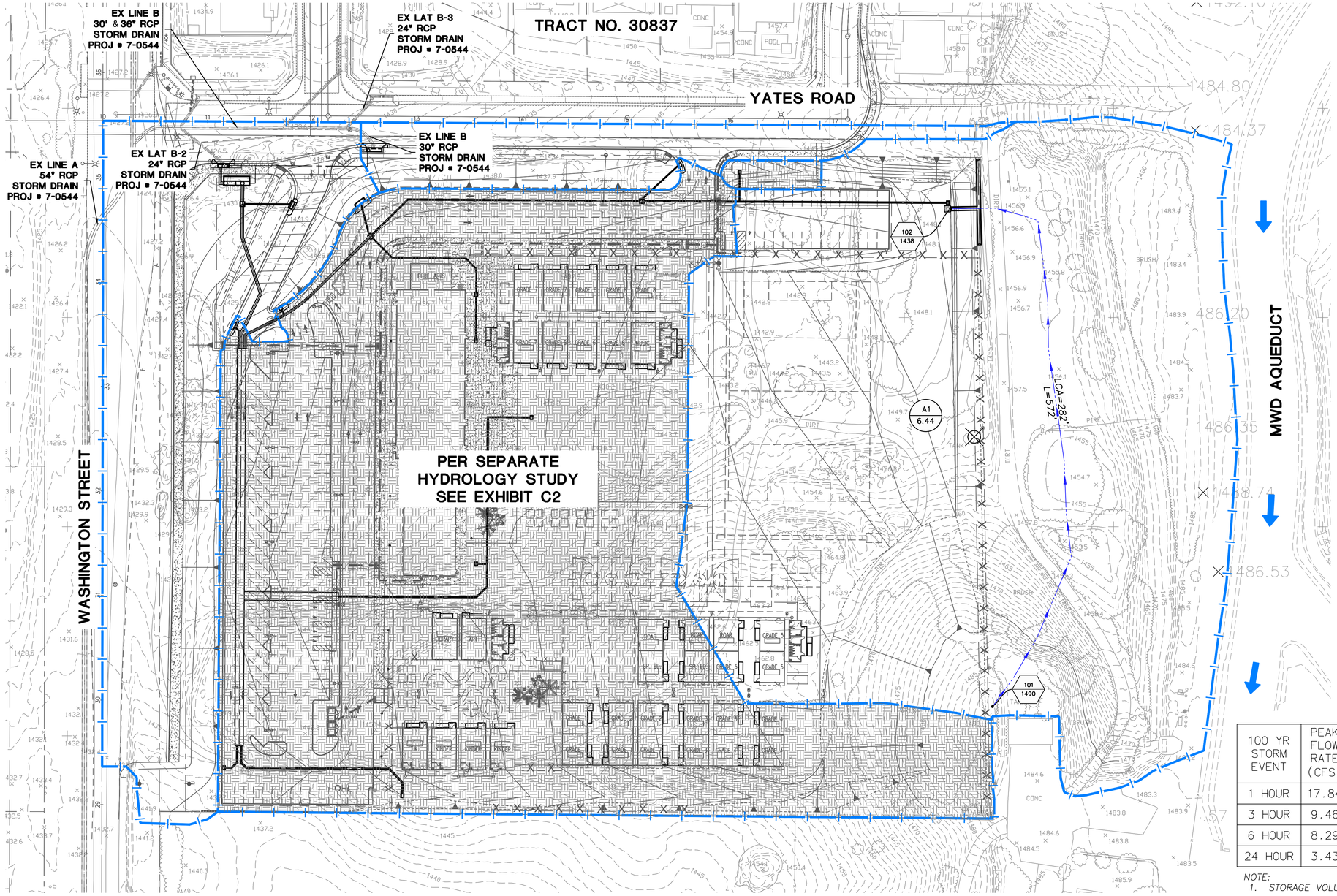
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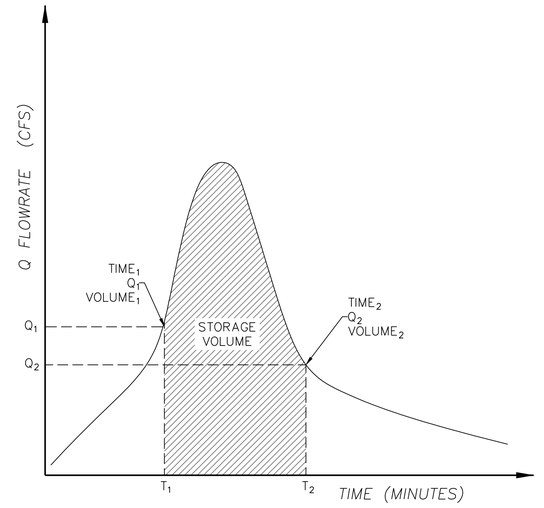
EXHIBIT C1: AREA A1 POST PROJECT UNIT HYDROGRAPH

