PRELIMINARY DRAINAGE REPORT
915 9th Street
Ramona, Ca 92065

Project Addresses:

915 9th Street
Ramona, Ca 92065

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Prepared: August 2025
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Preliminary Drainage Study
for
915 9th Street
Ramona, Ca

DECLARATION OF RESPONSIBLE CHARGE

I hereby declare that I am the Civil Engineer of Work for this Project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of The Business and Professions Code, and that the design is consistent with current standards.

I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as engineer of work, of my responsibility for project design.

_____ _____

Dane P. McDougall, R.C.E. 80705 Date
CEO, C&V Consulting, Inc.

1.0 SITE DESCRIPTION:

The existing site of the proposed development encompasses three (3) parcels, APN 284-202-21-00, 284-203-08-00, and 284-244-01-00 per the ALTA Survey prepared by C & V Consulting, Inc. dated October 25, 2024. The proposed development is approximately 18.84 acres. The site is mostly vacant aside from a single family residence and multiple shed-like structures on a portion of Parcel 1. Onsite elevations for Parcels 1, 2, and 4 range from 1511 to 1468 sloping from east to west. Along the northern property line of Parcel 1 and the southern property line of Parcel 4, there is existing wooden and chain link fencing separating the project site from the adjacent properties. Along the southern property line of the Parcel 2, there is an existing block/retaining wall separating the project site from the adjacent properties. A half width of 10th Street will be vacated along the project frontage.

According to the Natural Resources Conservation Service (NRCS) the project site consists of Placentia sandy loam with 2 to 9 percent slopes and Fallbrook sandy loam with 9 to 15 percent slopes (eroded). The Hydrologic Soil Group of the site is determined to be Type C soils per the County of San Diego Hydrology Manual. See Appendix C.

According to the federal Emergency Management Agency (FEMA) FIRM rate map number 06073C1136G, effective date May 16, 2012, the site is located within flood Zone X, area of minimal flood hazard.

2.0 PURPOSE OF STUDY:

The purpose of this report is to provide a quantitative analysis to verify the hydrologic compliance of the proposed storm drain infrastructure and evaluate potential impacts on existing downstream systems. All calculations and design parameters conform to the San Diego County Hydrology Manual, as mandated by the County Department of Public Works Flood Control Section. The project adheres to the agency's objective of providing 100-year return frequency flood protection for all habitable and non-flood-proof structures. Accordingly, this report demonstrates that the drainage design successfully mitigates the 100-year storm event. As the site discharges into an earthen channel, the project is subject to hydromodification management requirements. Analysis for the 2-year and 10-year storm events is detailed in the separately prepared Storm Water Quality Management Plan (SWQMP). Ultimately, the site design fulfills all drainage and hydrologic criteria established by the County of San Diego and the City of Ramona.

3.0 EXISTING CONDITIONS:

The site consists of 3 parcels (Parcel 1, 2, and 4). Parcel 2 is bounded by 10th Street to the northeast, 11th Street to the southwest, San Vicente Road and a Private Residence to the northwest, and a Private Residence to the southeast. Parcels 1 and 4 are bounded by 10th Street to the southwest, Private residences to the Northwest and Southeast, and 9th Street to the northeast. Based on aerial survey, the site elevations for Parcel 2 range from 1453 to 1435 and the site elevations for Parcels 1 and 4 range from 1511 to 1468. Stormwater generally flows overland from the southeast to the northwest with some small variations throughout the site. The

majority of the site is unpaved so the assumed land use for the hydrology calculations was undisturbed natural terrain which is assigned a runoff coefficient of 0.3.

In the existing condition, the tributary area consists of four (4) major drainage areas: X1, X2, X3, and X4. Drainage Area X1 encompasses the southern portion of the site, characterized by an east-to-west gradient. Sheet flow originates at the right of way of 9th Street and traverses the site to 10th Street. Existing topography indicates that runoff is then conveyed overland through downgradient neighboring properties to 11th Street. From there, flows follow 11th Street northwest toward San Vicente Road, ultimately discharging into an existing onsite headwall located just south of the intersection. Further analysis of 11th Street was conducted to verify street capacity and the amount of runoff from the subarea that actually enters the headwall. The analysis is included in Appendix D.

Drainage Area X2 comprises the central portion of the site and receives run-on from 9th Street. This area also slopes from east to west, directing surface flow across the site toward the western corner. Runoff is collected and discharged into the same existing onsite headwall located at the property's western boundary.

Drainage Area X3 covers the northern portion of the site, including an existing residential structure and run-on from 9th Street. Drainage is conveyed overland from east to west until it reaches the San Vicente Road right-of-way. Once within the public right-of-way, runoff is captured by the curb and gutter system and conveyed south to an existing catch basin at the intersection of San Vicente Road and 11th Street.

Drainage Area X4 includes the project site's 9th Street frontage and offsite residential lots on the north side of 9th Street. Runoff from these lots flows onto the property through an existing culvert under 9th Street, ultimately discharging onsite along the eastern property line.

This site is located within the San Dieguito Watershed Management Area. All runoff from the site eventually enters the existing catch basin at the intersection of San Vicente Road and 11th Street and is conveyed to the Santa Maria Creek which confluences with the Santa Ysabel Creek. The Santa Ysabel Creek eventually discharges into the San Dieguito River which outlets into the Pacific Ocean. The Santa Maria Creek is an earthen channel, therefore the site is subject to hydromodification mitigation. Per the Potential Critical Coarse Sediment Yield Areas Exhibit dated September 8, 2014, the site is not located in an area of concern.

Refer to the “Existing Conditions Hydrology Map” located within Appendix A and of this study for more information. The Hydromodification Watershed Map and Potential Critical Coarse Sediment Yield Area Exhibit are included in Appendix C.

4.0 PROPOSED CONDITIONS:

The development proposes the construction of eighty-eight (88) detached single family residential units with open space areas that will incorporate landscaping to the maximum extent feasible. Parcels 1 and 4 will be accessible via two (2) driveways each off of 9th Street and 10th Street and Parcel 2 will be accessible via one driveway off of 10th Street. It is being proposed that

along the project frontage, the halfwidth of the 10th Street Right of Way will be vacated. Onsite drive aisles and parking areas will consist of asphalt concrete pavement and sidewalk areas will be Portland cement concrete (PCC). Landscaping, including vegetation and trees, will be incorporated into open space areas. Based on the land use of the residential lot (4.3 DU/A), the imperviousness was estimated to be 30%. Final imperviousness will be calculated during final engineering, and hydrology calculations will be updated.

Proposed grading has been designed in order to limit retaining walls and to preserve the overall grades of the site. Stormwater runoff onsite will be conveyed via curb and gutter into proposed curb inlet catch basins and grated inlet catch basins that will route low flows into adjacent Modular Wetland (MWS) biofiltration vault for water quality treatment. Private yards will be equipped with area drains to collect runoff and convey it to an adjacent MWS unit. When the water quality treatment flowrate is exceeded, runoff will bypass treatment within the MWS vault and be conveyed into the underground storm drain detention system. The detention system will be sized to mitigate for hydromodification requirements and the 100-year storm event peak flow rate.

The proposed condition will be divided into six (6) main drainage management areas X1, X2, X4, P1, P2, and P3 (each with an initial subarea) which will be graded to match the existing drainage condition to the maximum extent possible.

Drainage Area X1 is the offsite area south of the property lines on the east and west sides of 10th Street that was accepting flows from the project site in the existing condition and consists of single family homes as well. The runoff within these private properties will follow historic drainage conditions.

Drainage Area X2 consists of an area to the northwest of the proposed development that drains to San Vicente. In the existing condition, X2 conveys flows overland through the project site. In the proposed condition, runoff from this area will be conveyed along the San Vicente Right of way in a vegetated swale. A proposed inlet will collect runoff near the 11th Street intersection and convey it into the onsite storm drain system and furthermore to the existing headwall. Flows from X2 will be kept separate from onsite flows and therefore water quality, hydromodification, and peak flow mitigation requirements do not apply.

Drainage Area X4 consists of the flows from the 9th Street right-of-way and land to the east of 9th street that are conveyed onsite via surface flow and an existing culvert that discharges onsite. Under proposed conditions, stormwater runoff within 9th Street that historically entered the site will now be managed within the public right-of-way. To provide necessary water quality treatment, reverse parkway drains will be installed intermittently beneath the proposed sidewalk to capture and convey flows into a vegetated swale equipped with an underdrain. Following treatment, the underdrain system will convey the runoff to a proposed junction structure located near the project entrance. Notably, this 9th Street runoff is subject solely to water quality requirements, which will be fully satisfied prior to entering the proposed junction structure. Flows that are historically discharged onsite through the existing culvert that cross under 9th Street will be conveyed into the proposed junction structure. A proposed storm drain pipe will convey these flows from the junction structure to the west through the site, discharging at the

existing headwall near 11th Street. As the land area associated with the culvert is to remain untouched, water quality and hydrology mitigation is not required for these flows. The onsite detention system will be sized to mitigate the increase in peak flow rate that the proposed improvements within 9th Street will incur however, offsite runoff will not comingle with the onsite runoff. On-site flows are strictly isolated from this storm drain line and will only be introduced once all water quality treatment, hydromodification management, and peak flow mitigation requirements have been fully satisfied.

Drainage Area P1 consists of the southeast portion of the site. Runoff will be conveyed via curb and gutter and routed into catch basins throughout the site. Low flows entering the catch basin will be routed to an adjacent MWS vault for water quality treatment. Flows exceeding the water quality flow rate will bypass treatment and be conveyed into the proposed underground detention system. The detention system is equipped with an orifice to mitigate the increase in peak flow rates from the proposed development.

Drainage Area P2 consists of the northern part of the development. Runoff will be collected via surface flow into one (1) proposed catch basin placed near 10th Street. Low flows will be conveyed through the MWS vault for water quality treatment and then be routed to the underground detention system. Runoff from the private yards will be routed into a second MWS vault for water quality treatment via area drain system that will be designed during final engineering. Runoff that exceeds the water quality flow rate will bypass the MWS vault and be conveyed into the underground detention system. The detention system will be equipped with an orifice to provide hydromodification management and to mitigate peak flow rates discharging from this portion of the site. Runoff leaving the detention system will be conveyed in a proposed underground storm drain pipe to the south in 10th Street where it will discharge into the proposed storm drain and continue west to the existing onsite headwall.

Drainage area P3 is located on the west side of 10th Street. Runoff within this drainage area will be conveyed via surface flow into one (1) proposed catch basin which will convey low flows to the adjacent MWS vault for water quality treatment. When the water quality treatment flow rate is exceeded, runoff will bypass treatment and be conveyed into the proposed detention system. Similar to the previously discussed detention facilities, an orifice will meter the flows prior to entering the proposed storm drain. Once runoff enters the storm drain, it is conveyed west to the existing onsite headwall. Runoff within the private yards will be collected and conveyed by a series of area drains and follow similar flow paths to street flow into the MWS vault for water quality treatment. The area drain system will be designed during final engineering.

The existing headwall will be protected in place, as it currently functions as the discharge point for off-site run-on that will remain in the proposed condition. To integrate the site's new drainage system, a storm drain pipe equipped with energy dissipation devices will discharge just south of the headwall. This improvement will facilitate controlled discharge into the headwall while providing essential erosion protection at the transition point.

The historic drainage pattern of the site will be preserved in the proposed condition and downstream facilities will not be negatively affected.

During final engineering, water surface elevation will be analyzed and provided to verify all habitable structures will have at least a 1 foot of freeboard above the 100-year storm event.

The "Proposed Conditions Preliminary Hydrology Map" is included in Appendix A for reference.

5.0 METHODOLOGY:

This drainage study will evaluate the onsite storm water runoff of the 100-year, 6-hour storm events frequency for the pre- and post-developed conditions utilizing the Rational Method in CivilCadd/CivilDesign Engineering Software.

The pre- and post-developed conditions were analyzed per the requirements of the San Diego County Hydrology Manual. Each drainage area was divided into an initial subarea and analyzed for acreage, impervious cover, soil type, and time of concentration. The peak flow rates are expressed in cubic feet per second (cfs) at each node and summed based on confluence points of connection. Peak flow rates and the time of concentrations were utilized to determine hydraulic calculations for pipe and catch basin sizing. The proposed development alters the general function and landuse of the site and in order to prevent negative impacts to downstream structures, onsite water quality and detention facilities are proposed. The hydrology maps in Appendix A show that the site and surrounding areas drain to an existing headwall at the north corner of the site. Peak flows were analyzed at this point for the 100-year storm event. The onsite detention system was sized to mitigate for hydromodification requirements and the increase peak flow rates of the post development condition including offsite areas.

Refer to the Hydrology Maps located within Appendix A for more information.

The minimum size of catch basins, storm water conveyance pipes, is based on comparing the pre-developed 100-year storm event to the post-developed 100-year storm event. Catch basin and pipe sizing calculations will be provided during final engineering.

6.0 RESULTS:

Hydrology Summary Utilizing the Rational Method

Existing Condition

DMA	Area (ac)	C	Intensity (in/hr)	Velocity (ft/s)	Q100 (cfs)	Tc (min)
X1	13.34	0.3	4.943	8.748	4.2*	13.15
X2	13.29	0.3	4.858	6.983	19.370	13.50
X4	8.56	0.3	9.222		23.991	5.0
Total to Headwall	**35.19**				**47.561**	
X3	2.63	0.3	5.369	4.616	4.236	11.57
Total Site & Tributary Area	**37.82**				**51.797**	

**Street Capacity Analysis of 11th Street shows that the street only carries 4.2 cfs. Flows over 4.2 cfs overtop the centerline and do not enter the headwall*

Proposed Condition (Unmitigated)

DMA	Area (ac)	C	Intensity (in/hr)	Velocity (ft/s)	Q100 (cfs)	Tc (min)
P1	11.98	0.48	7.187	10.07	36.16	7.36
P2	4.6	0.48	5.233	8.73	11.541	9.32
P3	2.77	0.48	6.927	7.40	9.21	7.79
X1	8.55				4.2	13.15
X2	1.39				0	0
X4	8.56	0.3	9.222		23.991	5.0
Total to Headwall	**37.82**	**0.395**	**5.672**	**7.89**	**73.93**	

Proposed Condition (Mitigated)

DMA	Area (ac)	Q100 (cfs)
P1 (mitigated)	11.98	11.799
P2 (mitigated)	4.6	5.88
P3 (mitigated)	2.77	3.239
X1	8.55	4.2
X2	0	
X4	8.56	25.584
Total Mitigated to Headwall	**37.82**	**50.7**

Refer to Appendix A & B of this report for additional information shown in the Rational Method and CivilDesign/CivilCADD output data, as well as the existing condition and proposed condition hydrology maps.

Detention Sizing

In order to mitigate the increased peak flow rate due to the proposed development, an underground detention system will be utilized onsite. The 6hr 100 year storm event Hydrograph

was generated using Civil Design. Detention routing was performed using the Federal Highway Administration program Hydraulic Toolbox.

A stage storage analysis was performed based on the inflow and allowable outflow through the proposed orifices and an overflow weir. Six (6) foot diameter detention pipes are proposed as shown on the hydrology maps in Appendix A.

The Q100 post development hydrograph and routed hydrograph are provided in Appendix D.

Catch Basin Sizing

Catch basin Sizing will be analyzed for the 100-year storm event peak flow rates and will be provided during final engineering in Appendix D.

Pipe Sizing

WSPG software has been utilized to verify hydraulic grade line (HGL) based on the 100-year storm event peak flow rate within the main Storm drain line that conveys runoff from 9th Street (offsite) through the site and into the existing head wall. Analysis of the rest of the system and other storm events will be provided during final engineering. As built information was not available at the time of this study, therefore the beginning water surface elevation was estimated to be 5' above the flow line at the head wall/ point of discharge.

100-Year Water Surface Elevations

Water surface elevations for the 100-year storm event peak flow rates will verify that the proposed finish floor elevations are set at least 1' above the water surface elevation and will be calculated and provided during final engineering in Appendix D.

7.0 CONCLUSIONS:

The results from this preliminary drainage study utilizing the San Diego County Hydrology Manual 2003 demonstrates that the proposed condition does generate an increase in peak flow rates. The increase in peak flow rates is caused by the increase in impervious area and change in land use from the existing condition. The proposed condition estimates site imperviousness at 30% and during final engineering, imperviousness will be verified based on the finalized landscape plan. The onsite detention system is sized to mitigate hydromodification requirements for the 2- through 10- year storm events, and peak flow rate mitigation for the 100-year storm event. Although the drainage pattern of the site will be slightly altered, the proposed development improves the existing drainage patterns and mitigates for the increase in peak flows, therefore the proposed development will not result in the flooding or other negative impacts of facilities downstream.

Refer to Appendix B for Peak Runoff Calculations.

CEQA Questions:

Discuss whether or not the proposed project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

The proposed development maintains the site's existing drainage patterns and does not substantially alter the hydrology of the surrounding area. The grading and storm drain design have been engineered to ensure that post-project runoff follows a flow path consistent with pre-development conditions.

To manage increased runoff volumes, on-site detention systems have been sized to mitigate peak flow rates for the 2-, 10-, and 100-year storm events, adhering to both San Diego County Hydrology and Hydromodification Control Requirements. Furthermore, the proposed discharge point remains coincident with the existing point of compliance, ensuring downstream consistency. The proposed improvements to the existing headwall include the construction of a concrete apron which in turn will improve the existing condition in regards to potential erosion.

Discuss whether or not the proposed project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

The analysis in this report maintains the existing drainage boundaries (Areas X1, X2, X3, and X4) and discharges at the same historical locations, ensuring no diversion of flow to adjacent properties as all onsite flows will be kept onsite and conveyed through the proposed underground storm drain system to the point of discharge. The project does not involve the alteration of any natural stream or river course. The existing headwall will be protected in place, with added erosion protection (concrete apron) to maintain headwall integrity.

Although the project introduces new impervious surfaces, on-site detention systems have been sized to attenuate peak flow rates for the 100-year storm event (as well as the 2- through 10-year storm events per hydromodification requirements) to pre-development levels. This ensures that the rate and amount of surface runoff will not increase in a manner that would result in on- or off-site flooding. The project design adheres to the San Diego County Manual and the San Diego County Hydromodification requirements, specifically managing flow duration to prevent downstream erosion and flooding. Therefore, the project will have a less than significant impact on existing drainage patterns and will not result in flooding on- or off-site

Discuss whether or not the proposed project would create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems? Provide reasons and mitigations proposed.

The proposed project will not create or contribute runoff that exceeds the capacity of existing or planned stormwater drainage systems. While the development will increase impervious surface area, the project includes site-specific design features to ensure post-development discharge rates do not exceed pre-development levels.

In accordance with the San Diego County Hydrology Manual and Hydromodification Requirements, the project incorporates on-site detention systems sized to mitigate peak flow rates for the 2-, 10-, and 100-year storm events. This ensures that the volume and velocity of runoff entering the downstream system remain within its design capacity. The project utilizes the existing point of discharge (the onsite headwall) which currently handles off-site run-on. By maintaining the existing drainage boundaries (Areas X1, X2, X3, and X4) and discharge locations, the project avoids diverting flows to systems that were not designed to receive them.

Discuss whether or not the proposed project would place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, including County Floodplain Maps? Provide reasons and mitigations proposed.

The proposed project will not place housing within a 100-year flood hazard area as mapped by federal or local agencies. Based on a review of the FEMA Flood Insurance Rate Maps (FIRMs) and San Diego County Floodplain Maps, the project site is located within Zone X, which is defined as an area of minimal flood hazard outside the 1% annual chance (100-year) floodplain. All runoff will be mitigated onsite and discharged at or below the existing condition flow rates. In addition, all habitable structures will be constructed with finished floor elevations that provide a minimum of one foot of freeboard above the adjacent natural grade or calculated water surface elevation to provide an extra margin of safety

Discuss whether or not the proposed project would place structures within a 100-year flood hazard area which would impede or redirect flood flows?

The proposed project would not place structures within a 100-year flood hazard area in a manner that would impede or redirect flood flows. All parts of the proposed development, including habitable buildings and secondary structures, are located outside of mapped 100-year

floodplains as delineated on FEMA Flood Insurance Rate Maps (FIRMs) and County Floodplain Maps. By utilizing on-site detention systems sized for the 100-year storm, the project ensures that the velocity and volume of discharge will not cause downstream backwater effects or flow redirection.

Discuss whether or not the proposed project would expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of levee or dam?

The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding due to the failure of a levee or dam. The project site is not located within a designated dam inundation zone or near any known levee systems. The site's location and elevation are outside the historical inundation areas of regional dams, such as Sutherland Reservoir or Lake Ramona, which are the primary large-scale water storage facilities in the greater Ramona area. The site is situated at an elevation and location that places it outside the predicted path of floodwaters for both extremely high and high-hazard dams monitored by the California Division of Safety of Dams. According to the San Diego County Dam Inundation Map, the subject property is not encumbered by any inundation boundaries that would require specialized evacuation planning or structural mitigation

8.0 DESIGN ASSUMPTIONS:

1. The onsite drainage area was analyzed for the 100-year storm event using Rational Method per the San Diego County Hydrology Manual and CivilCadd/CivilDesign Engineering Software. Calculations are provided in Appendix B.

2. The site is located in Soil Group C per the County of San Diego Hydrology Manual, Soil Hydrology Groups Exhibit, provided in Appendix C.

3. The rainfall intensity for a 100-year, 6-hour storm is 3.5 inches according to the County of San Diego Hydrology Manual 100-year, 6-hour Rainfall Isopluvial. The rainfall intensity for a 100-year, 24-hour storm is 6.0 inches according to the County of San Diego Hydrology Manual 100-year, 24-hour Rainfall Isopluvial. See Appendix C for County Isopluvial maps

4. CivilCadd/CivilDesign Engineering Software 1989-2019 Version 9.1 Rational Hydrology Study and Pipe-Flow software were utilized to calculated peak flow rates, time of concentrations, and hydraulic grade line.

9.0 REFERENCES:

1. Proposed Tentative Tract Map prepared by C&V Consulting, Inc.

2. San Diego County Hydrology Manual, June 2003

3. San Diego County Hydraulic Design Manual, dated September 2014

4. CivilCadd/CivilDesign Engineering Software 1989-2019 Version 9.1 Rational Hydrology Study

5. City of Ramona Improvement Plan As-Builts

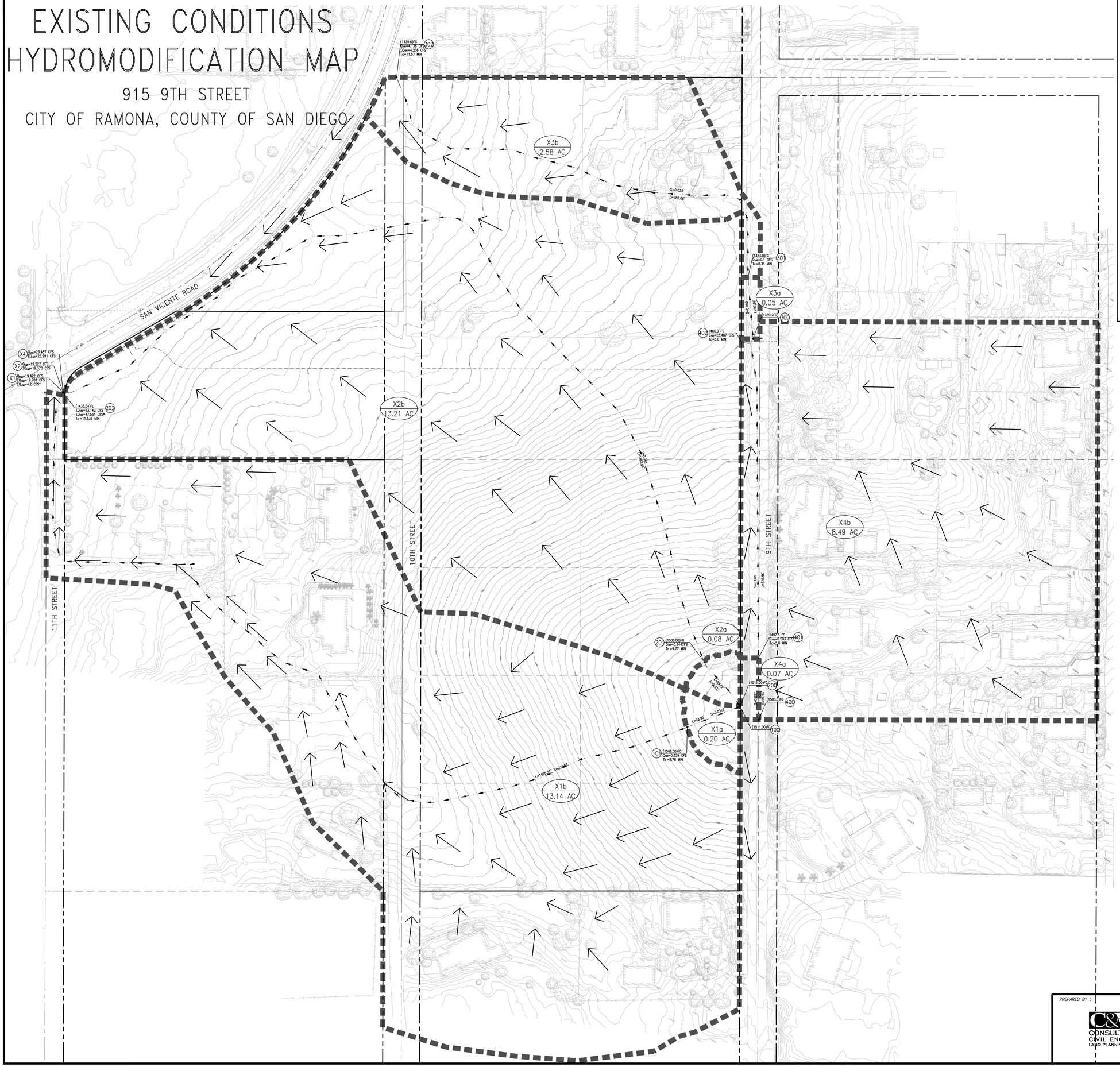
APPENDIX A
HYDROLOGY MAPS

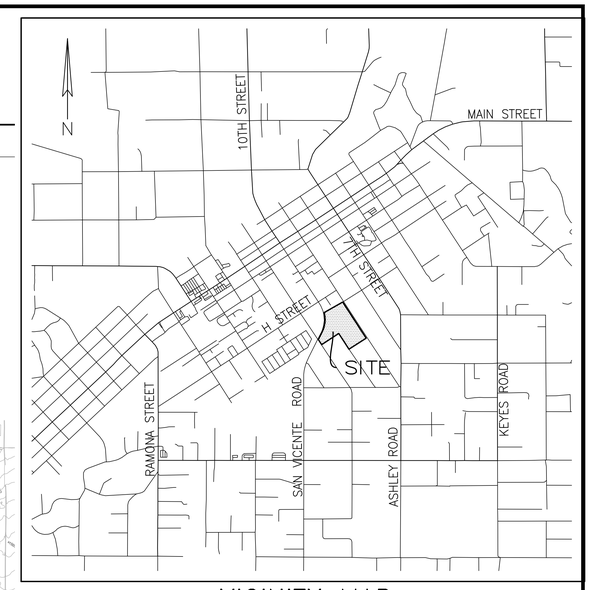
Existing Conditions Preliminary Hydrology Map

EXISTING CONDITIONS HYDROMODIFICATION MAP

915 9TH STREET

CITY OF RAMONA, COUNTY OF SAN DIEGO





VICINITY MAP

N.T.S.

LEGEND:

- DRAINAGE MANAGEMENT AREA (DMA) BOUNDARY
- EXISTING RIGHT-OF-WAY/ SITE BOUNDARY
- FLOW DIRECTION
- FLOW LINE
- PERVIOUS AREA
- XX / X.XX AC — DRAINAGE AREA ID / DRAINAGE AREA IN ACRES
- INITIAL SUBAREA NODE
- (00.0) FS — SPOT ELEVATION
- Q_{100} =X.XX CFS — PEAK RUNOFF (CFS)
- T_c =X.X MIN — TIME OF CONCENTRATION (MIN)

NOTES:

* STREET CAPACITY ANALYSIS OF 11TH STREET SHOWS THAT THE ROAD ONLY CARRIES 4.2 CFS BEFORE OVERTOPPING

1" = 50'

0 25 50 100

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EXISTING CONDITIONS HYDROLOGY MAP

915 9TH STREET
RAMONA, CA

SHEET 1 OF 1

SCALE: 1"=40' | DRAWN BY: sm | CHECKED BY: --

CITY OF RAMONA

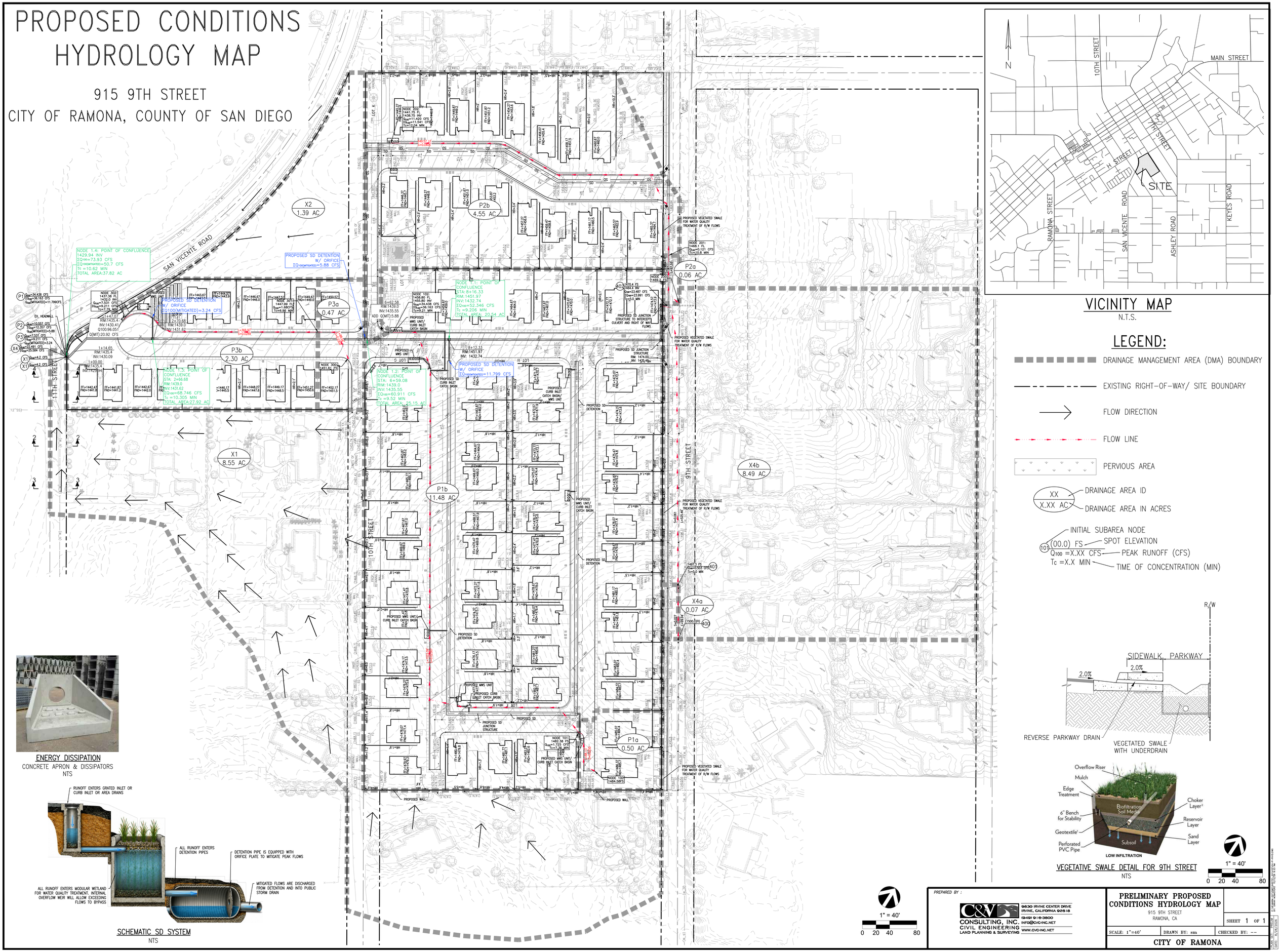
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Proposed Conditions Preliminary Hydrology Map

PROPOSED CONDITIONS HYDROLOGY MAP

915 9TH STREET

CITY OF RAMONA, COUNTY OF SAN DIEGO



VICINITY MAP

N.T.S.

LEGEND:

- DRAINAGE MANAGEMENT AREA (DMA) BOUNDARY
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- INITIAL SUBAREA NODE
- (00.0) FS — SPOT ELEVATION
- Q_{100} =X.XX CFS — PEAK RUNOFF (CFS)
- Tc =X.X MIN — TIME OF CONCENTRATION (MIN)

ENERGY DISSIPATION

CONCRETE APRON & DISSIPATORS

NTS

SCHEMATIC SD SYSTEM

NTS

VEGETATIVE SWALE DETAIL FOR 9TH STREET

NTS

1" = 40'

0 20 40 80

1" = 40'

0 20 40 80

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PRELIMINARY PROPOSED CONDITIONS HYDROLOGY MAP

915 9TH STREET
RAMONA, CA

SHEET 1 OF 1

SCALE: 1"=40' | DRAWN BY: sm | CHECKED BY: --

CITY OF RAMONA

APPENDIX B
HYDROLOGY CALCULATIONS

Existing & Proposed Conditions Hydrology Calculations (100-year Storm Event)

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2019 Version 9.1

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
        Rational Hydrology Study   Date: 10/12/26

WARM-021
RAMONA
EX COND
Q100

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

Program License Serial Number 6677

Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 3.500
24 hour precipitation(inches) = 6.000
P6/P24 =   58.3%
San Diego hydrology manual 'C' values used

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Process from Point/Station   100.000 to Point/Station   101.000
**** INITIAL AREA EVALUATION ****
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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
[UNDISTURBED NATURAL TERRAIN   ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Initial subarea total flow distance =   93.950(Ft.)
Highest elevation = 1511.000(Ft.)
Lowest elevation = 1508.000(Ft.)
Elevation difference =   3.000(Ft.) Slope = 3.193 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   3.19 %, in a development type of
 Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration =   9.78 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.3000)*(100.000^.5)/(3.193^(1/3)]=   9.78

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Rainfall intensity (I) =      5.983(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.300
Subarea runoff =      0.359(CFS)
Total initial stream area =        0.200(Ac.)


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Process from Point/Station      101.000 to Point/Station      102.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
!!Warning: Water is above left or right bank elevations
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!!Warning: Water is above left or right bank elevations
!!Warning: Water is above left or right bank elevations
Estimated mean flow rate at midpoint of channel =     10.109(CFS)
Depth of flow =   1.259(Ft.), Average velocity =   7.396(Ft/s)
!!Warning: Water is above left or right bank elevations
        ******* Irregular Channel Data ***********
----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.00
        2            998.50            579.37
Manning's 'N' friction factor =   0.030
----------------------------------------------------------------
Sub-Channel flow  =     10.109(CFS)
  '     '        flow top width =      2.170(Ft.)
  '     '    velocity=    7.397(Ft/s)
  '     '        area =      1.367(Sq.Ft)
  '     '        Froude number =     1.643

Upstream point elevation =  1508.000(Ft.)
Downstream point elevation =  1433.040(Ft.)
Flow length =  1495.310(Ft.)
Travel time  =    3.37 min.
Time of concentration =   13.15 min.
Depth of flow =   1.259(Ft.)
Average velocity =   7.396(Ft/s)
Total irregular channel flow =    10.109(CFS)
Irregular channel normal depth above invert elev. =   1.259(Ft.)
Average velocity of channel(s) =   7.396(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
Rainfall intensity (I) =      4.943(In/Hr) for a   100.0 year storm
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Rainfall intensity =      4.943(In/Hr) for a   100.0 year storm
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Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.300  CA =      4.002
Subarea runoff =     19.422(CFS) for     13.140(Ac.)
Total runoff =     19.781(CFS)  Total area =      13.340(Ac.)
Depth of flow =   1.620(Ft.), Average velocity =   8.748(Ft/s)
!!Warning: Water is above left or right bank elevations


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Process from Point/Station      100.000 to Point/Station      102.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.340(Ac.)
Runoff from this stream =     19.781(CFS)
Time of concentration =   13.15 min.
Rainfall intensity =     4.943(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Initial subarea total flow distance  =   93.520(Ft.)
Highest elevation = 1511.000(Ft.)
Lowest elevation = 1508.000(Ft.)
Elevation difference =    3.000(Ft.) Slope =  3.208 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   3.20 %, in a development type of
 Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration =   9.77 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.3000)*( 100.000^.5)/(   3.200^(1/3)]=   9.77
Rainfall intensity (I) =      5.986(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.300
Subarea runoff =      0.144(CFS)
Total initial stream area =        0.080(Ac.)


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Process from Point/Station      201.000 to Point/Station      102.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
!!Warning: Water is above left or right bank elevations
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!!Warning: Water is above left or right bank elevations
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!!Warning: Water is above left or right bank elevations
Estimated mean flow rate at midpoint of channel =      9.800(CFS)
Depth of flow =   1.138(Ft.), Average velocity =   6.983(Ft/s)
!!Warning: Water is above left or right bank elevations
        ******* Irregular Channel Data ***********
-----------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.00
        2           1026.10            473.46
Manning's 'N' friction factor =   0.030
-----------------------------------------------------------------
Sub-Channel flow  =      9.800(CFS)
  '     '        flow top width =      2.466(Ft.)
  '     '    velocity=    6.983(Ft/s)
  '     '        area =      1.403(Sq.Ft)
  '     '        Froude number =     1.631

Upstream point elevation =  1508.000(Ft.)
Downstream point elevation =  1433.040(Ft.)
Flow length =  1563.660(Ft.)
Travel time  =    3.73 min.
Time of concentration =   13.50 min.
Depth of flow =   1.138(Ft.)
Average velocity =   6.983(Ft/s)
Total irregular channel flow =     9.800(CFS)
Irregular channel normal depth above invert elev. =   1.138(Ft.)
Average velocity of channel(s) =   6.983(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
Rainfall intensity (I) =      4.858(In/Hr) for a   100.0 year storm
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Rainfall intensity =      4.858(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.300  CA =      3.987
Subarea runoff =     19.227(CFS) for     13.210(Ac.)
Total runoff =     19.370(CFS)  Total area =      13.290(Ac.)
Depth of flow =   1.469(Ft.), Average velocity =   8.280(Ft/s)
!!Warning: Water is above left or right bank elevations


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Process from Point/Station      200.000 to Point/Station      102.000
**** CONFLUENCE OF MAIN STREAMS ****
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_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     13.290(Ac.)
Runoff from this stream =     19.370(CFS)
Time of concentration =   13.50 min.
Rainfall intensity =     4.858(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
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
[COMMERCIAL area type                         ]
(Neighborhod Commercial )
Impervious value, Ai = 0.800
Sub-Area C Value = 0.780
Initial subarea total flow distance  =   99.940(Ft.)
Highest elevation = 1500.000(Ft.)
Lowest elevation = 1497.300(Ft.)
Elevation difference =    2.700(Ft.) Slope =  2.702 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of   2.70 %, in a development type of
 Neighborhod Commercial
In Accordance With Figure 3-3
Initial Area Time of Concentration =   3.81 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.7800)*(  85.000^.5)/(   2.700^(1/3)]=   3.81
Calculated TC of    3.814 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      9.222(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.780
Subarea runoff =      0.503(CFS)
Total initial stream area =        0.070(Ac.)


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Process from Point/Station      401.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
Calculated TC of    3.814 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      9.222(In/Hr) for a   100.0 year storm
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
[UNDISTURBED NATURAL TERRAIN                  ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
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Sub-Area C Value = 0.300
Time of concentration =     3.81 min.
Rainfall intensity =      9.222(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.304  CA =      2.602
Subarea runoff =     23.487(CFS) for      8.490(Ac.)
Total runoff =     23.991(CFS)  Total area =       8.560(Ac.)


