# Appendix H-1

## Drainage Report

Stantec

**BRANDEIS-BARDIN CAMPUS**
**CAMP ALONIM**
**COUNTY OF VENTURA, CA**

# DRAINAGE REPORT, STORMWATER QUALITY ANALYSIS, AND LOW IMPACT DEVELOPMENT

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# INTRODUCTION

The purpose of the following report is to provide hydrology and hydraulic analysis and storm water quality analysis for the planned extension of the main Brandeis-Bardin campus. The total project site is approximately 7 acres of site improvements. The proposed development will include approximately 5.5 acres of site improvements east of the main campus and will build cabin buildings located on the southwesterly corner of High Road and Creek Road. The site improvement will include grading, drainage, and utility improvements. Another main site portion of the proposed development will include approximately 1.5 acres to accommodate a proposed visitor center and parking lot located on the east of Creek Road and south of High Road. These improvements within this portion of the development will only include grading and drainage. The existing project site is largely vacant land with some existing buildings and trees that will be removed. The site's drainage is a natural flow coming from the hilly mountain side north of High Road, the road intercepts some of its water and then sheet flows to Meier Canyon Creek just south of the project site.

This report will identify storm water impacts due to the proposed development. Methods for treating runoff for water quality and mitigating the increase in runoff are identified. Runoff calculations are performed using the Rational Method outlined by the Ventura County Hydrology Manual. The water quality analysis is completed in accordance with the 2011 Ventura County Technical Guidance Manual (2011 TGM) per Resolution No. 2016-108.



**Figure 1.1** – *Project Location*

## METHODOLOGY

The Rational Method as described in the Ventura County Watershed Protection District Design Hydrology Manual dated July 2017 was used to calculate the existing and developed peak runoff amounts. Times of concentration were calculated for the existing and developed conditions by using the Ventura County Time of Concentration Calculator.

The following guidelines/assumptions were applied in use of the hydrology calculations:

The project area is located in Flood Zone 3 and in K Rainfall Intensity Zone which was obtained from the Design Hydrology Manual. The soil type was determined using the shapefile to be majority soils type 2. Refer to Figures 2.1-2.3 below.

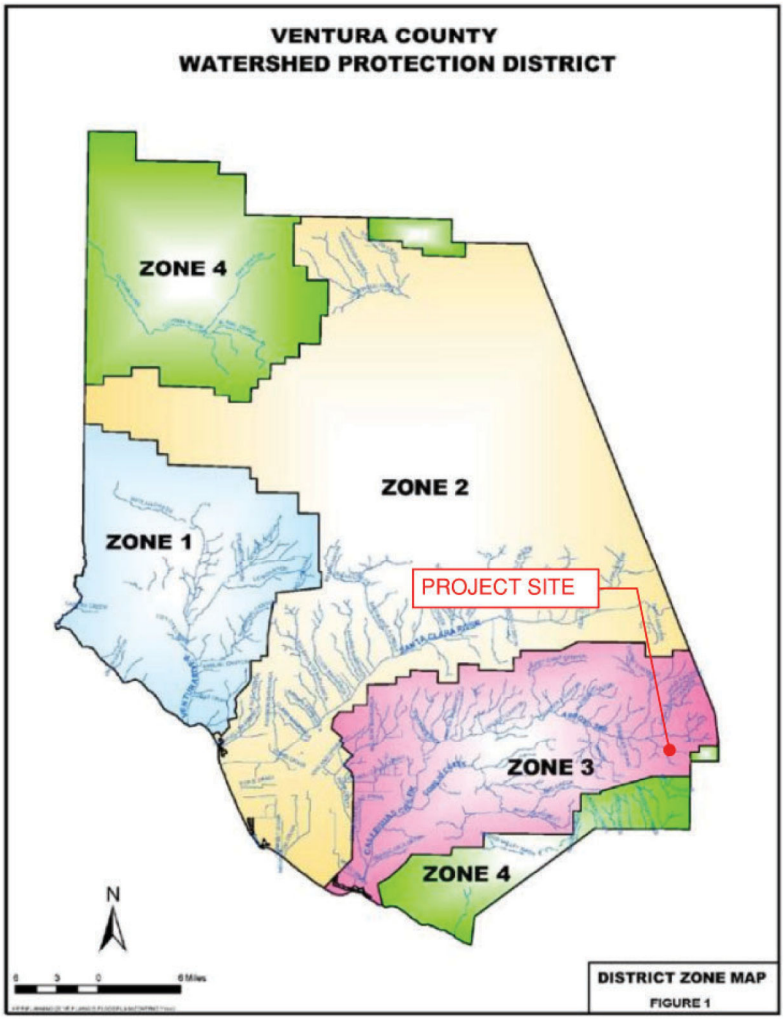



**Figure 2.1** – *Flood Zones*

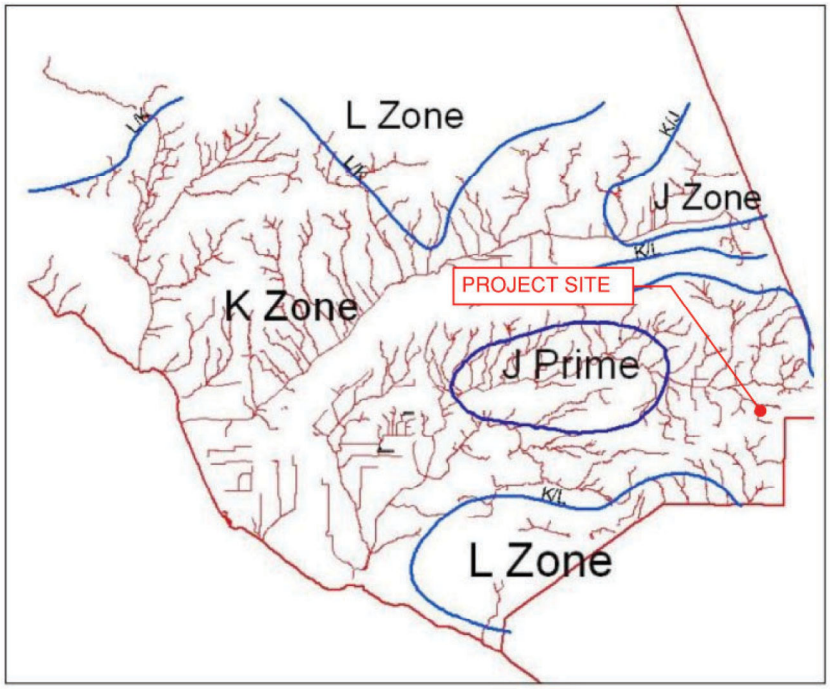



**Figure 2.2** – *Rainfall Intensity Zones*

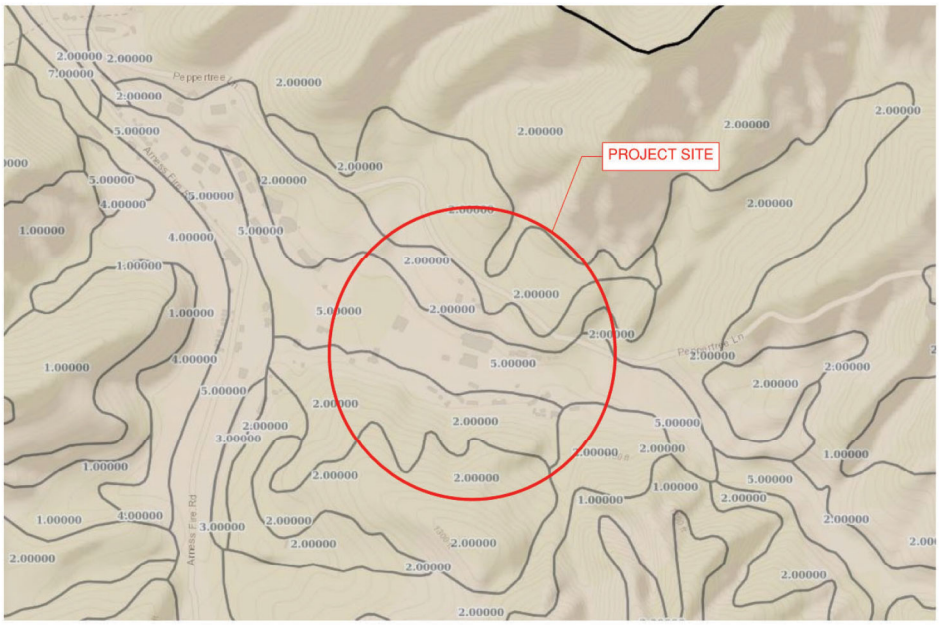



**Figure 2.3** – *Soil Types*

## EXISTING CONDITION

The existing condition of the site is mostly undeveloped barren land with some existing buildings and unpaved pathways. The main site drains towards the south and sheet flows passing existing field, buildings, and pathways and into the southern Meier Canyon creek. The eastern site, where the proposed parking lot will be, drains directly south and into the creek.

The total project site is approximately 7 acres of site improvements and has an average existing slope of 10.3% within the footprint of disturbance. The pre-development drainage study is represented by 6 main watershed areas with several sub-watersheds, the 6 discharge points that are summarized in Table 1. The drainage map showing the existing condition can be found in Map 1 of Appendix B and existing hydrology calculations can be found in Appendix B.

*Table 1 – **Existing Peak Runoff***

| Discharge Point | ∑ Area (AC) | ∑Q10 (CFS) | ∑Q25 (CFS) | ∑Q50 (CFS) | ∑Q100 (CFS) |
|---|---|---|---|---|---|
| 1 | 66.09 | 74.60 | 96.60 | 113.30 | 131.10 |
| 2 | 45.44 | 52.10 | 66.60 | 78.70 | 94.50 |
| 3 | 18.84 | 25.00 | 32.00 | 39.00 | 44.70 |
| 4 | 5.73 | 8.80 | 12.30 | 14.10 | 19.30 |
| 5 | 11.09 | 13.90 | 18.70 | 23.10 | 26.50 |
| 6 | 36.23 | 36.50 | 46.50 | 57.10 | 65.90 |
| **Total** | **183.42** | **210.90** | **272.70** | **325.30** | **382.00** |

## DEVELOPED CONDITION

As shown in the Developed condition hydrology map, runoff from the northerly areas of the site will surface flow towards the south via overland sheet flow. To reduce flow on the project site and improve drainage to the overall site, three bypass culverts will be added to collect runoff water from existing upstream watershed areas north of High Road. Two of the proposed culverts will take the runoff to a daylighted outlet where the flow's velocity will be mitigated by a riprap and the runoff will naturally sheet flow into the creek. Another bypass culvert will take the existing runoff and discharge into an existing watershed. See Appendix C, Map 2 for the proposed storm drain layout.

The calculations of the peak flow and overall volumes of the watersheds are done by VCRAT and according to section 6.15.3 of the Ventura Hydrology Manual. This section was applied due to the small areas of the watersheds that are less than 5 acres. In order to be consistent with the larger areas that are more than 5 acres, the manual

suggested a method to linear upsize the areas by 10x. Therefore, the final peak flow and overall volumes results on VCRAT are reduced by a factor of 10. The results shown on the summary tables are the results of the VCRAT runs that are reduced by 10. The original upsized VCRAT runs can be found in Appendix C.

The proposed condition will increase the impervious areas of the existing site. See table 2 for the pervious and impervious area comparison of the existing and proposed conditions. Proposed impervious areas will be treated using low-impact development methods such as infiltration basins and Permeable Pavers. Refer to the LID concept section below.

*Table 2 –* ***Pervious/Impervious Areas Summary***

| | Disturbed Areas (AC) | Pervious (AC) | Impervious (AC) |
|---|---|---|---|
| Existing | 7 | 6.525 | 0.475 |
| Proposed | 7 | 4.53 | 2.47 |

Hydraulic calculations of the proposed pipes and inlets can be found in Appendix D and developed condition hydrology calculations can be found in Appendix C. The drainage map showing the developed conditions can be found in Map 2 of Appendix C.

*Table 3 –* ***Developed Peak Runoff***

| Discharge Point | ∑ Area (AC) | ∑Q10 (CFS) | ∑Q25 (CFS) | ∑Q50 (CFS) | ∑Q100 (CFS) |
|---|---|---|---|---|---|
| 1 | 66.09 | 74.60 | 96.60 | 113.30 | 131.11 |
| 2 | 42.46 | 51.90 | 65.60 | 77.30 | 89.00 |
| 3 | 2.80 | 5.30 | 7.20 | 8.20 | 9.40 |
| 4 | 18.78 | 25.70 | 32.30 | 39.30 | 45.00 |
| 5 | 11.26 | 17.70 | 24.80 | 28.30 | 38.80 |
| 6 | 6.29 | 7.30 | 9.60 | 11.70 | 14.50 |
| 7 | 35.74 | 36.50 | 46.50 | 57.10 | 65.90 |
| **Total** | **183.42** | **219.00** | **282.60** | **335.20** | **393.71** |

## PEAK REDUCTION

The increase of the overall developed runoff peak will be mitigated by the infiltration basins provided throughout the project. See table 4 below for peak flow comparison of existing and proposed. To demonstrate the mitigation process, the existing and proposed hydrographs from watersheds that have flow increase were used. The areas between the proposed and existing hydrographs at certain peaks and time will determine the volume needed for the basin to reduce the peak to the existing conditions. The increase in the peak for each storm event varied from 8 to 12 cfs. Analyzing the 100-year storm event where the peak increase was the maximum, the required reduction in the peak to meet the existing flows resulted in volume equivalent

to 3,252 cubic-feet. The proposed bio-infiltration basins volumes equivalent of 5,324 cubic-feet will provide more than sufficient volume to address the peak reduction. See Chart 1 and chart 2 below and summary Table 5 for the volume calculation and comparison.

*Table 4 – **Comparison Table***

| | EXISTING | | | PROPOSED | | |
|---|---|---|---|---|---|---|
| **Discharge Point** | **∑Area (AC)** | **∑Q10 (CFS)** | **∑Q100 (CFS)** | **∑Area (AC)** | **∑Q10 (CFS)** | **∑Q100 (CFS)** |
| **1** | 66.09 | 74.60 | 131.10 | 66.09 | 74.60 | 131.11 |
| 2 | 45.44 | 52.10 | 94.50 | 42.46 | 51.90 | 89.00 |
| 3 | 18.84 | 25.00 | 44.70 | 2.80 | 5.30 | 9.40 |
| 4 | 5.73 | 8.80 | 19.30 | 18.78 | 25.70 | 45.00 |
| 5 | 11.09 | 13.90 | 26.50 | 11.26 | 17.70 | 38.80 |
| 6 | 36.23 | 36.50 | 65.90 | 6.29 | 7.30 | 14.50 |
| 7 | - | - | - | 35.74 | 36.50 | 65.90 |
| Total | **183.42** | **210.90** | **382.00** | **183.42** | **219** | **393.71** |

Chart 1 – Hydrograph

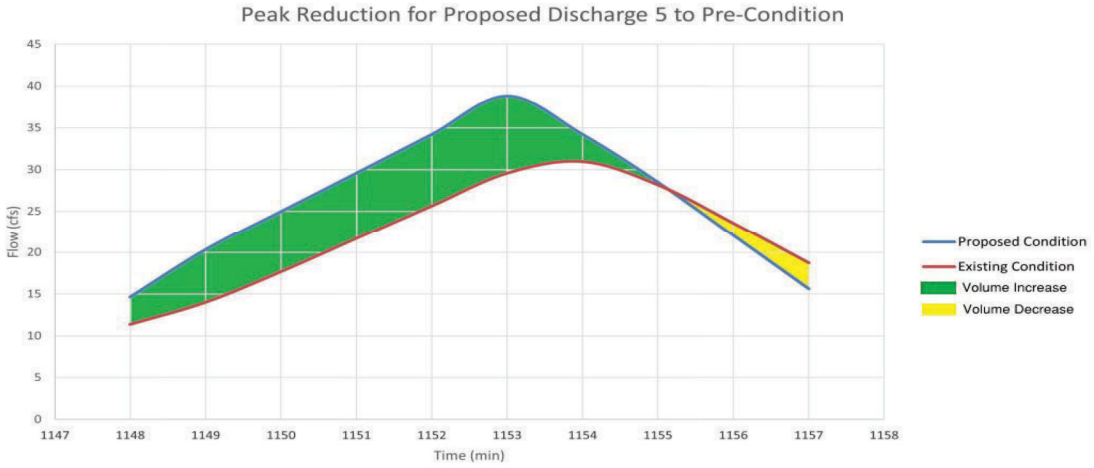



Table 5 – Area under the curve & volume summary table

| | Proposed at 30A | Existing at 41A & 30A |
|---|---|---|
| Time(Min) | Flow(cfs) | Flow(cfs) |
| 1148 | 14.637 | 11.376 |
| 1149 | 20.322 | 14.018 |
| 1150 | 24.967 | 17.688 |
| 1151 | 29.569 | 21.689 |
| 1152 | 34.2 | 25.66 |
| 1153 | 38.8 | 29.594 |
| 1154 | 34.2 | 30.982 |
| 1155 | 28.479 | 28.188 |
| 1156 | 22.05 | 23.576 |
| 1157 | 15.625 | 18.734 |
| | **Net Volume = 2476 cubic-feet** | |

Chart 2 – Hydrograph

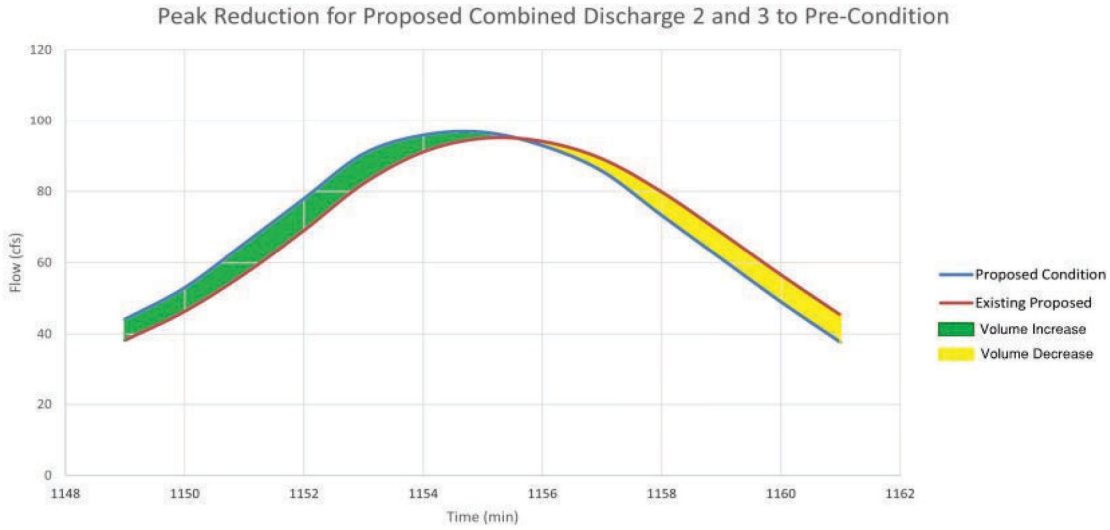



Table 6 – Area under the curve & volume summary table

| | Proposed at Discharge 2 & 3 | Existing at Discharge 2 |
|---|---|---|
| Time(Min) | Flow(cfs) | Flow(cfs) |
| 1149 | 44.146 | 38.253 |
| 1150 | 52.991 | 46.335 |
| 1151 | 65.394 | 56.806 |
| 1152 | 78 | 69.072 |
| 1153 | 90.589 | 82.223 |
| 1154 | 95.831 | 91.067 |
| 1155 | 96.654 | 94.881 |
| 1156 | 92.916 | 94.02 |
| 1157 | 85.748 | 89.129 |
| 1158 | 73.357 | 79.88 |
| 1159 | 61.191 | 68.438 |
| 1160 | 49.045 | 56.587 |
| 1161 | 37.703 | 45.315 |
| | **Net Volume = 782 cubic-feet** | |

# LID CONCEPT

Compliance with MS4 water quality requirements for the proposed project is provided by infiltration BMPs at various collection points throughout the site. The treatment facilities will be designed to treat the Stormwater Quality Design Volume (SQDV) and Stormwater Quality Design Flow (SQDF) based on the methodology in the Ventura County Technical Guidance Manual (TGM).

To meet stormwater quality compliance, the Effective Impervious Area (EIA) must be reduced to 5% or less. Site-specific geotechnical and infiltration investigation by GeoSoils Consultants, see Appendix F, concludes that infiltration will not be a hazard to the proposed development and is suitable for storm water infiltration. As such, infiltration based BMPs are proposed for this project. The western portion of the site project will achieve stormwater quality compliance using volume-base infiltration basin (INF-7 per the TGM) to treat and capture all the roof water from the proposed cabins and hardscape in the area. The proposed parking lot on the eastern side of the project site, will implement a combination of volume-based infiltration basin (INF-7 per the TGM) and Permeable Pavers (INF-5 per the TGM). Calculation methodology used to determine SQDV is outlined below. See Appendix E for an LID Exhibit and for detailed calculations for each BMP used. Refer to table 6 below for the LID summary.

### *Pre-treatment*

In accordance with the Ventura County Technical Guidance Manual (TGM), all proposed BMP's are required to have a pre-treatment system. Various pre-treatment systems such as catch basin filters and downspouts filters are proposed to satisfy the requirement. See the LID summary table 6 for more information on pre-treatment system on each proposed BMP.

### *Infiltration*

Infiltration testing was performed by GeoSoils Consultants, Inc, where they conducted hand dug test pits at a maximum depth of four feet below the existing ground surface at locations where the proposed BMP's will be placed. Based on the test, the site has an average infiltration rate ranging from 2.40 to 11.45 inch per hour and the report concluded that the on-site infiltration will not be a hazard to the development and is suitable for storm water infiltration. This report can be found on Appendix F. Per the TGM, all infiltration testing are required to extend 11 feet beneath the invert elevation of proposed infiltration BMPs. This, however, could not be done because the previous borings conducted on the site encountered refusal due to a high number of cobbles and boulders within the alluvial soils, as a result, shallow test pits were conducted instead. A supplemental letter and report by GeoSoils can be found on Appendix F for further details on why the 11 feet of excavation was not performed.

### *Infiltration Safety Factor*

Per the TGM, all proposed infiltration basins will be sized using an adjusted design percolation rate obtained from dividing the measured percolation rate by a combined safety factor measured using table-6-4 in the TGM. The combined safety factor used for this project was determined with the help of the geotechnical infiltration report and design information from the proposed pre-treatment and BMPs. As an example, each of the proposed BMP's will be less than 2 acres, therefore, will have a low concern factor value of 1. See table below for the infiltration safety factor summary and calculations.

**Table 6-14: Infiltration Facility Safety Factor Determination Worksheet**

| Factor Category | | Factor Description | Assigned Weight (w) | Factor Value (v) | Product (p) p = w x v |
|---|---|---|---|---|---|
| A | Suitability Assessment | Soil assessment methods | 0.25 | 1 | 0.25 |
| | | Predominant soil texture | 0.25 | 2 | 0.5 |
| | | Site soil variability | 0.25 | 2 | 0.5 |
| | | Depth to groundwater / impervious layer | 0.25 | 2 | 0.5 |
| | | Suitability Assessment Safety Factor, $S_A = \Sigma p$ | | | 1.75 |
| B | Design | Tributary area size | 0.25 | 1 | 0.25 |
| | | Level of pre-treatment/ expected sediment loads | 0.25 | 2 | 0.5 |
| | | Redundancy | 0.25 | 2 | 0.5 |
| | | Compaction during construction | 0.25 | 2 | 0.5 |
| | | Design Safety Factor, $S_B = \Sigma p$ | | | 1.75 |
| | | | | | |
| | | **Combined Safety Factor = $S_A$ x $S_B$** | | | 3.06 |

**Note:** The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

### *Calculate Allowable EIA*

The allowable EIA for a project is calculated as:

$EIA_{allowable} = (A_{project})*(5\%)$

Where: $EIA_{allowable}$ = The maximum impervious area from which runoff can be treated and discharged offsite (and not retained onsite), acres
$A_{project}$ = The total project area, acres

The individual BMPs of this project are calculated with 0% EIA because they will each have 100% impervious areas and the proposed BMP's are designed to capture 100% of the area. Detailed calculations are shown in Appendix E. However, for the overall project, 5% of the EIA are implemented and resulted to have 0.35 acres of maximum impervious area allowable to be treated and discharged. LID Watershed 1B shown

on the LID map will be part of the 5% EIA that will be pre-treated by a filtered downspout and will sheet flow into existing landscaping.

***Calculate Impervious Area to be Retained ($A_{retain}$)***

The impervious area from which runoff must be retained onsite.

$A_{retain} = (imp * A_{project}) - EIA_{allowable}$

Where: $A_{retain}$ = Drainage area from which runoff must be retained, acres

imp = Impervious fraction of the site

$A_{porject}$ = Total Project area, acres

$EIA_{allowable}$ = The maximum impervious area from which runoff can be treated and discharged offsite (and not retained onsite), acres

***Calculate Stormwater Quality Design Volume (SQDV)***

$SQDV = C * (0.75/12) * A_{retain}$

Where: SQDV = Stormwater Quality Design Volume that must be retained onsite, ac-ft

C = Runoff coefficient, 0.95 for impervious areas

0.75 = the design rainfall depth, in, based on sizing method 3

$A_{retain}$ = Drainage area from which runoff must be retained, acres

The completed INF-5 & INF-7 worksheets and calculations of the SQDV and the required areas of each BMP are included in Appendix E. Also refer to LID map in Appendix E for the infiltration basin and Permeable Pavers locations.

As the project moves on to future phases, it is possible that other BMPs such as rainwater harvesting, green roof, etc can be utilized to reduce the size of current infiltration basins. It is also possible that the current BMP designs need be modified if the landscaping, architectural design and grading have significant changes.

*Table 6 – **LID Summary***

| Area Name | Area (AC) | Req. SQDV. (cu-ft) | RWHDV (ac-ft) | Req. Daily Demand. (Gallons) | Proposed BMP | Proposed Pretreatment | Area Req. (sq-ft) | Area Prop. (sq-ft) | Basin Volume (cubic-feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1A | 0.113 | 292 | - | - | Infiltration Basin | Filtered catch basin | 226 | 229 | 351 |
| 2A | 0.129 | 334 | - | - | Infiltration Basin | Filtered catch basin | 206 | 233 | 347 |
| 3A | 0.173 | 447 | - | - | Infiltration Basin | Filtered catch basin | 312 | 314 | 587 |
| 4A | 0.110 | 285 | - | - | Infiltration Basin | Filtered catch basin | 176 | 177 | 420 |
| 5A | 0.150 | 388 | - | - | Permeable Pavers | - | 652 | 6531 | - |
| 6A | 0.76 | 1966 | - | - | Permeable Pavers | Filtered downspout & Filtered trench drain | 3842 | 4660 | - |
| 8A | 1.376 | 3559 | - | - | Infiltration Basin | Filtered catch basin | 3147 | 3985 | 3610 |
| 1B | 0.069 | - | - | - | EIA allowable 5% to sheet flow | Filtered downspout | - | - | - |

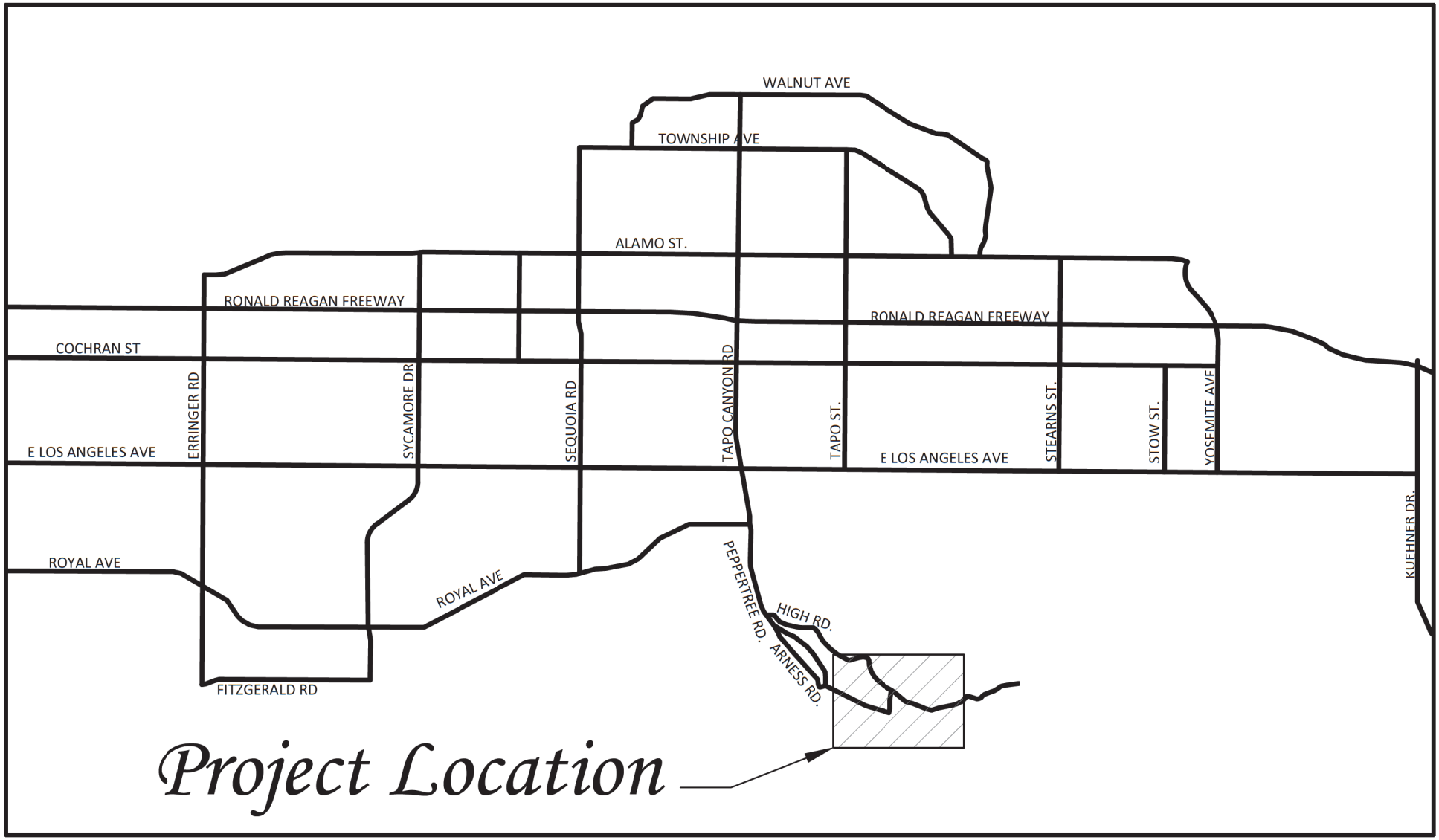
## CONCLUSION

The drainage improvements and stormwater quality treatment systems for this project have been designed in accordance with the requirements of the County of Ventura, using the methods proscribed in the County of Ventura Hydrology Manual.

In summary, the proposed project as designed will not increase the peak stormwater runoff. While there is an increased impervious area on the proposed site, the increased peak flow will be reduced by the proposed bio-infiltration basins' volume capacities to below the pre-project condition. The added bypass inlets on the north side of the High Road will have a positive impact on the existing watershed areas. The project will provide stormwater treatment in compliance with the Ventura County Technical Guidance Manual which will also positively impact stormwater quality in the area.

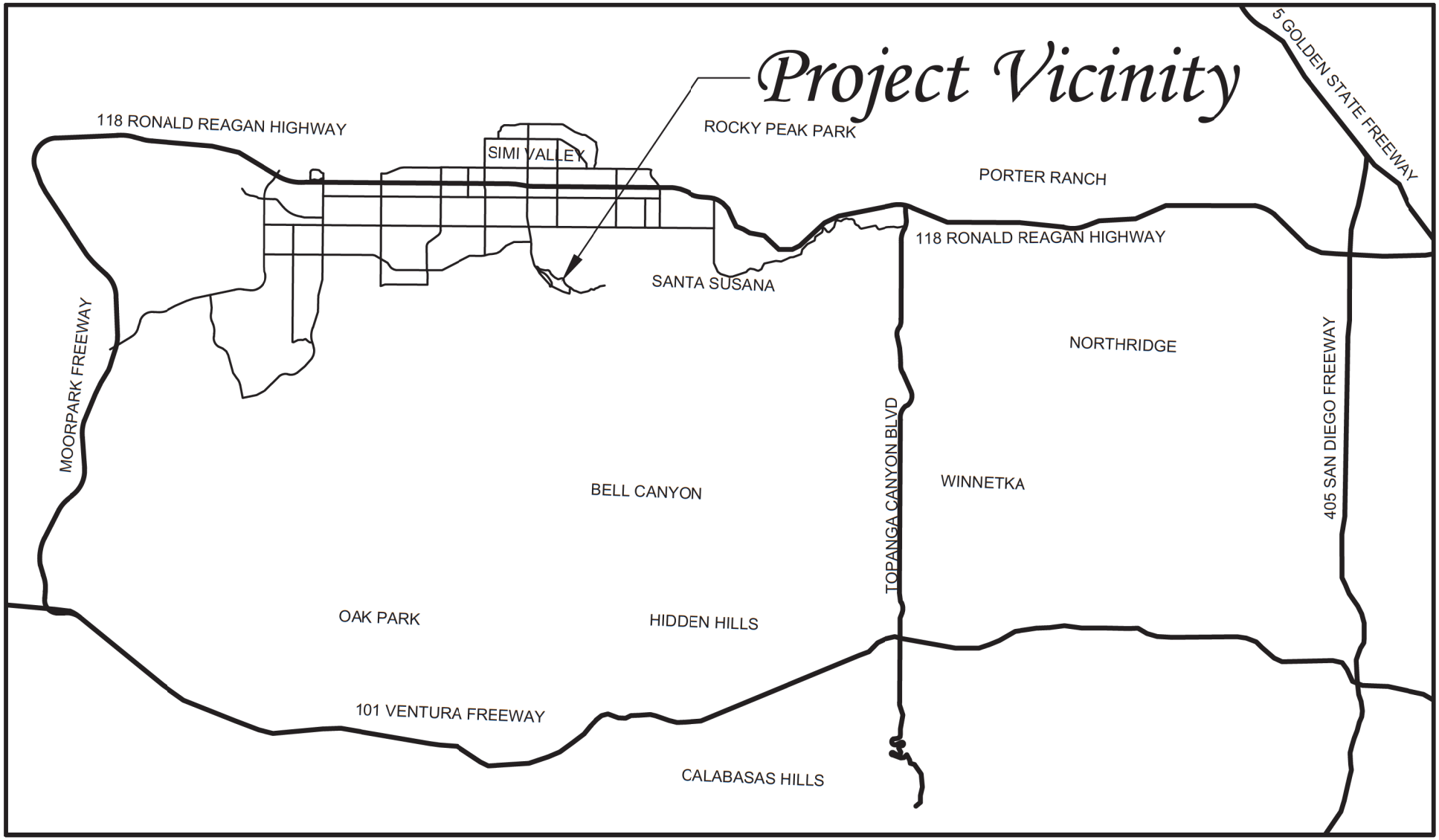
# APPENDIX A

## LOCATION/VICINITY MAP




# LOCATION MAP

NO SCALE




# VICINITY MAP

NO SCALE

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Plot Date: Monday, March 28, 2022 1:30:29 PM
Plotted By: AUGUSTIN, PIERRE

# APPENDIX B

## EXISTING CONDITION HYDROLOGY CALCULATIONS AND MAP 1: EXISTING CONDITION HYDROLOGY MAP

| Discharge Point | Area Name | Area (AC) | Σ Area (AC) | 10-year Event Q10 (cfs) | 10-year Event ΣQ10 (CFS) | 25-year Event Q25 (cfs) | 25-year Event ΣQ25 (CFS) | 50-year Event Q50 (cfs) | 50-year Event ΣQ50 (CFS) | 100-year Event Q100 (cfs) | 100-year Event ΣQ100 (CFS) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1A | 11.22 | 11.22 | 13.40 | 13.40 | 17.80 | 17.80 | 20.50 | 20.50 | 23.60 | 23.60 |
| | 2A | 25.25 | 36.47 | 32.20 | 44.50 | 40.50 | 57.20 | 46.60 | 66.00 | 53.50 | 76.00 |
| | 3A | 20.11 | 56.58 | 21.60 | 65.50 | 28.90 | 85.00 | 35.10 | 99.80 | 40.50 | 115.00 |
| | 4A | 8.16 | 64.74 | 11.11 | 73.90 | 15.20 | 95.20 | 17.50 | 112.30 | 20.00 | 129.90 |
| | 5A | 1.35 | 66.09 | 2.50 | 74.60 | 3.10 | 96.60 | 3.80 | 113.30 | 4.10 | 131.10 |
| 2 | 10A | 9.77 | 9.77 | 12.60 | 12.60 | 15.90 | 15.90 | 18.30 | 18.30 | 22.50 | 22.50 |
| | 11A | 15.38 | 25.15 | 21.30 | 33.30 | 26.80 | 41.70 | 30.90 | 48.20 | 35.30 | 56.80 |
| | 12A | 17.31 | 42.46 | 19.90 | 50.70 | 25.00 | 64.30 | 30.40 | 75.70 | 35.00 | 90.40 |
| | 13A | 2.98 | 45.44 | 5.10 | 52.10 | 6.40 | 66.60 | 7.30 | 78.70 | 8.30 | 94.50 |
| 3 | 20A | 15.48 | 15.48 | 20.00 | 20.00 | 25.10 | 25.10 | 31.30 | 31.10 | 35.60 | 35.60 |
| | 21A | 3.36 | 18.84 | 5.30 | 25.00 | 7.20 | 32.00 | 8.20 | 39.00 | 9.40 | 44.70 |
| 4 | 30A | 5.73 | 5.73 | 8.80 | 8.80 | 12.30 | 12.30 | 14.10 | 14.10 | 19.30 | 19.30 |
| 5 | 40A | 6.29 | 6.29 | 7.70 | 7.70 | 10.20 | 10.20 | 12.60 | 12.60 | 14.50 | 14.50 |
| | 41A | 4.80 | 11.09 | 6.60 | 13.90 | 8.80 | 18.70 | 11.10 | 23.10 | 12.60 | 26.50 |
| 6 | 50A | 31.14 | 31.14 | 32.50 | 32.50 | 40.60 | 40.60 | 50.10 | 50.10 | 57.80 | 57.80 |
| | 51A | 5.09 | 36.23 | 4.40 | 36.50 | 6.10 | 46.50 | 7.80 | 57.10 | 9.00 | 65.90 |




HYDROLOGY LEGEND

SUBAREA
1A
8.42 Ac.
AREA (AC.)
SUBAREA BOUNDARY (COLOR VARIES)
EXISTING STORM DRAIN
SUB-AREA
TC FLOW PATH
RL FLOW PATH
FEMA FLOOD LINE

Notes

Revision | By | Appd | YYYY.MM.DD

Issued | By | Appd | YYYY.MM.DD

Permit/Seal

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Client/Project Logo

Client/Project
AMERICAN JEWISH UNIVERSITY-
BRANDEIS-BARDIN CAMPUS

CAMP ALONIM
MODIFICATION TO C.U.P. 1776

1101 PEPPERTREE LANE, BRANDEIS, CA 93064

Title
EXISTING CONDITION
HYDROLOGY MAP

Project No. 000000000 | Scale

Revision | Sheet of 1 | Drawing No.

C:\Users\mike.bolton\ACCDocuments\Camp Alonim\214000C-EXTSD.rvt
2022.6.0 (x64)
DRAWING SHEET - ARCH E

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A10     9    0    110    134      110     134   1153    VALLEY
 940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A10     8    0    250    322      360     445   1155    VALLEY
 891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A10    11    0    200    216      560     655   1155    VALLEY
 788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A10     7    0     80    111      640     739   1156    VALLEY
 489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A10     5    5     14     25      654     746   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
-----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:              746    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             21.64 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.47   200       0.47   300       0.47   400
0.47
      500       0.47   600       0.48   700       0.51   800       0.51   900
0.54
     1000       0.59  1050       0.64  1100      24.71  1110      50.84  1120
87.65
     1130     102.60  1131     102.96  1132     103.63  1133     104.28  1134
105.27
     1135     106.48  1136     107.88  1137     109.46  1138     111.14  1139
```

112.83
1140 114.56 1141 117.15 1142 121.08 1143 126.73 1144
134.17
1145 145.46 1146 160.47 1147 180.11 1148 204.48 1149
240.39
1150 291.07 1151 361.33 1152 449.92 1153 551.73 1154
644.63
1155 714.58 1156 746.10 1157 739.07 1158 705.58 1159
655.60
1160 590.23 1161 515.93 1162 439.99 1163 366.26 1164
298.38
1165 239.03 1166 190.52 1167 154.73 1168 129.56 1169
111.76
1170 98.66 1171 88.02 1172 79.38 1173 71.95 1174
65.53
1175 59.45 1176 54.05 1177 49.52 1178 45.12 1179
40.99
1180 37.51 1181 34.22 1182 30.85 1183 27.47 1184
24.64
1185 22.63 1186 20.49 1187 18.20 1188 15.75 1189
13.29
1190 11.02 1191 9.09 1192 7.48 1193 6.16 1194
5.08
1195 4.22 1196 3.50 1197 2.91 1198 2.42 1199
2.04
1200 1.72 1201 1.47 1202 1.26 1203 1.11 1204
0.98
1205 0.88 1206 0.80 1207 0.75 1208 0.71 1209
0.68
1210 0.64 1211 0.63 1212 0.62 1213 0.61 1214
0.60
1215 0.60 1216 0.60 1217 0.60 1218 0.59 1219
0.59
1220 0.59 1221 0.59 1222 0.58 1223 0.59 1224
0.59
1225 0.58 1226 0.56 1227 0.54 1228 0.53 1229
0.51
1230 0.51 1231 0.51 1232 0.52 1233 0.52 1234
0.52
1235 0.51 1236 0.51 1237 0.51 1238 0.51 1239
0.51
1240 0.52 1241 0.52 1242 0.52 1243 0.51 1244
0.51
1245 0.51 1246 0.51 1247 0.51 1248 0.52 1249
0.52
1250 0.52 1251 0.51 1252 0.51 1253 0.51 1254
0.51
1255 0.51 1256 0.52 1257 0.52 1258 0.52 1259
0.51
1260 0.51 1261 0.51 1262 0.51 1263 0.51 1264

0.52
     1265       0.52  1266       0.52  1267       0.51  1268       0.51  1269
0.51
     1270       0.51  1271       0.51  1272       0.52  1273       0.52  1274
0.52
     1275       0.51  1276       0.51  1277       0.51  1278       0.51  1279
0.51
     1280       0.52  1281       0.52  1282       0.52  1283       0.51  1284
0.51
     1285       0.51  1286       0.51  1287       0.51  1288       0.52  1289
0.52
     1290       0.52  1291       0.51  1292       0.51  1293       0.51  1294
0.51
     1295       0.51  1296       0.52  1297       0.51  1298       0.50  1299
0.49
     1300       0.48  1310       0.47  1320       0.48  1330       0.47  1340
0.48
     1350       0.47  1360       0.47  1370       0.48  1380       0.47  1390
0.47
     1400       0.48  1420       0.47  1440       0.47  1460       0.40  1500
0.40



VCRat Model Input

Model Lines
---
---
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011009A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020011A97200788004600
006     1  004A 020000008007A97200489004100
006     1  005A 020005001405A97                              1  2
999

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A25     8    0    110    178      110     178   1154    VALLEY
 940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A25     8    0    250    405      360     572   1154    VALLEY
 891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A25    10    0    200    289      560     850   1155    VALLEY
 788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A25     6    0     80    152      640     952   1155    VALLEY
 489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A25     5    5     14     31      654     966   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:              966    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             31.83 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.49   200       0.49   300       0.49   400
0.49
      500       0.49   600       0.50   700       0.54   800       0.54   900
0.57
     1000       0.63  1050      10.98  1100      60.49  1110      97.15  1120
141.79
     1130     157.14  1131     157.98  1132     159.10  1133     160.39  1134
161.97
     1135     163.89  1136     166.00  1137     168.14  1138     170.17  1139
```

172.28
1140 174.34 1141 177.71 1142 183.22 1143 191.18 1144
202.12
1145 217.86 1146 238.53 1147 264.63 1148 295.49 1149
342.97
1150 413.03 1151 507.75 1152 624.67 1153 757.87 1154
876.01
1155 949.14 1156 966.10 1157 942.98 1158 889.43 1159
812.60
1160 716.82 1161 614.84 1162 514.24 1163 419.74 1164
335.87
1165 267.86 1166 219.28 1167 186.85 1168 165.00 1169
148.99
1170 136.50 1171 125.92 1172 116.86 1173 108.82 1174
101.26
1175 94.62 1176 88.32 1177 82.61 1178 77.84 1179
73.77
1180 69.72 1181 65.47 1182 61.13 1183 57.41 1184
53.64
1185 49.93 1186 45.97 1187 41.86 1188 37.72 1189
33.33
1190 29.40 1191 25.83 1192 22.73 1193 20.10 1194
17.78
1195 15.39 1196 13.02 1197 11.09 1198 10.03 1199
8.91
1200 7.82 1201 6.80 1202 5.87 1203 5.05 1204
4.33
1205 3.70 1206 3.17 1207 2.72 1208 2.34 1209
2.01
1210 1.75 1211 1.53 1212 1.35 1213 1.19 1214
1.08
1215 0.98 1216 0.89 1217 0.83 1218 0.79 1219
0.75
1220 0.72 1221 0.70 1222 0.68 1223 0.66 1224
0.65
1225 0.64 1226 0.61 1227 0.59 1228 0.57 1229
0.55
1230 0.54 1231 0.54 1232 0.54 1233 0.54 1234
0.54
1235 0.54 1236 0.54 1237 0.54 1238 0.54 1239
0.54
1240 0.54 1241 0.54 1242 0.54 1243 0.54 1244
0.54
1245 0.54 1246 0.54 1247 0.54 1248 0.54 1249
0.54
1250 0.54 1251 0.54 1252 0.54 1253 0.54 1254
0.54
1255 0.54 1256 0.54 1257 0.54 1258 0.54 1259
0.54
1260 0.54 1261 0.54 1262 0.54 1263 0.54 1264

0.54

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1265 | 0.54 | 1266 | 0.54 | 1267 | 0.54 | 1268 | 0.54 | 1269 | 0.54 |
| 1270 | 0.54 | 1271 | 0.54 | 1272 | 0.54 | 1273 | 0.54 | 1274 | 0.54 |
| 1275 | 0.54 | 1276 | 0.54 | 1277 | 0.54 | 1278 | 0.54 | 1279 | 0.54 |
| 1280 | 0.54 | 1281 | 0.54 | 1282 | 0.54 | 1283 | 0.54 | 1284 | 0.54 |
| 1285 | 0.54 | 1286 | 0.54 | 1287 | 0.54 | 1288 | 0.54 | 1289 | 0.54 |
| 1290 | 0.54 | 1291 | 0.54 | 1292 | 0.54 | 1293 | 0.54 | 1294 | 0.54 |
| 1295 | 0.54 | 1296 | 0.54 | 1297 | 0.53 | 1298 | 0.52 | 1299 | 0.50 |
| 1300 | 0.50 | 1310 | 0.49 | 1320 | 0.49 | 1330 | 0.49 | 1340 | 0.49 |
| 1350 | 0.49 | 1360 | 0.49 | 1370 | 0.49 | 1380 | 0.49 | 1390 | 0.49 |
| 1400 | 0.49 | 1420 | 0.49 | 1440 | 0.49 | 1460 | 0.40 | 1500 | 0.40 |



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011008A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020010A97200788004600
006     1  004A 020000008006A97200489004100
006     1  005A 020005001405A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A50     8    0    110    205      110     205   1153    VALLEY
 940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A50     8    0    250    466      360     660   1154    VALLEY
 891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A50     9    0    200    351      560     998   1155    VALLEY
 788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A50     6    0     80    175      640    1123   1155    VALLEY
 489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A50     5    5     14     36      654    1133   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:             1133    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             40.30 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.50   200       0.50   300       0.50   400
0.50
      500       0.50   600       0.51   700       0.56   800       0.56   900
0.59
     1000       0.66  1050      28.03  1100      89.34  1110     130.44  1120
183.37
     1130     198.31  1131     199.24  1132     200.59  1133     202.24  1134
204.33
     1135     206.85  1136     209.36  1137     211.99  1138     214.50  1139
```

216.88
1140 219.05 1141 222.76 1142 228.91 1143 238.25 1144
250.84
1145 269.41 1146 294.55 1147 326.02 1148 362.81 1149
419.39
1150 504.02 1151 618.28 1152 757.42 1153 914.56 1154
1050.11
1155 1126.69 1156 1133.20 1157 1103.28 1158 1031.76 1159
926.16
1160 800.53 1161 676.03 1162 557.10 1163 448.72 1164
359.51
1165 294.73 1166 250.78 1167 221.08 1168 199.50 1169
182.65
1170 169.06 1171 156.89 1172 146.34 1173 136.61 1174
128.07
1175 120.11 1176 113.32 1177 107.82 1178 103.29 1179
99.17
1180 94.79 1181 89.73 1182 85.00 1183 80.16 1184
75.38
1185 70.58 1186 65.46 1187 60.19 1188 55.40 1189
50.87
1190 47.21 1191 43.64 1192 40.35 1193 36.76 1194
33.10
1195 29.46 1196 26.98 1197 24.72 1198 22.23 1199
19.56
1200 16.86 1201 14.28 1202 11.95 1203 9.92 1204
8.19
1205 6.75 1206 5.55 1207 4.57 1208 3.76 1209
3.11
1210 2.58 1211 2.16 1212 1.82 1213 1.54 1214
1.34
1215 1.16 1216 1.04 1217 0.94 1218 0.86 1219
0.81
1220 0.76 1221 0.74 1222 0.71 1223 0.70 1224
0.68
1225 0.66 1226 0.63 1227 0.61 1228 0.58 1229
0.56
1230 0.55 1231 0.55 1232 0.55 1233 0.55 1234
0.56
1235 0.56 1236 0.56 1237 0.56 1238 0.56 1239
0.55
1240 0.55 1241 0.55 1242 0.55 1243 0.55 1244
0.56
1245 0.56 1246 0.56 1247 0.56 1248 0.56 1249
0.55
1250 0.55 1251 0.55 1252 0.55 1253 0.55 1254
0.56
1255 0.56 1256 0.56 1257 0.56 1258 0.56 1259
0.55
1260 0.55 1261 0.55 1262 0.55 1263 0.55 1264

0.56
     1265       0.56  1266       0.56  1267       0.56  1268       0.55  1269
0.55
     1270       0.55  1271       0.55  1272       0.55  1273       0.56  1274
0.56
     1275       0.56  1276       0.56  1277       0.56  1278       0.55  1279
0.55
     1280       0.55  1281       0.55  1282       0.55  1283       0.56  1284
0.56
     1285       0.56  1286       0.56  1287       0.56  1288       0.55  1289
0.55
     1290       0.55  1291       0.55  1292       0.55  1293       0.56  1294
0.56
     1295       0.56  1296       0.56  1297       0.54  1298       0.54  1299
0.52
     1300       0.51  1310       0.50  1320       0.50  1330       0.50  1340
0.50
     1350       0.50  1360       0.50  1370       0.50  1380       0.50  1390
0.50
     1400       0.50  1420       0.50  1440       0.50  1460       0.40  1500
0.40



VCRat Model Input

Model Lines
---
---
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011008A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020009A97200788004600
006     1  004A 020000008006A97200489004100
006     1  005A 020005001405A97                              1  2
999

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A100    8    0    110    236      110     236   1153    VALLEY
940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A100    8    0    250    535      360     760   1154    VALLEY
891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A100    9    0    200    405      560    1150   1155    VALLEY
788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A100    6    0     80    200      640    1299   1155    VALLEY
489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A100    5    5     14     41      654    1311   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:             1311    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             51.13 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.51   200       0.51   300       0.51   400
0.51
      500       0.51   600       0.53   700       0.57   800       0.57   900
0.62
     1000      10.85  1050      49.48  1100     118.30  1110     167.52  1120
224.96
     1130     239.92  1131     241.12  1132     243.00  1133     245.10  1134
247.54
     1135     250.31  1136     253.23  1137     256.21  1138     258.92  1139
```

261.56
1140 264.22 1141 268.56 1142 275.58 1143 286.41 1144
301.37
1145 323.34 1146 352.41 1147 388.68 1148 431.30 1149
497.87
1150 597.78 1151 731.44 1152 892.44 1153 1072.02 1154
1224.55
1155 1306.83 1156 1310.76 1157 1268.47 1158 1181.84 1159
1055.66
1160 908.69 1161 766.11 1162 629.85 1163 506.80 1164
407.57
1165 336.94 1166 290.04 1167 258.93 1168 236.72 1169
219.07
1170 204.09 1171 191.01 1172 179.72 1173 169.57 1174
160.20
1175 150.78 1176 143.31 1177 137.81 1178 133.14 1179
128.58
1180 123.43 1181 117.55 1182 112.10 1183 106.04 1184
100.05
1185 94.14 1186 88.02 1187 82.03 1188 76.61 1189
71.80
1190 68.07 1191 64.52 1192 60.83 1193 56.62 1194
52.03
1195 47.91 1196 44.58 1197 41.05 1198 37.16 1199
33.24
1200 29.31 1201 25.84 1202 22.66 1203 19.99 1204
17.96
1205 16.57 1206 15.46 1207 14.47 1208 13.78 1209
13.26
1210 13.05 1211 12.79 1212 12.40 1213 12.19 1214
12.10
1215 12.20 1216 12.19 1217 11.97 1218 12.00 1219
12.05
1220 12.29 1221 12.26 1222 12.12 1223 12.08 1224
12.25
1225 12.09 1226 11.55 1227 10.83 1228 10.42 1229
9.85
1230 9.18 1231 8.43 1232 7.68 1233 6.91 1234
6.15
1235 5.42 1236 4.75 1237 4.14 1238 3.60 1239
3.12
1240 2.71 1241 2.35 1242 2.04 1243 1.77 1244
1.55
1245 1.36 1246 1.21 1247 1.07 1248 0.98 1249
0.89
1250 0.82 1251 0.77 1252 0.73 1253 0.69 1254
0.66
1255 0.63 1256 0.63 1257 0.61 1258 0.60 1259
0.60
1260 0.59 1261 0.59 1262 0.58 1263 0.57 1264

0.58
     1265       0.58  1266       0.58  1267       0.58  1268       0.58  1269
0.58
     1270       0.58  1271       0.57  1272       0.58  1273       0.58  1274
0.58
     1275       0.58  1276       0.58  1277       0.58  1278       0.58  1279
0.57
     1280       0.58  1281       0.58  1282       0.58  1283       0.58  1284
0.58
     1285       0.58  1286       0.58  1287       0.57  1288       0.58  1289
0.58
     1290       0.58  1291       0.58  1292       0.58  1293       0.58  1294
0.58
     1295       0.57  1296       0.58  1297       0.57  1298       0.55  1299
0.54
     1300       0.53  1310       0.52  1320       0.51  1330       0.52  1340
0.51
     1350       0.52  1360       0.52  1370       0.51  1380       0.52  1390
0.51
     1400       0.52  1420       0.51  1440       0.51  1460       0.40  1500
0.40



VCRat Model Input

Model Lines
---
---
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011008A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020009A97200788004600
006     1  004A 020000008006A97200489004100
006     1  005A 020005001405A97                              1  2
999

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A10     8    0     98    126       98     126   1153    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A10     7    0    154    213      252     333   1155    MOUNTAIN
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A10    10    0    173    199      425     507   1156    VALLEY
 548  0.03600    ---     ----    -----  -----    --     --
      13A :  Subarea
      13A   020   A10     5    0     30     51      455     521   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   13A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     455    acres
            HYDROGRAPH PEAK:              521    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             15.12 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       0.40  1100      17.00  1110      35.83  1120
60.34
     1130      70.68  1131      71.21  1132      71.87  1133      72.47  1134
73.36
     1135      74.31  1136      75.23  1137      76.13  1138      77.17  1139
78.35
     1140      79.74  1141      82.39  1142      86.22  1143      91.08  1144
96.24
```

1145 104.76 1146 115.81 1147 130.15 1148 147.09 1149
176.67
1150 216.82 1151 268.02 1152 327.95 1153 398.03 1154
456.06
1155 499.04 1156 520.59 1157 520.19 1158 499.32 1159
461.60
1160 406.97 1161 346.46 1162 285.45 1163 227.33 1164
177.65
1165 141.68 1166 117.56 1167 100.23 1168 86.96 1169
76.29
1170 68.04 1171 61.28 1172 55.42 1173 50.17 1174
45.16
1175 40.14 1176 36.46 1177 33.88 1178 31.17 1179
28.13
1180 25.57 1181 23.20 1182 20.99 1183 18.74 1184
16.59
1185 14.93 1186 13.06 1187 11.45 1188 10.12 1189
8.98
1190 7.96 1191 7.05 1192 6.24 1193 5.51 1194
4.85
1195 4.25 1196 3.72 1197 3.25 1198 2.84 1199
2.47
1200 2.16 1201 1.88 1202 1.64 1203 1.44 1204
1.27
1205 1.12 1206 1.00 1207 0.89 1208 0.81 1209
0.73
1210 0.67 1211 0.62 1212 0.58 1213 0.55 1214
0.52
1215 0.50 1216 0.48 1217 0.46 1218 0.45 1219
0.44
1220 0.43 1221 0.43 1222 0.42 1223 0.42 1224
0.41
1225 0.41 1226 0.41 1227 0.41 1228 0.41 1229
0.40
1230 0.40 1231 0.40 1232 0.40 1233 0.40 1234
0.40
1235 0.40 1236 0.40 1237 0.40 1238 0.40 1239
0.40
1240 0.40 1241 0.40 1242 0.40 1243 0.40 1244
0.40
1245 0.40 1246 0.40 1247 0.40 1248 0.40 1249
0.40
1250 0.40 1251 0.40 1252 0.40 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| | 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| | 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |
| | 1285 | 0.40 | 1286 | 0.40 | 1287 | 0.40 | 1288 | 0.40 | 1289 | 0.40 |
| | 1290 | 0.40 | 1291 | 0.40 | 1292 | 0.40 | 1293 | 0.40 | 1294 | 0.40 |
| | 1295 | 0.40 | 1296 | 0.40 | 1297 | 0.40 | 1298 | 0.40 | 1299 | 0.40 |
| | 1300 | 0.40 | 1310 | 0.40 | 1320 | 0.40 | 1330 | 0.40 | 1340 | 0.40 |
| | 1350 | 0.40 | 1360 | 0.40 | 1370 | 0.40 | 1380 | 0.40 | 1390 | 0.40 |
| | 1400 | 0.40 | 1420 | 0.40 | 1440 | 0.40 | 1460 | 0.40 | 1500 | 0.40 |



VCRat Model Input

Model Lines

```
005     1  010A Header place holder
005     1  013A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97100995007500
006     1  012A 020000017310A97200548003600
006     1  013A 020000003005A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A25     8    0     98    159       98     159   1154    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A25     7    0    154    268      252     417   1155    MOUNTAIN
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A25    10    0    173    250      425     643   1156    VALLEY
 548  0.03600    ---     ----    -----  -----    --     --
      13A :  Subarea
      13A   020   A25     5    0     30     64      455     666   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


------------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
------------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   13A
------------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     455    acres
            HYDROGRAPH PEAK:              666    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             22.18 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       7.48  1100      41.62  1110      67.73  1120
97.22
     1130     108.80  1131     109.79  1132     110.61  1133     111.51  1134
112.58
     1135     113.93  1136     115.20  1137     116.55  1138     117.89  1139
119.37
     1140     120.99  1141     124.22  1142     129.02  1143     135.04  1144
142.26
```

1145 153.26 1146 167.08 1147 185.03 1148 206.17 1149
243.29
1150 293.82 1151 357.85 1152 433.96 1153 522.58 1154
593.79
1155 643.65 1156 665.68 1157 659.28 1158 626.72 1159
574.64
1160 503.13 1161 426.32 1162 350.90 1163 280.28 1164
222.04
1165 180.88 1166 153.40 1167 133.55 1168 119.02 1169
107.00
1170 97.87 1171 90.36 1172 83.55 1173 76.96 1174
70.83
1175 65.52 1176 61.48 1177 58.23 1178 54.98 1179
51.73
1180 48.41 1181 45.32 1182 42.54 1183 39.87 1184
37.25
1185 34.36 1186 31.38 1187 28.30 1188 25.65 1189
23.18
1190 20.96 1191 18.58 1192 16.51 1193 14.32 1194
12.34
1195 10.70 1196 9.37 1197 8.24 1198 7.25 1199
6.58
1200 5.87 1201 5.24 1202 4.70 1203 4.24 1204
3.82
1205 3.44 1206 3.10 1207 2.78 1208 2.50 1209
2.24
1210 2.01 1211 1.80 1212 1.62 1213 1.46 1214
1.31
1215 1.19 1216 1.08 1217 0.98 1218 0.89 1219
0.82
1220 0.76 1221 0.70 1222 0.66 1223 0.62 1224
0.58
1225 0.56 1226 0.53 1227 0.51 1228 0.49 1229
0.48
1230 0.47 1231 0.45 1232 0.45 1233 0.44 1234
0.43
1235 0.43 1236 0.42 1237 0.42 1238 0.42 1239
0.41
1240 0.41 1241 0.41 1242 0.41 1243 0.41 1244
0.41
1245 0.40 1246 0.40 1247 0.40 1248 0.40 1249
0.40
1250 0.40 1251 0.40 1252 0.40 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| | 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| | 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |
| | 1285 | 0.40 | 1286 | 0.40 | 1287 | 0.40 | 1288 | 0.40 | 1289 | 0.40 |
| | 1290 | 0.40 | 1291 | 0.40 | 1292 | 0.40 | 1293 | 0.40 | 1294 | 0.40 |
| | 1295 | 0.40 | 1296 | 0.40 | 1297 | 0.40 | 1298 | 0.40 | 1299 | 0.40 |
| | 1300 | 0.40 | 1310 | 0.40 | 1320 | 0.40 | 1330 | 0.40 | 1340 | 0.40 |
| | 1350 | 0.40 | 1360 | 0.40 | 1370 | 0.40 | 1380 | 0.40 | 1390 | 0.40 |
| | 1400 | 0.40 | 1420 | 0.40 | 1440 | 0.40 | 1460 | 0.40 | 1500 | 0.40 |



VCRat Model Input

Model Lines