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

AREA A1 POST-PROJECT CONDITION SITE HYDROLOGY MAP





100 YR STORM EVENT	PEAK FLOW RATE (CFS)	$TIME_1$ (MIN.)	Q_1 (CFS)	$VOLUME_1$ (AC-FT)	$TIME_2$ (MIN.)	Q_2 (CFS)	$VOLUME_2$ (AC-FT)	STORAGE VOLUME (AC-FT)	Q_{OUT} (CFS)
1 HOUR	17.84	0	0.00	0.00	65	0.00	0.54	0.54	0.00
3 HOUR	9.46	45	1.05	0.04	180	1.65	0.66	0.62	1.65
6 HOUR	8.29	215	1.09	0.11	350	1.12	0.74	0.63	1.12
24 HOUR	3.43	745	2.11	0.45	925	2.08	1.06	0.61	2.11

NOTE:
1. STORAGE VOLUME = $VOLUME_2$ – $VOLUME_1$

LEGEND:

- XXX.X / XXXX — NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
- XXXX.X — APPROXIMATE INVERT ELEVATION
- XXX / X.X — SUB AREA / ACRES
- L=XXX' — FLOW DISTANCE
- AREA CENTROID
- FLOW PATH
- WATERSHED BOUNDARY

N

GRAPHIC SCALE
50' 0 25' 50' 100'
1" = 50'

PUBLIC USE PERMIT 230001

EXHIBIT "C1"