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Process from Point/Station      400.000 to Point/Station      102.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      8.560(Ac.)
Runoff from this stream =     23.991(CFS)
Time of concentration =    3.81 min.
Rainfall intensity =     9.222(In/Hr)
Summary of stream data:

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


1       19.781     13.15                4.943
2       19.370     13.50                4.858
3       23.991      3.81                9.222
Qmax(1) =
           1.000 *    1.000 *    19.781) +
           1.000 *    0.974 *    19.370) +
           0.536 *    1.000 *    23.991) + =      51.500
Qmax(2) =
           0.983 *    1.000 *    19.781) +
           1.000 *    1.000 *    19.370) +
           0.527 *    1.000 *    23.991) + =      51.454
Qmax(3) =
           1.000 *    0.290 *    19.781) +
           1.000 *    0.282 *    19.370) +
           1.000 *    1.000 *    23.991) + =      35.199

Total of 3 main streams to confluence:
Flow rates before confluence point:
      19.781      19.370      23.991
Maximum flow rates at confluence using above data:
       51.500       51.454       35.199
Area of streams before confluence:
       13.340       13.290        8.560


Results of confluence:
Total flow rate =     51.500(CFS)
Time of concentration =    13.148 min.
Effective stream area after confluence  =     35.190(Ac.)
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Process from Point/Station 102.000 to Point/Station 102.000
**** 6 HOUR HYDROGRAPH ****
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Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 13.15
Basin Area = 35.19 Acres
6 Hour Rainfall = 3.500 Inches
Runoff Coefficient = 0.301
Peak Discharge = 51.50 CFS

Time (Min)	Discharge (CFS)
0	0.000
13	2.261
26	2.318
39	2.443
52	2.513
65	2.668
78	2.756
91	2.955
104	3.070
117	3.337
130	3.494
143	3.875
156	4.110
169	4.711
182	5.108
195	6.243
208	7.111
221	10.441
234	14.711
247	51.500
260	8.374
273	5.603
286	4.384
299	3.672
312	3.196
325	2.851
338	2.588
351	2.379
364	2.208

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

Hydrograph in 1 Minute intervals ((CFS))

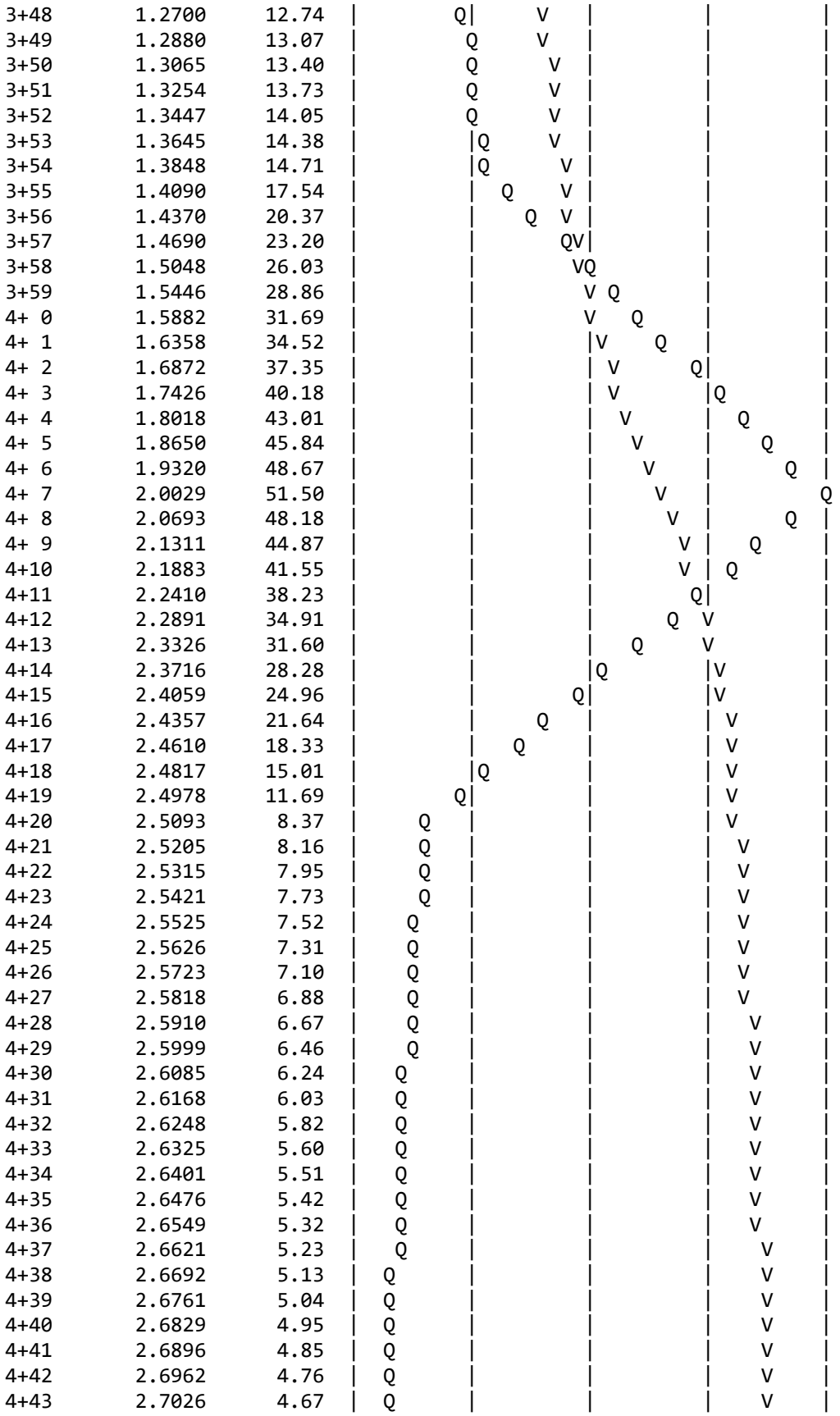
Time(h+m)	Volume Ac.Ft	Q(CFS)	0	12.9	25.8	38.6	51.5
0+ 0	0.0000	0.00	Q	|	|	|	|
0+ 1	0.0002	0.17	Q	|	|	|	|
0+ 2	0.0007	0.35	Q	|	|	|	|
0+ 3	0.0014	0.52	Q	|	|	|	|

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0+ 4       0.0024      0.70  Q        |          |          |          |
0+ 5       0.0036      0.87  Q        |          |          |          |
0+ 6       0.0050      1.04  Q        |          |          |          |
0+ 7       0.0067      1.22  Q        |          |          |          |
0+ 8       0.0086      1.39  VQ       |          |          |          |
0+ 9       0.0108      1.57  VQ       |          |          |          |
0+10       0.0132      1.74  VQ       |          |          |          |
0+11       0.0158      1.91  VQ       |          |          |          |
0+12       0.0187      2.09  VQ       |          |          |          |
0+13       0.0218      2.26  VQ       |          |          |          |
0+14       0.0249      2.27  VQ       |          |          |          |
0+15       0.0280      2.27  VQ       |          |          |          |
0+16       0.0312      2.27  VQ       |          |          |          |
0+17       0.0343      2.28  VQ       |          |          |          |
0+18       0.0375      2.28  VQ       |          |          |          |
0+19       0.0406      2.29  VQ       |          |          |          |
0+20       0.0438      2.29  VQ       |          |          |          |
0+21       0.0469      2.30  VQ       |          |          |          |
0+22       0.0501      2.30  VQ       |          |          |          |
0+23       0.0533      2.30  VQ       |          |          |          |
0+24       0.0565      2.31  VQ       |          |          |          |
0+25       0.0596      2.31  VQ       |          |          |          |
0+26       0.0628      2.32  VQ       |          |          |          |
0+27       0.0660      2.33  VQ       |          |          |          |
0+28       0.0693      2.34  VQ       |          |          |          |
0+29       0.0725      2.35  VQ       |          |          |          |
0+30       0.0757      2.36  VQ       |          |          |          |
0+31       0.0790      2.37  |Q       |          |          |          |
0+32       0.0823      2.38  |Q       |          |          |          |
0+33       0.0856      2.39  |Q       |          |          |          |
0+34       0.0889      2.40  |Q       |          |          |          |
0+35       0.0922      2.40  |Q       |          |          |          |
0+36       0.0955      2.41  |Q       |          |          |          |
0+37       0.0988      2.42  |Q       |          |          |          |
0+38       0.1022      2.43  |Q       |          |          |          |
0+39       0.1056      2.44  |Q       |          |          |          |
0+40       0.1089      2.45  |Q       |          |          |          |
0+41       0.1123      2.45  |Q       |          |          |          |
0+42       0.1157      2.46  |Q       |          |          |          |
0+43       0.1191      2.46  |Q       |          |          |          |
0+44       0.1225      2.47  |Q       |          |          |          |
0+45       0.1259      2.48  |Q       |          |          |          |
0+46       0.1293      2.48  |Q       |          |          |          |
0+47       0.1327      2.49  |Q       |          |          |          |
0+48       0.1362      2.49  |Q       |          |          |          |
0+49       0.1396      2.50  |Q       |          |          |          |
0+50       0.1431      2.50  |Q       |          |          |          |
0+51       0.1465      2.51  |Q       |          |          |          |
0+52       0.1500      2.51  |Q       |          |          |          |
0+53       0.1535      2.52  |QV      |          |          |          |
0+54       0.1569      2.54  |QV      |          |          |          |
0+55       0.1605      2.55  |QV      |          |          |          |
0+56       0.1640      2.56  |QV      |          |          |          |
0+57       0.1675      2.57  |QV      |          |          |          |
0+58       0.1711      2.58  | Q      |          |          |          |
0+59       0.1747      2.60  | Q      |          |          |          |
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1+ 0	0.1783	2.61	Q			
1+ 1	0.1819	2.62	Q			
1+ 2	0.1855	2.63	Q			
1+ 3	0.1891	2.64	Q			
1+ 4	0.1928	2.66	Q			
1+ 5	0.1965	2.67	Q			
1+ 6	0.2002	2.68	Q			
1+ 7	0.2039	2.68	Q			
1+ 8	0.2076	2.69	Q			
1+ 9	0.2113	2.70	Q			
1+10	0.2150	2.70	Q			
1+11	0.2187	2.71	Q			
1+12	0.2225	2.72	Q			
1+13	0.2262	2.72	Q			
1+14	0.2300	2.73	QV			
1+15	0.2337	2.74	QV			
1+16	0.2375	2.74	QV			
1+17	0.2413	2.75	QV			
1+18	0.2451	2.76	QV			
1+19	0.2489	2.77	QV			
1+20	0.2528	2.79	QV			
1+21	0.2566	2.80	QV			
1+22	0.2605	2.82	QV			
1+23	0.2644	2.83	QV			
1+24	0.2683	2.85	QV			
1+25	0.2723	2.86	QV			
1+26	0.2762	2.88	QV			
1+27	0.2802	2.89	QV			
1+28	0.2842	2.91	QV			
1+29	0.2883	2.92	QV			
1+30	0.2923	2.94	QV			
1+31	0.2964	2.96	QV			
1+32	0.3005	2.96	QV			
1+33	0.3045	2.97	Q V			
1+34	0.3087	2.98	Q V			
1+35	0.3128	2.99	Q V			
1+36	0.3169	3.00	Q V			
1+37	0.3210	3.01	Q V			
1+38	0.3252	3.02	Q V			
1+39	0.3294	3.03	Q V			
1+40	0.3336	3.03	Q V			
1+41	0.3377	3.04	Q V			
1+42	0.3419	3.05	Q V			
1+43	0.3462	3.06	Q V			
1+44	0.3504	3.07	Q V			
1+45	0.3546	3.09	Q V			
1+46	0.3589	3.11	Q V			
1+47	0.3632	3.13	Q V			
1+48	0.3676	3.15	Q V			
1+49	0.3720	3.17	Q V			
1+50	0.3764	3.19	Q V			
1+51	0.3808	3.21	Q V			
1+52	0.3852	3.23	Q V			
1+53	0.3897	3.25	Q V			
1+54	0.3942	3.28	Q V			
1+55	0.3988	3.30	Q V			

1+56	0.4033	3.32	Q V			
1+57	0.4079	3.34	Q V			
1+58	0.4125	3.35	Q V			
1+59	0.4172	3.36	Q V			
2+ 0	0.4218	3.37	Q V			
2+ 1	0.4265	3.39	Q V			
2+ 2	0.4312	3.40	Q V			
2+ 3	0.4359	3.41	Q V			
2+ 4	0.4406	3.42	Q V			
2+ 5	0.4453	3.43	Q V			
2+ 6	0.4500	3.45	Q V			
2+ 7	0.4548	3.46	Q V			
2+ 8	0.4596	3.47	Q V			
2+ 9	0.4644	3.48	Q V			
2+10	0.4692	3.49	Q V			
2+11	0.4741	3.52	Q V			
2+12	0.4789	3.55	Q V			
2+13	0.4839	3.58	Q V			
2+14	0.4889	3.61	Q V			
2+15	0.4939	3.64	Q V			
2+16	0.4989	3.67	Q V			
2+17	0.5040	3.70	Q V			
2+18	0.5092	3.73	Q V			
2+19	0.5143	3.76	Q V			
2+20	0.5195	3.79	Q V			
2+21	0.5248	3.82	Q V			
2+22	0.5301	3.85	Q V			
2+23	0.5354	3.88	Q V			
2+24	0.5408	3.89	Q V			
2+25	0.5462	3.91	Q V			
2+26	0.5516	3.93	Q V			
2+27	0.5570	3.95	Q V			
2+28	0.5625	3.97	Q V			
2+29	0.5680	3.98	Q V			
2+30	0.5735	4.00	Q V			
2+31	0.5790	4.02	Q V			
2+32	0.5846	4.04	Q V			
2+33	0.5902	4.06	Q V			
2+34	0.5958	4.07	Q V			
2+35	0.6014	4.09	Q V			
2+36	0.6071	4.11	Q V			
2+37	0.6128	4.16	Q V			
2+38	0.6186	4.20	Q V			
2+39	0.6245	4.25	Q V			
2+40	0.6304	4.29	Q V			
2+41	0.6363	4.34	Q V			
2+42	0.6424	4.39	Q V			
2+43	0.6485	4.43	Q V			
2+44	0.6547	4.48	Q V			
2+45	0.6609	4.53	Q V			
2+46	0.6672	4.57	Q V			
2+47	0.6736	4.62	Q V			
2+48	0.6800	4.66	Q V			
2+49	0.6865	4.71	Q V			
2+50	0.6930	4.74	Q V			
2+51	0.6996	4.77	Q V			

```
2+52       0.7062      4.80  |  Q     V|          |          |          |
2+53       0.7128      4.83  |  Q     V|          |          |          |
2+54       0.7195      4.86  |  Q     V|          |          |          |
2+55       0.7263      4.89  |  Q     V|          |          |          |
2+56       0.7331      4.92  |  Q     V|          |          |          |
2+57       0.7399      4.96  |  Q     V|          |          |          |
2+58       0.7468      4.99  |  Q     V|          |          |          |
2+59       0.7537      5.02  |  Q     V|          |          |          |
3+ 0       0.7606      5.05  |  Q      V          |          |          |
3+ 1       0.7676      5.08  |  Q      V          |          |          |
3+ 2       0.7747      5.11  |  Q      V          |          |          |
3+ 3       0.7818      5.20  |   Q     V          |          |          |
3+ 4       0.7891      5.28  |   Q     V          |          |          |
3+ 5       0.7965      5.37  |   Q     V          |          |          |
3+ 6       0.8040      5.46  |   Q     V          |          |          |
3+ 7       0.8116      5.54  |   Q     V          |          |          |
3+ 8       0.8194      5.63  |   Q     V          |          |          |
3+ 9       0.8273      5.72  |   Q     V          |          |          |
3+10       0.8353      5.81  |   Q     V          |          |          |
3+11       0.8434      5.89  |   Q     |V         |          |          |
3+12       0.8516      5.98  |   Q     |V         |          |          |
3+13       0.8600      6.07  |   Q     |V         |          |          |
3+14       0.8685      6.16  |   Q     |V         |          |          |
3+15       0.8771      6.24  |   Q     |V         |          |          |
3+16       0.8858      6.31  |   Q     |V         |          |          |
3+17       0.8945      6.38  |   Q     |V         |          |          |
3+18       0.9034      6.44  |    Q    |V         |          |          |
3+19       0.9124      6.51  |    Q    |V         |          |          |
3+20       0.9214      6.58  |    Q    | V        |          |          |
3+21       0.9306      6.64  |    Q    | V        |          |          |
3+22       0.9398      6.71  |    Q    | V        |          |          |
3+23       0.9492      6.78  |    Q    | V        |          |          |
3+24       0.9586      6.84  |    Q    | V        |          |          |
3+25       0.9681      6.91  |    Q    | V        |          |          |
3+26       0.9777      6.98  |    Q    | V        |          |          |
3+27       0.9874      7.04  |    Q    | V        |          |          |
3+28       0.9972      7.11  |    Q    |  V       |          |          |
3+29       1.0074      7.37  |    Q    |  V       |          |          |
3+30       1.0179      7.62  |    Q    |  V       |          |          |
3+31       1.0287      7.88  |     Q   |  V       |          |          |
3+32       1.0399      8.14  |     Q   |  V       |          |          |
3+33       1.0515      8.39  |     Q   |  V       |          |          |
3+34       1.0634      8.65  |     Q   |  V       |          |          |
3+35       1.0757      8.90  |     Q   |   V      |          |          |
3+36       1.0883      9.16  |      Q  |   V      |          |          |
3+37       1.1012      9.42  |      Q  |   V      |          |          |
3+38       1.1146      9.67  |      Q  |   V      |          |          |
3+39       1.1282      9.93  |      Q  |   V      |          |          |
3+40       1.1423     10.18  |      Q  |    V     |          |          |
3+41       1.1567     10.44  |       Q |    V     |          |          |
3+42       1.1715     10.77  |       Q |    V     |          |          |
3+43       1.1868     11.10  |       Q |    V     |          |          |
3+44       1.2025     11.43  |       Q |    V     |          |          |
3+45       1.2187     11.76  |        Q|     V    |          |          |
3+46       1.2354     12.08  |        Q|     V    |          |          |
3+47       1.2524     12.41  |        Q|     V    |          |          |
```



```
4+44       2.7089      4.57  |  Q      |         |         |    V    |
4+45       2.7151      4.48  |  Q      |         |         |    V    |
4+46       2.7211      4.38  |  Q      |         |         |    V    |
4+47       2.7271      4.33  |  Q      |         |         |    V    |
4+48       2.7330      4.27  |  Q      |         |         |    V    |
4+49       2.7388      4.22  |  Q      |         |         |     V   |
4+50       2.7445      4.16  |  Q      |         |         |     V   |
4+51       2.7502      4.11  |  Q      |         |         |     V   |
4+52       2.7558      4.06  |  Q      |         |         |     V   |
4+53       2.7613      4.00  |  Q      |         |         |     V   |
4+54       2.7667      3.95  |  Q      |         |         |     V   |
4+55       2.7721      3.89  |  Q      |         |         |     V   |
4+56       2.7773      3.84  | Q       |         |         |     V   |
4+57       2.7826      3.78  | Q       |         |         |     V   |
4+58       2.7877      3.73  | Q       |         |         |     V   |
4+59       2.7927      3.67  | Q       |         |         |     V   |
5+ 0       2.7978      3.64  | Q       |         |         |     V   |
5+ 1       2.8027      3.60  | Q       |         |         |     V   |
5+ 2       2.8076      3.56  | Q       |         |         |     V   |
5+ 3       2.8125      3.53  | Q       |         |         |     V   |
5+ 4       2.8173      3.49  | Q       |         |         |      V  |
5+ 5       2.8220      3.45  | Q       |         |         |      V  |
5+ 6       2.8267      3.42  | Q       |         |         |      V  |
5+ 7       2.8314      3.38  | Q       |         |         |      V  |
5+ 8       2.8360      3.34  | Q       |         |         |      V  |
5+ 9       2.8406      3.31  | Q       |         |         |      V  |
5+10       2.8451      3.27  | Q       |         |         |      V  |
5+11       2.8495      3.23  | Q       |         |         |      V  |
5+12       2.8539      3.20  | Q       |         |         |      V  |
5+13       2.8583      3.17  | Q       |         |         |      V  |
5+14       2.8626      3.14  | Q       |         |         |      V  |
5+15       2.8669      3.12  | Q       |         |         |      V  |
5+16       2.8712      3.09  | Q       |         |         |      V  |
5+17       2.8754      3.06  | Q       |         |         |      V  |
5+18       2.8796      3.04  | Q       |         |         |      V  |
5+19       2.8837      3.01  | Q       |         |         |      V  |
5+20       2.8878      2.98  | Q       |         |         |      V  |
5+21       2.8919      2.96  | Q       |         |         |       V |
5+22       2.8959      2.93  | Q       |         |         |       V |
5+23       2.8999      2.90  | Q       |         |         |       V |
5+24       2.9039      2.88  | Q       |         |         |       V |
5+25       2.9078      2.85  | Q       |         |         |       V |
5+26       2.9117      2.83  | Q       |         |         |       V |
5+27       2.9156      2.81  | Q       |         |         |       V |
5+28       2.9194      2.79  | Q       |         |         |       V |
5+29       2.9232      2.77  | Q       |         |         |       V |
5+30       2.9270      2.75  | Q       |         |         |       V |
5+31       2.9308      2.73  | Q       |         |         |       V |
5+32       2.9345      2.71  | Q       |         |         |       V |
5+33       2.9382      2.69  | Q       |         |         |       V |
5+34       2.9419      2.67  | Q       |         |         |       V |
5+35       2.9456      2.65  | Q       |         |         |       V |
5+36       2.9492      2.63  | Q       |         |         |       V |
5+37       2.9528      2.61  | Q       |         |         |       V |
5+38       2.9563      2.59  | Q       |         |         |       V |
5+39       2.9599      2.57  |Q        |         |         |       V |
```

```
    5+40       2.9634      2.56  |Q        |         |         |       V |
    5+41       2.9669      2.54  |Q        |         |         |        V|
    5+42       2.9704      2.52  |Q        |         |         |        V|
    5+43       2.9738      2.51  |Q        |         |         |        V|
    5+44       2.9773      2.49  |Q        |         |         |        V|
    5+45       2.9807      2.48  |Q        |         |         |        V|
    5+46       2.9840      2.46  |Q        |         |         |        V|
    5+47       2.9874      2.44  |Q        |         |         |        V|
    5+48       2.9908      2.43  |Q        |         |         |        V|
    5+49       2.9941      2.41  |Q        |         |         |        V|
    5+50       2.9974      2.39  |Q        |         |         |        V|
    5+51       3.0007      2.38  |Q        |         |         |        V|
    5+52       3.0039      2.37  |Q        |         |         |        V|
    5+53       3.0071      2.35  |Q        |         |         |        V|
    5+54       3.0104      2.34  |Q        |         |         |        V|
    5+55       3.0136      2.33  |Q        |         |         |        V|
    5+56       3.0168      2.31  |Q        |         |         |        V|
    5+57       3.0199      2.30  |Q        |         |         |        V|
    5+58       3.0231      2.29  |Q        |         |         |        V|
    5+59       3.0262      2.27  |Q        |         |         |        V|
    6+ 0       3.0293      2.26  |Q        |         |         |        V|
    6+ 1       3.0324      2.25  |Q        |         |         |        V|
    6+ 2       3.0355      2.23  |Q        |         |         |        V|
    6+ 3       3.0386      2.22  |Q        |         |         |        V|
    6+ 4       3.0416      2.21  |Q        |         |         |         V
--------------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________________
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Initial subarea total flow distance  =   99.660(Ft.)
Highest elevation = 1469.200(Ft.)
Lowest elevation = 1464.000(Ft.)
Elevation difference =    5.200(Ft.) Slope =  5.218 %
Top of Initial Area Slope adjusted by User to  5.200 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   5.20 %, in a development type of
 Permanent Open Space
In Accordance With Figure 3-3
Initial Area Time of Concentration =   8.31 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
```

```
TC = [1.8*(1.1-0.3000)*( 100.000^.5)/(   5.200^(1/3)]=   8.31
Rainfall intensity (I) =      6.644(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.300
Subarea runoff =      0.100(CFS)
Total initial stream area =        0.050(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****
________________________________________________________________________
!!Warning: Water is above left or right bank elevations
!!Warning: Water is above left or right bank elevations
!!Warning: Water is above left or right bank elevations
!!Warning: Water is above left or right bank elevations
!!Warning: Water is above left or right bank elevations
Estimated mean flow rate at midpoint of channel =      2.203(CFS)
Depth of flow =   0.611(Ft.), Average velocity =   3.920(Ft/s)
!!Warning: Water is above left or right bank elevations
        ******* Irregular Channel Data ***********
------------------------------------------------------------------
Information entered for subchannel number 1 :
Point number      'X' coordinate     'Y' coordinate
        1              0.00              0.00
        2            560.48            186.02
Manning's 'N' friction factor =   0.030
------------------------------------------------------------------
Sub-Channel flow  =      2.203(CFS)
  '     '        flow top width =      1.840(Ft.)
  '     '    velocity=    3.920(Ft/s)
  '     '        area =      0.562(Sq.Ft)
  '     '        Froude number =     1.250

Upstream point elevation =  1464.000(Ft.)
Downstream point elevation =  1439.000(Ft.)
Flow length =   765.660(Ft.)
Travel time  =    3.26 min.
Time of concentration =   11.57 min.
Depth of flow =   0.611(Ft.)
Average velocity =   3.920(Ft/s)
Total irregular channel flow =     2.203(CFS)
Irregular channel normal depth above invert elev. =   0.611(Ft.)
Average velocity of channel(s) =   3.920(Ft/s)
!!Warning: Water is above left or right bank elevations
 Adding area flow to channel
Rainfall intensity (I) =      5.369(In/Hr) for a   100.0 year storm
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Rainfall intensity =      5.369(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
```

```
(Q=KCIA) is C = 0.300  CA =      0.789
Subarea runoff =      4.136(CFS) for      2.580(Ac.)
Total runoff =      4.236(CFS)  Total area =       2.630(Ac.)
Depth of flow =   0.780(Ft.), Average velocity =   4.616(Ft/s)
!!Warning: Water is above left or right bank elevations
End of computations, total study area =          37.820 (Ac.)
```

San Diego County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c)1991-2019 Version 9.1

Rational method hydrology program based on
San Diego County Flood Control Division 2003 hydrology manual
        Rational Hydrology Study   Date: 10/12/26

WARM-021
RAMONA
PROPOSED
Q100

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

Program License Serial Number 6677

Rational hydrology study storm event year is   100.0
English (in-lb) input data Units used

Map data precipitation entered:
6 hour, precipitation(inches) = 3.500
24 hour precipitation(inches) = 6.000
P6/P24 =   58.3%
San Diego hydrology manual 'C' values used

++
Process from Point/Station   100.000 to Point/Station   101.000
**** INITIAL AREA EVALUATION ****
_____
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
[MEDIUM DENSITY RESIDENTIAL   ]
(4.3 DU/A or Less   )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Initial subarea total flow distance =   88.130(Ft.)
Highest elevation = 1484.580(Ft.)
Lowest elevation = 1482.380(Ft.)
Elevation difference =   2.200(Ft.) Slope = 2.496 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 80.00 (Ft)
for the top area slope value of   2.50 %, in a development type of
 4.3 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   7.36 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4800)*(80.000^.5)/(2.496^(1/3)]=   7.36

```
Rainfall intensity (I) =      7.187(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.480
Subarea runoff =      1.725(CFS)
Total initial stream area =        0.500(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1482.380(Ft.)
End of street segment elevation =  1458.800(Ft.)
Length of street segment  =  1022.090(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  46.000(Ft.)
Distance from crown to crossfall grade break  =  44.500(Ft.)
Slope from gutter to grade break (v/hz) =   1.000
Slope from grade break to crown (v/hz)  =   1.000
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   5.500(Ft.)
Slope from curb to property line (v/hz) =   2.000
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  0.125(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0120
 Manning's N from grade break to crown =  0.0120
Estimated mean flow rate at midpoint of street =     18.991(CFS)
Depth of flow =   0.942(Ft.), Average velocity =  10.065(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    0.22(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   2.431(Ft.)
Flow velocity =  10.06(Ft/s)
Travel time =    1.69 min.     TC =    9.05  min.
 Adding area flow to street
Rainfall intensity (I) =      6.289(In/Hr) for a   100.0 year storm
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
[MEDIUM DENSITY RESIDENTIAL                  ]
(4.3 DU/A or Less       )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Rainfall intensity =      6.289(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.480  CA =      5.750
Subarea runoff =     34.438(CFS) for     11.480(Ac.)
Total runoff =     36.163(CFS)  Total area =      11.980(Ac.)
Street flow at end of street =     36.163(CFS)
Half street flow at end of street =     36.163(CFS)
Depth of flow =   1.329(Ft.), Average velocity =  11.947(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    0.41(Ft.)
Flow width (from curb towards crown)=   2.819(Ft.)
```

++
Process from Point/Station 102.000 to Point/Station 1.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1455.800(Ft.)
Downstream point/station elevation = 1433.000(Ft.)
Pipe length = 216.00(Ft.) Slope = 0.1056 Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 36.163(CFS)
Nearest computed pipe diameter = 21.00(In.)
Calculated individual pipe flow = 36.163(CFS)
Normal flow depth in pipe = 12.98(In.)
Flow top width inside pipe = 20.40(In.)
Critical depth could not be calculated.
Pipe flow velocity = 23.18(Ft/s)
Travel time through pipe = 0.16 min.
Time of concentration (TC) = 9.21 min.

++
Process from Point/Station 100.000 to Point/Station 102.000
**** 6 HOUR HYDROGRAPH ****

++
Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003

Time of Concentration = 9.21
Basin Area = 11.98 Acres
6 Hour Rainfall = 3.500 Inches
Runoff Coefficient = 0.480
Peak Discharge = 36.16 CFS

Time (Min)	Discharge (CFS)
0	0.000
9	1.184
18	1.223
27	1.244
36	1.289
45	1.313
54	1.364
63	1.392
72	1.452
81	1.485
90	1.556
99	1.595
108	1.682
117	1.730
126	1.837
135	1.897
144	2.034
153	2.113
162	2.297
171	2.405
180	2.667
189	2.829
198	3.242

207	3.516
216	4.297
225	4.895
234	7.187
243	10.126
252	36.163
261	5.764
270	3.857
279	3.018
288	2.528
297	2.200
306	1.963
315	1.781
324	1.637
333	1.520
342	1.421
351	1.338
360	1.266
369	1.203

++

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

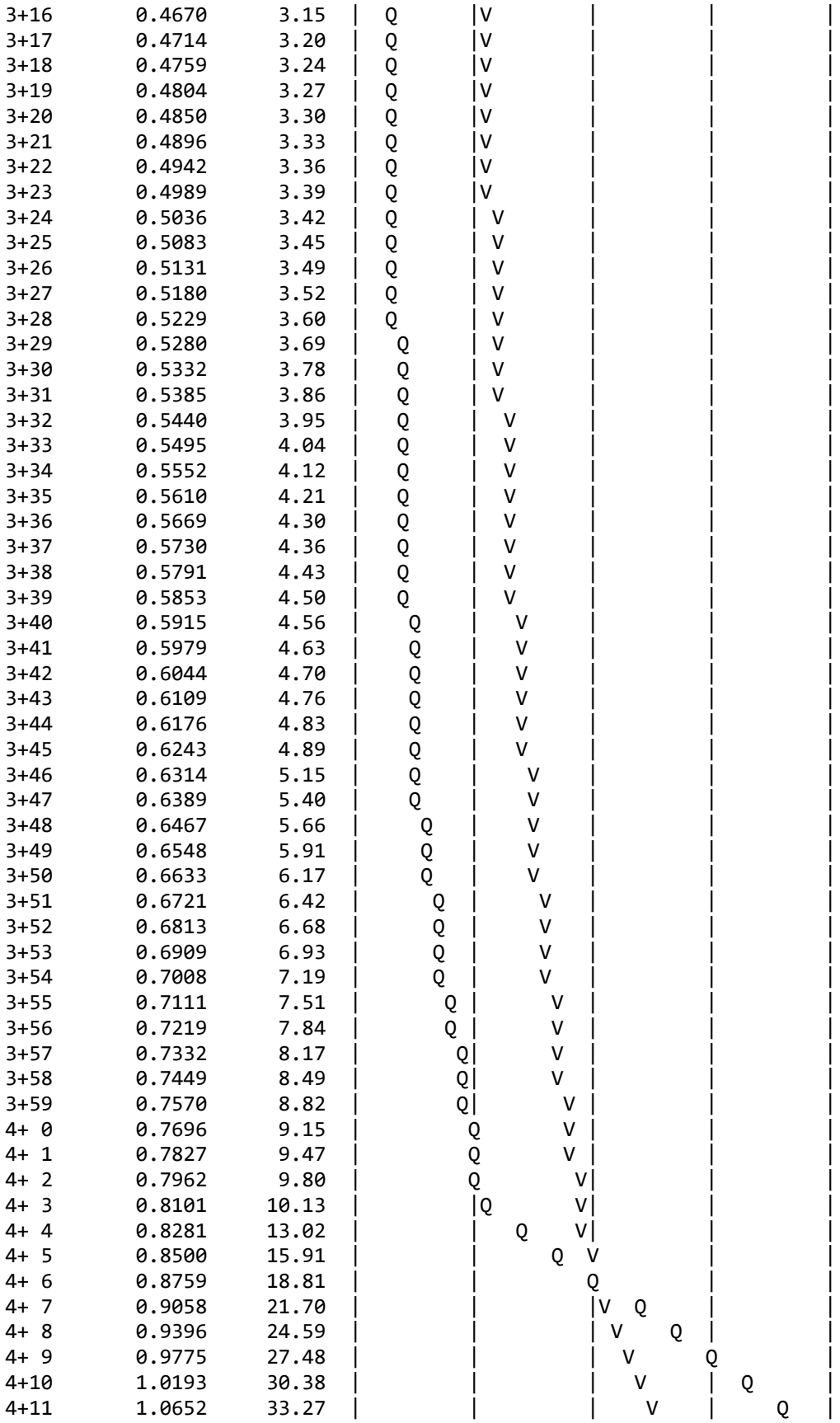
Hydrograph in 1 Minute intervals ((CFS))

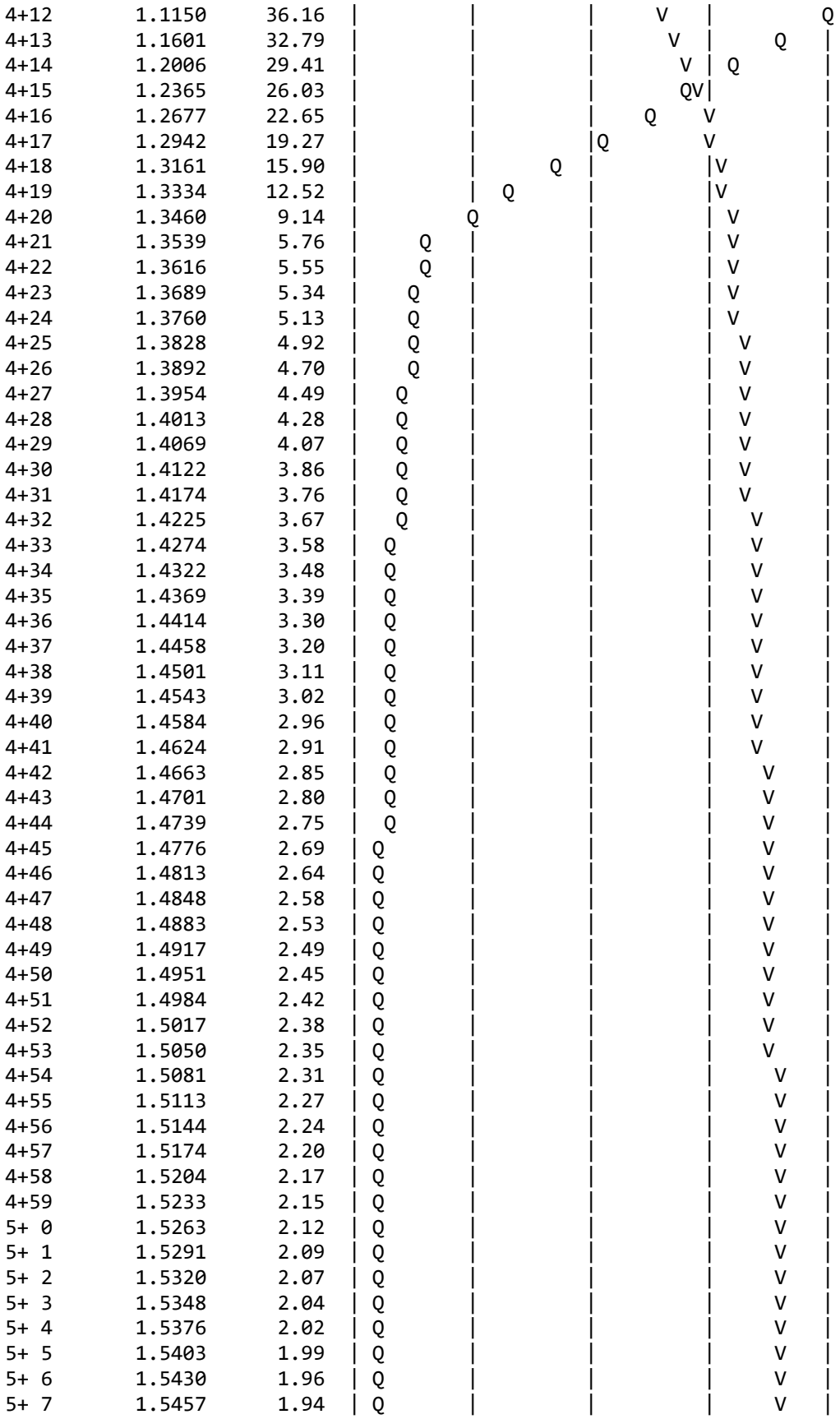
Time(h+m)	Volume Ac.Ft	Q(CFS)	0	9.0	18.1	27.1	36.2
0+ 0	0.0000	0.00	Q	|	|	|	|
0+ 1	0.0002	0.13	Q	|	|	|	|
0+ 2	0.0005	0.26	Q	|	|	|	|
0+ 3	0.0011	0.39	Q	|	|	|	|
0+ 4	0.0018	0.53	Q	|	|	|	|
0+ 5	0.0027	0.66	Q	|	|	|	|
0+ 6	0.0038	0.79	Q	|	|	|	|
0+ 7	0.0051	0.92	VQ	|	|	|	|
0+ 8	0.0065	1.05	VQ	|	|	|	|
0+ 9	0.0082	1.18	VQ	|	|	|	|
0+10	0.0098	1.19	VQ	|	|	|	|
0+11	0.0114	1.19	VQ	|	|	|	|
0+12	0.0131	1.20	VQ	|	|	|	|
0+13	0.0147	1.20	VQ	|	|	|	|
0+14	0.0164	1.21	VQ	|	|	|	|
0+15	0.0181	1.21	VQ	|	|	|	|
0+16	0.0197	1.21	VQ	|	|	|	|
0+17	0.0214	1.22	VQ	|	|	|	|
0+18	0.0231	1.22	VQ	|	|	|	|
0+19	0.0248	1.23	VQ	|	|	|	|
0+20	0.0265	1.23	VQ	|	|	|	|
0+21	0.0282	1.23	VQ	|	|	|	|
0+22	0.0299	1.23	VQ	|	|	|	|
0+23	0.0316	1.23	VQ	|	|	|	|
0+24	0.0333	1.24	VQ	|	|	|	|
0+25	0.0350	1.24	VQ	|	|	|	|
0+26	0.0367	1.24	VQ	|	|	|	|
0+27	0.0384	1.24	VQ	|	|	|	|

```
0+28       0.0401      1.25  VQ        |         |         |         |
0+29       0.0419      1.25  |Q        |         |         |         |
0+30       0.0436      1.26  |Q        |         |         |         |
0+31       0.0453      1.26  |Q        |         |         |         |
0+32       0.0471      1.27  |Q        |         |         |         |
0+33       0.0488      1.27  |Q        |         |         |         |
0+34       0.0506      1.28  |Q        |         |         |         |
0+35       0.0524      1.28  |Q        |         |         |         |
0+36       0.0541      1.29  |Q        |         |         |         |
0+37       0.0559      1.29  |Q        |         |         |         |
0+38       0.0577      1.29  |Q        |         |         |         |
0+39       0.0595      1.30  |Q        |         |         |         |
0+40       0.0613      1.30  |Q        |         |         |         |
0+41       0.0631      1.30  |Q        |         |         |         |
0+42       0.0649      1.30  |Q        |         |         |         |
0+43       0.0667      1.31  |Q        |         |         |         |
0+44       0.0685      1.31  |Q        |         |         |         |
0+45       0.0703      1.31  |Q        |         |         |         |
0+46       0.0721      1.32  |Q        |         |         |         |
0+47       0.0739      1.32  |Q        |         |         |         |
0+48       0.0758      1.33  |Q        |         |         |         |
0+49       0.0776      1.34  |Q        |         |         |         |
0+50       0.0794      1.34  |Q        |         |         |         |
0+51       0.0813      1.35  |Q        |         |         |         |
0+52       0.0832      1.35  |Q        |         |         |         |
0+53       0.0850      1.36  |QV       |         |         |         |
0+54       0.0869      1.36  |QV       |         |         |         |
0+55       0.0888      1.37  |QV       |         |         |         |
0+56       0.0907      1.37  |QV       |         |         |         |
0+57       0.0926      1.37  |QV       |         |         |         |
0+58       0.0945      1.38  |QV       |         |         |         |
0+59       0.0964      1.38  |QV       |         |         |         |
1+ 0       0.0983      1.38  |QV       |         |         |         |
1+ 1       0.1002      1.39  |QV       |         |         |         |
1+ 2       0.1021      1.39  |QV       |         |         |         |
1+ 3       0.1040      1.39  |QV       |         |         |         |
1+ 4       0.1059      1.40  |QV       |         |         |         |
1+ 5       0.1079      1.41  |QV       |         |         |         |
1+ 6       0.1098      1.41  |QV       |         |         |         |
1+ 7       0.1118      1.42  |QV       |         |         |         |
1+ 8       0.1137      1.43  |QV       |         |         |         |
1+ 9       0.1157      1.43  |QV       |         |         |         |
1+10       0.1177      1.44  |QV       |         |         |         |
1+11       0.1197      1.45  |QV       |         |         |         |
1+12       0.1217      1.45  |QV       |         |         |         |
1+13       0.1237      1.46  |QV       |         |         |         |
1+14       0.1257      1.46  |Q V      |         |         |         |
1+15       0.1277      1.46  |Q V      |         |         |         |
1+16       0.1297      1.47  |Q V      |         |         |         |
1+17       0.1318      1.47  |Q V      |         |         |         |
1+18       0.1338      1.47  |Q V      |         |         |         |
1+19       0.1358      1.48  |Q V      |         |         |         |
1+20       0.1379      1.48  |Q V      |         |         |         |
1+21       0.1399      1.49  |Q V      |         |         |         |
1+22       0.1420      1.49  |Q V      |         |         |         |
1+23       0.1440      1.50  |Q V      |         |         |         |
```