```
005     1  010A Header place holder
005     1  013A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97100995007500
006     1  012A 020000017310A97200548003600
006     1  013A 020000003005A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A50     8    0     98    183       98     183   1153    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A50     7    0    154    309      252     482   1154    MOUNTAIN
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A50     9    0    173    304      425     757   1156    VALLEY
 548  0.03600    ---     ----    -----  -----    --     --
      13A :  Subarea
      13A   020   A50     5    0     30     73      455     787   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   13A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     455    acres
            HYDROGRAPH PEAK:              787    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             28.04 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050      19.30  1100      61.54  1110      91.19  1120
125.95
     1130     137.57  1131     138.73  1132     139.70  1133     140.83  1134
142.20
     1135     143.95  1136     145.31  1137     147.09  1138     148.89  1139
150.58
     1140     152.09  1141     155.64  1142     161.06  1143     168.12  1144
176.47
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1145 | 190.01 | 1146 | 207.38 | 1147 | 228.99 | 1148 | 254.37 | 1149 | 299.54 |
| 1150 | 360.68 | 1151 | 437.54 | 1152 | 529.45 | 1153 | 635.92 | 1154 | 717.24 |
| 1155 | 768.09 | 1156 | 787.29 | 1157 | 774.99 | 1158 | 722.02 | 1159 | 643.00 |
| 1160 | 552.23 | 1161 | 460.32 | 1162 | 370.34 | 1163 | 294.38 | 1164 | 241.42 |
| 1165 | 205.42 | 1166 | 178.92 | 1167 | 158.72 | 1168 | 142.71 | 1169 | 129.85 |
| 1170 | 120.10 | 1171 | 111.31 | 1172 | 103.14 | 1173 | 95.21 | 1174 | 88.55 |
| 1175 | 83.41 | 1176 | 79.77 | 1177 | 76.27 | 1178 | 72.78 | 1179 | 69.11 |
| 1180 | 65.34 | 1181 | 61.65 | 1182 | 58.55 | 1183 | 55.58 | 1184 | 52.02 |
| 1185 | 48.27 | 1186 | 44.57 | 1187 | 41.12 | 1188 | 38.84 | 1189 | 36.17 |
| 1190 | 33.80 | 1191 | 30.77 | 1192 | 27.99 | 1193 | 25.27 | 1194 | 22.89 |
| 1195 | 20.45 | 1196 | 18.21 | 1197 | 16.25 | 1198 | 14.30 | 1199 | 12.59 |
| 1200 | 11.18 | 1201 | 9.95 | 1202 | 8.85 | 1203 | 7.84 | 1204 | 6.92 |
| 1205 | 6.10 | 1206 | 5.35 | 1207 | 4.68 | 1208 | 4.08 | 1209 | 3.55 |
| 1210 | 3.09 | 1211 | 2.68 | 1212 | 2.32 | 1213 | 2.02 | 1214 | 1.75 |
| 1215 | 1.53 | 1216 | 1.34 | 1217 | 1.18 | 1218 | 1.04 | 1219 | 0.93 |
| 1220 | 0.83 | 1221 | 0.75 | 1222 | 0.69 | 1223 | 0.63 | 1224 | 0.59 |
| 1225 | 0.55 | 1226 | 0.52 | 1227 | 0.50 | 1228 | 0.48 | 1229 | 0.46 |
| 1230 | 0.45 | 1231 | 0.44 | 1232 | 0.43 | 1233 | 0.43 | 1234 | 0.42 |
| 1235 | 0.42 | 1236 | 0.41 | 1237 | 0.41 | 1238 | 0.41 | 1239 | 0.41 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |

```
     1270       0.40  1271       0.40  1272       0.40  1273       0.40  1274
0.40
     1275       0.40  1276       0.40  1277       0.40  1278       0.40  1279
0.40
     1280       0.40  1281       0.40  1282       0.40  1283       0.40  1284
0.40
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  010A Header place holder
005     1  013A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97100995007500
006     1  012A 020000017309A97200548003600
006     1  013A 020000003005A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A100    7    0     98    225       98     225   1153    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A100    7    0    154    353      252     568   1154    MOUNTAIN
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A100    9    0    173    350      425     885   1156    VALLEY
 548  0.03600    ---     ----    -----  -----    --     --
      13A :  Subarea
      13A   020   A100    5    0     30     83      455     925   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   13A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     455    acres
            HYDROGRAPH PEAK:              925    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             35.51 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       7.36  1050      34.11  1100      81.90  1110     116.95  1120
154.80
     1130     166.68  1131     168.00  1132     169.40  1133     170.64  1134
172.14
     1135     173.98  1136     175.87  1137     177.92  1138     179.99  1139
181.98
     1140     183.82  1141     187.72  1142     193.74  1143     202.21  1144
212.02
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1145 | 227.67 | 1146 | 247.78 | 1147 | 273.43 | 1148 | 303.81 | 1149 | 357.49 |
| 1150 | 429.90 | 1151 | 520.01 | 1152 | 628.32 | 1153 | 754.36 | 1154 | 849.91 |
| 1155 | 907.07 | 1156 | 924.69 | 1157 | 904.33 | 1158 | 835.20 | 1159 | 734.75 |
| 1160 | 623.05 | 1161 | 512.40 | 1162 | 406.91 | 1163 | 319.80 | 1164 | 260.79 |
| 1165 | 222.92 | 1166 | 196.69 | 1167 | 177.97 | 1168 | 163.52 | 1169 | 151.63 |
| 1170 | 142.22 | 1171 | 133.81 | 1172 | 125.21 | 1173 | 116.63 | 1174 | 109.36 |
| 1175 | 103.45 | 1176 | 99.56 | 1177 | 96.13 | 1178 | 92.27 | 1179 | 88.48 |
| 1180 | 84.73 | 1181 | 80.56 | 1182 | 77.12 | 1183 | 73.36 | 1184 | 68.99 |
| 1185 | 64.53 | 1186 | 60.01 | 1187 | 56.06 | 1188 | 53.33 | 1189 | 50.35 |
| 1190 | 47.61 | 1191 | 44.51 | 1192 | 41.35 | 1193 | 38.33 | 1194 | 35.58 |
| 1195 | 32.75 | 1196 | 30.39 | 1197 | 27.56 | 1198 | 24.55 | 1199 | 22.14 |
| 1200 | 19.85 | 1201 | 18.06 | 1202 | 16.46 | 1203 | 15.02 | 1204 | 13.75 |
| 1205 | 12.69 | 1206 | 11.83 | 1207 | 11.13 | 1208 | 10.53 | 1209 | 9.90 |
| 1210 | 9.40 | 1211 | 9.20 | 1212 | 9.07 | 1213 | 8.89 | 1214 | 8.60 |
| 1215 | 8.37 | 1216 | 8.39 | 1217 | 8.44 | 1218 | 8.60 | 1219 | 8.34 |
| 1220 | 8.32 | 1221 | 8.33 | 1222 | 8.34 | 1223 | 8.32 | 1224 | 8.32 |
| 1225 | 7.82 | 1226 | 7.54 | 1227 | 6.79 | 1228 | 6.07 | 1229 | 5.50 |
| 1230 | 5.17 | 1231 | 4.95 | 1232 | 4.71 | 1233 | 4.45 | 1234 | 4.17 |
| 1235 | 3.88 | 1236 | 3.59 | 1237 | 3.32 | 1238 | 3.05 | 1239 | 2.80 |
| 1240 | 2.55 | 1241 | 2.33 | 1242 | 2.11 | 1243 | 1.92 | 1244 | 1.74 |
| 1245 | 1.57 | 1246 | 1.43 | 1247 | 1.30 | 1248 | 1.18 | 1249 | 1.07 |
| 1250 | 0.98 | 1251 | 0.90 | 1252 | 0.83 | 1253 | 0.77 | 1254 | 0.72 |
| 1255 | 0.67 | 1256 | 0.63 | 1257 | 0.59 | 1258 | 0.57 | 1259 | 0.54 |
| 1260 | 0.52 | 1261 | 0.50 | 1262 | 0.48 | 1263 | 0.47 | 1264 | 0.46 |
| 1265 | 0.45 | 1266 | 0.44 | 1267 | 0.44 | 1268 | 0.43 | 1269 | 0.43 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1270 | 0.42 | 1271 | 0.42 | 1272 | 0.42 | 1273 | 0.41 | 1274 | 0.41 |
| | 1275 | 0.41 | 1276 | 0.41 | 1277 | 0.41 | 1278 | 0.41 | 1279 | 0.40 |
| | 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |
| | 1285 | 0.40 | 1286 | 0.40 | 1287 | 0.40 | 1288 | 0.40 | 1289 | 0.40 |
| | 1290 | 0.40 | 1291 | 0.40 | 1292 | 0.40 | 1293 | 0.40 | 1294 | 0.40 |
| | 1295 | 0.40 | 1296 | 0.40 | 1297 | 0.40 | 1298 | 0.40 | 1299 | 0.40 |
| | 1300 | 0.40 | 1310 | 0.40 | 1320 | 0.40 | 1330 | 0.40 | 1340 | 0.40 |
| | 1350 | 0.40 | 1360 | 0.40 | 1370 | 0.40 | 1380 | 0.40 | 1390 | 0.40 |
| | 1400 | 0.40 | 1420 | 0.40 | 1440 | 0.40 | 1460 | 0.40 | 1500 | 0.40 |



VCRat Model Input

Model Lines

```
005     1  010A Header place holder
005     1  013A Header place holder
999
999
006     1  010A 020000009807A97200990009500                    G1
006     1  011A 020000015407A97100995007500
006     1  012A 020000017309A97200548003600
006     1  013A 020000003005A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 3


Model Results

| SUBAREA DATA AND RESULTS | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      20A :  Subarea
      20A   020   A10     8    0    155    200      155     200   1153    VALLEY
 550  0.07600    ---     ----    -----  -----    --     --
      21A :  Subarea
      21A   020   A10     7   12     34     53      189     250   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   21A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     189    acres
            HYDROGRAPH PEAK:              250    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              8.10 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.83   200       0.83   300       0.83   400
0.83
      500       0.83   600       0.89   700       1.07   800       1.07   900
1.23
     1000       1.50  1050       1.81  1100      10.01  1110      20.86  1120
30.70
     1130      31.81  1131      32.03  1132      32.37  1133      32.84  1134
33.59
     1135      34.36  1136      35.09  1137      35.63  1138      36.03  1139
36.64
     1140      37.09  1141      38.54  1142      41.66  1143      45.80  1144
50.19
     1145      57.38  1146      66.92  1147      78.01  1148      87.85  1149
107.65
     1150     136.80  1151     170.88  1152     203.78  1153     235.01  1154
249.85
     1155     249.82  1156     236.13  1157     213.29  1158     179.91  1159
144.26
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 109.03 | 1161 | 79.45 | 1162 | 55.37 | 1163 | 41.54 | 1164 | 35.51 |
| 1165 | 32.22 | 1166 | 29.54 | 1167 | 26.93 | 1168 | 24.23 | 1169 | 21.74 |
| 1170 | 19.46 | 1171 | 17.33 | 1172 | 15.50 | 1173 | 13.51 | 1174 | 12.31 |
| 1175 | 12.14 | 1176 | 12.08 | 1177 | 11.48 | 1178 | 10.80 | 1179 | 9.50 |
| 1180 | 8.27 | 1181 | 6.74 | 1182 | 5.55 | 1183 | 4.44 | 1184 | 3.32 |
| 1185 | 2.55 | 1186 | 2.18 | 1187 | 2.01 | 1188 | 1.93 | 1189 | 1.86 |
| 1190 | 1.74 | 1191 | 1.70 | 1192 | 1.67 | 1193 | 1.63 | 1194 | 1.53 |
| 1195 | 1.50 | 1196 | 1.50 | 1197 | 1.53 | 1198 | 1.50 | 1199 | 1.50 |
| 1200 | 1.50 | 1201 | 1.53 | 1202 | 1.50 | 1203 | 1.50 | 1204 | 1.50 |
| 1205 | 1.53 | 1206 | 1.50 | 1207 | 1.50 | 1208 | 1.50 | 1209 | 1.53 |
| 1210 | 1.50 | 1211 | 1.50 | 1212 | 1.50 | 1213 | 1.53 | 1214 | 1.50 |
| 1215 | 1.50 | 1216 | 1.50 | 1217 | 1.53 | 1218 | 1.50 | 1219 | 1.50 |
| 1220 | 1.50 | 1221 | 1.53 | 1222 | 1.50 | 1223 | 1.50 | 1224 | 1.50 |
| 1225 | 1.46 | 1226 | 1.40 | 1227 | 1.30 | 1228 | 1.23 | 1229 | 1.20 |
| 1230 | 1.13 | 1231 | 1.06 | 1232 | 1.06 | 1233 | 1.06 | 1234 | 1.10 |
| 1235 | 1.06 | 1236 | 1.06 | 1237 | 1.06 | 1238 | 1.06 | 1239 | 1.06 |
| 1240 | 1.06 | 1241 | 1.06 | 1242 | 1.10 | 1243 | 1.06 | 1244 | 1.06 |
| 1245 | 1.06 | 1246 | 1.06 | 1247 | 1.06 | 1248 | 1.06 | 1249 | 1.06 |
| 1250 | 1.10 | 1251 | 1.06 | 1252 | 1.06 | 1253 | 1.06 | 1254 | 1.06 |
| 1255 | 1.06 | 1256 | 1.06 | 1257 | 1.06 | 1258 | 1.10 | 1259 | 1.06 |
| 1260 | 1.06 | 1261 | 1.06 | 1262 | 1.06 | 1263 | 1.06 | 1264 | 1.06 |
| 1265 | 1.06 | 1266 | 1.10 | 1267 | 1.06 | 1268 | 1.06 | 1269 | 1.06 |
| 1270 | 1.06 | 1271 | 1.06 | 1272 | 1.06 | 1273 | 1.06 | 1274 | 1.10 |
| 1275 | 1.06 | 1276 | 1.06 | 1277 | 1.06 | 1278 | 1.06 | 1279 | 1.06 |
| 1280 | 1.06 | 1281 | 1.06 | 1282 | 1.10 | 1283 | 1.06 | 1284 | 1.06 |

```
     1285       1.06  1286       1.06  1287       1.06  1288       1.06  1289
1.06
     1290       1.10  1291       1.06  1292       1.06  1293       1.06  1294
1.06
     1295       1.06  1296       1.06  1297       1.03  1298       1.00  1299
0.96
     1300       0.93  1310       0.82  1320       0.84  1330       0.82  1340
0.84
     1350       0.82  1360       0.82  1370       0.84  1380       0.82  1390
0.82
     1400       0.84  1420       0.82  1440       0.83  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  020A Header place holder
005     1  021A Header place holder
999
999
006     1  020A 020000015508A97200550007600                    G1
006     1  021A 020012003407A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 3


Model Results

| SUBAREA DATA AND RESULTS | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      20A :  Subarea
      20A   020   A25     8    0    155    251      155     251   1154    VALLEY
 550  0.07600    ---     ----    -----  -----    --     --
      21A :  Subarea
      21A   020   A25     6   12     34     72      189     320   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   21A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     189    acres
            HYDROGRAPH PEAK:              320    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             11.25 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.92   200       0.92   300       0.92   400
0.92
      500       0.92   600       0.99   700       1.20   800       1.21   900
1.39
     1000       1.73  1050       5.38  1100      20.59  1110      34.74  1120
45.95
     1130      47.97  1131      48.62  1132      49.08  1133      49.73  1134
50.49
     1135      51.44  1136      52.42  1137      52.84  1138      53.49  1139
53.89
     1140      54.26  1141      56.63  1142      60.78  1143      66.21  1144
71.84
     1145      80.60  1146      92.23  1147     104.34  1148     116.19  1149
142.31
     1150     179.87  1151     221.37  1152     263.00  1153     302.09  1154
320.09
     1155     310.23  1156     291.51  1157     260.90  1158     217.38  1159
171.83
```

1160 134.74 1161 100.32 1162 73.46 1163 57.81 1164
50.98
1165 47.23 1166 44.35 1167 40.71 1168 37.15 1169
34.20
1170 31.20 1171 28.81 1172 26.55 1173 24.50 1174
23.28
1175 23.01 1176 22.95 1177 22.41 1178 21.10 1179
19.39
1180 17.43 1181 15.52 1182 13.60 1183 12.03 1184
10.75
1185 9.03 1186 8.10 1187 7.67 1188 7.50 1189
7.32
1190 6.55 1191 5.26 1192 4.29 1193 3.44 1194
2.71
1195 2.22 1196 1.98 1197 1.90 1198 1.79 1199
1.76
1200 1.74 1201 1.77 1202 1.72 1203 1.72 1204
1.76
1205 1.72 1206 1.72 1207 1.72 1208 1.76 1209
1.72
1210 1.72 1211 1.76 1212 1.76 1213 1.72 1214
1.72
1215 1.76 1216 1.72 1217 1.72 1218 1.72 1219
1.76
1220 1.72 1221 1.72 1222 1.76 1223 1.72 1224
1.72
1225 1.64 1226 1.56 1227 1.49 1228 1.37 1229
1.33
1230 1.21 1231 1.18 1232 1.21 1233 1.18 1234
1.21
1235 1.18 1236 1.21 1237 1.21 1238 1.21 1239
1.21
1240 1.21 1241 1.21 1242 1.21 1243 1.21 1244
1.18
1245 1.21 1246 1.18 1247 1.21 1248 1.18 1249
1.21
1250 1.21 1251 1.21 1252 1.21 1253 1.21 1254
1.21
1255 1.21 1256 1.21 1257 1.21 1258 1.21 1259
1.18
1260 1.21 1261 1.18 1262 1.21 1263 1.18 1264
1.21
1265 1.21 1266 1.21 1267 1.21 1268 1.21 1269
1.21
1270 1.21 1271 1.21 1272 1.18 1273 1.21 1274
1.18
1275 1.21 1276 1.18 1277 1.21 1278 1.21 1279
1.21
1280 1.21 1281 1.21 1282 1.21 1283 1.21 1284
1.21

```
     1285       1.18  1286       1.21  1287       1.18  1288       1.21  1289
1.18
     1290       1.21  1291       1.21  1292       1.21  1293       1.21  1294
1.21
     1295       1.21  1296       1.21  1297       1.18  1298       1.10  1299
1.06
     1300       1.02  1310       0.91  1320       0.91  1330       0.91  1340
0.93
     1350       0.91  1360       0.91  1370       0.93  1380       0.91  1390
0.91
     1400       0.93  1420       0.91  1440       0.92  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  020A Header place holder
005     1  021A Header place holder
999
999
006     1  020A 020000015508A97200550007600                   G1
006     1  021A 020012003406A97                             1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 3


Model Results

| SUBAREA DATA AND RESULTS | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      20A :  Subarea
      20A   020   A50     7    0    155    311      155     311   1153    VALLEY
 550  0.07600    ---     ----    -----  -----    --     --
      21A :  Subarea
      21A   020   A50     6   12     34     82      189     390   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   21A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     189    acres
            HYDROGRAPH PEAK:              390    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             13.86 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.99   200       0.99   300       0.99   400
0.99
      500       0.99   600       1.06   700       1.31   800       1.31   900
1.52
     1000       1.90  1050      11.11  1100      28.63  1110      45.02  1120
58.17
     1130      59.93  1131      60.81  1132      61.48  1133      62.38  1134
63.44
     1135      64.70  1136      65.63  1137      66.27  1138      67.05  1139
67.15
     1140      67.18  1141      69.66  1142      74.83  1143      81.55  1144
88.58
     1145      99.75  1146     114.30  1147     129.35  1148     142.97  1149
173.02
     1150     220.48  1151     273.77  1152     323.53  1153     369.20  1154
390.40
     1155     378.58  1156     342.09  1157     286.63  1158     228.55  1159
172.17
```

```
     1160     125.85  1161      90.77  1162      72.01  1163      64.42  1164
61.26
     1165      58.30  1166      54.82  1167      50.56  1168      46.50  1169
42.19
     1170      38.37  1171      35.38  1172      32.62  1173      31.23  1174
30.97
     1175      30.97  1176      30.98  1177      30.35  1178      28.53  1179
26.37
     1180      23.82  1181      21.57  1182      19.13  1183      17.07  1184
15.52
     1185      14.14  1186      14.02  1187      13.72  1188      13.69  1189
13.19
     1190      11.94  1191      10.36  1192       8.89  1193       7.23  1194
5.73
     1195       4.42  1196       3.39  1197       2.68  1198       2.22  1199
2.07
     1200       1.95  1201       1.94  1202       1.89  1203       1.92  1204
1.91
     1205       1.91  1206       1.91  1207       1.87  1208       1.91  1209
1.87
     1210       1.91  1211       1.87  1212       1.91  1213       1.91  1214
1.91
     1215       1.91  1216       1.87  1217       1.91  1218       1.87  1219
1.91
     1220       1.87  1221       1.91  1222       1.91  1223       1.91  1224
1.91
     1225       1.80  1226       1.72  1227       1.60  1228       1.52  1229
1.37
     1230       1.29  1231       1.29  1232       1.29  1233       1.29  1234
1.29
     1235       1.33  1236       1.33  1237       1.33  1238       1.33  1239
1.29
     1240       1.29  1241       1.29  1242       1.29  1243       1.29  1244
1.29
     1245       1.33  1246       1.33  1247       1.33  1248       1.33  1249
1.29
     1250       1.29  1251       1.29  1252       1.29  1253       1.29  1254
1.29
     1255       1.33  1256       1.33  1257       1.33  1258       1.33  1259
1.29
     1260       1.29  1261       1.29  1262       1.29  1263       1.29  1264
1.29
     1265       1.33  1266       1.33  1267       1.33  1268       1.29  1269
1.29
     1270       1.29  1271       1.29  1272       1.29  1273       1.29  1274
1.33
     1275       1.33  1276       1.33  1277       1.33  1278       1.29  1279
1.29
     1280       1.29  1281       1.29  1282       1.29  1283       1.29  1284
1.33
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1285 | 1.33 | 1286 | 1.33 | 1287 | 1.33 | 1288 | 1.29 | 1289 | 1.29 |
| 1290 | 1.29 | 1291 | 1.29 | 1292 | 1.29 | 1293 | 1.29 | 1294 | 1.33 |
| 1295 | 1.33 | 1296 | 1.33 | 1297 | 1.25 | 1298 | 1.21 | 1299 | 1.14 |
| 1300 | 1.10 | 1310 | 0.98 | 1320 | 0.98 | 1330 | 0.98 | 1340 | 1.00 |
| 1350 | 0.98 | 1360 | 0.98 | 1370 | 0.98 | 1380 | 1.00 | 1390 | 0.98 |
| 1400 | 0.98 | 1420 | 0.99 | 1440 | 0.98 | 1460 | 0.40 | 1500 | 0.40 |



VCRat Model Input

Model Lines

```
005     1  020A Header place holder
005     1  021A Header place holder
999
999
006     1  020A 020000015507A97200550007600                   G1
006     1  021A 020012003406A97                             1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 3


Model Results

| SUBAREA DATA AND RESULTS | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      20A :  Subarea
      20A   020   A100    7    0    155    356      155     356   1153    VALLEY
 550  0.07600    ---     ----    -----  -----    --     --
      21A :  Subarea
      21A   020   A100    6   12     34     94      189     447   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   21A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     189    acres
            HYDROGRAPH PEAK:              447    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             17.12 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.07   200       1.06   300       1.07   400
1.06
      500       1.07   600       1.15   700       1.42   800       1.42   900
1.65
     1000       4.99  1050      17.27  1100      37.29  1110      56.26  1120
70.18
     1130      72.21  1131      73.26  1132      74.35  1133      75.29  1134
76.26
     1135      77.36  1136      78.67  1137      79.70  1138      80.14  1139
80.29
     1140      80.27  1141      83.57  1142      89.60  1143      97.05  1144
104.71
     1145     116.98  1146     133.87  1147     151.16  1148     166.54  1149
201.72
     1150     256.75  1151     317.12  1152     373.29  1153     424.36  1154
447.07
     1155     432.97  1156     391.28  1157     327.91  1158     261.71  1159
197.71
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 144.77 | 1161 | 105.11 | 1162 | 84.44 | 1163 | 76.31 | 1164 | 73.21 |
| 1165 | 70.37 | 1166 | 66.22 | 1167 | 61.50 | 1168 | 57.11 | 1169 | 52.71 |
| 1170 | 48.36 | 1171 | 44.71 | 1172 | 41.71 | 1173 | 40.21 | 1174 | 40.11 |
| 1175 | 40.19 | 1176 | 39.99 | 1177 | 39.12 | 1178 | 37.29 | 1179 | 34.57 |
| 1180 | 31.66 | 1181 | 29.00 | 1182 | 26.07 | 1183 | 23.87 | 1184 | 22.05 |
| 1185 | 20.50 | 1186 | 20.40 | 1187 | 20.38 | 1188 | 20.39 | 1189 | 19.81 |
| 1190 | 18.24 | 1191 | 16.51 | 1192 | 14.66 | 1193 | 12.47 | 1194 | 10.36 |
| 1195 | 8.66 | 1196 | 6.85 | 1197 | 5.96 | 1198 | 5.41 | 1199 | 5.18 |
| 1200 | 5.17 | 1201 | 5.17 | 1202 | 5.30 | 1203 | 5.16 | 1204 | 5.12 |
| 1205 | 4.93 | 1206 | 5.14 | 1207 | 5.10 | 1208 | 4.90 | 1209 | 4.98 |
| 1210 | 4.85 | 1211 | 5.09 | 1212 | 5.09 | 1213 | 4.89 | 1214 | 4.98 |
| 1215 | 4.85 | 1216 | 5.09 | 1217 | 5.08 | 1218 | 5.10 | 1219 | 5.12 |
| 1220 | 5.13 | 1221 | 5.28 | 1222 | 5.16 | 1223 | 5.12 | 1224 | 4.92 |
| 1225 | 4.52 | 1226 | 4.17 | 1227 | 3.29 | 1228 | 2.46 | 1229 | 1.97 |
| 1230 | 1.64 | 1231 | 1.53 | 1232 | 1.48 | 1233 | 1.44 | 1234 | 1.47 |
| 1235 | 1.42 | 1236 | 1.41 | 1237 | 1.45 | 1238 | 1.41 | 1239 | 1.41 |
| 1240 | 1.41 | 1241 | 1.41 | 1242 | 1.45 | 1243 | 1.41 | 1244 | 1.41 |
| 1245 | 1.45 | 1246 | 1.41 | 1247 | 1.41 | 1248 | 1.41 | 1249 | 1.41 |
| 1250 | 1.45 | 1251 | 1.41 | 1252 | 1.41 | 1253 | 1.45 | 1254 | 1.41 |
| 1255 | 1.41 | 1256 | 1.41 | 1257 | 1.41 | 1258 | 1.45 | 1259 | 1.41 |
| 1260 | 1.41 | 1261 | 1.45 | 1262 | 1.41 | 1263 | 1.41 | 1264 | 1.41 |
| 1265 | 1.41 | 1266 | 1.45 | 1267 | 1.41 | 1268 | 1.41 | 1269 | 1.45 |
| 1270 | 1.41 | 1271 | 1.41 | 1272 | 1.41 | 1273 | 1.41 | 1274 | 1.45 |
| 1275 | 1.41 | 1276 | 1.41 | 1277 | 1.45 | 1278 | 1.41 | 1279 | 1.41 |
| 1280 | 1.41 | 1281 | 1.41 | 1282 | 1.45 | 1283 | 1.41 | 1284 | 1.41 |

```
     1285       1.45  1286       1.41  1287       1.41  1288       1.41  1289
1.41
     1290       1.45  1291       1.41  1292       1.41  1293       1.45  1294
1.41
     1295       1.41  1296       1.41  1297       1.37  1298       1.33  1299
1.21
     1300       1.18  1310       1.07  1320       1.05  1330       1.07  1340
1.05
     1350       1.07  1360       1.07  1370       1.05  1380       1.07  1390
1.05
     1400       1.07  1420       1.06  1440       1.06  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  020A Header place holder
005     1  021A Header place holder
999
999
006     1  020A 020000015507A97200550007600                    G1
006     1  021A 020012003406A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A10     9   26     57     88       57      88   1153    VALLEY
 762  0.07600    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---       57      87   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      57    acres
            HYDROGRAPH PEAK:               87    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:              7.07 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.55   200       1.55   300       1.55   400
1.55
      500       1.55   600       1.75   700       2.40   800       2.45   900
2.95
     1000       3.99  1050       5.02  1100       8.53  1110      11.88  1120
15.58
     1130      16.29  1131      16.29  1132      16.34  1133      16.44  1134
16.58
     1135      16.79  1136      17.04  1137      17.24  1138      17.41  1139
17.57
     1140      17.79  1141      18.01  1142      18.47  1143      19.51  1144
20.74
     1145      21.96  1146      24.06  1147      27.13  1148      30.47  1149
34.19
     1150      41.11  1151      51.22  1152      61.94  1153      72.76  1154
82.15
     1155      86.52  1156      86.08  1157      83.77  1158      79.74  1159
72.29
     1160      62.27  1161      51.91  1162      41.64  1163      31.40  1164
23.97
```

1165 20.00 1166 17.71 1167 16.24 1168 15.17 1169
14.22
1170 13.33 1171 12.57 1172 11.93 1173 11.20 1174
10.40
1175 9.82 1176 9.57 1177 9.42 1178 9.23 1179
8.97
1180 8.56 1181 8.12 1182 7.70 1183 7.26 1184
6.80
1185 6.34 1186 5.96 1187 5.66 1188 5.49 1189
5.41
1190 5.35 1191 5.25 1192 5.12 1193 5.00 1194
4.87
1195 4.74 1196 4.60 1197 4.46 1198 4.32 1199
4.19
1200 4.10 1201 4.06 1202 4.05 1203 4.03 1204
4.01
1205 4.01 1206 4.02 1207 4.02 1208 4.01 1209
4.01
1210 4.02 1211 4.02 1212 4.00 1213 4.01 1214
4.02
1215 4.02 1216 4.00 1217 4.01 1218 4.02 1219
4.02
1220 4.00 1221 4.01 1222 4.02 1223 4.02 1224
4.00
1225 4.01 1226 4.00 1227 3.94 1228 3.82 1229
3.68
1230 3.52 1231 3.35 1232 3.18 1233 3.02 1234
2.87
1235 2.72 1236 2.60 1237 2.52 1238 2.47 1239
2.46
1240 2.45 1241 2.45 1242 2.44 1243 2.44 1244
2.44
1245 2.42 1246 2.41 1247 2.42 1248 2.43 1249
2.43
1250 2.44 1251 2.44 1252 2.43 1253 2.42 1254
2.41
1255 2.42 1256 2.43 1257 2.43 1258 2.44 1259
2.44
1260 2.43 1261 2.42 1262 2.41 1263 2.42 1264
2.43
1265 2.43 1266 2.44 1267 2.44 1268 2.43 1269
2.42
1270 2.41 1271 2.42 1272 2.43 1273 2.43 1274
2.44
1275 2.44 1276 2.43 1277 2.42 1278 2.41 1279
2.42
1280 2.43 1281 2.43 1282 2.44 1283 2.44 1284
2.43
1285 2.42 1286 2.41 1287 2.42 1288 2.43 1289
2.43

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1290 | 2.44 | 1291 | 2.44 | 1292 | 2.43 | 1293 | 2.42 | 1294 | 2.41 |
| 1295 | 2.42 | 1296 | 2.43 | 1297 | 2.43 | 1298 | 2.43 | 1299 | 2.40 |
| 1300 | 2.33 | 1310 | 1.70 | 1320 | 1.57 | 1330 | 1.56 | 1340 | 1.56 |
| 1350 | 1.56 | 1360 | 1.55 | 1370 | 1.56 | 1380 | 1.56 | 1390 | 1.55 |
| 1400 | 1.56 | 1420 | 1.56 | 1440 | 1.55 | 1460 | 1.55 | 1500 | 1.55 |



VCRat Model Input

Model Lines

```
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020026005709A97200762007600                   G1
006     1  031A 010      099A97                             1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A25     7   26     57    123       57     123   1154    VALLEY
 762  0.07600    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---       57     122   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      57    acres
            HYDROGRAPH PEAK:              122    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:              8.90 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.88   200       1.88   300       1.89   400
1.88
      500       1.88   600       2.12   700       2.89   800       2.95   900
3.55
     1000       4.81  1050       6.87  1100      12.22  1110      16.61  1120
20.92
     1130      21.85  1131      21.95  1132      22.12  1133      22.31  1134
22.51
     1135      22.81  1136      23.16  1137      23.51  1138      23.77  1139
23.87
     1140      24.02  1141      24.19  1142      24.93  1143      26.51  1144
28.41
     1145      30.70  1146      34.16  1147      38.71  1148      43.57  1149
48.83
     1150      58.86  1151      74.16  1152      90.46  1153     105.63  1154
117.32
     1155     121.92  1156     118.20  1157     106.41  1158      90.18  1159
73.90
     1160      57.98  1161      42.69  1162      31.98  1163      26.45  1164
23.74
```

1165 22.59 1166 21.66 1167 20.42 1168 19.26 1169
18.13
1170 16.95 1171 15.84 1172 14.73 1173 13.86 1174
13.45
1175 13.27 1176 13.20 1177 13.17 1178 13.00 1179
12.51
1180 11.89 1181 11.20 1182 10.45 1183 9.75 1184
9.03
1185 8.39 1186 8.01 1187 7.83 1188 7.81 1189
7.82
1190 7.65 1191 7.32 1192 6.88 1193 6.40 1194
5.98
1195 5.65 1196 5.37 1197 5.14 1198 4.99 1199
4.91
1200 4.87 1201 4.85 1202 4.84 1203 4.83 1204
4.83
1205 4.83 1206 4.83 1207 4.83 1208 4.83 1209
4.83
1210 4.83 1211 4.83 1212 4.83 1213 4.84 1214
4.86
1215 4.86 1216 4.84 1217 4.84 1218 4.83 1219
4.83
1220 4.83 1221 4.83 1222 4.83 1223 4.83 1224
4.83
1225 4.83 1226 4.80 1227 4.69 1228 4.51 1229
4.31
1230 4.07 1231 3.83 1232 3.58 1233 3.34 1234
3.15
1235 3.04 1236 2.98 1237 2.95 1238 2.92 1239
2.92
1240 2.94 1241 2.94 1242 2.95 1243 2.95 1244
2.95
1245 2.95 1246 2.93 1247 2.91 1248 2.91 1249
2.90
1250 2.90 1251 2.90 1252 2.91 1253 2.93 1254
2.94
1255 2.95 1256 2.95 1257 2.95 1258 2.95 1259
2.96
1260 2.95 1261 2.93 1262 2.91 1263 2.91 1264
2.90
1265 2.90 1266 2.90 1267 2.91 1268 2.93 1269
2.94
1270 2.95 1271 2.95 1272 2.95 1273 2.95 1274
2.92
1275 2.91 1276 2.91 1277 2.90 1278 2.90 1279
2.90
1280 2.91 1281 2.93 1282 2.94 1283 2.95 1284
2.95
1285 2.95 1286 2.95 1287 2.92 1288 2.91 1289
2.91

```
     1290       2.90  1291       2.90  1292       2.90  1293       2.91  1294
2.93
     1295       2.94  1296       2.95  1297       2.95  1298       2.94  1299
2.90
     1300       2.80  1310       2.04  1320       1.88  1330       1.88  1340
1.90
     1350       1.90  1360       1.88  1370       1.90  1380       1.90  1390
1.88
     1400       1.90  1420       1.90  1440       1.88  1460       1.88  1500
1.88
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020026005707A97200762007600                    G1
006     1  031A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A50     7   26     57    141       57     141   1153    VALLEY
 762  0.07600    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---       57     140   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      57    acres
            HYDROGRAPH PEAK:              140    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             10.34 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       2.13   200       2.14   300       2.13   400
2.13
      500       2.14   600       2.39   700       3.26   800       3.32   900
4.00
     1000       5.42  1050       8.88  1100      15.02  1110      20.09  1120
25.12
     1130      26.01  1131      26.13  1132      26.34  1133      26.58  1134
26.85
     1135      27.23  1136      27.63  1137      27.95  1138      28.23  1139
28.45
     1140      28.53  1141      28.61  1142      29.46  1143      31.29  1144
33.57
     1145      36.15  1146      40.03  1147      45.35  1148      50.85  1149
56.93
     1150      68.59  1151      86.21  1152     104.86  1153     121.89  1154
134.82
     1155     139.64  1156     134.84  1157     121.01  1158     102.44  1159
83.71
     1160      65.53  1161      48.45  1162      36.77  1163      30.90  1164
28.10
```

1165 26.84 1166 25.66 1167 24.32 1168 23.01 1169
21.61
1170 20.21 1171 18.90 1172 17.62 1173 16.70 1174
16.21
1175 16.02 1176 16.03 1177 16.04 1178 15.78 1179
15.13
1180 14.44 1181 13.70 1182 12.86 1183 12.03 1184
11.23
1185 10.56 1186 10.21 1187 10.05 1188 9.98 1189
9.95
1190 9.74 1191 9.31 1192 8.80 1193 8.26 1194
7.68
1195 7.07 1196 6.50 1197 6.05 1198 5.77 1199
5.61
1200 5.52 1201 5.48 1202 5.45 1203 5.44 1204
5.44
1205 5.43 1206 5.45 1207 5.47 1208 5.46 1209
5.45
1210 5.44 1211 5.43 1212 5.43 1213 5.43 1214
5.43
1215 5.45 1216 5.47 1217 5.46 1218 5.45 1219
5.44
1220 5.43 1221 5.43 1222 5.43 1223 5.43 1224
5.45
1225 5.47 1226 5.43 1227 5.30 1228 5.09 1229
4.85
1230 4.56 1231 4.25 1232 3.94 1233 3.67 1234
3.49
1235 3.39 1236 3.33 1237 3.31 1238 3.33 1239
3.35
1240 3.35 1241 3.33 1242 3.30 1243 3.28 1244
3.27
1245 3.27 1246 3.26 1247 3.27 1248 3.30 1249
3.33
1250 3.34 1251 3.32 1252 3.29 1253 3.28 1254
3.27
1255 3.27 1256 3.26 1257 3.27 1258 3.30 1259
3.33
1260 3.34 1261 3.32 1262 3.29 1263 3.28 1264
3.27
1265 3.27 1266 3.26 1267 3.27 1268 3.30 1269
3.32
1270 3.31 1271 3.29 1272 3.28 1273 3.27 1274
3.26
1275 3.26 1276 3.27 1277 3.30 1278 3.33 1279
3.34
1280 3.32 1281 3.29 1282 3.28 1283 3.27 1284
3.27
1285 3.26 1286 3.27 1287 3.30 1288 3.33 1289
3.34

```
     1290       3.32  1291       3.29  1292       3.28  1293       3.27  1294
3.27
     1295       3.26  1296       3.27  1297       3.30  1298       3.31  1299
3.26
     1300       3.16  1310       2.31  1320       2.13  1330       2.13  1340
2.15
     1350       2.15  1360       2.13  1370       2.13  1380       2.15  1390
2.15
     1400       2.13  1420       2.13  1440       2.13  1460       2.13  1500
2.13
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020026005707A97200762007600                    G1
006     1  031A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A100    5   26     57    193       57     193   1153    VALLEY
 762  0.07600    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---       57     181   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      57    acres
            HYDROGRAPH PEAK:              181    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             11.98 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       2.42   200       2.42   300       2.42   400
2.42
      500       2.42   600       2.70   700       3.65   800       3.72   900
4.49
     1000       6.82  1050      11.02  1100      18.05  1110      23.89  1120
29.31
     1130      30.27  1131      30.45  1132      30.77  1133      31.29  1134
31.73
     1135      32.16  1136      32.71  1137      33.08  1138      33.19  1139
33.23
     1140      33.24  1141      33.39  1142      34.85  1143      37.86  1144
41.51
     1145      45.73  1146      51.73  1147      58.43  1148      64.30  1149
72.92
     1150      91.62  1151     117.05  1152     142.21  1153     166.81  1154
180.69
     1155     170.78  1156     145.31  1157     116.95  1158      88.59  1159
62.37
     1160      45.41  1161      37.09  1162      33.12  1163      31.34  1164
30.49
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1165 | 30.02 | 1166 | 29.08 | 1167 | 27.43 | 1168 | 25.53 | 1169 | 23.59 |
| 1170 | 21.48 | 1171 | 19.96 | 1172 | 19.51 | 1173 | 19.35 | 1174 | 19.14 |
| 1175 | 19.21 | 1176 | 19.23 | 1177 | 19.10 | 1178 | 18.78 | 1179 | 17.88 |
| 1180 | 16.66 | 1181 | 15.37 | 1182 | 14.07 | 1183 | 13.08 | 1184 | 12.60 |
| 1185 | 12.39 | 1186 | 12.31 | 1187 | 12.27 | 1188 | 12.26 | 1189 | 12.25 |
| 1190 | 11.93 | 1191 | 11.30 | 1192 | 10.61 | 1193 | 9.65 | 1194 | 8.60 |
| 1195 | 7.76 | 1196 | 7.28 | 1197 | 7.04 | 1198 | 6.93 | 1199 | 6.88 |
| 1200 | 6.94 | 1201 | 7.00 | 1202 | 6.95 | 1203 | 6.89 | 1204 | 6.86 |
| 1205 | 6.85 | 1206 | 6.84 | 1207 | 6.84 | 1208 | 6.84 | 1209 | 6.84 |
| 1210 | 6.83 | 1211 | 6.83 | 1212 | 6.83 | 1213 | 6.83 | 1214 | 6.83 |
| 1215 | 6.83 | 1216 | 6.83 | 1217 | 6.83 | 1218 | 6.83 | 1219 | 6.91 |
| 1220 | 6.99 | 1221 | 6.95 | 1222 | 6.89 | 1223 | 6.86 | 1224 | 6.85 |
| 1225 | 6.84 | 1226 | 6.66 | 1227 | 6.21 | 1228 | 5.72 | 1229 | 5.23 |
| 1230 | 4.71 | 1231 | 4.30 | 1232 | 4.03 | 1233 | 3.85 | 1234 | 3.77 |
| 1235 | 3.75 | 1236 | 3.73 | 1237 | 3.73 | 1238 | 3.72 | 1239 | 3.72 |
| 1240 | 3.70 | 1241 | 3.67 | 1242 | 3.67 | 1243 | 3.69 | 1244 | 3.70 |
| 1245 | 3.71 | 1246 | 3.71 | 1247 | 3.71 | 1248 | 3.70 | 1249 | 3.67 |
| 1250 | 3.67 | 1251 | 3.69 | 1252 | 3.70 | 1253 | 3.71 | 1254 | 3.71 |
| 1255 | 3.71 | 1256 | 3.70 | 1257 | 3.67 | 1258 | 3.67 | 1259 | 3.69 |
| 1260 | 3.70 | 1261 | 3.71 | 1262 | 3.71 | 1263 | 3.71 | 1264 | 3.70 |
| 1265 | 3.67 | 1266 | 3.67 | 1267 | 3.69 | 1268 | 3.70 | 1269 | 3.71 |
| 1270 | 3.71 | 1271 | 3.71 | 1272 | 3.70 | 1273 | 3.67 | 1274 | 3.67 |
| 1275 | 3.69 | 1276 | 3.70 | 1277 | 3.71 | 1278 | 3.71 | 1279 | 3.71 |
| 1280 | 3.70 | 1281 | 3.67 | 1282 | 3.67 | 1283 | 3.69 | 1284 | 3.70 |
| 1285 | 3.71 | 1286 | 3.71 | 1287 | 3.71 | 1288 | 3.70 | 1289 | 3.67 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1290 | 3.67 | 1291 | 3.69 | 1292 | 3.70 | 1293 | 3.71 | 1294 | 3.71 |
| 1295 | 3.71 | 1296 | 3.70 | 1297 | 3.67 | 1298 | 3.65 | 1299 | 3.60 |
| 1300 | 3.45 | 1310 | 2.49 | 1320 | 2.42 | 1330 | 2.42 | 1340 | 2.42 |
| 1350 | 2.42 | 1360 | 2.45 | 1370 | 2.42 | 1380 | 2.42 | 1390 | 2.42 |
| 1400 | 2.42 | 1420 | 2.43 | 1440 | 2.42 | 1460 | 2.42 | 1500 | 2.42 |



VCRat Model Input

Model Lines

```
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020026005705A97200762007600                   G1
006     1  031A 010      099A97                            1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      40A :  Subarea
      40A   020   A10     9    0     63     77       63      77   1153    VALLEY
 740  0.08100    ---     ----    -----  -----    --     --
      41A :  Subarea
      41A   020   A10     8    6     48     66      111     139   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     111    acres
            HYDROGRAPH PEAK:              139    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:              5.23 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.70   200       0.70   300       0.70   400
0.70
      500       0.70   600       0.74   700       0.87   800       0.87   900
0.98
     1000       1.18  1050       1.39  1100       6.09  1110      12.36  1120
18.06
     1130      18.97  1131      19.09  1132      19.26  1133      19.47  1134
19.93
     1135      20.24  1136      20.60  1137      20.91  1138      21.20  1139
21.56
     1140      21.76  1141      23.04  1142      24.54  1143      26.57  1144
28.80
     1145      33.01  1146      37.68  1147      43.08  1148      48.92  1149
60.68
     1150      75.18  1151      92.94  1152     111.39  1153     128.17  1154
136.87
     1155     139.37  1156     136.17  1157     124.44  1158     111.21  1159
94.98
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 76.20 | 1161 | 56.75 | 1162 | 44.34 | 1163 | 33.75 | 1164 | 26.72 |
| 1165 | 22.10 | 1166 | 19.07 | 1167 | 17.02 | 1168 | 15.37 | 1169 | 13.87 |
| 1170 | 12.62 | 1171 | 11.05 | 1172 | 9.83 | 1173 | 9.20 | 1174 | 8.71 |
| 1175 | 7.90 | 1176 | 7.56 | 1177 | 7.18 | 1178 | 6.38 | 1179 | 5.73 |
| 1180 | 5.20 | 1181 | 4.45 | 1182 | 3.47 | 1183 | 2.98 | 1184 | 2.57 |
| 1185 | 2.20 | 1186 | 1.92 | 1187 | 1.75 | 1188 | 1.62 | 1189 | 1.52 |
| 1190 | 1.44 | 1191 | 1.37 | 1192 | 1.33 | 1193 | 1.30 | 1194 | 1.25 |
| 1195 | 1.21 | 1196 | 1.18 | 1197 | 1.18 | 1198 | 1.18 | 1199 | 1.18 |
| 1200 | 1.18 | 1201 | 1.18 | 1202 | 1.18 | 1203 | 1.18 | 1204 | 1.18 |
| 1205 | 1.18 | 1206 | 1.18 | 1207 | 1.18 | 1208 | 1.18 | 1209 | 1.18 |
| 1210 | 1.18 | 1211 | 1.18 | 1212 | 1.18 | 1213 | 1.18 | 1214 | 1.18 |
| 1215 | 1.18 | 1216 | 1.18 | 1217 | 1.18 | 1218 | 1.18 | 1219 | 1.18 |
| 1220 | 1.18 | 1221 | 1.18 | 1222 | 1.18 | 1223 | 1.18 | 1224 | 1.18 |
| 1225 | 1.14 | 1226 | 1.12 | 1227 | 1.06 | 1228 | 1.02 | 1229 | 0.97 |
| 1230 | 0.95 | 1231 | 0.91 | 1232 | 0.87 | 1233 | 0.87 | 1234 | 0.87 |
| 1235 | 0.87 | 1236 | 0.87 | 1237 | 0.87 | 1238 | 0.87 | 1239 | 0.87 |
| 1240 | 0.87 | 1241 | 0.87 | 1242 | 0.87 | 1243 | 0.87 | 1244 | 0.87 |
| 1245 | 0.87 | 1246 | 0.87 | 1247 | 0.87 | 1248 | 0.87 | 1249 | 0.87 |
| 1250 | 0.87 | 1251 | 0.87 | 1252 | 0.87 | 1253 | 0.87 | 1254 | 0.87 |
| 1255 | 0.87 | 1256 | 0.87 | 1257 | 0.87 | 1258 | 0.87 | 1259 | 0.87 |
| 1260 | 0.87 | 1261 | 0.87 | 1262 | 0.87 | 1263 | 0.87 | 1264 | 0.87 |
| 1265 | 0.87 | 1266 | 0.87 | 1267 | 0.87 | 1268 | 0.87 | 1269 | 0.87 |
| 1270 | 0.87 | 1271 | 0.87 | 1272 | 0.87 | 1273 | 0.87 | 1274 | 0.87 |
| 1275 | 0.87 | 1276 | 0.87 | 1277 | 0.87 | 1278 | 0.87 | 1279 | 0.87 |
| 1280 | 0.87 | 1281 | 0.87 | 1282 | 0.87 | 1283 | 0.87 | 1284 | 0.87 |

```
     1285       0.87  1286       0.87  1287       0.87  1288       0.87  1289
0.87
     1290       0.87  1291       0.87  1292       0.87  1293       0.87  1294
0.87
     1295       0.87  1296       0.87  1297       0.85  1298       0.81  1299
0.81
     1300       0.79  1310       0.70  1320       0.71  1330       0.70  1340
0.71
     1350       0.70  1360       0.70  1370       0.71  1380       0.70  1390
0.70
     1400       0.71  1420       0.70  1440       0.70  1460       0.40  1500
0.40
```


Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job:  1  Project: AJU Brandeis Discharge 5
Page:  3


VCRat Model Input

```
Model Lines
-------------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006309A97200740008100                    G1
006     1  041A 020006004808A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      40A :  Subarea
      40A   020   A25     8    0     63    102       63     102   1154    VALLEY
 740  0.08100    ---     ----    -----  -----    --     --
      41A :  Subarea
      41A   020   A25     7    6     48     88      111     187   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     111    acres
            HYDROGRAPH PEAK:              187    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:              7.10 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.77   200       0.77   300       0.77   400
0.77
      500       0.77   600       0.82   700       0.97   800       0.97   900
1.10
     1000       1.34  1050       3.37  1100      12.24  1110      20.53  1120
27.03
     1130      28.51  1131      28.86  1132      29.02  1133      29.46  1134
29.89
     1135      30.42  1136      30.98  1137      31.30  1138      31.52  1139
31.95
     1140      32.12  1141      33.76  1142      35.94  1143      38.69  1144
42.16
     1145      47.50  1146      53.74  1147      61.20  1148      67.35  1149
83.73
     1150     103.97  1151     127.98  1152     151.53  1153     174.64  1154
185.01
     1155     186.77  1156     172.01  1157     153.56  1158     130.31  1159
103.96
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 77.47 | 1161 | 60.38 | 1162 | 46.32 | 1163 | 37.10 | 1164 | 32.41 |
| 1165 | 28.83 | 1166 | 26.56 | 1167 | 24.65 | 1168 | 22.54 | 1169 | 20.55 |
| 1170 | 18.88 | 1171 | 17.00 | 1172 | 16.09 | 1173 | 15.19 | 1174 | 14.45 |
| 1175 | 14.04 | 1176 | 13.85 | 1177 | 13.28 | 1178 | 12.43 | 1179 | 11.59 |
| 1180 | 10.40 | 1181 | 9.43 | 1182 | 8.40 | 1183 | 7.13 | 1184 | 6.57 |
| 1185 | 5.99 | 1186 | 5.43 | 1187 | 5.25 | 1188 | 4.80 | 1189 | 4.24 |
| 1190 | 3.93 | 1191 | 3.03 | 1192 | 2.62 | 1193 | 2.24 | 1194 | 1.94 |
| 1195 | 1.71 | 1196 | 1.58 | 1197 | 1.50 | 1198 | 1.45 | 1199 | 1.41 |
| 1200 | 1.39 | 1201 | 1.37 | 1202 | 1.36 | 1203 | 1.35 | 1204 | 1.35 |
| 1205 | 1.34 | 1206 | 1.34 | 1207 | 1.34 | 1208 | 1.34 | 1209 | 1.34 |
| 1210 | 1.34 | 1211 | 1.34 | 1212 | 1.36 | 1213 | 1.34 | 1214 | 1.34 |
| 1215 | 1.34 | 1216 | 1.34 | 1217 | 1.34 | 1218 | 1.34 | 1219 | 1.34 |
| 1220 | 1.34 | 1221 | 1.34 | 1222 | 1.34 | 1223 | 1.34 | 1224 | 1.34 |
| 1225 | 1.29 | 1226 | 1.22 | 1227 | 1.20 | 1228 | 1.13 | 1229 | 1.08 |
| 1230 | 1.03 | 1231 | 0.96 | 1232 | 0.96 | 1233 | 0.96 | 1234 | 0.96 |
| 1235 | 0.96 | 1236 | 0.96 | 1237 | 0.96 | 1238 | 0.99 | 1239 | 0.96 |
| 1240 | 0.99 | 1241 | 0.96 | 1242 | 0.99 | 1243 | 0.96 | 1244 | 0.96 |
| 1245 | 0.96 | 1246 | 0.96 | 1247 | 0.96 | 1248 | 0.96 | 1249 | 0.96 |
| 1250 | 0.96 | 1251 | 0.99 | 1252 | 0.96 | 1253 | 0.99 | 1254 | 0.96 |
| 1255 | 0.99 | 1256 | 0.96 | 1257 | 0.99 | 1258 | 0.96 | 1259 | 0.96 |
| 1260 | 0.96 | 1261 | 0.96 | 1262 | 0.96 | 1263 | 0.96 | 1264 | 0.96 |
| 1265 | 0.96 | 1266 | 0.99 | 1267 | 0.96 | 1268 | 0.99 | 1269 | 0.96 |
| 1270 | 0.99 | 1271 | 0.96 | 1272 | 0.96 | 1273 | 0.96 | 1274 | 0.96 |
| 1275 | 0.96 | 1276 | 0.96 | 1277 | 0.96 | 1278 | 0.96 | 1279 | 0.99 |
| 1280 | 0.96 | 1281 | 0.99 | 1282 | 0.96 | 1283 | 0.99 | 1284 | 0.96 |

```
     1285       0.96  1286       0.96  1287       0.96  1288       0.96  1289
0.96
     1290       0.96  1291       0.96  1292       0.99  1293       0.96  1294
0.99
     1295       0.96  1296       0.99  1297       0.94  1298       0.92  1299
0.87
     1300       0.87  1310       0.76  1320       0.76  1330       0.76  1340
0.78
     1350       0.76  1360       0.76  1370       0.78  1380       0.76  1390
0.76
     1400       0.78  1420       0.76  1440       0.77  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006308A97200740008100                    G1
006     1  041A 020006004807A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      40A :  Subarea
      40A   020   A50     7    0     63    126       63     126   1153    VALLEY
 740  0.08100    ---     ----    -----  -----    --     --
      41A :  Subarea
      41A   020   A50     6    6     48    111      111     231   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     111    acres
            HYDROGRAPH PEAK:              231    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              8.64 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.81   200       0.82   300       0.81   400
0.81
      500       0.82   600       0.87   700       1.04   800       1.04   900
1.19
     1000       1.46  1050       6.73  1100      16.97  1110      26.58  1120
34.19
     1130      35.59  1131      36.08  1132      36.35  1133      36.96  1134
37.59
     1135      38.33  1136      38.80  1137      39.10  1138      39.65  1139
39.59
     1140      39.66  1141      41.67  1142      44.65  1143      48.27  1144
52.29
     1145      59.82  1146      67.98  1147      75.59  1148      83.62  1149
104.34
     1150     130.87  1151     160.03  1152     190.43  1153     219.43  1154
231.21
     1155     219.91  1156     197.20  1157     166.33  1158     131.59  1159
96.97
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 74.96 | 1161 | 57.09 | 1162 | 45.86 | 1163 | 40.18 | 1164 | 37.27 |
| 1165 | 34.63 | 1166 | 32.64 | 1167 | 29.93 | 1168 | 27.54 | 1169 | 24.82 |
| 1170 | 22.67 | 1171 | 21.46 | 1172 | 19.99 | 1173 | 19.10 | 1174 | 18.87 |
| 1175 | 18.64 | 1176 | 18.34 | 1177 | 17.79 | 1178 | 16.74 | 1179 | 15.63 |
| 1180 | 13.92 | 1181 | 12.72 | 1182 | 11.42 | 1183 | 10.39 | 1184 | 9.94 |
| 1185 | 9.01 | 1186 | 8.87 | 1187 | 8.38 | 1188 | 8.28 | 1189 | 7.67 |
| 1190 | 6.97 | 1191 | 6.08 | 1192 | 5.10 | 1193 | 4.15 | 1194 | 3.40 |
| 1195 | 2.92 | 1196 | 2.44 | 1197 | 2.08 | 1198 | 1.82 | 1199 | 1.70 |
| 1200 | 1.58 | 1201 | 1.55 | 1202 | 1.49 | 1203 | 1.50 | 1204 | 1.49 |
| 1205 | 1.48 | 1206 | 1.47 | 1207 | 1.44 | 1208 | 1.47 | 1209 | 1.44 |
| 1210 | 1.47 | 1211 | 1.44 | 1212 | 1.47 | 1213 | 1.47 | 1214 | 1.47 |
| 1215 | 1.47 | 1216 | 1.44 | 1217 | 1.47 | 1218 | 1.44 | 1219 | 1.47 |
| 1220 | 1.44 | 1221 | 1.47 | 1222 | 1.47 | 1223 | 1.47 | 1224 | 1.47 |
| 1225 | 1.38 | 1226 | 1.33 | 1227 | 1.25 | 1228 | 1.19 | 1229 | 1.08 |
| 1230 | 1.03 | 1231 | 1.03 | 1232 | 1.03 | 1233 | 1.03 | 1234 | 1.03 |
| 1235 | 1.06 | 1236 | 1.06 | 1237 | 1.06 | 1238 | 1.06 | 1239 | 1.03 |
| 1240 | 1.03 | 1241 | 1.03 | 1242 | 1.03 | 1243 | 1.03 | 1244 | 1.03 |
| 1245 | 1.06 | 1246 | 1.06 | 1247 | 1.06 | 1248 | 1.06 | 1249 | 1.03 |
| 1250 | 1.03 | 1251 | 1.03 | 1252 | 1.03 | 1253 | 1.03 | 1254 | 1.03 |
| 1255 | 1.06 | 1256 | 1.06 | 1257 | 1.06 | 1258 | 1.06 | 1259 | 1.03 |
| 1260 | 1.03 | 1261 | 1.03 | 1262 | 1.03 | 1263 | 1.03 | 1264 | 1.03 |
| 1265 | 1.06 | 1266 | 1.06 | 1267 | 1.06 | 1268 | 1.03 | 1269 | 1.03 |
| 1270 | 1.03 | 1271 | 1.03 | 1272 | 1.03 | 1273 | 1.03 | 1274 | 1.06 |
| 1275 | 1.06 | 1276 | 1.06 | 1277 | 1.06 | 1278 | 1.03 | 1279 | 1.03 |
| 1280 | 1.03 | 1281 | 1.03 | 1282 | 1.03 | 1283 | 1.03 | 1284 | 1.06 |

```
     1285       1.06  1286       1.06  1287       1.06  1288       1.03  1289
1.03
     1290       1.03  1291       1.03  1292       1.03  1293       1.03  1294
1.06
     1295       1.06  1296       1.06  1297       1.00  1298       0.97  1299
0.92
     1300       0.89  1310       0.81  1320       0.81  1330       0.81  1340
0.83
     1350       0.81  1360       0.81  1370       0.81  1380       0.83  1390
0.81
     1400       0.81  1420       0.82  1440       0.81  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006307A97200740008100                    G1
006     1  041A 020006004806A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      40A :  Subarea
      40A   020   A100    7    0     63    145       63     145   1153    VALLEY
 740  0.08100    ---     ----    -----  -----    --     --
      41A :  Subarea
      41A   020   A100    6    6     48    126      111     265   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     111    acres
            HYDROGRAPH PEAK:              265    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             10.56 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.87   200       0.87   300       0.87   400
0.87
      500       0.87   600       0.93   700       1.12   800       1.12   900
1.29
     1000       3.13  1050      10.31  1100      22.11  1110      33.16  1120
41.28
     1130      42.82  1131      43.38  1132      44.00  1133      44.46  1134
45.14
     1135      45.82  1136      46.58  1137      46.99  1138      47.10  1139
47.53
     1140      47.50  1141      49.89  1142      53.15  1143      57.30  1144
62.03
     1145      70.03  1146      79.55  1147      88.42  1148      97.48  1149
121.61
     1150     152.22  1151     185.60  1152     219.81  1153     252.11  1154
265.21
     1155     251.76  1156     225.64  1157     190.54  1158     150.55  1159
111.32
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 86.22 | 1161 | 65.86 | 1162 | 53.46 | 1163 | 47.29 | 1164 | 44.28 |
| 1165 | 41.70 | 1166 | 39.15 | 1167 | 36.56 | 1168 | 33.91 | 1169 | 30.84 |
| 1170 | 28.37 | 1171 | 26.94 | 1172 | 25.53 | 1173 | 24.49 | 1174 | 24.03 |
| 1175 | 23.94 | 1176 | 23.83 | 1177 | 22.93 | 1178 | 21.91 | 1179 | 20.41 |
| 1180 | 18.57 | 1181 | 17.22 | 1182 | 15.48 | 1183 | 14.36 | 1184 | 13.80 |
| 1185 | 12.77 | 1186 | 12.61 | 1187 | 12.41 | 1188 | 12.09 | 1189 | 11.54 |
| 1190 | 10.77 | 1191 | 9.79 | 1192 | 8.48 | 1193 | 7.16 | 1194 | 6.02 |
| 1195 | 5.65 | 1196 | 4.69 | 1197 | 4.11 | 1198 | 3.72 | 1199 | 3.71 |
| 1200 | 3.50 | 1201 | 3.17 | 1202 | 3.20 | 1203 | 3.20 | 1204 | 3.42 |
| 1205 | 3.06 | 1206 | 3.07 | 1207 | 3.13 | 1208 | 3.10 | 1209 | 3.32 |
| 1210 | 3.01 | 1211 | 3.04 | 1212 | 3.10 | 1213 | 3.08 | 1214 | 3.31 |
| 1215 | 3.00 | 1216 | 3.03 | 1217 | 3.10 | 1218 | 3.36 | 1219 | 3.31 |
| 1220 | 3.06 | 1221 | 3.13 | 1222 | 3.16 | 1223 | 3.40 | 1224 | 3.05 |
| 1225 | 2.23 | 1226 | 2.22 | 1227 | 2.03 | 1228 | 1.75 | 1229 | 1.51 |
| 1230 | 1.32 | 1231 | 1.25 | 1232 | 1.21 | 1233 | 1.17 | 1234 | 1.18 |
| 1235 | 1.14 | 1236 | 1.13 | 1237 | 1.15 | 1238 | 1.12 | 1239 | 1.12 |
| 1240 | 1.12 | 1241 | 1.11 | 1242 | 1.14 | 1243 | 1.11 | 1244 | 1.11 |
| 1245 | 1.14 | 1246 | 1.11 | 1247 | 1.11 | 1248 | 1.11 | 1249 | 1.11 |
| 1250 | 1.14 | 1251 | 1.11 | 1252 | 1.11 | 1253 | 1.14 | 1254 | 1.11 |
| 1255 | 1.11 | 1256 | 1.11 | 1257 | 1.11 | 1258 | 1.14 | 1259 | 1.11 |
| 1260 | 1.11 | 1261 | 1.14 | 1262 | 1.11 | 1263 | 1.11 | 1264 | 1.11 |
| 1265 | 1.11 | 1266 | 1.14 | 1267 | 1.11 | 1268 | 1.11 | 1269 | 1.14 |
| 1270 | 1.11 | 1271 | 1.11 | 1272 | 1.11 | 1273 | 1.11 | 1274 | 1.14 |
| 1275 | 1.11 | 1276 | 1.11 | 1277 | 1.14 | 1278 | 1.11 | 1279 | 1.11 |
| 1280 | 1.11 | 1281 | 1.11 | 1282 | 1.14 | 1283 | 1.11 | 1284 | 1.11 |