POST-PROJECT HYDROLOGY MAP

TEMECULA VALLEY CHARTER SCHOOL

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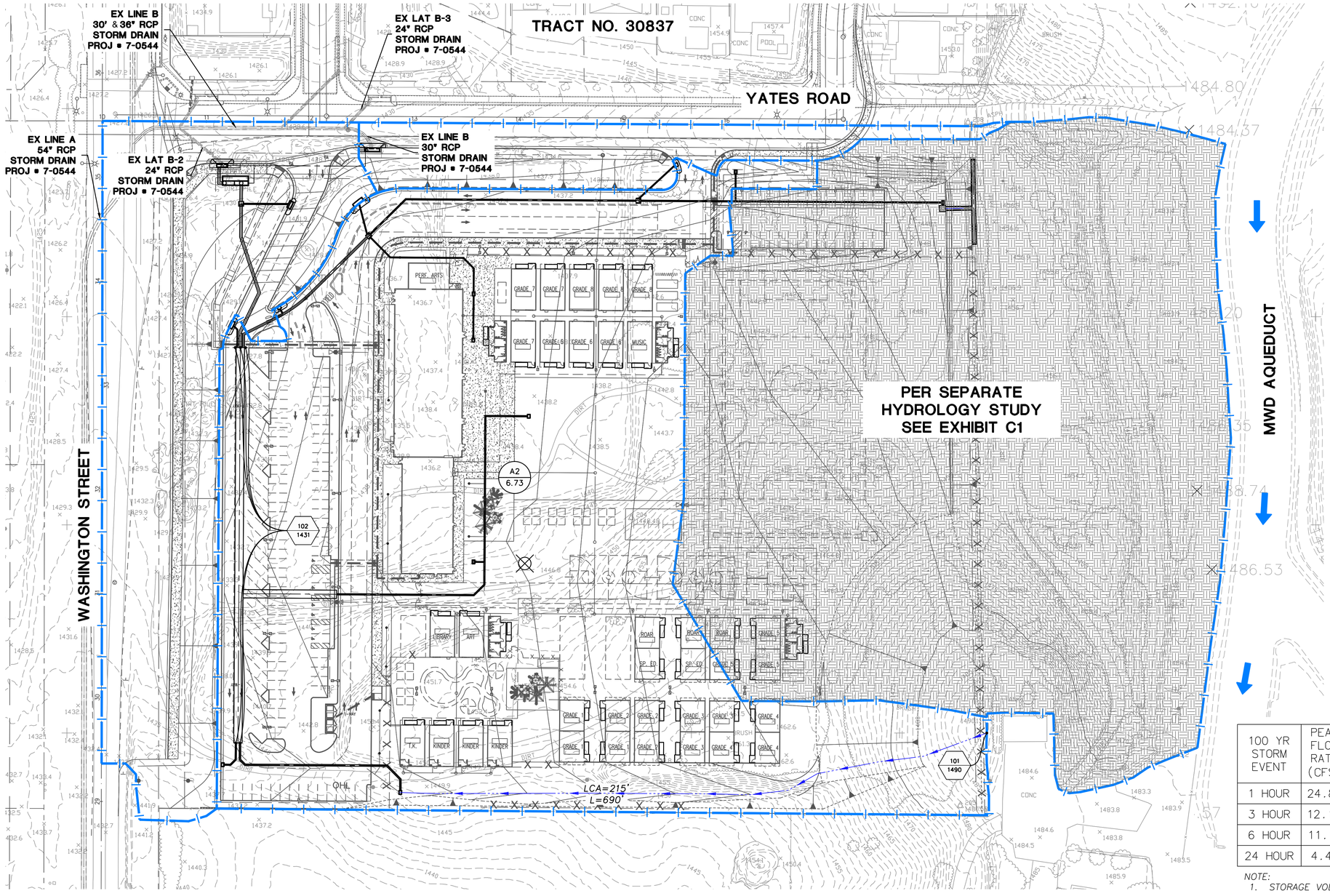
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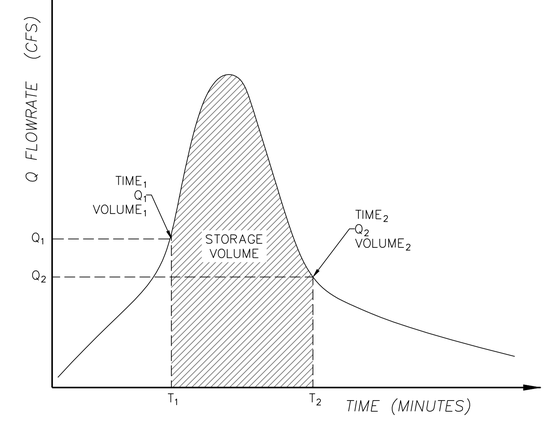
EXHIBIT C2: AREA A2 POST PROJECT UNIT HYDROGRAPH

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

AREA A2 POST-PROJECT CONDITION SITE HYDROLOGY MAP





100 YR STORM EVENT	PEAK FLOW RATE (CFS)	$TIME_1$ (MIN.)	Q_1 (CFS)	$VOLUME_1$ (AC-FT)	$TIME_2$ (MIN.)	Q_2 (CFS)	$VOLUME_2$ (AC-FT)	STORAGE VOLUME (AC-FT)	Q_{OUT} (CFS)
1 HOUR	24.80	45	11.56	0.33	60	5.14	0.64	0.31	11.56
3 HOUR	12.13	DETENTION NOT REQUIRED							
6 HOUR	11.11	DETENTION NOT REQUIRED							
24 HOUR	4.49	DETENTION NOT REQUIRED							

NOTE:
1. STORAGE VOLUME = $VOLUME_2$ – $VOLUME_1$

LEGEND:

- XXX.X / XXXX — NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
- XXXX.X — APPROXIMATE INVERT ELEVATION
- XXX / X.X — SUB AREA / ACRES
- L=XXX' — FLOW DISTANCE
- AREA CENTROID
- FLOW PATH
- WATERSHED BOUNDARY

GRAPHIC SCALE
50' 0 25' 50' 100'
1" = 50'

PUBLIC USE PERMIT 230001

EXHIBIT "C2"