1+24	0.1461	1.51	Q V				
1+25	0.1482	1.52	Q V				
1+26	0.1503	1.52	Q V				
1+27	0.1524	1.53	Q V				
1+28	0.1545	1.54	Q V				
1+29	0.1567	1.55	Q V				
1+30	0.1588	1.56	Q V				
1+31	0.1610	1.56	Q V				
1+32	0.1631	1.57	Q V				
1+33	0.1653	1.57	Q V				
1+34	0.1675	1.57	Q V				
1+35	0.1696	1.58	Q V				
1+36	0.1718	1.58	Q V				
1+37	0.1740	1.59	Q V				
1+38	0.1762	1.59	Q V				
1+39	0.1784	1.60	Q V				
1+40	0.1806	1.61	Q V				
1+41	0.1828	1.61	Q V				
1+42	0.1851	1.62	Q V				
1+43	0.1873	1.63	Q V				
1+44	0.1896	1.64	Q V				
1+45	0.1918	1.65	Q V				
1+46	0.1941	1.66	Q V				
1+47	0.1964	1.67	Q V				
1+48	0.1988	1.68	Q V				
1+49	0.2011	1.69	Q V				
1+50	0.2034	1.69	Q V				
1+51	0.2057	1.70	Q V				
1+52	0.2081	1.70	Q V				
1+53	0.2104	1.71	Q V				
1+54	0.2128	1.71	Q V				
1+55	0.2152	1.72	Q V				
1+56	0.2175	1.72	Q V				
1+57	0.2199	1.73	Q V				
1+58	0.2223	1.74	Q V				
1+59	0.2247	1.75	Q V				
2+ 0	0.2272	1.77	Q V				
2+ 1	0.2296	1.78	Q V				
2+ 2	0.2321	1.79	Q V				
2+ 3	0.2346	1.80	Q V				
2+ 4	0.2371	1.81	Q V				
2+ 5	0.2396	1.82	Q V				
2+ 6	0.2421	1.84	Q V				
2+ 7	0.2447	1.84	Q V				
2+ 8	0.2472	1.85	Q V				
2+ 9	0.2498	1.86	Q V				
2+10	0.2523	1.86	Q V				
2+11	0.2549	1.87	Q V				
2+12	0.2575	1.88	Q V				
2+13	0.2601	1.88	Q V				
2+14	0.2627	1.89	Q V				
2+15	0.2653	1.90	Q V				
2+16	0.2679	1.91	Q V				
2+17	0.2706	1.93	Q V				
2+18	0.2733	1.94	Q V				
2+19	0.2760	1.96	Q V				

```
2+20       0.2787      1.97  | Q   V   |         |         |         |
2+21       0.2814      1.99  | Q   V   |         |         |         |
2+22       0.2842      2.00  | Q   V   |         |         |         |
2+23       0.2870      2.02  | Q   V   |         |         |         |
2+24       0.2898      2.03  | Q   V   |         |         |         |
2+25       0.2926      2.04  | Q   V   |         |         |         |
2+26       0.2954      2.05  | Q    V  |         |         |         |
2+27       0.2982      2.06  | Q    V  |         |         |         |
2+28       0.3011      2.07  | Q    V  |         |         |         |
2+29       0.3039      2.08  | Q    V  |         |         |         |
2+30       0.3068      2.09  | Q    V  |         |         |         |
2+31       0.3097      2.10  | Q    V  |         |         |         |
2+32       0.3126      2.10  | Q    V  |         |         |         |
2+33       0.3155      2.11  | Q    V  |         |         |         |
2+34       0.3185      2.13  | Q    V  |         |         |         |
2+35       0.3214      2.15  | Q    V  |         |         |         |
2+36       0.3244      2.17  | Q    V  |         |         |         |
2+37       0.3274      2.19  | Q    V  |         |         |         |
2+38       0.3305      2.21  | Q    V  |         |         |         |
2+39       0.3336      2.24  | Q    V  |         |         |         |
2+40       0.3367      2.26  | Q     V |         |         |         |
2+41       0.3398      2.28  | Q     V |         |         |         |
2+42       0.3430      2.30  | Q     V |         |         |         |
2+43       0.3462      2.31  | Q     V |         |         |         |
2+44       0.3493      2.32  | Q     V |         |         |         |
2+45       0.3526      2.33  | Q     V |         |         |         |
2+46       0.3558      2.34  | Q     V |         |         |         |
2+47       0.3590      2.36  | Q     V |         |         |         |
2+48       0.3623      2.37  | Q     V |         |         |         |
2+49       0.3656      2.38  | Q     V |         |         |         |
2+50       0.3689      2.39  | Q     V |         |         |         |
2+51       0.3722      2.41  | Q     V |         |         |         |
2+52       0.3755      2.43  | Q     V |         |         |         |
2+53       0.3789      2.46  | Q      V|         |         |         |
2+54       0.3824      2.49  | Q      V|         |         |         |
2+55       0.3858      2.52  | Q      V|         |         |         |
2+56       0.3894      2.55  | Q      V|         |         |         |
2+57       0.3929      2.58  | Q      V|         |         |         |
2+58       0.3965      2.61  | Q      V|         |         |         |
2+59       0.4001      2.64  | Q      V|         |         |         |
3+ 0       0.4038      2.67  | Q      V|         |         |         |
3+ 1       0.4075      2.69  | Q      V|         |         |         |
3+ 2       0.4112      2.70  | Q      V|         |         |         |
3+ 3       0.4150      2.72  |  Q     V|         |         |         |
3+ 4       0.4188      2.74  |  Q      V         |         |         |
3+ 5       0.4226      2.76  |  Q      V         |         |         |
3+ 6       0.4264      2.77  |  Q      V         |         |         |
3+ 7       0.4302      2.79  |  Q      V         |         |         |
3+ 8       0.4341      2.81  |  Q      V         |         |         |
3+ 9       0.4380      2.83  |  Q      V         |         |         |
3+10       0.4419      2.87  |  Q      V         |         |         |
3+11       0.4460      2.92  |  Q      V         |         |         |
3+12       0.4501      2.97  |  Q      V         |         |         |
3+13       0.4542      3.01  |  Q      V         |         |         |
3+14       0.4584      3.06  |  Q      V         |         |         |
3+15       0.4627      3.10  |  Q      |V        |         |         |
```





5+ 8	1.5483	1.92	Q			V
5+ 9	1.5510	1.90	Q			V
5+10	1.5536	1.88	Q			V
5+11	1.5561	1.86	Q			V
5+12	1.5587	1.84	Q			V
5+13	1.5612	1.82	Q			V
5+14	1.5636	1.80	Q			V
5+15	1.5661	1.78	Q			V
5+16	1.5685	1.77	Q			V
5+17	1.5709	1.75	Q			V
5+18	1.5733	1.73	Q			V
5+19	1.5757	1.72	Q			V
5+20	1.5780	1.70	Q			V
5+21	1.5804	1.69	Q			V
5+22	1.5827	1.67	Q			V
5+23	1.5849	1.65	Q			V
5+24	1.5872	1.64	Q			V
5+25	1.5894	1.62	Q			V
5+26	1.5916	1.61	Q			V
5+27	1.5938	1.60	Q			V
5+28	1.5960	1.58	Q			V
5+29	1.5982	1.57	Q			V
5+30	1.6003	1.56	Q			V
5+31	1.6025	1.55	Q			V
5+32	1.6046	1.53	Q			V
5+33	1.6067	1.52	Q			V
5+34	1.6087	1.51	Q			V
5+35	1.6108	1.50	Q			V
5+36	1.6129	1.49	Q			V
5+37	1.6149	1.48	Q			V
5+38	1.6169	1.47	Q			V
5+39	1.6189	1.45	Q			V
5+40	1.6209	1.44	Q			V
5+41	1.6229	1.43	Q			V
5+42	1.6248	1.42	Q			V
5+43	1.6268	1.41	Q			V
5+44	1.6287	1.40	Q			V
5+45	1.6306	1.39	Q			V
5+46	1.6325	1.38	Q			V
5+47	1.6344	1.38	Q			V
5+48	1.6363	1.37	Q			V
5+49	1.6382	1.36	Q			V
5+50	1.6400	1.35	Q			V
5+51	1.6419	1.34	Q			V
5+52	1.6437	1.33	Q			V
5+53	1.6455	1.32	Q			V
5+54	1.6473	1.31	Q			V
5+55	1.6491	1.31	Q			V
5+56	1.6509	1.30	Q			V
5+57	1.6527	1.29	Q			V
5+58	1.6545	1.28	Q			V
5+59	1.6562	1.27	Q			V
6+ 0	1.6580	1.27	Q			V
6+ 1	1.6597	1.26	Q			V
6+ 2	1.6614	1.25	Q			V
6+ 3	1.6631	1.24	Q			V

```
    6+ 4       1.6648      1.24  |Q        |         |         |        V|
    6+ 5       1.6665      1.23  |Q        |         |         |        V|
    6+ 6       1.6682      1.22  |Q        |         |         |        V|
    6+ 7       1.6699      1.22  |Q        |         |         |        V|
    6+ 8       1.6716      1.21  |Q        |         |         |        V|
    6+ 9       1.6732      1.20  |Q        |         |         |         V
-------------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      100.000 to Point/Station        1.100
**** CONFLUENCE OF MAIN STREAMS ****
__________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     11.980(Ac.)
Runoff from this stream =     36.163(CFS)
Time of concentration =    9.21 min.
Rainfall intensity =     6.220(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      400.000 to Point/Station      401.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________________
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
[COMMERCIAL area type                         ]
(Neighborhod Commercial )
Impervious value, Ai = 0.800
Sub-Area C Value = 0.780
Initial subarea total flow distance  =   99.940(Ft.)
Highest elevation = 1500.000(Ft.)
Lowest elevation = 1497.300(Ft.)
Elevation difference =    2.700(Ft.) Slope =  2.702 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 85.00 (Ft)
for the top area slope value of   2.70 %, in a development type of
 Neighborhod Commercial
In Accordance With Figure 3-3
Initial Area Time of Concentration =   3.81 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.7800)*(  85.000^.5)/(   2.700^(1/3)]=   3.81
Calculated TC of    3.814 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      9.222(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.780
Subarea runoff =      0.503(CFS)
Total initial stream area =        0.070(Ac.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station        1.100
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________________
Calculated TC of    3.814 minutes is less than 5 minutes,
 resetting TC to 5.0 minutes for rainfall intensity calculations
Rainfall intensity (I) =      9.222(In/Hr) for a   100.0 year storm
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Time of concentration =     3.81 min.
Rainfall intensity =      9.222(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.304  CA =      2.602
Subarea runoff =     23.487(CFS) for      8.490(Ac.)
Total runoff =     23.991(CFS)  Total area =       8.560(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station        1.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________________
Upstream point/station elevation =  1460.000(Ft.)
Downstream point/station elevation =  1433.000(Ft.)
Pipe length  =   446.00(Ft.) Slope =   0.0605  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.991(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    23.991(CFS)
Normal flow depth in pipe =   13.71(In.)
Flow top width inside pipe =   15.34(In.)
Critical depth could not be calculated.
Pipe flow velocity =     16.61(Ft/s)
Travel time through pipe =    0.45 min.
Time of concentration (TC) =     4.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.100 to Point/Station        1.100
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      8.560(Ac.)
Runoff from this stream =     23.991(CFS)
Time of concentration =    4.26 min.
Rainfall intensity =     9.222(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
```

```
 No.       (CFS)       (min)                 (In/Hr)


1       36.163      9.21                  6.220
2       23.991      4.26                  9.222
Qmax(1) =
           1.000 *    1.000 *    36.163) +
           0.675 *    1.000 *    23.991) + =      52.346
Qmax(2) =
           1.000 *    0.463 *    36.163) +
           1.000 *    1.000 *    23.991) + =      40.729

Total of 2 main streams to confluence:
Flow rates before confluence point:
      36.163      23.991
Maximum flow rates at confluence using above data:
       52.346       40.729
Area of streams before confluence:
       11.980        8.560


Results of confluence:
Total flow rate =     52.346(CFS)
Time of concentration =     9.206 min.
Effective stream area after confluence  =     20.540(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.100 to Point/Station        1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1433.000(Ft.)
Downstream point/station elevation =  1432.250(Ft.)
Pipe length  =   150.00(Ft.) Slope =   0.0050  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.346(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    52.346(CFS)
Normal flow depth in pipe =   28.83(In.)
Flow top width inside pipe =   34.25(In.)
Critical Depth =   27.73(In.)
Pipe flow velocity =      7.96(Ft/s)
Travel time through pipe =    0.31 min.
Time of concentration (TC) =     9.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.200
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.540(Ac.)
Runoff from this stream =     52.346(CFS)
Time of concentration =    9.52 min.
Rainfall intensity =     6.087(In/Hr)
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________________
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
[LOW DENSITY RESIDENTIAL                      ]
(1.0 DU/A or Less       )
Impervious value, Ai = 0.100
Sub-Area C Value = 0.360
Initial subarea total flow distance  =   97.330(Ft.)
Highest elevation = 1469.200(Ft.)
Lowest elevation = 1468.100(Ft.)
Elevation difference =    1.100(Ft.) Slope =  1.130 %
Top of Initial Area Slope adjusted by User to  1.100 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 70.00 (Ft)
for the top area slope value of   1.10 %, in a development type of
 1.0 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =  10.80 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.3600)*(  70.000^.5)/(   1.100^(1/3)]=  10.80
Rainfall intensity (I) =      5.613(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.360
Subarea runoff =      0.121(CFS)
Total initial stream area =        0.060(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      202.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________________
Top of street segment elevation =  1468.100(Ft.)
End of street segment elevation =  1441.750(Ft.)
Length of street segment  =   649.570(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  46.000(Ft.)
Distance from crown to crossfall grade break  =  44.500(Ft.)
Slope from gutter to grade break (v/hz) =   1.000
Slope from grade break to crown (v/hz)  =   1.000
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   5.500(Ft.)
Slope from curb to property line (v/hz) =   2.000
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  0.125(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0120
 Manning's N from grade break to crown =  0.0120
Estimated mean flow rate at midpoint of street =      5.804(CFS)
Depth of flow =   0.398(Ft.), Average velocity =   8.730(Ft/s)
Streetflow hydraulics at midpoint of street travel:
```

```
Halfstreet flow width =   1.888(Ft.)
Flow velocity =   8.73(Ft/s)
Travel time =    1.24 min.     TC =   12.04  min.
 Adding area flow to street
Rainfall intensity (I) =      5.233(In/Hr) for a   100.0 year storm
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
[MEDIUM DENSITY RESIDENTIAL                  ]
(4.3 DU/A or Less       )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Rainfall intensity =      5.233(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.478  CA =      2.206
Subarea runoff =     11.420(CFS) for      4.550(Ac.)
Total runoff =     11.541(CFS)  Total area =       4.610(Ac.)
Street flow at end of street =     11.541(CFS)
Half street flow at end of street =     11.541(CFS)
Depth of flow =   0.603(Ft.), Average velocity =  10.735(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    0.05(Ft.)
Flow width (from curb towards crown)=   2.093(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      202.000
**** 6 HOUR HYDROGRAPH ****
______________________________________________________________________
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003


Time of Concentration =  12.04
Basin Area =    25.15 Acres
6 Hour Rainfall =  3.500 Inches
Runoff Coefficient =  0.088
Peak Discharge =    11.54 CFS
     Time (Min)     Discharge (CFS)
       0               0.000
       12               0.463
       24               0.473
       36               0.496
       48               0.508
       60               0.536
       72               0.551
       84               0.585
       96               0.604
       108               0.648
       120               0.673
       132               0.732
       144               0.766
       156               0.850
       168               0.901
       180               1.033
```

192	1.120
204	1.369
216	1.559
228	2.290
240	3.226
252	11.541
264	1.836
276	1.229
288	0.961
300	0.805
312	0.701
324	0.625
336	0.567
348	0.522
360	0.484
372	0.453

++

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

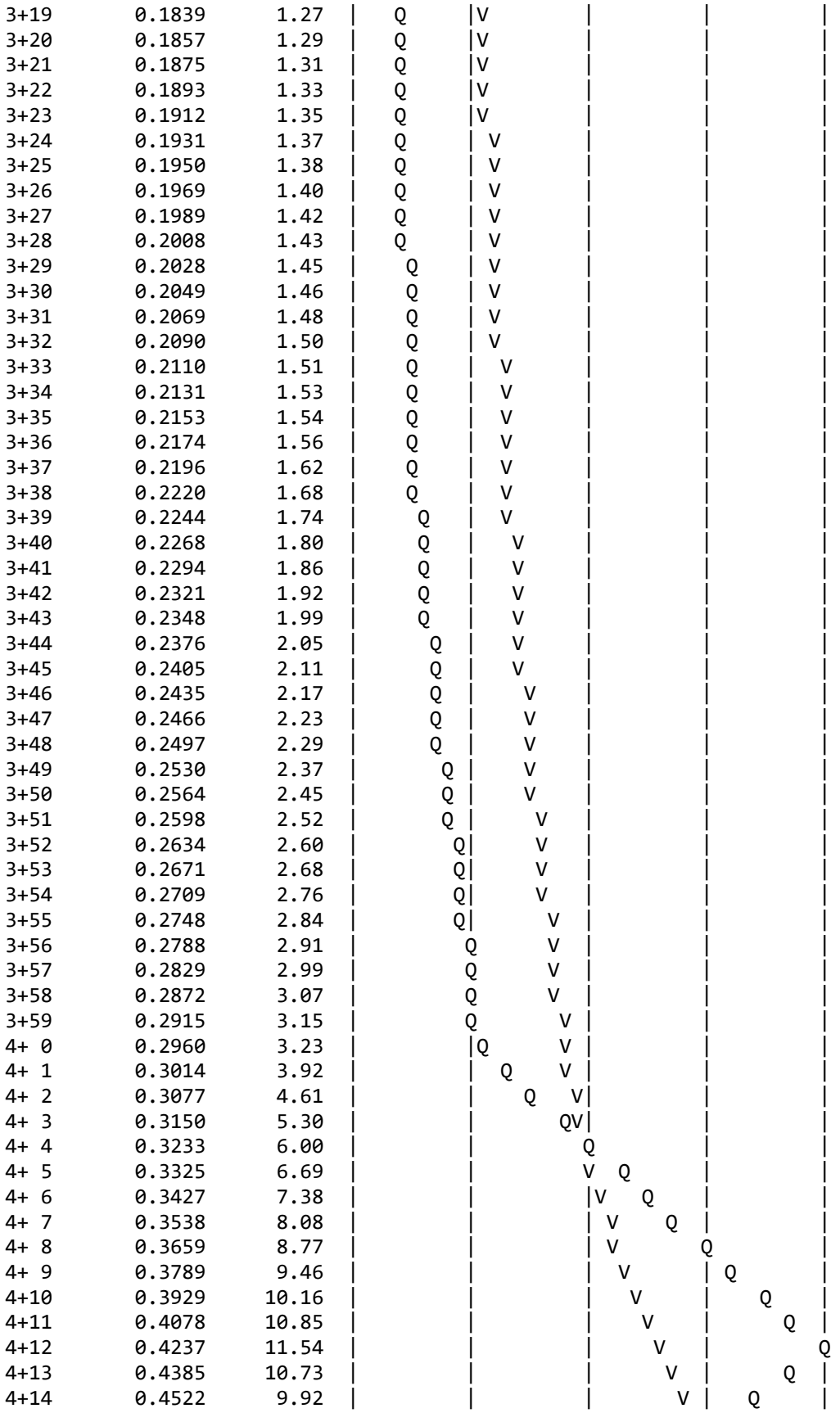
Hydrograph in 1 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.9	5.8	8.7	11.5
0+ 0	0.0000	0.00	Q	|	|	|	|
0+ 1	0.0001	0.04	Q	|	|	|	|
0+ 2	0.0002	0.08	Q	|	|	|	|
0+ 3	0.0003	0.12	Q	|	|	|	|
0+ 4	0.0005	0.15	Q	|	|	|	|
0+ 5	0.0008	0.19	Q	|	|	|	|
0+ 6	0.0011	0.23	Q	|	|	|	|
0+ 7	0.0015	0.27	Q	|	|	|	|
0+ 8	0.0019	0.31	VQ	|	|	|	|
0+ 9	0.0024	0.35	VQ	|	|	|	|
0+10	0.0029	0.39	VQ	|	|	|	|
0+11	0.0035	0.42	VQ	|	|	|	|
0+12	0.0041	0.46	VQ	|	|	|	|
0+13	0.0048	0.46	VQ	|	|	|	|
0+14	0.0054	0.46	VQ	|	|	|	|
0+15	0.0061	0.47	VQ	|	|	|	|
0+16	0.0067	0.47	VQ	|	|	|	|
0+17	0.0073	0.47	VQ	|	|	|	|
0+18	0.0080	0.47	VQ	|	|	|	|
0+19	0.0086	0.47	VQ	|	|	|	|
0+20	0.0093	0.47	VQ	|	|	|	|
0+21	0.0099	0.47	VQ	|	|	|	|
0+22	0.0106	0.47	VQ	|	|	|	|
0+23	0.0112	0.47	VQ	|	|	|	|
0+24	0.0119	0.47	VQ	|	|	|	|
0+25	0.0125	0.48	VQ	|	|	|	|
0+26	0.0132	0.48	VQ	|	|	|	|
0+27	0.0139	0.48	VQ	|	|	|	|
0+28	0.0145	0.48	VQ	|	|	|	|
0+29	0.0152	0.48	VQ	|	|	|	|
0+30	0.0158	0.48	VQ	|	|	|	|

0+31	0.0165	0.49	|Q	|	|	|	|
0+32	0.0172	0.49	|Q	|	|	|	|
0+33	0.0179	0.49	|Q	|	|	|	|
0+34	0.0185	0.49	|Q	|	|	|	|
0+35	0.0192	0.49	|Q	|	|	|	|
0+36	0.0199	0.50	|Q	|	|	|	|
0+37	0.0206	0.50	|Q	|	|	|	|
0+38	0.0213	0.50	|Q	|	|	|	|
0+39	0.0220	0.50	|Q	|	|	|	|
0+40	0.0227	0.50	|Q	|	|	|	|
0+41	0.0233	0.50	|Q	|	|	|	|
0+42	0.0240	0.50	|Q	|	|	|	|
0+43	0.0247	0.50	|Q	|	|	|	|
0+44	0.0254	0.50	|Q	|	|	|	|
0+45	0.0261	0.51	|Q	|	|	|	|
0+46	0.0268	0.51	|Q	|	|	|	|
0+47	0.0275	0.51	|Q	|	|	|	|
0+48	0.0282	0.51	|Q	|	|	|	|
0+49	0.0289	0.51	|Q	|	|	|	|
0+50	0.0296	0.51	|Q	|	|	|	|
0+51	0.0303	0.52	|Q	|	|	|	|
0+52	0.0310	0.52	|Q	|	|	|	|
0+53	0.0318	0.52	|Q	|	|	|	|
0+54	0.0325	0.52	|QV	|	|	|	|
0+55	0.0332	0.52	|QV	|	|	|	|
0+56	0.0339	0.53	|QV	|	|	|	|
0+57	0.0347	0.53	|QV	|	|	|	|
0+58	0.0354	0.53	|QV	|	|	|	|
0+59	0.0361	0.53	|QV	|	|	|	|
1+ 0	0.0369	0.54	|QV	|	|	|	|
1+ 1	0.0376	0.54	|QV	|	|	|	|
1+ 2	0.0383	0.54	|QV	|	|	|	|
1+ 3	0.0391	0.54	|QV	|	|	|	|
1+ 4	0.0398	0.54	|QV	|	|	|	|
1+ 5	0.0406	0.54	|QV	|	|	|	|
1+ 6	0.0413	0.54	|QV	|	|	|	|
1+ 7	0.0421	0.54	|QV	|	|	|	|
1+ 8	0.0428	0.55	|QV	|	|	|	|
1+ 9	0.0436	0.55	|QV	|	|	|	|
1+10	0.0443	0.55	|QV	|	|	|	|
1+11	0.0451	0.55	|QV	|	|	|	|
1+12	0.0459	0.55	|QV	|	|	|	|
1+13	0.0466	0.55	|QV	|	|	|	|
1+14	0.0474	0.56	|QV	|	|	|	|
1+15	0.0482	0.56	|QV	|	|	|	|
1+16	0.0489	0.56	|Q V	|	|	|	|
1+17	0.0497	0.57	|Q V	|	|	|	|
1+18	0.0505	0.57	|Q V	|	|	|	|
1+19	0.0513	0.57	|Q V	|	|	|	|
1+20	0.0521	0.57	|Q V	|	|	|	|
1+21	0.0529	0.58	|Q V	|	|	|	|
1+22	0.0537	0.58	| QV	|	|	|	|
1+23	0.0545	0.58	| QV	|	|	|	|
1+24	0.0553	0.59	| QV	|	|	|	|
1+25	0.0561	0.59	| QV	|	|	|	|
1+26	0.0569	0.59	| QV	|	|	|	|

1+27	0.0577	0.59	QV			
1+28	0.0585	0.59	QV			
1+29	0.0593	0.59	QV			
1+30	0.0602	0.59	QV			
1+31	0.0610	0.60	QV			
1+32	0.0618	0.60	QV			
1+33	0.0626	0.60	QV			
1+34	0.0635	0.60	QV			
1+35	0.0643	0.60	QV			
1+36	0.0651	0.60	Q V			
1+37	0.0660	0.61	Q V			
1+38	0.0668	0.61	Q V			
1+39	0.0676	0.62	Q V			
1+40	0.0685	0.62	Q V			
1+41	0.0694	0.62	Q V			
1+42	0.0702	0.63	Q V			
1+43	0.0711	0.63	Q V			
1+44	0.0720	0.63	Q V			
1+45	0.0728	0.64	Q V			
1+46	0.0737	0.64	Q V			
1+47	0.0746	0.64	Q V			
1+48	0.0755	0.65	Q V			
1+49	0.0764	0.65	Q V			
1+50	0.0773	0.65	Q V			
1+51	0.0782	0.65	Q V			
1+52	0.0791	0.66	Q V			
1+53	0.0800	0.66	Q V			
1+54	0.0809	0.66	Q V			
1+55	0.0818	0.66	Q V			
1+56	0.0827	0.66	Q V			
1+57	0.0837	0.67	Q V			
1+58	0.0846	0.67	Q V			
1+59	0.0855	0.67	Q V			
2+ 0	0.0864	0.67	Q V			
2+ 1	0.0874	0.68	Q V			
2+ 2	0.0883	0.68	Q V			
2+ 3	0.0893	0.69	Q V			
2+ 4	0.0902	0.69	Q V			
2+ 5	0.0912	0.70	Q V			
2+ 6	0.0921	0.70	Q V			
2+ 7	0.0931	0.71	Q V			
2+ 8	0.0941	0.71	Q V			
2+ 9	0.0951	0.72	Q V			
2+10	0.0961	0.72	Q V			
2+11	0.0971	0.73	Q V			
2+12	0.0981	0.73	Q V			
2+13	0.0991	0.73	Q V			
2+14	0.1001	0.74	Q V			
2+15	0.1011	0.74	Q V			
2+16	0.1022	0.74	Q V			
2+17	0.1032	0.75	Q V			
2+18	0.1042	0.75	Q V			
2+19	0.1052	0.75	Q V			
2+20	0.1063	0.75	Q V			
2+21	0.1073	0.76	Q V			
2+22	0.1084	0.76	Q V			

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2+23       0.1094      0.76  | Q   V   |         |         |         |
2+24       0.1105      0.77  | Q   V   |         |         |         |
2+25       0.1116      0.77  | Q   V   |         |         |         |
2+26       0.1126      0.78  | Q    V  |         |         |         |
2+27       0.1137      0.79  | Q    V  |         |         |         |
2+28       0.1148      0.79  | Q    V  |         |         |         |
2+29       0.1159      0.80  | Q    V  |         |         |         |
2+30       0.1170      0.81  | Q    V  |         |         |         |
2+31       0.1181      0.81  | Q    V  |         |         |         |
2+32       0.1193      0.82  | Q    V  |         |         |         |
2+33       0.1204      0.83  | Q    V  |         |         |         |
2+34       0.1216      0.84  | Q    V  |         |         |         |
2+35       0.1227      0.84  | Q    V  |         |         |         |
2+36       0.1239      0.85  | Q    V  |         |         |         |
2+37       0.1251      0.85  | Q    V  |         |         |         |
2+38       0.1263      0.86  | Q    V  |         |         |         |
2+39       0.1274      0.86  | Q    V  |         |         |         |
2+40       0.1286      0.87  |  Q    V |         |         |         |
2+41       0.1298      0.87  |  Q    V |         |         |         |
2+42       0.1310      0.88  |  Q    V |         |         |         |
2+43       0.1323      0.88  |  Q    V |         |         |         |
2+44       0.1335      0.88  |  Q    V |         |         |         |
2+45       0.1347      0.89  |  Q    V |         |         |         |
2+46       0.1359      0.89  |  Q    V |         |         |         |
2+47       0.1372      0.90  |  Q    V |         |         |         |
2+48       0.1384      0.90  |  Q    V |         |         |         |
2+49       0.1397      0.91  |  Q    V |         |         |         |
2+50       0.1409      0.92  |  Q    V |         |         |         |
2+51       0.1422      0.93  |  Q    V |         |         |         |
2+52       0.1435      0.95  |  Q    V |         |         |         |
2+53       0.1448      0.96  |  Q     V|         |         |         |
2+54       0.1462      0.97  |  Q     V|         |         |         |
2+55       0.1475      0.98  |  Q     V|         |         |         |
2+56       0.1489      0.99  |  Q     V|         |         |         |
2+57       0.1503      1.00  |  Q     V|         |         |         |
2+58       0.1517      1.01  |  Q     V|         |         |         |
2+59       0.1531      1.02  |  Q     V|         |         |         |
3+ 0       0.1545      1.03  |  Q     V|         |         |         |
3+ 1       0.1559      1.04  |  Q     V|         |         |         |
3+ 2       0.1574      1.05  |  Q     V|         |         |         |
3+ 3       0.1588      1.05  |  Q     V|         |         |         |
3+ 4       0.1603      1.06  |  Q     V|         |         |         |
3+ 5       0.1617      1.07  |  Q      V         |         |         |
3+ 6       0.1632      1.08  |  Q      V         |         |         |
3+ 7       0.1647      1.08  |  Q      V         |         |         |
3+ 8       0.1662      1.09  |  Q      V         |         |         |
3+ 9       0.1677      1.10  |  Q      V         |         |         |
3+10       0.1693      1.11  |  Q      V         |         |         |
3+11       0.1708      1.11  |  Q      V         |         |         |
3+12       0.1723      1.12  |  Q      V         |         |         |
3+13       0.1739      1.14  |  Q      V         |         |         |
3+14       0.1755      1.16  |   Q     V         |         |         |
3+15       0.1771      1.18  |   Q     |V        |         |         |
3+16       0.1788      1.20  |   Q     |V        |         |         |
3+17       0.1805      1.22  |   Q     |V        |         |         |
3+18       0.1822      1.24  |   Q     |V        |         |         |
```


3+19 0.1839 1.27
3+20 0.1857 1.29
3+21 0.1875 1.31
3+22 0.1893 1.33
3+23 0.1912 1.35
3+24 0.1931 1.37
3+25 0.1950 1.38
3+26 0.1969 1.40
3+27 0.1989 1.42
3+28 0.2008 1.43
3+29 0.2028 1.45
3+30 0.2049 1.46
3+31 0.2069 1.48
3+32 0.2090 1.50
3+33 0.2110 1.51
3+34 0.2131 1.53
3+35 0.2153 1.54
3+36 0.2174 1.56
3+37 0.2196 1.62
3+38 0.2220 1.68
3+39 0.2244 1.74
3+40 0.2268 1.80
3+41 0.2294 1.86
3+42 0.2321 1.92
3+43 0.2348 1.99
3+44 0.2376 2.05
3+45 0.2405 2.11
3+46 0.2435 2.17
3+47 0.2466 2.23
3+48 0.2497 2.29
3+49 0.2530 2.37
3+50 0.2564 2.45
3+51 0.2598 2.52
3+52 0.2634 2.60
3+53 0.2671 2.68
3+54 0.2709 2.76
3+55 0.2748 2.84
3+56 0.2788 2.91
3+57 0.2829 2.99
3+58 0.2872 3.07
3+59 0.2915 3.15
4+ 0 0.2960 3.23
4+ 1 0.3014 3.92
4+ 2 0.3077 4.61
4+ 3 0.3150 5.30
4+ 4 0.3233 6.00
4+ 5 0.3325 6.69
4+ 6 0.3427 7.38
4+ 7 0.3538 8.08
4+ 8 0.3659 8.77
4+ 9 0.3789 9.46
4+10 0.3929 10.16
4+11 0.4078 10.85
4+12 0.4237 11.54
4+13 0.4385 10.73
4+14 0.4522 9.92

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4+15       0.4647      9.12  |          |          |        V |Q         |
4+16       0.4762      8.31  |          |          |        QV|          |
4+17       0.4865      7.50  |          |          |     Q    V          |
4+18       0.4957      6.69  |          |          |  Q       V          |
4+19       0.5038      5.88  |          |          Q          |V         |
4+20       0.5108      5.07  |          |       Q  |          |V         |
4+21       0.5167      4.26  |          |    Q     |          | V        |
4+22       0.5214      3.45  |          |Q         |          | V        |
4+23       0.5251      2.65  |          Q|         |          | V        |
4+24       0.5276      1.84  |       Q  |         |          | V        |
4+25       0.5301      1.79  |       Q  |         |          | V        |
4+26       0.5325      1.74  |       Q  |         |          |  V       |
4+27       0.5348      1.68  |     Q    |         |          |  V       |
4+28       0.5370      1.63  |     Q    |         |          |  V       |
4+29       0.5392      1.58  |     Q    |         |          |  V       |
4+30       0.5413      1.53  |     Q    |         |          |  V       |
4+31       0.5434      1.48  |     Q    |         |          |  V       |
4+32       0.5453      1.43  |    Q     |         |          |  V       |
4+33       0.5472      1.38  |    Q     |         |          |   V      |
4+34       0.5491      1.33  |    Q     |         |          |   V      |
4+35       0.5508      1.28  |    Q     |         |          |   V      |
4+36       0.5525      1.23  |    Q     |         |          |   V      |
4+37       0.5542      1.21  |    Q     |         |          |   V      |
4+38       0.5558      1.18  |    Q     |         |          |   V      |
4+39       0.5574      1.16  |    Q     |         |          |   V      |
4+40       0.5590      1.14  |  Q       |         |          |   V      |
4+41       0.5605      1.12  |  Q       |         |          |   V      |
4+42       0.5620      1.10  |  Q       |         |          |   V      |
4+43       0.5635      1.07  |  Q       |         |          |    V     |
4+44       0.5650      1.05  |  Q       |         |          |    V     |
4+45       0.5664      1.03  |  Q       |         |          |    V     |
4+46       0.5678      1.01  |  Q       |         |          |    V     |
4+47       0.5691      0.98  |  Q       |         |          |    V     |
4+48       0.5704      0.96  |  Q       |         |          |    V     |
4+49       0.5717      0.95  |  Q       |         |          |    V     |
4+50       0.5730      0.94  |  Q       |         |          |    V     |
4+51       0.5743      0.92  |  Q       |         |          |    V     |
4+52       0.5756      0.91  |  Q       |         |          |    V     |
4+53       0.5768      0.90  |  Q       |         |          |    V     |
4+54       0.5780      0.88  |  Q       |         |          |    V     |
4+55       0.5792      0.87  |  Q       |         |          |     V    |
4+56       0.5804      0.86  | Q        |         |          |     V    |
4+57       0.5815      0.84  | Q        |         |          |     V    |
4+58       0.5827      0.83  | Q        |         |          |     V    |
4+59       0.5838      0.82  | Q        |         |          |     V    |
5+ 0       0.5849      0.81  | Q        |         |          |     V    |
5+ 1       0.5860      0.80  | Q        |         |          |     V    |
5+ 2       0.5871      0.79  | Q        |         |          |     V    |
5+ 3       0.5882      0.78  | Q        |         |          |     V    |
5+ 4       0.5892      0.77  | Q        |         |          |     V    |
5+ 5       0.5903      0.76  | Q        |         |          |     V    |
5+ 6       0.5913      0.75  | Q        |         |          |     V    |
5+ 7       0.5924      0.74  | Q        |         |          |     V    |
5+ 8       0.5934      0.74  | Q        |         |          |     V    |
5+ 9       0.5944      0.73  | Q        |         |          |     V    |
5+10       0.5954      0.72  | Q        |         |          |      V   |
```

5+11	0.5963	0.71	Q				V
5+12	0.5973	0.70	Q				V
5+13	0.5983	0.69	Q				V
5+14	0.5992	0.69	Q				V
5+15	0.6001	0.68	Q				V
5+16	0.6011	0.68	Q				V
5+17	0.6020	0.67	Q				V
5+18	0.6029	0.66	Q				V
5+19	0.6038	0.66	Q				V
5+20	0.6047	0.65	Q				V
5+21	0.6056	0.64	Q				V
5+22	0.6065	0.64	Q				V
5+23	0.6074	0.63	Q				V
5+24	0.6082	0.63	Q				V
5+25	0.6091	0.62	Q				V
5+26	0.6099	0.62	Q				V
5+27	0.6108	0.61	Q				V
5+28	0.6116	0.61	Q				V
5+29	0.6124	0.60	Q				V
5+30	0.6132	0.60	Q				V
5+31	0.6141	0.59	Q				V
5+32	0.6149	0.59	Q				V
5+33	0.6157	0.58	Q				V
5+34	0.6165	0.58	Q				V
5+35	0.6172	0.57	Q				V
5+36	0.6180	0.57	Q				V
5+37	0.6188	0.56	Q				V
5+38	0.6196	0.56	Q				V
5+39	0.6203	0.56	Q				V
5+40	0.6211	0.55	Q				V
5+41	0.6219	0.55	Q				V
5+42	0.6226	0.54	Q				V
5+43	0.6234	0.54	Q				V
5+44	0.6241	0.54	Q				V
5+45	0.6248	0.53	Q				V
5+46	0.6256	0.53	Q				V
5+47	0.6263	0.53	Q				V
5+48	0.6270	0.52	Q				V
5+49	0.6277	0.52	Q				V
5+50	0.6284	0.52	Q				V
5+51	0.6291	0.51	Q				V
5+52	0.6298	0.51	Q				V
5+53	0.6305	0.51	Q				V
5+54	0.6312	0.50	Q				V
5+55	0.6319	0.50	Q				V
5+56	0.6326	0.50	Q				V
5+57	0.6333	0.49	Q				V
5+58	0.6339	0.49	Q				V
5+59	0.6346	0.49	Q				V
6+ 0	0.6353	0.48	Q				V
6+ 1	0.6359	0.48	Q				V
6+ 2	0.6366	0.48	Q				V
6+ 3	0.6373	0.48	Q				V
6+ 4	0.6379	0.47	Q				V
6+ 5	0.6386	0.47	Q				V
6+ 6	0.6392	0.47	Q				V

```
    6+ 7       0.6399      0.47  |Q        |         |         |        V|
    6+ 8       0.6405      0.46  |Q        |         |         |        V|
    6+ 9       0.6411      0.46  |Q        |         |         |        V|
    6+10       0.6418      0.46  |Q        |         |         |        V|
    6+11       0.6424      0.46  |Q        |         |         |        V|
    6+12       0.6430      0.45  |Q        |         |         |         V
-------------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      202.000 to Point/Station        1.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1438.750(Ft.)
Downstream point/station elevation =  1432.250(Ft.)
Pipe length  =   403.80(Ft.) Slope =   0.0161  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.541(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.541(CFS)
Normal flow depth in pipe =   12.94(In.)
Flow top width inside pipe =   16.19(In.)
Critical Depth =   15.54(In.)
Pipe flow velocity =      8.49(Ft/s)
Travel time through pipe =    0.79 min.
Time of concentration (TC) =    12.83 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station        1.200
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.610(Ac.)
Runoff from this stream =     11.541(CFS)
Time of concentration =   12.83 min.
Rainfall intensity =     5.022(In/Hr)
Summary of stream data:

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


1       52.346      9.52                6.087
2       11.541     12.83                5.022
Qmax(1) =
           1.000 *    1.000 *    52.346) +
           1.000 *    0.742 *    11.541) + =      60.911
Qmax(2) =
           0.825 *    1.000 *    52.346) +
           1.000 *    1.000 *    11.541) + =      54.727
```

```
Total of 2 main streams to confluence:
Flow rates before confluence point:
      52.346      11.541
Maximum flow rates at confluence using above data:
       60.911       54.727
Area of streams before confluence:
       20.540        4.610


Results of confluence:
Total flow rate =     60.911(CFS)
Time of concentration =     9.520 min.
Effective stream area after confluence  =     25.150(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.200 to Point/Station        1.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1432.250(Ft.)
Downstream point/station elevation =  1430.300(Ft.)
Pipe length  =   390.90(Ft.) Slope =   0.0050  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    60.911(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    60.911(CFS)
Normal flow depth in pipe =   29.95(In.)
Flow top width inside pipe =   37.99(In.)
Critical Depth =   29.37(In.)
Pipe flow velocity =      8.30(Ft/s)
Travel time through pipe =    0.78 min.
Time of concentration (TC) =    10.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.300 to Point/Station        1.300
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     25.150(Ac.)
Runoff from this stream =     60.911(CFS)
Time of concentration =   10.31 min.
Rainfall intensity =     5.784(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
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
[MEDIUM DENSITY RESIDENTIAL                  ]
(4.3 DU/A or Less       )
```

```
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
Initial subarea total flow distance  =   88.000(Ft.)
Highest elevation = 1451.610(Ft.)
Lowest elevation = 1447.990(Ft.)
Elevation difference =    3.620(Ft.) Slope =  4.114 %
INITIAL AREA TIME OF CONCENTRATION CALCULATIONS:
The maximum overland flow distance is 100.00 (Ft)
for the top area slope value of   4.11 %, in a development type of
 4.3 DU/A or Less
In Accordance With Figure 3-3
Initial Area Time of Concentration =   6.96 minutes
TC = [1.8*(1.1-C)*distance(Ft.)^.5)/(% slope^(1/3)]
TC = [1.8*(1.1-0.4800)*( 100.000^.5)/(   4.114^(1/3)]=   6.96
Rainfall intensity (I) =      7.447(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.480
Subarea runoff =      1.680(CFS)
Total initial stream area =        0.470(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of street segment elevation =  1447.990(Ft.)
End of street segment elevation =  1437.380(Ft.)
Length of street segment  =   366.970(Ft.)
Height of curb above gutter flowline  =    6.0(In.)
Width of half street (curb to crown)  =  46.000(Ft.)
Distance from crown to crossfall grade break  =  44.500(Ft.)
Slope from gutter to grade break (v/hz) =   1.000
Slope from grade break to crown (v/hz)  =   1.000
Street flow is on [1] side(s) of the street
Distance from curb to property line  =   5.500(Ft.)
Slope from curb to property line (v/hz) =   2.000
Gutter width =   1.500(Ft.)
Gutter hike from flowline =  0.125(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =      5.490(CFS)
Depth of flow =   0.438(Ft.), Average velocity =   7.405(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =   1.928(Ft.)
Flow velocity =   7.40(Ft/s)
Travel time =    0.83 min.     TC =    7.79  min.
 Adding area flow to street
Rainfall intensity (I) =      6.927(In/Hr) for a   100.0 year storm
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
[MEDIUM DENSITY RESIDENTIAL                  ]
(4.3 DU/A or Less       )
Impervious value, Ai = 0.300
Sub-Area C Value = 0.480
```

```
Rainfall intensity =      6.927(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.480  CA =      1.330
Subarea runoff =      7.531(CFS) for      2.300(Ac.)
Total runoff =      9.211(CFS)  Total area =       2.770(Ac.)
Street flow at end of street =      9.211(CFS)
Half street flow at end of street =      9.211(CFS)
Depth of flow =   0.602(Ft.), Average velocity =   8.582(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    0.05(Ft.)
Flow width (from curb towards crown)=   2.092(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      302.000
**** 6 HOUR HYDROGRAPH ****
________________________________________________________________________
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Hydrograph Data - Section 6, San Diego County Hydrology manual, June 2003


Time of Concentration =   7.79
Basin Area =    27.92 Acres
6 Hour Rainfall =  3.500 Inches
Runoff Coefficient =  0.048
Peak Discharge =     9.21 CFS
     Time (Min)     Discharge (CFS)
       0               0.000
       7               0.279
       14               0.283
       21               0.290
       28               0.294
       35               0.303
       42               0.307
       49               0.317
       56               0.322
       63               0.333
       70               0.338
       77               0.350
       84               0.357
       91               0.371
       98               0.379
       105               0.395
       112               0.404
       119               0.423
       126               0.434
       133               0.457
       140               0.470
       147               0.499
       154               0.516
       161               0.553
       168               0.575
       175               0.624
       182               0.654
       189               0.725
       196               0.769
```