```
     1285       1.14  1286       1.11  1287       1.11  1288       1.11  1289
1.11
     1290       1.14  1291       1.11  1292       1.11  1293       1.14  1294
1.11
     1295       1.11  1296       1.11  1297       1.08  1298       1.06  1299
0.97
     1300       0.95  1310       0.88  1320       0.86  1330       0.88  1340
0.86
     1350       0.88  1360       0.88  1370       0.86  1380       0.88  1390
0.86
     1400       0.88  1420       0.87  1440       0.87  1460       0.40  1500
0.40
```


Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job:  1  Project: AJU Brandeis Discharge 5
Page:  3


VCRat Model Input

```
Model Lines
-------------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006307A97200740008100                    G1
006     1  041A 020006004806A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      50A :  Subarea
      50A   020   A10    11    0    300    325      300     325   1155    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A10    15    0     50     44      350     365   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              365    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             11.82 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       0.40  1100      14.64  1110      30.15  1120
49.16
     1130      55.02  1131      55.13  1132      55.43  1133      55.92  1134
56.60
     1135      57.41  1136      58.37  1137      59.18  1138      59.89  1139
60.66
     1140      61.51  1141      63.05  1142      65.69  1143      70.15  1144
75.62
     1145      82.29  1146      91.16  1147     103.54  1148     117.34  1149
135.73
     1150     165.83  1151     209.36  1152     256.93  1153     303.39  1154
340.16
     1155     361.26  1156     365.17  1157     358.86  1158     347.56  1159
335.58
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 319.35 | 1161 | 291.19 | 1162 | 253.82 | 1163 | 215.51 | 1164 | 174.15 |
| 1165 | 132.56 | 1166 | 98.94 | 1167 | 75.83 | 1168 | 59.43 | 1169 | 51.18 |
| 1170 | 45.71 | 1171 | 41.46 | 1172 | 37.73 | 1173 | 34.34 | 1174 | 31.47 |
| 1175 | 28.62 | 1176 | 25.74 | 1177 | 22.95 | 1178 | 20.55 | 1179 | 18.66 |
| 1180 | 16.98 | 1181 | 15.05 | 1182 | 13.57 | 1183 | 12.13 | 1184 | 10.36 |
| 1185 | 8.57 | 1186 | 7.00 | 1187 | 5.58 | 1188 | 4.12 | 1189 | 2.91 |
| 1190 | 2.07 | 1191 | 1.51 | 1192 | 1.14 | 1193 | 0.89 | 1194 | 0.73 |
| 1195 | 0.62 | 1196 | 0.54 | 1197 | 0.50 | 1198 | 0.46 | 1199 | 0.44 |
| 1200 | 0.43 | 1201 | 0.42 | 1202 | 0.41 | 1203 | 0.41 | 1204 | 0.41 |
| 1205 | 0.40 | 1206 | 0.40 | 1207 | 0.40 | 1208 | 0.40 | 1209 | 0.40 |
| 1210 | 0.40 | 1211 | 0.40 | 1212 | 0.40 | 1213 | 0.40 | 1214 | 0.40 |
| 1215 | 0.40 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030011A97201040006100                    G1
006     1  051A 020000005015A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      50A :  Subarea
      50A   020   A25    11    0    300    408      300     408   1154    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A25    13    0     50     61      350     465   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              465    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             17.24 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       6.55  1100      33.92  1110      54.90  1120
77.11
     1130      84.14  1131      84.71  1132      85.43  1133      86.32  1134
87.11
     1135      88.13  1136      89.27  1137      90.31  1138      91.23  1139
92.03
     1140      93.07  1141      95.02  1142      98.79  1143     104.77  1144
111.65
     1145     120.28  1146     131.46  1147     146.14  1148     162.15  1149
185.94
     1150     224.71  1151     279.18  1152     338.26  1153     395.89  1154
439.66
     1155     462.60  1156     465.05  1157     456.05  1158     440.82  1159
424.47
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 402.89 | 1161 | 365.94 | 1162 | 313.47 | 1163 | 261.20 | 1164 | 209.91 |
| 1165 | 158.41 | 1166 | 117.72 | 1167 | 95.45 | 1168 | 82.41 | 1169 | 74.83 |
| 1170 | 69.23 | 1171 | 64.11 | 1172 | 59.81 | 1173 | 56.18 | 1174 | 52.42 |
| 1175 | 48.68 | 1176 | 45.14 | 1177 | 41.70 | 1178 | 39.43 | 1179 | 37.37 |
| 1180 | 34.95 | 1181 | 32.84 | 1182 | 30.71 | 1183 | 28.41 | 1184 | 26.22 |
| 1185 | 23.79 | 1186 | 21.45 | 1187 | 19.08 | 1188 | 16.62 | 1189 | 14.22 |
| 1190 | 12.36 | 1191 | 10.82 | 1192 | 9.29 | 1193 | 7.76 | 1194 | 6.13 |
| 1195 | 5.01 | 1196 | 4.01 | 1197 | 3.08 | 1198 | 2.32 | 1199 | 1.77 |
| 1200 | 1.38 | 1201 | 1.10 | 1202 | 0.90 | 1203 | 0.75 | 1204 | 0.65 |
| 1205 | 0.58 | 1206 | 0.53 | 1207 | 0.49 | 1208 | 0.47 | 1209 | 0.45 |
| 1210 | 0.43 | 1211 | 0.42 | 1212 | 0.42 | 1213 | 0.41 | 1214 | 0.41 |
| 1215 | 0.41 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030011A97201040006100                    G1
006     1  051A 020000005013A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      50A :  Subarea
      50A   020   A50    10    0    300    501      300     501   1154    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A50    11    0     50     78      350     571   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              571    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             21.80 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050      16.57  1100      48.84  1110      75.44  1120
101.58
     1130     106.49  1131     107.25  1132     108.02  1133     109.03  1134
110.07
     1135     111.46  1136     112.82  1137     114.03  1138     115.15  1139
116.40
     1140     117.58  1141     119.78  1142     124.01  1143     131.34  1144
139.56
     1145     149.84  1146     163.99  1147     182.95  1148     203.03  1149
233.56
     1150     284.52  1151     354.57  1152     425.86  1153     494.83  1154
547.26
     1155     571.32  1156     565.78  1157     549.22  1158     529.39  1159
501.39
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 446.42 | 1161 | 378.98 | 1162 | 311.43 | 1163 | 246.42 | 1164 | 183.87 |
| 1165 | 142.84 | 1166 | 120.07 | 1167 | 106.55 | 1168 | 97.80 | 1169 | 90.71 |
| 1170 | 84.48 | 1171 | 79.10 | 1172 | 74.24 | 1173 | 69.33 | 1174 | 64.37 |
| 1175 | 59.60 | 1176 | 56.68 | 1177 | 54.56 | 1178 | 52.68 | 1179 | 50.49 |
| 1180 | 47.88 | 1181 | 45.25 | 1182 | 42.40 | 1183 | 39.53 | 1184 | 36.89 |
| 1185 | 33.77 | 1186 | 30.77 | 1187 | 27.65 | 1188 | 25.33 | 1189 | 23.42 |
| 1190 | 22.10 | 1191 | 20.60 | 1192 | 18.78 | 1193 | 16.60 | 1194 | 15.04 |
| 1195 | 13.02 | 1196 | 11.23 | 1197 | 9.11 | 1198 | 7.21 | 1199 | 5.64 |
| 1200 | 4.22 | 1201 | 3.02 | 1202 | 2.12 | 1203 | 1.53 | 1204 | 1.14 |
| 1205 | 0.89 | 1206 | 0.72 | 1207 | 0.61 | 1208 | 0.54 | 1209 | 0.49 |
| 1210 | 0.46 | 1211 | 0.44 | 1212 | 0.43 | 1213 | 0.42 | 1214 | 0.41 |
| 1215 | 0.41 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030010A97201040006100                    G1
006     1  051A 020000005011A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      50A :  Subarea
      50A   020   A100   10    0    300    578      300     578   1154    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A100   11    0     50     90      350     659   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              659    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             27.57 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       6.07  1050      27.92  1100      64.54  1110      95.71  1120
123.64
     1130     128.80  1131     129.84  1132     130.92  1133     132.19  1134
133.41
     1135     134.57  1136     136.03  1137     137.60  1138     139.02  1139
140.28
     1140     141.46  1141     144.32  1142     149.43  1143     157.47  1144
166.87
     1145     178.76  1146     194.98  1147     216.17  1148     238.94  1149
275.30
     1150     335.10  1151     415.31  1152     495.77  1153     573.90  1154
633.25
     1155     659.39  1156     651.87  1157     631.60  1158     607.89  1159
574.86
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 510.69 | 1161 | 433.08 | 1162 | 356.15 | 1163 | 281.46 | 1164 | 211.58 |
| 1165 | 166.41 | 1166 | 141.83 | 1167 | 127.57 | 1168 | 118.20 | 1169 | 110.74 |
| 1170 | 103.98 | 1171 | 97.98 | 1172 | 92.75 | 1173 | 87.58 | 1174 | 81.91 |
| 1175 | 76.36 | 1176 | 72.76 | 1177 | 70.81 | 1178 | 69.04 | 1179 | 66.22 |
| 1180 | 63.11 | 1181 | 60.09 | 1182 | 56.66 | 1183 | 53.38 | 1184 | 50.12 |
| 1185 | 46.45 | 1186 | 43.09 | 1187 | 39.65 | 1188 | 37.02 | 1189 | 35.24 |
| 1190 | 33.78 | 1191 | 32.00 | 1192 | 29.83 | 1193 | 27.39 | 1194 | 25.17 |
| 1195 | 22.77 | 1196 | 20.30 | 1197 | 17.83 | 1198 | 15.33 | 1199 | 12.90 |
| 1200 | 10.67 | 1201 | 8.98 | 1202 | 8.05 | 1203 | 7.32 | 1204 | 7.01 |
| 1205 | 6.74 | 1206 | 6.62 | 1207 | 6.67 | 1208 | 6.51 | 1209 | 6.54 |
| 1210 | 6.31 | 1211 | 6.28 | 1212 | 6.26 | 1213 | 6.25 | 1214 | 6.39 |
| 1215 | 6.23 | 1216 | 6.22 | 1217 | 6.22 | 1218 | 6.37 | 1219 | 6.37 |
| 1220 | 6.36 | 1221 | 6.52 | 1222 | 6.43 | 1223 | 6.49 | 1224 | 6.44 |
| 1225 | 5.98 | 1226 | 5.81 | 1227 | 5.30 | 1228 | 4.60 | 1229 | 3.74 |
| 1230 | 2.89 | 1231 | 2.19 | 1232 | 1.69 | 1233 | 1.33 | 1234 | 1.07 |
| 1235 | 0.88 | 1236 | 0.75 | 1237 | 0.65 | 1238 | 0.58 | 1239 | 0.53 |
| 1240 | 0.49 | 1241 | 0.47 | 1242 | 0.45 | 1243 | 0.43 | 1244 | 0.42 |
| 1245 | 0.42 | 1246 | 0.41 | 1247 | 0.41 | 1248 | 0.41 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030010A97201040006100                    G1
006     1  051A 020000005011A97                              1  2
999
```

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
TIME OF CONCENTRATION
TC Program Version: 2.64.0.37
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

S U M M A R Y  O F  C O M P U T A T I O N S

Watershed Name: Watershed

| Name | Zone | Storm | Soil | Area (acres) | TC (min) |
|---|---|---|---|---|---|
| 1A | K | 10 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 1A | K | 25 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 1A | K | 50 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 1A | K | 100 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 2A | K | 10 | 2.00 | 25.3 / 25 | 8.713 / 9 |
| 2A | K | 25 | 2.00 | 25.3 / 25 | 8.437 / 8 |
| 2A | K | 50 | 2.00 | 25.3 / 25 | 8.245 / 8 |
| 2A | K | 100 | 2.00 | 25.3 / 25 | 7.540 / 8 |
| 3A | K | 10 | 2.00 | 20.1 / 20 | 11.029 / 11 |
| 3A | K | 25 | 2.00 | 20.1 / 20 | 10.596 / 11 |
| 3A | K | 50 | 2.00 | 20.1 / 20 | 10.200 / 10 |
| 3A | K | 100 | 2.00 | 20.1 / 20 | 9.325 / 9 |
| 4A | K | 10 | 2.00 | 8.2 / 8 | 6.698 / 7 |
| 4A | K | 25 | 2.00 | 8.2 / 8 | 6.538 / 7 |
| 4A | K | 50 | 2.00 | 8.2 / 8 | 6.382 / 6 |
| 4A | K | 100 | 2.00 | 8.2 / 8 | 5.871 / 6 |
| 5A | K | 10 | 5.00 | 1.3 / 1 | 6.072 / 6 |
| 5A | K | 25 | 5.00 | 1.3 / 1 | 5.231 / 5 |
| 5A | K | 50 | 5.00 | 1.3 / 1 | TC ERROR |
| 5A | K | 100 | 5.00 | 1.3 / 1 | TC ERROR |
| 10A | K | 10 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 10A | K | 25 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 10A | K | 50 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 10A | K | 100 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 11A | K | 10 | 2.00 | 15.4 / 15 | 7.306 / 7 |
| 11A | K | 25 | 2.00 | 15.4 / 15 | 7.132 / 7 |
| 11A | K | 50 | 2.00 | 15.4 / 15 | 6.997 / 7 |
| 11A | K | 100 | 2.00 | 15.4 / 15 | SCOUR ERROR |
| 12A | K | 10 | 2.00 | 17.3 / 17 | 10.606 / 11 |
| 12A | K | 25 | 2.00 | 17.3 / 17 | 10.286 / 10 |
| 12A | K | 50 | 2.00 | 17.3 / 17 | 10.049 / 10 |
| 12A | K | 100 | 2.00 | 17.3 / 17 | 9.187 / 9 |
| 13A | K | 10 | 5.00 | 3.0 / 3 | TC ERROR |
| 13A | K | 25 | 5.00 | 3.0 / 3 | TC ERROR |
| 13A | K | 50 | 5.00 | 3.0 / 3 | TC ERROR |
| 13A | K | 100 | 5.00 | 3.0 / 3 | TC ERROR |

| | | | | | |
|---|---|---|---|---|---|
| 20A | K | 10 | 2.00 | 6.6 / 7 | 8.308 / 8 |
| 20A | K | 25 | 2.00 | 6.6 / 7 | 8.092 / 8 |
| 20A | K | 50 | 2.00 | 6.6 / 7 | 7.917 / 8 |
| 20A | K | 100 | 2.00 | 6.6 / 7 | 7.232 / 7 |
| 21A | K | 10 | 2.00 | 3.4 / 3 | 7.988 / 8 |
| 21A | K | 25 | 2.00 | 3.4 / 3 | 7.030 / 7 |
| 21A | K | 50 | 2.00 | 3.4 / 3 | 6.399 / 6 |
| 21A | K | 100 | 2.00 | 3.4 / 3 | 5.632 / 6 |
| 30A | K | 10 | 2.00 | 5.7 / 6 | 8.589 / 9 |
| 30A | K | 25 | 2.00 | 5.7 / 6 | 7.230 / 7 |
| 30A | K | 50 | 2.00 | 5.7 / 6 | 6.512 / 7 |
| 30A | K | 100 | 2.00 | 5.7 / 6 | 5.358 / 5 |
| 40A | K | 10 | 2.00 | 6.3 / 6 | 9.522 / 10 |
| 40A | K | 25 | 2.00 | 6.3 / 6 | 8.723 / 9 |
| 40A | K | 50 | 2.00 | 6.3 / 6 | 8.174 / 8 |
| 40A | K | 100 | 2.00 | 6.3 / 6 | SCOUR ERROR |
| 41A | K | 10 | 2.00 | 4.8 / 5 | 9.011 / 9 |
| 41A | K | 25 | 2.00 | 4.8 / 5 | 7.685 / 8 |
| 41A | K | 50 | 2.00 | 4.8 / 5 | 6.873 / 7 |
| 41A | K | 100 | 2.00 | 4.8 / 5 | 5.765 / 6 |
| 50A | K | 10 | 2.00 | 31.1 / 31 | 12.000 / 12 |
| 50A | K | 25 | 2.00 | 31.1 / 31 | SCOUR ERROR |
| 50A | K | 50 | 2.00 | 31.1 / 31 | SCOUR ERROR |
| 50A | K | 100 | 2.00 | 31.1 / 31 | SCOUR ERROR |
| 51A | K | 10 | 2.00 | 5.1 / 5 | 18.298 / 18 |
| 51A | K | 25 | 2.00 | 5.1 / 5 | 15.133 / 15 |
| 51A | K | 50 | 2.00 | 5.1 / 5 | 13.290 / 13 |
| 51A | K | 100 | 2.00 | 5.1 / 5 | 10.678 / 11 |

---

♠

---

Watershed Name: Watershed

---

Sub-Area Name: 1A
Computing Tc for all rainfall frequencies for sub-area 1A...

---

Tc for frequency = 10.00: 8.923 Minutes
DATA FOR SUB AREA 1

---

SUB AREA TIME OF CONCENTRATION: 8.923 min. = 9 min. ** SCOUR ERROR **

---

SUB AREA INPUT DATA

---

Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00

Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 1.976
C Total: 0.759
Sum Q Segments (cfs): 0.00
Q Total (cfs): 16.17
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.923
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 16.17
Avg Velocity (ft/s): 6.31
Passed Scour Check: No
Scour Velocity (ft/sec): 6.31
Tc for frequency = 25.00: 8.589 Minutes
DATA FOR SUB AREA 1
---
SUB AREA TIME OF CONCENTRATION: 8.589 min. = 9 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.183
C Total: 0.776
Sum Q Segments (cfs): 0.00

Q Total (cfs): 18.28
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.589
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 18.28
Avg Velocity (ft/s): 6.57
Passed Scour Check: No
Scour Velocity (ft/sec): 6.57
♠
Tc for frequency = 50.00: 8.339 Minutes
DATA FOR SUB AREA 1
---
SUB AREA TIME OF CONCENTRATION: 8.339 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.543
C Total: 0.802
Sum Q Segments (cfs): 0.00
Q Total (cfs): 22.07
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.339
---
DATA FOR FLOW PATH 1

---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 22.07
Avg Velocity (ft/s): 7.00
Passed Scour Check: No
Scour Velocity (ft/sec): 7.00
🡅
Tc for frequency = 100.00: 7.579 Minutes
DATA FOR SUB AREA 1
---
SUB AREA TIME OF CONCENTRATION: 7.579 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.790
C Total: 0.817
Sum Q Segments (cfs): 0.00
Q Total (cfs): 24.58
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 7.579
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491

Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 24.58
Avg Velocity (ft/s): 7.25
Passed Scour Check: No
Scour Velocity (ft/sec): 7.25
↟
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 2A
Computing Tc for all rainfall frequencies for sub-area 2A...
---
Tc for frequency = 10.00: 8.713 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 8.713 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.680
C Total: 0.810
Sum Q Segments (cfs): 54.84
Q Total (cfs): 54.84
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 522.76
Time of Concentration (min): 8.713
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 7.5808
Flow Type: Overland

Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 6.82
Avg Velocity (ft/s): 1.91
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.69
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 1.1318
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 48.02
Q Top (cfs): 6.82
Q Bottom (cfs): 54.84
Velocity Top (ft/s): 2.84
Velocity Bottom (ft/s): 5.68
Avg Velocity (ft/s): 4.26
Wave Velocity (ft/s): 6.39
Tc for frequency = 25.00: 8.437 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 8.437 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---
Intensity (in/hr): 3.191
C Total: 0.837
Sum Q Segments (cfs): 67.45
Q Total (cfs): 67.45
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 506.24
Time of Concentration (min): 8.437
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 7.3808
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 8.39
Avg Velocity (ft/s): 1.97
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.01
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 1.0565
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 59.06
Q Top (cfs): 8.39
Q Bottom (cfs): 67.45
Velocity Top (ft/s): 3.04
Velocity Bottom (ft/s): 6.09
Avg Velocity (ft/s): 4.56
Wave Velocity (ft/s): 6.84

Tc for frequency = 50.00: 8.245 Minutes
DATA FOR SUB AREA 2

---
SUB AREA TIME OF CONCENTRATION: 8.245 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.525
C Total: 0.851
Sum Q Segments (cfs): 75.74
Q Total (cfs): 75.74
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 494.68
Time of Concentration (min): 8.245
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 7.2282
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 9.42
Avg Velocity (ft/s): 2.01
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.23
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 1.0165
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11

Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 66.32
Q Top (cfs): 9.42
Q Bottom (cfs): 75.74
Velocity Top (ft/s): 3.16
Velocity Bottom (ft/s): 6.32
Avg Velocity (ft/s): 4.74
Wave Velocity (ft/s): 7.11
🡅
Tc for frequency = 100.00: 7.540 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 7.540 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.953
C Total: 0.866
Sum Q Segments (cfs): 86.46
Q Total (cfs): 86.46
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 452.38
Time of Concentration (min): 7.540
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 6.5670
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378

Effective Slope: 0.2047
Q for Flow Path (cfs): 10.75
Avg Velocity (ft/s): 2.21
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.47
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 0.9727
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 75.70
Q Top (cfs): 10.75
Q Bottom (cfs): 86.46
Velocity Top (ft/s): 3.30
Velocity Bottom (ft/s): 6.61
Avg Velocity (ft/s): 4.96
Wave Velocity (ft/s): 7.43
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 3A
Computing Tc for all rainfall frequencies for sub-area 3A...
---
Tc for frequency = 10.00: 11.029 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 11.029 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---
Intensity (in/hr): 2.396
C Total: 0.792
Sum Q Segments (cfs): 38.16
Q Total (cfs): 38.16
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 661.76
Time of Concentration (min): 11.029
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 8.8290
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 8.01
Avg Velocity (ft/s): 1.85
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.89
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 2.2003
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 30.15
Q Top (cfs): 8.01
Q Bottom (cfs): 38.16
Velocity Top (ft/s): 3.21
Velocity Bottom (ft/s): 5.40
Avg Velocity (ft/s): 4.30
Wave Velocity (ft/s): 6.45

Tc for frequency = 25.00: 10.596 Minutes
DATA FOR SUB AREA 3

---
SUB AREA TIME OF CONCENTRATION: 10.596 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.657
C Total: 0.809
Sum Q Segments (cfs): 43.24
Q Total (cfs): 43.24
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 635.77
Time of Concentration (min): 10.596
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 8.4856
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 9.07
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.10
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 2.1105
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89

Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 34.17
Q Top (cfs): 9.07
Q Bottom (cfs): 43.24
Velocity Top (ft/s): 3.35
Velocity Bottom (ft/s): 5.63
Avg Velocity (ft/s): 4.49
Wave Velocity (ft/s): 6.73

Tc for frequency = 50.00: 10.200 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 10.200 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.161
C Total: 0.836
Sum Q Segments (cfs): 53.12
Q Total (cfs): 53.12
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 612.01
Time of Concentration (min): 10.200
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 8.2295
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072

Effective Slope: 0.1979
Q for Flow Path (cfs): 11.15
Avg Velocity (ft/s): 1.98
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.46
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 1.9707
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 41.98
Q Top (cfs): 11.15
Q Bottom (cfs): 53.12
Velocity Top (ft/s): 3.58
Velocity Bottom (ft/s): 6.03
Avg Velocity (ft/s): 4.80
Wave Velocity (ft/s): 7.21
Tc for frequency = 100.00: 9.325 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 9.325 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.740
C Total: 0.859
Sum Q Segments (cfs): 64.58
Q Total (cfs): 64.58
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 559.47
Time of Concentration (min): 9.325

```
--------------------------------------------------------------------------
DATA FOR FLOW PATH 1
--------------------------------------------------------------------------
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 7.4779
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 13.55
Avg Velocity (ft/s): 2.18
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.83
DATA FOR FLOW PATH 2
--------------------------------------------------------------------------
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 1.8467
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 51.03
Q Top (cfs): 13.55
Q Bottom (cfs): 64.58
Velocity Top (ft/s): 3.82
Velocity Bottom (ft/s): 6.43
Avg Velocity (ft/s): 5.13
Wave Velocity (ft/s): 7.69
♠
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
--------------------------------------------------------------------------
Sub-Area Name: 4A
Computing Tc for all rainfall frequencies for sub-area 4A...
--------------------------------------------------------------------------
Tc for frequency = 10.00: 6.698 Minutes
DATA FOR SUB AREA 4
```

---
SUB AREA TIME OF CONCENTRATION: 6.698 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.094
C Total: 0.833
Sum Q Segments (cfs): 21.03
Q Total (cfs): 21.03
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 401.85
Time of Concentration (min): 6.698
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 5.2755
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 2.35
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.28
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.4220
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25

Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 18.69
Q Top (cfs): 2.35
Q Bottom (cfs): 21.03
Velocity Top (ft/s): 3.62
Velocity Bottom (ft/s): 6.18
Avg Velocity (ft/s): 4.90
Wave Velocity (ft/s): 7.35

Tc for frequency = 25.00: 6.538 Minutes
DATA FOR SUB AREA 4
---
SUB AREA TIME OF CONCENTRATION: 6.538 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.848
Sum Q Segments (cfs): 23.90
Q Total (cfs): 23.90
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 392.28
Time of Concentration (min): 6.538
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 5.1609
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485

Effective Slope: 0.2067
Q for Flow Path (cfs): 2.67
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.42
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.3770
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 21.24
Q Top (cfs): 2.67
Q Bottom (cfs): 23.90
Velocity Top (ft/s): 3.72
Velocity Bottom (ft/s): 6.40
Avg Velocity (ft/s): 5.06
Wave Velocity (ft/s): 7.60
Tc for frequency = 50.00: 6.382 Minutes
DATA FOR SUB AREA 4
---
SUB AREA TIME OF CONCENTRATION: 6.382 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 4.100
C Total: 0.870
Sum Q Segments (cfs): 29.11
Q Total (cfs): 29.11
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 382.93
Time of Concentration (min): 6.382

---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 5.0727
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 3.25
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.65
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.3094
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 25.87
Q Top (cfs): 3.25
Q Bottom (cfs): 29.11
Velocity Top (ft/s): 3.89
Velocity Bottom (ft/s): 6.76
Avg Velocity (ft/s): 5.32
Wave Velocity (ft/s): 7.99
♠
Tc for frequency = 100.00: 5.871 Minutes
DATA FOR SUB AREA 4
---
SUB AREA TIME OF CONCENTRATION: 5.871 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3

Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 4.590
C Total: 0.881
Sum Q Segments (cfs): 33.00
Q Total (cfs): 33.00
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 352.28
Time of Concentration (min): 5.871
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 4.6039
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 3.68
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.81
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.2676
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 29.32
Q Top (cfs): 3.68
Q Bottom (cfs): 33.00
Velocity Top (ft/s): 4.00

Velocity Bottom (ft/s): 7.00
Avg Velocity (ft/s): 5.50
Wave Velocity (ft/s): 8.25
♠
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 5A
Computing Tc for all rainfall frequencies for sub-area 5A...
---
Tc for frequency = 10.00: 6.072 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 6.072 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 3.400
C Total: 0.703
Sum Q Segments (cfs): 3.18
Q Total (cfs): 3.18
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 364.31
Time of Concentration (min): 6.072
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 4.9328
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950

Effective Slope: 0.0950
Q for Flow Path (cfs): 0.74
Avg Velocity (ft/s): 0.68
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.50
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.1391
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 2.44
Q Top (cfs): 0.74
Q Bottom (cfs): 3.18
Velocity Top (ft/s): 2.56
Velocity Bottom (ft/s): 3.43
Avg Velocity (ft/s): 3.00
Wave Velocity (ft/s): 4.49
Tc for frequency = 25.00: 5.231 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 5.231 min. = 5 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 4.272
C Total: 0.731
Sum Q Segments (cfs): 4.15
Q Total (cfs): 4.15
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 313.86
Time of Concentration (min): 5.231

---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 4.1534
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 0.97
Avg Velocity (ft/s): 0.80
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.63
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.0776
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 3.18
Q Top (cfs): 0.97
Q Bottom (cfs): 4.15
Velocity Top (ft/s): 2.69
Velocity Bottom (ft/s): 3.65
Avg Velocity (ft/s): 3.17
Wave Velocity (ft/s): 4.75
♠
Tc for frequency = 50.00: 4.749 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 4.749 min. = 5 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3

Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 4.548
C Total: 0.736
Sum Q Segments (cfs): 4.45
Q Total (cfs): 4.45
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 284.96
Time of Concentration (min): 4.749
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 3.6875
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 1.04
Avg Velocity (ft/s): 0.90
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.68
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.0619
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 3.41
Q Top (cfs): 1.04
Q Bottom (cfs): 4.45
Velocity Top (ft/s): 2.72

Velocity Bottom (ft/s): 3.70
Avg Velocity (ft/s): 3.21
Wave Velocity (ft/s): 4.82
🠉
Tc for frequency = 100.00: 4.033 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 4.033 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 5.100
C Total: 0.744
Sum Q Segments (cfs): 5.05
Q Total (cfs): 5.05
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 242.00
Time of Concentration (min): 4.033
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 2.9999
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 1.18
Avg Velocity (ft/s): 1.11
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.82
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2

FLOW PATH TRAVEL TIME (min): 1.0334
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 3.87
Q Top (cfs): 1.18
Q Bottom (cfs): 5.05
Velocity Top (ft/s): 2.79
Velocity Bottom (ft/s): 3.81
Avg Velocity (ft/s): 3.30
Wave Velocity (ft/s): 4.95

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 10A
Computing Tc for all rainfall frequencies for sub-area 10A...

---

Tc for frequency = 10.00: 8.669 Minutes
DATA FOR SUB AREA 6

---

SUB AREA TIME OF CONCENTRATION: 8.669 min. = 9 min. ** SCOUR ERROR **

---

SUB AREA INPUT DATA

---

Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---

Intensity (in/hr): 1.976
C Total: 0.759
Sum Q Segments (cfs): 0.00
Q Total (cfs): 14.10
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.669

```
--------------------------------------------------------------------------
DATA FOR FLOW PATH 1
--------------------------------------------------------------------------
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 14.10
Avg Velocity (ft/s): 6.20
Passed Scour Check: No
Scour Velocity (ft/sec): 6.20
```

```
Tc for frequency = 25.00: 8.486 Minutes
DATA FOR SUB AREA 6
--------------------------------------------------------------------------
SUB AREA TIME OF CONCENTRATION: 8.486 min. = 8 min. ** SCOUR ERROR **
--------------------------------------------------------------------------
SUB AREA INPUT DATA
--------------------------------------------------------------------------
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
--------------------------------------------------------------------------
Intensity (in/hr): 2.183
C Total: 0.776
Sum Q Segments (cfs): 0.00
Q Total (cfs): 15.95
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.486
--------------------------------------------------------------------------
DATA FOR FLOW PATH 1
--------------------------------------------------------------------------
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
```

Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 15.95
Avg Velocity (ft/s): 6.46
Passed Scour Check: No
Scour Velocity (ft/sec): 6.46
Tc for frequency = 50.00: 8.346 Minutes
DATA FOR SUB AREA 6
---
SUB AREA TIME OF CONCENTRATION: 8.346 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.543
C Total: 0.802
Sum Q Segments (cfs): 0.00
Q Total (cfs): 19.26
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.346
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain

Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 19.26
Avg Velocity (ft/s): 6.88
Passed Scour Check: No
Scour Velocity (ft/sec): 6.88

Tc for frequency = 100.00: 7.573 Minutes
DATA FOR SUB AREA 6
---
SUB AREA TIME OF CONCENTRATION: 7.573 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.790
C Total: 0.817
Sum Q Segments (cfs): 0.00
Q Total (cfs): 21.44
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 7.573
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 21.44
Avg Velocity (ft/s): 7.13
Passed Scour Check: No

Scour Velocity (ft/sec): 7.13

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 11A
Computing Tc for all rainfall frequencies for sub-area 11A...

---

Tc for frequency = 10.00: 7.306 Minutes
DATA FOR SUB AREA 7

---

SUB AREA TIME OF CONCENTRATION: 7.306 min. = 7 min.

---

SUB AREA INPUT DATA

---

Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---

Intensity (in/hr): 3.094
C Total: 0.833
Sum Q Segments (cfs): 39.64
Q Total (cfs): 39.64
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 438.38
Time of Concentration (min): 7.306

---

DATA FOR FLOW PATH 1

---

Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 5.7239
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 10.10

Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.52
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.5824
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 29.54
Q Top (cfs): 10.10
Q Bottom (cfs): 39.64
Velocity Top (ft/s): 4.76
Velocity Bottom (ft/s): 6.89
Avg Velocity (ft/s): 5.83
Wave Velocity (ft/s): 8.74
Tc for frequency = 25.00: 7.132 Minutes
DATA FOR SUB AREA 7
---
SUB AREA TIME OF CONCENTRATION: 7.132 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.848
Sum Q Segments (cfs): 45.06
Q Total (cfs): 45.06
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 427.89
Time of Concentration (min): 7.132
---
DATA FOR FLOW PATH 1

---
Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 5.6035
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 11.48
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.76
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.5281
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 33.57
Q Top (cfs): 11.48
Q Bottom (cfs): 45.06
Velocity Top (ft/s): 4.92
Velocity Bottom (ft/s): 7.14
Avg Velocity (ft/s): 6.03
Wave Velocity (ft/s): 9.05
🠉
Tc for frequency = 50.00: 6.997 Minutes
DATA FOR SUB AREA 7
---
SUB AREA TIME OF CONCENTRATION: 6.997 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50

Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.771
C Total: 0.860
Sum Q Segments (cfs): 49.87
Q Total (cfs): 49.87
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 419.80
Time of Concentration (min): 6.997
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 5.5107
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 12.71
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.98
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.4859
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 37.16
Q Top (cfs): 12.71
Q Bottom (cfs): 49.87
Velocity Top (ft/s): 5.05
Velocity Bottom (ft/s): 7.35
Avg Velocity (ft/s): 6.20

Wave Velocity (ft/s): 9.31

Tc for frequency = 100.00: 6.512 Minutes
DATA FOR SUB AREA 7
---
SUB AREA TIME OF CONCENTRATION: 6.512 min. = 7 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.740
C Total: 0.859
Sum Q Segments (cfs): 0.00
Q Total (cfs): 46.81
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 6.512
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 11.93
Avg Velocity (ft/s): 6.01
Passed Scour Check: No
Scour Velocity (ft/sec): 6.01
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.5121
Flow Type: Natural Channel

Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 34.88
Q Top (cfs): 11.93
Q Bottom (cfs): 46.81
Velocity Top (ft/s): 4.97
Velocity Bottom (ft/s): 7.22
Avg Velocity (ft/s): 6.10
Wave Velocity (ft/s): 9.14

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 12A
Computing Tc for all rainfall frequencies for sub-area 12A...

---

Tc for frequency = 10.00: 10.606 Minutes
DATA FOR SUB AREA 8

---

SUB AREA TIME OF CONCENTRATION: 10.606 min. = 11 min.

---

SUB AREA INPUT DATA

---

Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT

---

Intensity (in/hr): 2.396
C Total: 0.811
Sum Q Segments (cfs): 33.63
Q Total (cfs): 33.63
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 636.37
Time of Concentration (min): 10.606

---

DATA FOR FLOW PATH 1

---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 8.0999
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 4.53
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.19
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.5062
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 29.10
Q Top (cfs): 4.53
Q Bottom (cfs): 33.63
Velocity Top (ft/s): 2.48
Velocity Bottom (ft/s): 4.83
Avg Velocity (ft/s): 3.65
Wave Velocity (ft/s): 5.48

Tc for frequency = 25.00: 10.286 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 10.286 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25

Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT
---
Intensity (in/hr): 2.806
C Total: 0.834
Sum Q Segments (cfs): 40.48
Q Total (cfs): 40.48
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 617.14
Time of Concentration (min): 10.286
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 7.9295
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 5.45
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.44
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.3562
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 35.03
Q Top (cfs): 5.45
Q Bottom (cfs): 40.48
Velocity Top (ft/s): 2.64
Velocity Bottom (ft/s): 5.14
Avg Velocity (ft/s): 3.89

Wave Velocity (ft/s): 5.83

Tc for frequency = 50.00: 10.049 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 10.049 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT
---
Intensity (in/hr): 3.161
C Total: 0.849
Sum Q Segments (cfs): 46.48
Q Total (cfs): 46.48
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 602.91
Time of Concentration (min): 10.049
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 7.7982
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 6.26
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.67
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.2503
Flow Type: Natural Channel

Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 40.22
Q Top (cfs): 6.26
Q Bottom (cfs): 46.48
Velocity Top (ft/s): 2.76
Velocity Bottom (ft/s): 5.38
Avg Velocity (ft/s): 4.07
Wave Velocity (ft/s): 6.10
🡅
Tc for frequency = 100.00: 9.187 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 9.187 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT
---
Intensity (in/hr): 3.740
C Total: 0.870
Sum Q Segments (cfs): 56.30
Q Total (cfs): 56.30
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 551.23
Time of Concentration (min): 9.187
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 7.0761
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33

Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 7.58
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.97
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.1111
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 48.72
Q Top (cfs): 7.58
Q Bottom (cfs): 56.30
Velocity Top (ft/s): 2.94
Velocity Bottom (ft/s): 5.73
Avg Velocity (ft/s): 4.34
Wave Velocity (ft/s): 6.51

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 13A
Computing Tc for all rainfall frequencies for sub-area 13A...
---
Tc for frequency = 10.00: 3.574 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 3.574 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 13A
Total Area (ac): 2.98
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10

Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 13
SUB AREA OUTPUT
---
Intensity (in/hr): 4.125
C Total: 0.745
Sum Q Segments (cfs): 9.16
Q Total (cfs): 9.16
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 214.44
Time of Concentration (min): 3.574
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 13A1
FLOW PATH TRAVEL TIME (min): 2.6704
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1000
Contributing Area (acres): 0.24
Percent of Sub-Area (%): 8.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1900
Effective Slope: 0.1544
Q for Flow Path (cfs): 0.74
Avg Velocity (ft/s): 1.25
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.91
DATA FOR FLOW PATH 2
---
Flow Path Name: 13A2
FLOW PATH TRAVEL TIME (min): 0.9037
Flow Type: Natural Channel
Length (ft): 231.1
Top Elevation (ft): 1000
Bottom Elevation (ft): 995
Contributing Area (acres): 2.74
Percent of Sub-Area (%): 91.9
Overland Type: Valley
Map Slope: 0.0216
Effective Slope: 0.0216
Q for Flow Path (cfs): 8.42
Q Top (cfs): 0.74
Q Bottom (cfs): 9.16
Velocity Top (ft/s): 2.09
Velocity Bottom (ft/s): 3.60
Avg Velocity (ft/s): 2.84

Wave Velocity (ft/s): 4.26

Tc for frequency = 25.00: 3.324 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 3.324 min. = 3 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 13A
Total Area (ac): 2.98
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 13
SUB AREA OUTPUT
---
Intensity (in/hr): 4.280
C Total: 0.749
Sum Q Segments (cfs): 9.56
Q Total (cfs): 9.56
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 199.47
Time of Concentration (min): 3.324
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 13A1
FLOW PATH TRAVEL TIME (min): 2.4294
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1000
Contributing Area (acres): 0.24
Percent of Sub-Area (%): 8.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1900
Effective Slope: 0.1544
Q for Flow Path (cfs): 0.77
Avg Velocity (ft/s): 1.37
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.02
DATA FOR FLOW PATH 2
---
Flow Path Name: 13A2
FLOW PATH TRAVEL TIME (min): 0.8951
Flow Type: Natural Channel

Length (ft): 231.1
Top Elevation (ft): 1000
Bottom Elevation (ft): 995
Contributing Area (acres): 2.74
Percent of Sub-Area (%): 91.9
Overland Type: Valley
Map Slope: 0.0216
Effective Slope: 0.0216
Q for Flow Path (cfs): 8.79
Q Top (cfs): 0.77
Q Bottom (cfs): 9.56
Velocity Top (ft/s): 2.10
Velocity Bottom (ft/s): 3.63
Avg Velocity (ft/s): 2.87
Wave Velocity (ft/s): 4.30

Tc for frequency = 50.00: 3.092 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 3.092 min. = 3 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 13A
Total Area (ac): 2.98
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 13
SUB AREA OUTPUT
---
Intensity (in/hr): 5.900
C Total: 0.770
Sum Q Segments (cfs): 13.53
Q Total (cfs): 13.53
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 185.52
Time of Concentration (min): 3.092
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 13A1
FLOW PATH TRAVEL TIME (min): 2.2658
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1000
Contributing Area (acres): 0.24

Percent of Sub-Area (%): 8.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1900
Effective Slope: 0.1544
Q for Flow Path (cfs): 1.09
Avg Velocity (ft/s): 1.47
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.16
DATA FOR FLOW PATH 2
---
Flow Path Name: 13A2
FLOW PATH TRAVEL TIME (min): 0.8262
Flow Type: Natural Channel
Length (ft): 231.1
Top Elevation (ft): 1000
Bottom Elevation (ft): 995
Contributing Area (acres): 2.74
Percent of Sub-Area (%): 91.9
Overland Type: Valley
Map Slope: 0.0216
Effective Slope: 0.0216
Q for Flow Path (cfs): 12.44
Q Top (cfs): 1.09
Q Bottom (cfs): 13.53
Velocity Top (ft/s): 2.24
Velocity Bottom (ft/s): 3.97
Avg Velocity (ft/s): 3.11
Wave Velocity (ft/s): 4.66
Tc for frequency = 100.00: 2.834 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 2.834 min. = 3 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 13A
Total Area (ac): 2.98
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 13
SUB AREA OUTPUT
---
Intensity (in/hr): 5.440
C Total: 0.765
Sum Q Segments (cfs): 12.40

Q Total (cfs): 12.40
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 170.06
Time of Concentration (min): 2.834
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 13A1
FLOW PATH TRAVEL TIME (min): 1.9910
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1000
Contributing Area (acres): 0.24
Percent of Sub-Area (%): 8.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1900
Effective Slope: 0.1544
Q for Flow Path (cfs): 1.00
Avg Velocity (ft/s): 1.67
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.15
DATA FOR FLOW PATH 2
---
Flow Path Name: 13A2
FLOW PATH TRAVEL TIME (min): 0.8433
Flow Type: Natural Channel
Length (ft): 231.1
Top Elevation (ft): 1000
Bottom Elevation (ft): 995
Contributing Area (acres): 2.74
Percent of Sub-Area (%): 91.9
Overland Type: Valley
Map Slope: 0.0216
Effective Slope: 0.0216
Q for Flow Path (cfs): 11.40
Q Top (cfs): 1.00
Q Bottom (cfs): 12.40
Velocity Top (ft/s): 2.21
Velocity Bottom (ft/s): 3.88
Avg Velocity (ft/s): 3.05
Wave Velocity (ft/s): 4.57

---
Sub-Area Name: 20A

Computing Tc for all rainfall frequencies for sub-area 20A...
---
Tc for frequency = 10.00: 8.308 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 8.308 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A
Total Area (ac): 6.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.865
C Total: 0.821
Sum Q Segments (cfs): 15.48
Q Total (cfs): 15.48
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 498.48
Time of Concentration (min): 8.308
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 6.2813
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 52.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 8.14
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.12
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 2.0267
Flow Type: Natural Channel

Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 47.4
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 7.34
Q Top (cfs): 8.14
Q Bottom (cfs): 15.48
Velocity Top (ft/s): 3.63
Velocity Bottom (ft/s): 4.49
Avg Velocity (ft/s): 4.06
Wave Velocity (ft/s): 6.09
🠉
Tc for frequency = 25.00: 8.092 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 8.092 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A
Total Area (ac): 6.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.191
C Total: 0.837
Sum Q Segments (cfs): 17.58
Q Total (cfs): 17.58
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 485.52
Time of Concentration (min): 8.092
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 6.1491
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46

Percent of Sub-Area (%): 52.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 9.24
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.34
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.9428
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 47.4
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 8.33
Q Top (cfs): 9.24
Q Bottom (cfs): 17.58
Velocity Top (ft/s): 3.78
Velocity Bottom (ft/s): 4.69
Avg Velocity (ft/s): 4.23
Wave Velocity (ft/s): 6.35
Tc for frequency = 50.00: 7.917 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 7.917 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A
Total Area (ac): 6.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.525
C Total: 0.851
Sum Q Segments (cfs): 19.74

Q Total (cfs): 19.74
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 474.99
Time of Concentration (min): 7.917
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 6.0473
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 52.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 10.38
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.58
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.8693
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 47.4
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 9.36
Q Top (cfs): 10.38
Q Bottom (cfs): 19.74
Velocity Top (ft/s): 3.93
Velocity Bottom (ft/s): 4.87
Avg Velocity (ft/s): 4.40
Wave Velocity (ft/s): 6.60
🠉
Tc for frequency = 100.00: 7.232 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 7.232 min. = 7 min.
---
SUB AREA INPUT DATA

---
Sub Area Name: 20A
Total Area (ac): 6.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 4.226
C Total: 0.873
Sum Q Segments (cfs): 24.27
Q Total (cfs): 24.27
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 433.93
Time of Concentration (min): 7.232
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 5.4873
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 52.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 12.76
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.95
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.7448
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 47.4
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038

Q for Flow Path (cfs): 11.51
Q Top (cfs): 12.76
Q Bottom (cfs): 24.27
Velocity Top (ft/s): 4.21
Velocity Bottom (ft/s): 5.22
Avg Velocity (ft/s): 4.71
Wave Velocity (ft/s): 7.07

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 21A
Computing Tc for all rainfall frequencies for sub-area 21A...

---

Tc for frequency = 10.00: 7.988 Minutes
DATA FOR SUB AREA 11

---

SUB AREA TIME OF CONCENTRATION: 7.988 min. = 8 min.

---

SUB AREA INPUT DATA

---

Sub Area Name: 21A
Total Area (ac): 3.36
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 1
SUB AREA OUTPUT

---

Intensity (in/hr): 2.865
C Total: 0.822
Sum Q Segments (cfs): 7.92
Q Total (cfs): 7.92
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 479.25
Time of Concentration (min): 7.988

---

DATA FOR FLOW PATH 1

---

Flow Path Name: 21C1
FLOW PATH TRAVEL TIME (min): 4.7519
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.24

Percent of Sub-Area (%): 7.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.57
Avg Velocity (ft/s): 0.70
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.40
DATA FOR FLOW PATH 2
---
Flow Path Name: 21C2
FLOW PATH TRAVEL TIME (min): 3.2357
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 92.9
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 7.35
Q Top (cfs): 0.57
Q Bottom (cfs): 7.92
Velocity Top (ft/s): 1.49
Velocity Bottom (ft/s): 3.59
Avg Velocity (ft/s): 2.54
Wave Velocity (ft/s): 3.81
🠉
Tc for frequency = 25.00: 7.030 Minutes
DATA FOR SUB AREA 11
---
SUB AREA TIME OF CONCENTRATION: 7.030 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 21A
Total Area (ac): 3.36
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 1
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.849
Sum Q Segments (cfs): 9.85

Q Total (cfs): 9.85
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 421.81
Time of Concentration (min): 7.030
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21C1
FLOW PATH TRAVEL TIME (min): 4.0220
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.24
Percent of Sub-Area (%): 7.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.70
Avg Velocity (ft/s): 0.83
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.50
DATA FOR FLOW PATH 2
---
Flow Path Name: 21C2
FLOW PATH TRAVEL TIME (min): 3.0082
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 92.9
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 9.15
Q Top (cfs): 0.70
Q Bottom (cfs): 9.85
Velocity Top (ft/s): 1.60
Velocity Bottom (ft/s): 3.86
Avg Velocity (ft/s): 2.73
Wave Velocity (ft/s): 4.10
Tc for frequency = 50.00: 6.399 Minutes
DATA FOR SUB AREA 11
---
SUB AREA TIME OF CONCENTRATION: 6.399 min. = 6 min.
---
SUB AREA INPUT DATA

---
Sub Area Name: 21A
Total Area (ac): 3.36
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 1
SUB AREA OUTPUT
---
Intensity (in/hr): 4.100
C Total: 0.871
Sum Q Segments (cfs): 12.00
Q Total (cfs): 12.00
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 383.96
Time of Concentration (min): 6.399
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21C1
FLOW PATH TRAVEL TIME (min): 3.5820
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.24
Percent of Sub-Area (%): 7.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.86
Avg Velocity (ft/s): 0.93
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.60
DATA FOR FLOW PATH 2
---
Flow Path Name: 21C2
FLOW PATH TRAVEL TIME (min): 2.8173
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 92.9
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038

Q for Flow Path (cfs): 11.14
Q Top (cfs): 0.86
Q Bottom (cfs): 12.00
Velocity Top (ft/s): 1.71
Velocity Bottom (ft/s): 4.13
Avg Velocity (ft/s): 2.92
Wave Velocity (ft/s): 4.38

Tc for frequency = 100.00: 5.632 Minutes
DATA FOR SUB AREA 11
---
SUB AREA TIME OF CONCENTRATION: 5.632 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 21A
Total Area (ac): 3.36
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 1
SUB AREA OUTPUT
---
Intensity (in/hr): 4.590
C Total: 0.882
Sum Q Segments (cfs): 13.60
Q Total (cfs): 13.60
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 337.92
Time of Concentration (min): 5.632
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21C1
FLOW PATH TRAVEL TIME (min): 2.9297
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.24
Percent of Sub-Area (%): 7.1
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.97
Avg Velocity (ft/s): 1.14
Passed Scour Check: YES

Scour Velocity (ft/sec): 1.67
DATA FOR FLOW PATH 2
---
Flow Path Name: 21C2
FLOW PATH TRAVEL TIME (min): 2.7024
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 3.12
Percent of Sub-Area (%): 92.9
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 12.63
Q Top (cfs): 0.97
Q Bottom (cfs): 13.60
Velocity Top (ft/s): 1.79
Velocity Bottom (ft/s): 4.30
Avg Velocity (ft/s): 3.04
Wave Velocity (ft/s): 4.57
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 30A
Computing Tc for all rainfall frequencies for sub-area 30A...
---
Tc for frequency = 10.00: 8.589 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 8.589 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 30A
Total Area (ac): 5.73
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 26
SUB AREA OUTPUT
---
Intensity (in/hr): 2.680
C Total: 0.847
Sum Q Segments (cfs): 13.00

Q Total (cfs): 13.00
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 515.36
Time of Concentration (min): 8.589
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 6.1663
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.32
Percent of Sub-Area (%): 5.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 0.73
Avg Velocity (ft/s): 0.54
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.25
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 2.4230
Flow Type: Natural Channel
Length (ft): 561.5
Top Elevation (ft): 1028
Bottom Elevation (ft): 983
Contributing Area (acres): 5.41
Percent of Sub-Area (%): 94.4
Overland Type: Mountain
Map Slope: 0.0801
Effective Slope: 0.0801
Q for Flow Path (cfs): 12.28
Q Top (cfs): 0.73
Q Bottom (cfs): 13.00
Velocity Top (ft/s): 1.43
Velocity Bottom (ft/s): 3.72
Avg Velocity (ft/s): 2.57
Wave Velocity (ft/s): 3.86
Tc for frequency = 25.00: 7.230 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 7.230 min. = 7 min.
---
SUB AREA INPUT DATA

---
Sub Area Name: 30A
Total Area (ac): 5.73
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 26
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.875
Sum Q Segments (cfs): 17.31
Q Total (cfs): 17.31
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 433.78
Time of Concentration (min): 7.230
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 5.0270
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.32
Percent of Sub-Area (%): 5.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 0.97
Avg Velocity (ft/s): 0.66
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.37
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 2.2027
Flow Type: Natural Channel
Length (ft): 561.5
Top Elevation (ft): 1028
Bottom Elevation (ft): 983
Contributing Area (acres): 5.41
Percent of Sub-Area (%): 94.4
Overland Type: Mountain
Map Slope: 0.0801
Effective Slope: 0.0801

Q for Flow Path (cfs): 16.34
Q Top (cfs): 0.97
Q Bottom (cfs): 17.31
Velocity Top (ft/s): 1.57
Velocity Bottom (ft/s): 4.10
Avg Velocity (ft/s): 2.83
Wave Velocity (ft/s): 4.25

Tc for frequency = 50.00: 6.512 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 6.512 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 30A
Total Area (ac): 5.73
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 26
SUB AREA OUTPUT
---
Intensity (in/hr): 3.771
C Total: 0.883
Sum Q Segments (cfs): 19.09
Q Total (cfs): 19.09
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 390.72
Time of Concentration (min): 6.512
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 4.3798
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.32
Percent of Sub-Area (%): 5.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 1.07
Avg Velocity (ft/s): 0.76
Passed Scour Check: YES

Scour Velocity (ft/sec): 1.42
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 2.1322
Flow Type: Natural Channel
Length (ft): 561.5
Top Elevation (ft): 1028
Bottom Elevation (ft): 983
Contributing Area (acres): 5.41
Percent of Sub-Area (%): 94.4
Overland Type: Mountain
Map Slope: 0.0801
Effective Slope: 0.0801
Q for Flow Path (cfs): 18.02
Q Top (cfs): 1.07
Q Bottom (cfs): 19.09
Velocity Top (ft/s): 1.62
Velocity Bottom (ft/s): 4.23
Avg Velocity (ft/s): 2.93
Wave Velocity (ft/s): 4.39
Tc for frequency = 100.00: 5.358 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 5.358 min. = 5 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 30A
Total Area (ac): 5.73
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 26
SUB AREA OUTPUT
---
Intensity (in/hr): 5.100
C Total: 0.907
Sum Q Segments (cfs): 26.49
Q Total (cfs): 26.49
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 321.51
Time of Concentration (min): 5.358
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1

FLOW PATH TRAVEL TIME (min): 3.4468
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.32
Percent of Sub-Area (%): 5.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 1.48
Avg Velocity (ft/s): 0.97
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.57
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 1.9117
Flow Type: Natural Channel
Length (ft): 561.5
Top Elevation (ft): 1028
Bottom Elevation (ft): 983
Contributing Area (acres): 5.41
Percent of Sub-Area (%): 94.4
Overland Type: Mountain
Map Slope: 0.0801
Effective Slope: 0.0801
Q for Flow Path (cfs): 25.01
Q Top (cfs): 1.48
Q Bottom (cfs): 26.49
Velocity Top (ft/s): 1.81
Velocity Bottom (ft/s): 4.72
Avg Velocity (ft/s): 3.26
Wave Velocity (ft/s): 4.90

---
Sub-Area Name: 40A
Computing Tc for all rainfall frequencies for sub-area 40A...
---
Tc for frequency = 10.00: 9.522 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 9.522 min. = 10 min.
---
SUB AREA INPUT DATA

---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.524
C Total: 0.801
Sum Q Segments (cfs): 12.72
Q Total (cfs): 12.72
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 571.31
Time of Concentration (min): 9.522
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 9.5218
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 12.72
Avg Velocity (ft/s): 1.33
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.12
🠉
Tc for frequency = 25.00: 8.723 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 8.723 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25

Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.987
C Total: 0.828
Sum Q Segments (cfs): 15.56
Q Total (cfs): 15.56
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 523.38
Time of Concentration (min): 8.723
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 8.7230
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 15.56
Avg Velocity (ft/s): 1.45
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.46
Tc for frequency = 50.00: 8.174 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 8.174 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.525

C Total: 0.851
Sum Q Segments (cfs): 18.87
Q Total (cfs): 18.87
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 490.47
Time of Concentration (min): 8.174
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 8.1745
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 18.87
Avg Velocity (ft/s): 1.54
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.84
Tc for frequency = 100.00: 7.228 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 7.228 min. = 7 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.953
C Total: 0.866
Sum Q Segments (cfs): 0.00
Q Total (cfs): 20.20
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 7.228

---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 20.20
Avg Velocity (ft/s): 6.10
Passed Scour Check: No
Scour Velocity (ft/sec): 6.10
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 41A
Computing Tc for all rainfall frequencies for sub-area 41A...
---
Tc for frequency = 10.00: 9.011 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 9.011 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 41A
Total Area (ac): 4.8
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 7
SUB AREA OUTPUT
---
Intensity (in/hr): 2.680
C Total: 0.820
Sum Q Segments (cfs): 10.55
Q Total (cfs): 10.55
Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 540.68
Time of Concentration (min): 9.011
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 41A1
FLOW PATH TRAVEL TIME (min): 6.1663
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.43
Percent of Sub-Area (%): 9.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 0.95
Avg Velocity (ft/s): 0.54
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.37
DATA FOR FLOW PATH 2
---
Flow Path Name: 41A2
FLOW PATH TRAVEL TIME (min): 2.8449
Flow Type: Natural Channel
Length (ft): 628.6
Top Elevation (ft): 1028
Bottom Elevation (ft): 980
Contributing Area (acres): 4.37
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0764
Effective Slope: 0.0764
Q for Flow Path (cfs): 9.61
Q Top (cfs): 0.95
Q Bottom (cfs): 10.55
Velocity Top (ft/s): 1.52
Velocity Bottom (ft/s): 3.39
Avg Velocity (ft/s): 2.46
Wave Velocity (ft/s): 3.68
♠
Tc for frequency = 25.00: 7.685 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 7.685 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 41A

Total Area (ac): 4.8
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 7
SUB AREA OUTPUT
---
Intensity (in/hr): 3.191
C Total: 0.845
Sum Q Segments (cfs): 12.94
Q Total (cfs): 12.94
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 461.09
Time of Concentration (min): 7.685
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 41A1
FLOW PATH TRAVEL TIME (min): 5.0270
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.43
Percent of Sub-Area (%): 9.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 1.16
Avg Velocity (ft/s): 0.66
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.46
DATA FOR FLOW PATH 2
---
Flow Path Name: 41A2
FLOW PATH TRAVEL TIME (min): 2.6578
Flow Type: Natural Channel
Length (ft): 628.6
Top Elevation (ft): 1028
Bottom Elevation (ft): 980
Contributing Area (acres): 4.37
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0764
Effective Slope: 0.0764
Q for Flow Path (cfs): 11.78
Q Top (cfs): 1.16

Q Bottom (cfs): 12.94
Velocity Top (ft/s): 1.63
Velocity Bottom (ft/s): 3.63
Avg Velocity (ft/s): 2.63
Wave Velocity (ft/s): 3.94

Tc for frequency = 50.00: 6.873 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 6.873 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 41A
Total Area (ac): 4.8
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 7
SUB AREA OUTPUT
---
Intensity (in/hr): 3.771
C Total: 0.866
Sum Q Segments (cfs): 15.68
Q Total (cfs): 15.68
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 412.39
Time of Concentration (min): 6.873
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 41A1
FLOW PATH TRAVEL TIME (min): 4.3798
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.43
Percent of Sub-Area (%): 9.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 1.40
Avg Velocity (ft/s): 0.76
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.56
DATA FOR FLOW PATH 2

---
Flow Path Name: 41A2
FLOW PATH TRAVEL TIME (min): 2.4934
Flow Type: Natural Channel
Length (ft): 628.6
Top Elevation (ft): 1028
Bottom Elevation (ft): 980
Contributing Area (acres): 4.37
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0764
Effective Slope: 0.0764
Q for Flow Path (cfs): 14.27
Q Top (cfs): 1.40
Q Bottom (cfs): 15.68
Velocity Top (ft/s): 1.73
Velocity Bottom (ft/s): 3.87
Avg Velocity (ft/s): 2.80
Wave Velocity (ft/s): 4.20
Tc for frequency = 100.00: 5.765 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 5.765 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 41A
Total Area (ac): 4.8
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 7
SUB AREA OUTPUT
---
Intensity (in/hr): 4.590
C Total: 0.886
Sum Q Segments (cfs): 19.52
Q Total (cfs): 19.52
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 345.89
Time of Concentration (min): 5.765
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 41A1
FLOW PATH TRAVEL TIME (min): 3.4468
Flow Type: Overland

Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1028
Contributing Area (acres): 0.43
Percent of Sub-Area (%): 9.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0650
Effective Slope: 0.0650
Q for Flow Path (cfs): 1.75
Avg Velocity (ft/s): 0.97
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.67
DATA FOR FLOW PATH 2
---
Flow Path Name: 41A2
FLOW PATH TRAVEL TIME (min): 2.3181
Flow Type: Natural Channel
Length (ft): 628.6
Top Elevation (ft): 1028
Bottom Elevation (ft): 980
Contributing Area (acres): 4.37
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0764
Effective Slope: 0.0764
Q for Flow Path (cfs): 17.77
Q Top (cfs): 1.75
Q Bottom (cfs): 19.52
Velocity Top (ft/s): 1.86
Velocity Bottom (ft/s): 4.16
Avg Velocity (ft/s): 3.01
Wave Velocity (ft/s): 4.52
↟
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 50A
Computing Tc for all rainfall frequencies for sub-area 50A...
---
Tc for frequency = 10.00: 12.000 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 12.000 min. = 12 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A

Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.289
C Total: 0.784
Sum Q Segments (cfs): 55.88
Q Total (cfs): 55.88
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 720.01
Time of Concentration (min): 12.000
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 8.5193
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 14.27
Avg Velocity (ft/s): 1.61
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.67
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.8201
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 26.52
Q Top (cfs): 14.27

Q Bottom (cfs): 40.79
Velocity Top (ft/s): 4.97
Velocity Bottom (ft/s): 7.04
Avg Velocity (ft/s): 6.00
Wave Velocity (ft/s): 9.01
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.6608
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 15.09
Q Top (cfs): 40.79
Q Bottom (cfs): 55.88
Velocity Top (ft/s): 4.43
Velocity Bottom (ft/s): 4.92
Avg Velocity (ft/s): 4.68
Wave Velocity (ft/s): 7.01
Tc for frequency = 25.00: 11.333 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 11.333 min. = 11 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A
Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.657
C Total: 0.809
Sum Q Segments (cfs): 0.00
Q Total (cfs): 63.28
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 11.333

---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 16.16
Avg Velocity (ft/s): 6.01
Passed Scour Check: No
Scour Velocity (ft/sec): 6.01
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.7462
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 30.04
Q Top (cfs): 16.16
Q Bottom (cfs): 46.19
Velocity Top (ft/s): 5.17
Velocity Bottom (ft/s): 7.34
Avg Velocity (ft/s): 6.26
Wave Velocity (ft/s): 9.39
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.5934
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain

Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 17.09
Q Top (cfs): 46.19
Q Bottom (cfs): 63.28
Velocity Top (ft/s): 4.62
Velocity Bottom (ft/s): 5.13
Avg Velocity (ft/s): 4.87
Wave Velocity (ft/s): 7.31
Tc for frequency = 50.00: 10.953 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 10.953 min. = 11 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A
Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.624
C Total: 0.807
Sum Q Segments (cfs): 0.00
Q Total (cfs): 63.53
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 10.953
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 16.22

Avg Velocity (ft/s): 6.02
Passed Scour Check: No
Scour Velocity (ft/sec): 6.02
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.7439
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 30.16
Q Top (cfs): 16.22
Q Bottom (cfs): 46.38
Velocity Top (ft/s): 5.18
Velocity Bottom (ft/s): 7.35
Avg Velocity (ft/s): 6.27
Wave Velocity (ft/s): 9.40
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.5913
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 17.16
Q Top (cfs): 46.38
Q Bottom (cfs): 63.53
Velocity Top (ft/s): 4.62
Velocity Bottom (ft/s): 5.13
Avg Velocity (ft/s): 4.88
Wave Velocity (ft/s): 7.32
Tc for frequency = 100.00: 10.113 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 10.113 min. = 10 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA

---
Sub Area Name: 50A
Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.790
C Total: 0.817
Sum Q Segments (cfs): 0.00
Q Total (cfs): 68.34
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 10.113
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 17.45
Avg Velocity (ft/s): 6.17
Passed Scour Check: No
Scour Velocity (ft/sec): 6.17
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.7020
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339

Q for Flow Path (cfs): 32.44
Q Top (cfs): 17.45
Q Bottom (cfs): 49.89
Velocity Top (ft/s): 5.31
Velocity Bottom (ft/s): 7.53
Avg Velocity (ft/s): 6.42
Wave Velocity (ft/s): 9.63
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.5531
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 18.46
Q Top (cfs): 49.89
Q Bottom (cfs): 68.34
Velocity Top (ft/s): 4.74
Velocity Bottom (ft/s): 5.26
Avg Velocity (ft/s): 5.00
Wave Velocity (ft/s): 7.50
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 51A
Computing Tc for all rainfall frequencies for sub-area 51A...
---
Tc for frequency = 10.00: 18.298 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 18.298 min. = 18 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 5.09
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00

Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 1.863
C Total: 0.748
Sum Q Segments (cfs): 7.09
Q Total (cfs): 7.09
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 1,097.85
Time of Concentration (min): 18.298
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 16.9441
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.7
Percent of Sub-Area (%): 53.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 3.76
Avg Velocity (ft/s): 0.55
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.29
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.3535
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.39
Percent of Sub-Area (%): 47.0
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 3.33
Q Top (cfs): 3.76
Q Bottom (cfs): 7.09
Velocity Top (ft/s): 4.36
Velocity Bottom (ft/s): 5.07
Avg Velocity (ft/s): 4.71
Wave Velocity (ft/s): 7.07


Tc for frequency = 25.00: 15.133 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 15.133 min. = 15 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 5.09
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.256
C Total: 0.781
Sum Q Segments (cfs): 8.97
Q Total (cfs): 8.97
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 908.00
Time of Concentration (min): 15.133
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 13.8542
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.7
Percent of Sub-Area (%): 53.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 4.76
Avg Velocity (ft/s): 0.67
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.42
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.2791
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008

Bottom Elevation (ft): 980
Contributing Area (acres): 2.39
Percent of Sub-Area (%): 47.0
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 4.21
Q Top (cfs): 4.76
Q Bottom (cfs): 8.97
Velocity Top (ft/s): 4.61
Velocity Bottom (ft/s): 5.37
Avg Velocity (ft/s): 4.99
Wave Velocity (ft/s): 7.48

Tc for frequency = 50.00: 13.290 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 13.290 min. = 13 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 5.09
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.802
C Total: 0.818
Sum Q Segments (cfs): 11.66
Q Total (cfs): 11.66
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 797.41
Time of Concentration (min): 13.290
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 12.0909
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.7
Percent of Sub-Area (%): 53.0
Overland Type: Mountain

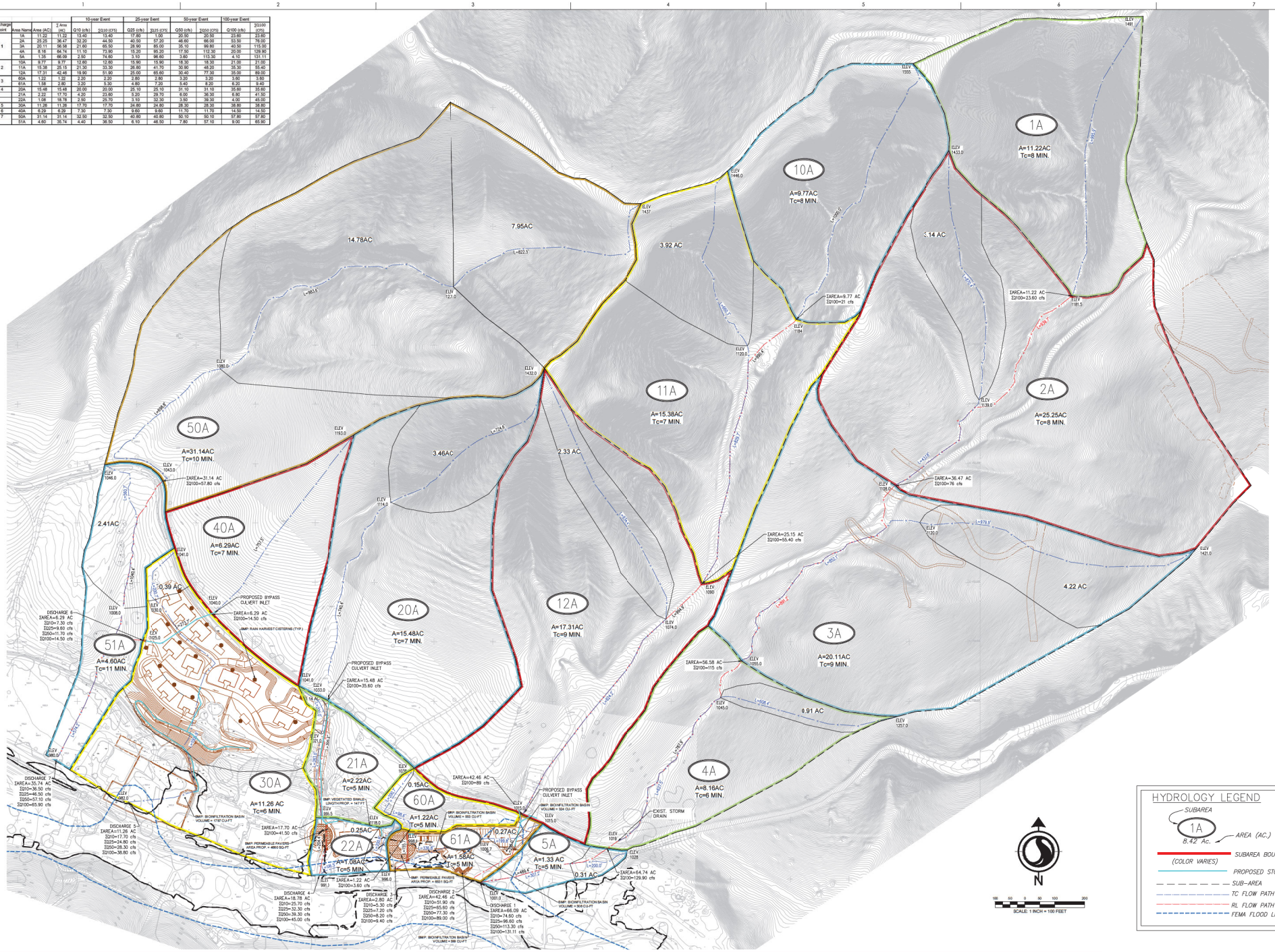
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 6.19
Avg Velocity (ft/s): 0.77
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.64
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.1992
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.39
Percent of Sub-Area (%): 47.0
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 5.48
Q Top (cfs): 6.19
Q Bottom (cfs): 11.66
Velocity Top (ft/s): 4.90
Velocity Bottom (ft/s): 5.74
Avg Velocity (ft/s): 5.32
Wave Velocity (ft/s): 7.98
Tc for frequency = 100.00: 10.678 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 10.678 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 5.09
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.387
C Total: 0.845
Sum Q Segments (cfs): 14.57
Q Total (cfs): 14.57
Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 640.68
Time of Concentration (min): 10.678
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 9.5445
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.7
Percent of Sub-Area (%): 53.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 7.73
Avg Velocity (ft/s): 0.98
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.83
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.1335
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.39
Percent of Sub-Area (%): 47.0
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 6.84
Q Top (cfs): 7.73
Q Bottom (cfs): 14.57
Velocity Top (ft/s): 5.17
Velocity Bottom (ft/s): 6.08
Avg Velocity (ft/s): 5.63
Wave Velocity (ft/s): 8.44

# APPENDIX C

## DEVELOPED CONDITION HYDROLOGY CALCULATIONS
## AND
## MAP 2: DEVELOPED CONDITION HYDROLOGY MAP

| Discharge Point | Area Name | Area (AC) | Σ Area (AC) | 10-year Event Q10 (cfs) | 10-year Event ΣQ10 (CFS) | 25-year Event Q25 (cfs) | 25-year Event ΣQ25 (CFS) | 50-year Event Q50 (cfs) | 50-year Event ΣQ50 (CFS) | 100-year Event Q100 (cfs) | 100-year Event ΣQ100 (CFS) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1A | 11.22 | 11.22 | 13.40 | 13.40 | 17.80 | 1.00 | 20.50 | 20.50 | 23.60 | 23.60 |
| | 2A | 25.25 | 36.47 | 32.20 | 44.50 | 40.50 | 57.20 | 46.60 | 66.00 | 53.50 | 76.00 |
| | 3A | 20.11 | 56.58 | 21.60 | 65.50 | 28.90 | 85.00 | 35.10 | 99.80 | 40.50 | 115.00 |
| | 4A | 8.16 | 64.74 | 11.10 | 73.90 | 15.20 | 95.20 | 17.50 | 112.30 | 20.00 | 129.90 |
| | 5A | 1.35 | 66.09 | 2.50 | 74.60 | 3.10 | 96.60 | 3.60 | 113.30 | 4.10 | 131.11 |
| 2 | 10A | 9.77 | 9.77 | 12.60 | 12.60 | 15.90 | 15.90 | 18.30 | 18.30 | 21.00 | 21.00 |
| | 11A | 15.38 | 25.15 | 21.30 | 33.30 | 26.80 | 41.70 | 30.90 | 48.20 | 35.30 | 55.40 |
| | 12A | 17.31 | 42.46 | 19.90 | 51.90 | 25.00 | 65.60 | 30.40 | 77.30 | 35.00 | 89.00 |
| 3 | 60A | 1.22 | 1.22 | 2.20 | 2.20 | 2.80 | 2.80 | 3.20 | 3.20 | 3.60 | 3.60 |
| 4 | 61A | 1.58 | 2.80 | 3.20 | 5.30 | 4.80 | 7.20 | 5.40 | 8.20 | 6.20 | 9.40 |
| | 30A | 15.48 | 15.48 | 20.00 | 20.00 | 25.10 | 25.10 | 31.10 | 31.10 | 35.60 | 35.60 |
| | 21A | 2.22 | 17.70 | 4.20 | 23.60 | 5.20 | 29.70 | 6.00 | 36.30 | 6.80 | 41.50 |
| | 22A | 1.08 | 18.78 | 2.50 | 25.70 | 3.10 | 32.30 | 3.50 | 39.30 | 4.00 | 45.00 |
| 5 | 30A | 11.26 | 11.26 | 17.70 | 17.70 | 24.80 | 24.80 | 28.30 | 28.30 | 38.80 | 38.80 |
| 6 | 40A | 6.29 | 6.29 | 7.30 | 7.30 | 9.60 | 9.60 | 11.70 | 11.70 | 14.50 | 14.50 |
| 7 | 50A | 31.14 | 31.14 | 32.50 | 32.50 | 40.80 | 40.80 | 50.10 | 50.10 | 57.80 | 57.80 |
| | 51A | 4.60 | 35.74 | 4.40 | 36.50 | 6.10 | 46.50 | 7.80 | 57.10 | 9.00 | 65.90 |




Notes

Revision | By | Appd | YYYY.MM.DD

Issued | By | Appd | YYYY.MM.DD

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Consultant

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File Name: 214000C-EXTSD | Dsn. | Dsgn. | Chkd. | YYYY.MM.DD | 07/29/2022

Client/Project Logo

Client/Project
AMERICAN JEWISH UNIVERSITY-
BRANDEIS-BARDIN CAMPUS

CAMP ALONIM
MODIFICATION TO C.U.P. 1776

1101 PEPPERTREE LANE, BRANDEIS, CA 93064

Title
PROPOSED CONDITION
HYDROLOGY MAP

Project No.
000000000

Scale

Revision | Sheet
of 1

Drawing No.

C:\Users\chris.lindsey\ENG\Desktop\Camp\Exhibit\Exhibit.dwg
Plotted: 7/29/2022 By: CHRIS.LINDSEY
ORIGINAL SHEET - ARCH E

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A50     8    0     98    183       98     183   1153    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A50     7    0    154    309      252     482   1154    VALLEY
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A50     9    0    173    304      425     773   1155    PIPE
 296  0.06400     5.25  ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   12A
------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     425    acres
            HYDROGRAPH PEAK:              773    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             26.17 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050      20.45  1100      59.35  1110      93.56  1120
123.19
     1130     129.64  1131     130.85  1132     131.67  1133     133.30  1134
135.06
     1135     137.13  1136     138.66  1137     140.72  1138     142.70  1139
143.83
     1140     144.40  1141     150.11  1142     156.94  1143     166.31  1144
177.49
     1145     197.73  1146     220.29  1147     247.17  1148     276.98  1149
336.92
     1150     409.59  1151     501.18  1152     600.48  1153     700.73  1154
```