POST-PROJECT HYDROLOGY MAP

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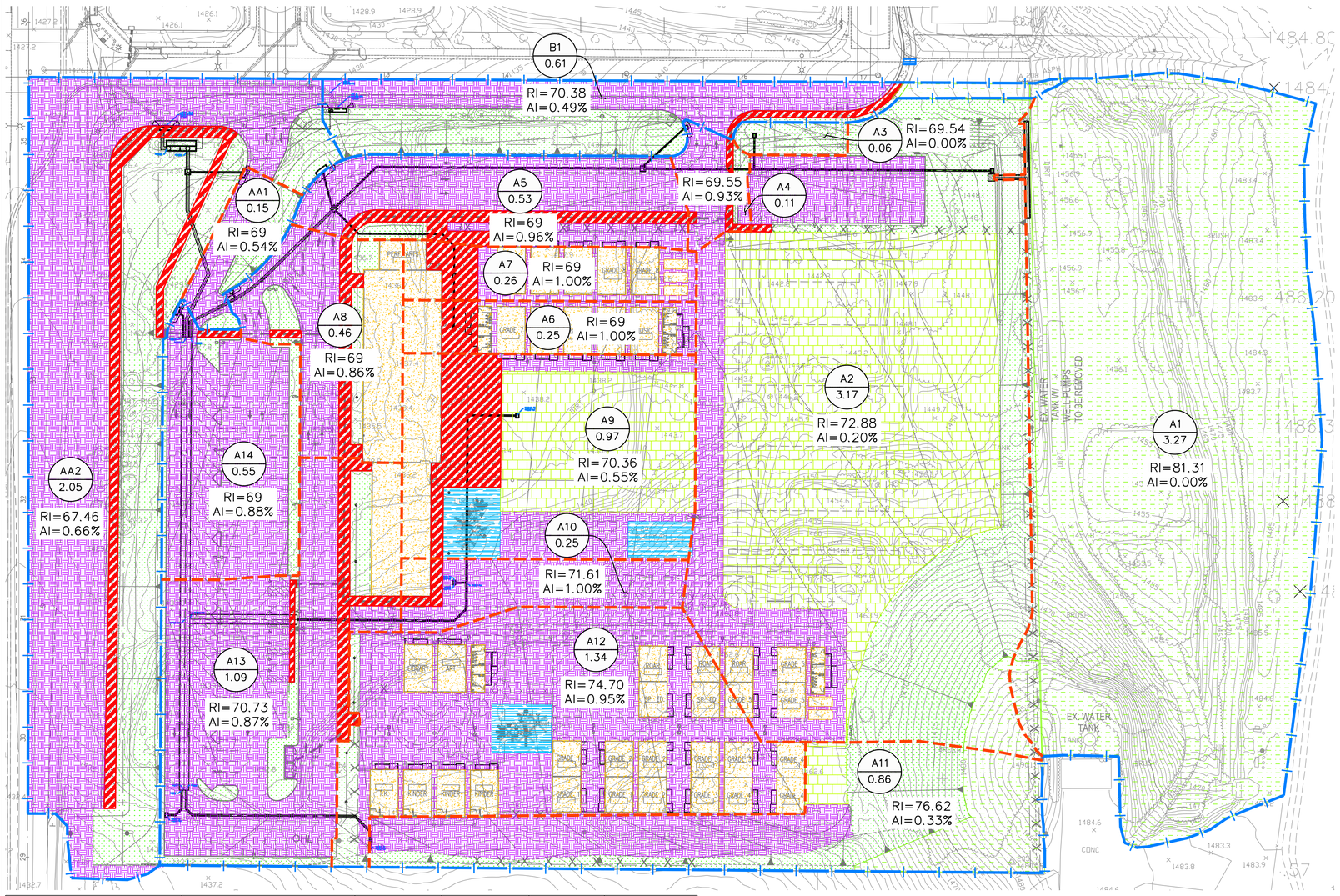
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EXHIBIT D: LAND USE MAP & RUNOFF INDEX CALCULATIONS

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

LAND USE COVER



A1	TOTAL AREA		3.27	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	81.31	0
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	-	-	-		
CONCRETE	-	-	-	-		
TURF	-	-	-	-		
OPEN SPACE	-	34,946.22	104,651.46	139,597.68		
LANDSCAPE	-	1,544	1,176.68	2,270.68		