203	0.882
210	0.956
217	1.168
224	1.331
231	1.954
238	2.753
245	9.211
252	1.567
259	1.049
266	0.821
273	0.687
280	0.598
287	0.534
294	0.484
301	0.445
308	0.413
315	0.386
322	0.364
329	0.344
336	0.327
343	0.312
350	0.299
357	0.287
364	0.276

++

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

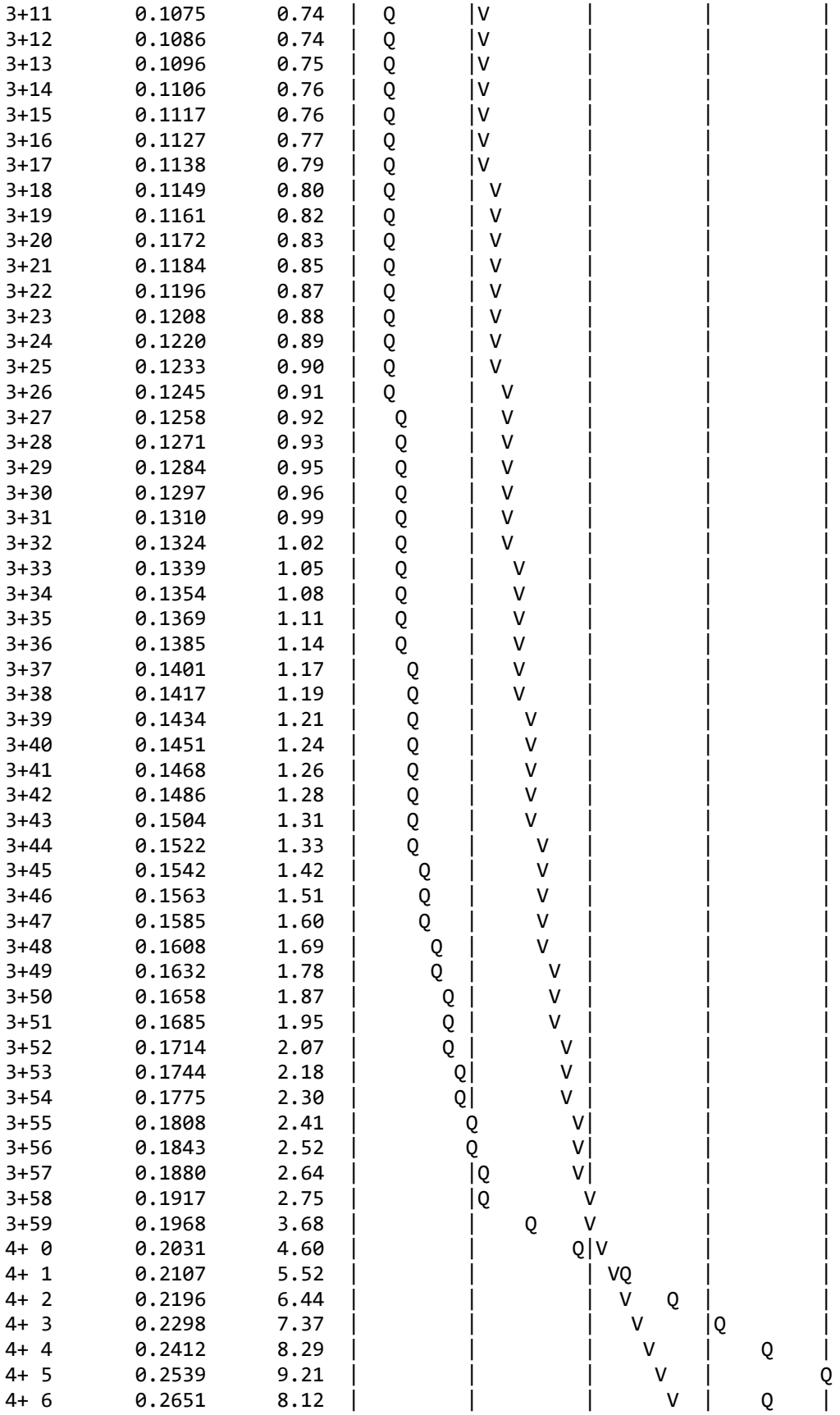
Hydrograph in 1 Minute intervals ((CFS))

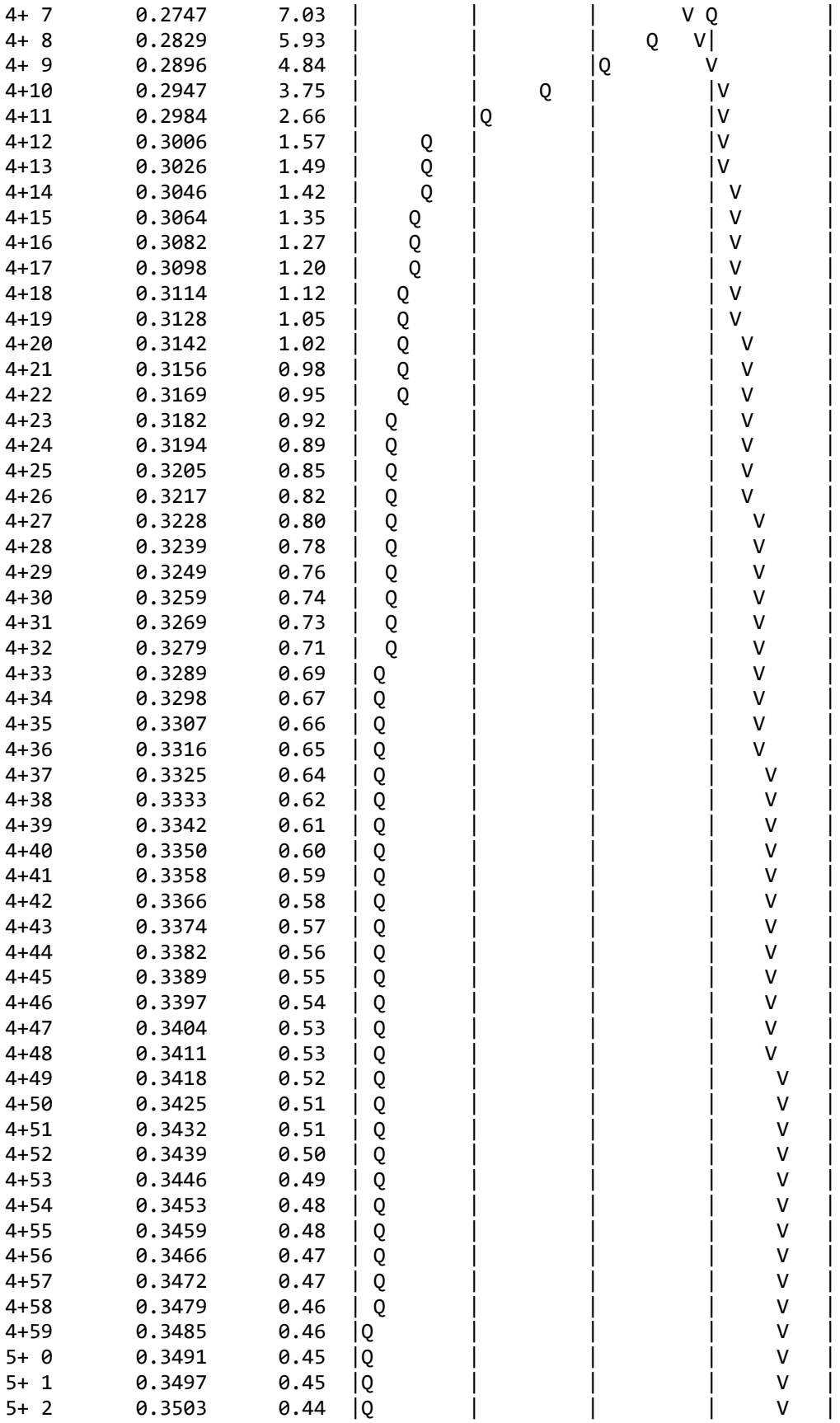
Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.3	4.6	6.9	9.2
0+ 0	0.0000	0.00	Q	|	|	|	|
0+ 1	0.0001	0.04	Q	|	|	|	|
0+ 2	0.0002	0.08	Q	|	|	|	|
0+ 3	0.0003	0.12	Q	|	|	|	|
0+ 4	0.0005	0.16	Q	|	|	|	|
0+ 5	0.0008	0.20	Q	|	|	|	|
0+ 6	0.0012	0.24	VQ	|	|	|	|
0+ 7	0.0015	0.28	VQ	|	|	|	|
0+ 8	0.0019	0.28	VQ	|	|	|	|
0+ 9	0.0023	0.28	VQ	|	|	|	|
0+10	0.0027	0.28	VQ	|	|	|	|
0+11	0.0031	0.28	VQ	|	|	|	|
0+12	0.0035	0.28	VQ	|	|	|	|
0+13	0.0039	0.28	VQ	|	|	|	|
0+14	0.0042	0.28	VQ	|	|	|	|
0+15	0.0046	0.28	VQ	|	|	|	|
0+16	0.0050	0.28	VQ	|	|	|	|
0+17	0.0054	0.29	VQ	|	|	|	|
0+18	0.0058	0.29	VQ	|	|	|	|
0+19	0.0062	0.29	VQ	|	|	|	|
0+20	0.0066	0.29	VQ	|	|	|	|
0+21	0.0070	0.29	VQ	|	|	|	|
0+22	0.0074	0.29	VQ	|	|	|	|

```
0+23      0.0078     0.29  VQ       |         |         |         |
0+24      0.0082     0.29  VQ       |         |         |         |
0+25      0.0086     0.29  VQ       |         |         |         |
0+26      0.0090     0.29  VQ       |         |         |         |
0+27      0.0094     0.29  VQ       |         |         |         |
0+28      0.0098     0.29  |Q       |         |         |         |
0+29      0.0102     0.30  |Q       |         |         |         |
0+30      0.0107     0.30  |Q       |         |         |         |
0+31      0.0111     0.30  |Q       |         |         |         |
0+32      0.0115     0.30  |Q       |         |         |         |
0+33      0.0119     0.30  |Q       |         |         |         |
0+34      0.0123     0.30  |Q       |         |         |         |
0+35      0.0127     0.30  |Q       |         |         |         |
0+36      0.0131     0.30  |Q       |         |         |         |
0+37      0.0136     0.30  |Q       |         |         |         |
0+38      0.0140     0.30  |Q       |         |         |         |
0+39      0.0144     0.31  |Q       |         |         |         |
0+40      0.0148     0.31  |Q       |         |         |         |
0+41      0.0152     0.31  |Q       |         |         |         |
0+42      0.0157     0.31  |Q       |         |         |         |
0+43      0.0161     0.31  |Q       |         |         |         |
0+44      0.0165     0.31  |Q       |         |         |         |
0+45      0.0170     0.31  |Q       |         |         |         |
0+46      0.0174     0.31  |Q       |         |         |         |
0+47      0.0178     0.31  |Q       |         |         |         |
0+48      0.0183     0.32  |Q       |         |         |         |
0+49      0.0187     0.32  |Q       |         |         |         |
0+50      0.0191     0.32  |QV      |         |         |         |
0+51      0.0196     0.32  |QV      |         |         |         |
0+52      0.0200     0.32  |QV      |         |         |         |
0+53      0.0204     0.32  |QV      |         |         |         |
0+54      0.0209     0.32  |QV      |         |         |         |
0+55      0.0213     0.32  |QV      |         |         |         |
0+56      0.0218     0.32  |QV      |         |         |         |
0+57      0.0222     0.32  |QV      |         |         |         |
0+58      0.0227     0.32  |QV      |         |         |         |
0+59      0.0231     0.33  |QV      |         |         |         |
1+ 0      0.0236     0.33  |QV      |         |         |         |
1+ 1      0.0240     0.33  |QV      |         |         |         |
1+ 2      0.0245     0.33  |QV      |         |         |         |
1+ 3      0.0249     0.33  |QV      |         |         |         |
1+ 4      0.0254     0.33  |QV      |         |         |         |
1+ 5      0.0259     0.33  |QV      |         |         |         |
1+ 6      0.0263     0.34  |QV      |         |         |         |
1+ 7      0.0268     0.34  |QV      |         |         |         |
1+ 8      0.0272     0.34  |QV      |         |         |         |
1+ 9      0.0277     0.34  |QV      |         |         |         |
1+10      0.0282     0.34  |QV      |         |         |         |
1+11      0.0286     0.34  |Q V     |         |         |         |
1+12      0.0291     0.34  |Q V     |         |         |         |
1+13      0.0296     0.34  |Q V     |         |         |         |
1+14      0.0301     0.35  |Q V     |         |         |         |
1+15      0.0305     0.35  |Q V     |         |         |         |
1+16      0.0310     0.35  |Q V     |         |         |         |
1+17      0.0315     0.35  |Q V     |         |         |         |
1+18      0.0320     0.35  |Q V     |         |         |         |
```

```
1+19       0.0325      0.35  |Q V      |          |          |          |
1+20       0.0330      0.35  |Q V      |          |          |          |
1+21       0.0334      0.35  |Q V      |          |          |          |
1+22       0.0339      0.36  |Q V      |          |          |          |
1+23       0.0344      0.36  |Q V      |          |          |          |
1+24       0.0349      0.36  |Q V      |          |          |          |
1+25       0.0354      0.36  |Q V      |          |          |          |
1+26       0.0359      0.36  |Q V      |          |          |          |
1+27       0.0364      0.36  |Q V      |          |          |          |
1+28       0.0369      0.36  |Q V      |          |          |          |
1+29       0.0374      0.37  |Q V      |          |          |          |
1+30       0.0379      0.37  |Q V      |          |          |          |
1+31       0.0384      0.37  |Q  V     |          |          |          |
1+32       0.0389      0.37  |Q  V     |          |          |          |
1+33       0.0395      0.37  |Q  V     |          |          |          |
1+34       0.0400      0.37  |Q  V     |          |          |          |
1+35       0.0405      0.38  |Q  V     |          |          |          |
1+36       0.0410      0.38  |Q  V     |          |          |          |
1+37       0.0415      0.38  |Q  V     |          |          |          |
1+38       0.0421      0.38  |Q  V     |          |          |          |
1+39       0.0426      0.38  |Q  V     |          |          |          |
1+40       0.0431      0.38  |Q  V     |          |          |          |
1+41       0.0436      0.39  |Q  V     |          |          |          |
1+42       0.0442      0.39  |Q  V     |          |          |          |
1+43       0.0447      0.39  |Q  V     |          |          |          |
1+44       0.0452      0.39  |Q  V     |          |          |          |
1+45       0.0458      0.39  |Q  V     |          |          |          |
1+46       0.0463      0.40  |Q  V     |          |          |          |
1+47       0.0469      0.40  |Q  V     |          |          |          |
1+48       0.0474      0.40  |Q   V    |          |          |          |
1+49       0.0480      0.40  |Q   V    |          |          |          |
1+50       0.0485      0.40  |Q   V    |          |          |          |
1+51       0.0491      0.40  |Q   V    |          |          |          |
1+52       0.0496      0.40  |Q   V    |          |          |          |
1+53       0.0502      0.41  |Q   V    |          |          |          |
1+54       0.0508      0.41  |Q   V    |          |          |          |
1+55       0.0513      0.41  |Q   V    |          |          |          |
1+56       0.0519      0.41  |Q   V    |          |          |          |
1+57       0.0525      0.42  |Q   V    |          |          |          |
1+58       0.0531      0.42  |Q   V    |          |          |          |
1+59       0.0536      0.42  |Q   V    |          |          |          |
2+ 0       0.0542      0.42  |Q   V    |          |          |          |
2+ 1       0.0548      0.43  |Q   V    |          |          |          |
2+ 2       0.0554      0.43  |Q   V    |          |          |          |
2+ 3       0.0560      0.43  |Q   V    |          |          |          |
2+ 4       0.0566      0.43  |Q   V    |          |          |          |
2+ 5       0.0572      0.43  |Q    V   |          |          |          |
2+ 6       0.0578      0.43  |Q    V   |          |          |          |
2+ 7       0.0584      0.44  |Q    V   |          |          |          |
2+ 8       0.0590      0.44  |Q    V   |          |          |          |
2+ 9       0.0596      0.44  |Q    V   |          |          |          |
2+10       0.0602      0.45  |Q    V   |          |          |          |
2+11       0.0608      0.45  |Q    V   |          |          |          |
2+12       0.0615      0.45  |Q    V   |          |          |          |
2+13       0.0621      0.46  |Q    V   |          |          |          |
2+14       0.0627      0.46  |Q    V   |          |          |          |
```

```
2+15       0.0634      0.46  | Q   V   |         |         |         |
2+16       0.0640      0.46  | Q   V   |         |         |         |
2+17       0.0646      0.46  | Q   V   |         |         |         |
2+18       0.0653      0.47  | Q   V   |         |         |         |
2+19       0.0659      0.47  | Q   V   |         |         |         |
2+20       0.0666      0.47  | Q    V  |         |         |         |
2+21       0.0672      0.47  | Q    V  |         |         |         |
2+22       0.0679      0.48  | Q    V  |         |         |         |
2+23       0.0686      0.48  | Q    V  |         |         |         |
2+24       0.0692      0.49  | Q    V  |         |         |         |
2+25       0.0699      0.49  | Q    V  |         |         |         |
2+26       0.0706      0.50  | Q    V  |         |         |         |
2+27       0.0713      0.50  | Q    V  |         |         |         |
2+28       0.0720      0.50  | Q    V  |         |         |         |
2+29       0.0727      0.50  | Q    V  |         |         |         |
2+30       0.0734      0.51  | Q    V  |         |         |         |
2+31       0.0741      0.51  | Q    V  |         |         |         |
2+32       0.0748      0.51  | Q    V  |         |         |         |
2+33       0.0755      0.51  | Q    V  |         |         |         |
2+34       0.0762      0.52  | Q     V |         |         |         |
2+35       0.0769      0.52  | Q     V |         |         |         |
2+36       0.0776      0.53  | Q     V |         |         |         |
2+37       0.0784      0.53  | Q     V |         |         |         |
2+38       0.0791      0.54  | Q     V |         |         |         |
2+39       0.0798      0.54  | Q     V |         |         |         |
2+40       0.0806      0.55  | Q     V |         |         |         |
2+41       0.0814      0.55  | Q     V |         |         |         |
2+42       0.0821      0.56  | Q     V |         |         |         |
2+43       0.0829      0.56  | Q     V |         |         |         |
2+44       0.0837      0.56  | Q     V |         |         |         |
2+45       0.0845      0.57  | Q     V |         |         |         |
2+46       0.0852      0.57  | Q     V |         |         |         |
2+47       0.0860      0.57  | Q      V|         |         |         |
2+48       0.0868      0.57  | Q      V|         |         |         |
2+49       0.0876      0.58  | Q      V|         |         |         |
2+50       0.0884      0.59  | Q      V|         |         |         |
2+51       0.0892      0.60  | Q      V|         |         |         |
2+52       0.0901      0.60  | Q      V|         |         |         |
2+53       0.0909      0.61  | Q      V|         |         |         |
2+54       0.0918      0.62  | Q      V|         |         |         |
2+55       0.0926      0.62  | Q      V|         |         |         |
2+56       0.0935      0.63  | Q      V|         |         |         |
2+57       0.0944      0.63  | Q      V|         |         |         |
2+58       0.0952      0.64  | Q       V         |         |         |
2+59       0.0961      0.64  | Q       V         |         |         |
3+ 0       0.0970      0.65  | Q       V         |         |         |
3+ 1       0.0979      0.65  | Q       V         |         |         |
3+ 2       0.0988      0.65  | Q       V         |         |         |
3+ 3       0.0997      0.66  | Q       V         |         |         |
3+ 4       0.1007      0.67  | Q       V         |         |         |
3+ 5       0.1016      0.68  | Q       V         |         |         |
3+ 6       0.1026      0.69  |  Q      V         |         |         |
3+ 7       0.1035      0.70  |  Q      V         |         |         |
3+ 8       0.1045      0.72  |  Q      |V        |         |         |
3+ 9       0.1055      0.73  |  Q      |V        |         |         |
3+10       0.1065      0.73  |  Q      |V        |         |         |
```




4+ 7 0.2747 7.03
4+ 8 0.2829 5.93
4+ 9 0.2896 4.84
4+10 0.2947 3.75
4+11 0.2984 2.66
4+12 0.3006 1.57
4+13 0.3026 1.49
4+14 0.3046 1.42
4+15 0.3064 1.35
4+16 0.3082 1.27
4+17 0.3098 1.20
4+18 0.3114 1.12
4+19 0.3128 1.05
4+20 0.3142 1.02
4+21 0.3156 0.98
4+22 0.3169 0.95
4+23 0.3182 0.92
4+24 0.3194 0.89
4+25 0.3205 0.85
4+26 0.3217 0.82
4+27 0.3228 0.80
4+28 0.3239 0.78
4+29 0.3249 0.76
4+30 0.3259 0.74
4+31 0.3269 0.73
4+32 0.3279 0.71
4+33 0.3289 0.69
4+34 0.3298 0.67
4+35 0.3307 0.66
4+36 0.3316 0.65
4+37 0.3325 0.64
4+38 0.3333 0.62
4+39 0.3342 0.61
4+40 0.3350 0.60
4+41 0.3358 0.59
4+42 0.3366 0.58
4+43 0.3374 0.57
4+44 0.3382 0.56
4+45 0.3389 0.55
4+46 0.3397 0.54
4+47 0.3404 0.53
4+48 0.3411 0.53
4+49 0.3418 0.52
4+50 0.3425 0.51
4+51 0.3432 0.51
4+52 0.3439 0.50
4+53 0.3446 0.49
4+54 0.3453 0.48
4+55 0.3459 0.48
4+56 0.3466 0.47
4+57 0.3472 0.47
4+58 0.3479 0.46
4+59 0.3485 0.46
5+ 0 0.3491 0.45
5+ 1 0.3497 0.45
5+ 2 0.3503 0.44

```
5+ 3       0.3509      0.44  |Q        |         |         |     V   |
5+ 4       0.3515      0.43  |Q        |         |         |      V  |
5+ 5       0.3521      0.43  |Q        |         |         |      V  |
5+ 6       0.3527      0.42  |Q        |         |         |      V  |
5+ 7       0.3533      0.42  |Q        |         |         |      V  |
5+ 8       0.3538      0.41  |Q        |         |         |      V  |
5+ 9       0.3544      0.41  |Q        |         |         |      V  |
5+10       0.3550      0.41  |Q        |         |         |      V  |
5+11       0.3555      0.40  |Q        |         |         |      V  |
5+12       0.3561      0.40  |Q        |         |         |      V  |
5+13       0.3566      0.39  |Q        |         |         |      V  |
5+14       0.3571      0.39  |Q        |         |         |      V  |
5+15       0.3577      0.39  |Q        |         |         |      V  |
5+16       0.3582      0.38  |Q        |         |         |      V  |
5+17       0.3587      0.38  |Q        |         |         |      V  |
5+18       0.3593      0.38  |Q        |         |         |      V  |
5+19       0.3598      0.37  |Q        |         |         |      V  |
5+20       0.3603      0.37  |Q        |         |         |      V  |
5+21       0.3608      0.37  |Q        |         |         |       V |
5+22       0.3613      0.36  |Q        |         |         |       V |
5+23       0.3618      0.36  |Q        |         |         |       V |
5+24       0.3623      0.36  |Q        |         |         |       V |
5+25       0.3628      0.36  |Q        |         |         |       V |
5+26       0.3632      0.35  |Q        |         |         |       V |
5+27       0.3637      0.35  |Q        |         |         |       V |
5+28       0.3642      0.35  |Q        |         |         |       V |
5+29       0.3647      0.34  |Q        |         |         |       V |
5+30       0.3652      0.34  |Q        |         |         |       V |
5+31       0.3656      0.34  |Q        |         |         |       V |
5+32       0.3661      0.34  |Q        |         |         |       V |
5+33       0.3665      0.33  |Q        |         |         |       V |
5+34       0.3670      0.33  |Q        |         |         |       V |
5+35       0.3675      0.33  |Q        |         |         |       V |
5+36       0.3679      0.33  |Q        |         |         |       V |
5+37       0.3684      0.32  |Q        |         |         |       V |
5+38       0.3688      0.32  |Q        |         |         |       V |
5+39       0.3692      0.32  |Q        |         |         |       V |
5+40       0.3697      0.32  |Q        |         |         |       V |
5+41       0.3701      0.32  |Q        |         |         |        V|
5+42       0.3705      0.31  |Q        |         |         |        V|
5+43       0.3710      0.31  |Q        |         |         |        V|
5+44       0.3714      0.31  |Q        |         |         |        V|
5+45       0.3718      0.31  |Q        |         |         |        V|
5+46       0.3723      0.31  |Q        |         |         |        V|
5+47       0.3727      0.30  |Q        |         |         |        V|
5+48       0.3731      0.30  |Q        |         |         |        V|
5+49       0.3735      0.30  |Q        |         |         |        V|
5+50       0.3739      0.30  |Q        |         |         |        V|
5+51       0.3743      0.30  |Q        |         |         |        V|
5+52       0.3747      0.30  |Q        |         |         |        V|
5+53       0.3751      0.29  |Q        |         |         |        V|
5+54       0.3755      0.29  |Q        |         |         |        V|
5+55       0.3759      0.29  |Q        |         |         |        V|
5+56       0.3763      0.29  |Q        |         |         |        V|
5+57       0.3767      0.29  |Q        |         |         |        V|
5+58       0.3771      0.28  |Q        |         |         |        V|
```

```
    5+59       0.3775      0.28  |Q        |         |         |        V|
    6+ 0       0.3779      0.28  |Q        |         |         |        V|
    6+ 1       0.3783      0.28  |Q        |         |         |        V|
    6+ 2       0.3787      0.28  |Q        |         |         |        V|
    6+ 3       0.3790      0.28  |Q        |         |         |        V|
    6+ 4       0.3794      0.28  |Q        |         |         |         V
------------------------------------------------------------------------
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station        1.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1432.400(Ft.)
Downstream point/station elevation =  1430.300(Ft.)
Pipe length  =   116.70(Ft.) Slope =   0.0180  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.211(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.211(CFS)
Normal flow depth in pipe =   10.61(In.)
Flow top width inside pipe =   17.71(In.)
Critical Depth =   14.08(In.)
Pipe flow velocity =      8.50(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =     8.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.300 to Point/Station        1.300
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.770(Ac.)
Runoff from this stream =      9.211(CFS)
Time of concentration =    8.02 min.
Rainfall intensity =     6.799(In/Hr)
Summary of stream data:

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


1       60.911     10.31                5.784
2        9.211      8.02                6.799
Qmax(1) =
           1.000 *    1.000 *    60.911) +
           0.851 *    1.000 *     9.211) + =      68.746
Qmax(2) =
           1.000 *    0.778 *    60.911) +
           1.000 *    1.000 *     9.211) + =      56.612
```

```
Total of 2 main streams to confluence:
Flow rates before confluence point:
      60.911       9.211
Maximum flow rates at confluence using above data:
       68.746       56.612
Area of streams before confluence:
       25.150        2.770


Results of confluence:
Total flow rate =     68.746(CFS)
Time of concentration =    10.305 min.
Effective stream area after confluence  =     27.920(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.300 to Point/Station        1.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1430.300(Ft.)
Downstream point/station elevation =  1429.440(Ft.)
Pipe length  =   169.00(Ft.) Slope =   0.0051  Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    68.746(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    68.746(CFS)
Normal flow depth in pipe =   32.91(In.)
Flow top width inside pipe =   34.60(In.)
Critical Depth =   31.20(In.)
Pipe flow velocity =      8.49(Ft/s)
Travel time through pipe =    0.33 min.
Time of concentration (TC) =    10.64 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.300 to Point/Station        1.400
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
Rainfall intensity (I) =      5.667(In/Hr) for a   100.0 year storm
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
[UNDISTURBED NATURAL TERRAIN                ]
(Permanent Open Space   )
Impervious value, Ai = 0.000
Sub-Area C Value = 0.300
Time of concentration =    10.64 min.
Rainfall intensity =      5.667(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for total area
(Q=KCIA) is C = 0.420  CA =     12.304
Subarea runoff =      0.981(CFS) for      1.390(Ac.)
Total runoff =     69.727(CFS)  Total area =      29.310(Ac.)
End of computations, total study area =          29.310 (Ac.)
```

APPENDIX C
San Diego County Hydrology Maps

Soil Map—San Diego County Area, California
(WARM-021)



Map Scale: 1:3,280 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 19, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded	7.5	37.7%
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	12.3	62.3%
Totals for Area of Interest		**19.8**	**100.0%**

San Diego County Area, California

FaD2—Fallbrook sandy loam, 9 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hbbv
Elevation: 200 to 3,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Fallbrook and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 12 inches: loam
H3 - 12 to 28 inches: sandy clay loam
H4 - 28 to 47 inches: loam
H5 - 47 to 51 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Vista
Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba
Percent of map unit: 2 percent
Hydric soil rating: No

Bonsall
Percent of map unit: 2 percent
Hydric soil rating: No

Las posas
Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 20, Aug 30, 2024

San Diego County Area, California

PeC—Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19

Map Unit Setting

National map unit symbol: 2tyyn
Elevation: 150 to 2,950 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 270 to 360 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Placentia and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Placentia

Setting

Landform: Terraces, alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Alluvium derived from granitoid

Typical profile

A1 - 0 to 4 inches: sandy loam
A2 - 4 to 13 inches: sandy loam
Bt1 - 13 to 21 inches: sandy clay
Bt2 - 21 to 34 inches: sandy clay
BC - 34 to 53 inches: sandy clay loam
C - 53 to 63 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R019XD061CA - CLAYPAN
Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 5 percent
Hydric soil rating: No

Fallbrook

Percent of map unit: 5 percent
Hydric soil rating: No

Ramona

Percent of map unit: 4 percent
Hydric soil rating: No

Typic natrixeralfs, occasionally ponded

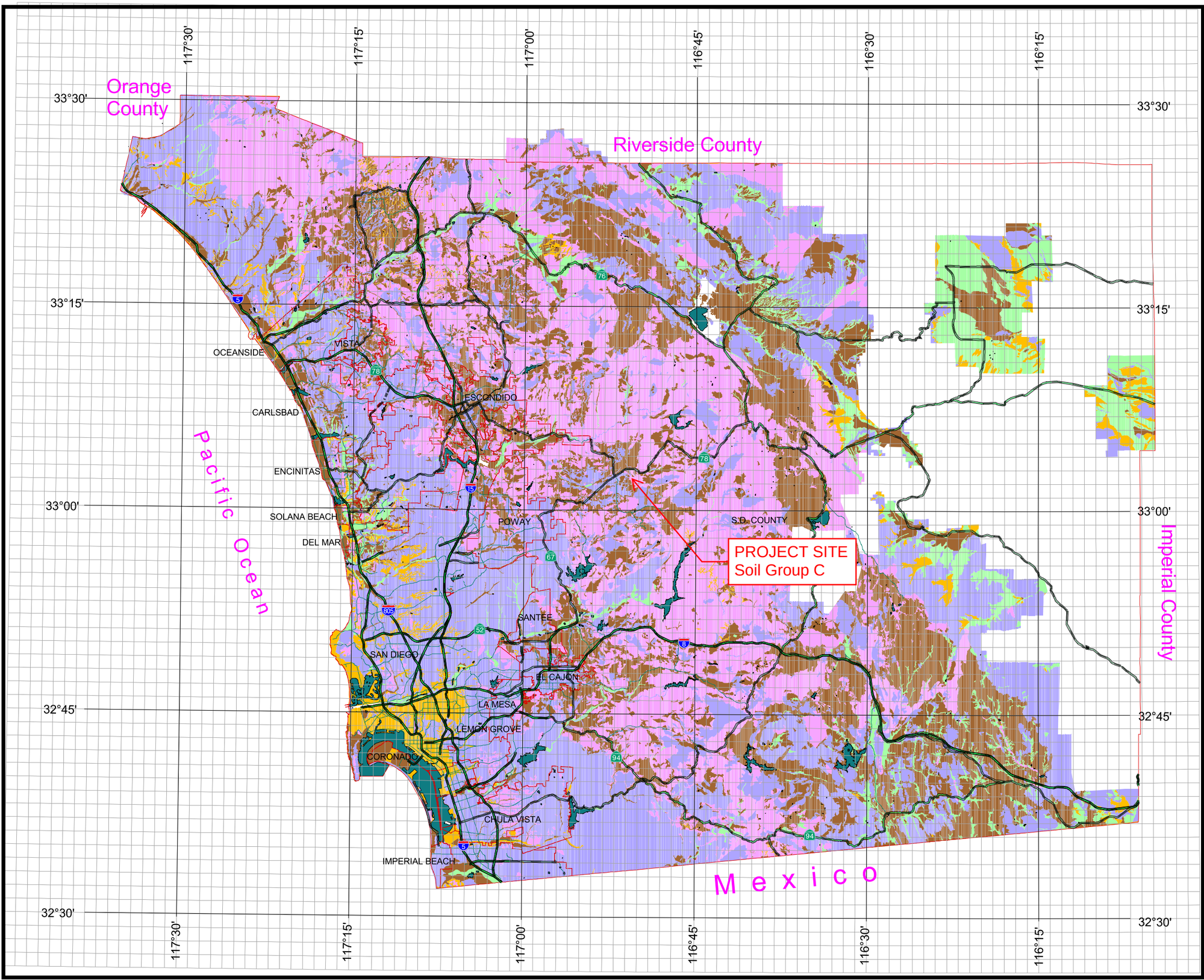
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 20, Aug 30, 2024

County of San Diego Hydrology Manual

Soil Hydrologic Groups



Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

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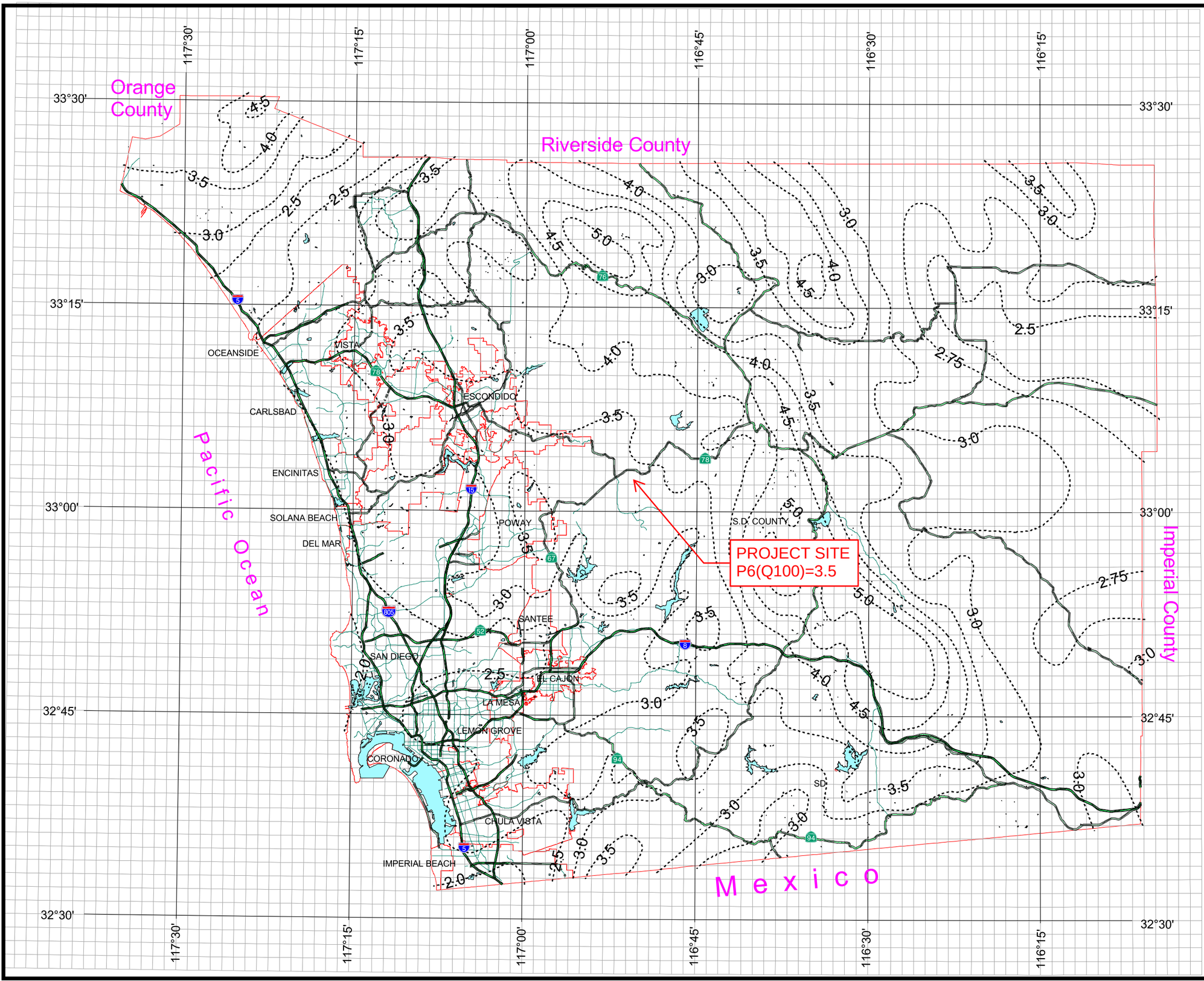
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)



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Department of Public Works
Geographic Information Services

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3 0 3 Miles

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County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

PROJECT SITE
P24(Q100)=6.0

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
POWAY
S.D. COUNTY
DEL MAR
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

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N W E S

3 0 3 Miles

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REACH ID	NAME
1	Santa Margarita River
2	San Luis Rey River
3	Buena Vista Creek
4	Agua Hedionda Creek
5	San Marcos Creek
6	Encinitas Creek
7	Cottonwood Creek (Carlsbad WMA)
8	Escondido Creek
9	San Dieguito Creek - Reach 1
10	San Dieguito Creek - Reach 2
11	Lusardi Creek
12	Los Penasquitos / Poway Creek
13	Rattlesnake Creek
14	Carroll Canyon Creek
15	Rose Creek
16	San Diego River
17	Sycamore Creek
18	Woodlan Way Creek
19	El Capitan Reservoir
20	Forester Creek
21	Chollas Creek
22	Sweetwater River - Reach 1
23	Sweetwater River - Reach 2
24	Otay River
25	Jamul / Dulzura Creek
26	Tijuana River
27	Cottonwood Creek (Tijuana WMA)

Legend

- Regional WMAA Streams
- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams
- Potential Critical Coarse Sediment Yield Areas

Aerial Imagery Source: DigitalGlobe, 06/2012

Miles 0 5 10 15

NORTH

Potential Critical Coarse Sediment Yield Areas

Regional San Diego County Watersheds

Exhibit Date: Sept. 8, 2014

Geosyntec consultants

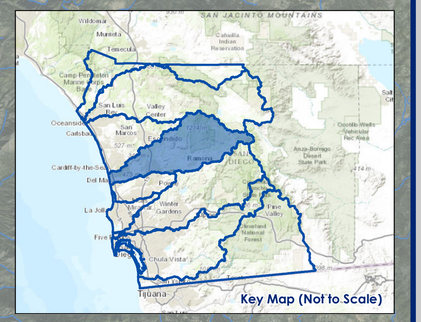
RICK Engineering Company

San Dieguito Watershed Management Area
HU 905.00, 346 mi2

Legend

- **Watershed Boundaries**
- **Municipal Boundaries**
- **Regional WMAA Streams**
- **Exempt Bodies:** Water Storage Reservoirs, Lakes, Enclosed Embayments, Pacific Ocean, Buena Vista Lagoon
- **Exempt River Reaches:** Reaches of San Luis Rey River, San Dieguito River, San Diego River, Forester Creek, Sweetwater River, Otay River
- **Exempt Conveyance Systems:** Existing underground storm drains or conveyance channels whose bed and bank are concrete-lined, discharging directly to exempt water bodies, exempt rivers, or localized areas of Agua Hedionda Lagoon and Batiquitos Lagoon

San Luis Rey River
VISTA
Buena Vista Creek
Agua Hedionda Creek
CARLSBAD
SAN MARCOS
ESCONDIDO
Escondido Creek
San Marcos Creek
Encinitas Creek
S.D. COUNTY
Santa Ysabel Creek
San Dieguito River
PROJECT SITE
ENCINITAS
Lusardi Creek
POWAY
Los Penasquitos Creek
SAN DIEGO
Carroll Canyon Creek
Rose Creek
SANTEE
MIRAMAR RESERVOIR
San Diego River