752.58
1155 772.69 1156 755.77 1157 708.16 1158 614.80 1159
515.15
1160 412.09 1161 314.91 1162 229.94 1163 188.50 1164
161.18
1165 143.32 1166 130.29 1167 119.64 1168 110.50 1169
102.38
1170 94.37 1171 86.84 1172 79.18 1173 72.95 1174
70.90
1175 68.25 1176 67.00 1177 64.90 1178 61.90 1179
58.19
1180 54.22 1181 50.96 1182 47.22 1183 42.05 1184
38.14
1185 33.78 1186 31.92 1187 30.51 1188 29.39 1189
27.24
1190 25.04 1191 21.89 1192 19.84 1193 16.31 1194
14.41
1195 11.02 1196 8.83 1197 6.74 1198 5.45 1199
4.42
1200 3.57 1201 2.86 1202 2.27 1203 1.80 1204
1.43
1205 1.15 1206 0.94 1207 0.79 1208 0.67 1209
0.59
1210 0.53 1211 0.49 1212 0.46 1213 0.44 1214
0.43
1215 0.42 1216 0.41 1217 0.41 1218 0.41 1219
0.40
1220 0.40 1221 0.40 1222 0.40 1223 0.40 1224
0.40
1225 0.40 1226 0.40 1227 0.40 1228 0.40 1229
0.40
1230 0.40 1231 0.40 1232 0.40 1233 0.40 1234
0.40
1235 0.40 1236 0.40 1237 0.40 1238 0.40 1239
0.40
1240 0.40 1241 0.40 1242 0.40 1243 0.40 1244
0.40
1245 0.40 1246 0.40 1247 0.40 1248 0.40 1249
0.40
1250 0.40 1251 0.40 1252 0.40 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40
1270 0.40 1271 0.40 1272 0.40 1273 0.40 1274
0.40
1275 0.40 1276 0.40 1277 0.40 1278 0.40 1279

```
0.40
     1280       0.40  1281       0.40  1282       0.40  1283       0.40  1284
0.40
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  010A Header place holder
005     1  012A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97200995007500
006     1  012A 020000017309A97400296006400                  1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A100    8    0     98    210       98     210   1153    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A100    7    0    154    353      252     554   1154    VALLEY
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A100    9    0    173    350      425     890   1155    PIPE
 296  0.06400     5.50  ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


------------------------------------------------------------------------------
------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   12A
------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     425    acres
            HYDROGRAPH PEAK:              890    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             33.16 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       7.46  1050      34.10  1100      78.50  1110     118.26  1120
149.90
     1130     156.86  1131     158.25  1132     159.91  1133     161.28  1134
163.24
     1135     165.26  1136     167.50  1137     169.84  1138     171.52  1139
173.26
     1140     173.65  1141     179.68  1142     188.58  1143     199.42  1144
211.91
     1145     233.70  1146     260.02  1147     291.75  1148     324.73  1149
394.78
     1150     479.20  1151     583.97  1152     698.08  1153     812.11  1154
```

869.80
1155 889.79 1156 867.66 1157 811.60 1158 703.29 1159
589.30
1160 472.08 1161 360.22 1162 265.36 1163 218.50 1164
188.76
1165 170.16 1166 155.60 1167 144.46 1168 134.71 1169
125.75
1170 117.50 1171 109.30 1172 100.13 1173 93.23 1174
90.51
1175 88.66 1176 87.04 1177 84.17 1178 81.31 1179
77.29
1180 72.31 1181 68.53 1182 63.55 1183 57.99 1184
53.61
1185 48.16 1186 46.08 1187 45.19 1188 43.50 1189
41.48
1190 39.13 1191 35.82 1192 32.98 1193 29.18 1194
26.17
1195 22.79 1196 18.61 1197 15.32 1198 13.70 1199
12.27
1200 11.05 1201 10.23 1202 9.69 1203 9.21 1204
8.71
1205 8.25 1206 8.15 1207 8.20 1208 7.40 1209
7.80
1210 7.68 1211 7.77 1212 7.93 1213 7.20 1214
7.66
1215 7.60 1216 7.67 1217 7.87 1218 7.80 1219
7.64
1220 7.70 1221 7.92 1222 8.02 1223 7.92 1224
7.73
1225 5.88 1226 4.75 1227 4.36 1228 3.74 1229
3.15
1230 2.70 1231 2.32 1232 1.98 1233 1.68 1234
1.42
1235 1.21 1236 1.03 1237 0.89 1238 0.77 1239
0.68
1240 0.62 1241 0.56 1242 0.52 1243 0.49 1244
0.47
1245 0.45 1246 0.44 1247 0.43 1248 0.42 1249
0.41
1250 0.41 1251 0.41 1252 0.41 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40
1270 0.40 1271 0.40 1272 0.40 1273 0.40 1274
0.40
1275 0.40 1276 0.40 1277 0.40 1278 0.40 1279

```
0.40
     1280       0.40  1281       0.40  1282       0.40  1283       0.40  1284
0.40
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  010A Header place holder
005     1  012A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97200995007500
006     1  012A 020000017309A97400296006400                  1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      60A :  Subarea
      60A   020   A10     5   10     12     22       12      22   1153    VALLEY
 156  0.01300    ---     ----    -----  -----    --     --
      61A :  Subarea
      61A   020   A10     7   46     16     32       28      53   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   61A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:      28    acres
            HYDROGRAPH PEAK:               53    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              4.27 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.17   200       1.17   300       1.17   400
1.17
      500       1.17   600       1.28   700       1.60   800       1.61   900
1.89
     1000       2.39  1050       2.96  1100       4.79  1110       6.85  1120
8.46
     1130       8.63  1131       8.70  1132       8.78  1133       8.89  1134
9.10
     1135       9.24  1136       9.39  1137       9.49  1138       9.50  1139
9.61
     1140       9.61  1141      10.05  1142      10.87  1143      11.80  1144
12.78
     1145      14.74  1146      16.72  1147      18.89  1148      20.40  1149
25.49
     1150      31.88  1151      39.02  1152      45.27  1153      51.61  1154
53.20
     1155      51.13  1156      43.32  1157      35.21  1158      27.18  1159
19.47
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1160 | 12.70 | 1161 | 10.27 | 1162 | 9.08 | 1163 | 8.89 | 1164 |
| 8.70 | | | | | | | | |
| 1165 | 8.22 | 1166 | 7.67 | 1167 | 7.26 | 1168 | 6.75 | 1169 |
| 6.21 | | | | | | | | |
| 1170 | 5.65 | 1171 | 5.20 | 1172 | 5.16 | 1173 | 5.12 | 1174 |
| 5.08 | | | | | | | | |
| 1175 | 5.09 | 1176 | 5.10 | 1177 | 4.87 | 1178 | 4.63 | 1179 |
| 4.34 | | | | | | | | |
| 1180 | 4.10 | 1181 | 3.64 | 1182 | 3.34 | 1183 | 3.20 | 1184 |
| 3.10 | | | | | | | | |
| 1185 | 3.09 | 1186 | 3.08 | 1187 | 3.07 | 1188 | 3.07 | 1189 |
| 3.01 | | | | | | | | |
| 1190 | 2.82 | 1191 | 2.75 | 1192 | 2.69 | 1193 | 2.62 | 1194 |
| 2.44 | | | | | | | | |
| 1195 | 2.38 | 1196 | 2.38 | 1197 | 2.44 | 1198 | 2.38 | 1199 |
| 2.38 | | | | | | | | |
| 1200 | 2.38 | 1201 | 2.44 | 1202 | 2.38 | 1203 | 2.38 | 1204 |
| 2.38 | | | | | | | | |
| 1205 | 2.44 | 1206 | 2.38 | 1207 | 2.38 | 1208 | 2.38 | 1209 |
| 2.44 | | | | | | | | |
| 1210 | 2.38 | 1211 | 2.38 | 1212 | 2.38 | 1213 | 2.44 | 1214 |
| 2.38 | | | | | | | | |
| 1215 | 2.38 | 1216 | 2.38 | 1217 | 2.44 | 1218 | 2.38 | 1219 |
| 2.38 | | | | | | | | |
| 1220 | 2.38 | 1221 | 2.44 | 1222 | 2.38 | 1223 | 2.38 | 1224 |
| 2.38 | | | | | | | | |
| 1225 | 2.32 | 1226 | 2.20 | 1227 | 2.02 | 1228 | 1.90 | 1229 |
| 1.84 | | | | | | | | |
| 1230 | 1.72 | 1231 | 1.60 | 1232 | 1.60 | 1233 | 1.60 | 1234 |
| 1.66 | | | | | | | | |
| 1235 | 1.60 | 1236 | 1.60 | 1237 | 1.60 | 1238 | 1.60 | 1239 |
| 1.60 | | | | | | | | |
| 1240 | 1.60 | 1241 | 1.60 | 1242 | 1.66 | 1243 | 1.60 | 1244 |
| 1.60 | | | | | | | | |
| 1245 | 1.60 | 1246 | 1.60 | 1247 | 1.60 | 1248 | 1.60 | 1249 |
| 1.60 | | | | | | | | |
| 1250 | 1.66 | 1251 | 1.60 | 1252 | 1.60 | 1253 | 1.60 | 1254 |
| 1.60 | | | | | | | | |
| 1255 | 1.60 | 1256 | 1.60 | 1257 | 1.60 | 1258 | 1.66 | 1259 |
| 1.60 | | | | | | | | |
| 1260 | 1.60 | 1261 | 1.60 | 1262 | 1.60 | 1263 | 1.60 | 1264 |
| 1.60 | | | | | | | | |
| 1265 | 1.60 | 1266 | 1.66 | 1267 | 1.60 | 1268 | 1.60 | 1269 |
| 1.60 | | | | | | | | |
| 1270 | 1.60 | 1271 | 1.60 | 1272 | 1.60 | 1273 | 1.60 | 1274 |
| 1.66 | | | | | | | | |
| 1275 | 1.60 | 1276 | 1.60 | 1277 | 1.60 | 1278 | 1.60 | 1279 |
| 1.60 | | | | | | | | |
| 1280 | 1.60 | 1281 | 1.60 | 1282 | 1.66 | 1283 | 1.60 | 1284 |
| 1.60 | | | | | | | | |

```
     1285       1.60  1286       1.60  1287       1.60  1288       1.60  1289
1.60
     1290       1.66  1291       1.60  1292       1.60  1293       1.60  1294
1.60
     1295       1.60  1296       1.60  1297       1.54  1298       1.48  1299
1.42
     1300       1.36  1310       1.16  1320       1.20  1330       1.16  1340
1.20
     1350       1.16  1360       1.16  1370       1.20  1380       1.16  1390
1.16
     1400       1.20  1420       1.16  1440       1.18  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  060A Header place holder
005     1  061A Header place holder
999
999
006     1  060A 020010001205A97200156001300                    G1
006     1  061A 020046001607A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      60A :  Subarea
      60A   020   A25     5   10     12     28       12      28   1153    VALLEY
 156  0.01300    ---     ----    -----  -----    --     --
      61A :  Subarea
      61A   020   A25     5   46     16     48       28      72   1153    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   61A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:      28    acres
            HYDROGRAPH PEAK:               72    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:              5.18 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.34   200       1.34   300       1.34   400
1.34
      500       1.34   600       1.46   700       1.85   800       1.86   900
2.19
     1000       2.80  1050       3.95  1100       6.68  1110       9.31  1120
11.12
     1130      11.49  1131      11.68  1132      11.74  1133      11.95  1134
12.17
     1135      12.42  1136      12.51  1137      12.56  1138      12.57  1139
12.58
     1140      12.58  1141      13.49  1142      14.76  1143      16.11  1144
17.66
     1145      20.44  1146      22.61  1147      24.96  1148      27.07  1149
35.35
     1150      43.91  1151      53.35  1152      62.78  1153      72.18  1154
68.24
     1155      59.31  1156      47.52  1157      35.21  1158      23.27  1159
17.12
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 13.64 | 1161 | 12.36 | 1162 | 11.86 | 1163 | 11.40 | 1164 | 11.29 |
| 1165 | 10.76 | 1166 | 10.03 | 1167 | 9.21 | 1168 | 8.47 | 1169 | 7.62 |
| 1170 | 7.34 | 1171 | 7.15 | 1172 | 7.08 | 1173 | 7.06 | 1174 | 7.05 |
| 1175 | 7.05 | 1176 | 7.05 | 1177 | 6.76 | 1178 | 6.27 | 1179 | 5.83 |
| 1180 | 5.23 | 1181 | 4.75 | 1182 | 4.54 | 1183 | 4.41 | 1184 | 4.35 |
| 1185 | 4.33 | 1186 | 4.32 | 1187 | 4.32 | 1188 | 4.32 | 1189 | 4.03 |
| 1190 | 3.84 | 1191 | 3.40 | 1192 | 3.14 | 1193 | 2.96 | 1194 | 2.90 |
| 1195 | 2.78 | 1196 | 2.85 | 1197 | 2.84 | 1198 | 2.75 | 1199 | 2.75 |
| 1200 | 2.83 | 1201 | 2.83 | 1202 | 2.75 | 1203 | 2.83 | 1204 | 2.83 |
| 1205 | 2.75 | 1206 | 2.75 | 1207 | 2.83 | 1208 | 2.83 | 1209 | 2.75 |
| 1210 | 2.83 | 1211 | 2.83 | 1212 | 2.83 | 1213 | 2.75 | 1214 | 2.83 |
| 1215 | 2.83 | 1216 | 2.75 | 1217 | 2.75 | 1218 | 2.83 | 1219 | 2.83 |
| 1220 | 2.75 | 1221 | 2.83 | 1222 | 2.83 | 1223 | 2.75 | 1224 | 2.75 |
| 1225 | 2.67 | 1226 | 2.41 | 1227 | 2.25 | 1228 | 2.08 | 1229 | 1.91 |
| 1230 | 1.83 | 1231 | 1.83 | 1232 | 1.83 | 1233 | 1.83 | 1234 | 1.83 |
| 1235 | 1.83 | 1236 | 1.91 | 1237 | 1.83 | 1238 | 1.91 | 1239 | 1.83 |
| 1240 | 1.91 | 1241 | 1.83 | 1242 | 1.91 | 1243 | 1.83 | 1244 | 1.83 |
| 1245 | 1.83 | 1246 | 1.83 | 1247 | 1.83 | 1248 | 1.83 | 1249 | 1.91 |
| 1250 | 1.83 | 1251 | 1.91 | 1252 | 1.83 | 1253 | 1.91 | 1254 | 1.83 |
| 1255 | 1.91 | 1256 | 1.83 | 1257 | 1.91 | 1258 | 1.83 | 1259 | 1.83 |
| 1260 | 1.83 | 1261 | 1.83 | 1262 | 1.83 | 1263 | 1.83 | 1264 | 1.91 |
| 1265 | 1.83 | 1266 | 1.91 | 1267 | 1.83 | 1268 | 1.91 | 1269 | 1.83 |
| 1270 | 1.91 | 1271 | 1.83 | 1272 | 1.83 | 1273 | 1.83 | 1274 | 1.83 |
| 1275 | 1.83 | 1276 | 1.83 | 1277 | 1.91 | 1278 | 1.83 | 1279 | 1.91 |
| 1280 | 1.83 | 1281 | 1.91 | 1282 | 1.83 | 1283 | 1.91 | 1284 | 1.83 |

```
     1285       1.83  1286       1.83  1287       1.83  1288       1.83  1289
1.83
     1290       1.91  1291       1.83  1292       1.91  1293       1.83  1294
1.91
     1295       1.83  1296       1.91  1297       1.74  1298       1.66  1299
1.49
     1300       1.49  1310       1.32  1320       1.32  1330       1.32  1340
1.36
     1350       1.32  1360       1.32  1370       1.36  1380       1.32  1390
1.32
     1400       1.36  1420       1.32  1440       1.34  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  060A Header place holder
005     1  061A Header place holder
999
999
006     1  060A 020010001205A97200156001300                    G1
006     1  061A 020046001605A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      60A :  Subarea
      60A   020   A50     5   10     12     32       12      32   1153    VALLEY
 156  0.01300    ---     ----    -----  -----    --     --
      61A :  Subarea
      61A   020   A50     5   46     16     54       28      82   1153    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   61A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:      28    acres
            HYDROGRAPH PEAK:               82    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:              5.89 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.46   200       1.46   300       1.46   400
1.46
      500       1.46   600       1.60   700       2.04   800       2.04   900
2.42
     1000       3.14  1050       5.00  1100       8.08  1110      11.14  1120
13.23
     1130      13.59  1131      13.82  1132      13.92  1133      14.17  1134
14.44
     1135      14.73  1136      14.69  1137      14.86  1138      14.87  1139
14.75
     1140      14.72  1141      15.90  1142      17.22  1143      18.78  1144
20.51
     1145      23.80  1146      26.27  1147      28.74  1148      31.19  1149
40.59
     1150      50.36  1151      61.23  1152      71.91  1153      82.45  1154
77.92
     1155      67.55  1156      53.98  1157      40.30  1158      26.56  1159
19.82
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 15.99 | 1161 | 14.68 | 1162 | 13.87 | 1163 | 13.65 | 1164 | 13.40 |
| 1165 | 12.73 | 1166 | 11.94 | 1167 | 11.05 | 1168 | 9.99 | 1169 | 9.07 |
| 1170 | 8.86 | 1171 | 8.54 | 1172 | 8.47 | 1173 | 8.43 | 1174 | 8.56 |
| 1175 | 8.44 | 1176 | 8.45 | 1177 | 8.13 | 1178 | 7.62 | 1179 | 7.04 |
| 1180 | 6.40 | 1181 | 5.88 | 1182 | 5.66 | 1183 | 5.53 | 1184 | 5.48 |
| 1185 | 5.46 | 1186 | 5.46 | 1187 | 5.31 | 1188 | 5.43 | 1189 | 4.99 |
| 1190 | 4.79 | 1191 | 4.24 | 1192 | 3.97 | 1193 | 3.47 | 1194 | 3.42 |
| 1195 | 3.23 | 1196 | 3.26 | 1197 | 3.15 | 1198 | 3.14 | 1199 | 3.13 |
| 1200 | 3.13 | 1201 | 3.12 | 1202 | 3.12 | 1203 | 3.21 | 1204 | 3.13 |
| 1205 | 3.21 | 1206 | 3.13 | 1207 | 3.13 | 1208 | 3.13 | 1209 | 3.12 |
| 1210 | 3.12 | 1211 | 3.12 | 1212 | 3.21 | 1213 | 3.13 | 1214 | 3.21 |
| 1215 | 3.13 | 1216 | 3.13 | 1217 | 3.13 | 1218 | 3.12 | 1219 | 3.12 |
| 1220 | 3.12 | 1221 | 3.21 | 1222 | 3.13 | 1223 | 3.21 | 1224 | 3.13 |
| 1225 | 2.96 | 1226 | 2.70 | 1227 | 2.52 | 1228 | 2.26 | 1229 | 2.00 |
| 1230 | 2.00 | 1231 | 2.00 | 1232 | 1.99 | 1233 | 1.99 | 1234 | 2.08 |
| 1235 | 2.08 | 1236 | 2.08 | 1237 | 2.08 | 1238 | 2.08 | 1239 | 1.99 |
| 1240 | 1.99 | 1241 | 1.99 | 1242 | 1.99 | 1243 | 1.99 | 1244 | 2.08 |
| 1245 | 2.08 | 1246 | 2.08 | 1247 | 2.08 | 1248 | 2.08 | 1249 | 1.99 |
| 1250 | 1.99 | 1251 | 1.99 | 1252 | 1.99 | 1253 | 1.99 | 1254 | 2.08 |
| 1255 | 2.08 | 1256 | 2.08 | 1257 | 2.08 | 1258 | 2.08 | 1259 | 1.99 |
| 1260 | 1.99 | 1261 | 1.99 | 1262 | 1.99 | 1263 | 1.99 | 1264 | 2.08 |
| 1265 | 2.08 | 1266 | 2.08 | 1267 | 2.08 | 1268 | 1.99 | 1269 | 1.99 |
| 1270 | 1.99 | 1271 | 1.99 | 1272 | 1.99 | 1273 | 2.08 | 1274 | 2.08 |
| 1275 | 2.08 | 1276 | 2.08 | 1277 | 2.08 | 1278 | 1.99 | 1279 | 1.99 |
| 1280 | 1.99 | 1281 | 1.99 | 1282 | 1.99 | 1283 | 2.08 | 1284 | 2.08 |

```
     1285       2.08  1286       2.08  1287       2.08  1288       1.99  1289
1.99
     1290       1.99  1291       1.99  1292       1.99  1293       2.08  1294
2.08
     1295       2.08  1296       2.08  1297       1.91  1298       1.83  1299
1.66
     1300       1.57  1310       1.45  1320       1.45  1330       1.45  1340
1.49
     1350       1.45  1360       1.45  1370       1.45  1380       1.49  1390
1.45
     1400       1.45  1420       1.47  1440       1.45  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  060A Header place holder
005     1  061A Header place holder
999
999
006     1  060A 020010001205A97200156001300                    G1
006     1  061A 020046001605A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 3

Project Description

---

Discharge 3

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      60A :  Subarea
      60A   020   A100    5   10     12     36       12      36   1153    VALLEY
 156  0.01300    ---     ----    -----  -----    --     --
      61A :  Subarea
      61A   020   A100    5   46     16     62       28      94   1153    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   61A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:      28    acres
            HYDROGRAPH PEAK:               94    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:              6.72 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.60   200       1.60   300       1.60   400
1.60
      500       1.60   600       1.75   700       2.23   800       2.24   900
2.66
     1000       3.87  1050       6.09  1100       9.62  1110      13.10  1120
15.33
     1130      15.76  1131      16.01  1132      16.28  1133      16.44  1134
16.72
     1135      17.01  1136      17.10  1137      17.16  1138      17.17  1139
17.17
     1140      17.18  1141      18.39  1142      19.88  1143      21.76  1144
23.59
     1145      27.25  1146      30.12  1147      33.03  1148      35.80  1149
46.68
     1150      57.91  1151      69.97  1152      81.92  1153      93.78  1154
88.51
     1155      76.75  1156      61.50  1157      45.88  1158      30.28  1159
22.61
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 18.37 | 1161 | 16.81 | 1162 | 15.96 | 1163 | 15.72 | 1164 | 15.47 |
| 1165 | 14.81 | 1166 | 13.87 | 1167 | 12.94 | 1168 | 11.84 | 1169 | 10.73 |
| 1170 | 10.34 | 1171 | 10.25 | 1172 | 10.07 | 1173 | 10.05 | 1174 | 10.17 |
| 1175 | 10.04 | 1176 | 10.04 | 1177 | 9.72 | 1178 | 9.06 | 1179 | 8.43 |
| 1180 | 7.76 | 1181 | 7.08 | 1182 | 6.83 | 1183 | 6.67 | 1184 | 6.62 |
| 1185 | 6.60 | 1186 | 6.59 | 1187 | 6.59 | 1188 | 6.59 | 1189 | 6.16 |
| 1190 | 5.93 | 1191 | 5.37 | 1192 | 4.80 | 1193 | 4.31 | 1194 | 4.10 |
| 1195 | 3.97 | 1196 | 3.90 | 1197 | 3.88 | 1198 | 3.87 | 1199 | 4.00 |
| 1200 | 3.88 | 1201 | 3.90 | 1202 | 3.88 | 1203 | 3.87 | 1204 | 3.86 |
| 1205 | 3.86 | 1206 | 3.86 | 1207 | 3.86 | 1208 | 3.86 | 1209 | 3.86 |
| 1210 | 3.86 | 1211 | 3.86 | 1212 | 3.86 | 1213 | 3.86 | 1214 | 3.86 |
| 1215 | 3.86 | 1216 | 3.86 | 1217 | 3.86 | 1218 | 4.00 | 1219 | 3.88 |
| 1220 | 3.89 | 1221 | 3.88 | 1222 | 3.87 | 1223 | 3.86 | 1224 | 3.86 |
| 1225 | 3.45 | 1226 | 3.23 | 1227 | 2.89 | 1228 | 2.49 | 1229 | 2.28 |
| 1230 | 2.26 | 1231 | 2.17 | 1232 | 2.25 | 1233 | 2.25 | 1234 | 2.25 |
| 1235 | 2.25 | 1236 | 2.25 | 1237 | 2.25 | 1238 | 2.25 | 1239 | 2.16 |
| 1240 | 2.25 | 1241 | 2.25 | 1242 | 2.25 | 1243 | 2.25 | 1244 | 2.25 |
| 1245 | 2.25 | 1246 | 2.25 | 1247 | 2.16 | 1248 | 2.25 | 1249 | 2.25 |
| 1250 | 2.25 | 1251 | 2.25 | 1252 | 2.25 | 1253 | 2.25 | 1254 | 2.25 |
| 1255 | 2.16 | 1256 | 2.25 | 1257 | 2.25 | 1258 | 2.25 | 1259 | 2.25 |
| 1260 | 2.25 | 1261 | 2.25 | 1262 | 2.25 | 1263 | 2.16 | 1264 | 2.25 |
| 1265 | 2.25 | 1266 | 2.25 | 1267 | 2.25 | 1268 | 2.25 | 1269 | 2.25 |
| 1270 | 2.25 | 1271 | 2.16 | 1272 | 2.25 | 1273 | 2.25 | 1274 | 2.25 |
| 1275 | 2.25 | 1276 | 2.25 | 1277 | 2.25 | 1278 | 2.25 | 1279 | 2.16 |
| 1280 | 2.25 | 1281 | 2.25 | 1282 | 2.25 | 1283 | 2.25 | 1284 | 2.25 |

```
     1285       2.25  1286       2.25  1287       2.16  1288       2.25  1289
2.25
     1290       2.25  1291       2.25  1292       2.25  1293       2.25  1294
2.25
     1295       2.16  1296       2.25  1297       2.16  1298       1.99  1299
1.83
     1300       1.74  1310       1.62  1320       1.57  1330       1.62  1340
1.57
     1350       1.62  1360       1.62  1370       1.57  1380       1.62  1390
1.57
     1400       1.62  1420       1.60  1440       1.60  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  060A Header place holder
005     1  061A Header place holder
999
999
006     1  060A 020010001205A97200156001300                    G1
006     1  061A 020046001605A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      20A :  Subarea
      20A   020   A10     8    0    155    200      155     200   1153    PIPE
 396  0.09000      3.00  ----    -----  -----    --     --
      21A :  Subarea
      21A   020   A10     5   13     22     42      177     236   1154    VALLEY
 196  0.02300    ---     ----    -----  -----    --     --
      22A :  Subarea
      22A   020   A10     5   36     11     25      188     257   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   22A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     188    acres
            HYDROGRAPH PEAK:              257    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              9.03 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.11   200       1.12   300       1.11   400
1.12
      500       1.11   600       1.21   700       1.51   800       1.52   900
1.77
     1000       2.24  1050       2.74  1100      11.07  1110      21.90  1120
31.95
     1130      32.92  1131      33.17  1132      33.58  1133      34.10  1134
34.88
     1135      35.77  1136      36.49  1137      36.96  1138      37.35  1139
37.79
     1140      38.22  1141      39.76  1142      43.16  1143      47.82  1144
52.56
     1145      59.91  1146      69.93  1147      80.77  1148      91.10  1149
111.29
     1150     142.32  1151     177.51  1152     212.49  1153     245.65  1154
```

257.34
1155 249.91 1156 233.92 1157 208.31 1158 171.63 1159
137.39
1160 107.67 1161 79.66 1162 56.49 1163 42.42 1164
36.18
1165 33.19 1166 30.60 1167 27.80 1168 24.78 1169
22.03
1170 20.14 1171 18.36 1172 16.42 1173 14.51 1174
13.40
1175 13.06 1176 13.03 1177 12.69 1178 11.92 1179
10.56
1180 9.16 1181 7.65 1182 6.39 1183 5.24 1184
4.09
1185 3.25 1186 2.92 1187 2.88 1188 2.83 1189
2.78
1190 2.66 1191 2.58 1192 2.45 1193 2.35 1194
2.26
1195 2.27 1196 2.26 1197 2.26 1198 2.22 1199
2.26
1200 2.25 1201 2.26 1202 2.22 1203 2.25 1204
2.25
1205 2.26 1206 2.22 1207 2.25 1208 2.25 1209
2.26
1210 2.22 1211 2.25 1212 2.25 1213 2.26 1214
2.22
1215 2.25 1216 2.25 1217 2.26 1218 2.22 1219
2.25
1220 2.25 1221 2.26 1222 2.22 1223 2.25 1224
2.25
1225 2.17 1226 2.06 1227 1.92 1228 1.78 1229
1.62
1230 1.56 1231 1.52 1232 1.55 1233 1.55 1234
1.56
1235 1.52 1236 1.51 1237 1.50 1238 1.49 1239
1.49
1240 1.53 1241 1.54 1242 1.56 1243 1.52 1244
1.51
1245 1.50 1246 1.49 1247 1.49 1248 1.53 1249
1.54
1250 1.56 1251 1.52 1252 1.51 1253 1.50 1254
1.49
1255 1.49 1256 1.53 1257 1.54 1258 1.56 1259
1.52
1260 1.51 1261 1.50 1262 1.49 1263 1.49 1264
1.53
1265 1.54 1266 1.56 1267 1.52 1268 1.51 1269
1.50
1270 1.49 1271 1.49 1272 1.53 1273 1.54 1274
1.56
1275 1.52 1276 1.51 1277 1.50 1278 1.49 1279

```
1.49
     1280       1.53  1281       1.54  1282       1.56  1283       1.52  1284
1.51
     1285       1.50  1286       1.49  1287       1.49  1288       1.53  1289
1.54
     1290       1.56  1291       1.52  1292       1.51  1293       1.50  1294
1.49
     1295       1.49  1296       1.53  1297       1.50  1298       1.41  1299
1.34
     1300       1.25  1310       1.10  1320       1.13  1330       1.11  1340
1.13
     1350       1.11  1360       1.10  1370       1.13  1380       1.11  1390
1.10
     1400       1.13  1420       1.11  1440       1.12  1460       0.70  1500
0.70
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  020A Header place holder
005     1  022A Header place holder
999
999
006     1  020A 020000015508A97400396009000                    G1
006     1  021A 020013002205A97200196002300
006     1  022A 020036001105A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      20A :  Subarea
      20A   020   A25     8    0    155    251      155     251   1154    PIPE
 396  0.09000      3.25  ----    -----  -----    --      --
      21A :  Subarea
      21A   020   A25     5   13     22     52      177     297   1154    VALLEY
 196  0.02300    ---     ----    -----  -----    --      --
      22A :  Subarea
      22A   020   A25     5   36     11     31      188     323   1154    -------
----  -------    ---     ----    -----  -----    --      --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   22A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     188    acres
            HYDROGRAPH PEAK:              323    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             12.36 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.27   200       1.27   300       1.27   400
1.27
      500       1.27   600       1.38   700       1.74   800       1.75   900
2.05
     1000       2.62  1050       6.42  1100      21.72  1110      35.82  1120
47.28
     1130      49.11  1131      49.79  1132      50.38  1133      51.00  1134
51.80
     1135      52.81  1136      53.68  1137      54.32  1138      54.76  1139
55.15
     1140      55.52  1141      57.60  1142      62.14  1143      67.83  1144
73.75
     1145      82.53  1146      94.00  1147     106.64  1148     118.94  1149
143.81
     1150     182.66  1151     226.00  1152     268.55  1153     308.93  1154
```

322.73
1155 312.70 1156 292.67 1157 260.27 1158 214.44 1159
172.31
1160 135.77 1161 101.63 1162 74.69 1163 58.78 1164
51.91
1165 48.60 1166 45.54 1167 41.77 1168 38.15 1169
34.95
1170 32.33 1171 29.81 1172 27.52 1173 25.55 1174
24.38
1175 24.07 1176 24.08 1177 23.64 1178 22.37 1179
20.61
1180 18.55 1181 16.43 1182 14.61 1183 13.07 1184
11.61
1185 10.16 1186 9.05 1187 8.56 1188 8.58 1189
8.39
1190 7.78 1191 6.54 1192 5.42 1193 4.38 1194
3.51
1195 2.93 1196 2.74 1197 2.67 1198 2.61 1199
2.60
1200 2.63 1201 2.64 1202 2.60 1203 2.64 1204
2.64
1205 2.60 1206 2.60 1207 2.63 1208 2.64 1209
2.60
1210 2.64 1211 2.64 1212 2.65 1213 2.61 1214
2.64
1215 2.64 1216 2.60 1217 2.60 1218 2.63 1219
2.64
1220 2.60 1221 2.64 1222 2.64 1223 2.60 1224
2.60
1225 2.54 1226 2.39 1227 2.25 1228 2.09 1229
1.93
1230 1.83 1231 1.77 1232 1.74 1233 1.73 1234
1.73
1235 1.72 1236 1.77 1237 1.73 1238 1.78 1239
1.74
1240 1.78 1241 1.74 1242 1.78 1243 1.74 1244
1.74
1245 1.73 1246 1.72 1247 1.72 1248 1.72 1249
1.77
1250 1.73 1251 1.78 1252 1.74 1253 1.78 1254
1.74
1255 1.78 1256 1.74 1257 1.78 1258 1.74 1259
1.74
1260 1.73 1261 1.72 1262 1.72 1263 1.72 1264
1.77
1265 1.73 1266 1.78 1267 1.74 1268 1.78 1269
1.74
1270 1.78 1271 1.74 1272 1.74 1273 1.73 1274
1.72
1275 1.72 1276 1.72 1277 1.77 1278 1.73 1279

1.78
     1280       1.74  1281       1.78  1282       1.74  1283       1.78  1284
1.74
     1285       1.74  1286       1.73  1287       1.72  1288       1.72  1289
1.72
     1290       1.77  1291       1.73  1292       1.78  1293       1.74  1294
1.78
     1295       1.74  1296       1.78  1297       1.69  1298       1.64  1299
1.51
     1300       1.47  1310       1.26  1320       1.26  1330       1.26  1340
1.29
     1350       1.26  1360       1.26  1370       1.29  1380       1.26  1390
1.26
     1400       1.29  1420       1.26  1440       1.27  1460       0.76  1500
0.76



VCRat Model Input

Model Lines
---
```
005     1  020A Header place holder
005     1  022A Header place holder
999
999
006     1  020A 020000015508A97400396009000                    G1
006     1  021A 020013002205A97200196002300
006     1  022A 020036001105A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      20A :  Subarea
      20A   020   A50     7    0    155    311      155     311   1153    PIPE
 396  0.09000      3.50  ----    -----  -----    --     --
      21A :  Subarea
      21A   020   A50     5   13     22     60      177     363   1154    VALLEY
 196  0.02300    ---     ----    -----  -----    --     --
      22A :  Subarea
      22A   020   A50     5   36     11     35      188     393   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   22A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     188    acres
            HYDROGRAPH PEAK:              393    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             15.07 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.38   200       1.38   300       1.38   400
1.38
      500       1.38   600       1.51   700       1.91   800       1.92   900
2.26
     1000       2.90  1050      12.17  1100      29.80  1110      46.08  1120
59.59
     1130      61.07  1131      62.01  1132      62.84  1133      63.72  1134
64.82
     1135      66.15  1136      66.98  1137      67.72  1138      68.34  1139
68.50
     1140      68.44  1141      70.76  1142      76.15  1143      83.30  1144
90.85
     1145     101.83  1146     116.25  1147     131.92  1148     145.87  1149
174.71
     1150     223.37  1151     278.75  1152     329.76  1153     376.07  1154
```

392.70
1155 380.84 1156 344.62 1157 286.23 1158 224.27 1159
172.56
1160 126.73 1161 92.02 1162 73.04 1163 65.42 1164
62.41
1165 59.79 1166 56.02 1167 51.73 1168 47.33 1169
43.04
1170 39.49 1171 36.29 1172 33.78 1173 32.37 1174
32.08
1175 32.08 1176 32.22 1177 31.64 1178 29.86 1179
27.48
1180 24.90 1181 22.38 1182 20.12 1183 18.13 1184
16.46
1185 15.34 1186 14.94 1187 14.77 1188 14.83 1189
14.28
1190 13.22 1191 11.56 1192 10.08 1193 8.29 1194
6.78
1195 5.31 1196 4.20 1197 3.40 1198 3.04 1199
2.92
1200 2.90 1201 2.89 1202 2.89 1203 2.93 1204
2.90
1205 2.95 1206 2.90 1207 2.90 1208 2.89 1209
2.89
1210 2.89 1211 2.89 1212 2.93 1213 2.90 1214
2.95
1215 2.90 1216 2.90 1217 2.89 1218 2.89 1219
2.89
1220 2.89 1221 2.93 1222 2.90 1223 2.95 1224
2.90
1225 2.81 1226 2.64 1227 2.49 1228 2.28 1229
2.06
1230 1.98 1231 1.92 1232 1.89 1233 1.88 1234
1.93
1235 1.93 1236 1.95 1237 1.95 1238 1.95 1239
1.91
1240 1.90 1241 1.89 1242 1.88 1243 1.88 1244
1.92
1245 1.93 1246 1.95 1247 1.95 1248 1.95 1249
1.91
1250 1.90 1251 1.89 1252 1.88 1253 1.88 1254
1.92
1255 1.93 1256 1.95 1257 1.95 1258 1.95 1259
1.91
1260 1.90 1261 1.89 1262 1.88 1263 1.88 1264
1.92
1265 1.93 1266 1.95 1267 1.95 1268 1.91 1269
1.90
1270 1.89 1271 1.88 1272 1.88 1273 1.92 1274
1.93
1275 1.95 1276 1.95 1277 1.95 1278 1.91 1279

```
1.90
     1280       1.89  1281       1.88  1282       1.88  1283       1.92  1284
1.93
     1285       1.95  1286       1.95  1287       1.95  1288       1.91  1289
1.90
     1290       1.89  1291       1.88  1292       1.88  1293       1.92  1294
1.93
     1295       1.95  1296       1.95  1297       1.86  1298       1.80  1299
1.67
     1300       1.58  1310       1.38  1320       1.38  1330       1.38  1340
1.40
     1350       1.38  1360       1.38  1370       1.38  1380       1.40  1390
1.38
     1400       1.38  1420       1.39  1440       1.38  1460       0.81  1500
0.81
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  020A Header place holder
005     1  022A Header place holder
999
999
006     1  020A 020000015507A97400396009000                    G1
006     1  021A 020013002205A97200196002300
006     1  022A 020036001105A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 4

Project Description

---

Discharge 4

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 4


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      20A :  Subarea
      20A   020   A100    7    0    155    356      155     356   1153    PIPE
 396  0.09000      3.75  ----    -----  -----    --      --
      21A :  Subarea
      21A   020   A100    5   13     22     68      177     415   1154    VALLEY
 196  0.02300    ---     ----    -----  -----    --      --
      22A :  Subarea
      22A   020   A100    5   36     11     40      188     450   1154    -------
----  -------    ---     ----    -----  -----    --      --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   22A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     188    acres
            HYDROGRAPH PEAK:              450    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:             18.45 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       1.51   200       1.51   300       1.51   400
1.51
      500       1.51   600       1.65   700       2.09   800       2.11   900
2.49
     1000       6.04  1050      18.37  1100      38.50  1110      57.35  1120
71.65
     1130      73.39  1131      74.53  1132      75.73  1133      76.78  1134
77.72
     1135      78.88  1136      80.04  1137      81.09  1138      81.71  1139
81.65
     1140      81.63  1141      84.61  1142      91.04  1143      99.11  1144
107.03
     1145     119.28  1146     135.97  1147     153.95  1148     169.78  1149
203.55
     1150     260.24  1151     322.68  1152     380.26  1153     432.88  1154
```