A2	TOTAL AREA		3.17	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	3,518.81	3,518.81	72.88	0.20
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	13,764.06	5,469.25	19,233.31		
CONCRETE	-	101.97	5,016.7	5,118.67		
TURF	-	63,848.34	5,632.73	69,481.07		
OPEN SPACE	-	-	2821.34	2821.34		
LANDSCAPE	-	10,382.14	27,345.6	37,727.74		

A3	TOTAL AREA		0.06	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	69.54	0
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	-	-	-		
CONCRETE	-	-	-	-		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	2,312.93	228.13	2,541.06		

A4	TOTAL AREA		0.11	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	69.55	0.93
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	4,141.96	-	4,141.96		
CONCRETE	-	-	451.16	451.16		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	338.24	-	338.24		

A11	TOTAL AREA		0.86	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	31.56	31.56	76.62	0.33
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	1,372.9	12,302.83	13,675.73		
CONCRETE	-	-	-	-		
TURF	-	-	1,821.63	1,821.63		
OPEN SPACE	-	-	8,820.43	8,820.43		
LANDSCAPE	-	1,511.98	11,511.44	13,023.42		

A12	TOTAL AREA		1.34	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	414.91	17,386.74	17,801.65	74.70	0.95
PLAYGROUND IMPERVIOUS	-	-	1,999.95	1,999.95		
PAVEMENT	-	2,134.63	33,562.86	35,697.49		
CONCRETE	-	-	-	-		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	380.15	2,481.03	2,861.18		

A13	TOTAL AREA		1.09	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	2,836.96	-	2,836.96	70.73	0.87
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	24,121.43	10,938.78	35,060.21		
CONCRETE	-	2,784.3	526.99	3,311.29		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	4,099.56	2,275.62	6,375.18		

A14	TOTAL AREA		0.55	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	69	0.88
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	20,649.76	-	20,649.76		
CONCRETE	-	220.12	-	220.12		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	2,926.76	-	2,926.79		

AA1	TOTAL AREA		0.15	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	69	0.54
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	3,428.03	-	3,428.03		
CONCRETE	-	-	-	-		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	2,916.83	-	2,916.83		

AA2	TOTAL AREA		2.05	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	67.46	0.66
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	9,923.78	41,709.66	-	51,633.44		
CONCRETE	641.39	6,178.43	-	6,819.82		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	30,755.29	-	30,755.29		

B1	TOTAL AREA		0.61	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	70.38	0.49
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	10,588.58	1,572.36	12,160.94		
CONCRETE	-	460.25	436.81	897.06		
TURF	-	-	-	-		
OPEN SPACE	-	-	1,662.98	1,662.98		
LANDSCAPE	-	11,698.97	266.81	11,965.78		

A5	TOTAL AREA		0.53	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	-	-	-	69	0.96
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	18,377.58	-	18,377.58		
CONCRETE	-	3,710.21	-	3,710.21		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	862.46	-	862.46		

A6	TOTAL AREA		0.25	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	7,212.06	-	7,212.06	69	1
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	2396.72	-	2396.72		
CONCRETE	-	1,332.37	-	1332.37		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	-	-	-		

A7	TOTAL AREA		0.26	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	6,604.71	-	6,604.71	69	1
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	2,996.6	-	2,996.6		
CONCRETE	-	1,731.42	-	1,731.42		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	-	-	-		

A8	TOTAL AREA		0.46	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	5,906.07	-	5,906.07	69	0.86
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	8,900.99	-	8,900.99		
CONCRETE	-	2224.13	-	2224.13		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	2,878.36	-	2,878.36		

A9	TOTAL AREA		0.97	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	4,978.74	-	4,978.74	70.36	0.55
PLAYGROUND IMPERVIOUS	-	4,463.99	-	4,463.99		
PAVEMENT	-	7,213.54	-	7,213.54		
CONCRETE	-	6,326.39	-	6,326.39		
TURF	-	19,183.69	-	19,183.69		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	-	-	-		