Aerial Imagery Source: DigitalGlobe, 06/2012

0 3.75 7.5 15 Miles

NORTH

Receiving Waters and Conveyance Systems Exempt from Hydromodification Management Requirements

Exhibit Date: Sept. 8, 2014

Geosyntec consultants

RICK ENGINEERING COMPANY

APPENDIX D
Hydraulic Calculations

Hydraulic Analysis Report

Project Data

Project Title: WARM-021

Designer:

Project Date: Wednesday, July 29, 2026

Project Units: U.S. Customary Units

Notes:

Detention Basin Analysis: Basin P1

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
6.00	0.69

Discharge Input Parameters

Riser: Riser 1

Circular Opening

Opening Diameter: 4.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 5.0000 ft

Base Elevation: 0.0000 ft

Weir: Weir 2

Weir Length: 4.0000 ft

Weir Coefficient: 3.1000

Height above base: 5.0000 ft

Base Elevation: 0.0000 ft

Riser: Orifice 1

Circular Opening

Opening Diameter: 0.0800 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 0.0000 ft

Base Elevation: 0.0000 ft

Riser: Orifice 2

Circular Opening

Opening Diameter: 0.1670 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 2.5000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
6.00	0.69	14.05

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 36.160 cfs, Time to Peak: 252.00 (min), Total Inflow Volume: 72990.46 ft^3

Time (min)	Discharge cfs
0.00	0.00
1.00	0.13
2.00	0.26
3.00	0.39
4.00	0.53
5.00	0.66

6.00	0.79
7.00	0.92
8.00	1.05
9.00	1.18
10.00	1.19
11.00	1.19
12.00	1.20
13.00	1.20
14.00	1.21
15.00	1.21
16.00	1.21
17.00	1.22
18.00	1.22
19.00	1.23
20.00	1.23
21.00	1.23
22.00	1.23
23.00	1.23
24.00	1.24
25.00	1.24
26.00	1.24
27.00	1.24
28.00	1.25
29.00	1.25
30.00	1.26
31.00	1.26
32.00	1.27
33.00	1.27
34.00	1.28
35.00	1.28
36.00	1.29
37.00	1.29
38.00	1.29
39.00	1.30
40.00	1.30
41.00	1.30
42.00	1.30
43.00	1.31
44.00	1.31
45.00	1.31
46.00	1.32
47.00	1.32
48.00	1.33
49.00	1.34
50.00	1.34
51.00	1.35
52.00	1.35
53.00	1.36
54.00	1.36
55.00	1.37

56.00	1.37
57.00	1.37
58.00	1.38
59.00	1.38
60.00	1.38
61.00	1.39
62.00	1.39
63.00	1.39
64.00	1.40
65.00	1.41
66.00	1.41
67.00	1.42
68.00	1.43
69.00	1.43
70.00	1.44
71.00	1.45
72.00	1.45
73.00	1.46
74.00	1.46
75.00	1.46
76.00	1.47
77.00	1.47
78.00	1.47
79.00	1.48
80.00	1.48
81.00	1.49
82.00	1.49
83.00	1.50
84.00	1.51
85.00	1.52
86.00	1.52
87.00	1.53
88.00	1.54
89.00	1.55
90.00	1.56
91.00	1.56
92.00	1.57
93.00	1.57
94.00	1.57
95.00	1.58
96.00	1.58
97.00	1.59
98.00	1.59
99.00	1.60
100.00	1.61
101.00	1.61
102.00	1.62
103.00	1.63
104.00	1.64
105.00	1.65

106.00	1.66
107.00	1.67
108.00	1.68
109.00	1.69
110.00	1.69
111.00	1.70
112.00	1.70
113.00	1.71
114.00	1.71
115.00	1.72
116.00	1.72
117.00	1.73
118.00	1.74
119.00	1.75
120.00	1.77
121.00	1.78
122.00	1.79
123.00	1.80
124.00	1.81
125.00	1.82
126.00	1.84
127.00	1.84
128.00	1.85
129.00	1.86
130.00	1.86
131.00	1.87
132.00	1.88
133.00	1.88
134.00	1.89
135.00	1.90
136.00	1.91
137.00	1.93
138.00	1.94
139.00	1.96
140.00	1.97
141.00	1.99
142.00	2.00
143.00	2.02
144.00	2.03
145.00	2.04
146.00	2.05
147.00	2.06
148.00	2.07
149.00	2.08
150.00	2.09
151.00	2.10
152.00	2.10
153.00	2.11
154.00	2.13
155.00	2.15

156.00	2.17
157.00	2.19
158.00	2.21
159.00	2.24
160.00	2.26
161.00	2.28
162.00	2.30
163.00	2.31
164.00	2.32
165.00	2.33
166.00	2.34
167.00	2.36
168.00	2.37
169.00	2.38
170.00	2.39
171.00	2.41
172.00	2.43
173.00	2.46
174.00	2.49
175.00	2.52
176.00	2.55
177.00	2.58
178.00	2.61
179.00	2.64
180.00	2.67
181.00	2.69
182.00	2.70
183.00	2.72
184.00	2.74
185.00	2.76
186.00	2.77
187.00	2.79
188.00	2.81
189.00	2.83
190.00	2.87
191.00	2.92
192.00	2.97
193.00	3.01
194.00	3.06
195.00	3.10
196.00	3.15
197.00	3.20
198.00	3.24
199.00	3.27
200.00	3.30
201.00	3.33
202.00	3.36
203.00	3.39
204.00	3.42
205.00	3.45

206.00	3.49
207.00	3.52
208.00	3.60
209.00	3.69
210.00	3.78
211.00	3.86
212.00	3.95
213.00	4.04
214.00	4.12
215.00	4.21
216.00	4.30
217.00	4.36
218.00	4.43
219.00	4.50
220.00	4.56
221.00	4.63
222.00	4.70
223.00	4.76
224.00	4.83
225.00	4.89
226.00	5.15
227.00	5.40
228.00	5.66
229.00	5.91
230.00	6.17
231.00	6.42
232.00	6.68
233.00	6.93
234.00	7.19
235.00	7.51
236.00	7.84
237.00	8.17
238.00	8.49
239.00	8.82
240.00	9.15
241.00	9.47
242.00	9.80
243.00	10.13
244.00	13.02
245.00	15.91
246.00	18.81
247.00	21.70
248.00	24.59
249.00	27.48
250.00	30.38
251.00	33.27
252.00	36.16
253.00	32.79
254.00	29.41
255.00	26.03

256.00	22.65
257.00	19.27
258.00	15.90
259.00	12.52
260.00	9.14
261.00	5.76
262.00	5.55
263.00	5.34
264.00	5.13
265.00	4.92
266.00	4.70
267.00	4.49
268.00	4.28
269.00	4.07
270.00	3.86
271.00	3.76
272.00	3.67
273.00	3.58
274.00	3.48
275.00	3.39
276.00	3.30
277.00	3.20
278.00	3.11
279.00	3.02
280.00	2.96
281.00	2.91
282.00	2.85
283.00	2.80
284.00	2.75
285.00	2.69
286.00	2.64
287.00	2.58
288.00	2.53
289.00	2.49
290.00	2.45
291.00	2.42
292.00	2.38
293.00	2.35
294.00	2.31
295.00	2.27
296.00	2.24
297.00	2.20
298.00	2.17
299.00	2.15
300.00	2.12
301.00	2.09
302.00	2.07
303.00	2.04
304.00	2.02
305.00	1.99

306.00	1.96
307.00	1.94
308.00	1.92
309.00	1.90
310.00	1.88
311.00	1.86
312.00	1.84
313.00	1.82
314.00	1.80
315.00	1.78
316.00	1.77
317.00	1.75
318.00	1.73
319.00	1.72
320.00	1.70
321.00	1.69
322.00	1.67
323.00	1.65
324.00	1.64
325.00	1.62
326.00	1.61
327.00	1.60
328.00	1.58
329.00	1.57
330.00	1.56
331.00	1.55
332.00	1.53
333.00	1.52
334.00	1.51
335.00	1.50
336.00	1.49
337.00	1.48
338.00	1.47
339.00	1.45
340.00	1.44
341.00	1.43
342.00	1.42
343.00	1.41
344.00	1.40
345.00	1.39
346.00	1.38
347.00	1.38
348.00	1.37
349.00	1.36
350.00	1.35
351.00	1.34
352.00	1.33
353.00	1.32
354.00	1.31
355.00	1.31

356.00	1.30
357.00	1.29
358.00	1.28
359.00	1.27
360.00	1.27
361.00	1.26
362.00	1.25
363.00	1.24
364.00	1.66
365.00	1.67
366.00	1.67
367.00	1.67
368.00	1.67
369.00	1.67

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

Routed Hydrograph

Peak Outflow Discharge: 11.799 cfs, Time to Peak: 259.00 (min), Total Outflow Volume: 73002.44 ft^3

Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
1.00	0.00	0.000177
2.00	0.01	0.000525
3.00	0.02	0.001040
4.00	0.03	0.001731
5.00	0.04	0.002580
6.00	0.06	0.003582
7.00	0.08	0.004732
8.00	0.11	0.006028
9.00	0.14	0.007464
10.00	0.17	0.008874
11.00	0.19	0.010245
12.00	0.22	0.011592
13.00	0.25	0.012901
14.00	0.28	0.014188
15.00	0.30	0.015440
16.00	0.33	0.016656
17.00	0.35	0.017853
18.00	0.38	0.019016
19.00	0.40	0.020161
20.00	0.42	0.021275
21.00	0.44	0.022357
22.00	0.47	0.023410
23.00	0.49	0.024433
24.00	0.51	0.025442
25.00	0.53	0.026423

26.00	0.55	0.027377
27.00	0.57	0.028304
28.00	0.59	0.029219
29.00	0.60	0.030109
30.00	0.62	0.030988
31.00	0.64	0.031843
32.00	0.66	0.032688
33.00	0.67	0.033509
34.00	0.69	0.034321
35.00	0.71	0.035111
36.00	0.72	0.035892
37.00	0.74	0.036652
38.00	0.75	0.037391
39.00	0.77	0.038123
40.00	0.78	0.038835
41.00	0.80	0.039527
42.00	0.81	0.040200
43.00	0.83	0.040868
44.00	0.84	0.041517
45.00	0.85	0.042149
46.00	0.86	0.042776
47.00	0.88	0.043386
48.00	0.89	0.043993
49.00	0.90	0.044597
50.00	0.91	0.045184
51.00	0.93	0.045769
52.00	0.94	0.046337
53.00	0.95	0.046903
54.00	0.96	0.047453
55.00	0.97	0.048002
56.00	0.98	0.048536
57.00	0.99	0.049055
58.00	1.00	0.049573
59.00	1.01	0.050077
60.00	1.02	0.050567
61.00	1.03	0.051057
62.00	1.04	0.051533
63.00	1.05	0.051996
64.00	1.06	0.052460
65.00	1.07	0.052925
66.00	1.08	0.053377
67.00	1.09	0.053830
68.00	1.10	0.054284
69.00	1.11	0.054725
70.00	1.12	0.055168
71.00	1.13	0.055612
72.00	1.14	0.056044
73.00	1.15	0.056478
74.00	1.15	0.056899
75.00	1.16	0.057309

76.00	1.17	0.057721
77.00	1.18	0.058122
78.00	1.19	0.058512
79.00	1.20	0.058904
80.00	1.20	0.059286
81.00	1.21	0.059671
82.00	1.22	0.060045
83.00	1.23	0.060422
84.00	1.23	0.060802
85.00	1.24	0.061186
86.00	1.25	0.061559
87.00	1.26	0.061935
88.00	1.26	0.062314
89.00	1.27	0.062697
90.00	1.28	0.063082
91.00	1.29	0.063457
92.00	1.30	0.063835
93.00	1.30	0.064202
94.00	1.31	0.064560
95.00	1.32	0.064921
96.00	1.33	0.065272
97.00	1.33	0.065627
98.00	1.34	0.065972
99.00	1.35	0.066321
100.00	1.35	0.066674
101.00	1.36	0.067018
102.00	1.37	0.067365
103.00	1.37	0.067717
104.00	1.38	0.068072
105.00	1.39	0.068431
106.00	1.40	0.068794
107.00	1.40	0.069160
108.00	1.41	0.069530
109.00	1.42	0.069903
110.00	1.43	0.070266
111.00	1.43	0.070632
112.00	1.44	0.070988
113.00	1.45	0.071348
114.00	1.46	0.071698
115.00	1.46	0.072052
116.00	1.47	0.072396
117.00	1.48	0.072744
118.00	1.48	0.073096
119.00	1.49	0.073452
120.00	1.50	0.073826
121.00	1.51	0.074202
122.00	1.51	0.074582
123.00	1.52	0.074965
124.00	1.53	0.075350
125.00	1.54	0.075739

126.00	1.55	0.076144
127.00	1.55	0.076538
128.00	1.56	0.076935
129.00	1.57	0.077334
130.00	1.58	0.077722
131.00	1.59	0.078113
132.00	1.59	0.078507
133.00	1.60	0.078890
134.00	1.61	0.079276
135.00	1.62	0.079665
136.00	1.63	0.080057
137.00	1.63	0.080465
138.00	1.64	0.080875
139.00	1.65	0.081301
140.00	1.66	0.081729
141.00	1.67	0.082172
142.00	1.68	0.082617
143.00	1.69	0.083076
144.00	1.70	0.083537
145.00	1.71	0.083998
146.00	1.71	0.084460
147.00	1.72	0.084923
148.00	1.73	0.085387
149.00	1.74	0.085851
150.00	1.75	0.086316
151.00	1.76	0.086782
152.00	1.77	0.087235
153.00	1.78	0.087689
154.00	1.79	0.088158
155.00	1.80	0.088640
156.00	1.81	0.089137
157.00	1.82	0.089647
158.00	1.83	0.090170
159.00	1.84	0.090720
160.00	1.85	0.091281
161.00	1.86	0.091854
162.00	1.88	0.092439
163.00	1.89	0.093021
164.00	1.90	0.093600
165.00	1.91	0.094177
166.00	1.92	0.094751
167.00	1.93	0.095337
168.00	1.95	0.095920
169.00	1.96	0.096501
170.00	1.97	0.097079
171.00	1.98	0.097668
172.00	1.99	0.098269
173.00	2.01	0.098893
174.00	2.02	0.099541
175.00	2.03	0.100212

176.00	2.05	0.100905
177.00	2.06	0.101619
178.00	2.08	0.102355
179.00	2.09	0.103110
180.00	2.11	0.103886
181.00	2.12	0.104668
182.00	2.14	0.105441
183.00	2.15	0.106220
184.00	2.17	0.107005
185.00	2.19	0.107795
186.00	2.20	0.108578
187.00	2.22	0.109365
188.00	2.23	0.110158
189.00	2.25	0.110956
190.00	2.27	0.111787
191.00	2.28	0.112662
192.00	2.30	0.113581
193.00	2.32	0.114529
194.00	2.34	0.115519
195.00	2.36	0.116536
196.00	2.38	0.117592
197.00	2.40	0.118688
198.00	2.43	0.119807
199.00	2.45	0.120936
200.00	2.47	0.122075
201.00	2.50	0.123223
202.00	2.52	0.124380
203.00	2.54	0.125545
204.00	2.57	0.126719
205.00	2.59	0.127902
206.00	2.62	0.129106
207.00	2.64	0.130318
208.00	2.67	0.131604
209.00	2.69	0.132978
210.00	2.72	0.134435
211.00	2.75	0.135961
212.00	2.78	0.137568
213.00	2.82	0.139251
214.00	2.85	0.140998
215.00	2.89	0.142818
216.00	2.93	0.144710
217.00	2.97	0.146631
218.00	3.00	0.148594
219.00	3.05	0.150598
220.00	3.09	0.152628
221.00	3.13	0.154697
222.00	3.17	0.156803
223.00	3.21	0.158934
224.00	3.26	0.161100
225.00	3.30	0.163288

226.00	3.35	0.165768
227.00	3.40	0.168520
228.00	3.46	0.171548
229.00	3.53	0.174833
230.00	3.59	0.178380
231.00	3.67	0.182168
232.00	3.75	0.186205
233.00	3.83	0.190470
234.00	3.92	0.194970
235.00	4.02	0.199780
236.00	4.12	0.204905
237.00	4.23	0.210337
238.00	4.34	0.216054
239.00	4.46	0.222061
240.00	4.58	0.228350
241.00	4.71	0.234899
242.00	4.85	0.241716
243.00	4.99	0.248793
244.00	5.17	0.259599
245.00	5.43	0.274033
246.00	5.76	0.292006
247.00	6.16	0.313409
248.00	6.63	0.338145
249.00	7.17	0.366123
250.00	7.77	0.397266
251.00	8.43	0.431474
252.00	9.16	0.468662
253.00	9.86	0.500244
254.00	10.45	0.526361
255.00	10.93	0.547165
256.00	11.30	0.562802
257.00	11.56	0.573416
258.00	11.73	0.579159
259.00	11.80	0.580151
260.00	11.77	0.578338
261.00	11.65	0.572467
262.00	11.49	0.564319
263.00	11.32	0.556112
264.00	11.15	0.547846
265.00	10.98	0.539523
266.00	10.81	0.531139
267.00	10.64	0.522694
268.00	10.47	0.514198
269.00	10.29	0.505651
270.00	10.12	0.497055
271.00	9.94	0.488538
272.00	9.77	0.480134
273.00	9.60	0.471840
274.00	9.43	0.463640
275.00	9.27	0.455544

276.00	9.10	0.447549
277.00	8.94	0.439640
278.00	8.78	0.431827
279.00	8.62	0.424109
280.00	8.47	0.416522
281.00	8.32	0.409077
282.00	8.16	0.401756
283.00	8.02	0.394570
284.00	7.87	0.387514
285.00	7.73	0.380572
286.00	7.59	0.373754
287.00	7.45	0.367044
288.00	7.32	0.360450
289.00	7.18	0.353985
290.00	7.05	0.347644
291.00	6.93	0.341438
292.00	6.80	0.335349
293.00	6.68	0.329388
294.00	6.56	0.323537
295.00	6.44	0.317794
296.00	6.32	0.312169
297.00	6.21	0.306644
298.00	6.10	0.301232
299.00	5.99	0.295943
300.00	5.88	0.290759
301.00	5.78	0.285677
302.00	5.68	0.280709
303.00	5.58	0.275837
304.00	5.48	0.271073
305.00	5.38	0.266400
306.00	5.29	0.261816
307.00	5.20	0.257331
308.00	5.11	0.252943
309.00	5.02	0.248649
310.00	4.93	0.244446
311.00	4.85	0.240333
312.00	4.76	0.236306
313.00	4.68	0.232363
314.00	4.60	0.228503
315.00	4.53	0.224721
316.00	4.45	0.221031
317.00	4.37	0.217416
318.00	4.30	0.213873
319.00	4.23	0.210415
320.00	4.16	0.207025
321.00	4.09	0.203716
322.00	4.03	0.200470
323.00	3.96	0.197288
324.00	3.90	0.194180
325.00	3.83	0.191130

326.00	3.77	0.188151
327.00	3.71	0.185241
328.00	3.65	0.182385
329.00	3.60	0.179593
330.00	3.54	0.176866
331.00	3.49	0.174200
332.00	3.43	0.171581
333.00	3.38	0.169020
334.00	3.33	0.166517
335.00	3.28	0.164069
336.00	3.23	0.161676
337.00	3.18	0.159335
338.00	3.13	0.157045
339.00	3.09	0.154792
340.00	3.04	0.152587
341.00	3.00	0.150429
342.00	2.95	0.148318
343.00	2.91	0.146251
344.00	2.87	0.144228
345.00	2.83	0.142247
346.00	2.79	0.140308
347.00	2.75	0.138422
348.00	2.71	0.136575
349.00	2.67	0.134765
350.00	2.64	0.132991
351.00	2.60	0.131254
352.00	2.57	0.129550
353.00	2.53	0.127880
354.00	2.50	0.126243
355.00	2.47	0.124651
356.00	2.43	0.123089
357.00	2.40	0.121557
358.00	2.37	0.120054
359.00	2.34	0.118579
360.00	2.31	0.117144
361.00	2.28	0.115736
362.00	2.25	0.114353
363.00	2.23	0.112994
364.00	2.20	0.112250
365.00	2.19	0.111529
366.00	2.18	0.110831
367.00	2.16	0.110154
368.00	2.15	0.109498
369.00	2.13	0.108862
370.00	2.10	0.105971
371.00	2.04	0.103160
372.00	1.98	0.100427
373.00	1.93	0.097769
374.00	1.88	0.095185
375.00	1.82	0.092672

376.00	1.77	0.090229
377.00	1.72	0.087853
378.00	1.68	0.085543
379.00	1.63	0.083297
380.00	1.59	0.081113
381.00	1.54	0.078989
382.00	1.50	0.076924
383.00	1.46	0.074917
384.00	1.42	0.072964
385.00	1.38	0.071066
386.00	1.34	0.069220
387.00	1.30	0.067425
388.00	1.27	0.065680
389.00	1.23	0.063983
390.00	1.20	0.062333
391.00	1.16	0.060729
392.00	1.13	0.059169
393.00	1.10	0.057652
394.00	1.07	0.056177
395.00	1.04	0.054743
396.00	1.01	0.053348
397.00	0.98	0.051992
398.00	0.96	0.050674
399.00	0.93	0.049392
400.00	0.90	0.048145
401.00	0.88	0.046933
402.00	0.86	0.045755
403.00	0.83	0.044609
404.00	0.81	0.043494
405.00	0.79	0.042411
406.00	0.76	0.041357
407.00	0.74	0.040333
408.00	0.72	0.039337
409.00	0.70	0.038368
410.00	0.68	0.037427
411.00	0.66	0.036511
412.00	0.65	0.035621
413.00	0.63	0.034755
414.00	0.61	0.033913
415.00	0.59	0.033094
416.00	0.58	0.032299
417.00	0.56	0.031525
418.00	0.55	0.030772
419.00	0.53	0.030040
420.00	0.52	0.029329
421.00	0.50	0.028637
422.00	0.49	0.027965
423.00	0.47	0.027310
424.00	0.46	0.026674
425.00	0.45	0.026056

426.00	0.44	0.025455
427.00	0.42	0.024870
428.00	0.41	0.024302
429.00	0.40	0.023749
430.00	0.39	0.023211
431.00	0.38	0.022689
432.00	0.37	0.022180
433.00	0.36	0.021686
434.00	0.35	0.021206
435.00	0.34	0.020739
436.00	0.33	0.020284
437.00	0.32	0.019843
438.00	0.31	0.019413
439.00	0.30	0.018996
440.00	0.29	0.018590
441.00	0.29	0.018195
442.00	0.28	0.017811
443.00	0.27	0.017437
444.00	0.26	0.017074
445.00	0.26	0.016722
446.00	0.25	0.016378
447.00	0.24	0.016045
448.00	0.24	0.015720
449.00	0.23	0.015405
450.00	0.22	0.015098
451.00	0.22	0.014800
452.00	0.21	0.014510
453.00	0.20	0.014228
454.00	0.20	0.013953
455.00	0.19	0.013687
456.00	0.19	0.013427
457.00	0.18	0.013175
458.00	0.18	0.012930
459.00	0.17	0.012692
460.00	0.17	0.012460
461.00	0.16	0.012235
462.00	0.16	0.012016
463.00	0.15	0.011802
464.00	0.15	0.011595
465.00	0.15	0.011394
466.00	0.14	0.011198
467.00	0.14	0.011008
468.00	0.13	0.010822
469.00	0.13	0.010642
470.00	0.13	0.010467
471.00	0.12	0.010297
472.00	0.12	0.010131
473.00	0.12	0.009970
474.00	0.11	0.009814
475.00	0.11	0.009662

476.00	0.11	0.009514
477.00	0.10	0.009370
478.00	0.10	0.009230
479.00	0.10	0.009094
480.00	0.10	0.008962
481.00	0.09	0.008833
482.00	0.09	0.008708
483.00	0.09	0.008586
484.00	0.09	0.008468
485.00	0.08	0.008353
486.00	0.08	0.008241
487.00	0.08	0.008133
488.00	0.08	0.008027
489.00	0.07	0.007924
490.00	0.07	0.007824
491.00	0.07	0.007727
492.00	0.07	0.007633
493.00	0.07	0.007541
494.00	0.06	0.007451
495.00	0.06	0.007364
496.00	0.06	0.007280
497.00	0.06	0.007198
498.00	0.06	0.007118
499.00	0.06	0.007040
500.00	0.05	0.006965
501.00	0.05	0.006891
502.00	0.05	0.006820
503.00	0.05	0.006751
504.00	0.05	0.006683
505.00	0.05	0.006618
506.00	0.05	0.006554
507.00	0.05	0.006492
508.00	0.04	0.006431
509.00	0.04	0.006373
510.00	0.04	0.006316
511.00	0.04	0.006260
512.00	0.04	0.006206
513.00	0.04	0.006154
514.00	0.04	0.006103
515.00	0.04	0.006053
516.00	0.03	0.006005
517.00	0.03	0.005958
518.00	0.03	0.005913
519.00	0.03	0.005868
520.00	0.03	0.005825
521.00	0.03	0.005783
522.00	0.03	0.005743
523.00	0.03	0.005703
524.00	0.03	0.005664
525.00	0.03	0.005627

526.00	0.03	0.005591
527.00	0.03	0.005555
528.00	0.02	0.005521
529.00	0.02	0.005487
530.00	0.02	0.005455
531.00	0.02	0.005423
532.00	0.02	0.005392
533.00	0.02	0.005362
534.00	0.02	0.005333
535.00	0.02	0.005305
536.00	0.02	0.005277
537.00	0.02	0.005251
538.00	0.02	0.005225
539.00	0.02	0.005199
540.00	0.02	0.005175

Detention Basin Analysis: Basin P2

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
6.00	0.37

Discharge Input Parameters

Weir: Weir 1

Weir Length: 4.0000 ft

Weir Coefficient: 3.1000

Height above base: 5.0000 ft

Base Elevation: 0.0000 ft

Riser: Riser 1

Circular Opening

Opening Diameter: 4.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 5.0000 ft

Base Elevation: 0.0000 ft

Riser: Orifice 1

Circular Opening

Opening Diameter: 0.0800 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 0.0000 ft

Base Elevation: 0.0000 ft

Riser: Orifice 2

Circular Opening

Opening Diameter: 0.1670 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 2.5000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
6.00	0.37	14.05

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 11.540 cfs, Time to Peak: 252.00 (min), Total Inflow Volume: 27997.50 ft^3

Time (min)	Discharge cfs
0.00	0.00
1.00	0.04
2.00	0.08
3.00	0.12
4.00	0.15
5.00	0.19

6.00	0.23
7.00	0.27
8.00	0.31
9.00	0.35
10.00	0.39
11.00	0.42
12.00	0.46
13.00	0.46
14.00	0.46
15.00	0.47
16.00	0.47
17.00	0.47
18.00	0.47
19.00	0.47
20.00	0.47
21.00	0.47
22.00	0.47
23.00	0.47
24.00	0.47
25.00	0.48
26.00	0.48
27.00	0.48
28.00	0.48
29.00	0.48
30.00	0.48
31.00	0.49
32.00	0.49
33.00	0.49
34.00	0.49
35.00	0.49
36.00	0.50
37.00	0.50
38.00	0.50
39.00	0.50
40.00	0.50
41.00	0.50
42.00	0.50
43.00	0.50
44.00	0.50
45.00	0.51
46.00	0.51
47.00	0.51
48.00	0.51
49.00	0.51
50.00	0.51
51.00	0.52
52.00	0.52
53.00	0.52
54.00	0.52
55.00	0.52

56.00	0.53
57.00	0.53
58.00	0.53
59.00	0.53
60.00	0.54
61.00	0.54
62.00	0.54
63.00	0.54
64.00	0.54
65.00	0.54
66.00	0.54
67.00	0.54
68.00	0.55
69.00	0.55
70.00	0.55
71.00	0.55
72.00	0.55
73.00	0.55
74.00	0.56
75.00	0.56
76.00	0.56
77.00	0.57
78.00	0.57
79.00	0.57
80.00	0.57
81.00	0.58
82.00	0.58
83.00	0.58
84.00	0.59
85.00	0.59
86.00	0.59
87.00	0.59
88.00	0.59
89.00	0.59
90.00	0.59
91.00	0.60
92.00	0.60
93.00	0.60
94.00	0.60
95.00	0.60
96.00	0.60
97.00	0.61
98.00	0.61
99.00	0.62
100.00	0.62
101.00	0.62
102.00	0.63
103.00	0.63
104.00	0.63
105.00	0.64

106.00	0.64
107.00	0.64
108.00	0.65
109.00	0.65
110.00	0.65
111.00	0.65
112.00	0.66
113.00	0.66
114.00	0.66
115.00	0.66
116.00	0.66
117.00	0.67
118.00	0.67
119.00	0.67
120.00	0.67
121.00	0.68
122.00	0.68
123.00	0.69
124.00	0.69
125.00	0.70
126.00	0.70
127.00	0.71
128.00	0.71
129.00	0.72
130.00	0.72
131.00	0.73
132.00	0.73
133.00	0.73
134.00	0.74
135.00	0.74
136.00	0.74
137.00	0.75
138.00	0.75
139.00	0.75
140.00	0.75
141.00	0.76
142.00	0.76
143.00	0.76
144.00	0.77
145.00	0.77
146.00	0.78
147.00	0.79
148.00	0.79
149.00	0.80
150.00	0.81
151.00	0.81
152.00	0.82
153.00	0.83
154.00	0.84
155.00	0.84

156.00	0.85
157.00	0.85
158.00	0.86
159.00	0.86
160.00	0.87
161.00	0.87
162.00	0.88
163.00	0.88
164.00	0.88
165.00	0.89
166.00	0.89
167.00	0.90
168.00	0.90
169.00	0.91
170.00	0.92
171.00	0.93
172.00	0.95
173.00	0.96
174.00	0.97
175.00	0.98
176.00	0.99
177.00	1.00
178.00	1.01
179.00	1.02
180.00	1.03
181.00	1.04
182.00	1.05
183.00	1.05
184.00	1.06
185.00	1.07
186.00	1.08
187.00	1.08
188.00	1.09
189.00	1.10
190.00	1.11
191.00	1.11
192.00	1.12
193.00	1.14
194.00	1.16
195.00	1.18
196.00	1.20
197.00	1.22
198.00	1.24
199.00	1.27
200.00	1.29
201.00	1.31
202.00	1.33
203.00	1.35
204.00	1.37
205.00	1.38

206.00	1.40
207.00	1.42
208.00	1.43
209.00	1.45
210.00	1.46
211.00	1.48
212.00	1.50
213.00	1.51
214.00	1.53
215.00	1.54
216.00	1.56
217.00	1.62
218.00	1.68
219.00	1.74
220.00	1.80
221.00	1.86
222.00	1.92
223.00	1.99
224.00	2.05
225.00	2.11
226.00	2.17
227.00	2.23
228.00	2.29
229.00	2.37
230.00	2.45
231.00	2.52
232.00	2.60
233.00	2.68
234.00	2.76
235.00	2.84
236.00	2.91
237.00	2.99
238.00	3.07
239.00	3.15
240.00	3.23
241.00	3.92
242.00	4.61
243.00	5.30
244.00	6.00
245.00	6.69
246.00	7.38
247.00	8.08
248.00	8.77
249.00	9.46
250.00	10.16
251.00	10.85
252.00	11.54
253.00	10.73
254.00	9.92
255.00	9.12

256.00	8.31
257.00	7.50
258.00	6.69
259.00	5.88
260.00	5.07
261.00	4.26
262.00	3.45
263.00	2.65
264.00	1.84
265.00	1.79
266.00	1.74
267.00	1.68
268.00	1.63
269.00	1.58
270.00	1.53
271.00	1.48
272.00	1.43
273.00	1.38
274.00	1.33
275.00	1.28
276.00	1.23
277.00	1.21
278.00	1.18
279.00	1.16
280.00	1.14
281.00	1.12
282.00	1.10
283.00	1.07
284.00	1.05
285.00	1.03
286.00	1.01
287.00	0.98
288.00	0.96
289.00	0.95
290.00	0.94
291.00	0.92
292.00	0.91
293.00	0.90
294.00	0.88
295.00	0.87
296.00	0.86
297.00	0.84
298.00	0.83
299.00	0.82
300.00	0.81
301.00	0.80
302.00	0.79
303.00	0.78
304.00	0.77
305.00	0.76

306.00	0.75
307.00	0.74
308.00	0.74
309.00	0.73
310.00	0.72
311.00	0.71
312.00	0.70
313.00	0.69
314.00	0.69
315.00	0.68
316.00	0.68
317.00	0.67
318.00	0.66
319.00	0.66
320.00	0.65
321.00	0.64
322.00	0.64
323.00	0.63
324.00	0.63
325.00	0.62
326.00	0.62
327.00	0.61
328.00	0.61
329.00	0.60
330.00	0.60
331.00	0.59
332.00	0.59
333.00	0.58
334.00	0.58
335.00	0.57
336.00	0.57
337.00	0.56
338.00	0.56
339.00	0.56
340.00	0.55
341.00	0.55
342.00	0.54
343.00	0.54
344.00	0.54
345.00	0.53
346.00	0.53
347.00	0.53
348.00	0.52
349.00	0.52
350.00	0.52
351.00	0.51
352.00	0.51
353.00	0.51
354.00	0.50
355.00	0.50

356.00	0.50
357.00	0.49
358.00	0.49
359.00	0.49
360.00	0.48
361.00	0.48
362.00	0.48
363.00	0.48
364.00	0.47
365.00	0.47
366.00	0.47
367.00	0.47
368.00	0.46
369.00	0.46
370.00	0.46
371.00	0.46
372.00	0.45

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

Routed Hydrograph

Peak Outflow Discharge: 5.944 cfs, Time to Peak: 259.00 (min), Total Outflow Volume: 28004.69 ft^3

Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
1.00	0.00	0.000054
2.00	0.00	0.000158
3.00	0.01	0.000311
4.00	0.02	0.000497
5.00	0.02	0.000727
6.00	0.03	0.000998
7.00	0.04	0.001310
8.00	0.06	0.001659
9.00	0.07	0.002044
10.00	0.09	0.002464
11.00	0.10	0.002902
12.00	0.12	0.003372
13.00	0.14	0.003817
14.00	0.15	0.004240
15.00	0.17	0.004655
16.00	0.18	0.005049
17.00	0.20	0.005422
18.00	0.21	0.005777
19.00	0.23	0.006113
20.00	0.24	0.006433
21.00	0.25	0.006736
22.00	0.26	0.007024

23.00	0.27	0.007297
24.00	0.28	0.007556
25.00	0.29	0.007815
26.00	0.30	0.008061
27.00	0.31	0.008295
28.00	0.32	0.008516
29.00	0.33	0.008727
30.00	0.34	0.008926
31.00	0.34	0.009129
32.00	0.35	0.009322
33.00	0.36	0.009504
34.00	0.36	0.009678
35.00	0.37	0.009842
36.00	0.38	0.010012
37.00	0.38	0.010173
38.00	0.39	0.010326
39.00	0.39	0.010471
40.00	0.40	0.010608
41.00	0.41	0.010739
42.00	0.41	0.010863
43.00	0.41	0.010981
44.00	0.42	0.011092
45.00	0.42	0.011212
46.00	0.43	0.011325
47.00	0.43	0.011432
48.00	0.44	0.011534
49.00	0.44	0.011631
50.00	0.44	0.011723
51.00	0.45	0.011824
52.00	0.45	0.011919
53.00	0.45	0.012010
54.00	0.46	0.012096
55.00	0.46	0.012178
56.00	0.46	0.012269
57.00	0.47	0.012355
58.00	0.47	0.012437
59.00	0.47	0.012514
60.00	0.48	0.012602
61.00	0.48	0.012684
62.00	0.48	0.012763
63.00	0.49	0.012837
64.00	0.49	0.012908
65.00	0.49	0.012975
66.00	0.49	0.013039
67.00	0.50	0.013099
68.00	0.50	0.013170
69.00	0.50	0.013237
70.00	0.50	0.013301
71.00	0.51	0.013362
72.00	0.51	0.013419

73.00	0.51	0.013473
74.00	0.51	0.013539
75.00	0.52	0.013600
76.00	0.52	0.013659
77.00	0.52	0.013728
78.00	0.52	0.013794
79.00	0.52	0.013856
80.00	0.53	0.013915
81.00	0.53	0.013985
82.00	0.53	0.014051
83.00	0.53	0.014113
84.00	0.54	0.014186
85.00	0.54	0.014255
86.00	0.54	0.014321
87.00	0.54	0.014383
88.00	0.55	0.014442
89.00	0.55	0.014498
90.00	0.55	0.014551
91.00	0.55	0.014615
92.00	0.56	0.014676
93.00	0.56	0.014733
94.00	0.56	0.014788
95.00	0.56	0.014840
96.00	0.56	0.014889
97.00	0.57	0.014949
98.00	0.57	0.015006
99.00	0.57	0.015074
100.00	0.57	0.015138
101.00	0.58	0.015199
102.00	0.58	0.015270
103.00	0.58	0.015338
104.00	0.58	0.015402
105.00	0.59	0.015476
106.00	0.59	0.015547
107.00	0.59	0.015613
108.00	0.59	0.015690
109.00	0.60	0.015763
110.00	0.60	0.015833
111.00	0.60	0.015898
112.00	0.60	0.015974
113.00	0.61	0.016046
114.00	0.61	0.016114
115.00	0.61	0.016179
116.00	0.62	0.016241
117.00	0.62	0.016313
118.00	0.62	0.016381
119.00	0.62	0.016445
120.00	0.63	0.016507
121.00	0.63	0.016578
122.00	0.63	0.016646

123.00	0.63	0.016724
124.00	0.64	0.016798
125.00	0.64	0.016882
126.00	0.64	0.016961
127.00	0.65	0.017050
128.00	0.65	0.017134
129.00	0.65	0.017228
130.00	0.66	0.017316
131.00	0.66	0.017414
132.00	0.66	0.017506
133.00	0.67	0.017594
134.00	0.67	0.017691
135.00	0.67	0.017783
136.00	0.68	0.017870
137.00	0.68	0.017966
138.00	0.68	0.018058
139.00	0.69	0.018144
140.00	0.69	0.018226
141.00	0.69	0.018318
142.00	0.70	0.018405
143.00	0.70	0.018487
144.00	0.70	0.018578
145.00	0.71	0.018665
146.00	0.71	0.018761
147.00	0.71	0.018866
148.00	0.72	0.018965
149.00	0.72	0.019072
150.00	0.73	0.019188
151.00	0.73	0.019297
152.00	0.73	0.019415
153.00	0.74	0.019539
154.00	0.74	0.019671
155.00	0.75	0.019797
156.00	0.75	0.019929
157.00	0.76	0.020054
158.00	0.76	0.020187
159.00	0.77	0.020313
160.00	0.77	0.020445
161.00	0.78	0.020571
162.00	0.78	0.020704
163.00	0.79	0.020831
164.00	0.79	0.020950
165.00	0.80	0.021077
166.00	0.80	0.021198
167.00	0.81	0.021326
168.00	0.81	0.021447
169.00	0.82	0.021576
170.00	0.82	0.021712
171.00	0.83	0.021854
172.00	0.83	0.022015

173.00	0.84	0.022182
174.00	0.85	0.022354
175.00	0.85	0.022530
176.00	0.86	0.022711
177.00	0.87	0.022896
178.00	0.87	0.023085
179.00	0.88	0.023278
180.00	0.89	0.023474
181.00	0.89	0.023674
182.00	0.90	0.023877
183.00	0.91	0.024070
184.00	0.92	0.024267
185.00	0.92	0.024466
186.00	0.93	0.024669
187.00	0.94	0.024862
188.00	0.95	0.025058
189.00	0.96	0.025258
190.00	0.96	0.025461
191.00	0.97	0.025653
192.00	0.98	0.025850
193.00	0.99	0.026063
194.00	0.99	0.026292
195.00	1.00	0.026536
196.00	1.01	0.026795
197.00	1.02	0.027067
198.00	1.03	0.027352
199.00	1.04	0.027663
200.00	1.06	0.027985
201.00	1.07	0.028318
202.00	1.08	0.028660
203.00	1.09	0.029012
204.00	1.11	0.029372
205.00	1.12	0.029728
206.00	1.14	0.030092
207.00	1.15	0.030465
208.00	1.16	0.030832
209.00	1.18	0.031208
210.00	1.19	0.031577
211.00	1.21	0.031955
212.00	1.22	0.032340
213.00	1.23	0.032719
214.00	1.25	0.033105
215.00	1.26	0.033486
216.00	1.28	0.033873
217.00	1.29	0.034322
218.00	1.31	0.034828
219.00	1.33	0.035389
220.00	1.36	0.036002
221.00	1.38	0.036664
222.00	1.41	0.037373

223.00	1.43	0.038140
224.00	1.46	0.038948
225.00	1.49	0.039796
226.00	1.53	0.040681
227.00	1.56	0.041601
228.00	1.60	0.042555
229.00	1.63	0.043568
230.00	1.67	0.044637
231.00	1.72	0.045745
232.00	1.76	0.046904
233.00	1.80	0.048111
234.00	1.85	0.049365
235.00	1.90	0.050661
236.00	1.95	0.051986
237.00	2.00	0.053351
238.00	2.05	0.054753
239.00	2.11	0.056191
240.00	2.16	0.057664
241.00	2.23	0.059987
242.00	2.34	0.063119
243.00	2.47	0.067017
244.00	2.63	0.071656
245.00	2.82	0.076985
246.00	3.04	0.082968
247.00	3.28	0.089586
248.00	3.54	0.096793
249.00	3.82	0.104559
250.00	4.13	0.112869
251.00	4.45	0.121682
252.00	4.80	0.130972
253.00	5.12	0.138701
254.00	5.38	0.144950
255.00	5.59	0.149805
256.00	5.75	0.153327
257.00	5.86	0.155581
258.00	5.93	0.156634
259.00	5.94	0.156589
260.00	5.92	0.155959
261.00	5.86	0.154274
262.00	5.75	0.151588
263.00	5.62	0.147958
264.00	5.44	0.143432
265.00	5.26	0.138652
266.00	5.08	0.134049
267.00	4.91	0.129600
268.00	4.74	0.125311
269.00	4.58	0.121173
270.00	4.43	0.117179
271.00	4.28	0.113321
272.00	4.14	0.109593