449.51
1155 435.24 1156 393.53 1157 326.45 1158 256.56 1159
197.90
1160 145.64 1161 106.41 1162 85.51 1163 77.37 1164
74.39
1165 71.87 1166 67.64 1167 62.61 1168 57.88 1169
53.54
1170 49.46 1171 45.84 1172 42.83 1173 41.33 1174
41.35
1175 41.39 1176 41.18 1177 40.54 1178 38.55 1179
35.75
1180 32.75 1181 29.72 1182 27.11 1183 24.93 1184
23.03
1185 21.74 1186 21.35 1187 21.44 1188 21.62 1189
20.97
1190 19.54 1191 17.65 1192 15.72 1193 13.52 1194
11.44
1195 9.47 1196 7.85 1197 6.86 1198 6.36 1199
6.18
1200 6.07 1201 6.24 1202 6.37 1203 6.29 1204
6.07
1205 6.01 1206 6.13 1207 6.21 1208 6.04 1209
5.90
1210 5.91 1211 6.09 1212 6.21 1213 6.04 1214
5.90
1215 5.91 1216 6.09 1217 6.21 1218 6.17 1219
6.07
1220 6.24 1221 6.37 1222 6.29 1223 6.07 1224
6.01
1225 5.75 1226 5.22 1227 4.16 1228 3.11 1229
2.50
1230 2.25 1231 2.12 1232 2.12 1233 2.11 1234
2.11
1235 2.11 1236 2.11 1237 2.11 1238 2.11 1239
2.06
1240 2.10 1241 2.10 1242 2.11 1243 2.11 1244
2.11
1245 2.11 1246 2.11 1247 2.06 1248 2.10 1249
2.10
1250 2.11 1251 2.11 1252 2.11 1253 2.11 1254
2.11
1255 2.06 1256 2.10 1257 2.10 1258 2.11 1259
2.11
1260 2.11 1261 2.11 1262 2.11 1263 2.06 1264
2.10
1265 2.10 1266 2.11 1267 2.11 1268 2.11 1269
2.11
1270 2.11 1271 2.06 1272 2.10 1273 2.10 1274
2.11
1275 2.11 1276 2.11 1277 2.11 1278 2.11 1279

```
2.06
     1280       2.10  1281       2.10  1282       2.11  1283       2.11  1284
2.11
     1285       2.11  1286       2.11  1287       2.06  1288       2.10  1289
2.10
     1290       2.11  1291       2.11  1292       2.11  1293       2.11  1294
2.11
     1295       2.06  1296       2.10  1297       2.05  1298       1.96  1299
1.84
     1300       1.74  1310       1.52  1320       1.50  1330       1.52  1340
1.50
     1350       1.52  1360       1.53  1370       1.50  1380       1.52  1390
1.50
     1400       1.52  1420       1.51  1440       1.51  1460       0.87  1500
0.87
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  020A Header place holder
005     1  022A Header place holder
999
999
006     1  020A 020000015507A97400396009000                    G1
006     1  021A 020013002205A97200196002300
006     1  022A 020036001105A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A10     9   28    113    177      113     177   1153    -------
----  -------    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---      113     177   1153    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:     113    acres
            HYDROGRAPH PEAK:              177    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:             14.58 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       3.30   200       3.32   300       3.30   400
3.32
      500       3.30   600       3.77   700       5.18   800       5.19   900
6.40
     1000       8.55  1050      10.93  1100      18.33  1110      27.10  1120
32.98
     1130      33.43  1131      33.73  1132      34.04  1133      34.34  1134
35.14
     1135      35.44  1136      35.75  1137      36.05  1138      36.35  1139
37.15
     1140      37.15  1141      39.70  1142      42.80  1143      44.87  1144
47.46
     1145      54.70  1146      61.30  1147      67.80  1148      73.80  1149
96.43
     1150     116.52  1151     136.20  1152     156.65  1153     177.16  1154
176.66
     1155     173.14  1156     166.62  1157     160.14  1158     137.20  1159
114.56
     1160      91.52  1161      68.30  1162      44.36  1163      37.65  1164
34.14
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1165 | 32.13 | 1166 | 30.12 | 1167 | 28.61 | 1168 | 26.60 | 1169 | 25.09 |
| 1170 | 24.09 | 1171 | 22.58 | 1172 | 20.57 | 1173 | 19.06 | 1174 | 19.56 |
| 1175 | 19.56 | 1176 | 19.06 | 1177 | 18.56 | 1178 | 17.55 | 1179 | 16.04 |
| 1180 | 15.54 | 1181 | 14.54 | 1182 | 13.53 | 1183 | 12.53 | 1184 | 11.82 |
| 1185 | 11.42 | 1186 | 11.22 | 1187 | 11.42 | 1188 | 11.42 | 1189 | 11.02 |
| 1190 | 10.62 | 1191 | 10.42 | 1192 | 10.02 | 1193 | 9.82 | 1194 | 9.42 |
| 1195 | 9.22 | 1196 | 8.82 | 1197 | 8.62 | 1198 | 8.42 | 1199 | 8.62 |
| 1200 | 8.62 | 1201 | 8.62 | 1202 | 8.42 | 1203 | 8.62 | 1204 | 8.62 |
| 1205 | 8.62 | 1206 | 8.42 | 1207 | 8.62 | 1208 | 8.62 | 1209 | 8.62 |
| 1210 | 8.42 | 1211 | 8.62 | 1212 | 8.62 | 1213 | 8.62 | 1214 | 8.42 |
| 1215 | 8.62 | 1216 | 8.62 | 1217 | 8.62 | 1218 | 8.42 | 1219 | 8.62 |
| 1220 | 8.62 | 1221 | 8.62 | 1222 | 8.42 | 1223 | 8.62 | 1224 | 8.62 |
| 1225 | 8.22 | 1226 | 7.82 | 1227 | 7.41 | 1228 | 7.01 | 1229 | 6.61 |
| 1230 | 6.21 | 1231 | 6.01 | 1232 | 5.61 | 1233 | 5.21 | 1234 | 5.21 |
| 1235 | 5.01 | 1236 | 5.21 | 1237 | 5.21 | 1238 | 5.21 | 1239 | 5.21 |
| 1240 | 5.21 | 1241 | 5.21 | 1242 | 5.21 | 1243 | 5.01 | 1244 | 5.21 |
| 1245 | 5.21 | 1246 | 5.21 | 1247 | 5.21 | 1248 | 5.21 | 1249 | 5.21 |
| 1250 | 5.21 | 1251 | 5.01 | 1252 | 5.21 | 1253 | 5.21 | 1254 | 5.21 |
| 1255 | 5.21 | 1256 | 5.21 | 1257 | 5.21 | 1258 | 5.21 | 1259 | 5.01 |
| 1260 | 5.21 | 1261 | 5.21 | 1262 | 5.21 | 1263 | 5.21 | 1264 | 5.21 |
| 1265 | 5.21 | 1266 | 5.21 | 1267 | 5.01 | 1268 | 5.21 | 1269 | 5.21 |
| 1270 | 5.21 | 1271 | 5.21 | 1272 | 5.21 | 1273 | 5.21 | 1274 | 5.21 |
| 1275 | 5.01 | 1276 | 5.21 | 1277 | 5.21 | 1278 | 5.21 | 1279 | 5.21 |
| 1280 | 5.21 | 1281 | 5.21 | 1282 | 5.21 | 1283 | 5.01 | 1284 | 5.21 |
| 1285 | 5.21 | 1286 | 5.21 | 1287 | 5.21 | 1288 | 5.21 | 1289 | 5.21 |

```
     1290       5.21  1291       5.01  1292       5.21  1293       5.21  1294
5.21
     1295       5.21  1296       5.21  1297       5.01  1298       4.61  1299
4.41
     1300       4.41  1310       3.25  1320       3.43  1330       3.25  1340
3.43
     1350       3.25  1360       3.25  1370       3.43  1380       3.25  1390
3.25
     1400       3.43  1420       3.25  1440       3.34  1460       0.00  1500
0.00
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020028011309A97                                 G1
006     1  031A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A25     7   28    113    248      113     248   1154    -------
----  -------    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---      113     248   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:     113    acres
            HYDROGRAPH PEAK:              248    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:            18.31 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       4.02   200       4.02   300       4.04   400
4.02
      500       4.02   600       4.56   700       6.24   800       6.26   900
7.70
     1000      10.32  1050      14.89  1100      25.83  1110      37.05  1120
43.53
     1130      44.93  1131      45.66  1132      45.72  1133      46.45  1134
47.19
     1135      47.92  1136      48.65  1137      48.71  1138      48.71  1139
49.38
     1140      49.38  1141      53.37  1142      57.36  1143      61.23  1144
66.37
     1145      76.01  1146      85.49  1147      95.59  1148     101.26  1149
132.78
     1150     164.20  1151     195.20  1152     221.78  1153     247.82  1154
247.82
     1155     241.92  1156     205.55  1157     169.33  1158     134.06  1159
98.11
     1160      61.87  1161      50.71  1162      46.06  1163      44.73  1164
44.73
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1165 | 41.40 | 1166 | 38.74 | 1167 | 36.79 | 1168 | 34.21 | 1169 |
| 31.62 | | | | | | | | |
| 1170 | 29.69 | 1171 | 27.10 | 1172 | 27.10 | 1173 | 27.10 | 1174 |
| 27.10 | | | | | | | | |
| 1175 | 27.10 | 1176 | 27.10 | 1177 | 25.81 | 1178 | 23.87 | 1179 |
| 22.58 | | | | | | | | |
| 1180 | 20.64 | 1181 | 19.35 | 1182 | 18.05 | 1183 | 16.12 | 1184 |
| 16.12 | | | | | | | | |
| 1185 | 16.12 | 1186 | 16.12 | 1187 | 16.76 | 1188 | 16.12 | 1189 |
| 14.82 | | | | | | | | |
| 1190 | 14.18 | 1191 | 12.24 | 1192 | 11.85 | 1193 | 11.34 | 1194 |
| 10.82 | | | | | | | | |
| 1195 | 10.31 | 1196 | 10.31 | 1197 | 10.31 | 1198 | 10.31 | 1199 |
| 10.31 | | | | | | | | |
| 1200 | 10.31 | 1201 | 10.31 | 1202 | 10.31 | 1203 | 10.31 | 1204 |
| 10.31 | | | | | | | | |
| 1205 | 10.31 | 1206 | 10.31 | 1207 | 10.31 | 1208 | 10.31 | 1209 |
| 10.31 | | | | | | | | |
| 1210 | 10.31 | 1211 | 10.31 | 1212 | 10.56 | 1213 | 10.31 | 1214 |
| 10.31 | | | | | | | | |
| 1215 | 10.31 | 1216 | 10.31 | 1217 | 10.31 | 1218 | 10.31 | 1219 |
| 10.31 | | | | | | | | |
| 1220 | 10.31 | 1221 | 10.31 | 1222 | 10.31 | 1223 | 10.31 | 1224 |
| 10.31 | | | | | | | | |
| 1225 | 9.79 | 1226 | 9.02 | 1227 | 8.76 | 1228 | 7.99 | 1229 |
| 7.47 | | | | | | | | |
| 1230 | 6.96 | 1231 | 6.18 | 1232 | 6.18 | 1233 | 6.18 | 1234 |
| 6.18 | | | | | | | | |
| 1235 | 6.18 | 1236 | 6.18 | 1237 | 6.18 | 1238 | 6.44 | 1239 |
| 6.18 | | | | | | | | |
| 1240 | 6.44 | 1241 | 6.18 | 1242 | 6.44 | 1243 | 6.18 | 1244 |
| 6.18 | | | | | | | | |
| 1245 | 6.18 | 1246 | 6.18 | 1247 | 6.18 | 1248 | 6.18 | 1249 |
| 6.18 | | | | | | | | |
| 1250 | 6.18 | 1251 | 6.44 | 1252 | 6.18 | 1253 | 6.44 | 1254 |
| 6.18 | | | | | | | | |
| 1255 | 6.44 | 1256 | 6.18 | 1257 | 6.44 | 1258 | 6.18 | 1259 |
| 6.18 | | | | | | | | |
| 1260 | 6.18 | 1261 | 6.18 | 1262 | 6.18 | 1263 | 6.18 | 1264 |
| 6.18 | | | | | | | | |
| 1265 | 6.18 | 1266 | 6.44 | 1267 | 6.18 | 1268 | 6.44 | 1269 |
| 6.18 | | | | | | | | |
| 1270 | 6.44 | 1271 | 6.18 | 1272 | 6.18 | 1273 | 6.18 | 1274 |
| 6.18 | | | | | | | | |
| 1275 | 6.18 | 1276 | 6.18 | 1277 | 6.18 | 1278 | 6.18 | 1279 |
| 6.44 | | | | | | | | |
| 1280 | 6.18 | 1281 | 6.44 | 1282 | 6.18 | 1283 | 6.44 | 1284 |
| 6.18 | | | | | | | | |
| 1285 | 6.18 | 1286 | 6.18 | 1287 | 6.18 | 1288 | 6.18 | 1289 |
| 6.18 | | | | | | | | |

```
     1290       6.18  1291       6.18  1292       6.44  1293       6.18  1294
6.44
     1295       6.18  1296       6.44  1297       5.93  1298       5.67  1299
5.15
     1300       5.15  1310       3.97  1320       3.97  1330       3.97  1340
4.15
     1350       3.97  1360       3.97  1370       4.15  1380       3.97  1390
3.97
     1400       4.15  1420       3.97  1440       4.06  1460       0.00  1500
0.00
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020028011307A97                                 G1
006     1  031A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A50     7   28    113    283      113     283   1153    -------
----  -------    ---     ----    -----  -----    --     --
      31A   ---   ---     --   --    ---    ---      113     283   1153    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:     113    acres
            HYDROGRAPH PEAK:              283    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:            21.22 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       4.54   200       4.56   300       4.54   400
4.54
      500       4.56   600       5.14   700       7.03   800       7.03   900
8.67
     1000      11.62  1050      19.14  1100      31.35  1110      44.46  1120
51.91
     1130      53.30  1131      54.17  1132      54.37  1133      55.23  1134
56.10
     1135      56.96  1136      57.16  1137      58.02  1138      58.02  1139
58.02
     1140      58.02  1141      62.51  1142      67.01  1143      72.15  1144
76.65
     1145      88.01  1146      99.37  1147     110.08  1148     117.01  1149
152.02
     1150     188.09  1151     224.38  1152     253.10  1153     283.49  1154
283.49
     1155     276.23  1156     235.43  1157     194.56  1158     153.30  1159
113.23
     1160      72.15  1161      60.59  1162      54.70  1163      54.03  1164
52.70
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1165 | 49.38 | 1166 | 46.72 | 1167 | 44.06 | 1168 | 40.74 | 1169 | 38.09 |
| 1170 | 35.50 | 1171 | 32.92 | 1172 | 32.92 | 1173 | 32.27 | 1174 | 32.92 |
| 1175 | 32.92 | 1176 | 32.92 | 1177 | 30.98 | 1178 | 29.04 | 1179 | 27.75 |
| 1180 | 25.81 | 1181 | 23.87 | 1182 | 22.58 | 1183 | 20.64 | 1184 | 20.64 |
| 1185 | 20.64 | 1186 | 20.64 | 1187 | 20.64 | 1188 | 20.64 | 1189 | 18.70 |
| 1190 | 18.05 | 1191 | 16.12 | 1192 | 15.47 | 1193 | 13.53 | 1194 | 12.88 |
| 1195 | 11.59 | 1196 | 11.85 | 1197 | 11.59 | 1198 | 11.59 | 1199 | 11.59 |
| 1200 | 11.59 | 1201 | 11.59 | 1202 | 11.59 | 1203 | 11.59 | 1204 | 11.59 |
| 1205 | 11.85 | 1206 | 11.59 | 1207 | 11.59 | 1208 | 11.59 | 1209 | 11.59 |
| 1210 | 11.59 | 1211 | 11.59 | 1212 | 11.59 | 1213 | 11.59 | 1214 | 11.85 |
| 1215 | 11.59 | 1216 | 11.59 | 1217 | 11.59 | 1218 | 11.59 | 1219 | 11.59 |
| 1220 | 11.59 | 1221 | 11.59 | 1222 | 11.59 | 1223 | 11.85 | 1224 | 11.59 |
| 1225 | 11.08 | 1226 | 10.31 | 1227 | 9.79 | 1228 | 9.02 | 1229 | 8.24 |
| 1230 | 7.47 | 1231 | 6.96 | 1232 | 6.96 | 1233 | 6.96 | 1234 | 6.96 |
| 1235 | 6.96 | 1236 | 7.21 | 1237 | 7.21 | 1238 | 7.21 | 1239 | 6.96 |
| 1240 | 6.96 | 1241 | 6.96 | 1242 | 6.96 | 1243 | 6.96 | 1244 | 6.96 |
| 1245 | 6.96 | 1246 | 7.21 | 1247 | 7.21 | 1248 | 7.21 | 1249 | 6.96 |
| 1250 | 6.96 | 1251 | 6.96 | 1252 | 6.96 | 1253 | 6.96 | 1254 | 6.96 |
| 1255 | 6.96 | 1256 | 7.21 | 1257 | 7.21 | 1258 | 7.21 | 1259 | 6.96 |
| 1260 | 6.96 | 1261 | 6.96 | 1262 | 6.96 | 1263 | 6.96 | 1264 | 6.96 |
| 1265 | 6.96 | 1266 | 7.21 | 1267 | 7.21 | 1268 | 6.96 | 1269 | 6.96 |
| 1270 | 6.96 | 1271 | 6.96 | 1272 | 6.96 | 1273 | 6.96 | 1274 | 6.96 |
| 1275 | 7.21 | 1276 | 7.21 | 1277 | 7.21 | 1278 | 6.96 | 1279 | 6.96 |
| 1280 | 6.96 | 1281 | 6.96 | 1282 | 6.96 | 1283 | 6.96 | 1284 | 6.96 |
| 1285 | 7.21 | 1286 | 7.21 | 1287 | 7.21 | 1288 | 6.96 | 1289 | 6.96 |

```
     1290       6.96  1291       6.96  1292       6.96  1293       6.96  1294
6.96
     1295       7.21  1296       7.21  1297       6.70  1298       6.44  1299
5.93
     1300       5.67  1310       4.51  1320       4.51  1330       4.51  1340
4.69
     1350       4.51  1360       4.51  1370       4.51  1380       4.69  1390
4.51
     1400       4.51  1420       4.60  1440       4.51  1460       0.00  1500
0.00
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020028011307A97                                 G1
006     1  031A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 5

Project Description

---

Discharge 5

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: CARP1: Carpenteria Coastal
Curve C: ALP1: Arroyo Las Posas
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 5


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      30A :  Subarea
      30A   020   A100    5   28    113    388      113     388   1153    -------
----  -------    ---     ----    -----  -----    --     --
      31A   ---   ---    --   --    ---    ---      113     388   1153    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   31A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:     113    acres
            HYDROGRAPH PEAK:              388    cfs
            TIME OF PEAK:                1153    minutes
            HYDROGRAPH VOLUME:            24.54 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       5.16   200       5.14   300       5.16   400
5.14
      500       5.16   600       5.81   700       7.88   800       7.90   900
9.72
     1000      14.52  1050      23.48  1100      37.50  1110      52.37  1120
60.20
     1130      62.00  1131      63.26  1132      64.52  1133      64.88  1134
66.14
     1135      67.40  1136      67.40  1137      67.40  1138      67.40  1139
67.40
     1140      67.40  1141      74.59  1142      81.70  1143      89.66  1144
96.73
     1145     114.37  1146     124.95  1147     135.60  1148     146.37  1149
203.22
     1150     249.67  1151     295.69  1152     342.02  1153     388.35  1154
342.02
     1155     284.79  1156     220.48  1157     156.25  1158      92.31  1159
73.70
     1160      64.70  1161      62.90  1162      61.10  1163      61.10  1164
60.20
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1165 | 56.56 | 1166 | 51.91 | 1167 | 48.18 | 1168 | 43.53 | 1169 |
| 38.87 | | | | | | | | |
| 1170 | 38.87 | 1171 | 39.80 | 1172 | 38.87 | 1173 | 38.87 | 1174 |
| 39.81 | | | | | | | | |
| 1175 | 38.87 | 1176 | 38.87 | 1177 | 37.05 | 1178 | 33.43 | 1179 |
| 30.72 | | | | | | | | |
| 1180 | 28.01 | 1181 | 25.29 | 1182 | 25.29 | 1183 | 25.29 | 1184 |
| 25.29 | | | | | | | | |
| 1185 | 25.29 | 1186 | 25.29 | 1187 | 25.29 | 1188 | 25.29 | 1189 |
| 22.58 | | | | | | | | |
| 1190 | 21.67 | 1191 | 18.96 | 1192 | 16.24 | 1193 | 14.44 | 1194 |
| 14.44 | | | | | | | | |
| 1195 | 14.44 | 1196 | 14.44 | 1197 | 14.44 | 1198 | 14.44 | 1199 |
| 15.34 | | | | | | | | |
| 1200 | 14.44 | 1201 | 14.44 | 1202 | 14.44 | 1203 | 14.44 | 1204 |
| 14.44 | | | | | | | | |
| 1205 | 14.44 | 1206 | 14.44 | 1207 | 14.44 | 1208 | 14.44 | 1209 |
| 14.44 | | | | | | | | |
| 1210 | 14.44 | 1211 | 14.44 | 1212 | 14.44 | 1213 | 14.44 | 1214 |
| 14.44 | | | | | | | | |
| 1215 | 14.44 | 1216 | 14.44 | 1217 | 14.44 | 1218 | 15.34 | 1219 |
| 14.44 | | | | | | | | |
| 1220 | 14.44 | 1221 | 14.44 | 1222 | 14.44 | 1223 | 14.44 | 1224 |
| 14.44 | | | | | | | | |
| 1225 | 11.90 | 1226 | 11.18 | 1227 | 10.10 | 1228 | 8.66 | 1229 |
| 7.94 | | | | | | | | |
| 1230 | 7.94 | 1231 | 7.57 | 1232 | 7.94 | 1233 | 7.94 | 1234 |
| 7.94 | | | | | | | | |
| 1235 | 7.94 | 1236 | 7.94 | 1237 | 7.94 | 1238 | 7.94 | 1239 |
| 7.57 | | | | | | | | |
| 1240 | 7.94 | 1241 | 7.94 | 1242 | 7.94 | 1243 | 7.94 | 1244 |
| 7.94 | | | | | | | | |
| 1245 | 7.94 | 1246 | 7.94 | 1247 | 7.57 | 1248 | 7.94 | 1249 |
| 7.94 | | | | | | | | |
| 1250 | 7.94 | 1251 | 7.94 | 1252 | 7.94 | 1253 | 7.94 | 1254 |
| 7.94 | | | | | | | | |
| 1255 | 7.57 | 1256 | 7.94 | 1257 | 7.94 | 1258 | 7.94 | 1259 |
| 7.94 | | | | | | | | |
| 1260 | 7.94 | 1261 | 7.94 | 1262 | 7.94 | 1263 | 7.57 | 1264 |
| 7.94 | | | | | | | | |
| 1265 | 7.94 | 1266 | 7.94 | 1267 | 7.94 | 1268 | 7.94 | 1269 |
| 7.94 | | | | | | | | |
| 1270 | 7.94 | 1271 | 7.57 | 1272 | 7.94 | 1273 | 7.94 | 1274 |
| 7.94 | | | | | | | | |
| 1275 | 7.94 | 1276 | 7.94 | 1277 | 7.94 | 1278 | 7.94 | 1279 |
| 7.57 | | | | | | | | |
| 1280 | 7.94 | 1281 | 7.94 | 1282 | 7.94 | 1283 | 7.94 | 1284 |
| 7.94 | | | | | | | | |
| 1285 | 7.94 | 1286 | 7.94 | 1287 | 7.57 | 1288 | 7.94 | 1289 |
| 7.94 | | | | | | | | |

```
     1290       7.94  1291       7.94  1292       7.94  1293       7.94  1294
7.94
     1295       7.57  1296       7.94  1297       7.57  1298       6.85  1299
6.13
     1300       5.77  1310       5.23  1320       5.05  1330       5.23  1340
5.05
     1350       5.23  1360       5.23  1370       5.05  1380       5.23  1390
5.05
     1400       5.23  1420       5.14  1440       5.14  1460       0.00  1500
0.00
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  030A Header place holder
005     1  031A Header place holder
999
999
006     1  030A 020028011305A97                                 G1
006     1  031A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      40A :  Subarea
      40A   020   A10    10    0     63     73       63      73   1154    PIPE
 263  0.05700      2.25  ----    -----  -----    --      --
      41A   ---   ---    --   --    ---    ---       63      72   1154    -------
----  -------    ---     ----    -----  -----    --      --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      63    acres
            HYDROGRAPH PEAK:               72    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              2.73 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       0.40  1100       2.88  1110       6.73  1120
9.72
     1130       9.92  1131      10.04  1132      10.16  1133      10.29  1134
10.53
     1135      10.76  1136      10.88  1137      11.01  1138      11.13  1139
11.37
     1140      11.60  1141      12.22  1142      13.46  1143      14.68  1144
15.66
     1145      17.79  1146      20.86  1147      23.62  1148      26.38  1149
33.02
     1150      42.75  1151      51.30  1152      59.55  1153      67.76  1154
72.18
     1155      71.62  1156      69.32  1157      66.53  1158      63.85  1159
56.95
     1160      47.01  1161      37.79  1162      28.24  1163      18.77  1164
12.90
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1165 | 10.57 | 1166 | 9.12 | 1167 | 8.40 | 1168 | 7.66 | 1169 | 6.83 |
| 1170 | 6.22 | 1171 | 5.69 | 1172 | 5.07 | 1173 | 4.36 | 1174 | 3.71 |
| 1175 | 3.45 | 1176 | 3.44 | 1177 | 3.26 | 1178 | 2.88 | 1179 | 2.51 |
| 1180 | 2.09 | 1181 | 1.68 | 1182 | 1.27 | 1183 | 0.92 | 1184 | 0.66 |
| 1185 | 0.47 | 1186 | 0.40 | 1187 | 0.40 | 1188 | 0.40 | 1189 | 0.40 |
| 1190 | 0.40 | 1191 | 0.40 | 1192 | 0.40 | 1193 | 0.40 | 1194 | 0.40 |
| 1195 | 0.40 | 1196 | 0.40 | 1197 | 0.40 | 1198 | 0.40 | 1199 | 0.40 |
| 1200 | 0.40 | 1201 | 0.40 | 1202 | 0.40 | 1203 | 0.40 | 1204 | 0.40 |
| 1205 | 0.40 | 1206 | 0.40 | 1207 | 0.40 | 1208 | 0.40 | 1209 | 0.40 |
| 1210 | 0.40 | 1211 | 0.40 | 1212 | 0.40 | 1213 | 0.40 | 1214 | 0.40 |
| 1215 | 0.40 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |
| 1285 | 0.40 | 1286 | 0.40 | 1287 | 0.40 | 1288 | 0.40 | 1289 | 0.40 |

```
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006310A97400263005700                    G1
006     1  041A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      40A :  Subarea
      40A   020   A25     9    0     63     96       63      96   1154    PIPE
 263  0.05700      2.50  ----    -----  -----    --      --
      41A   ---   ---    --   --    ---    ---       63      96   1154    -------
----  -------    ---     ----    -----  -----    --      --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      63    acres
            HYDROGRAPH PEAK:               96    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              3.67 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       1.31  1100       6.35  1110      11.33  1120
14.69
     1130      15.29  1131      15.55  1132      15.66  1133      15.82  1134
16.10
     1135      16.36  1136      16.63  1137      16.77  1138      16.92  1139
17.20
     1140      17.32  1141      18.28  1142      19.94  1143      21.36  1144
22.93
     1145      25.67  1146      29.40  1147      33.05  1148      36.55  1149
45.69
     1150      58.08  1151      68.99  1152      80.69  1153      91.73  1154
95.96
     1155      94.71  1156      91.46  1157      87.63  1158      77.98  1159
64.21
     1160      51.72  1161      38.88  1162      26.53  1163      18.87  1164
16.36
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1165 | 14.88 | 1166 | 13.83 | 1167 | 12.72 | 1168 | 11.65 | 1169 | 10.88 |
| 1170 | 10.05 | 1171 | 9.12 | 1172 | 8.31 | 1173 | 7.50 | 1174 | 7.03 |
| 1175 | 7.02 | 1176 | 7.02 | 1177 | 6.79 | 1178 | 6.24 | 1179 | 5.69 |
| 1180 | 5.11 | 1181 | 4.53 | 1182 | 4.05 | 1183 | 3.49 | 1184 | 2.91 |
| 1185 | 2.34 | 1186 | 1.94 | 1187 | 1.95 | 1188 | 2.00 | 1189 | 1.82 |
| 1190 | 1.49 | 1191 | 1.06 | 1192 | 0.62 | 1193 | 0.42 | 1194 | 0.40 |
| 1195 | 0.40 | 1196 | 0.40 | 1197 | 0.40 | 1198 | 0.40 | 1199 | 0.40 |
| 1200 | 0.40 | 1201 | 0.40 | 1202 | 0.40 | 1203 | 0.40 | 1204 | 0.40 |
| 1205 | 0.40 | 1206 | 0.40 | 1207 | 0.40 | 1208 | 0.40 | 1209 | 0.40 |
| 1210 | 0.40 | 1211 | 0.40 | 1212 | 0.40 | 1213 | 0.40 | 1214 | 0.40 |
| 1215 | 0.40 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |
| 1285 | 0.40 | 1286 | 0.40 | 1287 | 0.40 | 1288 | 0.40 | 1289 | 0.40 |

```
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006309A97400263005700                    G1
006     1  041A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      40A :  Subarea
      40A   020   A50     8    0     63    117       63     117   1153    PIPE
 263  0.05700      2.75  ----    -----  -----    --     --
      41A   ---   ---    --   --    ---    ---       63     117   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      63    acres
            HYDROGRAPH PEAK:              117    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              4.48 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       3.24  1100       8.96  1110      14.76  1120
18.71
     1130      19.22  1131      19.60  1132      19.75  1133      20.00  1134
20.37
     1135      20.72  1136      20.92  1137      21.15  1138      21.52  1139
21.51
     1140      21.53  1141      22.72  1142      24.64  1143      26.44  1144
28.44
     1145      32.08  1146      36.66  1147      41.08  1148      45.72  1149
56.36
     1150      71.58  1151      86.04  1152     100.83  1153     113.59  1154
117.42
     1155     115.68  1156     111.36  1157      98.85  1158      81.19  1159
64.97
     1160      48.58  1161      32.91  1162      23.71  1163      20.96  1164
19.60
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1165 | 18.54 | 1166 | 17.13 | 1167 | 15.93 | 1168 | 14.69 | 1169 | 13.48 |
| 1170 | 12.39 | 1171 | 11.33 | 1172 | 10.15 | 1173 | 9.65 | 1174 | 9.65 |
| 1175 | 9.65 | 1176 | 9.65 | 1177 | 9.38 | 1178 | 8.61 | 1179 | 7.85 |
| 1180 | 7.18 | 1181 | 6.53 | 1182 | 5.88 | 1183 | 5.11 | 1184 | 4.44 |
| 1185 | 4.03 | 1186 | 3.98 | 1187 | 4.00 | 1188 | 3.99 | 1189 | 3.77 |
| 1190 | 3.18 | 1191 | 2.70 | 1192 | 2.18 | 1193 | 1.67 | 1194 | 1.17 |
| 1195 | 0.72 | 1196 | 0.46 | 1197 | 0.40 | 1198 | 0.40 | 1199 | 0.40 |
| 1200 | 0.40 | 1201 | 0.40 | 1202 | 0.40 | 1203 | 0.40 | 1204 | 0.40 |
| 1205 | 0.40 | 1206 | 0.40 | 1207 | 0.40 | 1208 | 0.40 | 1209 | 0.40 |
| 1210 | 0.40 | 1211 | 0.40 | 1212 | 0.40 | 1213 | 0.40 | 1214 | 0.40 |
| 1215 | 0.40 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |
| 1285 | 0.40 | 1286 | 0.40 | 1287 | 0.40 | 1288 | 0.40 | 1289 | 0.40 |

```
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006308A97400263005700                    G1
006     1  041A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 6

Project Description

---

Discharge 6

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo



Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |

```
      40A :  Subarea
      40A   020   A100    7    0     63    145       63     145   1153    PIPE
 263  0.05700      3.00  ----    -----  -----    --     --
      41A   ---   ---    --   --    ---    ---       63     145   1154    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   41A
-------------------------------------------------------------------------------
-----------------
            TOTAL AREA TO HYDROGRAPH:      63    acres
            HYDROGRAPH PEAK:              145    cfs
            TIME OF PEAK:                1154    minutes
            HYDROGRAPH VOLUME:              5.45 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       1.15  1050       5.26  1100      11.81  1110      18.49  1120
22.63
     1130      23.28  1131      23.73  1132      24.09  1133      24.36  1134
24.62
     1135      25.07  1136      25.47  1137      25.90  1138      25.89  1139
25.74
     1140      25.94  1141      27.47  1142      29.98  1143      32.29  1144
34.62
     1145      39.29  1146      45.45  1147      51.15  1148      55.56  1149
68.87
     1150      89.20  1151     107.64  1152     124.82  1153     139.80  1154
144.53
     1155     142.14  1156     126.25  1157     103.09  1158      82.35  1159
60.88
     1160      40.50  1161      28.79  1162      25.23  1163      23.63  1164
23.38
```

1165 22.16 1166 20.48 1167 18.92 1168 17.73 1169
16.28
1170 14.71 1171 13.32 1172 12.57 1173 12.61 1174
12.76
1175 12.59 1176 12.61 1177 12.27 1178 11.21 1179
10.34
1180 9.44 1181 8.39 1182 7.64 1183 6.75 1184
6.14
1185 6.11 1186 6.12 1187 6.26 1188 6.27 1189
5.70
1190 5.12 1191 4.57 1192 3.85 1193 3.11 1194
2.26
1195 1.59 1196 1.33 1197 1.20 1198 1.08 1199
1.09
1200 1.24 1201 1.31 1202 1.20 1203 1.08 1204
1.09
1205 1.24 1206 1.22 1207 1.07 1208 1.01 1209
1.08
1210 1.24 1211 1.22 1212 1.07 1213 1.01 1214
1.08
1215 1.24 1216 1.22 1217 1.07 1218 1.09 1219
1.24
1220 1.31 1221 1.20 1222 1.08 1223 1.09 1224
1.24
1225 1.04 1226 0.64 1227 0.43 1228 0.40 1229
0.40
1230 0.40 1231 0.40 1232 0.40 1233 0.40 1234
0.40
1235 0.40 1236 0.40 1237 0.40 1238 0.40 1239
0.40
1240 0.40 1241 0.40 1242 0.40 1243 0.40 1244
0.40
1245 0.40 1246 0.40 1247 0.40 1248 0.40 1249
0.40
1250 0.40 1251 0.40 1252 0.40 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40
1270 0.40 1271 0.40 1272 0.40 1273 0.40 1274
0.40
1275 0.40 1276 0.40 1277 0.40 1278 0.40 1279
0.40
1280 0.40 1281 0.40 1282 0.40 1283 0.40 1284
0.40
1285 0.40 1286 0.40 1287 0.40 1288 0.40 1289
0.40

```
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  040A Header place holder
005     1  041A Header place holder
999
999
006     1  040A 020000006307A97400263005700                    G1
006     1  041A 010      099A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 7

Project Description

---

Discharge 7

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 7


Model Results

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | SUBAREA DATA AND RESULTS AREA (AC) | FLOW (CFS) | ACCUMULATED DATA AREA (AC) | FLOW (CFS) | TIME (MIN) | ROUTING AFTER ACCUMULATION CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      50A :  Subarea
      50A   020   A10    11    0    300    325      300     325   1155    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A10    15    0     50     44      350     365   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              365    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             11.82 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       0.40  1100      14.64  1110      30.15  1120
49.16
     1130      55.02  1131      55.13  1132      55.43  1133      55.92  1134
56.60
     1135      57.41  1136      58.37  1137      59.18  1138      59.89  1139
60.66
     1140      61.51  1141      63.05  1142      65.69  1143      70.15  1144
75.62
     1145      82.29  1146      91.16  1147     103.54  1148     117.34  1149
135.73
     1150     165.83  1151     209.36  1152     256.93  1153     303.39  1154
340.16
     1155     361.26  1156     365.17  1157     358.86  1158     347.56  1159
335.58
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 319.35 | 1161 | 291.19 | 1162 | 253.82 | 1163 | 215.51 | 1164 | 174.15 |
| 1165 | 132.56 | 1166 | 98.94 | 1167 | 75.83 | 1168 | 59.43 | 1169 | 51.18 |
| 1170 | 45.71 | 1171 | 41.46 | 1172 | 37.73 | 1173 | 34.34 | 1174 | 31.47 |
| 1175 | 28.62 | 1176 | 25.74 | 1177 | 22.95 | 1178 | 20.55 | 1179 | 18.66 |
| 1180 | 16.98 | 1181 | 15.05 | 1182 | 13.57 | 1183 | 12.13 | 1184 | 10.36 |
| 1185 | 8.57 | 1186 | 7.00 | 1187 | 5.58 | 1188 | 4.12 | 1189 | 2.91 |
| 1190 | 2.07 | 1191 | 1.51 | 1192 | 1.14 | 1193 | 0.89 | 1194 | 0.73 |
| 1195 | 0.62 | 1196 | 0.54 | 1197 | 0.50 | 1198 | 0.46 | 1199 | 0.44 |
| 1200 | 0.43 | 1201 | 0.42 | 1202 | 0.41 | 1203 | 0.41 | 1204 | 0.41 |
| 1205 | 0.40 | 1206 | 0.40 | 1207 | 0.40 | 1208 | 0.40 | 1209 | 0.40 |
| 1210 | 0.40 | 1211 | 0.40 | 1212 | 0.40 | 1213 | 0.40 | 1214 | 0.40 |
| 1215 | 0.40 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

```
Model Lines
-------------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030011A97201040006100                    G1
006     1  051A 020000005015A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 7

Project Description

---

Discharge 7

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 7


Model Results

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | SUBAREA DATA AND RESULTS AREA (AC) | FLOW (CFS) | ACCUMULATED DATA AREA (AC) | FLOW (CFS) | TIME (MIN) | ROUTING AFTER ACCUMULATION CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      50A :  Subarea
      50A   020   A25    11    0    300    408      300     408   1154    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A25    13    0     50     61      350     465   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              465    cfs
            TIME OF PEAK:                1156    minutes
            HYDROGRAPH VOLUME:             17.24 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       6.55  1100      33.92  1110      54.90  1120
77.11
     1130      84.14  1131      84.71  1132      85.43  1133      86.32  1134
87.11
     1135      88.13  1136      89.27  1137      90.31  1138      91.23  1139
92.03
     1140      93.07  1141      95.02  1142      98.79  1143     104.77  1144
111.65
     1145     120.28  1146     131.46  1147     146.14  1148     162.15  1149
185.94
     1150     224.71  1151     279.18  1152     338.26  1153     395.89  1154
439.66
     1155     462.60  1156     465.05  1157     456.05  1158     440.82  1159
424.47
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 402.89 | 1161 | 365.94 | 1162 | 313.47 | 1163 | 261.20 | 1164 | 209.91 |
| 1165 | 158.41 | 1166 | 117.72 | 1167 | 95.45 | 1168 | 82.41 | 1169 | 74.83 |
| 1170 | 69.23 | 1171 | 64.11 | 1172 | 59.81 | 1173 | 56.18 | 1174 | 52.42 |
| 1175 | 48.68 | 1176 | 45.14 | 1177 | 41.70 | 1178 | 39.43 | 1179 | 37.37 |
| 1180 | 34.95 | 1181 | 32.84 | 1182 | 30.71 | 1183 | 28.41 | 1184 | 26.22 |
| 1185 | 23.79 | 1186 | 21.45 | 1187 | 19.08 | 1188 | 16.62 | 1189 | 14.22 |
| 1190 | 12.36 | 1191 | 10.82 | 1192 | 9.29 | 1193 | 7.76 | 1194 | 6.13 |
| 1195 | 5.01 | 1196 | 4.01 | 1197 | 3.08 | 1198 | 2.32 | 1199 | 1.77 |
| 1200 | 1.38 | 1201 | 1.10 | 1202 | 0.90 | 1203 | 0.75 | 1204 | 0.65 |
| 1205 | 0.58 | 1206 | 0.53 | 1207 | 0.49 | 1208 | 0.47 | 1209 | 0.45 |
| 1210 | 0.43 | 1211 | 0.42 | 1212 | 0.42 | 1213 | 0.41 | 1214 | 0.41 |
| 1215 | 0.41 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030011A97201040006100                    G1
006     1  051A 020000005013A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 7

Project Description

---

Discharge 7

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 7


Model Results

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | SUBAREA DATA AND RESULTS AREA (AC) | FLOW (CFS) | ACCUMULATED DATA AREA (AC) | FLOW (CFS) | TIME (MIN) | ROUTING AFTER ACCUMULATION CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      50A :  Subarea
      50A   020   A50    10    0    300    501      300     501   1154    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A50    11    0     50     78      350     571   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              571    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             21.80 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050      16.57  1100      48.84  1110      75.44  1120
101.58
     1130     106.49  1131     107.25  1132     108.02  1133     109.03  1134
110.07
     1135     111.46  1136     112.82  1137     114.03  1138     115.15  1139
116.40
     1140     117.58  1141     119.78  1142     124.01  1143     131.34  1144
139.56
     1145     149.84  1146     163.99  1147     182.95  1148     203.03  1149
233.56
     1150     284.52  1151     354.57  1152     425.86  1153     494.83  1154
547.26
     1155     571.32  1156     565.78  1157     549.22  1158     529.39  1159
501.39
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 446.42 | 1161 | 378.98 | 1162 | 311.43 | 1163 | 246.42 | 1164 | 183.87 |
| 1165 | 142.84 | 1166 | 120.07 | 1167 | 106.55 | 1168 | 97.80 | 1169 | 90.71 |
| 1170 | 84.48 | 1171 | 79.10 | 1172 | 74.24 | 1173 | 69.33 | 1174 | 64.37 |
| 1175 | 59.60 | 1176 | 56.68 | 1177 | 54.56 | 1178 | 52.68 | 1179 | 50.49 |
| 1180 | 47.88 | 1181 | 45.25 | 1182 | 42.40 | 1183 | 39.53 | 1184 | 36.89 |
| 1185 | 33.77 | 1186 | 30.77 | 1187 | 27.65 | 1188 | 25.33 | 1189 | 23.42 |
| 1190 | 22.10 | 1191 | 20.60 | 1192 | 18.78 | 1193 | 16.60 | 1194 | 15.04 |
| 1195 | 13.02 | 1196 | 11.23 | 1197 | 9.11 | 1198 | 7.21 | 1199 | 5.64 |
| 1200 | 4.22 | 1201 | 3.02 | 1202 | 2.12 | 1203 | 1.53 | 1204 | 1.14 |
| 1205 | 0.89 | 1206 | 0.72 | 1207 | 0.61 | 1208 | 0.54 | 1209 | 0.49 |
| 1210 | 0.46 | 1211 | 0.44 | 1212 | 0.43 | 1213 | 0.42 | 1214 | 0.41 |
| 1215 | 0.41 | 1216 | 0.40 | 1217 | 0.40 | 1218 | 0.40 | 1219 | 0.40 |
| 1220 | 0.40 | 1221 | 0.40 | 1222 | 0.40 | 1223 | 0.40 | 1224 | 0.40 |
| 1225 | 0.40 | 1226 | 0.40 | 1227 | 0.40 | 1228 | 0.40 | 1229 | 0.40 |
| 1230 | 0.40 | 1231 | 0.40 | 1232 | 0.40 | 1233 | 0.40 | 1234 | 0.40 |
| 1235 | 0.40 | 1236 | 0.40 | 1237 | 0.40 | 1238 | 0.40 | 1239 | 0.40 |
| 1240 | 0.40 | 1241 | 0.40 | 1242 | 0.40 | 1243 | 0.40 | 1244 | 0.40 |
| 1245 | 0.40 | 1246 | 0.40 | 1247 | 0.40 | 1248 | 0.40 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030010A97201040006100                    G1
006     1  051A 020000005011A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 7

Project Description

---

Discharge 7

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 7


Model Results

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | SUBAREA DATA AND RESULTS AREA (AC) | FLOW (CFS) | ACCUMULATED DATA AREA (AC) | FLOW (CFS) | TIME (MIN) | ROUTING AFTER ACCUMULATION CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      50A :  Subarea
      50A   020   A100   10    0    300    578      300     578   1154    VALLEY
1040  0.06100    ---     ----    -----  -----    --     --
      51A :  Subarea
      51A   020   A100   11    0     50     90      350     659   1155    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   51A
-------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     350    acres
            HYDROGRAPH PEAK:              659    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             27.57 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       6.07  1050      27.92  1100      64.54  1110      95.71  1120
123.64
     1130     128.80  1131     129.84  1132     130.92  1133     132.19  1134
133.41
     1135     134.57  1136     136.03  1137     137.60  1138     139.02  1139
140.28
     1140     141.46  1141     144.32  1142     149.43  1143     157.47  1144
166.87
     1145     178.76  1146     194.98  1147     216.17  1148     238.94  1149
275.30
     1150     335.10  1151     415.31  1152     495.77  1153     573.90  1154
633.25
     1155     659.39  1156     651.87  1157     631.60  1158     607.89  1159
574.86
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1160 | 510.69 | 1161 | 433.08 | 1162 | 356.15 | 1163 | 281.46 | 1164 | 211.58 |
| 1165 | 166.41 | 1166 | 141.83 | 1167 | 127.57 | 1168 | 118.20 | 1169 | 110.74 |
| 1170 | 103.98 | 1171 | 97.98 | 1172 | 92.75 | 1173 | 87.58 | 1174 | 81.91 |
| 1175 | 76.36 | 1176 | 72.76 | 1177 | 70.81 | 1178 | 69.04 | 1179 | 66.22 |
| 1180 | 63.11 | 1181 | 60.09 | 1182 | 56.66 | 1183 | 53.38 | 1184 | 50.12 |
| 1185 | 46.45 | 1186 | 43.09 | 1187 | 39.65 | 1188 | 37.02 | 1189 | 35.24 |
| 1190 | 33.78 | 1191 | 32.00 | 1192 | 29.83 | 1193 | 27.39 | 1194 | 25.17 |
| 1195 | 22.77 | 1196 | 20.30 | 1197 | 17.83 | 1198 | 15.33 | 1199 | 12.90 |
| 1200 | 10.67 | 1201 | 8.98 | 1202 | 8.05 | 1203 | 7.32 | 1204 | 7.01 |
| 1205 | 6.74 | 1206 | 6.62 | 1207 | 6.67 | 1208 | 6.51 | 1209 | 6.54 |
| 1210 | 6.31 | 1211 | 6.28 | 1212 | 6.26 | 1213 | 6.25 | 1214 | 6.39 |
| 1215 | 6.23 | 1216 | 6.22 | 1217 | 6.22 | 1218 | 6.37 | 1219 | 6.37 |
| 1220 | 6.36 | 1221 | 6.52 | 1222 | 6.43 | 1223 | 6.49 | 1224 | 6.44 |
| 1225 | 5.98 | 1226 | 5.81 | 1227 | 5.30 | 1228 | 4.60 | 1229 | 3.74 |
| 1230 | 2.89 | 1231 | 2.19 | 1232 | 1.69 | 1233 | 1.33 | 1234 | 1.07 |
| 1235 | 0.88 | 1236 | 0.75 | 1237 | 0.65 | 1238 | 0.58 | 1239 | 0.53 |
| 1240 | 0.49 | 1241 | 0.47 | 1242 | 0.45 | 1243 | 0.43 | 1244 | 0.42 |
| 1245 | 0.42 | 1246 | 0.41 | 1247 | 0.41 | 1248 | 0.41 | 1249 | 0.40 |
| 1250 | 0.40 | 1251 | 0.40 | 1252 | 0.40 | 1253 | 0.40 | 1254 | 0.40 |
| 1255 | 0.40 | 1256 | 0.40 | 1257 | 0.40 | 1258 | 0.40 | 1259 | 0.40 |
| 1260 | 0.40 | 1261 | 0.40 | 1262 | 0.40 | 1263 | 0.40 | 1264 | 0.40 |
| 1265 | 0.40 | 1266 | 0.40 | 1267 | 0.40 | 1268 | 0.40 | 1269 | 0.40 |
| 1270 | 0.40 | 1271 | 0.40 | 1272 | 0.40 | 1273 | 0.40 | 1274 | 0.40 |
| 1275 | 0.40 | 1276 | 0.40 | 1277 | 0.40 | 1278 | 0.40 | 1279 | 0.40 |
| 1280 | 0.40 | 1281 | 0.40 | 1282 | 0.40 | 1283 | 0.40 | 1284 | 0.40 |

```
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  050A Header place holder
005     1  051A Header place holder
999
999
006     1  050A 020000030010A97201040006100                    G1
006     1  051A 020000005011A97                              1  2
999
```

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
TIME OF CONCENTRATION
TC Program Version: 2.64.0.37
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

S U M M A R Y  O F  C O M P U T A T I O N S

Watershed Name: Watershed

| Name | Zone | Storm | Soil | Area (acres) | TC (min) |
|---|---|---|---|---|---|
| 1A | K | 10 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 1A | K | 25 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 1A | K | 50 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 1A | K | 100 | 2.00 | 11.2 / 11 | SCOUR ERROR |
| 2A | K | 10 | 2.00 | 25.3 / 25 | 8.713 / 9 |
| 2A | K | 25 | 2.00 | 25.3 / 25 | 8.437 / 8 |
| 2A | K | 50 | 2.00 | 25.3 / 25 | 8.245 / 8 |
| 2A | K | 100 | 2.00 | 25.3 / 25 | 7.540 / 8 |
| 3A | K | 10 | 2.00 | 20.1 / 20 | 11.029 / 11 |
| 3A | K | 25 | 2.00 | 20.1 / 20 | 10.596 / 11 |
| 3A | K | 50 | 2.00 | 20.1 / 20 | 10.200 / 10 |
| 3A | K | 100 | 2.00 | 20.1 / 20 | 9.325 / 9 |
| 4A | K | 10 | 2.00 | 8.2 / 8 | 6.698 / 7 |
| 4A | K | 25 | 2.00 | 8.2 / 8 | 6.538 / 7 |
| 4A | K | 50 | 2.00 | 8.2 / 8 | 6.382 / 6 |
| 4A | K | 100 | 2.00 | 8.2 / 8 | 5.871 / 6 |
| 5A | K | 10 | 5.00 | 1.3 / 1 | 6.072 / 6 |
| 5A | K | 25 | 5.00 | 1.3 / 1 | 5.231 / 5 |
| 5A | K | 50 | 5.00 | 1.3 / 1 | TC ERROR |
| 5A | K | 100 | 5.00 | 1.3 / 1 | TC ERROR |
| 10A | K | 10 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 10A | K | 25 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 10A | K | 50 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 10A | K | 100 | 2.00 | 9.8 / 10 | SCOUR ERROR |
| 11A | K | 10 | 2.00 | 15.4 / 15 | 7.306 / 7 |
| 11A | K | 25 | 2.00 | 15.4 / 15 | 7.132 / 7 |
| 11A | K | 50 | 2.00 | 15.4 / 15 | 6.997 / 7 |
| 11A | K | 100 | 2.00 | 15.4 / 15 | SCOUR ERROR |
| 12A | K | 10 | 2.00 | 17.3 / 17 | 10.626 / 11 |
| 12A | K | 25 | 2.00 | 17.3 / 17 | 10.301 / 10 |
| 12A | K | 50 | 2.00 | 17.3 / 17 | 10.061 / 10 |
| 12A | K | 100 | 2.00 | 17.3 / 17 | 9.196 / 9 |
| 20A | K | 10 | 2.00 | 15.5 / 15 | 7.995 / 8 |
| 20A | K | 25 | 2.00 | 15.5 / 15 | 7.792 / 8 |
| 20A | K | 50 | 2.00 | 15.5 / 15 | 7.628 / 8 |
| 20A | K | 100 | 2.00 | 15.5 / 15 | 6.963 / 7 |

```
21A                     K        10   2.00     2.2 /   2      6.188 /  6
21A                     K        25   2.00     2.2 /   2      5.340 /  5
21A                     K        50   2.00     2.2 /   2        TC ERROR
21A                     K       100   2.00     2.2 /   2        TC ERROR
22A                     K        10   2.00     1.1 /   1        TC ERROR
22A                     K        25   2.00     1.1 /   1        TC ERROR
22A                     K        50   2.00     1.1 /   1        TC ERROR
22A                     K       100   2.00     1.1 /   1        NaN / Na
30A                     K        10   2.00    11.3 /  11      8.803 /  9
30A                     K        25   2.00    11.3 /  11      7.375 /  7
30A                     K        50   2.00    11.3 /  11      6.611 /  7
30A                     K       100   2.00    11.3 /  11      5.425 /  5
40A                     K        10   2.00     6.3 /   6      9.522 / 10
40A                     K        25   2.00     6.3 /   6      8.723 /  9
40A                     K        50   2.00     6.3 /   6      8.174 /  8
40A                     K       100   2.00     6.3 /   6     SCOUR ERROR
50A                     K        10   2.00    31.1 /  31     12.000 / 12
50A                     K        25   2.00    31.1 /  31     SCOUR ERROR
50A                     K        50   2.00    31.1 /  31     SCOUR ERROR
50A                     K       100   2.00    31.1 /  31     SCOUR ERROR
51A                     K        10   2.00     4.6 /   5     18.332 / 18
51A                     K        25   2.00     4.6 /   5     15.167 / 15
51A                     K        50   2.00     4.6 /   5     13.322 / 13
51A                     K       100   2.00     4.6 /   5     10.709 / 11
60A                     K        10   2.00     1.2 /   1      5.537 /  6
60A                     K        25   2.00     1.2 /   1        TC ERROR
60A                     K        50   2.00     1.2 /   1        TC ERROR
60A                     K       100   2.00     1.2 /   1        TC ERROR
61A                     K        10   2.00     1.6 /   2      7.902 /  8
61A                     K        25   2.00     1.6 /   2      6.927 /  7
61A                     K        50   2.00     1.6 /   2        TC ERROR
61A                     K       100   2.00     1.6 /   2        TC ERROR
--------------------------------------------------------------------------
♠
--------------------------------------------------------------------------
Watershed Name: Watershed
--------------------------------------------------------------------------
Sub-Area Name: 1A
Computing Tc for all rainfall frequencies for sub-area 1A...
--------------------------------------------------------------------------
Tc for frequency = 10.00: 8.923 Minutes
DATA FOR SUB AREA 1
--------------------------------------------------------------------------
SUB AREA TIME OF CONCENTRATION: 8.923 min. = 9 min. ** SCOUR ERROR **
--------------------------------------------------------------------------
SUB AREA INPUT DATA
--------------------------------------------------------------------------
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
```

Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 1.976
C Total: 0.759
Sum Q Segments (cfs): 0.00
Q Total (cfs): 16.17
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.923
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 16.17
Avg Velocity (ft/s): 6.31
Passed Scour Check: No
Scour Velocity (ft/sec): 6.31
🠉
Tc for frequency = 25.00: 8.589 Minutes
DATA FOR SUB AREA 1
---
SUB AREA TIME OF CONCENTRATION: 8.589 min. = 9 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---
Intensity (in/hr): 2.183
C Total: 0.776
Sum Q Segments (cfs): 0.00
Q Total (cfs): 18.28
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.589
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 18.28
Avg Velocity (ft/s): 6.57
Passed Scour Check: No
Scour Velocity (ft/sec): 6.57
♠
Tc for frequency = 50.00: 8.339 Minutes
DATA FOR SUB AREA 1
---
SUB AREA TIME OF CONCENTRATION: 8.339 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.543
C Total: 0.802
Sum Q Segments (cfs): 0.00
Q Total (cfs): 22.07
Sum Percent Area (%): 0.0

Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.339
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 22.07
Avg Velocity (ft/s): 7.00
Passed Scour Check: No
Scour Velocity (ft/sec): 7.00
🠉
Tc for frequency = 100.00: 7.579 Minutes
DATA FOR SUB AREA 1
---
SUB AREA TIME OF CONCENTRATION: 7.579 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 1A
Total Area (ac): 11.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.790
C Total: 0.817
Sum Q Segments (cfs): 0.00
Q Total (cfs): 24.58
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 7.579
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 1A

FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 995.9
Top Elevation (ft): 1491
Bottom Elevation (ft): 1181.5
Contributing Area (acres): 11.2
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3108
Effective Slope: 0.1988
Q for Flow Path (cfs): 24.58
Avg Velocity (ft/s): 7.25
Passed Scour Check: No
Scour Velocity (ft/sec): 7.25
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 2A
Computing Tc for all rainfall frequencies for sub-area 2A...
---
Tc for frequency = 10.00: 8.713 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 8.713 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.680
C Total: 0.810
Sum Q Segments (cfs): 54.84
Q Total (cfs): 54.84
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 522.76
Time of Concentration (min): 8.713
---
DATA FOR FLOW PATH 1

---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 7.5808
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 6.82
Avg Velocity (ft/s): 1.91
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.69
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 1.1318
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 48.02
Q Top (cfs): 6.82
Q Bottom (cfs): 54.84
Velocity Top (ft/s): 2.84
Velocity Bottom (ft/s): 5.68
Avg Velocity (ft/s): 4.26
Wave Velocity (ft/s): 6.39
Tc for frequency = 25.00: 8.437 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 8.437 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25

Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.191
C Total: 0.837
Sum Q Segments (cfs): 67.45
Q Total (cfs): 67.45
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 506.24
Time of Concentration (min): 8.437
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 7.3808
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 8.39
Avg Velocity (ft/s): 1.97
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.01
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 1.0565
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 59.06
Q Top (cfs): 8.39
Q Bottom (cfs): 67.45
Velocity Top (ft/s): 3.04
Velocity Bottom (ft/s): 6.09
Avg Velocity (ft/s): 4.56

Wave Velocity (ft/s): 6.84

Tc for frequency = 50.00: 8.245 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 8.245 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.525
C Total: 0.851
Sum Q Segments (cfs): 75.74
Q Total (cfs): 75.74
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 494.68
Time of Concentration (min): 8.245
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 7.2282
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14
Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 9.42
Avg Velocity (ft/s): 2.01
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.23
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 1.0165
Flow Type: Natural Channel

Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 66.32
Q Top (cfs): 9.42
Q Bottom (cfs): 75.74
Velocity Top (ft/s): 3.16
Velocity Bottom (ft/s): 6.32
Avg Velocity (ft/s): 4.74
Wave Velocity (ft/s): 7.11
🠉
Tc for frequency = 100.00: 7.540 Minutes
DATA FOR SUB AREA 2
---
SUB AREA TIME OF CONCENTRATION: 7.540 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 2A
Total Area (ac): 25.25
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.953
C Total: 0.866
Sum Q Segments (cfs): 86.46
Q Total (cfs): 86.46
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 452.38
Time of Concentration (min): 7.540
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 2A1
FLOW PATH TRAVEL TIME (min): 6.5670
Flow Type: Overland
Length (ft): 870.4
Top Elevation (ft): 1433
Bottom Elevation (ft): 1139
Contributing Area (acres): 3.14

Percent of Sub-Area (%): 12.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3378
Effective Slope: 0.2047
Q for Flow Path (cfs): 10.75
Avg Velocity (ft/s): 2.21
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.47
DATA FOR FLOW PATH 2
---
Flow Path Name: 2A2
FLOW PATH TRAVEL TIME (min): 0.9727
Flow Type: Natural Channel
Length (ft): 433.8
Top Elevation (ft): 1139
Bottom Elevation (ft): 1108
Contributing Area (acres): 22.11
Percent of Sub-Area (%): 87.6
Overland Type: Mountain
Map Slope: 0.0715
Effective Slope: 0.0715
Q for Flow Path (cfs): 75.70
Q Top (cfs): 10.75
Q Bottom (cfs): 86.46
Velocity Top (ft/s): 3.30
Velocity Bottom (ft/s): 6.61
Avg Velocity (ft/s): 4.96
Wave Velocity (ft/s): 7.43

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 3A
Computing Tc for all rainfall frequencies for sub-area 3A...
---
Tc for frequency = 10.00: 11.029 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 11.029 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10

Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.396
C Total: 0.792
Sum Q Segments (cfs): 38.16
Q Total (cfs): 38.16
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 661.76
Time of Concentration (min): 11.029
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 8.8290
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 8.01
Avg Velocity (ft/s): 1.85
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.89
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 2.2003
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 30.15
Q Top (cfs): 8.01
Q Bottom (cfs): 38.16
Velocity Top (ft/s): 3.21
Velocity Bottom (ft/s): 5.40
Avg Velocity (ft/s): 4.30

Wave Velocity (ft/s): 6.45

Tc for frequency = 25.00: 10.596 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 10.596 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.657
C Total: 0.809
Sum Q Segments (cfs): 43.24
Q Total (cfs): 43.24
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 635.77
Time of Concentration (min): 10.596
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 8.4856
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 9.07
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.10
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 2.1105
Flow Type: Natural Channel

Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 34.17
Q Top (cfs): 9.07
Q Bottom (cfs): 43.24
Velocity Top (ft/s): 3.35
Velocity Bottom (ft/s): 5.63
Avg Velocity (ft/s): 4.49
Wave Velocity (ft/s): 6.73
🠉
Tc for frequency = 50.00: 10.200 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 10.200 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.161
C Total: 0.836
Sum Q Segments (cfs): 53.12
Q Total (cfs): 53.12
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 612.01
Time of Concentration (min): 10.200
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 8.2295
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22

Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 11.15
Avg Velocity (ft/s): 1.98
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.46
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 1.9707
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 41.98
Q Top (cfs): 11.15
Q Bottom (cfs): 53.12
Velocity Top (ft/s): 3.58
Velocity Bottom (ft/s): 6.03
Avg Velocity (ft/s): 4.80
Wave Velocity (ft/s): 7.21
Tc for frequency = 100.00: 9.325 Minutes
DATA FOR SUB AREA 3
---
SUB AREA TIME OF CONCENTRATION: 9.325 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 3A
Total Area (ac): 20.11
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.740
C Total: 0.859
Sum Q Segments (cfs): 64.58

Q Total (cfs): 64.58
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 559.47
Time of Concentration (min): 9.325
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 3A1
FLOW PATH TRAVEL TIME (min): 7.4779
Flow Type: Overland
Length (ft): 979.9
Top Elevation (ft): 1421
Bottom Elevation (ft): 1120
Contributing Area (acres): 4.22
Percent of Sub-Area (%): 21.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3072
Effective Slope: 0.1979
Q for Flow Path (cfs): 13.55
Avg Velocity (ft/s): 2.18
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.83
DATA FOR FLOW PATH 2
---
Flow Path Name: 3A2
FLOW PATH TRAVEL TIME (min): 1.8467
Flow Type: Natural Channel
Length (ft): 852.1
Top Elevation (ft): 1120
Bottom Elevation (ft): 1050
Contributing Area (acres): 15.89
Percent of Sub-Area (%): 79.0
Overland Type: Mountain
Map Slope: 0.0821
Effective Slope: 0.0821
Q for Flow Path (cfs): 51.03
Q Top (cfs): 13.55
Q Bottom (cfs): 64.58
Velocity Top (ft/s): 3.82
Velocity Bottom (ft/s): 6.43
Avg Velocity (ft/s): 5.13
Wave Velocity (ft/s): 7.69

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 4A

```
Computing Tc for all rainfall frequencies for sub-area 4A...
------------------------------------------------------------------------
Tc for frequency = 10.00: 6.698 Minutes
DATA FOR SUB AREA 4
------------------------------------------------------------------------
SUB AREA TIME OF CONCENTRATION: 6.698 min. = 7 min.
------------------------------------------------------------------------
SUB AREA INPUT DATA
------------------------------------------------------------------------
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
------------------------------------------------------------------------
Intensity (in/hr): 3.094
C Total: 0.833
Sum Q Segments (cfs): 21.03
Q Total (cfs): 21.03
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 401.85
Time of Concentration (min): 6.698
------------------------------------------------------------------------
DATA FOR FLOW PATH 1
------------------------------------------------------------------------
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 5.2755
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 2.35
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.28
DATA FOR FLOW PATH 2
------------------------------------------------------------------------
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.4220
Flow Type: Natural Channel
```

Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 18.69
Q Top (cfs): 2.35
Q Bottom (cfs): 21.03
Velocity Top (ft/s): 3.62
Velocity Bottom (ft/s): 6.18
Avg Velocity (ft/s): 4.90
Wave Velocity (ft/s): 7.35

Tc for frequency = 25.00: 6.538 Minutes
DATA FOR SUB AREA 4
---
SUB AREA TIME OF CONCENTRATION: 6.538 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.848
Sum Q Segments (cfs): 23.90
Q Total (cfs): 23.90
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 392.28
Time of Concentration (min): 6.538
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 5.1609
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91

Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 2.67
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.42
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.3770
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 21.24
Q Top (cfs): 2.67
Q Bottom (cfs): 23.90
Velocity Top (ft/s): 3.72
Velocity Bottom (ft/s): 6.40
Avg Velocity (ft/s): 5.06
Wave Velocity (ft/s): 7.60
Tc for frequency = 50.00: 6.382 Minutes
DATA FOR SUB AREA 4
---
SUB AREA TIME OF CONCENTRATION: 6.382 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 4.100
C Total: 0.870
Sum Q Segments (cfs): 29.11

Q Total (cfs): 29.11
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 382.93
Time of Concentration (min): 6.382
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 5.0727
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 3.25
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.65
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.3094
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414
Q for Flow Path (cfs): 25.87
Q Top (cfs): 3.25
Q Bottom (cfs): 29.11
Velocity Top (ft/s): 3.89
Velocity Bottom (ft/s): 6.76
Avg Velocity (ft/s): 5.32
Wave Velocity (ft/s): 7.99
Tc for frequency = 100.00: 5.871 Minutes
DATA FOR SUB AREA 4
---
SUB AREA TIME OF CONCENTRATION: 5.871 min. = 6 min.
---
SUB AREA INPUT DATA

---
Sub Area Name: 4A
Total Area (ac): 8.16
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 4.590
C Total: 0.881
Sum Q Segments (cfs): 33.00
Q Total (cfs): 33.00
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 352.28
Time of Concentration (min): 5.871
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 4A1
FLOW PATH TRAVEL TIME (min): 4.6039
Flow Type: Overland
Length (ft): 608.4
Top Elevation (ft): 1257
Bottom Elevation (ft): 1045
Contributing Area (acres): 0.91
Percent of Sub-Area (%): 11.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3485
Effective Slope: 0.2067
Q for Flow Path (cfs): 3.68
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour Velocity (ft/sec): 3.81
DATA FOR FLOW PATH 2
---
Flow Path Name: 4A2
FLOW PATH TRAVEL TIME (min): 1.2676
Flow Type: Natural Channel
Length (ft): 627.5
Top Elevation (ft): 1045
Bottom Elevation (ft): 1019
Contributing Area (acres): 7.25
Percent of Sub-Area (%): 88.8
Overland Type: Valley
Map Slope: 0.0414
Effective Slope: 0.0414

Q for Flow Path (cfs): 29.32
Q Top (cfs): 3.68
Q Bottom (cfs): 33.00
Velocity Top (ft/s): 4.00
Velocity Bottom (ft/s): 7.00
Avg Velocity (ft/s): 5.50
Wave Velocity (ft/s): 8.25

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 5A
Computing Tc for all rainfall frequencies for sub-area 5A...