A10	TOTAL AREA		0.25	SUM OF LAND COVER AREA	WEIGHTED RI	WEIGHTED IMPERVIOUS %
	AREA BREAKDOWN FOR RUNOFF INDEX					
LAND COVER	B	C	D			
BUILDINGS	-	788.73	-	788.73	71.61	1
PLAYGROUND IMPERVIOUS	-	-	-	-		
PAVEMENT	-	4,808.09	4,758.09	9,566.18		
CONCRETE	-	597.52	-	597.52		
TURF	-	-	-	-		
OPEN SPACE	-	-	-	-		
LANDSCAPE	-	-	-	-		

LEGEND:

- BUILDING
- PLAYGROUND IMPERVIOUS
- TURF
- OPEN SPACE
- PAVEMENT
- CONCRETE
- LANDSCAPE

N

GRAPHIC SCALE
50' 0 25' 50' 100'
1" = 50'

EXHIBIT "D"

TEMECULA VALLEY CHARTER SCHOOL

LAND USE MAP

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EXHIBIT E: HYDROLOGIC SOILS MAP

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

SOILS MAP

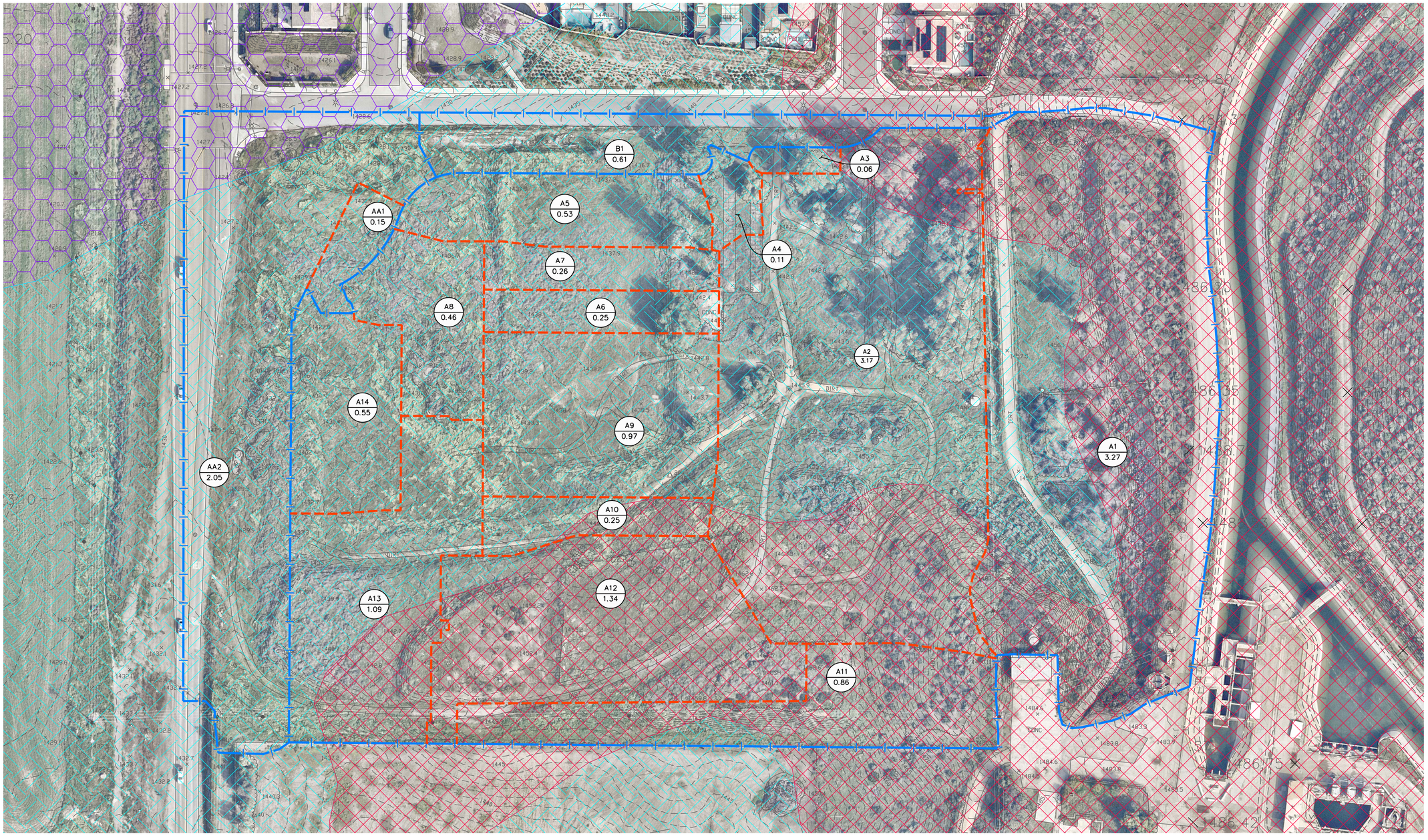


EXHIBIT "E"