273.00	4.00	0.105987
274.00	3.86	0.102498
275.00	3.73	0.099120
276.00	3.61	0.095847
277.00	3.48	0.092714
278.00	3.37	0.089700
279.00	3.26	0.086813
280.00	3.15	0.084046
281.00	3.05	0.081393
282.00	2.95	0.078849
283.00	2.85	0.076394
284.00	2.76	0.074037
285.00	2.67	0.071774
286.00	2.59	0.069599
287.00	2.51	0.067494
288.00	2.43	0.065470
289.00	2.35	0.063536
290.00	2.28	0.061687
291.00	2.21	0.059905
292.00	2.15	0.058200
293.00	2.08	0.056569
294.00	2.02	0.054994
295.00	1.96	0.053486
296.00	1.91	0.052042
297.00	1.85	0.050644
298.00	1.80	0.049304
299.00	1.75	0.048019
300.00	1.71	0.046786
301.00	1.66	0.045602
302.00	1.62	0.044466
303.00	1.57	0.043373
304.00	1.53	0.042323
305.00	1.49	0.041313
306.00	1.46	0.040341
307.00	1.42	0.039406
308.00	1.38	0.038518
309.00	1.35	0.037661
310.00	1.32	0.036835
311.00	1.29	0.036038
312.00	1.26	0.035268
313.00	1.23	0.034523
314.00	1.20	0.033817
315.00	1.18	0.033133
316.00	1.15	0.032484
317.00	1.13	0.031854
318.00	1.10	0.031244
319.00	1.08	0.030664
320.00	1.06	0.030101
321.00	1.04	0.029552
322.00	1.02	0.029032

323.00	1.00	0.028525
324.00	0.98	0.028044
325.00	0.96	0.027573
326.00	0.94	0.027127
327.00	0.93	0.026690
328.00	0.91	0.026275
329.00	0.90	0.025868
330.00	0.88	0.025482
331.00	0.87	0.025102
332.00	0.85	0.024742
333.00	0.84	0.024386
334.00	0.83	0.024048
335.00	0.81	0.023715
336.00	0.80	0.023398
337.00	0.79	0.023084
338.00	0.78	0.022786
339.00	0.77	0.022503
340.00	0.75	0.022221
341.00	0.74	0.021953
342.00	0.73	0.021686
343.00	0.72	0.021433
344.00	0.71	0.021192
345.00	0.71	0.020950
346.00	0.70	0.020720
347.00	0.69	0.020502
348.00	0.68	0.020282
349.00	0.67	0.020073
350.00	0.66	0.019875
351.00	0.66	0.019673
352.00	0.65	0.019482
353.00	0.64	0.019300
354.00	0.63	0.019114
355.00	0.63	0.018938
356.00	0.62	0.018771
357.00	0.62	0.018599
358.00	0.61	0.018435
359.00	0.60	0.018280
360.00	0.60	0.018119
361.00	0.59	0.017967
362.00	0.59	0.017822
363.00	0.58	0.017685
364.00	0.57	0.017541
365.00	0.57	0.017405
366.00	0.56	0.017275
367.00	0.56	0.017152
368.00	0.55	0.017022
369.00	0.55	0.016899
370.00	0.55	0.016782
371.00	0.54	0.016671
372.00	0.54	0.016552

373.00	0.52	0.015835
374.00	0.49	0.015154
375.00	0.47	0.014509
376.00	0.44	0.013896
377.00	0.42	0.013314
378.00	0.40	0.012762
379.00	0.38	0.012239
380.00	0.36	0.011741
381.00	0.34	0.011270
382.00	0.33	0.010822
383.00	0.31	0.010397
384.00	0.29	0.009994
385.00	0.28	0.009611
386.00	0.26	0.009248
387.00	0.25	0.008903
388.00	0.24	0.008576
389.00	0.23	0.008265
390.00	0.21	0.007971
391.00	0.20	0.007691
392.00	0.19	0.007426
393.00	0.18	0.007174
394.00	0.17	0.006935
395.00	0.16	0.006708
396.00	0.16	0.006493
397.00	0.15	0.006288
398.00	0.14	0.006094
399.00	0.13	0.005910
400.00	0.13	0.005736
401.00	0.12	0.005570
402.00	0.11	0.005413
403.00	0.11	0.005263
404.00	0.10	0.005122
405.00	0.10	0.004987
406.00	0.09	0.004860
407.00	0.09	0.004738
408.00	0.08	0.004623
409.00	0.08	0.004514
410.00	0.08	0.004411
411.00	0.07	0.004313
412.00	0.07	0.004219
413.00	0.06	0.004131
414.00	0.06	0.004047
415.00	0.06	0.003967
416.00	0.05	0.003892
417.00	0.05	0.003820
418.00	0.05	0.003752
419.00	0.05	0.003687
420.00	0.04	0.003626
421.00	0.04	0.003567
422.00	0.04	0.003512

423.00	0.04	0.003460
424.00	0.04	0.003410
425.00	0.03	0.003363
426.00	0.03	0.003318
427.00	0.03	0.003275
428.00	0.03	0.003235
429.00	0.03	0.003196
430.00	0.03	0.003160
431.00	0.03	0.003126
432.00	0.02	0.003093
433.00	0.02	0.003062
434.00	0.02	0.003032
435.00	0.02	0.003004
436.00	0.02	0.002978
437.00	0.02	0.002952
438.00	0.02	0.002928
439.00	0.02	0.002906
440.00	0.02	0.002884
441.00	0.01	0.002864
442.00	0.01	0.002844
443.00	0.01	0.002826
444.00	0.01	0.002808
445.00	0.01	0.002792
446.00	0.01	0.002776
447.00	0.01	0.002761
448.00	0.01	0.002747
449.00	0.01	0.002733
450.00	0.01	0.002721
451.00	0.01	0.002709
452.00	0.01	0.002697
453.00	0.01	0.002686
454.00	0.01	0.002676
455.00	0.01	0.002666
456.00	0.01	0.002657
457.00	0.01	0.002648
458.00	0.01	0.002639
459.00	0.01	0.002631
460.00	0.01	0.002624

Detention Basin Analysis: Basin P3

Notes:

Storage Input Parameters

Storage Capacity: Known volume

Elevation ft	Volume acre-ft
0.00	0.00
6.00	0.49

Discharge Input Parameters

Weir: Weir 1

Weir Length: 4.0000 ft

Weir Coefficient: 3.1000

Height above base: 5.0000 ft

Base Elevation: 0.0000 ft

Riser: Riser

Circular Opening

Opening Diameter: 4.5000 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 5.0000 ft

Base Elevation: 0.0000 ft

Riser: Orifice 1

Circular Opening

Opening Diameter: 0.0800 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 0.0000 ft

Base Elevation: 0.0000 ft

Riser: Orifice 2

Circular Opening

Opening Diameter: 0.1670 ft

Weir Coefficient: 0.5000

Orifice Coefficient: 0.6000

Height above Base Elev to Bottom of Opening: 2.5000 ft

Base Elevation: 0.0000 ft

Storage & Discharge Input Parameters

Elevation - Storage - Discharge

Elevation ft	Storage acre-ft	Discharge cfs
0.00	0.00	0.00
6.00	0.49	14.05

Detention Basin Input Parameters

Inflow Hydrograph

Peak Inflow Discharge: 9.210 cfs, Time to Peak: 245.00 (min), Total Inflow Volume: 16544.62 ft^3

Time (min)	Discharge cfs
0.00	0.00
1.00	0.04
2.00	0.08
3.00	0.12
4.00	0.16
5.00	0.20
6.00	0.24
7.00	0.28
8.00	0.28
9.00	0.28
10.00	0.28
11.00	0.28
12.00	0.28
13.00	0.28
14.00	0.28
15.00	0.28
16.00	0.28
17.00	0.29
18.00	0.29
19.00	0.29
20.00	0.29
21.00	0.29
22.00	0.29
23.00	0.29
24.00	0.29
25.00	0.29
26.00	0.29
27.00	0.29
28.00	0.29
29.00	0.30
30.00	0.30
31.00	0.30
32.00	0.30

33.00	0.30
34.00	0.30
35.00	0.30
36.00	0.30
37.00	0.30
38.00	0.30
39.00	0.31
40.00	0.31
41.00	0.31
42.00	0.31
43.00	0.31
44.00	0.31
45.00	0.31
46.00	0.31
47.00	0.31
48.00	0.32
49.00	0.32
50.00	0.32
51.00	0.32
52.00	0.32
53.00	0.32
54.00	0.32
55.00	0.32
56.00	0.32
57.00	0.32
58.00	0.32
59.00	0.33
60.00	0.33
61.00	0.33
62.00	0.33
63.00	0.33
64.00	0.33
65.00	0.33
66.00	0.34
67.00	0.34
68.00	0.34
69.00	0.34
70.00	0.34
71.00	0.34
72.00	0.34
73.00	0.34
74.00	0.35
75.00	0.35
76.00	0.35
77.00	0.35
78.00	0.35
79.00	0.35
80.00	0.35
81.00	0.35
82.00	0.36

83.00	0.36
84.00	0.36
85.00	0.36
86.00	0.36
87.00	0.36
88.00	0.36
89.00	0.37
90.00	0.37
91.00	0.37
92.00	0.37
93.00	0.37
94.00	0.37
95.00	0.38
96.00	0.38
97.00	0.38
98.00	0.38
99.00	0.38
100.00	0.38
101.00	0.39
102.00	0.39
103.00	0.39
104.00	0.39
105.00	0.39
106.00	0.40
107.00	0.40
108.00	0.40
109.00	0.40
110.00	0.40
111.00	0.40
112.00	0.40
113.00	0.41
114.00	0.41
115.00	0.41
116.00	0.41
117.00	0.42
118.00	0.42
119.00	0.42
120.00	0.42
121.00	0.43
122.00	0.43
123.00	0.43
124.00	0.43
125.00	0.43
126.00	0.43
127.00	0.44
128.00	0.44
129.00	0.44
130.00	0.45
131.00	0.45
132.00	0.45

133.00	0.46
134.00	0.46
135.00	0.46
136.00	0.46
137.00	0.46
138.00	0.47
139.00	0.47
140.00	0.47
141.00	0.47
142.00	0.48
143.00	0.48
144.00	0.49
145.00	0.49
146.00	0.50
147.00	0.50
148.00	0.50
149.00	0.50
150.00	0.51
151.00	0.51
152.00	0.51
153.00	0.51
154.00	0.52
155.00	0.52
156.00	0.53
157.00	0.53
158.00	0.54
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169.00	0.58
170.00	0.59
171.00	0.60
172.00	0.60
173.00	0.61
174.00	0.62
175.00	0.62
176.00	0.63
177.00	0.63
178.00	0.64
179.00	0.64
180.00	0.65
181.00	0.65
182.00	0.65

183.00	0.66
184.00	0.67
185.00	0.68
186.00	0.69
187.00	0.70
188.00	0.72
189.00	0.73
190.00	0.73
191.00	0.74
192.00	0.74
193.00	0.75
194.00	0.76
195.00	0.76
196.00	0.77
197.00	0.79
198.00	0.80
199.00	0.82
200.00	0.83
201.00	0.85
202.00	0.87
203.00	0.88
204.00	0.89
205.00	0.90
206.00	0.91
207.00	0.92
208.00	0.93
209.00	0.95
210.00	0.96
211.00	0.99
212.00	1.02
213.00	1.05
214.00	1.08
215.00	1.11
216.00	1.14
217.00	1.17
218.00	1.19
219.00	1.21
220.00	1.24
221.00	1.26
222.00	1.28
223.00	1.31
224.00	1.33
225.00	1.42
226.00	1.51
227.00	1.60
228.00	1.69
229.00	1.78
230.00	1.87
231.00	1.95
232.00	2.07

233.00	2.18
234.00	2.30
235.00	2.41
236.00	2.52
237.00	2.64
238.00	2.75
239.00	3.68
240.00	4.60
241.00	5.52
242.00	6.44
243.00	7.37
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245.00	9.21
246.00	8.12
247.00	7.03
248.00	5.93
249.00	4.84
250.00	3.75
251.00	2.66
252.00	1.57
253.00	1.49
254.00	1.42
255.00	1.35
256.00	1.27
257.00	1.20
258.00	1.12
259.00	1.05
260.00	1.02
261.00	0.98
262.00	0.95
263.00	0.92
264.00	0.89
265.00	0.85
266.00	0.82
267.00	0.80
268.00	0.78
269.00	0.76
270.00	0.74
271.00	0.73
272.00	0.71
273.00	0.69
274.00	0.67
275.00	0.66
276.00	0.65
277.00	0.64
278.00	0.62
279.00	0.61
280.00	0.60
281.00	0.59
282.00	0.58

283.00	0.57
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292.00	0.50
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296.00	0.47
297.00	0.47
298.00	0.46
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301.00	0.45
302.00	0.44
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311.00	0.40
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332.00	0.34

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335.00	0.33
336.00	0.33
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344.00	0.31
345.00	0.31
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349.00	0.30
350.00	0.30
351.00	0.30
352.00	0.30
353.00	0.29
354.00	0.29
355.00	0.29
356.00	0.29
357.00	0.29
358.00	0.28
359.00	0.28
360.00	0.38
361.00	0.38
362.00	0.38
363.00	0.38
364.00	0.38

Initial Storage = 0.0000 acre-ft

Detention Basin Result Parameters

Routed Hydrograph

Peak Outflow Discharge: 3.235 cfs, Time to Peak: 250.00 (min), Total Outflow Volume: 16549.09 ft^3

Time min	Discharge cfs	Storage acre-ft
0.00	0.00	0.000000
1.00	0.00	0.000054
2.00	0.00	0.000160
3.00	0.01	0.000316
4.00	0.01	0.000520
5.00	0.02	0.000770
6.00	0.03	0.001064
7.00	0.04	0.001401

8.00	0.04	0.001725
9.00	0.05	0.002037
10.00	0.06	0.002336
11.00	0.07	0.002624
12.00	0.08	0.002900
13.00	0.09	0.003166
14.00	0.09	0.003422
15.00	0.10	0.003668
16.00	0.11	0.003904
17.00	0.12	0.004144
18.00	0.12	0.004376
19.00	0.13	0.004598
20.00	0.13	0.004812
21.00	0.14	0.005017
22.00	0.15	0.005214
23.00	0.15	0.005404
24.00	0.16	0.005587
25.00	0.16	0.005762
26.00	0.17	0.005931
27.00	0.17	0.006093
28.00	0.18	0.006249
29.00	0.18	0.006412
30.00	0.19	0.006569
31.00	0.19	0.006720
32.00	0.19	0.006865
33.00	0.20	0.007004
34.00	0.20	0.007138
35.00	0.21	0.007267
36.00	0.21	0.007391
37.00	0.21	0.007510
38.00	0.22	0.007624
39.00	0.22	0.007748
40.00	0.22	0.007867
41.00	0.23	0.007981
42.00	0.23	0.008091
43.00	0.23	0.008196
44.00	0.24	0.008297
45.00	0.24	0.008395
46.00	0.24	0.008489
47.00	0.24	0.008579
48.00	0.25	0.008679
49.00	0.25	0.008775
50.00	0.25	0.008867
51.00	0.26	0.008956
52.00	0.26	0.009042
53.00	0.26	0.009124
54.00	0.26	0.009203
55.00	0.26	0.009279
56.00	0.27	0.009352
57.00	0.27	0.009422

58.00	0.27	0.009489
59.00	0.27	0.009568
60.00	0.28	0.009643
61.00	0.28	0.009715
62.00	0.28	0.009785
63.00	0.28	0.009852
64.00	0.28	0.009916
65.00	0.29	0.009978
66.00	0.29	0.010051
67.00	0.29	0.010121
68.00	0.29	0.010188
69.00	0.29	0.010253
70.00	0.29	0.010315
71.00	0.30	0.010375
72.00	0.30	0.010433
73.00	0.30	0.010488
74.00	0.30	0.010555
75.00	0.30	0.010619
76.00	0.31	0.010681
77.00	0.31	0.010740
78.00	0.31	0.010797
79.00	0.31	0.010851
80.00	0.31	0.010904
81.00	0.31	0.010955
82.00	0.31	0.011017
83.00	0.32	0.011076
84.00	0.32	0.011134
85.00	0.32	0.011189
86.00	0.32	0.011242
87.00	0.32	0.011293
88.00	0.32	0.011342
89.00	0.33	0.011403
90.00	0.33	0.011461
91.00	0.33	0.011517
92.00	0.33	0.011571
93.00	0.33	0.011623
94.00	0.33	0.011672
95.00	0.34	0.011734
96.00	0.34	0.011793
97.00	0.34	0.011849
98.00	0.34	0.011904
99.00	0.34	0.011956
100.00	0.34	0.012007
101.00	0.35	0.012069
102.00	0.35	0.012128
103.00	0.35	0.012185
104.00	0.35	0.012240
105.00	0.35	0.012293
106.00	0.35	0.012357
107.00	0.36	0.012419

108.00	0.36	0.012479
109.00	0.36	0.012536
110.00	0.36	0.012591
111.00	0.36	0.012644
112.00	0.36	0.012694
113.00	0.36	0.012757
114.00	0.37	0.012817
115.00	0.37	0.012874
116.00	0.37	0.012929
117.00	0.37	0.012996
118.00	0.37	0.013060
119.00	0.38	0.013122
120.00	0.38	0.013181
121.00	0.38	0.013252
122.00	0.38	0.013319
123.00	0.38	0.013385
124.00	0.38	0.013447
125.00	0.39	0.013507
126.00	0.39	0.013565
127.00	0.39	0.013634
128.00	0.39	0.013701
129.00	0.39	0.013765
130.00	0.40	0.013839
131.00	0.40	0.013911
132.00	0.40	0.013981
133.00	0.40	0.014061
134.00	0.40	0.014138
135.00	0.41	0.014212
136.00	0.41	0.014283
137.00	0.41	0.014351
138.00	0.41	0.014430
139.00	0.41	0.014506
140.00	0.42	0.014580
141.00	0.42	0.014650
142.00	0.42	0.014731
143.00	0.42	0.014809
144.00	0.43	0.014898
145.00	0.43	0.014983
146.00	0.43	0.015078
147.00	0.43	0.015169
148.00	0.44	0.015257
149.00	0.44	0.015342
150.00	0.44	0.015437
151.00	0.44	0.015528
152.00	0.45	0.015616
153.00	0.45	0.015700
154.00	0.45	0.015795
155.00	0.45	0.015885
156.00	0.46	0.015986
157.00	0.46	0.016083

158.00	0.46	0.016190
159.00	0.47	0.016292
160.00	0.47	0.016405
161.00	0.47	0.016512
162.00	0.47	0.016629
163.00	0.48	0.016742
164.00	0.48	0.016850
165.00	0.48	0.016968
166.00	0.49	0.017081
167.00	0.49	0.017189
168.00	0.49	0.017294
169.00	0.50	0.017407
170.00	0.50	0.017530
171.00	0.50	0.017662
172.00	0.51	0.017789
173.00	0.51	0.017924
174.00	0.52	0.018067
175.00	0.52	0.018205
176.00	0.52	0.018351
177.00	0.53	0.018492
178.00	0.53	0.018640
179.00	0.54	0.018783
180.00	0.54	0.018934
181.00	0.54	0.019079
182.00	0.55	0.019218
183.00	0.55	0.019365
184.00	0.56	0.019521
185.00	0.56	0.019683
186.00	0.57	0.019853
187.00	0.57	0.020030
188.00	0.58	0.020227
189.00	0.58	0.020430
190.00	0.59	0.020625
191.00	0.59	0.020826
192.00	0.60	0.021019
193.00	0.61	0.021218
194.00	0.61	0.021423
195.00	0.62	0.021620
196.00	0.62	0.021823
197.00	0.63	0.022046
198.00	0.64	0.022273
199.00	0.64	0.022518
200.00	0.65	0.022767
201.00	0.66	0.023034
202.00	0.66	0.023317
203.00	0.67	0.023603
204.00	0.68	0.023891
205.00	0.69	0.024182
206.00	0.70	0.024475
207.00	0.71	0.024770

208.00	0.71	0.025067
209.00	0.72	0.025380
210.00	0.73	0.025694
211.00	0.74	0.026036
212.00	0.75	0.026406
213.00	0.76	0.026802
214.00	0.77	0.027223
215.00	0.79	0.027668
216.00	0.80	0.028137
217.00	0.81	0.028628
218.00	0.83	0.029127
219.00	0.84	0.029633
220.00	0.86	0.030161
221.00	0.87	0.030695
222.00	0.89	0.031235
223.00	0.90	0.031796
224.00	0.92	0.032361
225.00	0.94	0.033026
226.00	0.96	0.033787
227.00	0.98	0.034640
228.00	1.01	0.035582
229.00	1.03	0.036608
230.00	1.07	0.037717
231.00	1.10	0.038890
232.00	1.13	0.040181
233.00	1.17	0.041569
234.00	1.21	0.043067
235.00	1.26	0.044655
236.00	1.30	0.046329
237.00	1.35	0.048102
238.00	1.41	0.049954
239.00	1.48	0.052990
240.00	1.58	0.057152
241.00	1.71	0.062395
242.00	1.88	0.068678
243.00	2.07	0.075974
244.00	2.30	0.084230
245.00	2.55	0.093409
246.00	2.78	0.100761
247.00	2.97	0.106355
248.00	3.10	0.110247
249.00	3.19	0.112516
250.00	3.24	0.113225
251.00	3.23	0.112829
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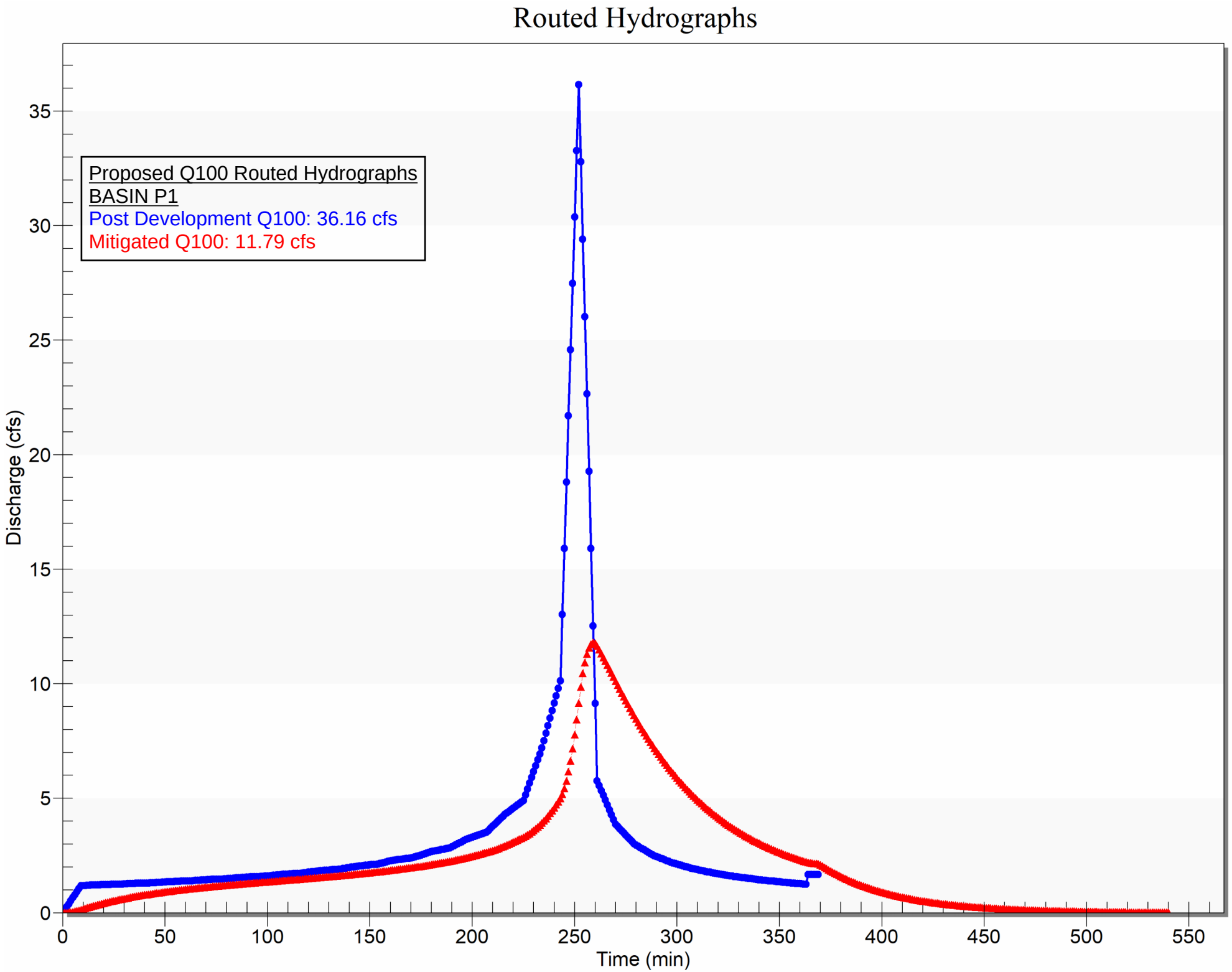
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272.00	1.97	0.069139
273.00	1.92	0.067439
274.00	1.88	0.065778
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276.00	1.78	0.062606
277.00	1.74	0.061091
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286.00	1.39	0.049190
287.00	1.36	0.048047
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295.00	1.13	0.040080
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297.00	1.08	0.038370
298.00	1.05	0.037551
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300.00	1.01	0.035992
301.00	0.99	0.035251
302.00	0.97	0.034526
303.00	0.95	0.033828
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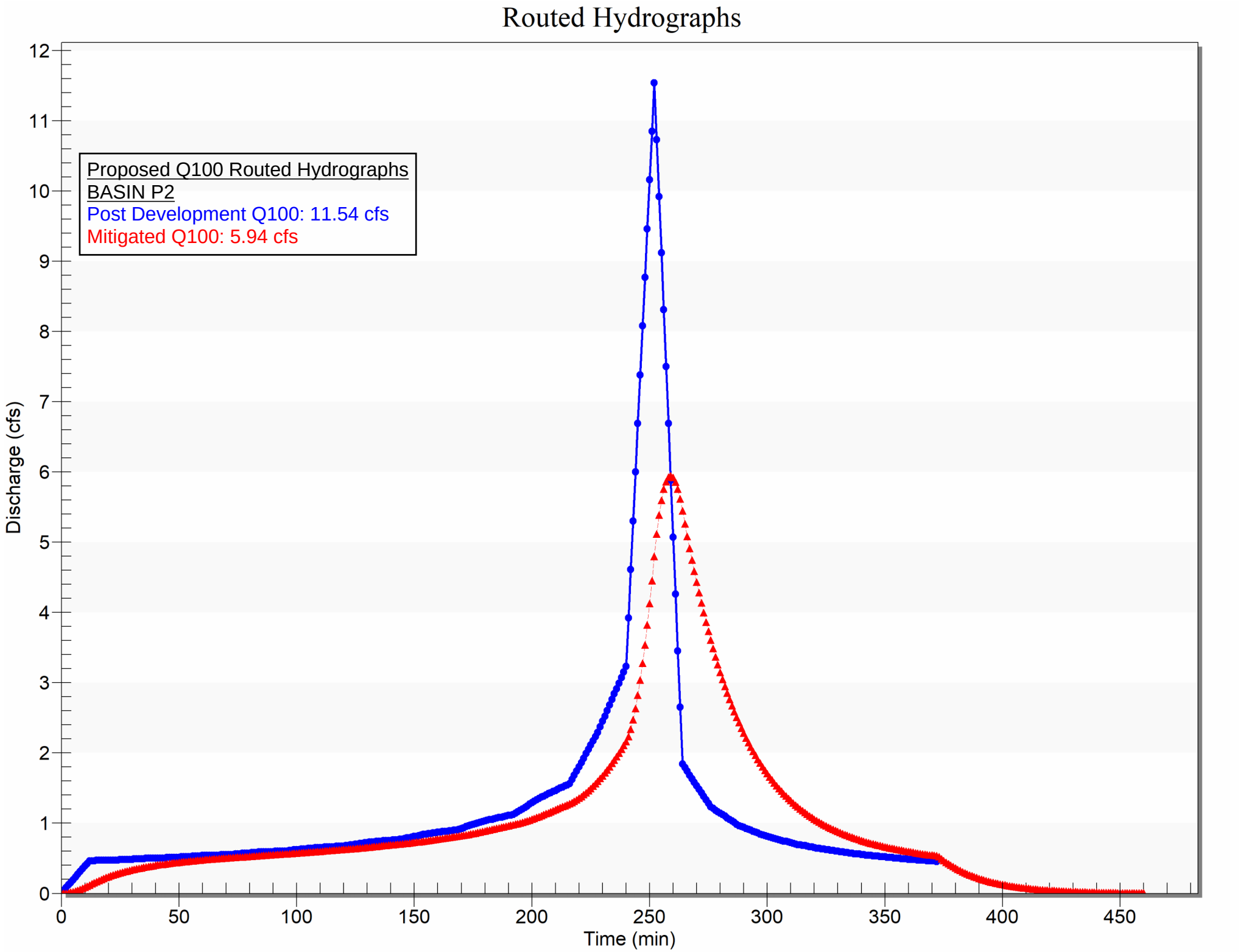
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321.00	0.67	0.024189
322.00	0.65	0.023783
323.00	0.64	0.023394
324.00	0.63	0.023019
325.00	0.62	0.022659
326.00	0.61	0.022299
327.00	0.60	0.021953
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334.00	0.54	0.019780
335.00	0.53	0.019505
336.00	0.52	0.019241
337.00	0.51	0.018973
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339.00	0.50	0.018468
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344.00	0.47	0.017328
345.00	0.46	0.017121
346.00	0.45	0.016921
347.00	0.45	0.016716
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349.00	0.44	0.016330
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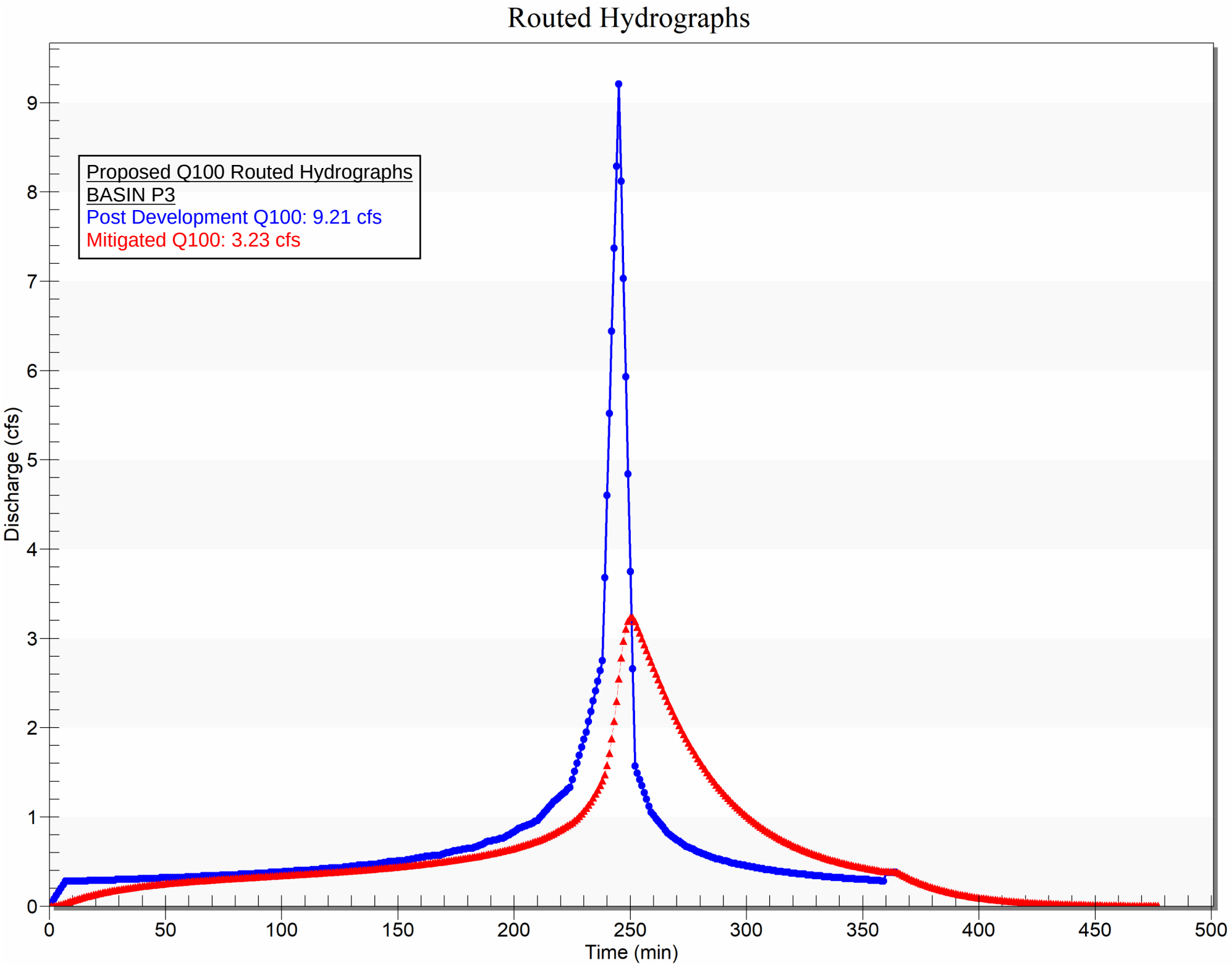
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373.00	0.28	0.010600
374.00	0.27	0.010234
375.00	0.26	0.009883
376.00	0.25	0.009545
377.00	0.24	0.009220
378.00	0.23	0.008908
379.00	0.22	0.008608
380.00	0.21	0.008320
381.00	0.20	0.008043
382.00	0.19	0.007776
383.00	0.19	0.007520
384.00	0.18	0.007274
385.00	0.17	0.007037
386.00	0.17	0.006809
387.00	0.16	0.006591
388.00	0.15	0.006380
389.00	0.15	0.006178
390.00	0.14	0.005984
391.00	0.14	0.005797
392.00	0.13	0.005617
393.00	0.13	0.005445
394.00	0.12	0.005279
395.00	0.12	0.005119
396.00	0.11	0.004966
397.00	0.11	0.004819
398.00	0.10	0.004677
399.00	0.10	0.004541
400.00	0.10	0.004410
401.00	0.09	0.004284
402.00	0.09	0.004163
403.00	0.08	0.004047
404.00	0.08	0.003935
405.00	0.08	0.003828
406.00	0.07	0.003724
407.00	0.07	0.003625

408.00	0.07	0.003529
409.00	0.07	0.003438
410.00	0.06	0.003349
411.00	0.06	0.003265
412.00	0.06	0.003183
413.00	0.06	0.003105
414.00	0.05	0.003029
415.00	0.05	0.002957
416.00	0.05	0.002887
417.00	0.05	0.002821
418.00	0.05	0.002756
419.00	0.04	0.002694
420.00	0.04	0.002635
421.00	0.04	0.002578
422.00	0.04	0.002523
423.00	0.04	0.002470
424.00	0.04	0.002419
425.00	0.04	0.002371
426.00	0.03	0.002324
427.00	0.03	0.002279
428.00	0.03	0.002235
429.00	0.03	0.002194
430.00	0.03	0.002154
431.00	0.03	0.002115
432.00	0.03	0.002078
433.00	0.03	0.002043
434.00	0.02	0.002008
435.00	0.02	0.001975
436.00	0.02	0.001944
437.00	0.02	0.001913
438.00	0.02	0.001884
439.00	0.02	0.001856
440.00	0.02	0.001829
441.00	0.02	0.001803
442.00	0.02	0.001778
443.00	0.02	0.001754
444.00	0.02	0.001731
445.00	0.02	0.001709
446.00	0.02	0.001688
447.00	0.01	0.001667
448.00	0.01	0.001648
449.00	0.01	0.001629
450.00	0.01	0.001611
451.00	0.01	0.001593
452.00	0.01	0.001576
453.00	0.01	0.001560
454.00	0.01	0.001545
455.00	0.01	0.001530
456.00	0.01	0.001516
457.00	0.01	0.001502

458.00	0.01	0.001488
459.00	0.01	0.001476
460.00	0.01	0.001463
461.00	0.01	0.001452
462.00	0.01	0.001440
463.00	0.01	0.001430
464.00	0.01	0.001419
465.00	0.01	0.001409
466.00	0.01	0.001399
467.00	0.01	0.001390
468.00	0.01	0.001381
469.00	0.01	0.001373
470.00	0.01	0.001364
471.00	0.01	0.001356
472.00	0.01	0.001349
473.00	0.01	0.001341
474.00	0.01	0.001334
475.00	0.00	0.001328
476.00	0.00	0.001321
477.00	0.00	0.001315


Routed Hydrographs
Proposed Q100 Routed Hydrographs
BASIN P1
Post Development Q100: 36.16 cfs
Mitigated Q100: 11.79 cfs
Discharge (cfs)
0
5
10
15
20
25
30
35
0
50
100
150
200
250
300
350
400
450
500
550
Time (min)


Routed Hydrographs
Proposed Q100 Routed Hydrographs
BASIN P2
Post Development Q100: 11.54 cfs
Mitigated Q100: 5.94 cfs
Discharge (cfs)
Time (min)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
50
100
150
200
250
300
350
400
450


Routed Hydrographs
Proposed Q100 Routed Hydrographs
BASIN P3
Post Development Q100: 9.21 cfs
Mitigated Q100: 3.23 cfs
Discharge (cfs)
Time (min)
0
1
2
3
4
5
6
7
8
9
0
50
100
150
200
250
300
350
400
450
500

Program Package Serial Number: 7296
WATER SURFACE PROFILE LISTING Date: 8-27-2026
Time: 8:22:39

TM 5665
RAMONA, CA
Q100 PRELIMINARY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	No Wth Prs/Pip	ZL	ZR	L/Elem	Ch Slope	SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	Type Ch
1.000	1429.940	5.000	1434.940	65.41	3.33	.17	1435.11	.00	2.28	.00	5.000	.000	.00	1	.0										
113.650	.0004																	.0006	.07	5.00	.00	5.00	.013	.00	.00 PIPE
114.650	1429.990	5.047	1435.037	65.41	3.33	.17	1435.21	.00	2.28	.00	5.000	.000	.00	1	.0										
5.909	.0130																	.0006	.00	5.05	.00	1.60	.013	.00	.00 PIPE
120.559	1430.067	5.000	1435.067	65.41	3.33	.17	1435.24	.00	2.28	.00	5.000	.000	.00	1	.0										

```
   |-
    26.511    .0130                                    .0006      .02     5.00     .00    1.60    .013       .00
.00  PIPE
          |         |        |         |         |              |         |       |        |        |       |       |
   |
   147.070  1430.410    4.661  1435.071     65.41    3.43     .18  1435.25     .00    2.28     2.52    5.000     .000
.00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
    29.534    .0101                                    .0006      .02     4.66     .22    1.70    .013       .00
.00  PIPE
          |         |        |         |         |              |         |       |        |        |       |       |
   |
   176.604  1430.709    4.360  1435.069     65.41    3.60     .20  1435.27     .00    2.28     3.34    5.000     .000
.00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
    22.683    .0101                                    .0006      .01     4.36     .27    1.70    .013       .00
.00  PIPE
          |         |        |         |         |              |         |       |        |        |       |       |
   |
   199.286  1430.938    4.124  1435.062     65.41    3.78     .22  1435.28     .00    2.28     3.80    5.000     .000
.00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
    19.118    .0101                                    .0007      .01     4.12     .31    1.70    .013       .00
.00  PIPE
          |         |        |         |         |              |         |       |        |        |       |       |
   |
   218.405  1431.132    3.921  1435.053     65.41    3.96     .24  1435.30     .00    2.28     4.11    5.000     .000
.00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
    16.789    .0101                                    .0007      .01     3.92     .35    1.70    .013       .00
.00  PIPE
          |         |        |         |         |              |         |       |        |        |       |       |
   |
   235.193  1431.301    3.739  1435.041     65.41    4.15     .27  1435.31     .00    2.28     4.34    5.000     .000
.00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
    14.957    .0101                                    .0008      .01     3.74     .38    1.70    .013       .00
.00  PIPE
```

Program Package Serial Number: 7296
WATER SURFACE PROFILE LISTING Date: 8-27-2026
Time: 8:22:39

TM 5665
RAMONA, CA
Q100 PRELIMINARY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt|or I.D.	No Wth Prs/Pip	ZL	L/Elem	Ch Slope	SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
250.150	1431.453	3.573	1435.026	65.41	4.36	.29	1435.32	.00	2.28	4.52	5.000	.000	.00	1	.0										
13.302	.0101					.0009	.01	3.57	.42	1.70	.013	.00	.00	PIPE											
263.453	1431.587	3.421	1435.008	65.41	4.57	.32	1435.33	.00	2.28	4.65	5.000	.000	.00	1	.0										
3.227	.0101					.0010	.00	3.42	.46	1.70	.013	.00	.00	PIPE											
266.680	1431.620	3.384	1435.004	65.41	4.63	.33	1435.34	1.22	2.28	4.68	5.000	.000	.00	1	.0										

```
  |-
 JUNCT STR   .0000                                                  4.60     .47            .013      .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |
  |
  270.680  1431.620    2.256  1433.876     61.38   10.76    1.80  1435.68     .00    2.53     2.59    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
  193.928    .0101                                        .0101     1.96     2.26    1.28    2.26    .013       .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |
  |
  464.608  1433.582    2.256  1435.839     61.38   10.76    1.80  1437.64     .00    2.53     2.59    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
  123.380    .0101                                        .0100     1.23     2.26    1.28    2.26    .013       .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |
  |
  587.988  1434.831    2.282  1437.113     61.38   10.64    1.76  1438.87     .00    2.53     2.56    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
   60.906    .0101                                        .0094      .57     2.28    1.25    2.26    .013       .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |
  |
  648.894  1435.447    2.396  1437.843     61.38   10.14    1.60  1439.44     .00    2.53     2.41    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
   10.186    .0101                                        .0085      .09     2.40    1.13    2.26    .013       .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |
  |
  659.080  1435.550    2.526  1438.076     61.38    9.66    1.45  1439.53    3.00    2.53     2.19    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
 JUNCT STR   .0000                                        .0077      .03    3.00    1.00            .013       .00
.00  PIPE
```