---

Tc for frequency = 10.00: 6.072 Minutes
DATA FOR SUB AREA 5

---

SUB AREA TIME OF CONCENTRATION: 6.072 min. = 6 min.

---

SUB AREA INPUT DATA

---

Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT

---

Intensity (in/hr): 3.400
C Total: 0.703
Sum Q Segments (cfs): 3.18
Q Total (cfs): 3.18
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 364.31
Time of Concentration (min): 6.072

---

DATA FOR FLOW PATH 1

---

Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 4.9328
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31

Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 0.74
Avg Velocity (ft/s): 0.68
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.50
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.1391
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 2.44
Q Top (cfs): 0.74
Q Bottom (cfs): 3.18
Velocity Top (ft/s): 2.56
Velocity Bottom (ft/s): 3.43
Avg Velocity (ft/s): 3.00
Wave Velocity (ft/s): 4.49
Tc for frequency = 25.00: 5.231 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 5.231 min. = 5 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 4.272
C Total: 0.731
Sum Q Segments (cfs): 4.15

Q Total (cfs): 4.15
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 313.86
Time of Concentration (min): 5.231
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 4.1534
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 0.97
Avg Velocity (ft/s): 0.80
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.63
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.0776
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 3.18
Q Top (cfs): 0.97
Q Bottom (cfs): 4.15
Velocity Top (ft/s): 2.69
Velocity Bottom (ft/s): 3.65
Avg Velocity (ft/s): 3.17
Wave Velocity (ft/s): 4.75
♠
Tc for frequency = 50.00: 4.749 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 4.749 min. = 5 min. ** TC ERROR **
---
SUB AREA INPUT DATA

---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 4.548
C Total: 0.736
Sum Q Segments (cfs): 4.45
Q Total (cfs): 4.45
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 284.96
Time of Concentration (min): 4.749
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 3.6875
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 1.04
Avg Velocity (ft/s): 0.90
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.68
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.0619
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326

Q for Flow Path (cfs): 3.41
Q Top (cfs): 1.04
Q Bottom (cfs): 4.45
Velocity Top (ft/s): 2.72
Velocity Bottom (ft/s): 3.70
Avg Velocity (ft/s): 3.21
Wave Velocity (ft/s): 4.82

Tc for frequency = 100.00: 4.033 Minutes
DATA FOR SUB AREA 5
---
SUB AREA TIME OF CONCENTRATION: 4.033 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 5A
Total Area (ac): 1.33
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 5.00
Percent Impervious: 5
SUB AREA OUTPUT
---
Intensity (in/hr): 5.100
C Total: 0.744
Sum Q Segments (cfs): 5.05
Q Total (cfs): 5.05
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 242.00
Time of Concentration (min): 4.033
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 5A1
FLOW PATH TRAVEL TIME (min): 2.9999
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1028
Bottom Elevation (ft): 1009
Contributing Area (acres): 0.31
Percent of Sub-Area (%): 23.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0950
Effective Slope: 0.0950
Q for Flow Path (cfs): 1.18
Avg Velocity (ft/s): 1.11
Passed Scour Check: YES

Scour Velocity (ft/sec): 1.82
DATA FOR FLOW PATH 2
---
Flow Path Name: 5A2
FLOW PATH TRAVEL TIME (min): 1.0334
Flow Type: Natural Channel
Length (ft): 307.2
Top Elevation (ft): 1009
Bottom Elevation (ft): 999
Contributing Area (acres): 1.02
Percent of Sub-Area (%): 76.7
Overland Type: Valley
Map Slope: 0.0326
Effective Slope: 0.0326
Q for Flow Path (cfs): 3.87
Q Top (cfs): 1.18
Q Bottom (cfs): 5.05
Velocity Top (ft/s): 2.79
Velocity Bottom (ft/s): 3.81
Avg Velocity (ft/s): 3.30
Wave Velocity (ft/s): 4.95
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 10A
Computing Tc for all rainfall frequencies for sub-area 10A...
---
Tc for frequency = 10.00: 8.669 Minutes
DATA FOR SUB AREA 6
---
SUB AREA TIME OF CONCENTRATION: 8.669 min. = 9 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 1.976
C Total: 0.759
Sum Q Segments (cfs): 0.00

Q Total (cfs): 14.10
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.669
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 14.10
Avg Velocity (ft/s): 6.20
Passed Scour Check: No
Scour Velocity (ft/sec): 6.20
♠
Tc for frequency = 25.00: 8.486 Minutes
DATA FOR SUB AREA 6
---
SUB AREA TIME OF CONCENTRATION: 8.486 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.183
C Total: 0.776
Sum Q Segments (cfs): 0.00
Q Total (cfs): 15.95
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.486
---
DATA FOR FLOW PATH 1

---
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 15.95
Avg Velocity (ft/s): 6.46
Passed Scour Check: No
Scour Velocity (ft/sec): 6.46
Tc for frequency = 50.00: 8.346 Minutes
DATA FOR SUB AREA 6
---
SUB AREA TIME OF CONCENTRATION: 8.346 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.543
C Total: 0.802
Sum Q Segments (cfs): 0.00
Q Total (cfs): 19.26
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 8.346
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555

Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710
Effective Slope: 0.2104
Q for Flow Path (cfs): 19.26
Avg Velocity (ft/s): 6.88
Passed Scour Check: No
Scour Velocity (ft/sec): 6.88
↟
Tc for frequency = 100.00: 7.573 Minutes
DATA FOR SUB AREA 6
---
SUB AREA TIME OF CONCENTRATION: 7.573 min. = 8 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 10A
Total Area (ac): 9.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.790
C Total: 0.817
Sum Q Segments (cfs): 0.00
Q Total (cfs): 21.44
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 7.573
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 10A
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 1555
Bottom Elevation (ft): 1184
Contributing Area (acres): 9.77
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3710

Effective Slope: 0.2104
Q for Flow Path (cfs): 21.44
Avg Velocity (ft/s): 7.13
Passed Scour Check: No
Scour Velocity (ft/sec): 7.13

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 11A
Computing Tc for all rainfall frequencies for sub-area 11A...

---

Tc for frequency = 10.00: 7.306 Minutes
DATA FOR SUB AREA 7

---

SUB AREA TIME OF CONCENTRATION: 7.306 min. = 7 min.

---

SUB AREA INPUT DATA

---

Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---

Intensity (in/hr): 3.094
C Total: 0.833
Sum Q Segments (cfs): 39.64
Q Total (cfs): 39.64
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 438.38
Time of Concentration (min): 7.306

---

DATA FOR FLOW PATH 1

---

Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 5.7239
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain

Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 10.10
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.52
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.5824
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 29.54
Q Top (cfs): 10.10
Q Bottom (cfs): 39.64
Velocity Top (ft/s): 4.76
Velocity Bottom (ft/s): 6.89
Avg Velocity (ft/s): 5.83
Wave Velocity (ft/s): 8.74
Tc for frequency = 25.00: 7.132 Minutes
DATA FOR SUB AREA 7
---
SUB AREA TIME OF CONCENTRATION: 7.132 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.848
Sum Q Segments (cfs): 45.06
Q Total (cfs): 45.06
Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 427.89
Time of Concentration (min): 7.132
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 5.6035
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 11.48
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.76
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.5281
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 33.57
Q Top (cfs): 11.48
Q Bottom (cfs): 45.06
Velocity Top (ft/s): 4.92
Velocity Bottom (ft/s): 7.14
Avg Velocity (ft/s): 6.03
Wave Velocity (ft/s): 9.05
♠
Tc for frequency = 50.00: 6.997 Minutes
DATA FOR SUB AREA 7
---
SUB AREA TIME OF CONCENTRATION: 6.997 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 11A

Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.771
C Total: 0.860
Sum Q Segments (cfs): 49.87
Q Total (cfs): 49.87
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 419.80
Time of Concentration (min): 6.997
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 5.5107
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 12.71
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.98
DATA FOR FLOW PATH 2
---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.4859
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 37.16
Q Top (cfs): 12.71

Q Bottom (cfs): 49.87
Velocity Top (ft/s): 5.05
Velocity Bottom (ft/s): 7.35
Avg Velocity (ft/s): 6.20
Wave Velocity (ft/s): 9.31

Tc for frequency = 100.00: 6.512 Minutes
DATA FOR SUB AREA 7
---
SUB AREA TIME OF CONCENTRATION: 6.512 min. = 7 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 11A
Total Area (ac): 15.38
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.740
C Total: 0.859
Sum Q Segments (cfs): 0.00
Q Total (cfs): 46.81
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 6.512
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 11A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 660.3
Top Elevation (ft): 1446
Bottom Elevation (ft): 1120
Contributing Area (acres): 3.92
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4937
Effective Slope: 0.2212
Q for Flow Path (cfs): 11.93
Avg Velocity (ft/s): 6.01
Passed Scour Check: No
Scour Velocity (ft/sec): 6.01
DATA FOR FLOW PATH 2

---
Flow Path Name: 11A2
FLOW PATH TRAVEL TIME (min): 1.5121
Flow Type: Natural Channel
Length (ft): 829.7
Top Elevation (ft): 1120
Bottom Elevation (ft): 1090
Contributing Area (acres): 11.46
Percent of Sub-Area (%): 74.5
Overland Type: Valley
Map Slope: 0.0362
Effective Slope: 0.0362
Q for Flow Path (cfs): 34.88
Q Top (cfs): 11.93
Q Bottom (cfs): 46.81
Velocity Top (ft/s): 4.97
Velocity Bottom (ft/s): 7.22
Avg Velocity (ft/s): 6.10
Wave Velocity (ft/s): 9.14
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 12A
Computing Tc for all rainfall frequencies for sub-area 12A...
---
Tc for frequency = 10.00: 10.626 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 10.626 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.396
C Total: 0.792
Sum Q Segments (cfs): 32.85
Q Total (cfs): 32.85
Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 637.56
Time of Concentration (min): 10.626
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 8.0999
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 4.42
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.15
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.5261
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 28.42
Q Top (cfs): 4.42
Q Bottom (cfs): 32.85
Velocity Top (ft/s): 2.46
Velocity Bottom (ft/s): 4.79
Avg Velocity (ft/s): 3.63
Wave Velocity (ft/s): 5.44
♠
Tc for frequency = 25.00: 10.301 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 10.301 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A

Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.806
C Total: 0.818
Sum Q Segments (cfs): 39.71
Q Total (cfs): 39.71
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 618.05
Time of Concentration (min): 10.301
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 7.9295
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 5.35
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.41
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.3713
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 34.37
Q Top (cfs): 5.35

Q Bottom (cfs): 39.71
Velocity Top (ft/s): 2.62
Velocity Bottom (ft/s): 5.11
Avg Velocity (ft/s): 3.86
Wave Velocity (ft/s): 5.79
Tc for frequency = 50.00: 10.061 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 10.061 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.161
C Total: 0.836
Sum Q Segments (cfs): 45.73
Q Total (cfs): 45.73
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 603.64
Time of Concentration (min): 10.061
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 7.7982
Flow Type: Overland
Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 6.16
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.64
DATA FOR FLOW PATH 2

---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.2625
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 39.57
Q Top (cfs): 6.16
Q Bottom (cfs): 45.73
Velocity Top (ft/s): 2.74
Velocity Bottom (ft/s): 5.35
Avg Velocity (ft/s): 4.05
Wave Velocity (ft/s): 6.07
Tc for frequency = 100.00: 9.196 Minutes
DATA FOR SUB AREA 8
---
SUB AREA TIME OF CONCENTRATION: 9.196 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 12A
Total Area (ac): 17.31
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.740
C Total: 0.859
Sum Q Segments (cfs): 55.59
Q Total (cfs): 55.59
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 551.77
Time of Concentration (min): 9.196
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 12A1
FLOW PATH TRAVEL TIME (min): 7.0761
Flow Type: Overland

Length (ft): 934.4
Top Elevation (ft): 1432
Bottom Elevation (ft): 1074
Contributing Area (acres): 2.33
Percent of Sub-Area (%): 13.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3831
Effective Slope: 0.2121
Q for Flow Path (cfs): 7.48
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour Velocity (ft/sec): 4.95
DATA FOR FLOW PATH 2
---
Flow Path Name: 12A2
FLOW PATH TRAVEL TIME (min): 2.1201
Flow Type: Natural Channel
Length (ft): 824.2
Top Elevation (ft): 1074
Bottom Elevation (ft): 1015
Contributing Area (acres): 14.98
Percent of Sub-Area (%): 86.5
Overland Type: Mountain
Map Slope: 0.0716
Effective Slope: 0.0716
Q for Flow Path (cfs): 48.11
Q Top (cfs): 7.48
Q Bottom (cfs): 55.59
Velocity Top (ft/s): 2.93
Velocity Bottom (ft/s): 5.71
Avg Velocity (ft/s): 4.32
Wave Velocity (ft/s): 6.48

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 20A
Computing Tc for all rainfall frequencies for sub-area 20A...
---
Tc for frequency = 10.00: 7.995 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 7.995 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A

Total Area (ac): 15.48
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.865
C Total: 0.821
Sum Q Segments (cfs): 36.42
Q Total (cfs): 36.42
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 479.72
Time of Concentration (min): 7.995
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 6.2813
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 22.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 8.14
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.12
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.7141
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 12.02
Percent of Sub-Area (%): 77.6
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 28.28
Q Top (cfs): 8.14

Q Bottom (cfs): 36.42
Velocity Top (ft/s): 3.63
Velocity Bottom (ft/s): 5.97
Avg Velocity (ft/s): 4.80
Wave Velocity (ft/s): 7.20

Tc for frequency = 25.00: 7.792 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 7.792 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A
Total Area (ac): 15.48
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.191
C Total: 0.837
Sum Q Segments (cfs): 41.35
Q Total (cfs): 41.35
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 467.54
Time of Concentration (min): 7.792
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 6.1491
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 22.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 9.24
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.34
DATA FOR FLOW PATH 2

---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.6432
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 12.02
Percent of Sub-Area (%): 77.6
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 32.11
Q Top (cfs): 9.24
Q Bottom (cfs): 41.35
Velocity Top (ft/s): 3.78
Velocity Bottom (ft/s): 6.23
Avg Velocity (ft/s): 5.01
Wave Velocity (ft/s): 7.51
Tc for frequency = 50.00: 7.628 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 7.628 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A
Total Area (ac): 15.48
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.525
C Total: 0.851
Sum Q Segments (cfs): 46.43
Q Total (cfs): 46.43
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 457.69
Time of Concentration (min): 7.628
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 6.0473
Flow Type: Overland

Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 22.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 10.38
Avg Velocity (ft/s): 2.00
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.58
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.5810
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 12.02
Percent of Sub-Area (%): 77.6
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 36.05
Q Top (cfs): 10.38
Q Bottom (cfs): 46.43
Velocity Top (ft/s): 3.93
Velocity Bottom (ft/s): 6.48
Avg Velocity (ft/s): 5.20
Wave Velocity (ft/s): 7.81
🠉
Tc for frequency = 100.00: 6.963 Minutes
DATA FOR SUB AREA 9
---
SUB AREA TIME OF CONCENTRATION: 6.963 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 20A
Total Area (ac): 15.48
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---
Intensity (in/hr): 4.226
C Total: 0.873
Sum Q Segments (cfs): 57.10
Q Total (cfs): 57.10
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 417.78
Time of Concentration (min): 6.963
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 20A1
FLOW PATH TRAVEL TIME (min): 5.4873
Flow Type: Overland
Length (ft): 724.6
Top Elevation (ft): 1432
Bottom Elevation (ft): 1114
Contributing Area (acres): 3.46
Percent of Sub-Area (%): 22.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4389
Effective Slope: 0.2179
Q for Flow Path (cfs): 12.76
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.95
DATA FOR FLOW PATH 2
---
Flow Path Name: 20A2
FLOW PATH TRAVEL TIME (min): 1.4757
Flow Type: Natural Channel
Length (ft): 740.4
Top Elevation (ft): 1114
Bottom Elevation (ft): 1033
Contributing Area (acres): 12.02
Percent of Sub-Area (%): 77.6
Overland Type: Mountain
Map Slope: 0.1094
Effective Slope: 0.1038
Q for Flow Path (cfs): 44.34
Q Top (cfs): 12.76
Q Bottom (cfs): 57.10
Velocity Top (ft/s): 4.21
Velocity Bottom (ft/s): 6.94
Avg Velocity (ft/s): 5.57
Wave Velocity (ft/s): 8.36

Project: AJU Brandeis
Date: 12:00:00 AM

Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 21A
Computing Tc for all rainfall frequencies for sub-area 21A...
---
Tc for frequency = 10.00: 6.188 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 6.188 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 21A
Total Area (ac): 2.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT
---
Intensity (in/hr): 3.400
C Total: 0.858
Sum Q Segments (cfs): 6.48
Q Total (cfs): 6.48
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 371.27
Time of Concentration (min): 6.188
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21A1
FLOW PATH TRAVEL TIME (min): 4.7519
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.14
Percent of Sub-Area (%): 6.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.41
Avg Velocity (ft/s): 0.70
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.25
DATA FOR FLOW PATH 2

---
Flow Path Name: 21A2
FLOW PATH TRAVEL TIME (min): 1.4360
Flow Type: Natural Channel
Length (ft): 283
Top Elevation (ft): 1021
Bottom Elevation (ft): 995.5
Contributing Area (acres): 2.08
Percent of Sub-Area (%): 93.7
Overland Type: Mountain
Map Slope: 0.0901
Effective Slope: 0.0901
Q for Flow Path (cfs): 6.07
Q Top (cfs): 0.41
Q Bottom (cfs): 6.48
Velocity Top (ft/s): 1.25
Velocity Bottom (ft/s): 3.13
Avg Velocity (ft/s): 2.19
Wave Velocity (ft/s): 3.28
Tc for frequency = 25.00: 5.340 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 5.340 min. = 5 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 21A
Total Area (ac): 2.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT
---
Intensity (in/hr): 4.272
C Total: 0.883
Sum Q Segments (cfs): 8.38
Q Total (cfs): 8.38
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 320.42
Time of Concentration (min): 5.340
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21A1
FLOW PATH TRAVEL TIME (min): 4.0220
Flow Type: Overland

Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.14
Percent of Sub-Area (%): 6.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.53
Avg Velocity (ft/s): 0.83
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.35
DATA FOR FLOW PATH 2
---
Flow Path Name: 21A2
FLOW PATH TRAVEL TIME (min): 1.3183
Flow Type: Natural Channel
Length (ft): 283
Top Elevation (ft): 1021
Bottom Elevation (ft): 995.5
Contributing Area (acres): 2.08
Percent of Sub-Area (%): 93.7
Overland Type: Mountain
Map Slope: 0.0901
Effective Slope: 0.0901
Q for Flow Path (cfs): 7.85
Q Top (cfs): 0.53
Q Bottom (cfs): 8.38
Velocity Top (ft/s): 1.36
Velocity Bottom (ft/s): 3.41
Avg Velocity (ft/s): 2.39
Wave Velocity (ft/s): 3.58
Tc for frequency = 50.00: 4.871 Minutes
DATA FOR SUB AREA 10
---
SUB AREA TIME OF CONCENTRATION: 4.871 min. = 5 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 21A
Total Area (ac): 2.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT

---
Intensity (in/hr): 4.548
C Total: 0.888
Sum Q Segments (cfs): 8.97
Q Total (cfs): 8.97
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 292.23
Time of Concentration (min): 4.871
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21A1
FLOW PATH TRAVEL TIME (min): 3.5820
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.14
Percent of Sub-Area (%): 6.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.57
Avg Velocity (ft/s): 0.93
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.39
DATA FOR FLOW PATH 2
---
Flow Path Name: 21A2
FLOW PATH TRAVEL TIME (min): 1.2885
Flow Type: Natural Channel
Length (ft): 283
Top Elevation (ft): 1021
Bottom Elevation (ft): 995.5
Contributing Area (acres): 2.08
Percent of Sub-Area (%): 93.7
Overland Type: Mountain
Map Slope: 0.0901
Effective Slope: 0.0901
Q for Flow Path (cfs): 8.40
Q Top (cfs): 0.57
Q Bottom (cfs): 8.97
Velocity Top (ft/s): 1.39
Velocity Bottom (ft/s): 3.49
Avg Velocity (ft/s): 2.44
Wave Velocity (ft/s): 3.66

Tc for frequency = 100.00: 4.165 Minutes
DATA FOR SUB AREA 10

---
SUB AREA TIME OF CONCENTRATION: 4.165 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 21A
Total Area (ac): 2.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 12
SUB AREA OUTPUT
---
Intensity (in/hr): 5.100
C Total: 0.898
Sum Q Segments (cfs): 10.17
Q Total (cfs): 10.17
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 249.92
Time of Concentration (min): 4.165
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 21A1
FLOW PATH TRAVEL TIME (min): 2.9297
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1021
Contributing Area (acres): 0.14
Percent of Sub-Area (%): 6.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.1000
Effective Slope: 0.0965
Q for Flow Path (cfs): 0.64
Avg Velocity (ft/s): 1.14
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.50
DATA FOR FLOW PATH 2
---
Flow Path Name: 21A2
FLOW PATH TRAVEL TIME (min): 1.2357
Flow Type: Natural Channel
Length (ft): 283
Top Elevation (ft): 1021
Bottom Elevation (ft): 995.5
Contributing Area (acres): 2.08

Percent of Sub-Area (%): 93.7
Overland Type: Mountain
Map Slope: 0.0901
Effective Slope: 0.0901
Q for Flow Path (cfs): 9.53
Q Top (cfs): 0.64
Q Bottom (cfs): 10.17
Velocity Top (ft/s): 1.45
Velocity Bottom (ft/s): 3.64
Avg Velocity (ft/s): 2.54
Wave Velocity (ft/s): 3.82

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 22A
Computing Tc for all rainfall frequencies for sub-area 22A...

---

Tc for frequency = 10.00: 2.329 Minutes
DATA FOR SUB AREA 11

---

SUB AREA TIME OF CONCENTRATION: 2.329 min. = 2 min. ** TC ERROR **

---

SUB AREA INPUT DATA

---

Sub Area Name: 22A
Total Area (ac): 1.08
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 36
SUB AREA OUTPUT

---

Intensity (in/hr): 5.100
C Total: 0.912
Sum Q Segments (cfs): 5.03
Q Total (cfs): 5.03
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 139.72
Time of Concentration (min): 2.329

---

DATA FOR FLOW PATH 1

---

Flow Path Name: 22A1
FLOW PATH TRAVEL TIME (min): 1.7337
Flow Type: Overland

Length (ft): 200
Top Elevation (ft): 1118
Bottom Elevation (ft): 995
Contributing Area (acres): 0.25
Percent of Sub-Area (%): 23.1
Overland Type: Mountain
Development Type: Commercial
Map Slope: 0.6150
Effective Slope: 0.6150
Q for Flow Path (cfs): 1.16
Avg Velocity (ft/s): 1.92
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 22A2
FLOW PATH TRAVEL TIME (min): 0.5950
Flow Type: Natural Channel
Length (ft): 156.5
Top Elevation (ft): 995
Bottom Elevation (ft): 991
Contributing Area (acres): 0.83
Percent of Sub-Area (%): 76.9
Overland Type: Valley
Map Slope: 0.0256
Effective Slope: 0.0256
Q for Flow Path (cfs): 3.86
Q Top (cfs): 1.16
Q Bottom (cfs): 5.03
Velocity Top (ft/s): 2.47
Velocity Bottom (ft/s): 3.38
Avg Velocity (ft/s): 2.92
Wave Velocity (ft/s): 4.38
♠
Tc for frequency = 25.00: 2.316 Minutes
DATA FOR SUB AREA 11
---
SUB AREA TIME OF CONCENTRATION: 2.316 min. = 2 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 22A
Total Area (ac): 1.08
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 36
SUB AREA OUTPUT
---

Intensity (in/hr): 4.290
C Total: 0.902
Sum Q Segments (cfs): 4.18
Q Total (cfs): 4.18
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 138.98
Time of Concentration (min): 2.316
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 22A1
FLOW PATH TRAVEL TIME (min): 1.6972
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1118
Bottom Elevation (ft): 995
Contributing Area (acres): 0.25
Percent of Sub-Area (%): 23.1
Overland Type: Mountain
Development Type: Commercial
Map Slope: 0.6150
Effective Slope: 0.6150
Q for Flow Path (cfs): 0.97
Avg Velocity (ft/s): 1.96
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 22A2
FLOW PATH TRAVEL TIME (min): 0.6191
Flow Type: Natural Channel
Length (ft): 156.5
Top Elevation (ft): 995
Bottom Elevation (ft): 991
Contributing Area (acres): 0.83
Percent of Sub-Area (%): 76.9
Overland Type: Valley
Map Slope: 0.0256
Effective Slope: 0.0256
Q for Flow Path (cfs): 3.21
Q Top (cfs): 0.97
Q Bottom (cfs): 4.18
Velocity Top (ft/s): 2.38
Velocity Bottom (ft/s): 3.23
Avg Velocity (ft/s): 2.81
Wave Velocity (ft/s): 4.21
Tc for frequency = 50.00: 2.239 Minutes
DATA FOR SUB AREA 11
---
SUB AREA TIME OF CONCENTRATION: 2.239 min. = 2 min. ** TC ERROR **

---
SUB AREA INPUT DATA
---
Sub Area Name: 22A
Total Area (ac): 1.08
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 36
SUB AREA OUTPUT
---
Intensity (in/hr): 6.150
C Total: 0.921
Sum Q Segments (cfs): 6.11
Q Total (cfs): 6.11
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 134.34
Time of Concentration (min): 2.239
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 22A1
FLOW PATH TRAVEL TIME (min): 1.6691
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1118
Bottom Elevation (ft): 995
Contributing Area (acres): 0.25
Percent of Sub-Area (%): 23.1
Overland Type: Mountain
Development Type: Commercial
Map Slope: 0.6150
Effective Slope: 0.6150
Q for Flow Path (cfs): 1.42
Avg Velocity (ft/s): 2.00
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 22A2
FLOW PATH TRAVEL TIME (min): 0.5699
Flow Type: Natural Channel
Length (ft): 156.5
Top Elevation (ft): 995
Bottom Elevation (ft): 991
Contributing Area (acres): 0.83
Percent of Sub-Area (%): 76.9
Overland Type: Valley
Map Slope: 0.0256

Effective Slope: 0.0256
Q for Flow Path (cfs): 4.70
Q Top (cfs): 1.42
Q Bottom (cfs): 6.11
Velocity Top (ft/s): 2.56
Velocity Bottom (ft/s): 3.54
Avg Velocity (ft/s): 3.05
Wave Velocity (ft/s): 4.58

Tc for frequency = 100.00: NaN Minutes
DATA FOR SUB AREA 11
---
SUB AREA TIME OF CONCENTRATION: NaN min. = NaN min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 22A
Total Area (ac): 1.08
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 36
SUB AREA OUTPUT
---
Intensity (in/hr): 7.140
C Total: NaN
Sum Q Segments (cfs): NaN
Q Total (cfs): NaN
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): NaN
Time of Concentration (min): NaN
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 22A1
FLOW PATH TRAVEL TIME (min): 1.5146
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1118
Bottom Elevation (ft): 995
Contributing Area (acres): 0.25
Percent of Sub-Area (%): 23.1
Overland Type: Mountain
Development Type: Commercial
Map Slope: 0.6150
Effective Slope: 0.6150
Q for Flow Path (cfs): NaN
Avg Velocity (ft/s): 2.20

Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 22A2
FLOW PATH TRAVEL TIME (min): NaN
Flow Type: Natural Channel
Length (ft): 156.5
Top Elevation (ft): 995
Bottom Elevation (ft): 991
Contributing Area (acres): 0.83
Percent of Sub-Area (%): 76.9
Overland Type: Valley
Map Slope: 0.0256
Effective Slope: 0.0256
Q for Flow Path (cfs): NaN
Q Top (cfs): NaN
Q Bottom (cfs): NaN
Velocity Top (ft/s): NaN
Velocity Bottom (ft/s): NaN
Avg Velocity (ft/s): NaN
Wave Velocity (ft/s): NaN
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 30A
Computing Tc for all rainfall frequencies for sub-area 30A...
---
Tc for frequency = 10.00: 8.803 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 8.803 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 30A
Total Area (ac): 11.26
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Residential
Soil Type: 2.00
Percent Impervious: 28
SUB AREA OUTPUT
---
Intensity (in/hr): 2.680
C Total: 0.850
Sum Q Segments (cfs): 25.64

Q Total (cfs): 25.64
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 528.18
Time of Concentration (min): 8.803
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 6.6134
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1030
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 3.5
Overland Type: Mountain
Development Type: Residential
Map Slope: 0.0550
Effective Slope: 0.0550
Q for Flow Path (cfs): 0.89
Avg Velocity (ft/s): 0.50
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 2.1896
Flow Type: Natural Channel
Length (ft): 1005.9
Top Elevation (ft): 1030
Bottom Elevation (ft): 982
Contributing Area (acres): 10.87
Percent of Sub-Area (%): 96.5
Overland Type: Valley
Map Slope: 0.0477
Effective Slope: 0.0477
Q for Flow Path (cfs): 24.75
Q Top (cfs): 0.89
Q Bottom (cfs): 25.64
Velocity Top (ft/s): 3.21
Velocity Bottom (ft/s): 7.00
Avg Velocity (ft/s): 5.10
Wave Velocity (ft/s): 7.66
Tc for frequency = 25.00: 7.375 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 7.375 min. = 7 min.
---
SUB AREA INPUT DATA
---

Sub Area Name: 30A
Total Area (ac): 11.26
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Residential
Soil Type: 2.00
Percent Impervious: 28
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.877
Sum Q Segments (cfs): 34.10
Q Total (cfs): 34.10
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 442.50
Time of Concentration (min): 7.375
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 5.3362
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1030
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 3.5
Overland Type: Mountain
Development Type: Residential
Map Slope: 0.0550
Effective Slope: 0.0550
Q for Flow Path (cfs): 1.18
Avg Velocity (ft/s): 0.62
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 2.0388
Flow Type: Natural Channel
Length (ft): 1005.9
Top Elevation (ft): 1030
Bottom Elevation (ft): 982
Contributing Area (acres): 10.87
Percent of Sub-Area (%): 96.5
Overland Type: Valley
Map Slope: 0.0477
Effective Slope: 0.0477
Q for Flow Path (cfs): 32.92
Q Top (cfs): 1.18

Q Bottom (cfs): 34.10
Velocity Top (ft/s): 3.38
Velocity Bottom (ft/s): 7.58
Avg Velocity (ft/s): 5.48
Wave Velocity (ft/s): 8.22

Tc for frequency = 50.00: 6.611 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 6.611 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 30A
Total Area (ac): 11.26
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Residential
Soil Type: 2.00
Percent Impervious: 28
SUB AREA OUTPUT
---
Intensity (in/hr): 3.771
C Total: 0.885
Sum Q Segments (cfs): 37.58
Q Total (cfs): 37.58
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 396.67
Time of Concentration (min): 6.611
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 4.6223
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1041
Bottom Elevation (ft): 1030
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 3.5
Overland Type: Mountain
Development Type: Residential
Map Slope: 0.0550
Effective Slope: 0.0550
Q for Flow Path (cfs): 1.30
Avg Velocity (ft/s): 0.72
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---

Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 1.9888
Flow Type: Natural Channel
Length (ft): 1005.9
Top Elevation (ft): 1030
Bottom Elevation (ft): 982
Contributing Area (acres): 10.87
Percent of Sub-Area (%): 96.5
Overland Type: Valley
Map Slope: 0.0477
Effective Slope: 0.0477
Q for Flow Path (cfs): 36.28
Q Top (cfs): 1.30
Q Bottom (cfs): 37.58
Velocity Top (ft/s): 3.45
Velocity Bottom (ft/s): 7.79
Avg Velocity (ft/s): 5.62
Wave Velocity (ft/s): 8.43

Tc for frequency = 100.00: 5.425 Minutes
DATA FOR SUB AREA 12
---
SUB AREA TIME OF CONCENTRATION: 5.425 min. = 5 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 30A
Total Area (ac): 11.26
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Residential
Soil Type: 2.00
Percent Impervious: 28
SUB AREA OUTPUT
---
Intensity (in/hr): 5.100
C Total: 0.908
Sum Q Segments (cfs): 52.13
Q Total (cfs): 52.13
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 325.50
Time of Concentration (min): 5.425
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 30A1
FLOW PATH TRAVEL TIME (min): 3.5984
Flow Type: Overland
Length (ft): 200

Top Elevation (ft): 1041
Bottom Elevation (ft): 1030
Contributing Area (acres): 0.39
Percent of Sub-Area (%): 3.5
Overland Type: Mountain
Development Type: Residential
Map Slope: 0.0550
Effective Slope: 0.0550
Q for Flow Path (cfs): 1.81
Avg Velocity (ft/s): 0.93
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 30A2
FLOW PATH TRAVEL TIME (min): 1.8266
Flow Type: Natural Channel
Length (ft): 1005.9
Top Elevation (ft): 1030
Bottom Elevation (ft): 982
Contributing Area (acres): 10.87
Percent of Sub-Area (%): 96.5
Overland Type: Valley
Map Slope: 0.0477
Effective Slope: 0.0477
Q for Flow Path (cfs): 50.32
Q Top (cfs): 1.81
Q Bottom (cfs): 52.13
Velocity Top (ft/s): 3.68
Velocity Bottom (ft/s): 8.56
Avg Velocity (ft/s): 6.12
Wave Velocity (ft/s): 9.18

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 40A
Computing Tc for all rainfall frequencies for sub-area 40A...
---
Tc for frequency = 10.00: 9.522 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 9.522 min. = 10 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3

Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.524
C Total: 0.801
Sum Q Segments (cfs): 12.72
Q Total (cfs): 12.72
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 571.31
Time of Concentration (min): 9.522
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 9.5218
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 12.72
Avg Velocity (ft/s): 1.33
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.12
Tc for frequency = 25.00: 8.723 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 8.723 min. = 9 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---
Intensity (in/hr): 2.987
C Total: 0.828
Sum Q Segments (cfs): 15.56
Q Total (cfs): 15.56
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 523.38
Time of Concentration (min): 8.723
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 8.7230
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 15.56
Avg Velocity (ft/s): 1.45
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.46
♠
Tc for frequency = 50.00: 8.174 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 8.174 min. = 8 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.525
C Total: 0.851
Sum Q Segments (cfs): 18.87
Q Total (cfs): 18.87
Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 490.47
Time of Concentration (min): 8.174
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A
FLOW PATH TRAVEL TIME (min): 8.1745
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 18.87
Avg Velocity (ft/s): 1.54
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.84
♠
Tc for frequency = 100.00: 7.228 Minutes
DATA FOR SUB AREA 13
---
SUB AREA TIME OF CONCENTRATION: 7.228 min. = 7 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 40A
Total Area (ac): 6.29
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.953
C Total: 0.866
Sum Q Segments (cfs): 0.00
Q Total (cfs): 20.20
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 7.228
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 40A

FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 757
Top Elevation (ft): 1193
Bottom Elevation (ft): 1040
Contributing Area (acres): 6.29
Percent of Sub-Area (%): 100.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2021
Effective Slope: 0.1604
Q for Flow Path (cfs): 20.20
Avg Velocity (ft/s): 6.10
Passed Scour Check: No
Scour Velocity (ft/sec): 6.10
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 50A
Computing Tc for all rainfall frequencies for sub-area 50A...
---
Tc for frequency = 10.00: 12.000 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 12.000 min. = 12 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A
Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.289
C Total: 0.784
Sum Q Segments (cfs): 55.88
Q Total (cfs): 55.88
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 720.01
Time of Concentration (min): 12.000
---
DATA FOR FLOW PATH 1

---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 8.5193
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 14.27
Avg Velocity (ft/s): 1.61
Passed Scour Check: YES
Scour Velocity (ft/sec): 5.67
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.8201
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 26.52
Q Top (cfs): 14.27
Q Bottom (cfs): 40.79
Velocity Top (ft/s): 4.97
Velocity Bottom (ft/s): 7.04
Avg Velocity (ft/s): 6.00
Wave Velocity (ft/s): 9.01
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.6608
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529

Q for Flow Path (cfs): 15.09
Q Top (cfs): 40.79
Q Bottom (cfs): 55.88
Velocity Top (ft/s): 4.43
Velocity Bottom (ft/s): 4.92
Avg Velocity (ft/s): 4.68
Wave Velocity (ft/s): 7.01

Tc for frequency = 25.00: 11.333 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 11.333 min. = 11 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A
Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.657
C Total: 0.809
Sum Q Segments (cfs): 0.00
Q Total (cfs): 63.28
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 11.333
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 16.16
Avg Velocity (ft/s): 6.01
Passed Scour Check: No

Scour Velocity (ft/sec): 6.01
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.7462
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 30.04
Q Top (cfs): 16.16
Q Bottom (cfs): 46.19
Velocity Top (ft/s): 5.17
Velocity Bottom (ft/s): 7.34
Avg Velocity (ft/s): 6.26
Wave Velocity (ft/s): 9.39
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.5934
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 17.09
Q Top (cfs): 46.19
Q Bottom (cfs): 63.28
Velocity Top (ft/s): 4.62
Velocity Bottom (ft/s): 5.13
Avg Velocity (ft/s): 4.87
Wave Velocity (ft/s): 7.31
♠
Tc for frequency = 50.00: 10.953 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 10.953 min. = 11 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A

Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.624
C Total: 0.807
Sum Q Segments (cfs): 0.00
Q Total (cfs): 63.53
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 10.953
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 16.22
Avg Velocity (ft/s): 6.02
Passed Scour Check: No
Scour Velocity (ft/sec): 6.02
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.7439
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 30.16
Q Top (cfs): 16.22

Q Bottom (cfs): 46.38
Velocity Top (ft/s): 5.18
Velocity Bottom (ft/s): 7.35
Avg Velocity (ft/s): 6.27
Wave Velocity (ft/s): 9.40
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.5913
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 17.16
Q Top (cfs): 46.38
Q Bottom (cfs): 63.53
Velocity Top (ft/s): 4.62
Velocity Bottom (ft/s): 5.13
Avg Velocity (ft/s): 4.88
Wave Velocity (ft/s): 7.32
Tc for frequency = 100.00: 10.113 Minutes
DATA FOR SUB AREA 14
---
SUB AREA TIME OF CONCENTRATION: 10.113 min. = 10 min. ** SCOUR ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 50A
Total Area (ac): 31.14
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.790
C Total: 0.817
Sum Q Segments (cfs): 0.00
Q Total (cfs): 68.34
Sum Percent Area (%): 0.0
Sum of Flow Path Travel Times (sec): 0.00
Time of Concentration (min): 10.113

---
DATA FOR FLOW PATH 1
---
Flow Path Name: 50A1
FLOW PATH TRAVEL TIME (min): 0.0000
Flow Type: Overland
Length (ft): 822.5
Top Elevation (ft): 1437
Bottom Elevation (ft): 1231
Contributing Area (acres): 7.95
Percent of Sub-Area (%): 25.5
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2505
Effective Slope: 0.1807
Q for Flow Path (cfs): 17.45
Avg Velocity (ft/s): 6.17
Passed Scour Check: No
Scour Velocity (ft/sec): 6.17
DATA FOR FLOW PATH 2
---
Flow Path Name: 50A2
FLOW PATH TRAVEL TIME (min): 1.7020
Flow Type: Natural Channel
Length (ft): 983.6
Top Elevation (ft): 1231
Bottom Elevation (ft): 1080
Contributing Area (acres): 14.78
Percent of Sub-Area (%): 47.5
Overland Type: Mountain
Map Slope: 0.1535
Effective Slope: 0.1339
Q for Flow Path (cfs): 32.44
Q Top (cfs): 17.45
Q Bottom (cfs): 49.89
Velocity Top (ft/s): 5.31
Velocity Bottom (ft/s): 7.53
Avg Velocity (ft/s): 6.42
Wave Velocity (ft/s): 9.63
DATA FOR FLOW PATH 3
---
Flow Path Name: 50A3
FLOW PATH TRAVEL TIME (min): 1.5531
Flow Type: Natural Channel
Length (ft): 698.8
Top Elevation (ft): 1080
Bottom Elevation (ft): 1043
Contributing Area (acres): 8.41
Percent of Sub-Area (%): 27.0
Overland Type: Mountain

Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 18.46
Q Top (cfs): 49.89
Q Bottom (cfs): 68.34
Velocity Top (ft/s): 4.74
Velocity Bottom (ft/s): 5.26
Avg Velocity (ft/s): 5.00
Wave Velocity (ft/s): 7.50

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting

---

Sub-Area Name: 51A
Computing Tc for all rainfall frequencies for sub-area 51A...

---

Tc for frequency = 10.00: 18.332 Minutes
DATA FOR SUB AREA 15

---

SUB AREA TIME OF CONCENTRATION: 18.332 min. = 18 min.

---

SUB AREA INPUT DATA

---

Sub Area Name: 51A
Total Area (ac): 4.6
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

---

Intensity (in/hr): 1.863
C Total: 0.748
Sum Q Segments (cfs): 6.41
Q Total (cfs): 6.41
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 1,099.92
Time of Concentration (min): 18.332

---

DATA FOR FLOW PATH 1

---

Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 16.9441
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046

Bottom Elevation (ft): 1008
Contributing Area (acres): 2.41
Percent of Sub-Area (%): 52.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 3.36
Avg Velocity (ft/s): 0.55
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.21
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.3879
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.19
Percent of Sub-Area (%): 47.6
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 3.05
Q Top (cfs): 3.36
Q Bottom (cfs): 6.41
Velocity Top (ft/s): 4.25
Velocity Bottom (ft/s): 4.94
Avg Velocity (ft/s): 4.60
Wave Velocity (ft/s): 6.90
Tc for frequency = 25.00: 15.167 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 15.167 min. = 15 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 4.6
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.256

C Total: 0.781
Sum Q Segments (cfs): 8.11
Q Total (cfs): 8.11
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 910.00
Time of Concentration (min): 15.167
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 13.8542
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.41
Percent of Sub-Area (%): 52.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 4.25
Avg Velocity (ft/s): 0.67
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.33
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.3125
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.19
Percent of Sub-Area (%): 47.6
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 3.86
Q Top (cfs): 4.25
Q Bottom (cfs): 8.11
Velocity Top (ft/s): 4.49
Velocity Bottom (ft/s): 5.24
Avg Velocity (ft/s): 4.86
Wave Velocity (ft/s): 7.29
Tc for frequency = 50.00: 13.322 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 13.322 min. = 13 min.

---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 4.6
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 2.802
C Total: 0.818
Sum Q Segments (cfs): 10.54
Q Total (cfs): 10.54
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 799.34
Time of Concentration (min): 13.322
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 12.0909
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.41
Percent of Sub-Area (%): 52.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 5.52
Avg Velocity (ft/s): 0.77
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.54
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.2314
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.19
Percent of Sub-Area (%): 47.6
Overland Type: Valley

Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 5.02
Q Top (cfs): 5.52
Q Bottom (cfs): 10.54
Velocity Top (ft/s): 4.77
Velocity Bottom (ft/s): 5.59
Avg Velocity (ft/s): 5.18
Wave Velocity (ft/s): 7.77

Tc for frequency = 100.00: 10.709 Minutes
DATA FOR SUB AREA 15
---
SUB AREA TIME OF CONCENTRATION: 10.709 min. = 11 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 51A
Total Area (ac): 4.6
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT
---
Intensity (in/hr): 3.387
C Total: 0.845
Sum Q Segments (cfs): 13.17
Q Total (cfs): 13.17
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 642.55
Time of Concentration (min): 10.709
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 51A1
FLOW PATH TRAVEL TIME (min): 9.5445
Flow Type: Overland
Length (ft): 560.7
Top Elevation (ft): 1046
Bottom Elevation (ft): 1008
Contributing Area (acres): 2.41
Percent of Sub-Area (%): 52.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0678
Effective Slope: 0.0678
Q for Flow Path (cfs): 6.90

Avg Velocity (ft/s): 0.98
Passed Scour Check: YES
Scour Velocity (ft/sec): 2.72
DATA FOR FLOW PATH 2
---
Flow Path Name: 51A2
FLOW PATH TRAVEL TIME (min): 1.1647
Flow Type: Natural Channel
Length (ft): 574.2
Top Elevation (ft): 1008
Bottom Elevation (ft): 980
Contributing Area (acres): 2.19
Percent of Sub-Area (%): 47.6
Overland Type: Valley
Map Slope: 0.0488
Effective Slope: 0.0488
Q for Flow Path (cfs): 6.27
Q Top (cfs): 6.90
Q Bottom (cfs): 13.17
Velocity Top (ft/s): 5.03
Velocity Bottom (ft/s): 5.92
Avg Velocity (ft/s): 5.48
Wave Velocity (ft/s): 8.22
Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 60A
Computing Tc for all rainfall frequencies for sub-area 60A...
---
Tc for frequency = 10.00: 5.537 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 5.537 min. = 6 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 60A
Total Area (ac): 1.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 10
SUB AREA OUTPUT
---
Intensity (in/hr): 3.400

C Total: 0.856
Sum Q Segments (cfs): 3.55
Q Total (cfs): 3.55
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 332.23
Time of Concentration (min): 5.537
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 60A1
FLOW PATH TRAVEL TIME (min): 5.1215
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1020
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 12.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0900
Effective Slope: 0.0900
Q for Flow Path (cfs): 0.44
Avg Velocity (ft/s): 0.65
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.23
DATA FOR FLOW PATH 2
---
Flow Path Name: 60A2
FLOW PATH TRAVEL TIME (min): 0.4156
Flow Type: Natural Channel
Length (ft): 98.6
Top Elevation (ft): 1020
Bottom Elevation (ft): 998
Contributing Area (acres): 1.07
Percent of Sub-Area (%): 87.7
Overland Type: Mountain
Map Slope: 0.2231
Effective Slope: 0.1699
Q for Flow Path (cfs): 3.11
Q Top (cfs): 0.44
Q Bottom (cfs): 3.55
Velocity Top (ft/s): 1.75
Velocity Bottom (ft/s): 3.52
Avg Velocity (ft/s): 2.64
Wave Velocity (ft/s): 3.95
Tc for frequency = 25.00: 4.671 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 4.671 min. = 5 min. ** TC ERROR **

---
SUB AREA INPUT DATA
---
Sub Area Name: 60A
Total Area (ac): 1.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 10
SUB AREA OUTPUT
---
Intensity (in/hr): 4.272
C Total: 0.882
Sum Q Segments (cfs): 4.59
Q Total (cfs): 4.59
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 280.26
Time of Concentration (min): 4.671
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 60A1
FLOW PATH TRAVEL TIME (min): 4.2895
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1020
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 12.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0900
Effective Slope: 0.0900
Q for Flow Path (cfs): 0.56
Avg Velocity (ft/s): 0.78
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.33
DATA FOR FLOW PATH 2
---
Flow Path Name: 60A2
FLOW PATH TRAVEL TIME (min): 0.3815
Flow Type: Natural Channel
Length (ft): 98.6
Top Elevation (ft): 1020
Bottom Elevation (ft): 998
Contributing Area (acres): 1.07
Percent of Sub-Area (%): 87.7
Overland Type: Mountain

Map Slope: 0.2231
Effective Slope: 0.1699
Q for Flow Path (cfs): 4.03
Q Top (cfs): 0.56
Q Bottom (cfs): 4.59
Velocity Top (ft/s): 1.91
Velocity Bottom (ft/s): 3.84
Avg Velocity (ft/s): 2.87
Wave Velocity (ft/s): 4.31

Tc for frequency = 50.00: 4.152 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 4.152 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 60A
Total Area (ac): 1.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 10
SUB AREA OUTPUT
---
Intensity (in/hr): 5.160
C Total: 0.898
Sum Q Segments (cfs): 5.65
Q Total (cfs): 5.65
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 249.14
Time of Concentration (min): 4.152
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 60A1
FLOW PATH TRAVEL TIME (min): 3.7963
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1020
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 12.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0900
Effective Slope: 0.0900
Q for Flow Path (cfs): 0.69

Avg Velocity (ft/s): 0.88
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.42
DATA FOR FLOW PATH 2
---
Flow Path Name: 60A2
FLOW PATH TRAVEL TIME (min): 0.3560
Flow Type: Natural Channel
Length (ft): 98.6
Top Elevation (ft): 1020
Bottom Elevation (ft): 998
Contributing Area (acres): 1.07
Percent of Sub-Area (%): 87.7
Overland Type: Mountain
Map Slope: 0.2231
Effective Slope: 0.1699
Q for Flow Path (cfs): 4.96
Q Top (cfs): 0.69
Q Bottom (cfs): 5.65
Velocity Top (ft/s): 2.04
Velocity Bottom (ft/s): 4.11
Avg Velocity (ft/s): 3.08
Wave Velocity (ft/s): 4.62
♠
Tc for frequency = 100.00: 3.421 Minutes
DATA FOR SUB AREA 16
---
SUB AREA TIME OF CONCENTRATION: 3.421 min. = 3 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 60A
Total Area (ac): 1.22
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 10
SUB AREA OUTPUT
---
Intensity (in/hr): 5.440
C Total: 0.901
Sum Q Segments (cfs): 5.98
Q Total (cfs): 5.98
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 205.27
Time of Concentration (min): 3.421
---
DATA FOR FLOW PATH 1

---
Flow Path Name: 60A1
FLOW PATH TRAVEL TIME (min): 3.0718
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1038
Bottom Elevation (ft): 1020
Contributing Area (acres): 0.15
Percent of Sub-Area (%): 12.3
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.0900
Effective Slope: 0.0900
Q for Flow Path (cfs): 0.74
Avg Velocity (ft/s): 1.09
Passed Scour Check: YES
Scour Velocity (ft/sec): 1.48
DATA FOR FLOW PATH 2
---
Flow Path Name: 60A2
FLOW PATH TRAVEL TIME (min): 0.3494
Flow Type: Natural Channel
Length (ft): 98.6
Top Elevation (ft): 1020
Bottom Elevation (ft): 998
Contributing Area (acres): 1.07
Percent of Sub-Area (%): 87.7
Overland Type: Mountain
Map Slope: 0.2231
Effective Slope: 0.1699
Q for Flow Path (cfs): 5.25
Q Top (cfs): 0.74
Q Bottom (cfs): 5.98
Velocity Top (ft/s): 2.08
Velocity Bottom (ft/s): 4.19
Avg Velocity (ft/s): 3.14
Wave Velocity (ft/s): 4.70

Project: AJU Brandeis
Date: 12:00:00 AM
Engineer:
Consultant: Stantec Consulting
---
Sub-Area Name: 61A
Computing Tc for all rainfall frequencies for sub-area 61A...
---
Tc for frequency = 10.00: 7.902 Minutes
DATA FOR SUB AREA 17
---
SUB AREA TIME OF CONCENTRATION: 7.902 min. = 8 min.