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SOILS MAP

TEMECULA VALLEY CHARTER SCHOOL

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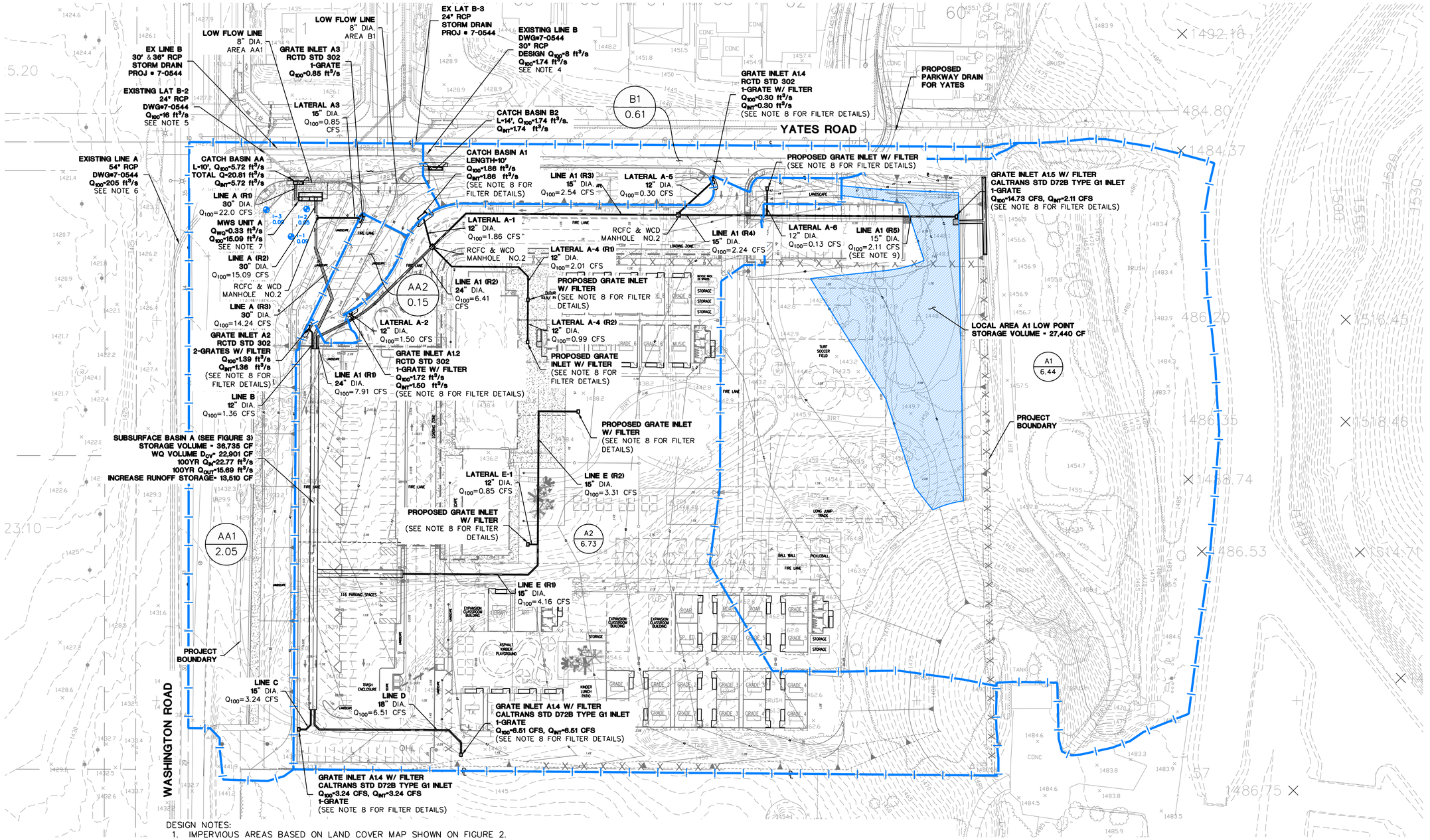
EXHIBIT F: DRAINAGE FACILITIES MAP