Program Package Serial Number: 7296
WATER SURFACE PROFILE LISTING Date: 8-27-2026
Time: 8:22:39

TM 5665
RAMONA, CA
Q100 PRELIMINARY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	No Wth ZL	Prs/Pip ZR	L/Elem	Ch Slope	SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	Type Ch
662.580	1435.550	3.145	1438.695	57.35	8.11	1.02	1439.72	.00	2.45	.00	3.000	.000	.00	1	.0									
149.750	-.0188																.0074	1.11	3.14	.00	.00	.013	.00	.00	PIPE
812.330	1432.740	7.062	1439.802	57.35	8.11	1.02	1440.82	.00	2.45	.00	3.000	.000	.00	1	.0									
JUNCT STR	.0000																.0066	.03	.00	.00		.013	.00	.00	PIPE
816.330	1432.740	7.506	1440.246	51.17	7.24	.81	1441.06	.00	2.33	.00	3.000	.000	.00	1	.0									

```
  |-
  298.633    .0213                                    .0059     1.76     7.51     .00    1.55    .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
  |
  1114.963  1439.087    3.149  1442.236     51.17    7.24     .81  1443.05     .00    2.33      .00    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
 HYDRAULIC JUMP

         |         |        |         |         |              |         |       |        |        |       |       |
  |
  1114.963  1439.087    1.655  1440.742     51.17   12.80    2.54  1443.29     .00    2.33     2.98    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
    4.212    .0213                                    .0169      .07     1.65    1.95    1.55    .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
  |
  1119.174  1439.177    1.660  1440.837     51.17   12.74    2.52  1443.36     .00    2.33     2.98    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
   30.007    .0213                                    .0158      .47     1.66    1.94    1.55    .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
  |
  1149.182  1439.814    1.726  1441.540     51.17   12.15    2.29  1443.83     .00    2.33     2.97    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
   19.021    .0213                                    .0140      .27     1.73    1.80    1.55    .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
  |
  1168.203  1440.219    1.796  1442.015     51.17   11.58    2.08  1444.10     .00    2.33     2.94    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
  |-
   13.107    .0213                                    .0124      .16     1.80    1.67    1.55    .013       .00
.00  PIPE
```

```
         |         |        |         |         |               |         |       |        |        |       |       |
   |
  1181.309  1440.497    1.869  1442.366     51.17   11.04    1.89  1444.26     .00    2.33     2.91    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
     9.059    .0213                                    .0110      .10     1.87    1.54    1.55    .013       .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |
   |
  1190.368  1440.690    1.948  1442.638     51.17   10.53    1.72  1444.36     .00    2.33     2.86    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
     6.387    .0213                                    .0097      .06     1.95    1.42    1.55    .013       .00
.00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |
   |
  1196.756  1440.825    2.031  1442.857     51.17   10.04    1.57  1444.42     .00    2.33     2.81    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
     4.157    .0213                                    .0087      .04     2.03    1.31    1.55    .013       .00
.00  PIPE
```


Program Package Serial Number: 7296

WATER SURFACE PROFILE LISTING Date: 8-27-2026

Time: 8:22:39

TM 5665
RAMONA, CA
Q100 PRELIMINARY

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

```
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***
** |*******
         |         |        |         |         |              |         |       |        |        |       |       |
   |
  1200.913  1440.914    2.121  1443.035     51.17    9.57    1.42  1444.46     .00    2.33     2.73    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
     2.396    .0213                                        .0077      .02     2.12    1.21    1.55    .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
   |
  1203.310  1440.965    2.218  1443.183     51.17    9.13    1.29  1444.48     .00    2.33     2.63    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
      .720    .0213                                        .0069      .00     2.22    1.10    1.55    .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
   |
  1204.030  1440.980    2.326  1443.306     51.17    8.70    1.18  1444.48    3.00    2.33     2.50    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
 JUNCT STR   .0213                                        .0040      .02     3.00    1.00            .013       .00
.00  PIPE
         |         |        |         |         |              |         |       |        |        |       |       |
   |
  1208.780  1441.081    3.935  1445.016     25.58    3.62     .20  1445.22     .00    1.63      .00    3.000     .000
.00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-
   |-
 JUNCT STR   .0213                                        .0030      .00     .00     .00            .013       .00
.00  PIPE
         |
```

Channel Report

11th Street Section 1 Q100

User-defined

Invert Elev (ft)	= 1434.59
Slope (%)	= 1.55
N-Value	= 0.016

Calculations

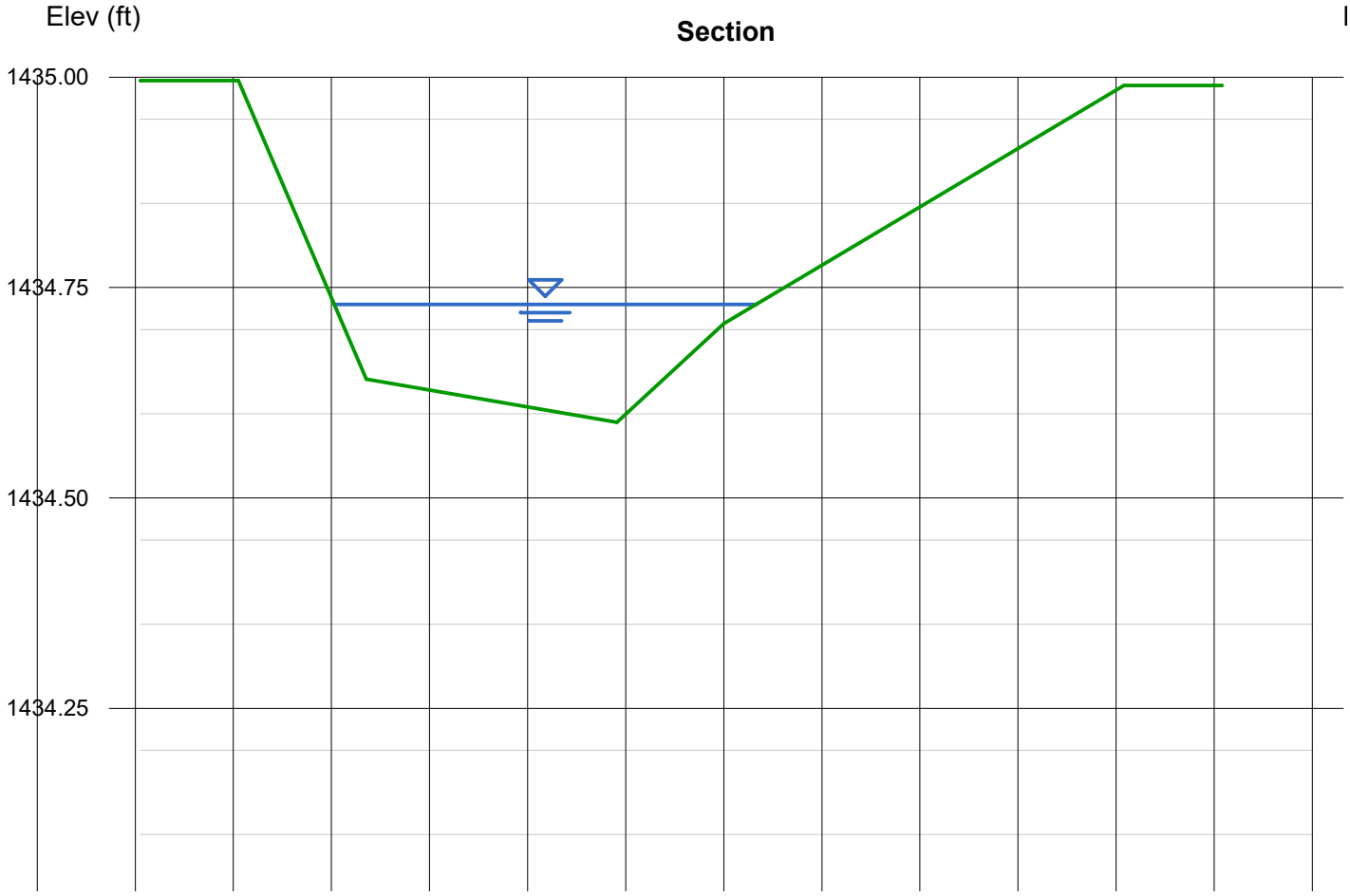
Compute by:	Known Q
Known Q (cfs)	= 4.20

Highlighted

Depth (ft)	= 0.14
Q (cfs)	= 4.200
Area (sqft)	= 2.00
Velocity (ft/s)	= 2.10
Wetted Perim (ft)	= 21.52
Crit Depth, Yc (ft)	= 0.16
Top Width (ft)	= 21.51
EGL (ft)	= 0.21

(Sta, El, n)-(Sta, El, n)...

(35.25, 1435.00)-(41.78, 1434.64, 0.016)-(54.55, 1434.59, 0.016)-(60.00, 1434.71, 0.016)-(80.40, 1434.99, 0.016)



Channel Report

11th Street Section 2 Q100

User-defined

Invert Elev (ft)	= 1435.37
Slope (%)	= 1.55
N-Value	= 0.016

Calculations

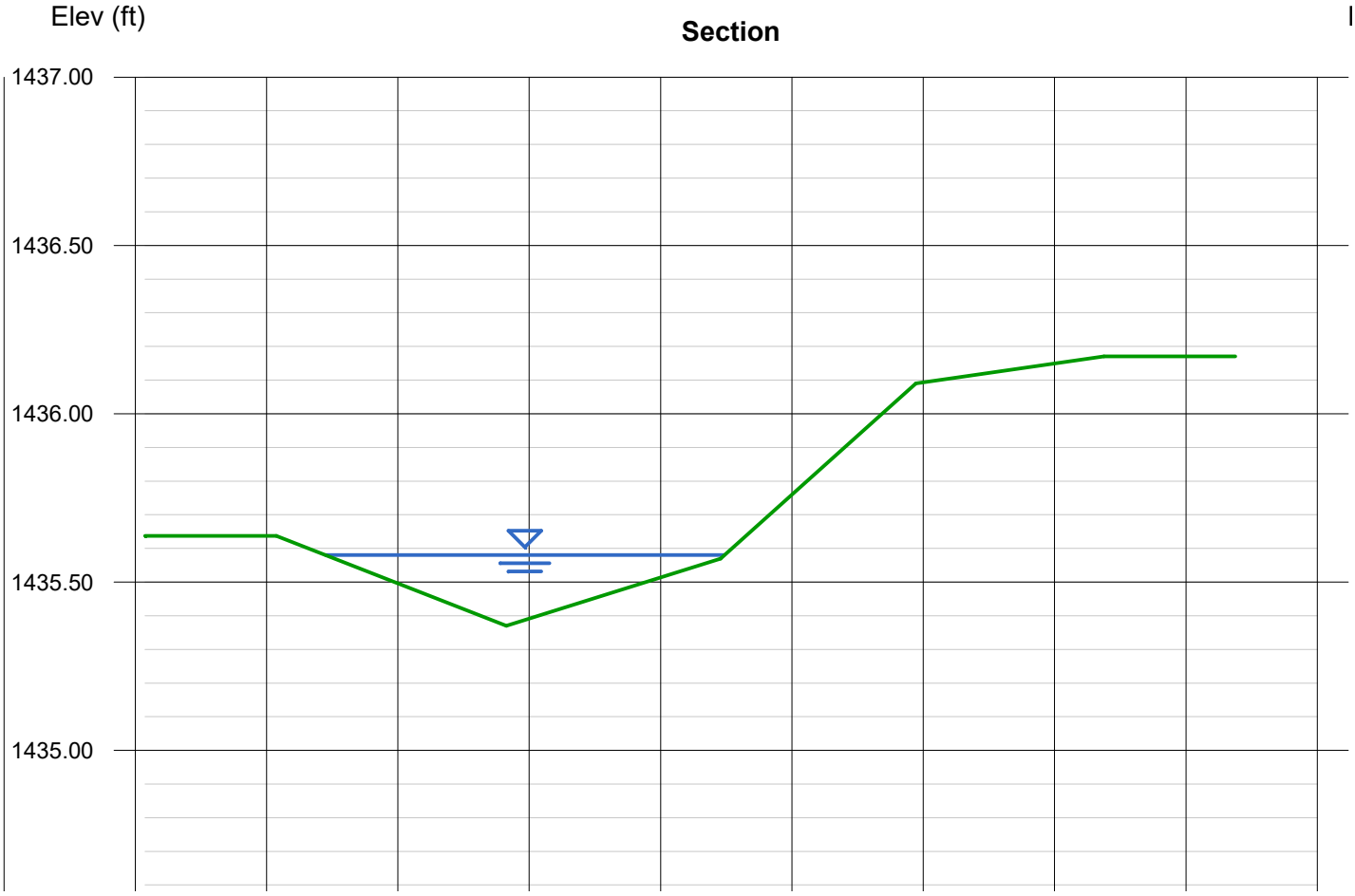
Compute by:	Known Q
Known Q (cfs)	= 4.20

Highlighted

Depth (ft)	= 0.21
Q (cfs)	= 4.200
Area (sqft)	= 1.62
Velocity (ft/s)	= 2.59
Wetted Perim (ft)	= 15.19
Crit Depth, Yc (ft)	= 0.24
Top Width (ft)	= 15.18
EGL (ft)	= 0.31

(Sta, El, n)-(Sta, El, n)...

(35.37, 1435.64)-(44.13, 1435.37, 0.016)-(52.28, 1435.57, 0.016)-(59.72, 1436.09, 0.016)-(66.88, 1436.17, 0.016)



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, 00

11th Street Section 3 Q100

User-defined

Invert Elev (ft)	= 1436.61
Slope (%)	= 1.55
N-Value	= 0.016

Calculations

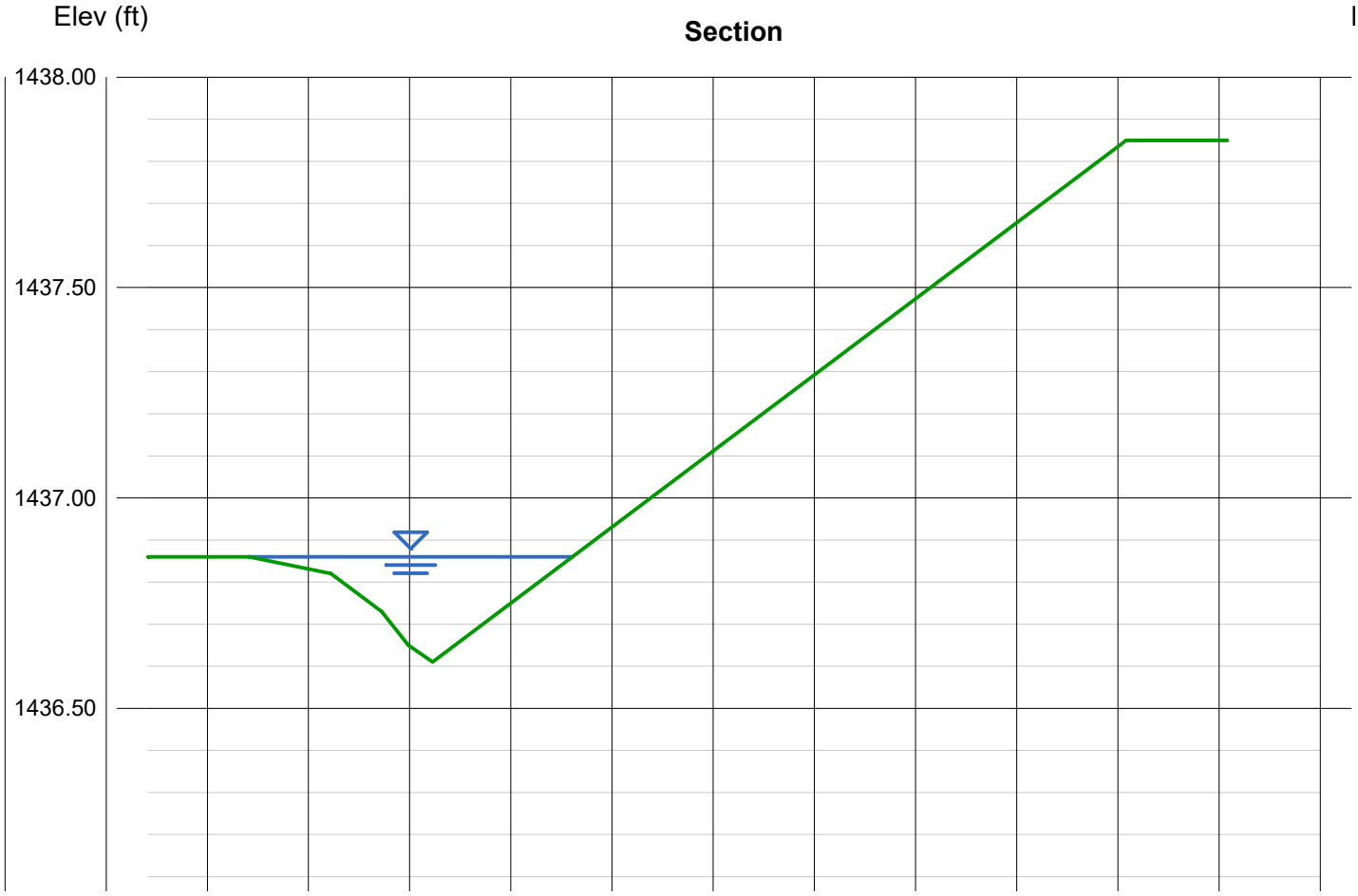
Compute by:	Known Q
Known Q (cfs)	= 4.20

Highlighted

Depth (ft)	= 0.25
Q (cfs)	= 4.200
Area (sqft)	= 1.66
Velocity (ft/s)	= 2.53
Wetted Perim (ft)	= 16.00
Crit Depth, Yc (ft)	= 0.28
Top Width (ft)	= 15.99
EGL (ft)	= 0.35

(Sta, El, n)-(Sta, El, n)...

(37.06, 1436.86)-(41.11, 1436.82, 0.016)-(43.61, 1436.73, 0.016)-(44.93, 1436.65, 0.016)-(46.14, 1436.61, 0.016)-(80.40, 1437.85, 0.016)



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, 00 2 2026

11th Street Section 4 Q100

User-defined

Invert Elev (ft)	= 1433.16
Slope (%)	= 1.55
N-Value	= 0.016

Calculations

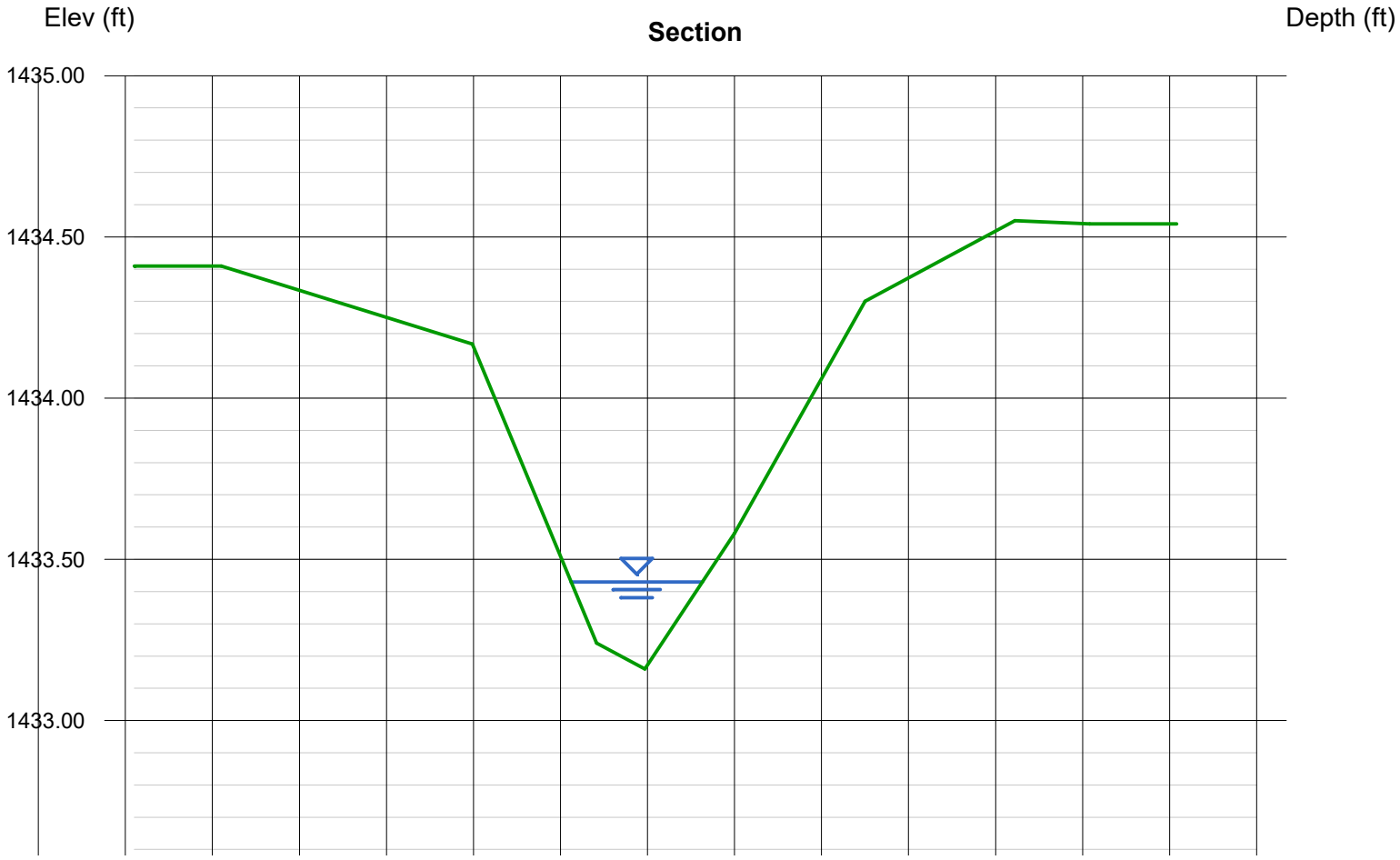
Compute by:	Known Q
Known Q (cfs)	= 4.20

Highlighted

Depth (ft)	= 0.27
Q (cfs)	= 4.200
Area (sqft)	= 1.23
Velocity (ft/s)	= 3.43
Wetted Perim (ft)	= 7.58
Crit Depth, Yc (ft)	= 0.33
Top Width (ft)	= 7.55
EGL (ft)	= 0.45

(Sta, El, n)-(Sta, El, n)...

(30.51, 1434.41)-(44.93, 1434.17, 0.016)-(52.07, 1433.24, 0.016)-(54.85, 1433.16, 0.016)-(60.00, 1433.58, 0.016)-(67.50, 1434.30, 0.016)-(76.11, 1434.55, 0.016)-(80.40, 1434.54, 0.016)



APPENDIX E
As-Builts & References

COUNTY OF SAN DIEGO VESTING TENTATIVE MAP 5665

IN THE UNINCORPORATED TERRITORY OF SAN DIEGO COUNTY, STATE OF CALIFORNIA

PRELIMINARY GRADING

PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003

APN: 284-202-21-00, 284-203-08-00, AND 284-244-01-00

LEGAL DESCRIPTION:

REAL PROPERTY IN THE UNINCORPORATED AREA OF THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

LD PARCEL 1: (APN: 284-203-08-00)

LOT 159 AND LOT 178 OF TOWN OF RAMONA, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 643, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, OCTOBER 15, 1890.

LD PARCEL 2: (APN: 284-202-21-00)

LOT 179 OF TOWN OF RAMONA, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 643, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, OCTOBER 15, 1890.

EXCEPTING THEREFROM THAT PORTION DEEDED TO THE COUNTY OF SAN DIEGO IN DEED RECORDED MARCH 27, 1972 AS INSTRUMENT NO. 72000 OF OFFICIAL RECORDS.

ALSO EXCEPTING THEREFROM THAT PORTION DEEDED TO THE COUNTY OF SAN DIEGO IN DEED RECORDED JULY 15, 1998 AS INSTRUMENT NO. 1998-0437610 OF OFFICIAL RECORDS.

LD PARCEL 3: (APN: 284-244-01)

LOTS 484, 486, 495, 496, 516, 517, 528 AND 529 OF TOWN OF RAMONA, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 643, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, OCTOBER 15, 1890.

APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

SITE ADDRESS:

APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

UTILITY PURVEYORS & SERVICES:

WATER:	RAMONA MUNICIPAL WATER DISTRICT	(760) 789-1330
SEWER:	RAMONA MUNICIPAL WATER DISTRICT	(760) 789-1330
ELECTRIC:	SAN DIEGO GAS & ELECTRIC	(800) 336-7343
GAS:	SAN DIEGO GAS & ELECTRIC	(800) 336-7343
TELEPHONE:	AT&T	(800) 255-5288
CABLE:	TIME WARNER CABLE	(800) 961-9941
TRASH/REFUSE:	RAMONA DISPOSAL SERVICE	(760) 789-516
SCHOOL DISTRICT:	RAMONA UNIFIED SCHOOL DISTRICT	(760) 787-2000

NOTE:

1. TENTATIVE MAP PREPARED BY: C&V CONSULTING, INC.
   9830 IRVINE CENTER DRIVE
   IRVINE, CA 92618
   PH: 949-916-3800
2. TOTAL GROSS AREA: 19.43 ACRES | NET AREA: 19.37 ACRES
3. TOTAL NUMBER OF LOTS: 99
   SINGLE FAMILY HOMES – 88
   PRIVATE STREET – 3
   LANDSCAPE AREA – 7
   HISTORICAL PRESERVATION – 1
4. TOTAL NUMBER OF DWELLING UNITS: 88
5. ALL PROPOSED UTILITIES TO BE UNDERGROUND.
6. EXISTING TOPOGRAPHY FROM C&V CONSULTING, INC. AERIAL PHOTOGRAMMETRY ON SEPTEMBER 6, 2024.
7. ALL ONSITE STREETS WILL BE PRIVATE WITH PUBLIC ACCESS EASEMENTS.
8. EXISTING STRUCTURES WITHIN THE DEVELOPMENT FOOTPRINT WILL BE DEMOLISHED UNLESS OTHERWISE NOTED.

GRADING QUANTITIES:

ALL GRADING QUANTITIES ARE PRELIMINARY ONLY

PROPOSED CUT:	176,831 CY
PROPOSED FILL:	60,900 CY
PROPOSED EXPORT:	115,931 CY

SUBDIVIDER:

WARMINGTON RESIDENTIAL
3090 PULLMAN STREET
COSTA MESA, CA 92626
PHONE: (714) 557-5511

ENGINEER:

C&V CONSULTING, INC.
9830 IRVINE CENTER DRIVE
IRVINE, CA 92618
(949)916-3800

OWNER'S REPRESENTATIVE CERTIFICATE:

WE HEREBY CERTIFY THAT WE ARE THE RECORD OWNERS/REPRESENTATIVES OF THE PROPERTY SHOWN ON THE TENTATIVE SUBDIVISION MAP AND THAT SAID MAP SHOWS ALL OUR CONTIGUOUS OWNERSHIP IN WHICH WE HAVE ANY DEED OR TRUST INTEREST. WE UNDERSTAND THAT OUR PROPERTY IS CONSIDERED CONTIGUOUS EVEN IF IT IS SEPARATED BY ROADS, STREETS, UTILITY EASEMENTS, OR RAILROAD RIGHT-OF-WAYS. WE WILL COMPLY WITH THE PARK AND LAND DEDICATION ORDINANCE.

_____

WARMINGTON RESIDENTIAL
3090 PULLMAN STREET
COSTA MESA, CA 92626
(714)434-4416

COMMUNITY PLAN:

RAMONA COMMUNITY PLAN

GENERAL PLAN DESIGNATION:

RAMONA LAND USE:

APN	LAND USE
284-202-21	VILLAGE RESIDENTIAL (VR-7.3)
284-203-08	VILLAGE RESIDENTIAL (VR-7.3)
284-244-01	VILLAGE RESIDENTIAL (VR-2)

LOT AREA SUMMARY:

Lot	Gross Area (SF)	Net Area (SF)	Lot Designation
***LOT A	104,799	104,799	Private Street
***LOT B	28,544	28,544	Private Street
***LOT C	32,104	32,104	Private Street
LOT D	16,365	16,365	Historic Preservation
***LOT E	15,473	14,997	Recreation
***LOT F	1,456	1,456	Landscape
***LOT G	1,281	1,281	Landscape
***LOT H	1,966	1,966	Landscape
***LOT I	1,151	1,151	Landscape
***LOT J	6,685	4,849	Landscape/Water Quality
***LOT K	3,881	3,881	Recreation
1	9,665	9,665	Single Family Home
2	8,396	8,396	Single Family Home
3	7,163	7,163	Single Family Home
4	8,399	8,399	Single Family Home
5	7,412	7,412	Single Family Home
6	8,432	8,432	Single Family Home
7	7,167	7,167	Single Family Home
8	8,405	8,405	Single Family Home
9	7,417	7,417	Single Family Home
10	8,407	8,407	Single Family Home
**11	7,172	7,172	Single Family Home
12	9,020	9,020	Single Family Home
13	7,199	7,199	Single Family Home
14	6,360	6,360	Single Family Home
**15	6,148	6,148	Single Family Home
16	7,208	7,208	Single Family Home
17	6,360	6,360	Single Family Home
**18	6,148	6,148	Single Family Home
19	7,208	7,208	Single Family Home
20	6,360	6,360	Single Family Home
**21	6,148	6,148	Single Family Home
22	7,191	7,191	Single Family Home
23	6,131	6,131	Single Family Home
24	6,360	6,360	Single Family Home
25	7,208	7,208	Single Family Home
26	6,360	6,360	Single Family Home
27	7,208	7,208	Single Family Home
**28	6,148	6,148	Single Family Home
29	7,208	7,208	Single Family Home
30	6,360	6,360	Single Family Home
**31	6,148	6,148	Single Family Home
32	7,199	7,199	Single Family Home
33	7,985	7,985	Single Family Home
34	7,260	7,260	Single Family Home
35	8,228	8,228	Single Family Home
*36	7,018	7,018	Single Family Home
37	8,228	8,228	Single Family Home
38	7,260	7,260	Single Family Home
39	8,228	8,228	Single Family Home
40	7,018	7,018	Single Family Home
41	8,228	8,228	Single Family Home
42	7,260	7,260	Single Family Home
43	8,228	8,228	Single Family Home
44	9,992	9,992	Single Family Home
45	8,110	8,110	Single Family Home
46	7,243	7,243	Single Family Home
47	6,379	6,379	Single Family Home
**48	7,802	7,802	Single Family Home
49	5,476	5,476	Single Family Home
50	4,732	4,732	Single Family Home
51	4,982	4,982	Single Family Home
52	4,745	4,745	Single Family Home
53	4,995	4,995	Single Family Home
54	4,758	4,758	Single Family Home
55	5,008	5,008	Single Family Home
56	4,909	4,909	Single Family Home
57	5,992	5,992	Single Family Home
58	11,741	11,741	Single Family Home
59	4,984	4,984	Single Family Home
60	4,739	4,739	Single Family Home
61	4,979	4,979	Single Family Home
62	4,734	4,734	Single Family Home
63	4,975	4,975	Single Family Home
64	5,360	5,360	Single Family Home
65	7,379	7,094	Single Family Home
66	6,442	6,442	Single Family Home
67	7,379	7,379	Single Family Home
68	6,208	6,208	Single Family Home
69	7,379	7,379	Single Family Home
70	6,442	6,442	Single Family Home
71	7,782	7,782	Single Family Home
72	8,354	8,354	Single Family Home
**73	6,390	6,390	Single Family Home
74	6,646	6,646	Single Family Home
75	7,804	7,804	Single Family Home
*76	8,019	8,019	Single Family Home
77	10,884	10,884	Single Family Home
78	9,806	9,806	Single Family Home
79	11,656	11,656	Single Family Home
80	7,931	7,931	Single Family Home
81	9,146	9,146	Single Family Home
*82	6,483	6,483	Single Family Home
83	6,748	6,748	Single Family Home
84	6,503	6,503	Single Family Home
85	7,505	7,505	Single Family Home
86	8,678	8,678	Single Family Home
87	9,748	9,748	Single Family Home
88	10,318	10,318	Single Family Home

Note: * Indicates affordable home (Moderate)

Note: ** Indicates affordable home (Very Low)

Note: *** Indicates proposed HOA lot

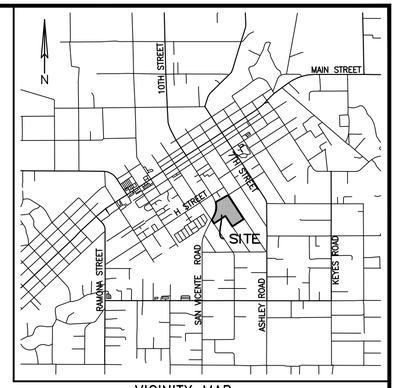
AFFORDABLE UNITS:

*MODERATE –
LOTS 36, 76, 82

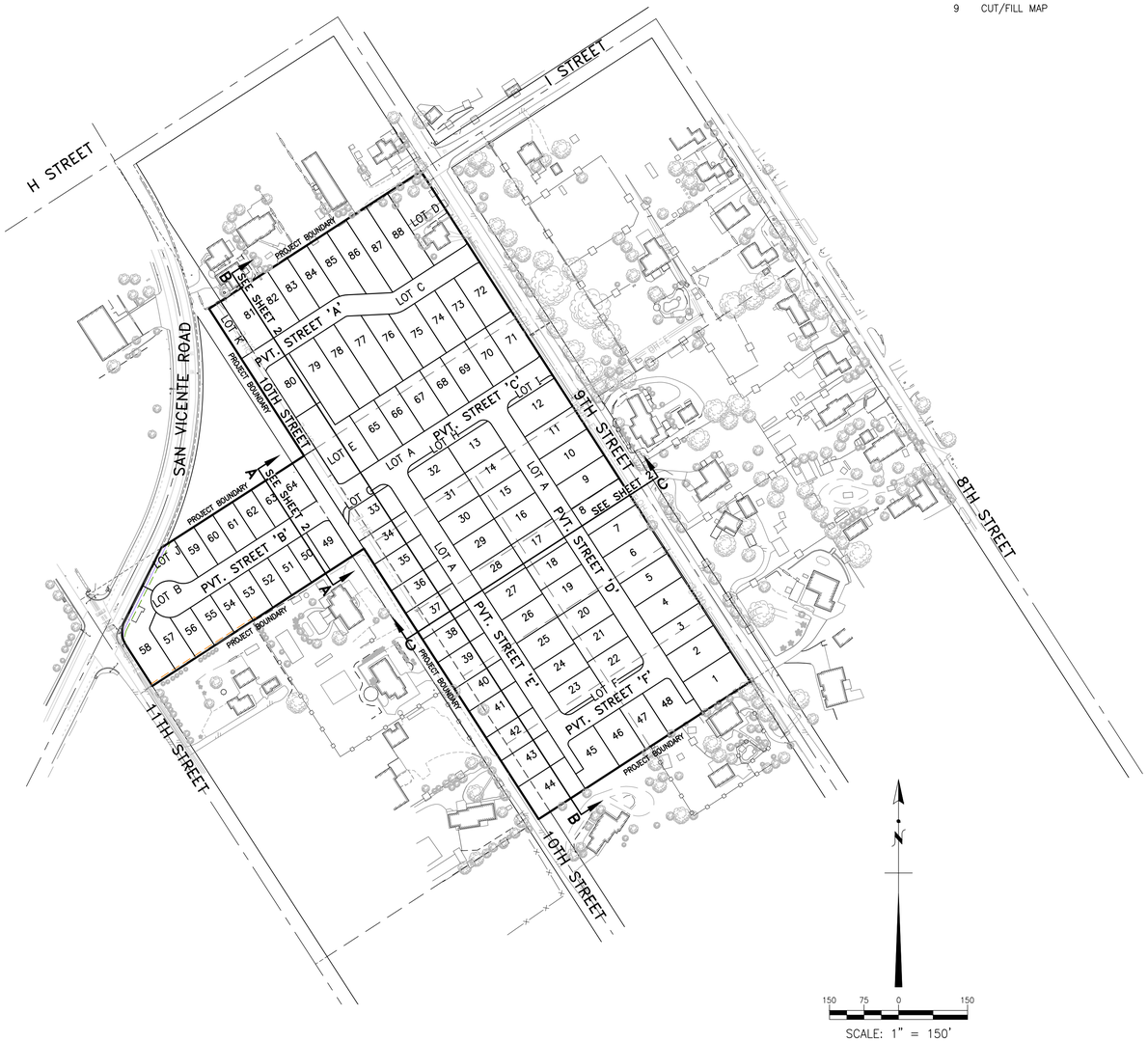
**VERY LOW –
LOTS 11, 15, 18, 21, 28, 31, 48, 73

SHEET INDEX:

1 TITLE SHEET
2 SITE SECTIONS
3 PRELIMINARY GRADING PLAN
4 PRELIMINARY GRADING PLAN
5 PRELIMINARY UTILITY PLAN
6 PRELIMINARY UTILITY PLAN
7 PRELIMINARY FIRE ACCESS & HYDRANT LOCATION PLAN
8 SLOPE ANALYSIS PLAN
9 CUT/FILL MAP



VICINITY MAP
SCALE: NONE



SCALE: 1" = 150'

SYMBOLS:

○ BO	BLOW-OFF VALVE
□ DI	DRAIN INLET
FH	FIRE HYDRANT
	LIGHT STANDARD
Ⓓ	STORM DRAIN MANHOLE
Ⓢ	SANITARY SEWER MANHOLE
	SIGN POST
GM	GAS METER
WM	WATER METER
⊗ V	UTILITY VALVE
	UTILITY/POWER POLE
	BLOCK/RETAINING SCREEN WALL
	BLOCK/RETAINING LOW WALL
	PLANTER/DECORATIVE WALL
OH-E	OVERHEAD WIRE
	EDGE OF ASPHALT PAVEMENT
	WOOD/WROUGHT IRON FENCE
X	CHAIN LINK FENCE
	DIRECTION OF FLOW
93	MINOR CONTOUR (1' INTERVAL)
100	MAJOR CONTOUR (5' INTERVAL)
×91.5	SPOT ELEVATION

LEGEND:

AP	ANGLE POINT
ASPH	ASPHALT PAVEMENT
BC	BUILDING CORNER
BEG	BEGIN
BO	BLOW-OFF VALVE
BLDG	BUILDING
BW	BLOCK WALL
CB	CATCH BASIN
CF	CURB FACE
CLF	CHAIN LINK FENCE
CMF	CORRUGATED METAL FENCE
CONC	CONCRETE PAVEMENT
DI	DRAIN INLET
DW	DOMESTIC WATER
DWY	DRIVEWAY
EX	EXISTING
FH	FIRE HYDRANT
FW	FIRE WATER
GM	GAS METER
HH	HAND HOLE
LAT	LATERAL
LS	LANDSCAPING
MH	MANHOLE
MWS	MODULAR WETLAND SYSTEM
PKWY	PARKWAY
PP	POWER POLE
PR	PROPOSED
PVT	PRIVATE
P/L	PROPERTY LINE
RET	RETAINING
ROW	RIGHT-OF-WAY
SD	STORM DRAIN
SFH	SINGLE-FAMILY HOME
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEANOUT
SSMH	SANITARY SEWER MANHOLE
ST LT	STREET LIGHT
SVC	SERVICE
TE	TRASH ENCLOSURE
TEMP	TEMPORARY
TF	TRANSFORMER
TS	TRAFFIC SIGNAL
TYP	TYPICAL
WF	WOOD FENCE
WL	WALL
WM	WATER METER
V	VALVE

REGISTERED PROFESSIONAL ENGINEER
DANIE P. MCDOUGALL
C 80705
CIVIL
STATE OF CALIFORNIA

PREPARED BY:

C&V CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING

9830 IRVINE CENTER DRIVE
IRVINE, CALIFORNIA 92618
(949) 916-3800
INFO@CVC-INC.NET
WWW.CVC-INC.NET

PREPARED FOR:

WARMINGTON RESIDENTIAL
3090 PULLMAN STREET
COSTA MESA, CA 92626
(714) 557-5511

COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND DEVELOPMENT

PROJECT NO. WARM-021

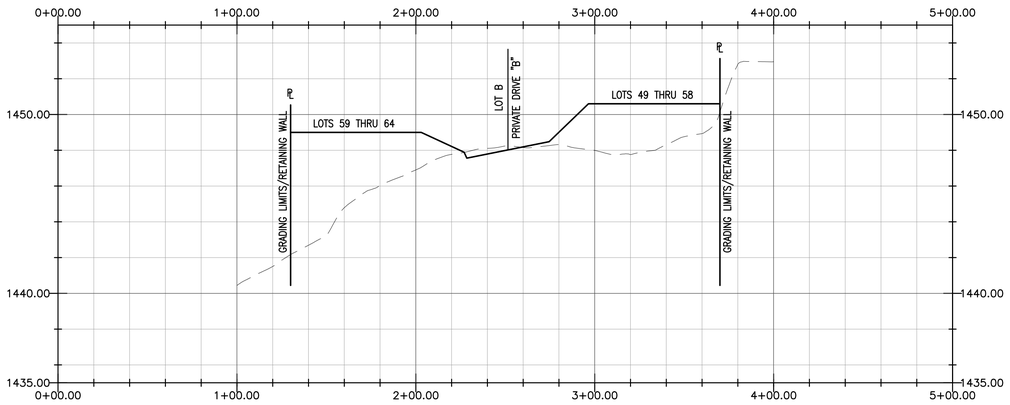
PRELIMINARY GRADING PLANS
PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003
APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