---
SUB AREA INPUT DATA
---
Sub Area Name: 61A
Total Area (ac): 1.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 46
SUB AREA OUTPUT
---
Intensity (in/hr): 2.865
C Total: 0.880
Sum Q Segments (cfs): 3.99
Q Total (cfs): 3.99
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 474.09
Time of Concentration (min): 7.902
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 61A1
FLOW PATH TRAVEL TIME (min): 6.6667
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1015
Bottom Elevation (ft): 1006.7
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 17.1
Overland Type: Valley
Development Type: Commercial
Map Slope: 0.0415
Effective Slope: 0.0415
Q for Flow Path (cfs): 0.68
Avg Velocity (ft/s): 0.50
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 61A2
FLOW PATH TRAVEL TIME (min): 1.2349
Flow Type: Natural Channel
Length (ft): 336.8
Top Elevation (ft): 1006.7
Bottom Elevation (ft): 996
Contributing Area (acres): 1.31
Percent of Sub-Area (%): 82.9
Overland Type: Valley
Map Slope: 0.0318

Effective Slope: 0.0318
Q for Flow Path (cfs): 3.30
Q Top (cfs): 0.68
Q Bottom (cfs): 3.99
Velocity Top (ft/s): 2.49
Velocity Bottom (ft/s): 3.57
Avg Velocity (ft/s): 3.03
Wave Velocity (ft/s): 4.55

Tc for frequency = 25.00: 6.927 Minutes
DATA FOR SUB AREA 17
---
SUB AREA TIME OF CONCENTRATION: 6.927 min. = 7 min.
---
SUB AREA INPUT DATA
---
Sub Area Name: 61A
Total Area (ac): 1.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 46
SUB AREA OUTPUT
---
Intensity (in/hr): 3.454
C Total: 0.895
Sum Q Segments (cfs): 4.88
Q Total (cfs): 4.88
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 415.61
Time of Concentration (min): 6.927
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 61A1
FLOW PATH TRAVEL TIME (min): 5.7436
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1015
Bottom Elevation (ft): 1006.7
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 17.1
Overland Type: Valley
Development Type: Commercial
Map Slope: 0.0415
Effective Slope: 0.0415
Q for Flow Path (cfs): 0.83
Avg Velocity (ft/s): 0.58

Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 61A2
FLOW PATH TRAVEL TIME (min): 1.1832
Flow Type: Natural Channel
Length (ft): 336.8
Top Elevation (ft): 1006.7
Bottom Elevation (ft): 996
Contributing Area (acres): 1.31
Percent of Sub-Area (%): 82.9
Overland Type: Valley
Map Slope: 0.0318
Effective Slope: 0.0318
Q for Flow Path (cfs): 4.05
Q Top (cfs): 0.83
Q Bottom (cfs): 4.88
Velocity Top (ft/s): 2.59
Velocity Bottom (ft/s): 3.74
Avg Velocity (ft/s): 3.16
Wave Velocity (ft/s): 4.74
Tc for frequency = 50.00: 4.411 Minutes
DATA FOR SUB AREA 17
---
SUB AREA TIME OF CONCENTRATION: 4.411 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 61A
Total Area (ac): 1.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 50
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 46
SUB AREA OUTPUT
---
Intensity (in/hr): 5.160
C Total: 0.919
Sum Q Segments (cfs): 7.49
Q Total (cfs): 7.49
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 264.64
Time of Concentration (min): 4.411
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 61A1

FLOW PATH TRAVEL TIME (min): 3.3333
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1015
Bottom Elevation (ft): 1006.7
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 17.1
Overland Type: Valley
Development Type: Commercial
Map Slope: 0.0415
Effective Slope: 0.0415
Q for Flow Path (cfs): 1.28
Avg Velocity (ft/s): 1.00
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 61A2
FLOW PATH TRAVEL TIME (min): 1.0773
Flow Type: Natural Channel
Length (ft): 336.8
Top Elevation (ft): 1006.7
Bottom Elevation (ft): 996
Contributing Area (acres): 1.31
Percent of Sub-Area (%): 82.9
Overland Type: Valley
Map Slope: 0.0318
Effective Slope: 0.0318
Q for Flow Path (cfs): 6.21
Q Top (cfs): 1.28
Q Bottom (cfs): 7.49
Velocity Top (ft/s): 2.80
Velocity Bottom (ft/s): 4.14
Avg Velocity (ft/s): 3.47
Wave Velocity (ft/s): 5.21
Tc for frequency = 100.00: 4.414 Minutes
DATA FOR SUB AREA 17
---
SUB AREA TIME OF CONCENTRATION: 4.414 min. = 4 min. ** TC ERROR **
---
SUB AREA INPUT DATA
---
Sub Area Name: 61A
Total Area (ac): 1.58
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Commercial
Soil Type: 2.00
Percent Impervious: 46

SUB AREA OUTPUT
---
Intensity (in/hr): 5.100
C Total: 0.918
Sum Q Segments (cfs): 7.40
Q Total (cfs): 7.40
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 264.81
Time of Concentration (min): 4.414
---
DATA FOR FLOW PATH 1
---
Flow Path Name: 61A1
FLOW PATH TRAVEL TIME (min): 3.3333
Flow Type: Overland
Length (ft): 200
Top Elevation (ft): 1015
Bottom Elevation (ft): 1006.7
Contributing Area (acres): 0.27
Percent of Sub-Area (%): 17.1
Overland Type: Valley
Development Type: Commercial
Map Slope: 0.0415
Effective Slope: 0.0415
Q for Flow Path (cfs): 1.26
Avg Velocity (ft/s): 1.00
Passed Scour Check: N/A
DATA FOR FLOW PATH 2
---
Flow Path Name: 61A2
FLOW PATH TRAVEL TIME (min): 1.0802
Flow Type: Natural Channel
Length (ft): 336.8
Top Elevation (ft): 1006.7
Bottom Elevation (ft): 996
Contributing Area (acres): 1.31
Percent of Sub-Area (%): 82.9
Overland Type: Valley
Map Slope: 0.0318
Effective Slope: 0.0318
Q for Flow Path (cfs): 6.14
Q Top (cfs): 1.26
Q Bottom (cfs): 7.40
Velocity Top (ft/s): 2.80
Velocity Bottom (ft/s): 4.13
Avg Velocity (ft/s): 3.46
Wave Velocity (ft/s): 5.20

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A10     9    0    110    134      110     134   1153    VALLEY
 940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A10     8    0    250    322      360     445   1155    VALLEY
 891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A10    11    0    200    216      560     655   1155    VALLEY
 788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A10     7    0     80    111      640     739   1156    VALLEY
 489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A10     5    5     14     25      654     746   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
-----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
-----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:              746    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             21.64 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.47   200       0.47   300       0.47   400
0.47
      500       0.47   600       0.48   700       0.51   800       0.51   900
0.54
     1000       0.59  1050       0.64  1100      24.71  1110      50.84  1120
87.65
     1130     102.60  1131     102.96  1132     103.63  1133     104.28  1134
105.27
     1135     106.48  1136     107.88  1137     109.46  1138     111.14  1139
```

112.83
1140 114.56 1141 117.15 1142 121.08 1143 126.73 1144
134.17
1145 145.46 1146 160.47 1147 180.11 1148 204.48 1149
240.39
1150 291.07 1151 361.33 1152 449.92 1153 551.73 1154
644.63
1155 714.58 1156 746.10 1157 739.07 1158 705.58 1159
655.60
1160 590.23 1161 515.93 1162 439.99 1163 366.26 1164
298.38
1165 239.03 1166 190.52 1167 154.73 1168 129.56 1169
111.76
1170 98.66 1171 88.02 1172 79.38 1173 71.95 1174
65.53
1175 59.45 1176 54.05 1177 49.52 1178 45.12 1179
40.99
1180 37.51 1181 34.22 1182 30.85 1183 27.47 1184
24.64
1185 22.63 1186 20.49 1187 18.20 1188 15.75 1189
13.29
1190 11.02 1191 9.09 1192 7.48 1193 6.16 1194
5.08
1195 4.22 1196 3.50 1197 2.91 1198 2.42 1199
2.04
1200 1.72 1201 1.47 1202 1.26 1203 1.11 1204
0.98
1205 0.88 1206 0.80 1207 0.75 1208 0.71 1209
0.68
1210 0.64 1211 0.63 1212 0.62 1213 0.61 1214
0.60
1215 0.60 1216 0.60 1217 0.60 1218 0.59 1219
0.59
1220 0.59 1221 0.59 1222 0.58 1223 0.59 1224
0.59
1225 0.58 1226 0.56 1227 0.54 1228 0.53 1229
0.51
1230 0.51 1231 0.51 1232 0.52 1233 0.52 1234
0.52
1235 0.51 1236 0.51 1237 0.51 1238 0.51 1239
0.51
1240 0.52 1241 0.52 1242 0.52 1243 0.51 1244
0.51
1245 0.51 1246 0.51 1247 0.51 1248 0.52 1249
0.52
1250 0.52 1251 0.51 1252 0.51 1253 0.51 1254
0.51
1255 0.51 1256 0.52 1257 0.52 1258 0.52 1259
0.51
1260 0.51 1261 0.51 1262 0.51 1263 0.51 1264

0.52
     1265       0.52  1266       0.52  1267       0.51  1268       0.51  1269
0.51
     1270       0.51  1271       0.51  1272       0.52  1273       0.52  1274
0.52
     1275       0.51  1276       0.51  1277       0.51  1278       0.51  1279
0.51
     1280       0.52  1281       0.52  1282       0.52  1283       0.51  1284
0.51
     1285       0.51  1286       0.51  1287       0.51  1288       0.52  1289
0.52
     1290       0.52  1291       0.51  1292       0.51  1293       0.51  1294
0.51
     1295       0.51  1296       0.52  1297       0.51  1298       0.50  1299
0.49
     1300       0.48  1310       0.47  1320       0.48  1330       0.47  1340
0.48
     1350       0.47  1360       0.47  1370       0.48  1380       0.47  1390
0.47
     1400       0.48  1420       0.47  1440       0.47  1460       0.40  1500
0.40



VCRat Model Input

Model Lines
---
---
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011009A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020011A97200788004600
006     1  004A 020000008007A97200489004100
006     1  005A 020005001405A97                              1  2
999

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A25     8    0    110    178      110     178   1154    VALLEY
 940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A25     8    0    250    405      360     572   1154    VALLEY
 891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A25    10    0    200    289      560     850   1155    VALLEY
 788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A25     6    0     80    152      640     952   1155    VALLEY
 489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A25     5    5     14     31      654     966   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:              966    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             31.83 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.49   200       0.49   300       0.49   400
0.49
      500       0.49   600       0.50   700       0.54   800       0.54   900
0.57
     1000       0.63  1050      10.98  1100      60.49  1110      97.15  1120
141.79
     1130     157.14  1131     157.98  1132     159.10  1133     160.39  1134
161.97
     1135     163.89  1136     166.00  1137     168.14  1138     170.17  1139
```

172.28
1140 174.34 1141 177.71 1142 183.22 1143 191.18 1144
202.12
1145 217.86 1146 238.53 1147 264.63 1148 295.49 1149
342.97
1150 413.03 1151 507.75 1152 624.67 1153 757.87 1154
876.01
1155 949.14 1156 966.10 1157 942.98 1158 889.43 1159
812.60
1160 716.82 1161 614.84 1162 514.24 1163 419.74 1164
335.87
1165 267.86 1166 219.28 1167 186.85 1168 165.00 1169
148.99
1170 136.50 1171 125.92 1172 116.86 1173 108.82 1174
101.26
1175 94.62 1176 88.32 1177 82.61 1178 77.84 1179
73.77
1180 69.72 1181 65.47 1182 61.13 1183 57.41 1184
53.64
1185 49.93 1186 45.97 1187 41.86 1188 37.72 1189
33.33
1190 29.40 1191 25.83 1192 22.73 1193 20.10 1194
17.78
1195 15.39 1196 13.02 1197 11.09 1198 10.03 1199
8.91
1200 7.82 1201 6.80 1202 5.87 1203 5.05 1204
4.33
1205 3.70 1206 3.17 1207 2.72 1208 2.34 1209
2.01
1210 1.75 1211 1.53 1212 1.35 1213 1.19 1214
1.08
1215 0.98 1216 0.89 1217 0.83 1218 0.79 1219
0.75
1220 0.72 1221 0.70 1222 0.68 1223 0.66 1224
0.65
1225 0.64 1226 0.61 1227 0.59 1228 0.57 1229
0.55
1230 0.54 1231 0.54 1232 0.54 1233 0.54 1234
0.54
1235 0.54 1236 0.54 1237 0.54 1238 0.54 1239
0.54
1240 0.54 1241 0.54 1242 0.54 1243 0.54 1244
0.54
1245 0.54 1246 0.54 1247 0.54 1248 0.54 1249
0.54
1250 0.54 1251 0.54 1252 0.54 1253 0.54 1254
0.54
1255 0.54 1256 0.54 1257 0.54 1258 0.54 1259
0.54
1260 0.54 1261 0.54 1262 0.54 1263 0.54 1264

0.54

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1265 | 0.54 | 1266 | 0.54 | 1267 | 0.54 | 1268 | 0.54 | 1269 | 0.54 |
| 1270 | 0.54 | 1271 | 0.54 | 1272 | 0.54 | 1273 | 0.54 | 1274 | 0.54 |
| 1275 | 0.54 | 1276 | 0.54 | 1277 | 0.54 | 1278 | 0.54 | 1279 | 0.54 |
| 1280 | 0.54 | 1281 | 0.54 | 1282 | 0.54 | 1283 | 0.54 | 1284 | 0.54 |
| 1285 | 0.54 | 1286 | 0.54 | 1287 | 0.54 | 1288 | 0.54 | 1289 | 0.54 |
| 1290 | 0.54 | 1291 | 0.54 | 1292 | 0.54 | 1293 | 0.54 | 1294 | 0.54 |
| 1295 | 0.54 | 1296 | 0.54 | 1297 | 0.53 | 1298 | 0.52 | 1299 | 0.50 |
| 1300 | 0.50 | 1310 | 0.49 | 1320 | 0.49 | 1330 | 0.49 | 1340 | 0.49 |
| 1350 | 0.49 | 1360 | 0.49 | 1370 | 0.49 | 1380 | 0.49 | 1390 | 0.49 |
| 1400 | 0.49 | 1420 | 0.49 | 1440 | 0.49 | 1460 | 0.40 | 1500 | 0.40 |



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011008A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020010A97200788004600
006     1  004A 020000008006A97200489004100
006     1  005A 020005001405A97                              1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A50     8    0    110    205      110     205   1153    VALLEY
 940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A50     8    0    250    466      360     660   1154    VALLEY
 891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A50     9    0    200    351      560     998   1155    VALLEY
 788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A50     6    0     80    175      640    1123   1155    VALLEY
 489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A50     5    5     14     36      654    1133   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:             1133    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             40.30 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.50   200       0.50   300       0.50   400
0.50
      500       0.50   600       0.51   700       0.56   800       0.56   900
0.59
     1000       0.66  1050      28.03  1100      89.34  1110     130.44  1120
183.37
     1130     198.31  1131     199.24  1132     200.59  1133     202.24  1134
204.33
     1135     206.85  1136     209.36  1137     211.99  1138     214.50  1139
```

216.88
1140 219.05 1141 222.76 1142 228.91 1143 238.25 1144
250.84
1145 269.41 1146 294.55 1147 326.02 1148 362.81 1149
419.39
1150 504.02 1151 618.28 1152 757.42 1153 914.56 1154
1050.11
1155 1126.69 1156 1133.20 1157 1103.28 1158 1031.76 1159
926.16
1160 800.53 1161 676.03 1162 557.10 1163 448.72 1164
359.51
1165 294.73 1166 250.78 1167 221.08 1168 199.50 1169
182.65
1170 169.06 1171 156.89 1172 146.34 1173 136.61 1174
128.07
1175 120.11 1176 113.32 1177 107.82 1178 103.29 1179
99.17
1180 94.79 1181 89.73 1182 85.00 1183 80.16 1184
75.38
1185 70.58 1186 65.46 1187 60.19 1188 55.40 1189
50.87
1190 47.21 1191 43.64 1192 40.35 1193 36.76 1194
33.10
1195 29.46 1196 26.98 1197 24.72 1198 22.23 1199
19.56
1200 16.86 1201 14.28 1202 11.95 1203 9.92 1204
8.19
1205 6.75 1206 5.55 1207 4.57 1208 3.76 1209
3.11
1210 2.58 1211 2.16 1212 1.82 1213 1.54 1214
1.34
1215 1.16 1216 1.04 1217 0.94 1218 0.86 1219
0.81
1220 0.76 1221 0.74 1222 0.71 1223 0.70 1224
0.68
1225 0.66 1226 0.63 1227 0.61 1228 0.58 1229
0.56
1230 0.55 1231 0.55 1232 0.55 1233 0.55 1234
0.56
1235 0.56 1236 0.56 1237 0.56 1238 0.56 1239
0.55
1240 0.55 1241 0.55 1242 0.55 1243 0.55 1244
0.56
1245 0.56 1246 0.56 1247 0.56 1248 0.56 1249
0.55
1250 0.55 1251 0.55 1252 0.55 1253 0.55 1254
0.56
1255 0.56 1256 0.56 1257 0.56 1258 0.56 1259
0.55
1260 0.55 1261 0.55 1262 0.55 1263 0.55 1264

0.56
     1265       0.56  1266       0.56  1267       0.56  1268       0.55  1269
0.55
     1270       0.55  1271       0.55  1272       0.55  1273       0.56  1274
0.56
     1275       0.56  1276       0.56  1277       0.56  1278       0.55  1279
0.55
     1280       0.55  1281       0.55  1282       0.55  1283       0.56  1284
0.56
     1285       0.56  1286       0.56  1287       0.56  1288       0.55  1289
0.55
     1290       0.55  1291       0.55  1292       0.55  1293       0.56  1294
0.56
     1295       0.56  1296       0.56  1297       0.54  1298       0.54  1299
0.52
     1300       0.51  1310       0.50  1320       0.50  1330       0.50  1340
0.50
     1350       0.50  1360       0.50  1370       0.50  1380       0.50  1390
0.50
     1400       0.50  1420       0.50  1440       0.50  1460       0.40  1500
0.40



VCRat Model Input

Model Lines
---
---
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011008A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020009A97200788004600
006     1  004A 020000008006A97200489004100
006     1  005A 020005001405A97                              1  2
999

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis Discharge 1

Project Description

---

Discharge 1

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CARP1: Carpenteria Coastal
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis Discharge 1


Model Results

| SUBAREA DATA AND RESULTS | | | | | | | ACCUMULATED DATA | | | ROUTING AFTER ACCUMULATION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | % IMP | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) |
| | | | | | | | | | | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) | |

```
      1A :  Subarea
      1A   020   A100    8    0    110    236      110     236   1153    VALLEY
940  0.07800    ---     ----    -----  -----    --     --
      2A :  Subarea
      2A   020   A100    8    0    250    535      360     760   1154    VALLEY
891  0.05900    ---     ----    -----  -----    --     --
      3A :  Subarea
      3A   020   A100    9    0    200    405      560    1150   1155    VALLEY
788  0.04600    ---     ----    -----  -----    --     --
      4A :  Subarea
      4A   020   A100    6    0     80    200      640    1299   1155    VALLEY
489  0.04100    ---     ----    -----  -----    --     --
      5A :  Subarea
      5A   020   A100    5    5     14     41      654    1311   1156    -------
----  -------    ---     ----    -----  -----    --     --


                                          Issue/Warning Messages
     TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


-------------------------------------------------------------------------------
-------------------------------------------------------
      NO ISSUES OR WARNINGS DETECTED
-------------------------------------------------------------------------------
----------------
           HYDROGRAPH PRINTOUT AT:    5A
-------------------------------------------------------------------------------
----------------
           DESCRIPTION: Subarea
           TOTAL AREA TO HYDROGRAPH:     654    acres
           HYDROGRAPH PEAK:             1311    cfs
           TIME OF PEAK:                1156    minutes
           HYDROGRAPH VOLUME:             51.13 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

-------------------------------------------------------------------------------
        0       0.00   100       0.51   200       0.51   300       0.51   400
0.51
      500       0.51   600       0.53   700       0.57   800       0.57   900
0.62
     1000      10.85  1050      49.48  1100     118.30  1110     167.52  1120
224.96
     1130     239.92  1131     241.12  1132     243.00  1133     245.10  1134
247.54
     1135     250.31  1136     253.23  1137     256.21  1138     258.92  1139
```

261.56
1140 264.22 1141 268.56 1142 275.58 1143 286.41 1144
301.37
1145 323.34 1146 352.41 1147 388.68 1148 431.30 1149
497.87
1150 597.78 1151 731.44 1152 892.44 1153 1072.02 1154
1224.55
1155 1306.83 1156 1310.76 1157 1268.47 1158 1181.84 1159
1055.66
1160 908.69 1161 766.11 1162 629.85 1163 506.80 1164
407.57
1165 336.94 1166 290.04 1167 258.93 1168 236.72 1169
219.07
1170 204.09 1171 191.01 1172 179.72 1173 169.57 1174
160.20
1175 150.78 1176 143.31 1177 137.81 1178 133.14 1179
128.58
1180 123.43 1181 117.55 1182 112.10 1183 106.04 1184
100.05
1185 94.14 1186 88.02 1187 82.03 1188 76.61 1189
71.80
1190 68.07 1191 64.52 1192 60.83 1193 56.62 1194
52.03
1195 47.91 1196 44.58 1197 41.05 1198 37.16 1199
33.24
1200 29.31 1201 25.84 1202 22.66 1203 19.99 1204
17.96
1205 16.57 1206 15.46 1207 14.47 1208 13.78 1209
13.26
1210 13.05 1211 12.79 1212 12.40 1213 12.19 1214
12.10
1215 12.20 1216 12.19 1217 11.97 1218 12.00 1219
12.05
1220 12.29 1221 12.26 1222 12.12 1223 12.08 1224
12.25
1225 12.09 1226 11.55 1227 10.83 1228 10.42 1229
9.85
1230 9.18 1231 8.43 1232 7.68 1233 6.91 1234
6.15
1235 5.42 1236 4.75 1237 4.14 1238 3.60 1239
3.12
1240 2.71 1241 2.35 1242 2.04 1243 1.77 1244
1.55
1245 1.36 1246 1.21 1247 1.07 1248 0.98 1249
0.89
1250 0.82 1251 0.77 1252 0.73 1253 0.69 1254
0.66
1255 0.63 1256 0.63 1257 0.61 1258 0.60 1259
0.60
1260 0.59 1261 0.59 1262 0.58 1263 0.57 1264

0.58
     1265       0.58  1266       0.58  1267       0.58  1268       0.58  1269
0.58
     1270       0.58  1271       0.57  1272       0.58  1273       0.58  1274
0.58
     1275       0.58  1276       0.58  1277       0.58  1278       0.58  1279
0.57
     1280       0.58  1281       0.58  1282       0.58  1283       0.58  1284
0.58
     1285       0.58  1286       0.58  1287       0.57  1288       0.58  1289
0.58
     1290       0.58  1291       0.58  1292       0.58  1293       0.58  1294
0.58
     1295       0.57  1296       0.58  1297       0.57  1298       0.55  1299
0.54
     1300       0.53  1310       0.52  1320       0.51  1330       0.52  1340
0.51
     1350       0.52  1360       0.52  1370       0.51  1380       0.52  1390
0.51
     1400       0.52  1420       0.51  1440       0.51  1460       0.40  1500
0.40



VCRat Model Input

Model Lines
---
---
005     1  001A Header place holder
005     1  005A Header place holder
999
999
006     1  001A 020000011008A97200940007800                    G1
006     1  002A 020000025008A97200891005900
006     1  003A 020000020009A97200788004600
006     1  004A 020000008006A97200489004100
006     1  005A 020005001405A97                              1  2
999

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A10     8    0     98    126       98     126   1153    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A10     7    0    154    213      252     333   1155    VALLEY
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A10    10    0    173    199      425     519   1155    PIPE
 296  0.06400     4.50  ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


------------------------------------------------------------------------------
-----------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   12A
------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     425    acres
            HYDROGRAPH PEAK:              519    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             14.13 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       0.40  1100      18.07  1110      40.52  1120
62.30
     1130      67.13  1131      67.48  1132      68.00  1133      68.68  1134
70.06
     1135      71.15  1136      72.44  1137      73.65  1138      74.83  1139
76.43
     1140      77.43  1141      81.03  1142      86.01  1143      92.19  1144
99.19
     1145     113.11  1146     129.37  1147     148.61  1148     169.54  1149
209.95
     1150     260.13  1151     320.56  1152     388.13  1153     457.34  1154
```

501.23
1155 519.46 1156 512.51 1157 483.44 1158 440.90 1159
375.02
1160 306.16 1161 237.62 1162 177.01 1163 126.40 1164
101.21
1165 84.09 1166 73.56 1167 65.34 1168 58.09 1169
51.93
1170 47.21 1171 42.01 1172 36.92 1173 32.03 1174
28.86
1175 27.32 1176 26.06 1177 23.91 1178 21.87 1179
19.62
1180 17.12 1181 14.53 1182 12.29 1183 10.34 1184
7.10
1185 5.61 1186 4.60 1187 3.76 1188 3.05 1189
2.45
1190 1.95 1191 1.56 1192 1.26 1193 1.02 1194
0.85
1195 0.72 1196 0.63 1197 0.56 1198 0.51 1199
0.48
1200 0.46 1201 0.44 1202 0.43 1203 0.42 1204
0.41
1205 0.41 1206 0.41 1207 0.40 1208 0.40 1209
0.40
1210 0.40 1211 0.40 1212 0.40 1213 0.40 1214
0.40
1215 0.40 1216 0.40 1217 0.40 1218 0.40 1219
0.40
1220 0.40 1221 0.40 1222 0.40 1223 0.40 1224
0.40
1225 0.40 1226 0.40 1227 0.40 1228 0.40 1229
0.40
1230 0.40 1231 0.40 1232 0.40 1233 0.40 1234
0.40
1235 0.40 1236 0.40 1237 0.40 1238 0.40 1239
0.40
1240 0.40 1241 0.40 1242 0.40 1243 0.40 1244
0.40
1245 0.40 1246 0.40 1247 0.40 1248 0.40 1249
0.40
1250 0.40 1251 0.40 1252 0.40 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40
1270 0.40 1271 0.40 1272 0.40 1273 0.40 1274
0.40
1275 0.40 1276 0.40 1277 0.40 1278 0.40 1279

```
0.40
     1280       0.40  1281       0.40  1282       0.40  1283       0.40  1284
0.40
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  010A Header place holder
005     1  012A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97200995007500
006     1  012A 020000017310A97400296006400                  1  2
999
```

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Modified Rational Model Results Report

Job: 1 Project: AJU Brandeis - Discharge 2

Project Description

---

Discharge 2

---

VCRat version: 2.64.0.37
VCRain version: 201801
DOS EXE version: PC 2.64-201605
VCRain Curve Set: VCWPD 2016 Revised Curve Set
Curve A: SIM1: Upper Arroyo Simi
Curve B: ALP1: Arroyo Las Posas
Curve C: CON2: NF/SB Arroyo Conejo - ASR
Curve D: CON1: Arroyo Conejo

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.64)

Job: 1 Project: AJU Brandeis - Discharge 2


Model Results

| SUBAREA DATA AND RESULTS | ACCUMULATED DATA | ROUTING AFTER ACCUMULATION |

| NODE ID | SOIL TYPE | RAIN ZONE | TC (MIN) | IMP % | AREA (AC) | FLOW (CFS) | AREA (AC) | FLOW (CFS) | TIME (MIN) | CHANNEL TYPE | LENGTH (FT) | SLOPE (FT/FT) | SIZE (FT) | H:V (Z) | N VALUES CHNL | N VALUES SIDES | VEL (FT/S) | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
      10A :  Subarea
      10A   020   A25     8    0     98    159       98     159   1154    VALLEY
 990  0.09500    ---     ----    -----  -----    --     --
      11A :  Subarea
      11A   020   A25     7    0    154    268      252     417   1155    VALLEY
 995  0.07500    ---     ----    -----  -----    --     --
      12A :  Subarea
      12A   020   A25    10    0    173    250      425     656   1155    PIPE
 296  0.06400     5.00   ----    -----  -----    --     --


                                          Issue/Warning Messages
      TYPE      ERR NO   PROCEDURE    LOCATION   MESSAGE


------------------------------------------------------------------------------
------------------------------------------------------
       NO ISSUES OR WARNINGS DETECTED
------------------------------------------------------------------------------
-----------------
            HYDROGRAPH PRINTOUT AT:   12A
------------------------------------------------------------------------------
-----------------
            DESCRIPTION: Subarea
            TOTAL AREA TO HYDROGRAPH:     425    acres
            HYDROGRAPH PEAK:              656    cfs
            TIME OF PEAK:                1155    minutes
            HYDROGRAPH VOLUME:             20.70 acre-ft

     TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME     FLOW    TIME
FLOW
     (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)    (cfs)   (min)
(cfs)

------------------------------------------------------------------------------
        0       0.00   100       0.40   200       0.40   300       0.40   400
0.40
      500       0.40   600       0.40   700       0.40   800       0.40   900
0.40
     1000       0.40  1050       8.15  1100      41.36  1110      70.98  1120
96.23
     1130     102.92  1131     103.84  1132     104.41  1133     105.66  1134
106.99
     1135     108.60  1136     110.36  1137     111.62  1138     113.28  1139
114.59
     1140     115.94  1141     120.33  1142     126.68  1143     134.64  1144
144.33
     1145     160.26  1146     179.47  1147     203.03  1148     227.34  1149
277.03
     1150     339.43  1151     415.11  1152     499.19  1153     583.78  1154
```

636.01
1155 655.94 1156 644.35 1157 604.77 1158 550.95 1159
467.78
1160 381.57 1161 298.93 1162 227.05 1163 167.29 1164
137.42
1165 117.88 1166 105.91 1167 96.42 1168 88.17 1169
81.33
1170 75.07 1171 68.52 1172 62.41 1173 57.40 1174
52.75
1175 51.01 1176 49.67 1177 47.57 1178 44.93 1179
42.38
1180 38.85 1181 35.87 1182 32.75 1183 28.93 1184
25.57
1185 21.63 1186 18.66 1187 17.29 1188 16.23 1189
14.29
1190 12.92 1191 10.17 1192 7.93 1193 6.10 1194
4.71
1195 4.01 1196 3.38 1197 2.84 1198 2.37 1199
1.97
1200 1.64 1201 1.36 1202 1.14 1203 0.97 1204
0.83
1205 0.72 1206 0.64 1207 0.58 1208 0.53 1209
0.50
1210 0.47 1211 0.45 1212 0.44 1213 0.43 1214
0.42
1215 0.42 1216 0.41 1217 0.41 1218 0.41 1219
0.40
1220 0.40 1221 0.40 1222 0.40 1223 0.40 1224
0.40
1225 0.40 1226 0.40 1227 0.40 1228 0.40 1229
0.40
1230 0.40 1231 0.40 1232 0.40 1233 0.40 1234
0.40
1235 0.40 1236 0.40 1237 0.40 1238 0.40 1239
0.40
1240 0.40 1241 0.40 1242 0.40 1243 0.40 1244
0.40
1245 0.40 1246 0.40 1247 0.40 1248 0.40 1249
0.40
1250 0.40 1251 0.40 1252 0.40 1253 0.40 1254
0.40
1255 0.40 1256 0.40 1257 0.40 1258 0.40 1259
0.40
1260 0.40 1261 0.40 1262 0.40 1263 0.40 1264
0.40
1265 0.40 1266 0.40 1267 0.40 1268 0.40 1269
0.40
1270 0.40 1271 0.40 1272 0.40 1273 0.40 1274
0.40
1275 0.40 1276 0.40 1277 0.40 1278 0.40 1279

```
0.40
     1280       0.40  1281       0.40  1282       0.40  1283       0.40  1284
0.40
     1285       0.40  1286       0.40  1287       0.40  1288       0.40  1289
0.40
     1290       0.40  1291       0.40  1292       0.40  1293       0.40  1294
0.40
     1295       0.40  1296       0.40  1297       0.40  1298       0.40  1299
0.40
     1300       0.40  1310       0.40  1320       0.40  1330       0.40  1340
0.40
     1350       0.40  1360       0.40  1370       0.40  1380       0.40  1390
0.40
     1400       0.40  1420       0.40  1440       0.40  1460       0.40  1500
0.40
```



VCRat Model Input

Model Lines