TEMECULA VALLEY CHARTER SCHOOL

COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

DRAINAGE FACILITIES MAP

NOTE:
1. Q_{INT} = Q INTERCEPTED
2. Q_{WQ} = Q WATER QUALITY
3. Q_{100} = Q 100 YEAR STORM EVENT



DESIGN NOTES:
1. IMPERVIOUS AREAS BASED ON LAND COVER MAP SHOWN ON FIGURE 2.
2. DUE TO PROJECT CONSTRAINTS DMA B1 AND DMA AA1 WILL BE TREATED USING A CATCH BASIN DIVERSION DEVICE TO SEND LOW FLOWS INTO MODULAR WETLAND SYSTEM. THESE AREAS PRODUCE RUNOFF FROM STREET RIGHT-OF-WAY.
3. SUBSURFACE BASIN A HAS BEEN DESIGNED TO CAPTURE THE D_{CV} AND INCREASE RUNOFF. THE PROJECT IS USING A COMBINATION OF TWO STRUCTURES a) SUBSURFACE STORMTECH MC-7200 AND b) MODULAR WETLAND SYSTEM. MODULAR WETLAND IS CLASSIFIED AS A PRIORITY 2 BIOFILTRATION BMP PER WQMP GUIDELINES SECTION 2.3.2.
4. EXISTING LINE B HAS BEEN CONSTRUCTED PER DWG# 7-0544. FLOW RATES LIMITED TO 8 CFS.
5. EXISTING LATERAL B-2 HAS BEEN CONSTRUCTED PER DWG# 7-0544. FLOW RATE LIMITED TO 16 CFS. CB AA INTERCEPTS 5.7 CFS. AS A RESULT, SUBSURFACE BASIN B WILL BE LIMITED TO APPROXIMATELY 14.7 CFS.
6. LINE A 54" STORM DRAIN DISCHARGED INTO RCFC&WCD BENTON CHANNEL WHICH IS A 100 YEAR STORM DRAIN FACILITY.
7. THE MWS WILL BE A MODEL # MWS-L-8-12 WHICH HAS A TREATMENT FLOW RATE CAPACITY OF 0.346 CFS AND A TREATMENT VOLUME CAPACITY OF 15,109 CF AT 48-HOUR DRAIN DOWN. THE DESIGN WQ FLOW RATE IS 0.33 CFS AND THE DESIGN WQ VOLUME IS 12,876 CF.
8. ALL INLETS THAT DRAIN DIRECTLY TO THE SUBSURFACE BASIN SHALL BE INSTALLED WITH FLOGARD +PLUS® STANDARD CATCH BASIN INSERT FILTERS. SEE APPENDIX 6 FOR FILTER DETAILS.
9. A PORTION OF DMA A1 WILL BE RETAINED TO THE EAST OF THE PROPOSED SOCCER FIELD. THIS RETENTION AREA WILL RECEIVE 14.73 CFS AND DISCHARGE 2.11 CFS INTO INLET A1.5.

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EXHIBIT "F"

DRAINAGE FACILITIES MAP

TEMECULA VALLEY CHARTER SCHOOL

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EXHIBIT G: RAINFALL MAPS

2 YEAR, 1 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 0.50

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2 YEAR, 3 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 0.80

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2 YEAR, 6 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 1.15

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2 YEAR, 24 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 1.8

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100 YEAR, 1 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 1.20

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100 YEAR, 3 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 1.80

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100 YEAR, 6 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 2.50

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100 YEAR, 24 HOUR

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 4.5

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EXHIBIT F: SLOPE OF INTENSITY DURATION CURVE

SLOPE INTENSITY CURVE

TEMECULA VALLEY
CHARTER SCHOOL
RAINFALL = 0.55

Engineering & Consulting, Inc.

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