TITLE SHEET

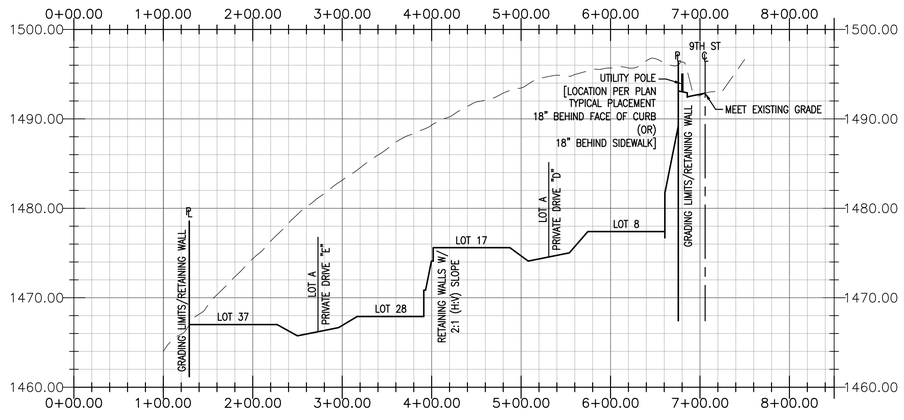
SHEET 1 OF 9

PLAN SET: PDS4
DATE: 10/07/2026

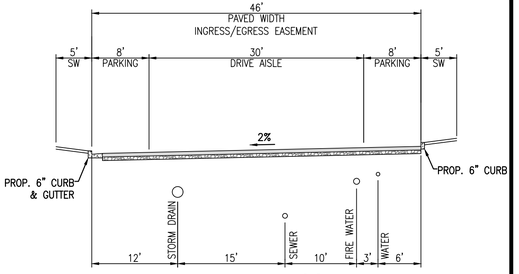
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BY: SARAH MCMATTERS



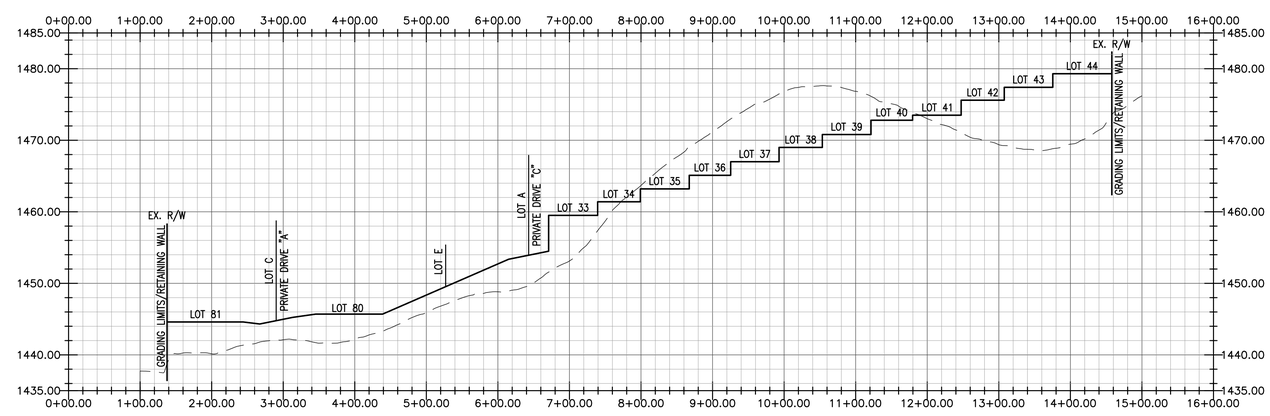
SECTION A-A
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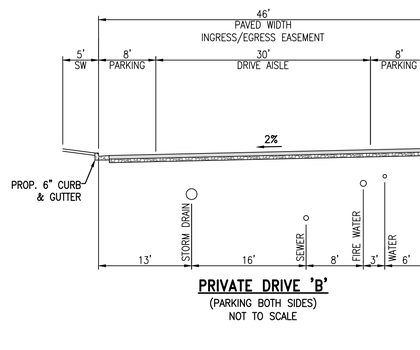
SECTION C-C
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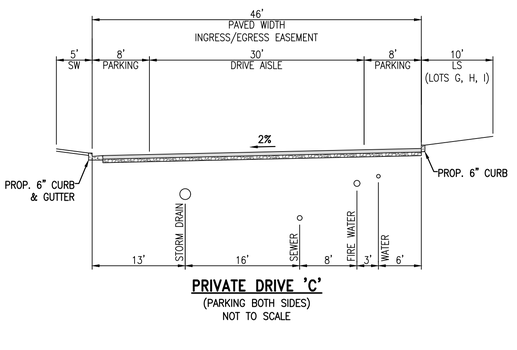
PRIVATE DRIVE 'A'
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NOT TO SCALE



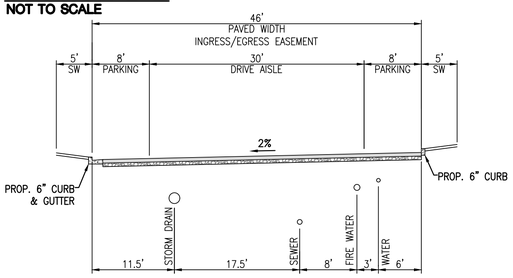
SECTION B-B
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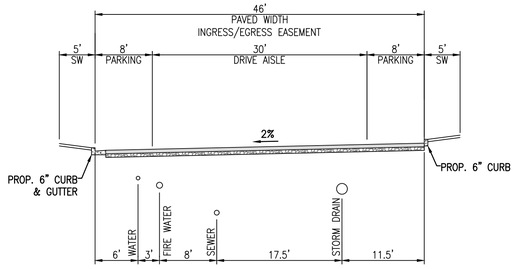
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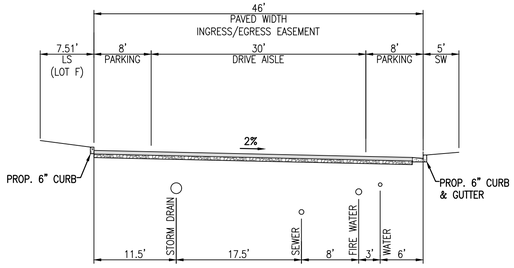
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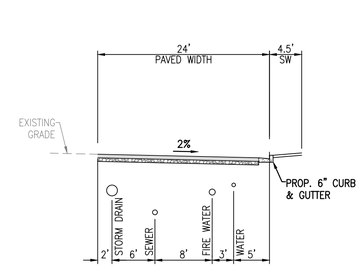
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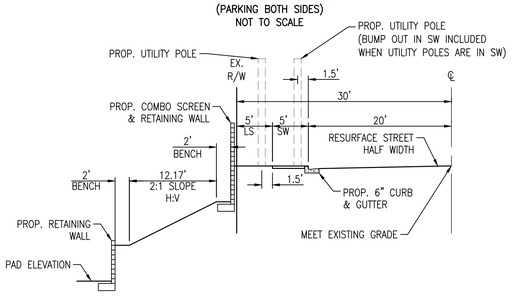
PRIVATE DRIVE 'E'
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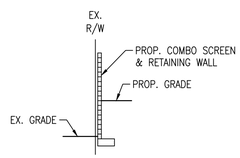
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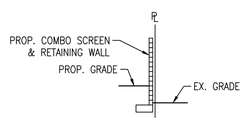
10TH STREET (PRIVATE STREET)
(NO PARKING)
NOT TO SCALE



EASTERN BOUNDARY/9TH STREET (PUBLIC STREET)
(NO PARKING)
NOT TO SCALE



WESTERN BOUNDARY (SAN VICENTE RD)
& NORTHERN BOUNDARY
NOT TO SCALE



SOUTHERN BOUNDARY
NOT TO SCALE

PREPARED BY:

C&V CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING
9830 IRVINE CENTER DRIVE
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WARMINGTON RESIDENTIAL
3090 PULLMAN STREET
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COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND DEVELOPMENT

PRELIMINARY GRADING PLANS
PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003
APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

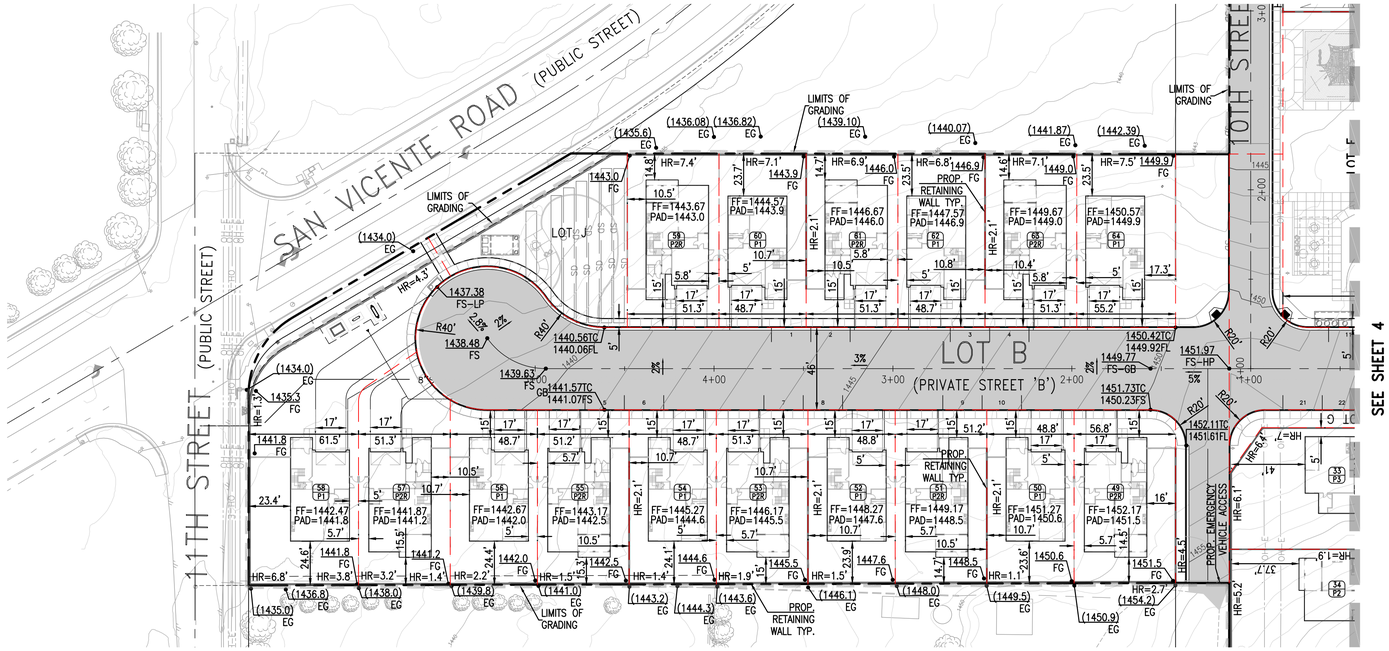
SITE SECTIONS

PROJECT NO. WARM-021

SHEET 2 OF 9

PLAN SET: PDS4
DATE: 10/03/2025

P:\WARM\WARM-021\DWG\SHEETS\PRELIM GRADING\TM-05-SECTIONS.DWG
PLOTTED: 10/3/2025 BY: SARAH MCWATTERS





INDEX MAP

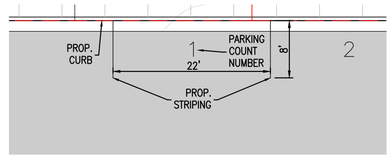
NOTE:
THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF THE PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE APPROVAL TO PERFORM AND GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.

DRAINAGE NOTES:
- LOTS 49–64 AND LOT J SHALL DRAIN TO LOT B (PRIVATE STREET 'B') THROUGH YARD DRAINS AND APPROVED DRAINAGE DEVICES.

AFFORDABLE UNITS

* MODERATE –
LOTS 36, 76, 82

** VERY LOW –
LOTS 11, 15, 18, 21, 28, 31, 48, 73



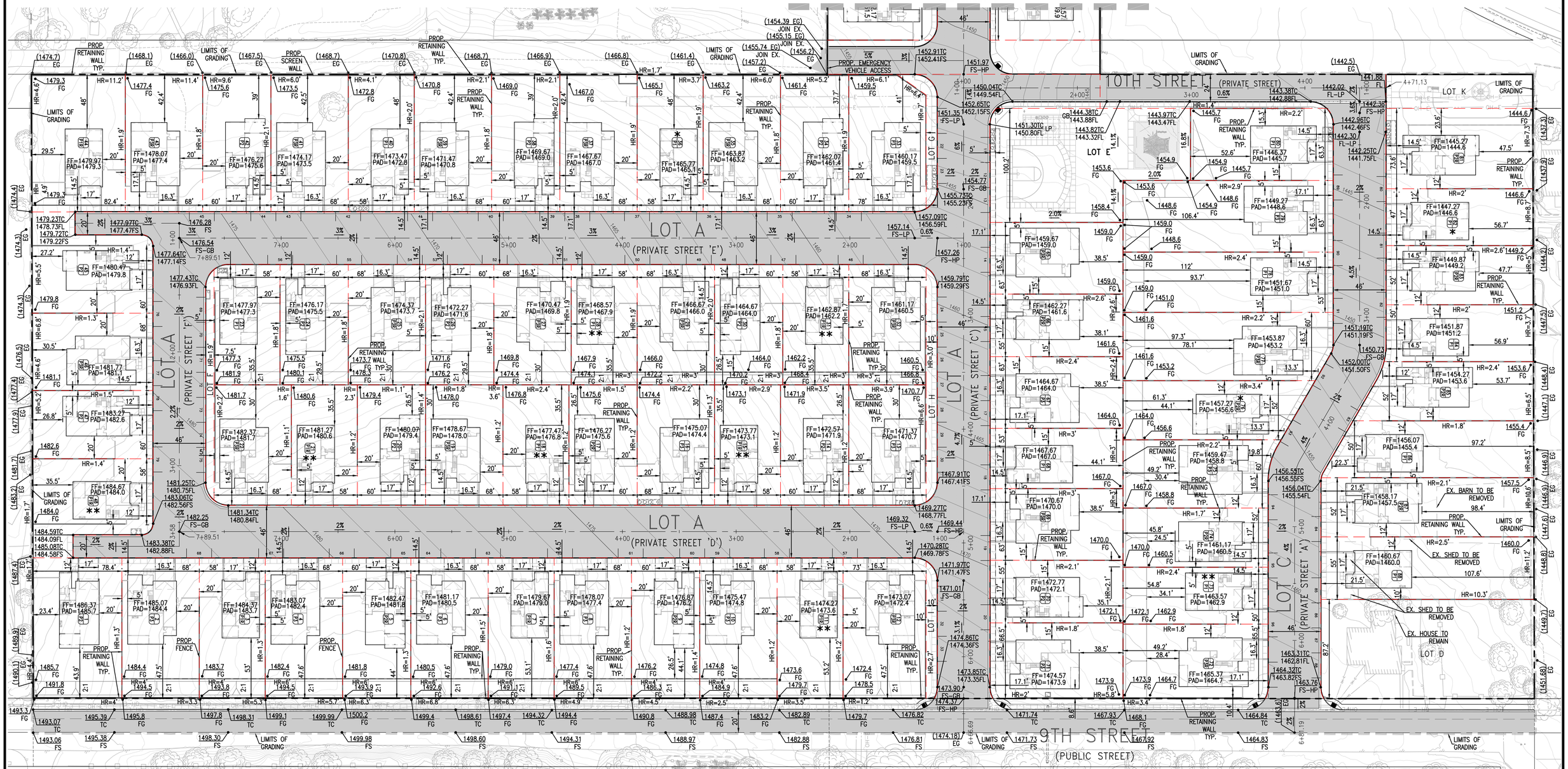
TYPICAL PARALLEL PARKING DETAIL
SCALE 1:10

1" = 40'
0 20 40 80

PREPARED BY:	PREPARED FOR:		
C&V CONSULTING, INC. CIVIL ENGINEERING LAND PLANNING & SURVEYING 9830 IRVINE CENTER DRIVE IRVINE, CALIFORNIA 92618 (949) 916-3800 INFO@CVC-INC.NET WWW.CVC-INC.NET	WARMINGTON RESIDENTIAL 3090 PULLMAN STREET COSTA MESA, CA 92626 (714) 557-5511	**COUNTY OF SAN DIEGO** DEPARTMENT OF PLANNING AND DEVELOPMENT **PRELIMINARY GRADING PLANS** PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003 APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00 **PRELIMINARY GRADING PLAN**	PROJECT NO. WARM-021 SHEET 3 OF 9

PLAN SET: PDEA
DATE: 10/03/2025
BY: HANNA SCHUSTER
P:\PDS\WARM-021\DWG\EXISTING\PRELIM GRADING\TM-25-005.DWG

SEE SHEET 3





INDEX MAP

AFFORDABLE UNITS

* MODERATE –
LOTS 36, 76, 82

** VERY LOW –
LOTS 11, 15, 18, 21, 28, 31, 48, 73

NOTE:
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DRAINAGE NOTES:
- LOTS 72–88, LOT E, AND LOT K SHALL DRAIN TO LOT C (PRIVATE STREET 'A' AND 10TH STREET) THROUGH YARD DRAINS AND APPROVED DRAINAGE DEVICES.
- LOTS 1–48, LOTS 65–71, LOT E, LOT F, LOT G, LOT H, AND LOT I SHALL DRAIN TO LOT A (PRIVATE STREET 'C', PRIVATE STREET 'D', PRIVATE STREET 'E', AND PRIVATE STREET 'F') THROUGH YARD DRAINS AND APPROVED DRAINAGE DEVICES.

1" = 40'
0 20 40 80

PREPARED BY:
C&V CONSULTING, INC.
CIVIL ENGINEERING
LAND PLANNING & SURVEYING
9830 IRVINE CENTER DRIVE
IRVINE, CALIFORNIA 92618
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PREPARED FOR:
WARMINGTON RESIDENTIAL
3090 PULLMAN STREET
COSTA MESA, CA 92626
(714) 557-5511

COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND DEVELOPMENT

PROJECT NO. WARM-021

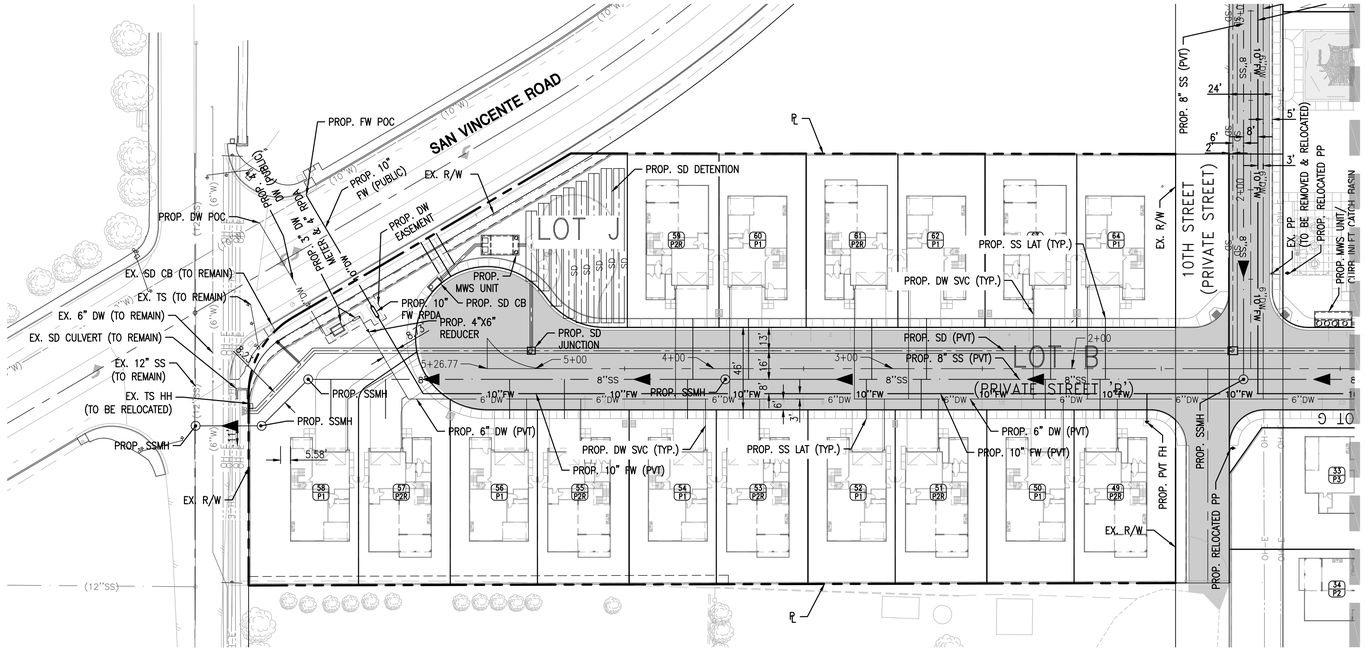
PRELIMINARY GRADING PLANS
PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003
APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

PRELIMINARY GRADING PLAN

SHEET 4 OF 9

PLAN SET: PDCA
DATE: 10/02/2026

J:\CVWARM-021\DWG\SHEETS\FINAL DRAWINGS\TM-ER-DB\GRAD
BY: JASON MCCARTERS



SEE SHEET 6

AFFORDABLE UNITS

* MODERATE –
LOTS 36, 76, 82

** VERY LOW –
LOTS 11, 15, 18, 21, 28, 31, 48, 73

1" = 40'

0 20 40 80

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COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND DEVELOPMENT

PROJECT NO.
WARM-021

PRELIMINARY GRADING PLANS
PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003
APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

PRELIMINARY UTILITY PLAN

SHEET 5 OF 9

PLAN SET: PDM
DATE: 10/03/2025

E:\WARM-021\DWG\SHEETS\PRELIM GRADING\TM-DA-UTIL.DWG
BY: HANNA MCMASTERS

SEE SHEET 5



AFFORDABLE UNITS

* MODERATE –
LOTS 36, 76, 82

** VERY LOW –
LOTS 11, 15, 18, 21, 28, 31, 48, 73

1" = 40'

0 20 40 80

PREPARED BY:	PREPARED FOR:		
C&V CONSULTING, INC. CIVIL ENGINEERING LAND PLANNING & SURVEYING 9830 IRVINE CENTER DRIVE IRVINE, CALIFORNIA 92618 (949) 916-3800 INFO@CVC-INC.NET WWW.CVC-INC.NET	WARMINGTON RESIDENTIAL 3090 PULLMAN STREET COSTA MESA, CA 92626 (714) 557-5511	**COUNTY OF SAN DIEGO** DEPARTMENT OF PLANNING AND DEVELOPMENT **PRELIMINARY GRADING PLANS** PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003 APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00 **PRELIMINARY UTILITY PLAN**	PROJECT NO. WARM-021 SHEET 6 OF 9

PLAN SET: PDS#
DATE: 10/07/2026 BY: SARAH MCMASTERS
K:\JOB\WARM-021\TMS\SHEETS\PRELIM GRADING\TM-04-UTILITIES.DWG

PROJECT GENERAL NOTES:

1. FIRE APPARATUS ACCESS ROADS SHALL HAVE AN UNOBSTRUCTED IMPROVED WIDTH OF NOT LESS THAN 24 FEET. EXCEPTION: SINGLE FAMILY RESIDENTIAL DRIVEWAYS SERVING NO MORE THAN TWO SINGLE-FAMILY DWELLINGS SHALL HAVE A MINIMUM OF 16 FEET OF UNOBSTRUCTED IMPROVED WIDTH. ALL FIRE APPARATUS ACCESS ROADS SHALL HAVE AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES. (COUNTY FIRE CODE 503.2.1)

2. THE INSIDE TURNING RADIUS OF A FIRE APPARATUS ACCESS ROAD SHALL BE A MINIMUM OF 28 FEET, OR AS APPROVED BY THE FIRE CODE OFFICIAL. (COUNTY FIRE CODE 503.2.4)

3. STRUCTURES SHALL HAVE AN AUTOMATIC FIRE SPRINKLER SYSTEM INSTALLED PER NFPA 13-D STANDARD AND THE COUNTY FIRE CODE. FIRE SPRINKLER SYSTEM PLANS SHALL BE SUBMITTED AND APPROVED BY SAN DIEGO COUNTY FIRE AND THE SYSTEM SHALL BE READY FOR HYDROSTATIC TESTING PRIOR TO FRAMING INSPECTION. (COUNTY FIRE CODE 903.2)

4. STRUCTURES SHALL HAVE AN AUTOMATIC FIRE SPRINKLER SYSTEM INSTALLED PER NFPA 13-D STANDARD AND THE COUNTY FIRE CODE. IF NOT FACTORY INSTALLED, FIRE SPRINKLER SYSTEM PLANS SHALL BE SUBMITTED TO, AND APPROVED BY, THE STATE OF CALIFORNIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT. FACTORY INSTALLED SYSTEMS SHALL BE HYDROSTATICALLY TESTED AT BUILDING FINAL INSPECTION. ON-SITE INSTALLED SYSTEMS SHALL BE HYDROSTATICALLY TESTED BEFORE PIPING IS CONCEALED. (COUNTY FIRE CODE 903.2)

5. APPROVED SIGNS OR OTHER APPROVED NOTICES SHALL BE PROVIDED AND MAINTAINED FOR FIRE APPARATUS ACCESS ROADS TO IDENTIFY SUCH ROADS AND PROHIBIT THE OBSTRUCTION THEREOF. (COUNTY FIRE CODE § 503.3) WHERE THE FIRE CODE OFFICIAL DETERMINES THAT IT IS NECESSARY TO ENSURE ADEQUATE FIRE ACCESS, THE FIRE CODE OFFICIAL MAY DESIGNATE EXISTING ROADWAYS AS FIRE APPARATUS ACCESS ROADS AS PROVIDED BY VEHICLE CODE SECTION 22500. (COUNTY FIRE CODE 503.3.1) ALL NEW PUBLIC ROADS, ALL PRIVATE ROADS WITHIN MAJOR SUBDIVISIONS, AND ALL PRIVATE ROAD EASEMENTS SERVING FOUR OR MORE PARCELS SHALL BE NAMED. ROAD NAME SIGNS SHALL COMPLY WITH COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS DESIGN STANDARD #DS-13. (COUNTY FIRE CODE 505.2)

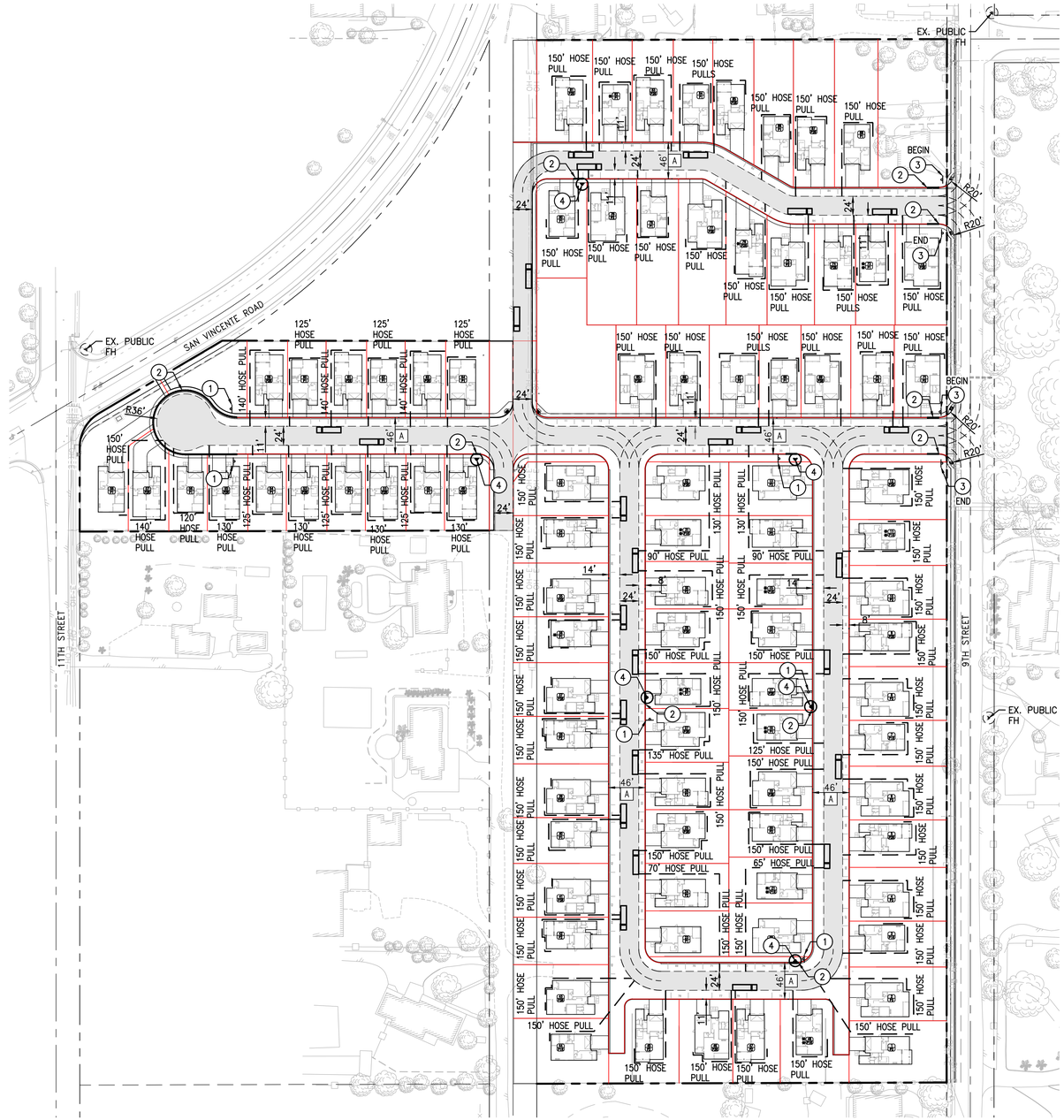
6. AN AUTOMATIC GATE ACROSS A FIRE ACCESS ROADWAY OR DRIVEWAY SHALL BE EQUIPPED WITH AN APPROVED EMERGENCY KEY-OPERATED SWITCH OVERRIDING ALL COMMAND FUNCTIONS AND OPENING THE GATE. FIRE CODE 503.6. (NO ENTRY GATE PROPOSED ON THIS PROJECT.)

7. ALL EASEMENTS WHICH ARE NOT NAMED DIFFERENTLY FROM THE ROADWAY FROM WHICH THEY ORIGINATE SHALL HAVE AN ADDRESS SIGN INSTALLED AND MAINTAINED, LISTING ALL ADDRESS NUMBERS OCCURRING ON THAT EASEMENT, LOCATED WHERE THE EASEMENT INTERSECTS THE NAMED ROADWAY. ADDRESS NUMBERS SHALL BE A MINIMUM OF 4 INCHES IN HEIGHT WITH A ½" STROKE; AND SHALL CONTRAST WITH THE BACKGROUND. (COUNTY FIRE CODE 505.3)

8. APPROVED NUMBERS AND/OR ADDRESSES SHALL BE PLACED ON ALL NEW AND EXISTING BUILDINGS AND AT APPROPRIATE ADDITIONAL LOCATIONS AS TO BE PLAINLY VISIBLE AND LEGIBLE FROM THE STREET OR ROADWAY FRONTING THE PROPERTY FROM EITHER DIRECTION OF APPROACH. ADDRESS NUMBERS SHALL BE A MINIMUM OF 4 INCHES IN HEIGHT WITH A ½" STROKE; AND SHALL CONTRAST WITH THE BACKGROUND. (COUNTY FIRE CODE 505.1)

9. FIRE APPARATUS ACCESS ROADS, INCLUDING PRIVATE RESIDENTIAL DRIVEWAYS, SHALL BE PROVIDED FOR EVERY FACILITY, BUILDING OR PORTION OF A BUILDING HEREAFTER CONSTRUCTED OR MOVED INTO OR WITHIN THE JURISDICTION. THE FIRE APPARATUS ACCESS ROAD SHALL EXTEND TO WITHIN 150 FEET OF ALL PORTIONS OF THE FACILITY AND ALL PORTIONS OF THE EXTERIOR WALLS OF THE FIRST STORY OF THE BUILDING AS MEASURED BY AN APPROVED ROUTE AROUND THE EXTERIOR OF THE BUILDING OR FACILITY. (COUNTY FIRE CODE 503.1.1)

10. ALL GATES OR OTHER STRUCTURES OR DEVICES THAT COULD OBSTRUCT FIRE ACCESS ROADWAYS OR OTHERWISE HINDER EMERGENCY OPERATIONS ARE PROHIBITED UNLESS THEY MEET STANDARDS AND RECEIVE SPECIFIC PLAN APPROVAL FROM THE FIRE CODE OFFICIAL. (COUNTY FIRE CODE 503.6) (NO GATES PROPOSED ON THIS PROJECT).



1" = 80'

0 40 80 160

LEGEND

- EXISTING STREET LIGHT
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED SIGN
- HOSE PULL
- PROPERTY LINE
- FIRE TRUCK
- XX — LOT NUMBER
- XXXX — PLAN TYPE
- FIRE LANE
- FH FIRE HYDRANT
- PROP. PROPOSED
- EX. EXISTING
- ~P PROPERTY LINE
- R/W RIGHT OF WAY

AFFORDABLE UNITS

* MODERATE –
LOTS 36, 76, 82

** VERY LOW –
LOTS 11, 15, 18, 21, 28, 31, 48, 73

CONSTRUCTION NOTES:

1. INSTALL "FIRE LANE" SIGN PER DETAIL 1 HEREON.
2. FIRE LANE IDENTIFICATION-RED CURBS PER DETAIL 2 HEREON.
3. INSTALL "FIRE LANE" SIGN BEGIN OR END PER DETAIL 3 HEREON.
4. PROPOSED PRIVATE FIRE HYDRANT LOCATION

PROPOSED EASEMENTS

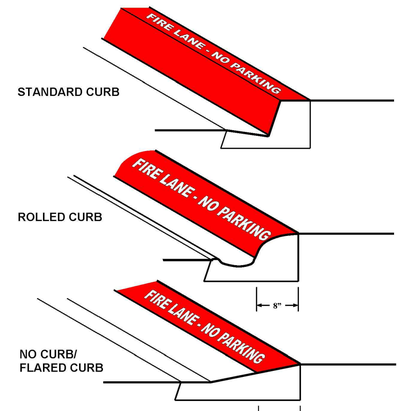
[A] INDICATES AN EASEMENT FOR INGRESS AND EGRESS FOR EMERGENCY AND PUBLIC SECURITY VEHICLE PURPOSES DEDICATED TO THE CITY OF RAMONA.

NOTE:
THE SITE IS WITHIN THE SAN DIEGO COUNTY FIRE PROTECTION DISTRICT.

NOTE:
SPEED BUMPS ARE NOT PROPOSED AS THEY ARE NOT SUPPORTED.

ATTACHMENT 9

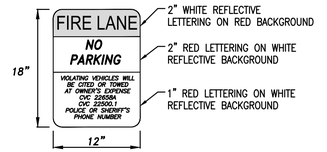
Fire Lane Identification – Red Curbs



1. Fire lane entrance sign(s) shall also be provided per Attachment 10 or 11.
2. Curbs shall be painted OSHA safety red.
3. "FIRE LANE – NO PARKING" shall be painted on top of curb in 3" white lettering at a spacing of 30' on center or portion thereof.

1. CURBS SHALL BE PAINTED RED
2. "FIRE LANE – NO PARKING" SHALL BE PAINTED ON TOP OF CURB IN 3' WHITE LETTERING AT A SPACING OF 30' ON CENTER OR PORTION THEREOF.

(2) RED CURB PAVEMENT MARKING
NOT TO SCALE



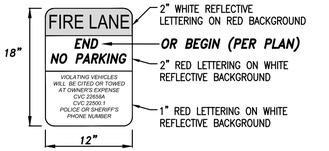
ALL SIGN AND LETTERING DIMENSIONS ARE MINIMUMS.

SIGNS SHALL BE SECURELY MOUNTED FACING THE DIRECTION OF TRAVEL AND CLEARLY VISIBLE TO ONCOMING TRAFFIC ENTERING THE DESIGNATED AREA. SIGNS SHALL BE MADE OF DURABLE MATERIAL.

(1) NO PARKING SIGN



TYPICAL EMERGENCY TURNAROUND RADII



ALL SIGN AND LETTERING DIMENSIONS ARE MINIMUMS.

SIGNS SHALL BE SECURELY MOUNTED FACING THE DIRECTION OF TRAVEL AND CLEARLY VISIBLE TO ONCOMING TRAFFIC ENTERING THE DESIGNATED AREA. SIGNS SHALL BE MADE OF DURABLE MATERIAL.

(3) BEGIN & END NO PARKING SIGN

PREPARED BY:

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PREPARED FOR:

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3090 PULLMAN STREET
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(714) 557-5511

COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND DEVELOPMENT

PROJECT NO. WARM-021

PRELIMINARY GRADING PLANS
PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003
APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

PRELIMINARY FIRE ACCESS & HYDRANT LOCATION PLAN

SHEET 7 OF 9

PLAN SET: PDCM
DATE: 10/02/2026

P:\JOB\WARM-021\DWG\SHEETS\PRELIM GRADING\TM-05-FLANS

BY: DAVID RICHESTER



Slopes Table					
Number	Minimum Slope	Maximum Slope	Area	LOT PERCENTAGE	Color
1	0.00%	15.00%	18.15	98.64%	
2	15.00%	25.00%	0.23	1.25%	
3	25.00%	50.00%	0.02	0.11%	
4	50.00%	100.00%	0.00	0.00%	

1" = 80'

0 40 80 160

PREPARED BY:

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COUNTY OF SAN DIEGO
DEPARTMENT OF PLANNING AND DEVELOPMENT

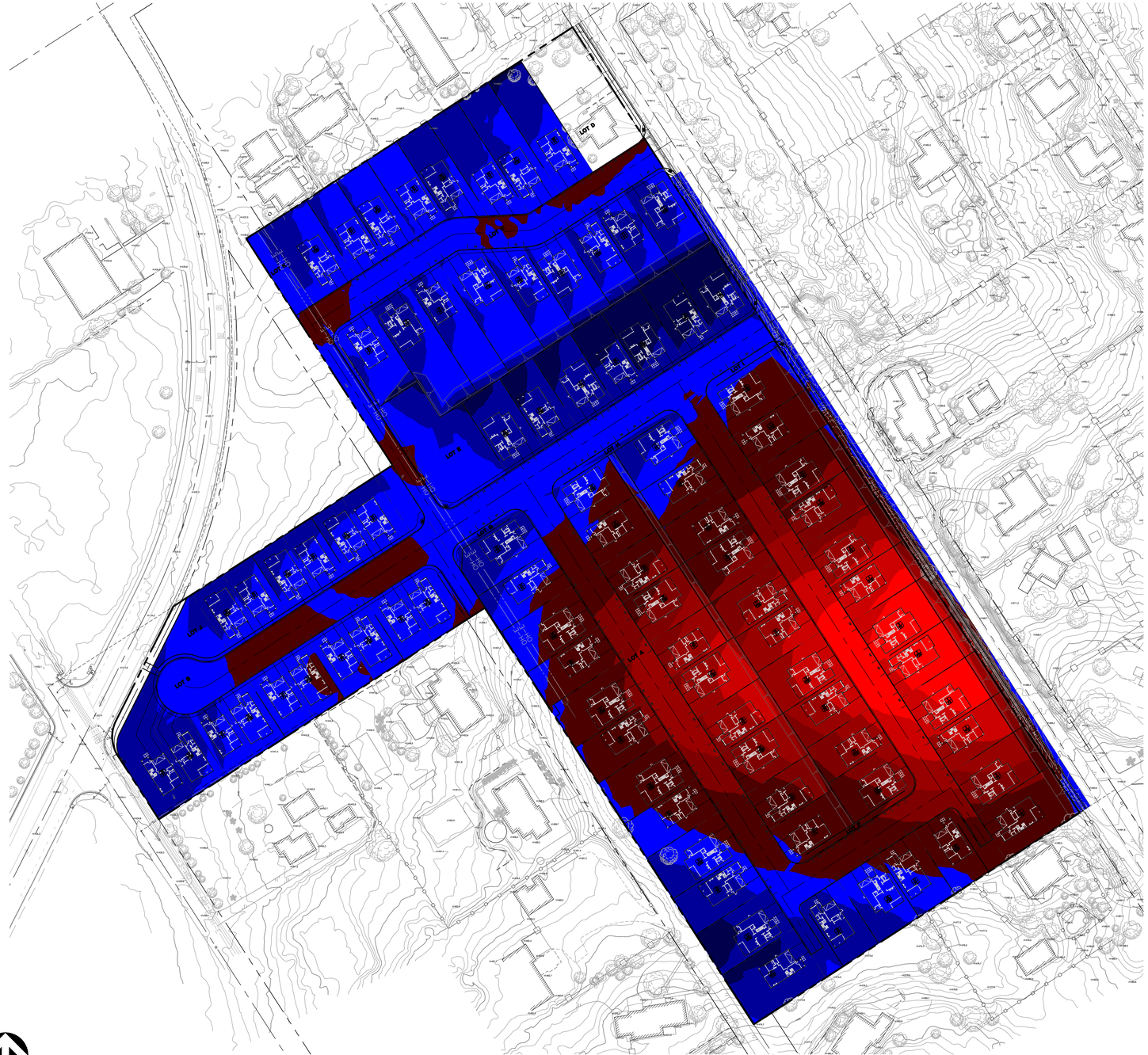
PROJECT NO.
WARM-021

PRELIMINARY GRADING PLANS
PDS2025-TM-5665, PDS2025-DB-25-005, PDS2025-ER-09-003
APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

SLOPE ANALYSIS PLAN

SHEET
8
OF
9

PDS4
P:\PJ\WARM-021\DWG\SHEETS\PRELIM GRADING\TM-DB-SLOPE.DWG
PLAN SET
DATE 10/07/2026
BY: SARAH MCMARTIN



Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	−35.000	−30.000	
2	−30.000	−25.000	
3	−25.000	−20.000	
4	−20.000	−15.000	
5	−15.000	−10.000	
6	−10.000	−5.000	
7	−5.000	0.000	
8	0.000	5.000	
9	5.000	10.000	
10	10.000	15.000	

1" = 80'

0 40 80 160

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APN: 284-202-21-00 AND 284-203-08-00 AND 284-244-01-00

CUT/FILL MAP

PROJECT NO. WARM-021

SHEET 9 OF 9

PLAN SET: PDS4
DATE: 10/27/2026

P:\PLW\WARM-021\DWG\SHEETS\RESUB_JUNE\PDS\TM-01-CUTFILL.DWG
BY: SARAH MCMASTERS