```
-------------------------------------------------------------------------------
-----------------
005     1  010A Header place holder
005     1  012A Header place holder
999
999
006     1  010A 020000009808A97200990009500                    G1
006     1  011A 020000015407A97200995007500
006     1  012A 020000017310A97400296006400                  1  2
999
```

# APPENDIX D

## HYDRAULIC CALCULATIONS FOR STORM DRAIN LINES

# Discharge 2 - 36" RCP_Calcs

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.013 |
| Channel Slope | 0.060 ft/ft |
| Diameter | 36.0 in |
| Discharge | 82.00 cfs |

| Results | |
|---|---|
| Normal Depth | 18.0 in |
| Flow Area | 3.5 $ft^2$ |
| Wetted Perimeter | 4.7 ft |
| Hydraulic Radius | 9.0 in |
| Top Width | 3.00 ft |
| Critical Depth | 33.5 in |
| Percent Full | 50.1 % |
| Critical Slope | 0.013 ft/ft |
| Velocity | 23.13 ft/s |
| Velocity Head | 8.32 ft |
| Specific Energy | 9.82 ft |
| Froude Number | 3.752 |
| Maximum Discharge | 175.74 cfs |
| Discharge Full | 163.37 cfs |
| Slope Full | 0.015 ft/ft |
| Flow Type | Supercritical |

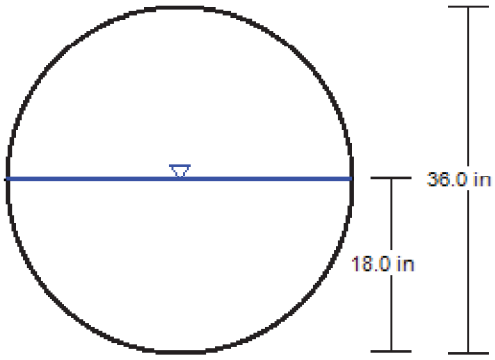
| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 50.1 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 18.0 in |
| Critical Depth | 33.5 in |
| Channel Slope | 0.060 ft/ft |
| Critical Slope | 0.013 ft/ft |

# Discharge 2 - 36" RCP_Cross Section

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.013 |
| Channel Slope | 0.060 ft/ft |
| Normal Depth | 18.0 in |
| Diameter | 36.0 in |
| Discharge | 82.00 cfs |




V: 1
H: 1

# Worksheet for Discharge 4 - 24" RCP

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.013 |
| Channel Slope | 0.090 ft/ft |
| Diameter | 24.0 in |
| Discharge | 34.00 cfs |

| Results | |
|---|---|
| Normal Depth | 12.0 in |
| Flow Area | 1.6 $ft^2$ |
| Wetted Perimeter | 3.1 ft |
| Hydraulic Radius | 6.0 in |
| Top Width | 2.00 ft |
| Critical Depth | 22.9 in |
| Percent Full | 50.1 % |
| Critical Slope | 0.020 ft/ft |
| Velocity | 21.61 ft/s |
| Velocity Head | 7.25 ft |
| Specific Energy | 8.26 ft |
| Froude Number | 4.294 |
| Maximum Discharge | 73.00 cfs |
| Discharge Full | 67.86 cfs |
| Slope Full | 0.023 ft/ft |
| Flow Type | Supercritical |

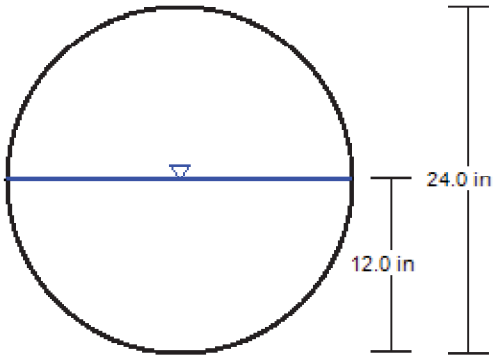
| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 50.1 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 12.0 in |
| Critical Depth | 22.9 in |
| Channel Slope | 0.090 ft/ft |
| Critical Slope | 0.020 ft/ft |

# Cross Section for Discharge 4 - 24" RCP

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.013 |
| Channel Slope | 0.090 ft/ft |
| Normal Depth | 12.0 in |
| Diameter | 24.0 in |
| Discharge | 34.00 cfs |




V: 1
H: 1

# Worksheet for Discharge 6 - 18" RCP

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.013 |
| Channel Slope | 0.061 ft/ft |
| Diameter | 18.0 in |
| Discharge | 18.78 cfs |

| Results | |
|---|---|
| Normal Depth | 11.4 in |
| Flow Area | 1.2 $ft^2$ |
| Wetted Perimeter | 2.8 ft |
| Hydraulic Radius | 5.1 in |
| Top Width | 1.45 ft |
| Critical Depth | 17.5 in |
| Percent Full | 63.1 % |
| Critical Slope | 0.028 ft/ft |
| Velocity | 15.98 ft/s |
| Velocity Head | 3.97 ft |
| Specific Energy | 4.91 ft |
| Froude Number | 3.126 |
| Maximum Discharge | 27.86 cfs |
| Discharge Full | 25.90 cfs |
| Slope Full | 0.032 ft/ft |
| Flow Type | Supercritical |

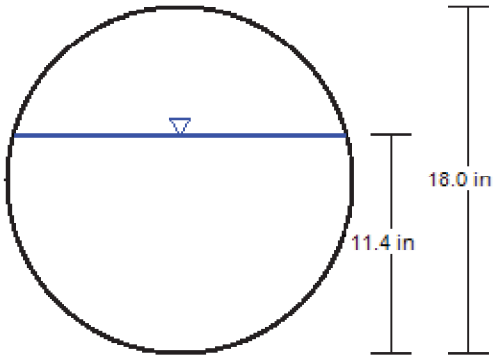
| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 63.1 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 11.4 in |
| Critical Depth | 17.5 in |
| Channel Slope | 0.061 ft/ft |
| Critical Slope | 0.028 ft/ft |

# Cross Section for Discharge 6 - 18" RCP

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.013 |
| Channel Slope | 0.061 ft/ft |
| Normal Depth | 11.4 in |
| Diameter | 18.0 in |
| Discharge | 18.78 cfs |




V: 1
H: 1

# APPENDIX E

## LOW-IMPACT DEVELOPMENT CALCULATIONS AND WORKSHEETS PER TGM
## MAP 3: LID MAP EXHIBIT




Notes

Revision | By | Appd | YYYY.MM.DD

Issued | By | Appd | YYYY.MM.DD

Permit/Seal

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Consultant

Stantec

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Client/Project Logo

Client/Project

AMERICAN JEWISH UNIVERSITY-
BRANDEIS-BARDIN CAMPUS

CAMP ALONIM
MODIFICATION TO C.U.P. 1776

1101 PEPPERTREE LANE, BRANDEIS, CA 93064

File Name: 414000C-EX700 | Dwn. | Dsgn. | Chkd. | 07/09/2022 YYYY.MM.DD

Title

EXISTING CONDITION
LID MAP

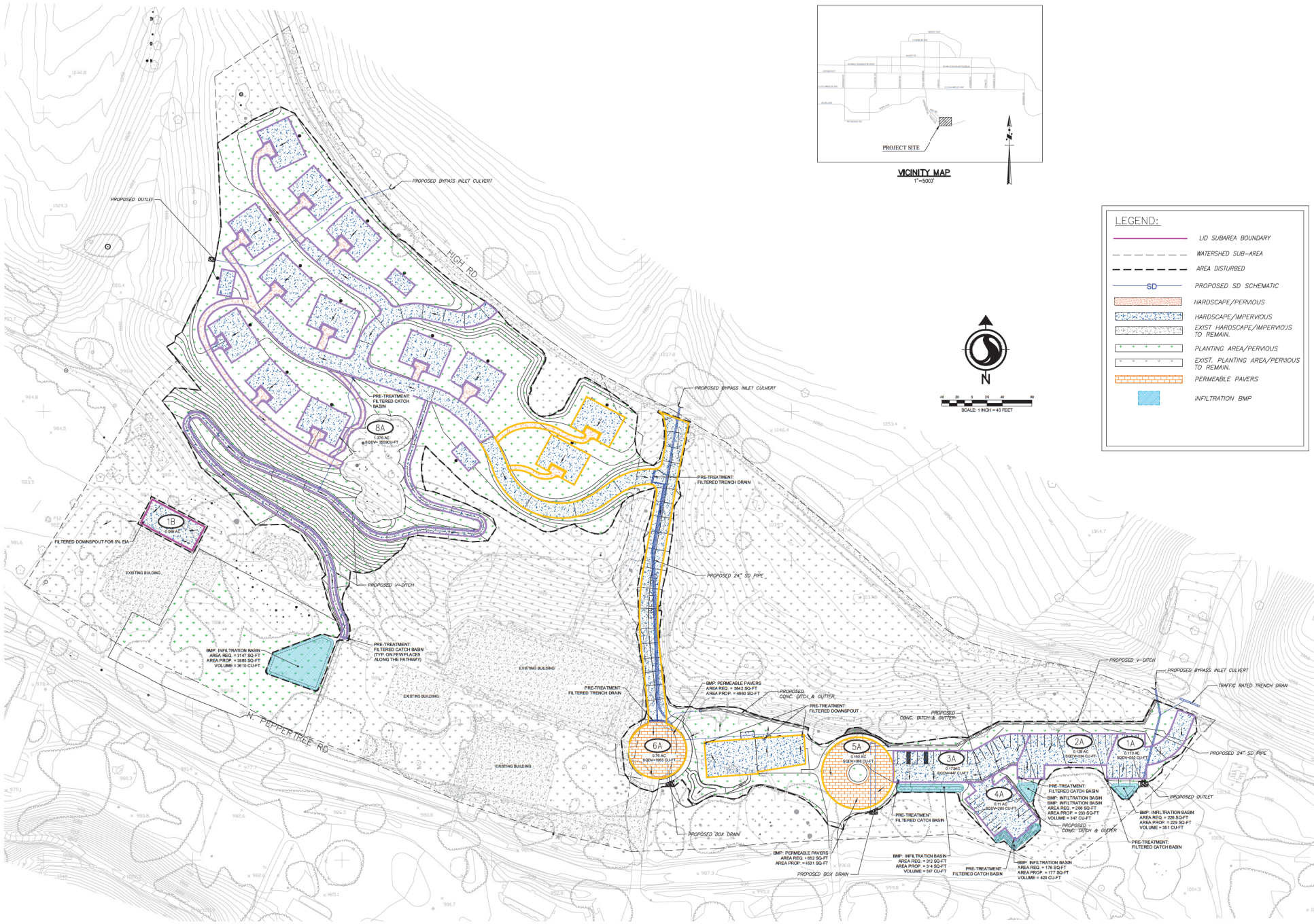
Project No. 000000000

Scale

Revision | Sheet | Drawing No.

of 1

Original Size: 1 inch = 40 feet




Notes

Revision | By | Appd | YYYY.MM.DD

Issued | By | Appd | YYYY.MM.DD

Permit/Seal

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Consultant

Stantec

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Pasadena CA 91101-4169
Tel (626) 796-9141
www.stantec.com

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Client/Project

AMERICAN JEWISH UNIVERSITY-
BRANDEIS-BARDIN CAMPUS

CAMP ALONIM
MODIFICATION TO C.U.P. 1776

1101 PEPPERTREE LANE, BRANDEIS, CA 93064

File Name: 61400C-EX751 | Dwn. | Dsgn. | Chkd. | YYYY.MM.DD | 2023.06.20

Title

PROPOSED CONDITION
LID MAP

Project No. 000000000 | Scale

Revision | Sheet of 1 | Drawing No.

# LID SUMMARY

| Area Name | Area (AC) | Req. SQDV. (cu-ft) | RWHDV (ac-ft) | Req. Daily Demand. (Gallons) | Proposed BMP | Proposed Pretreatment | Area Req. (sq-ft) | Area Prop. (sq-ft) | Basin Volume (cubic-feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1A | 0.113 | 292 | - | - | Infiltration Basin | Filtered catch basin | 226 | 229 | 351 |
| 2A | 0.129 | 334 | - | - | Infiltration Basin | Filtered catch basin | 206 | 233 | 347 |
| 3A | 0.173 | 447 | - | - | Infiltration Basin | Filtered catch basin | 312 | 314 | 587 |
| 4A | 0.110 | 285 | - | - | Infiltration Basin | Filtered catch basin | 176 | 177 | 420 |
| 5A | 0.150 | 388 | - | - | Permeable Pavers | - | 652 | 6531 | - |
| 6A | 0.76 | 1966 | - | - | Permeable Pavers | Filtered downspout & Filtered trench drain | 3842 | 4660 | - |
| 8A | 1.376 | 3559 | - | - | Infiltration Basin | Filtered catch basin | 3147 | 3985 | 3610 |
| 1B | 0.069 | - | - | - | EIA allowable 5% to sheet flow | Filtered downspout | - | - | - |

**Sizing Worksheet**

| | |
|---|---|
| Designer: N r C<br>Project Proponent: S r A<br>Date: 06/14/2023<br>Project: A A<br>Location: | |
| Type of Vegetation: (Check type used or describe "Other") | ____ Native Grasses<br>____ Irrigated Turf Grass<br>____ Other |
| Outflow Collection: | |
| **Step 1: Determine water quality design volume** | |
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ = 0.113 acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ = 0 % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowable}$ = 0 acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= 0.113 acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = 0.113 acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = 0 |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |

| | | |
|---|---|---|
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = | ft |
| 1-11. Calculate water quality design volume ($ft^3$), $SQDV=43560\times C^*P^*A_{retain}$ | SQDV= 292 | $ft^3$ |
| | | |
| **Step 2: Determine the design percolation rate** | | |
| 2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$ | $P_{measured}$ = | in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-1) | $S_A$ = | |
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-1) | $S_b$ = | |
| 2-4. Calculate combined safety factor, $S = S_A$ x $S_b$ | S = | |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = | in/hr |
| | | |
| **Step 3: Calculate the surface area** | | |
| 3-1. Enter required drain time(hours,72 hrs max.), $t$ | t = | hrs |
| 3-2. Calculate max. depth of runoff that can be infiltrated within the $t$ (ft), $d_{max} = P_{design}\ t/12$ | $d_{max}$ = | ft |
| 3-3. For basins, select ponding depth (ft), $d_p$, such that $d_p \le d_{max}$ | $d_p$ = | ft |
| 3-4. For trenches, enter trench fill aggregate porosity, $n_t$ | $n_t$ = | |
| 3-5. For trenches, enter depth of trench fill (ft), $d_t$ | $d_t$ = | ft |
| 3-5. For trenches, select ponding depth $d_p$ such that $d_p \le d_{max} - n_t d_t$ | $d_p$= | ft |
| 3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), $T$ | T = | hrs |

| | |
|---|---|
| 3-7. Calculate infiltrating surface area for infiltration basin ($ft^2$): $A_b = SQDV/((T\ P_{design}\ /12)+d_p)$ OR<br><br>Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells ($ft^2$):<br><br>$A_t = SQDV/((T\ P_{design}\ /12)+n_t d_t+dp)$ | $A_b$ = 226.36 sq-ft<br><br>$A_t$ = $ft^2$<br><br>Area provided = 229 sq-ft<br>Volume provided = 351 cu-ft |
| | |
| **Step 4: Size the forebay (infiltration basins or trenches)** | |
| If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4. | |
| 4-1. Calculate the volume of the forebay ($ft^3$), $V_{forebay}$=0.25*SQDV | $V_{forebay}$= $ft^3$ |
| 4-2. Determine forebay depth (ft), $d_{forebay}$ | $d_{forebay}$= ft |
| 4-3. Calculate forebay bottom surface area ($ft^2$), $A_{forebay}=V_{forebay}/d_{forebay}$ | $A_{forebay}$= $ft^2$ |
| 4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes. | |
| | |
| **Step 5: Provide conveyance capacity for filter clogging** | |
| 5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction. | |

**Sizing Worksheet**

| | |
|---|---|
| Designer: N r C<br>Project Proponent: S r A<br>Date: 06/14/2023<br>Project: A A<br>Location: | |
| Type of Vegetation: (Check type used or describe "Other") | ____ Native Grasses<br>____ Irrigated Turf Grass<br>____ Other |
| Outflow Collection: | |
| **Step 1: Determine water quality design volume** | |
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ = 0.129 acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ = 0 % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowable}$ = 0 acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = 0.129 acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = 0 |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |

| | |
|---|---|
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = ft |
| 1-11. Calculate water quality design volume ($ft^3$), $SQDV=43560\times C^*P^*A_{retain}$ | SQDV= 334 $ft^3$ |
| | |
| **Step 2: Determine the design percolation rate** | |
| 2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$ | $P_{measured}$ = in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-1) | $S_A$ = |
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-1) | $S_b$ = |
| 2-4. Calculate combined safety factor, $S = S_A \times S_b$ | S = |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = in/hr |
| | |
| **Step 3: Calculate the surface area** | |
| 3-1. Enter required drain time(hours,72 hrs max.), $t$ | t = hrs |
| 3-2. Calculate max. depth of runoff that can be infiltrated within the $t$ (ft), $d_{max} = P_{design}\ t/12$ | $d_{max}$ = ft |
| 3-3. For basins, select ponding depth (ft), $d_p$, such that $d_p \le d_{max}$ | $d_p$ = ft |
| 3-4. For trenches, enter trench fill aggregate porosity, $n_t$ | $n_t$ = |
| 3-5. For trenches, enter depth of trench fill (ft), $d_t$ | $d_t$ = ft |
| 3-5. For trenches, select ponding depth $d_p$ such that $d_p \le d_{max} - n_t d_t$ | $d_p$= ft |
| 3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), $T$ | T = hrs |

| | |
|---|---|
| 3-7. Calculate infiltrating surface area for infiltration basin ($ft^2$): $A_b = SQDV/((T\ P_{design}\ /12)+d_p)$ OR<br><br>Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells ($ft^2$):<br><br>$A_t = SQDV/((T\ P_{design}\ /12)+n_t d_t+dp)$ | $A_b$ = 205.6 sq-ft<br><br>$A_t$ = $ft^2$<br><br>Area provided = 233 sq-ft<br>Volume provided = 346.6 cu-ft |
| | |
| **Step 4: Size the forebay (infiltration basins or trenches)** | |
| If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4. | |
| 4-1. Calculate the volume of the forebay ($ft^3$), $V_{forebay}$=0.25*SQDV | $V_{forebay}$= $ft^3$ |
| 4-2. Determine forebay depth (ft), $d_{forebay}$ | $d_{forebay}$= ft |
| 4-3. Calculate forebay bottom surface area ($ft^2$), $A_{forebay}=V_{forebay}/d_{forebay}$ | $A_{forebay}$= $ft^2$ |
| 4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes. | |
| | |
| **Step 5: Provide conveyance capacity for filter clogging** | |
| 5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction. | |

**Sizing Worksheet**

| | |
|---|---|
| Designer: N r C<br>Project Proponent: S r A<br>Date: 06/14/2023<br>Project: A A<br>Location: | |
| Type of Vegetation: (Check type used or describe "Other") | ____ Native Grasses<br>____ Irrigated Turf Grass<br>____ Other |
| Outflow Collection: | |
| **Step 1: Determine water quality design volume** | |
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ = 0.173 acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ = 0 % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowable}$ = 0 acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = 0.173 acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = 0 |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |

| | |
|---|---|
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = ft |
| 1-11. Calculate water quality design volume ($ft^3$), $SQDV=43560\times C^*P^*A_{retain}$ | SQDV= 447 $ft^3$ |
| | |
| **Step 2: Determine the design percolation rate** | |
| 2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$ | $P_{measured}$ = in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-1) | $S_A$ = |
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-1) | $S_b$ = |
| 2-4. Calculate combined safety factor, $S = S_A \times S_b$ | S = |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = in/hr |
| | |
| **Step 3: Calculate the surface area** | |
| 3-1. Enter required drain time(hours,72 hrs max.), $t$ | t = hrs |
| 3-2. Calculate max. depth of runoff that can be infiltrated within the $t$ (ft), $d_{max} = P_{design}\ t/12$ | $d_{max}$ = ft |
| 3-3. For basins, select ponding depth (ft), $d_p$, such that $d_p \le d_{max}$ | $d_p$ = ft |
| 3-4. For trenches, enter trench fill aggregate porosity, $n_t$ | $n_t$ = |
| 3-5. For trenches, enter depth of trench fill (ft), $d_t$ | $d_t$ = ft |
| 3-5. For trenches, select ponding depth $d_p$ such that $d_p \le d_{max} - n_t d_t$ | $d_p$= ft |
| 3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), $T$ | T = hrs |

| | |
|---|---|
| 3-7. Calculate infiltrating surface area for infiltration basin ($ft^2$): $A_b = SQDV/((T\ P_{design}\ /12)+d_p)$ OR<br><br>Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells ($ft^2$):<br><br>$A_t = SQDV/((T\ P_{design}\ /12)+n_t d_t+dp)$ | $A_b$ = 312 sq-ft<br><br>$A_t$ = $ft^2$<br><br>Area provided = 314 sq-ft<br>Volume provided = 587 cu-ft |
| | |
| **Step 4: Size the forebay (infiltration basins or trenches)** | |
| If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4. | |
| 4-1. Calculate the volume of the forebay ($ft^3$), $V_{forebay}$=0.25*SQDV | $V_{forebay}$= $ft^3$ |
| 4-2. Determine forebay depth (ft), $d_{forebay}$ | $d_{forebay}$= ft |
| 4-3. Calculate forebay bottom surface area ($ft^2$), $A_{forebay}=V_{forebay}/d_{forebay}$ | $A_{forebay}$= $ft^2$ |
| 4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes. | |
| | |
| **Step 5: Provide conveyance capacity for filter clogging** | |
| 5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction. | |

**Sizing Worksheet**

| | |
|---|---|
| Designer: N r C<br>Project Proponent: S r A<br>Date: 06/14/2023<br>Project: A A<br>Location: | |
| Type of Vegetation: (Check type used or describe "Other") | ____ Native Grasses<br>____ Irrigated Turf Grass<br>____ Other |
| Outflow Collection: | |
| **Step 1: Determine water quality design volume** | |
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ = 0.110 acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ = 0 % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowable}$ = 0 acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= 0.110 acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = 0.110 acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = 0 |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |

| | |
|---|---|
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = ft |
| 1-11. Calculate water quality design volume ($ft^3$), $SQDV=43560\times C^*P^*A_{retain}$ | SQDV= 285 $ft^3$ |
| | |
| **Step 2: Determine the design percolation rate** | |
| 2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$ | $P_{measured}$ = in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-1) | $S_A$ = |
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-1) | $S_b$ = |
| 2-4. Calculate combined safety factor, $S = S_A \times S_b$ | S = |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = in/hr |
| | |
| **Step 3: Calculate the surface area** | |
| 3-1. Enter required drain time(hours,72 hrs max.), $t$ | t = hrs |
| 3-2. Calculate max. depth of runoff that can be infiltrated within the $t$ (ft), $d_{max} = P_{design}\ t/12$ | $d_{max}$ = ft |
| 3-3. For basins, select ponding depth (ft), $d_p$, such that $d_p \le d_{max}$ | $d_p$ = ft |
| 3-4. For trenches, enter trench fill aggregate porosity, $n_t$ | $n_t$ = |
| 3-5. For trenches, enter depth of trench fill (ft), $d_t$ | $d_t$ = ft |
| 3-5. For trenches, select ponding depth $d_p$ such that $d_p \le d_{max} - n_t d_t$ | $d_p$= ft |
| 3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), $T$ | T = hrs |

| | |
|---|---|
| 3-7. Calculate infiltrating surface area for infiltration basin (ft²): $A_b = SQDV/((T\ P_{design}\ /12)+d_p)$ OR<br><br>Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells (ft²):<br><br>$A_t = SQDV/((T\ P_{design}\ /12)+n_t d_t+dp)$ | $A_b$ = 176 sq-ft<br><br>$A_t$ = ft²<br><br>Area provided = 177 sq-ft<br>Volume provided = 420 cu-ft |
| | |
| **Step 4: Size the forebay (infiltration basins or trenches)** | |
| If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4. | |
| 4-1. Calculate the volume of the forebay (ft³), $V_{forebay}$=0.25*SQDV | $V_{forebay}$= ft³ |
| 4-2. Determine forebay depth (ft), $d_{forebay}$ | $d_{forebay}$= ft |
| 4-3. Calculate forebay bottom surface area (ft²), $A_{forebay}=V_{forebay}/d_{forebay}$ | $A_{forebay}$= ft² |
| 4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes. | |
| | |
| **Step 5: Provide conveyance capacity for filter clogging** | |
| 5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction. | |

## Sizing Worksheet

| **Step 1: Determine water quality design volume** | |
|---|---|
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ = acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowable}$= acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = ft |
| 1-11. Calculate water quality design volume ($ft^3$),<br>$SQDV=43560\times C*P*A_{retain}$ | SQDV= $ft^3$ |
| | |
| **Step 2: Determine the design percolation rate** | |
| 2-1. Enter measured soil percolation rate (0.5 in/hr minimum), $P_{measured}$ | $P_{measured}$ = in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-5) | $S_A$ = |

| **Step 2: Determine the design percolation rate** | |
|---|---|
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-5) | $S_B$ = |
| 2-4. Calculate combined safety factor, $S = S_A \times S_b$ | S = |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = in/hr |
| | |
| **Step 3: Determine the Gravel Drainage Layer Depth** | |
| 3-1. Enter drawdown time (hours, 72 hrs max.), $t$ | t = hours |
| 3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t, $d_{max}=P_{design}t/12$ | $d_{max}$ = ft |
| 3-3. Enter the gravel drainage layer porosity, $n$ (typically 32% or 0.32 for gravel) | n = |
| 3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$ | l = ft |
| | |
| **Step 4: Determine infiltrating surface area** | |
| 4-1. Enter gravel drainage layer porosity, $n$ | n = |
| 4-2. Enter depth of gravel drainage layer (ft), $l$ | l = ft |
| 4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), $T$ | T = hrs |
| 4-4. Calculate infiltrating surface area ($ft^3$): $A=SQDV/((TP_{design}/12)+nl)$ | A = $ft^2$ |
| | d |
| **Step 5: Provide conveyance capacity for clogging** | |
| 5-1. The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged. | |

## Sizing Worksheet

| **Step 1: Determine water quality design volume** | |
|---|---|
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ = 0.76 acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ 0 % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowable}$= 0 acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= 0.76 acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = 0.76 acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = 0 |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = ft |
| 1-11. Calculate water quality design volume ($ft^3$),<br>$SQDV=43560\times C*P*A_{retain}$ | SQDV= 1965.6 cu-ft |
| | |
| **Step 2: Determine the design percolation rate** | |
| 2-1. Enter measured soil percolation rate (0.5 in/hr minimum), $P_{measured}$ | $P_{measured}$ = in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-5) | $S_A$ = |

| **Step 2: Determine the design percolation rate** | |
|---|---|
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-5) | $S_B$ = |
| 2-4. Calculate combined safety factor, $S = S_A \times S_b$ | S = |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = in/hr |
| | |
| **Step 3: Determine the Gravel Drainage Layer Depth** | |
| 3-1. Enter drawdown time (hours, 72 hrs max.), $t$ | t = hours |
| 3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t, $d_{max}=P_{design}t/12$ | $d_{max}$ = ft |
| 3-3. Enter the gravel drainage layer porosity, $n$ (typically 32% or 0.32 for gravel) | n = |
| 3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$ | l = ft |
| | |
| **Step 4: Determine infiltrating surface area** | |
| 4-1. Enter gravel drainage layer porosity, $n$ | n = |
| 4-2. Enter depth of gravel drainage layer (ft), $l$ | l = ft |
| 4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), $T$ | T = hrs |
| 4-4. Calculate infiltrating surface area ($ft^3$): $A=SQDV/((TP_{design}/12)+nl)$ | A = 3842.4 sq-ft |
| | |
| **Step 5: Provide conveyance capacity for clogging** | |
| 5-1. The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged. | |

**Sizing Worksheet**

| | |
|---|---|
| Designer: N r C<br>Project Proponent: S r A<br>Date: 06/14/2023<br>Project: A A<br>Location: | |
| Type of Vegetation: (Check type used or describe "Other") | ____ Native Grasses<br>____ Irrigated Turf Grass<br>____ Other |
| Outflow Collection: | |
| **Step 1: Determine water quality design volume** | |
| 1-1. Enter Project area (acres), $A_{project}$ | $A_{project}$ 1.376 acres |
| 1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$ | $\%_{allowable}$ = 0 % |
| 1-3. Determine the maximum allowable effective impervious area (acres),<br>$EIA_{allowable} = (A_{project})*(\%_{allowable})$ | $EIA_{allowabl}$ = 0 acres |
| 1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60) | Imp= |
| 1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$ | TIA= 1.376 acres |
| 1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$ | $A_{retain}$ = 1.376 acres |
| 1-7. Determine pervious runoff coefficient using Table E-1, $C_p$ | $C_p$ = Not Used |
| 1-8. Calculate runoff coefficient,<br>$C = 0.95*imp + C_p\ (1-imp)$ | C = |
| 1-9. Enter design rainfall depth of the storm (in), $P_i$ | $P_i$ = in |

| | |
|---|---|
| 1-10. Calculate rainfall depth (ft), $P = P_i/12$ | P = ft |
| 1-11. Calculate water quality design volume ($ft^3$), $SQDV=43560\times C^*P^*A_{retain}$ | SQDV =3559 $ft^3$ |
| | |
| **Step 2: Determine the design percolation rate** | |
| 2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$ | $P_{measured}$ = in/hr |
| 2-2. Determine percolation rate correction factor, $S_A$ based on suitability assessment (see Section 6 INF-1) | $S_A$ = |
| 2-3. Determine percolation rate correction factor, $S_B$ based on design (see Section 6 INF-1) | $S_b$ = |
| 2-4. Calculate combined safety factor, $S = S_A \times S_b$ | S = |
| 2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$ | $P_{design}$ = in/hr |
| | |
| **Step 3: Calculate the surface area** | |
| 3-1. Enter required drain time(hours,72 hrs max.), $t$ | t = hrs |
| 3-2. Calculate max. depth of runoff that can be infiltrated within the $t$ (ft), $d_{max} = P_{design}\ t/12$ | $d_{max}$ = ft |
| 3-3. For basins, select ponding depth (ft), $d_p$, such that $d_p \le d_{max}$ | $d_p$ = ft |
| 3-4. For trenches, enter trench fill aggregate porosity, $n_t$ | $n_t$ = |
| 3-5. For trenches, enter depth of trench fill (ft), $d_t$ | $d_t$ = ft |
| 3-5. For trenches, select ponding depth $d_p$ such that $d_p \le d_{max} - n_t d_t$ | $d_p$= ft |
| 3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), $T$ | T = hrs |

| | |
|---|---|
| 3-7. Calculate infiltrating surface area for infiltration basin ($ft^2$): $A_b = SQDV/((T\ P_{design}\ /12)+d_p)$ OR<br><br>Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells ($ft^2$):<br><br>$A_t = SQDV/((T\ P_{design}\ /12)+n_t d_t+dp)$ | $A_b$ = 3147.4 sq-ft<br><br>$A_t$ = $ft^2$<br><br>Area provided = 3985 sq-ft<br>Volume provided = 3610 cu-ft |
| | |
| **Step 4: Size the forebay (infiltration basins or trenches)** | |
| If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4. | |
| 4-1. Calculate the volume of the forebay ($ft^3$), $V_{forebay}$=0.25*SQDV | $V_{forebay}$= $ft^3$ |
| 4-2. Determine forebay depth (ft), $d_{forebay}$ | $d_{forebay}$= ft |
| 4-3. Calculate forebay bottom surface area ($ft^2$), $A_{forebay}=V_{forebay}/d_{forebay}$ | $A_{forebay}$= $ft^2$ |
| 4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes. | |
| | |
| **Step 5: Provide conveyance capacity for filter clogging** | |
| 5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction. | |

# APPENDIX F

## GEOTECHNICAL REPORT,
## INFILTRATION REPORT,
## ADDITIONAL INFILTRATION REPORT FOR GROUNDWATER
## JUSTIFICAION LETTER

**PRELIMINARY GEOLOGIC AND GEOTECHNICAL ENGINEERING INVESTIGATION,**
**PROPOSED CABINS,**
**BRANDEIS-BARDIN CAMPUS,**
Simi Valley, California

for

AMERICAN JEWISH UNIVERSITY
c/o Jon Friedman
Jemstreet Properties

May 10, 2021 W.O. 7588

MDN 22134

GeoSoils Consultants Inc.

GeoSoils Consultants Inc.
GEOTECHNICAL GEOLOGIC ENVIRONMENTAL

May 10, 2021
W.O. 7588

AMERICAN JEWISH UNIVERSITY
c/o Jon Friedman
Jemstreet Properties
1016 Stuart Circle
Thousand Oaks, California 91362

Attention: Mr. Adrian Breitfeld

**Subject: Preliminary Geologic and Geotechnical Engineering Investigation, Proposed Cabins, Brandeis-Bardin Campus, Simi Valley, California**

## INTRODUCION

As requested, GeoSoils Consultants, Inc. (GSC) has performed a preliminary geologic and geotechnical engineering investigation for the subject site. The purpose of this investigation was to evaluate the geologic and geotechnical engineering conditions on the site and their impact on the proposed development. Proposed development will consist of grading to create building areas for proposed cabin structures. A site development plan was not available at the time this report was prepared. Once a plan is available, it should be forwarded to this office and this report should be updated accordingly.

This report has been prepared in accordance with generally accepted geotechnical engineering practices in the City of Simi Valley at the time it was prepared. The report presents a brief description of the site, the geotechnical engineering characteristics of the area, the seismicity of the area, an engineering analysis of the site characteristics and preliminary recommendations to development the site.

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Opinions presented in this report are based on 1) an inspection of the site, 2) geologic mapping at the site, 3) logging of backhoe test pits at the site, 4) a review of the regional geologic maps and seismic hazard reports, and 5) our general knowledge of the geologic and soils engineering conditions in the site area. The opinions presented have been arrived at through the exercise of the generally understood standard of care for our profession and standard of engineering practice, as we understand it.

## SITE LOCATION AND DESCRIPTION

The subject site is located within the southeastern part of Simi Valley on the eastern flanks of Meier Canyon (Figure 1). Meier Canyon is a tributary to the Arroyo Simi drainage channel located north of the subject property. A topographic map of the site is included as Plate 1, Geologic Map. The area addressed in this report consists of the west sloping surface between Peppertree Lane and the main canyon bottom, as shown on Plate 1. This area consists of a broad surface elevated above the main canyon bottom to the west. Two tributary canyons pass through the site before entering Meier Canyon. One of the tributaries is located along the northern part of the subject site and one passes through the central part of the site. The two tributary canyons continue to ascend to the east and above the subject property. The slope gradients range from flatter than 10:1 on the elevated surfaces to 2:1 along the sides of the central tributary channel.

Previous grading was performed on the site and fill was placed on the elevated surfaces at the approximate locations shown on Plate 1. In addition, it appears that the steeper slopes along the western part of the site were cut to create a wider valley floor. The gradient of these slopes is locally steeper than 2:1.

## PROPOSED DEVELOPMENT

A proposed development plan is not currently available. It is our understanding that site grading is being considered to create level building pads for construction of multiple cabin structures.




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SITE LOCATION MAP
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FIGURE 1

## SCOPE OF SERVICES

The following scope of services has been performed on the subject site by GSC:

1. Site reconnaissance and field mapping.
2. Review of regional geologic maps and seismic hazard zone maps.
3. Excavating, logging, and sampling of 11 backhoe test pits. The approximate locations of the test pits are shown on Plate 1, Geologic Map, and test pit logs are included in Appendix A.
4. Laboratory testing on samples retrieved from the test pits. The results of the testing will be included in a future report once a site development plan is available.
5. Preparation of a geologic map (Plate 1).
6. Preparation of this report.

## GEOLGIC CONDITIONS

### Regional Geologic Setting

The subject property is located within the Transverse Ranges Geomorphic province of California. The Transverse Ranges consist of generally east-west trending mountains and valleys, which are in contrast to the north-northwest regional trend elsewhere in the state.

The structure of the Transverse Ranges is controlled by the effects of north-south compressive deformation (crustal shortening), which is attributed to convergence between the big bend of the San Andreas Fault north of the San Gabriel Mountains and the motion of the Pacific Plate. The valleys and mountains of the Transverse Ranges are typically bounded by a series of east west trending, generally north dipping reverse faults with left-lateral oblique movement.

The Transverse Ranges are characterized by a very thick, nearly continuous sequence of Upper Cretaceous through Quaternary sedimentary rocks that has been deformed into a series of east-west trending folds associated with thrust and reverse faults. This

deformation has created intrabasin highlands and intervening lowlands. The closest active fault to the site is the Simi Fault, located approximately 2.9 miles north of the area of proposed development. A Regional Geologic Map is included as Figure 2.

## Local Geologic Setting

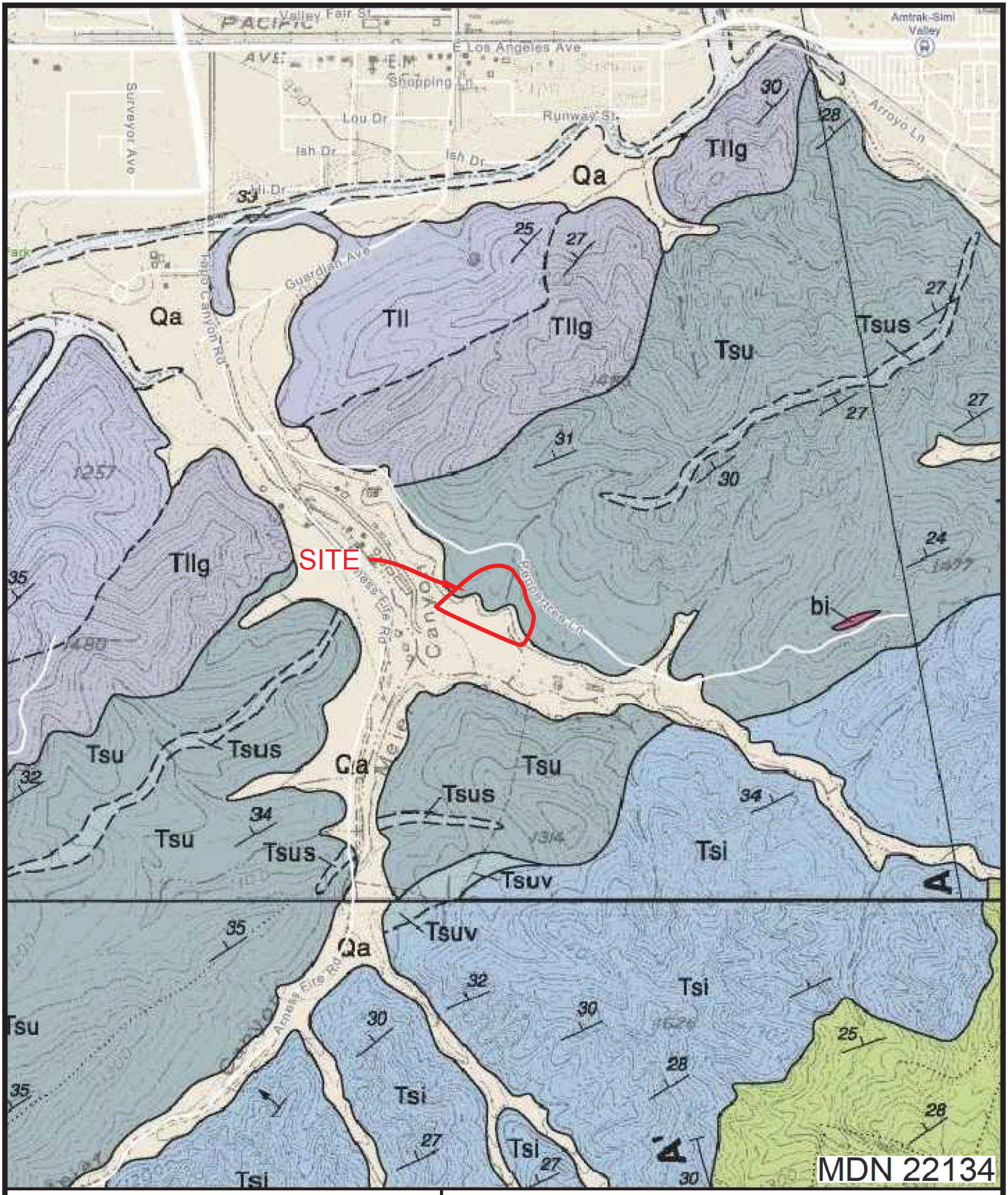
Simi Valley has accumulated over 500 feet of alluvial sediments derived from erosion of the surrounding hills and mountains. Younger alluvium is present on the valley floor as well as in the canyons that drain into the valley. Older alluvium is exposed along the margins of the valley and in the hills near the Oak Park and Canada de la Brea oil fields. Higher elevations are underlain predominantly by bedrock of the Tertiary-Age Santa Susana, Llajas, and Sespe Formations. Conejo volcanics are exposed in portions of the western Simi Valley, whereas the eastern end of the valley is dominated by the Cretaceous-Age Chatsworth formation. The subject site is underlain by terrace deposits and previously placed fill.

## Earth Units

Artificial fill and terrace deposits underlie the property. A brief description of the earth materials are as follows:

Artificial Fill (af): The artificial fill consisted of yellowish brown, silty, fine to coarse sand with gravel and some cobbles. The fill is loose to medium dense and dry to slightly moist. The fill is up to 11 feet thick is the central part of the site (Plate 1). The artificial fill is uncertified and unsuitable for structural support; therefore, it should be removed and recompacted in areas of proposed grading.

Terrace Deposits (Qt): The terrace deposits consisted of reddish brown, silty/clayey, fine to coarse sands with gravel and cobbles, and is dense to very dense and slightly moist to moist. These deposits were derived from runoff of the adjacent Simi Hills and were deposited on the valley floor. The test pits excavated at the southwestern part of the site encountered abundant cobbles and boulders and were difficult to excavate with a backhoe.

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REGIONAL GEOLOGIC MAP
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FIGURE 2

## Surface and Subsurface Water Conditions

Surface water on the site is limited to precipitation falling directly on the site and from the two tributary canyons that extend offsite to the east. Springs or seeps were not observed on the site.

Groundwater was not encountered any of test pits excavated on the site. However, groundwater may be close to the surface in the main canyon bottom to the west of the area addressed herein.

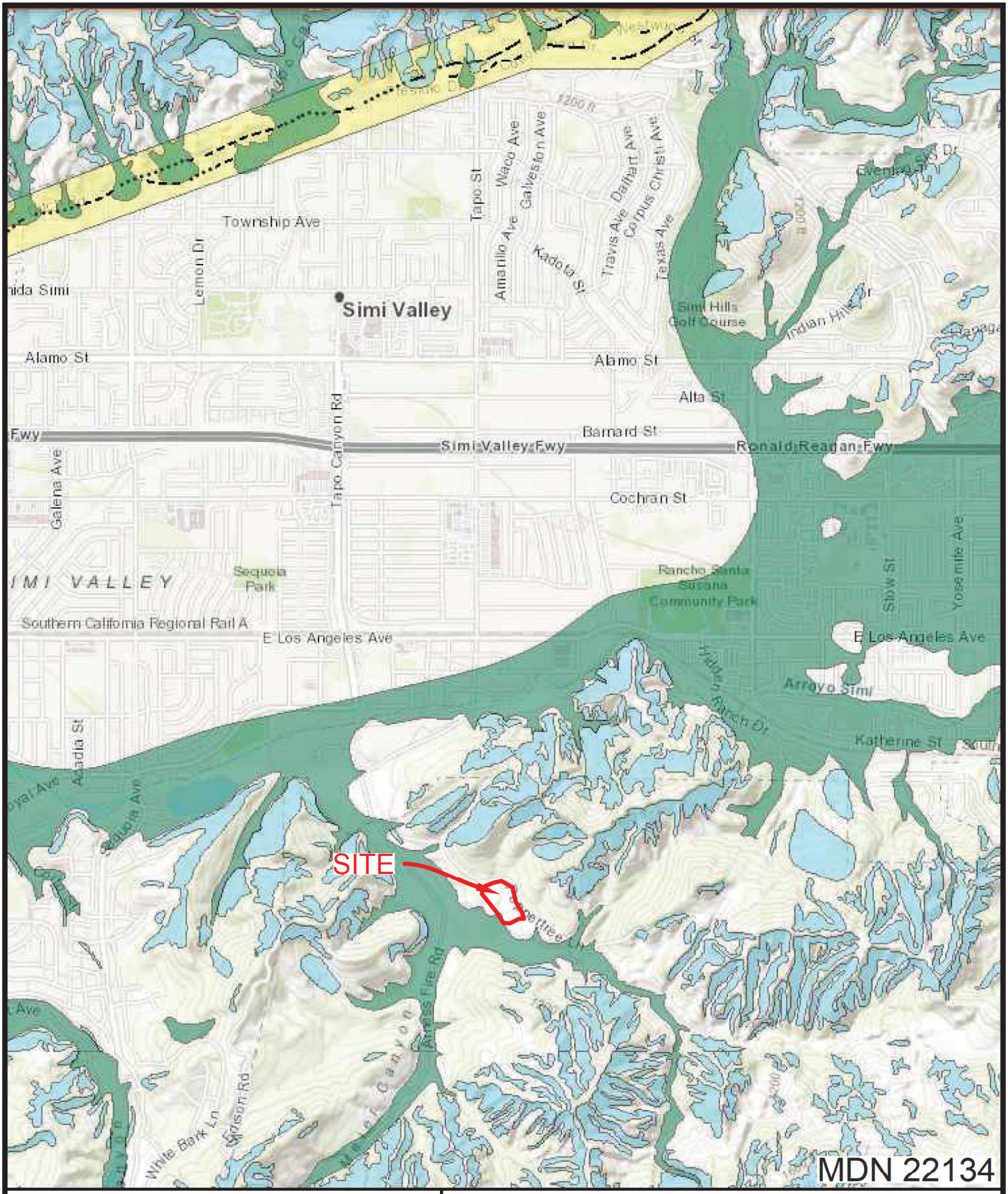
## FAULTING AND SEISMICITY

The proposed site is not within an Alquist-Priolo Earthquake Fault Zone and is not located within a Seismic Hazard Zone (Figure 3). There are faults in close enough proximity to the site to cause moderate to intense ground shaking during the lifetime of the proposed development.

## Ground Shaking and Seismic Design Criteria

This site has experienced earthquake-induced ground shaking in the past and can be expected to experience further shaking in the future. The 2019 CBC (California Building Code) seismic coefficient criteria are provided here for structural design consideration as a mitigation for ground shaking.

Under the Earthquake Design Regulations of Chapter 16, Section 1613 of the CBC 2019, and based on the mapped values, the following coefficients and factors apply to the lateral-force design for the proposed structures at the site. Terrace deposits are at depth and Class D is recommended.

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SEISMIC HAZARD ZONE MAP
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FIGURE 3

| 2019 CBC Section 1613, Earthquake Loads | |
|---|---|
| Site Class Definition | D |
| Mapped Spectral Response Acceleration Parameter, $S_s$ (Table 1613.3.1 for 0.2 second) | 1.652 |
| Mapped Spectral Response Acceleration Parameter, $S_1$ (Table 1613.3.1 for 1.0 second) | 0.6 |
| Site Coefficient, $F_a$ (Table 1613.3.3(1) short period) | 1.2 |
| Site Coefficient, $F_v$ (Table 1613.3.3(2) 1-second period) | 1.7 |
| Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter | 1.983 |
| Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter | 1.020 |
| Design Spectral Response Acceleration Parameter, $S_{DS}$ (Eq. 16-39) | 1.322 |
| Design Spectral Response Acceleration Parameter, $S_{D1}$ (Eq. 16-40) | 0.68 |
| Notes: Location: Longitude: 34.2581, Latitude: -118.7099<br>1. Site Class Designation: Class D is recommended based on subsurface condition.<br>2. Ss, SMs, and SDs are spectral response accelerations for the period of 0.2 second.<br>3. S1, SM1, and SD1 are spectral response accelerations for the period of 1.0 second.<br>4. These values may only be utilized where the value of the seismic response coefficient, Cs, satisfies equations 12.8.3 or 12.8.4 of the ASCE Standard 7-16. | |

Conformance to the above criteria for seismic excitation does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive. Following a major earthquake, a building may be damaged beyond repair, yet not collapse.

## Ground Rupture

Ground rupture occurs when movement on a fault breaks through to the surface. Surface rupture usually occurs along pre-existing fault traces where zones of weakness already exist. The State has established Earthquake Fault Zones for the purpose of mitigating the hazard of fault rupture by prohibiting the location of most human occupancy structures across the traces of active faults. Earthquake fault zones are regulatory zones that encompass surface traces of active faults with a potential for future surface fault rupture.

The California Geologic Survey (CGS) establishes criteria for faults as active, potentially active or inactive. Active faults are those that show evidence of surface displacement within the last 11,000 years (Holocene age). Potentially active faults are those that demonstrate displacement within the past 1.6 million years (Quaternary Age). Faults showing no evidence of displacement within the last 1.6 million years may be considered inactive for most structures, except for critical or certain life structures.

In 1972, the Alquist-Priolo Special Studies Zone Act (now known as the Alquist-Priolo Earthquake Fault Zone Act, 1994, or APEHA) was passed into law, requiring studies within 500 feet of mapped faults within a mapped Alquist-Priolo fault zone. Surface rupture caused by movement along a fault could likely result in catastrophic structural damage to buildings constructed along the fault trace.

Consequently, the State of California via the APEHA prohibits the construction of occupied "habitable" structures within the designated fault zone and it must be demonstrated that the structure does not encroach on a 50-foot setback from the fault trace. Per the Alquist-Priolo legislation, no structure for human occupancy is permitted on the trace of an active fault.

The term "structure for human occupancy" is defined as any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year. Unless proven otherwise, an area within 50 feet of an active fault is presumed to be underlain by active branches of the fault. Local government agencies may identify additional faults, in addition to those faults mandated by the State, for which minimum construction setback requirements must be maintained.

The site is not located within an established Earthquake Fault Zone (Figure 3). The Simi Fault is mapped approximately 2.9 miles to the north of the site. The Simi Fault is a left-oblique reverse fault within the Simi-Santa Rosa fault zone, a series of north-dipping faults that trend southwest from the northeastern end of Simi Valley to the Oxnard plain. The available stratigraphic and age data at the site provide a broadly constrained estimate of Holocene slip rate of about 1 mm/yr. The fault is considered active and is located within an Alquist-Priolo Earthquake Fault Zone.

The site is not located within a Fault Hazard Zone and there are no known active faults on the site; therefore, the potential for ground rupture on the site is considered low.

## Landsliding

Earthquake-induced landsliding often occurs in areas where previous landslides have moved and in areas where the topographic, geologic, geotechnical, and subsurface groundwater conditions are conducive to permanent ground displacements.

The site does not contain slopes susceptible to landsliding and is not located within a seismic hazard zone; therefore, the potential for earthquake-induced landsliding is considered low. However, the slope areas to the east of the site are located within landslide hazard zones. These slopes are not considered to represent a landslide hazard to the site. However, drainage from the slope areas should be evaluated by the Project Civil Engineer and appropriate drainage devices should be used to prevent runoff from impacting the proposed development.

## Seiches and Tsunamis

A seiche is the resonant oscillation of a body of water, typically a lake or swimming pool caused by earthquake shaking (waves). The hazard exists where water can be splashed out of the body of water and impact nearby structures. No bodies of constant water are near the site, therefore, the hazards associated with seiches are considered low.

Tsunamis are seismic sea waves generated by undersea earthquakes or landslides. When the ocean floor is offset or tilted during an earthquake, a set of waves are generated similar to the concentric waves caused by an object dropped in water. Tsunamis can have wavelengths of up to 120 miles and travel as fast as 500 miles per hour across hundreds of miles of deep ocean. Upon reaching shallow coastal waters, the once two-foot high wave can become up to 50 feet in height causing great devastation to structures within reach. Tsunamis can generate seiches as well. The site is not near the ocean; therefore, the tsunami hazard is considered very low.

## Liquefaction

Liquefaction describes a phenomenon where cyclic stresses, which are produced by earthquake-induced ground motion creates excess pore pressures in cohesionless soils. These soils may thereby acquire a high degree of mobility, which can lead to lateral sliding, consolidation and settlement of loose sediments, sand boils, and other damaging deformation. This phenomenon occurs only below the water table, but after liquefaction has developed, it can propagate upward into overlying, non-saturated soils as excess pore water escapes.

Liquefaction susceptibility is related to numerous factors and the following conditions must exist for liquefaction to occur: 1) sediments must be relatively young in age and must not have developed large amounts of cementation, 2) sediments must consist mainly of cohesionless sands and silts, 3) the sediments must not have a high relative density, 4) free groundwater must exist in the sediment, and 5) the site must be exposed to seismic events of a magnitude large enough to induce straining of soil particles.

This area addressed in this report is outside of the designated area of liquefaction potential presented on the State of California Seismic Hazard Zone map (Figure 3) and is underlain by terrace deposits. Therefore, liquefaction is not considered a potential hazard on this site. However, the main canyon bottom to the west of the subject site is located within a zone of potential liquefaction.

## Seismic Settlement

The site is underlain by dense terrace deposits that are not subject to seismically induced settlement provided that the grading recommendations presented below are followed.

# CONCLUSIONS AND RECOMMENDATIONS

The proposed development is feasible from a geologic and geotechnical engineering perspective, provided the recommendations contained herein are incorporated into the final design and construction phase of the proposed site improvements. The recommendations

provided in this report are applicable for improvements on the site provided positive drainage is maintained away from the structures. As in most of Southern California, the site lies within a seismically-active area, therefore earthquake resistant structural design is recommended.

## Removals

The existing fill on the site is not suitable for support of structures or structural fill. In order to reduce the impacts from settlement on the proposed structures, the fill should be removed and replaced as compacted fill below proposed structures. The limits of removals shall extend laterally beyond the footprint of proposed structures to a distance of at least five feet or equal to the depth of removals, whichever is deeper. The upper two to three feet of terrace deposits should be removed and recompacted in areas of proposed fill placement of new structures.

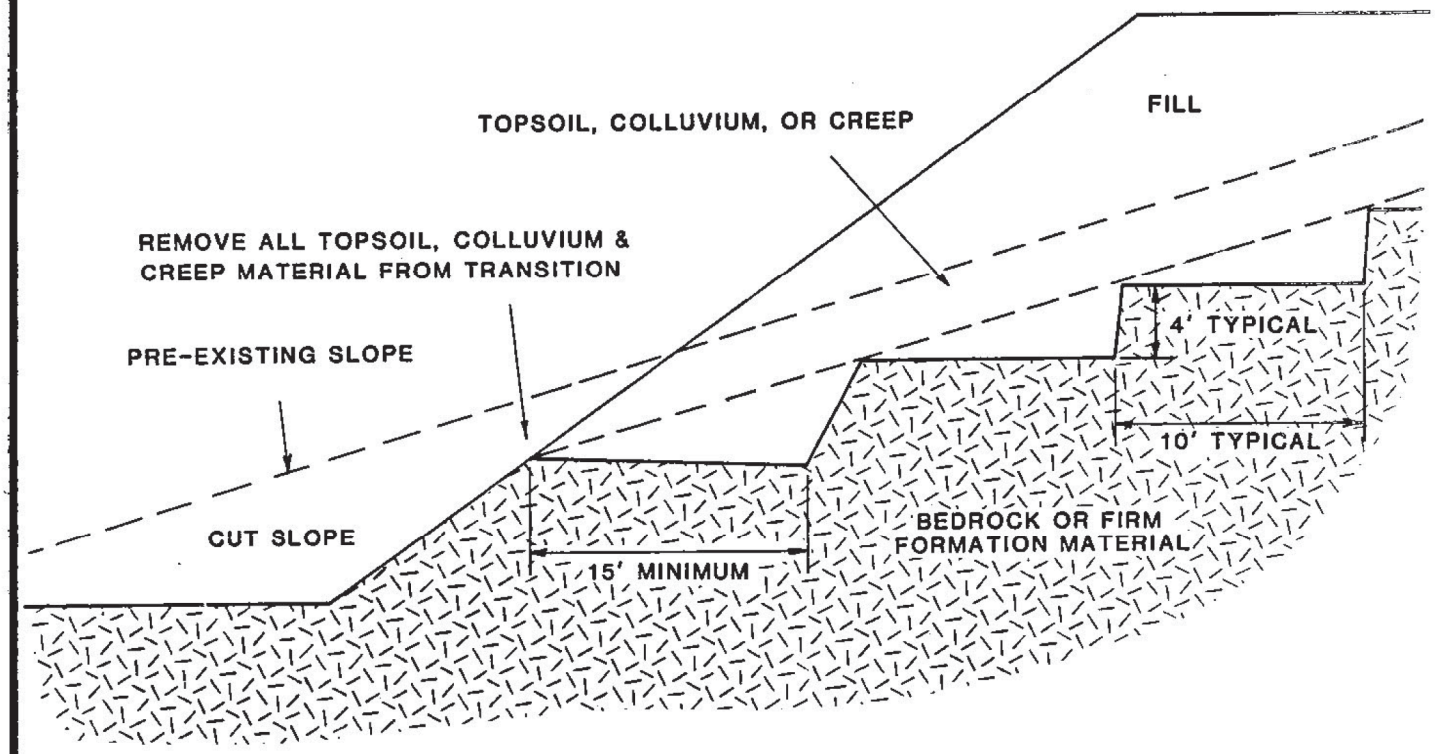
## Slopes

### Fill Slopes

Fill slopes should be constructed at slope ratios of 2:1 (horizontal: vertical) or flatter between benches. To maintain safety factors for surficial stability, intermediate drainage terraces are recommended for all fill slopes steeper than 5:1 with slope height greater than 30 feet. Fill slopes should be built in accordance with recommendations included herein. Fill over cut slopes should be constructed in accordance with the *Typical Fill Over Cut Slope Design* detail (Figure 4) and fill over natural slopes should be in accordance with the *Typical Fill Over Natural Slope Design* detail (Figure 5). Subdrains may be required at fill over cut or fill over natural conditions and will be evaluated during grading.

### Cut Slopes

Cut slopes should be designed at a gradient of 2:1 or flatter. All cut slopes should be observed by a geologist from this office. Cut slopes may require fill support if loose soil is exposed on the slope face (Figure 6).

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**TYPICAL FILL OVER CUT SLOPE DESIGN**

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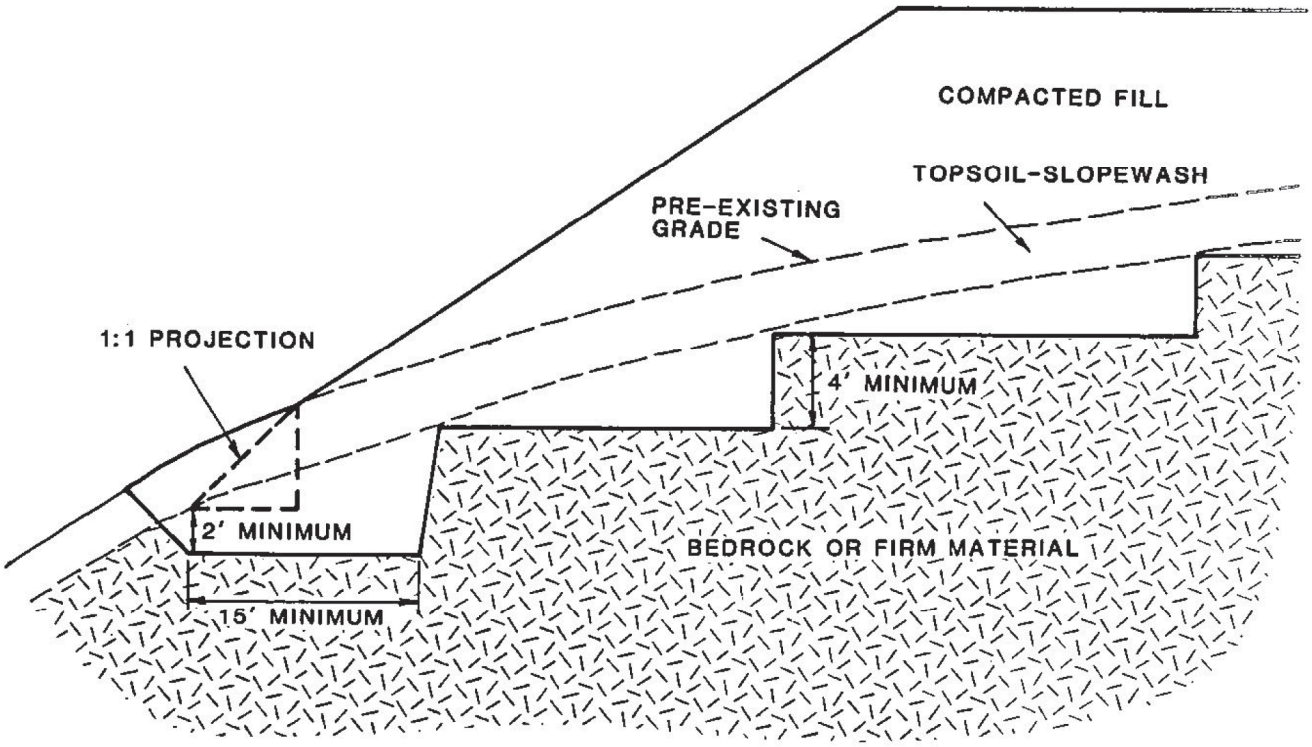
FIGURE 4

FORM 87/6-4




**TYPICAL FILL OVER NATURAL SLOPE DESIGN**

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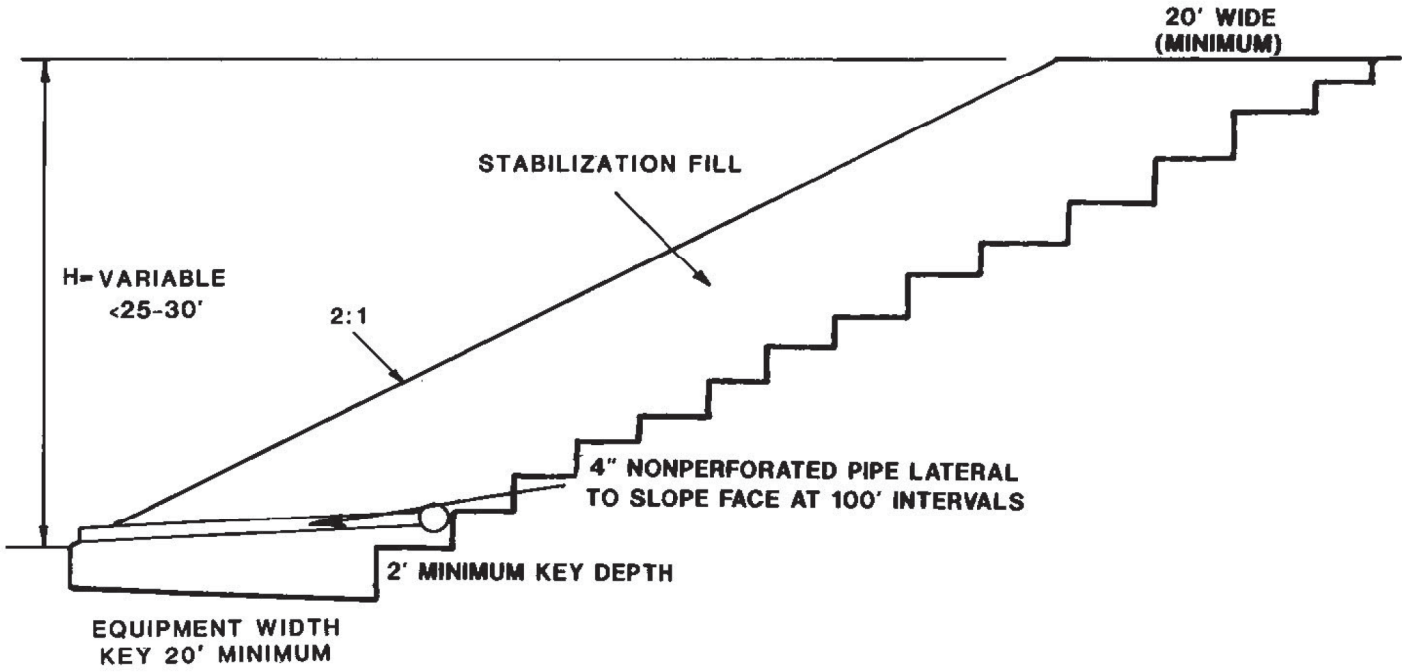
FIGURE 5

FORM 87/6-3




# TYPICAL STABILIZATION FILL DESIGN

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FIGURE 6

FORM 87/6-8

**Subdrains**

Subdrain systems should be provided in all canyon bottoms, where fill is proposed, keyways, and stabilization fills prior to fill placement (Figure 7, *Typical Design for Treatment of Natural Ground* and Figure 8, *Canyon Subdrain Design & Construction Methods*). Additional subdrains may be added as deemed necessary during grading.

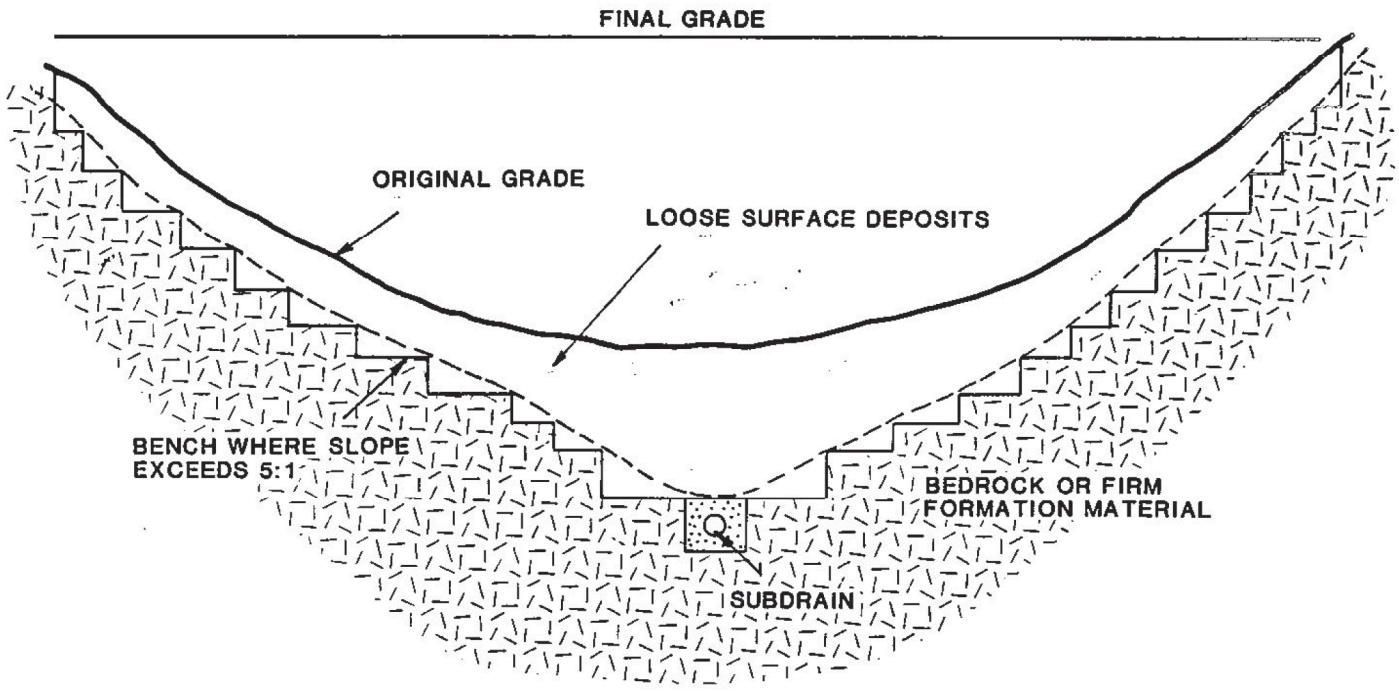
Filter material should be Class 2 permeable filter, or No. 2 and No. 3 concrete aggregate gradations per standard specifications for Public Works Construction, or approved equivalent, inspected and tested to verify its suitability. The filter should be clean with a wide range of sizes. An alternate filter may be one 50/50 mix of pea gravel and clean concrete sand or clean gravel wrapped in a suitable filter fabric, such as Mirafi 140N, or an approved equivalent.

Subdrain pipe should consist of Schedule 40 or equivalent and should be a minimum of 6 inches in diameter for lengths up to 500 feet. For lengths over 500, 8-inch diameter pipe should be used, and for lengths over 1,000 feet, two, 8-inch pipes should be used.

During grading, the Engineering Geologist should evaluate the necessity of placing additional subdrains. Additional drains will be required in fill-over cut keyways. The Engineering Geologist and Geotechnical Engineer should inspect all subdrainage systems prior to cover with compacted fill.

**Grading**

Grading of the site will consist of a cut/fill operation to create building pads, slopes, and associated access. The grading will involve the removing and recompacting artificial fill and loose terrace deposits, in addition to the mass-excavation. The following preliminary recommendations and construction considerations are provided for earthwork grading at the site.

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# TYPICAL DESIGN FOR TREATMENT OF NATURAL GROUND

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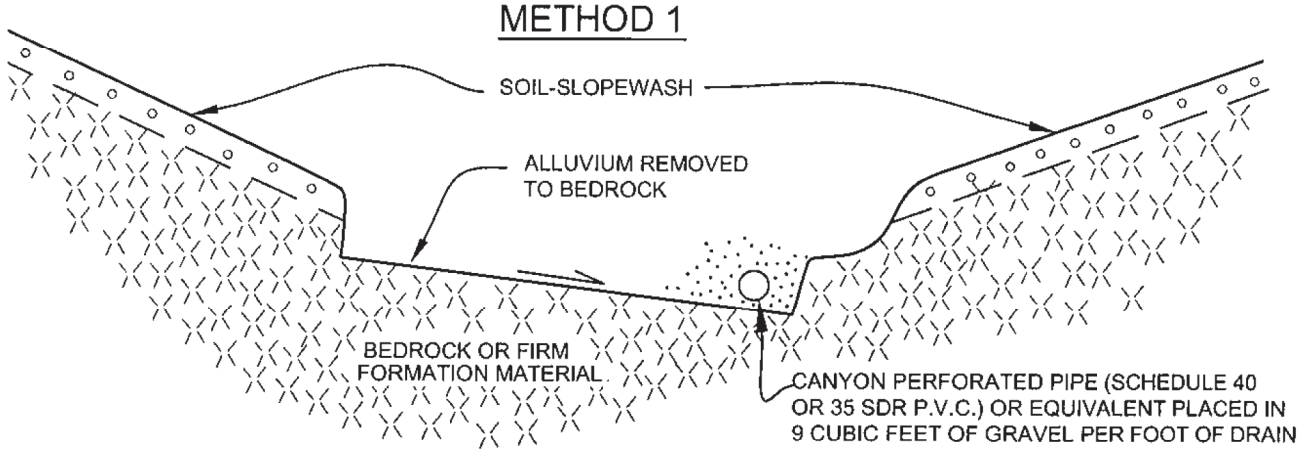
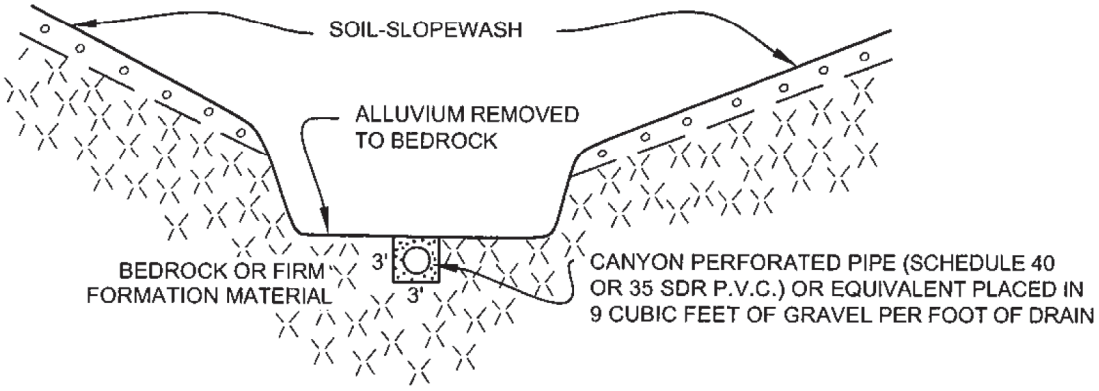
FIGURE 7

FORM 87/7-3

## METHOD 1

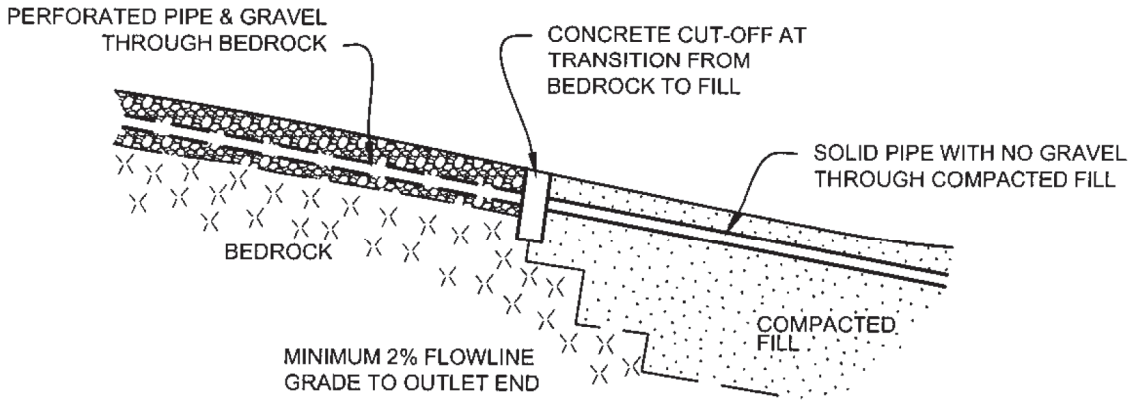



## METHOD 2




GRAVEL TO CONFORM TO STATE OF CALIFORNIA DEPT. OF PUBLIC WORKS STANDARD SPECIFICATIONS FOR CLASS 2 PERMEABLE MATERIAL AS ALTERNATE 3/4" GRAVEL MAY BE USED SURROUNDED WITH GEOTEXTILE FILTER FABRIC APPROVED BY THE GEOTECHNICAL ENGINEER.
(NOTE: CITY OF LOS ANGELES DOES NOT ALLOW GEOTEXTILE FABRIS WRAP AROUND SUBDRAIN SYSTEMS.)

## LONGITUDINAL SECTION

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# CANYON SUBDRAIN DESIGN & CONSTRUCTION METHODS

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FORM 87/7-1

## General

Monitoring: All earthwork (i.e., clearing, site preparation, fill placement, etc.) should be conducted with engineering control under observation and testing by the Geotechnical Engineer and in accordance with the requirements within a site specific Geologic and Geotechnical Engineering Report.

## Site Preparation

Existing Structure Location: The General Contractor should locate all surface and subsurface structures on the site or on the approved grading plan prior to preparing the ground.

Existing Structure Removal: Any underground structures (e.g., septic tanks, wells, pipelines, foundations, utilities, etc.) that have not been located prior to grading should be removed or treated in a manner recommended by the Geotechnical Engineer.

Clearing and Stripping: The construction areas should be cleared and stripped of all vegetation, trees, bushes, sod, topsoil, artificial fill, debris, asphalt, concrete and other deleterious material prior to fill placement.

Subgrade Preparation: Subgrade for foundations, pavement areas, overexcavations, and for those areas receiving any additional fill be prepared by scarifying the upper 12 inches and moisture conditioning, as required to obtain at least optimum moisture, but not greater than 120 percent of optimum. The scarified areas shall be compacted to at least 90 percent of the maximum laboratory density, as determined by ASTM D-1557-12 compaction method. All areas to receive fill should be observed by the Geotechnical Engineer prior to fill placement.

Subgrade Inspection: Prior to placing fill, the ground surface to receive fill should be observed, tested, and approved by the Geotechnical Engineer.

**Fill Placement**

Laboratory Testing: Representative samples of materials to be utilized as compacted fill should be analyzed in a laboratory to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material should be conducted.

On-Site Fill Material: The on-site soils are adequate for re-use in controlled fills provided the soils do not contain any organic matter, debris, or any individual particles greater than 12 inches in diameter.

Rock Fragments: Rock fragments less than 12 inches in diameter may be utilized in the fill, provided they are not placed in concentrated pockets, surrounded with fine grained material, and the distribution of the rocks is supervised by the Geotechnical Engineer. Any rock fragments over 6 inches should be kept below a depth of 5 feet. Rocks greater than 12 inches in diameter should be taken off-site, placed in fill areas designated as suitable for rock disposal, or placed in accordance with the recommendations of the Geotechnical Engineer.

Subgrade Verification and Compaction Testing: Regardless of material or location, all fill material should be placed over properly compacted subgrades in accordance with the *Site Preparation* section of this report. The condition of all subgrades shall be verified by the Geotechnical Engineer before fill placement or earthwork grading begins. Earthwork monitoring and field density testing shall be performed during grading to provide a basis for opinions concerning the degree of soil compaction attained.

Fill Placement: Approved on-site material shall be evenly placed, watered, processed, and compacted in controlled horizontal layers not exceeding eight inches in loose thickness, and each layer should be thoroughly compacted with approved equipment. All fill material should be moisture conditioned, as required to obtain at

least optimum moisture, but not greater than 120 percent of optimum moisture content. The fill should be placed and compacted in horizontal layers, unless otherwise recommended by the Geotechnical Engineer.

Compaction Criteria - Shallow Fills: For fills less than 40 feet in vertical thickness, each layer shall be compacted to at least 90 percent of the maximum laboratory density for material used as determined by ASTM D-1557-12. The field density shall be determined by the ASTM D-1556-07 method or equivalent. Where moisture content of the fill or density testing yields compaction results less than 90 percent, additional compaction effort and/or moisture conditioning, as necessary, shall be performed, until the fill material is in accordance with the requirements of the Geotechnical Engineer.

Fill Material - Moisture Content: All fill material placed must be moisture conditioned, as required to obtain at least optimum moisture, but not greater than 120 percent. If excessive moisture in the fill results in failing results or an unacceptable “pumping” condition, then the fill should be allowed to dry until the moisture content is within the necessary range to meet the required compaction requirements or reworked until acceptable conditions are obtained.

Keying and Benching: All fills should be keyed and benched through all topsoil, slopewash, alluvium or colluvium or creep material, into sound terrace deposits where the slope receiving fill is steeper than 5:1 (Horizontal: Vertical) or as determined by Geotechnical Engineer. The standard acceptable bench height is four feet into suitable material. The key for side hill fills should be a minimum of 15 feet within firm materials, with a minimum toe embankment of 2 feet into firm material, unless otherwise specified by the Geotechnical Engineer.

Drainage Devices: Drainage terraces and subdrainage devices should be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendations of the Geotechnical Engineer and Engineering Geologist.

Cut-Fill Transition: Where a cut-fill transition is present beneath planned structures, the cut area should be overexcavated three feet below the bottom of proposed footings and the excavated material should be replaced as compacted fill to reduce the transition condition. These guidelines should also be followed in areas where lots are underlain by soils or rock with differential expansion potential and also for lots located above descending buttress and stabilization fills.

**Grading Control**

Grading Inspection: Earthwork monitoring and field density testing shall be performed by the Geotechnical Engineer during grading to provide a basis for opinions concerning the degree of soil compaction attained. The Contractor should receive a copy of the Geotechnical Engineer's *Daily Field Engineering Report* which will indicate the results of field density tests for that day. Where failing tests occur or other field problems arise, the Contractor shall be notified of such conditions by written communication from the Geotechnical Engineer in the form of a conference memorandum, to avoid any misunderstanding arising from oral communication.

Subgrade Inspection: All processed ground to receive fill and overexcavations should be inspected and approved by the Geotechnical Engineer prior to placing any fill. The Contractor should be responsible for notifying the Geotechnical Engineer when such areas are ready for inspection. Inspection of the subgrade may also be required by the controlling governmental agency within the respective jurisdictions.

Subgrade Testing: Density tests should also be made on the prepared subgrade to receive fill, as required by the Geotechnical Engineer.

Density Testing Intervals: In general, density tests should be conducted at minimum intervals of 2 feet of fill height or every 500 cubic yards. Due to the variability that can occur in fill placement and different fill material characteristics, a higher number of density tests may be warranted to verify that the required compaction is being achieved.

**Drainage/Landscape Maintenance**

In areas of residential development, water should not be allowed to pond or seep into the ground, or flow over slopes in a concentrated manner. Pad drainage should be directed toward the street or any approved watercourse area swale via non-erosive channel, pipe and/or dispersion devices.

Drainage from the natural slopes to the east of the site shall be directed away from the proposed structures. The Project Civil Engineer shall design appropriate drainage structure for the offsite slope areas.

**Utility Trenching and Backfill**

Utility Trenching: Open excavations and excavations that are shored shall conform to all applicable Federal, State and local regulations.

Backfill Placement: Approved on-site or imported fill material shall be evenly placed, watered, processed, and compacted in controlled horizontal layers not exceeding eight inches in loose thickness, and each layer should be thoroughly compacted with approved equipment. All fill material should be moisture conditioned, as required to obtain at least optimum moisture, but not greater than 120 percent of optimum moisture content. The fill should be placed and compacted on a horizontal plane, unless otherwise recommended by the Geotechnical Engineer.

Backfill Compaction Criteria: Each layer of utility trench backfill shall be compacted to at least 90 percent of the maximum laboratory density determined by ASTM D-1557-12. The field density shall be determined by the ASTM D-1556-07 method or equivalent. Where moisture content of the fill or density testing yields compaction results less than 90 percent, additional compaction effort and/or moisture conditioning, as necessary, shall be performed, until the compaction criteria is reached.

Exterior Trenches Adjacent to Footings: Exterior trenches, paralleling a footing and extending below a 1H:1V plane projected from the outside bottom edge of the footing, should be compacted to 90 percent of the laboratory standard. Sand backfill, unless it is similar to the in-place fill, should not be allowed in these trench backfill areas. Density testing, along with probing, should be accomplished to verify the desired results.

Pipe Bedding: We recommend that a minimum of 6 inches of bedding material should be placed in the bottom of the utility trench. All bedding materials shall extend at least 4 inches above the top of utilities which require protection during subsequent trench backfilling. All trenches shall be wide enough to allow for compaction around the haunches of the pipe.

Groundwater Migration: Backfilled utility trenches may act as French drains to some extent, and considerable groundwater flow along utility bedding and backfill should be expected. Wherever buried utilities, or structures which they may intersect, could be adversely affected by such drainage, provisions shall be made to collect groundwater migrating along the trench lines. These situations include where buried utilities enter buildings, particularly where they enter below grade mechanical rooms, and where buried utilities enter junction boxes or switching stations that are intended to remain dry. Mitigation measures include, but are not limited to, placement of perforated drain pipes below and continuous with bedding materials, and placement of seepage barriers such as lean mix concrete or controlled density fill (CDF).

## Construction Considerations

Erosion Control: Erosion control measures, when necessary, should be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

Compaction Equipment: It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the project site to handle the amount of fill being placed and the type of fill material to be compacted. If necessary, excavation equipment should be shut down to permit completion of compaction in accordance with the recommendations contained herein. Sufficient watering devices/equipment should also be provided by the Contractor to achieve optimum moisture content in the fill material.

Final Grading Considerations: Care should be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of a permanent nature on or adjacent to the property.

## Temporary Excavations

Where the necessary space is available, temporary unsurcharged embankments may be slope back without shoring. The slope should not be cut steeper than the following gradient:

| Height | Temporary Gradient (Horizontal:Vertical) |
|---|---|
| 0-5' | Near Vertical |
| above 5' | 1:1 |

In areas where soils with little or no binder are encountered, shoring or flatter excavation slopes shall be made. The recommended temporary excavation slopes do not preclude local ravelling or sloughing. All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met.

Where sloped embankments are used, the top of the slope should be barricaded to prevent equipment and heavy storage loads within five feet of the top of the slope. If the temporary construction embankments are to be maintained for long periods, berms should be constructed along the top of the slope to prevent runoff water from eroding the slope faces.

The soils exposed in the temporary backcut slopes during excavation should be observed by our personnel so that modifications of the slopes can be made if variations in the soil conditions occur.

## PRELIMINARY FOUNDATION RECOMMENDATIONS

### Conventional Foundation Recommendations

The following recommendations are provided for preliminary design purposes and the final expansion index should be determined following grading. In our opinion, conventional or foundations should be used to support the proposed structures. We offer the following site-specific recommendations and comments for purposes of footing design and construction. All footings should meet current slope setback requirements. Foundations should be designed for low expansive soil conditions.

Bearing Subgrades: The proposed improvements should be founded into competent terrace deposits or compacted fill.

Subgrade Verification: All footing subgrades should consist of compacted fill or terrace material. Under no circumstances should footings be cast atop loose, soft, or slough, debris, existing artificial fill, topsoil, or surfaces covered by standing water. We recommend that a representative of GSC verify the condition of all subgrades before any concrete is placed.

Footing Depth and Width: Footings should be continuous and be founded at a minimum depth of 18 inches into compacted fill or terrace material and have a minimum width of 12 inches. Footings should be reinforced according to structural design.

Bearing Pressures: The allowable bearing capacity values shown in the following table include dead and live loads and may be used for design of footings and foundations. All foundations should be founded in compacted fill/terrace material and should be reinforced according to structural design. The allowable bearing capacity values may be increased by one-third when considering short duration loading conditions such as seismic or wind loads.

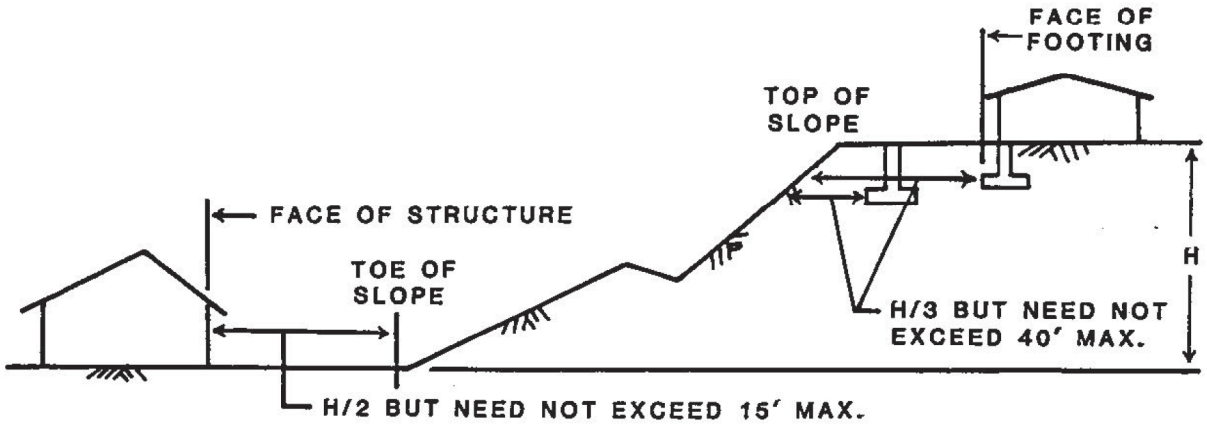
| Bearing Subgrade | Embedment Depth (inches) | Allowable Bearing Capacity (psf) | Bearing Capacity Increase per Foot Deeper | Bearing Capacity Increase per Foot Wider (%) | Maximum Allowable Bearing Capacity (psf) |
|---|---|---|---|---|---|
| Compacted Fill/Terrace Material | 18 | 2,000 | 20 | 10 | 4,000 |

Lateral Capacity: To resist lateral loads, the allowable passive earth pressures shown in the following table, expressed as an equivalent fluid pressure, may be used on that portion of shallow foundations which have a minimum embedment depth as previously recommended. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

| Soil Type | Allowable Lateral Bearing Pressure (pcf) | Maximum Allowable Lateral Bearing Pressure (pcf) | Coefficient of Friction |
|---|---|---|---|
| Compacted Fill/Terrace Material | 300 | 3,000 | 0.4 |

## General Recommendations

1. The above parameters are applicable provided structures have gutters and downspouts and positive drainage is maintained away from structures. Therefore, it is important that information regarding drainage and site maintenance be followed. All slab foundation areas should be moisture conditioned to at least optimum moisture, but no more than 5 percent above optimum moisture for a depth of at least 12 inches below subgrade for low EI soil. The subgrade soil moisture should be observed by a Soil Engineer or his/her representative prior to pouring concrete. It is suggested the above stated moisture be obtained and maintained at least a suggested 2 days prior to pouring concrete.




## REQUIRED SLOPE SETBACK DESIGN

GSC GeoSoils Consultants Inc.
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DATE 5/221 | W.O. NO. 7588

Geotechnical • Geologic • Environmental

FIGURE 9

FORM 87/7-9

2. A minimum 4-inch thick slab reinforced with No. 4 rebar spaced 16 inches on center is recommended. A 10-mil Visqueen vapor barrier should be placed underneath habitable area slabs and/or slabs with floor coverings. This barrier can be placed directly on the subgrade soils, but should be overlain by a two-inch layer of imported sand. This vapor barrier shall be lapped and sealed (especially around the utility perforations) adequately to provide a continuous waterproof barrier under the entire slab.

3. The above recommendations assume, and GeoSoils Consultants, Inc. strongly recommends, that surface water will be kept from infiltrating into the subgrade adjacent to the house foundation system. This may include, but not be limited to rainwater, roof water, landscape water and/or leaky plumbing. The lots are to be fine graded at the completion of construction to include positive drainage away from the structure and roof water will be collected via gutters, downspouts, and transported to the street in buried drainpipes. Homebuyers should be cautioned against constructing open draining planters adjacent to the houses or obstructing the yard drainage in any way.

4. Utility trenches beneath the slabs should be backfilled with compacted native soil materials, free of rocks.

5. Subgrade soil beneath footings and slabs should be premoistened prior to placement of concrete.

6. Standard City of Simi Valley structural setback guidelines are applicable, except where superseded by specific recommendations by the Project Geologist and Geotechnical Engineer.

7. Building or structure footings shall be set back a horizontal distance, x, from the face of adjacent descending slope. The horizontal distance is calculated as $x=H/3$, where H is the height of slope. The distance x should not be less than 5 feet nor more than 40 feet. The distance x may be provided by deepening the footings (Figure 4).

8. Prior to placing concrete in the footing excavations, an inspection should be made by our representative to ensure that the footings are free of loose and disturbed soils and are embedded in the recommended material.

## LIMITATIONS

The findings and recommendations of this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice for the City of Simi Valley at this time. We make no other warranty, either express or implied. The conclusions and recommendations contained in this report are based on site conditions disclosed in our subsurface investigation. However, soil conditions can vary significantly between test pits; therefore, further refinements of our recommendations contained herein may be necessary due to changes in the building plans or what is encountered during site grading.

The recommendations provided in this report are applicable for preliminary development planning for the referenced lot provided that surface water will be kept from infiltrating into the subgrade adjacent to the house foundation system. This may include, but not be limited to rainwater, roof water, landscape water and/or leaky plumbing. We caution against constructing open draining planters adjacent to the houses or obstructing the yard drainage in any way.

Since our investigation was based on the site conditions observed, selective laboratory testing, and engineering analysis, the conclusions and recommendations contained herein are professional opinions. Further, these opinions have been derived in accordance with standard engineering practices, and no warranty is expressed or implied.

If the conditions encountered during grading are not consistent with the findings presented in this report, or if proposed construction is moved from the location investigated, this office shall be notified immediately so that the condition or change can be evaluated and appropriate action taken.

## CLOSURE

We appreciate this opportunity to be of service to you. If you have any questions regarding the content of this report or any other aspects of the project, please do not hesitate to contact us.

Very truly yours,

GEOSOILS CONSULTANTS, INC.

RUDY F. RUBERTI
CEG 1708

KAREN L. MILLER
GE 2257

Encl: References
Plate 1, Geologic Map
Appendix A, Field Exploration Procedures
Plates TP-1 through TP-11, Test Pit Logs

cc: (1) Addressee

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1. Dibblee, T.W. Jr., 1992, Geologic Map of the Santa Susana Quadrangle, Ventura and Los Angeles County, California

2. Department of Conservation, Division of Mines and Geology, 1997, "Seismic Hazard Zone Report for the Simi Valley East and West 7.5 Minute Quadrangles, Ventura and Los Angeles Counties, California"

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8. Treiman, J.A., 1998, Simi-Santa Rosa fault zone in the Moorpark, Newbury Park, Simi Valley East, Simi Valley West, and Thousand Oaks quadrangles, Ventura County, California: California Division of Mines and Geology Fault Evaluation Report FER-244.

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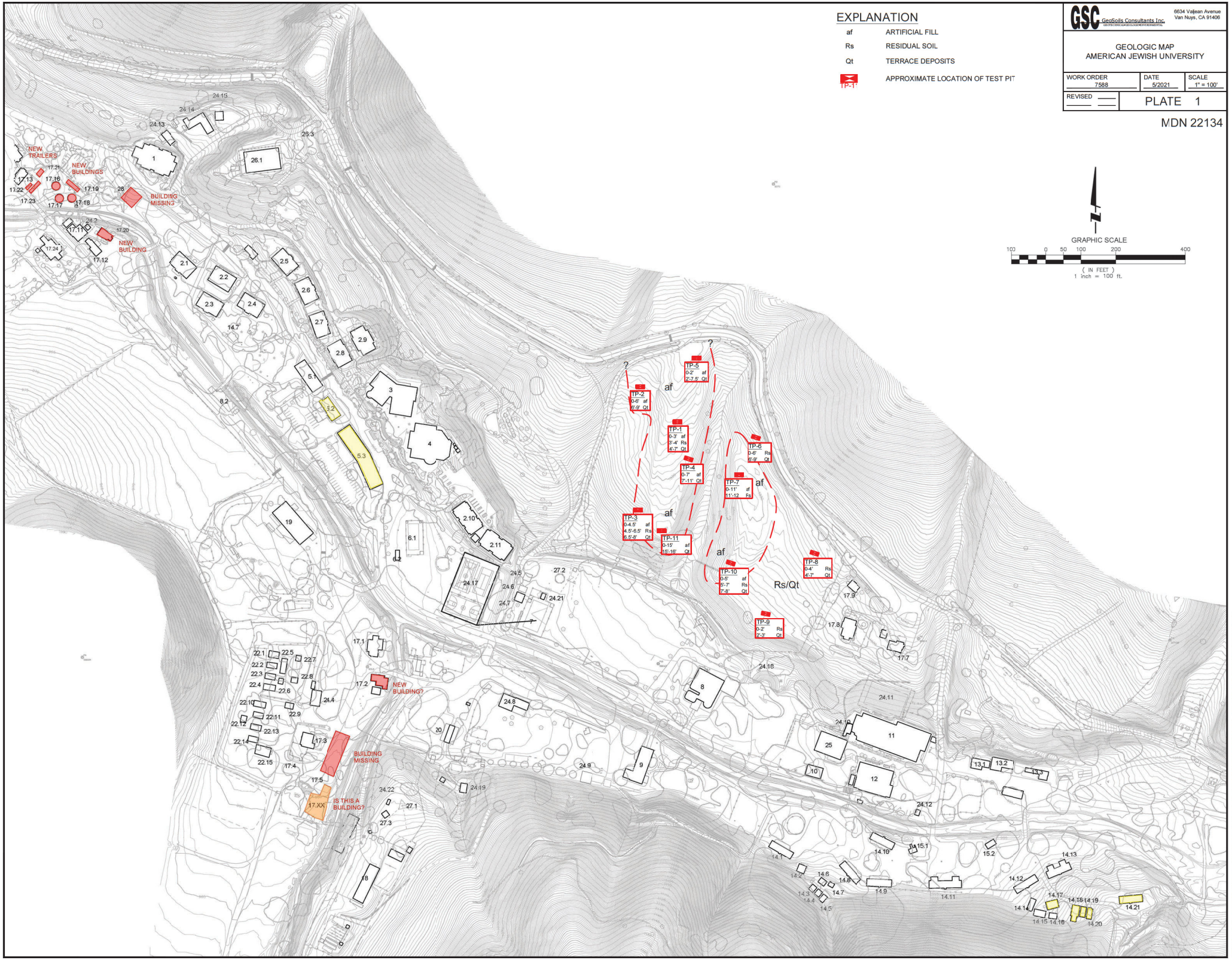


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May 10, 2021
W.O. 7588

# APPENDIX A

# FIELD EXPLORATION PROCEDURES

May 10, 2021
W.O. 7588

# APPENDIX A

## FIELD EXPLORATION PROCEDURES

Field exploration consisted of excavating 11 exploratory test pits with a rubber tire backhoe. operated by an independent company working under subcontract to GSC. Samples were obtained via the California ring sampler.

A representative from our firm continuously observed the test pits, logged the subsurface conditions, and collected representative soil samples. All samples were stored in watertight containers and later transported to our laboratory for further visual examination and testing, as deemed necessary. After the test pits were completed, the excavations was backfilled with soil cuttings.

The enclosed test pit logs, Plates TP-1 through TP-11, describe the vertical sequence of soils and materials encountered in each test pit, based primarily on our field classifications and supported by our subsequent laboratory examination and testing. Where a soil contact was observed to be gradational, our log indicates the average contact depth. Where a soil type changed between sample intervals, we inferred the contact depth.

# TEST PIT LOG 1

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

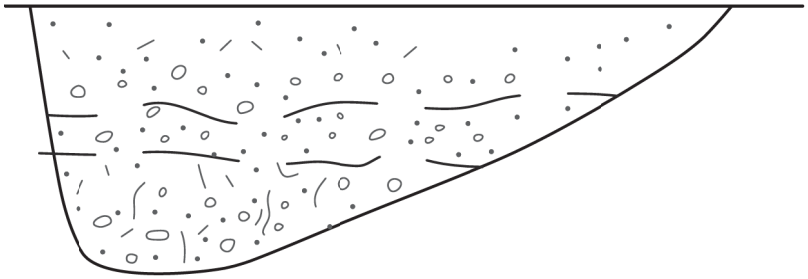
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-3' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 3-4' | Residual Soil (Rs) | Brown, gravelly, silty sand, slightly porous, slightly moist, moderately dense | |
| 4-7' | Older Alluvium (Qf) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 7.0'



TP-1

# TEST PIT LOG 2

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

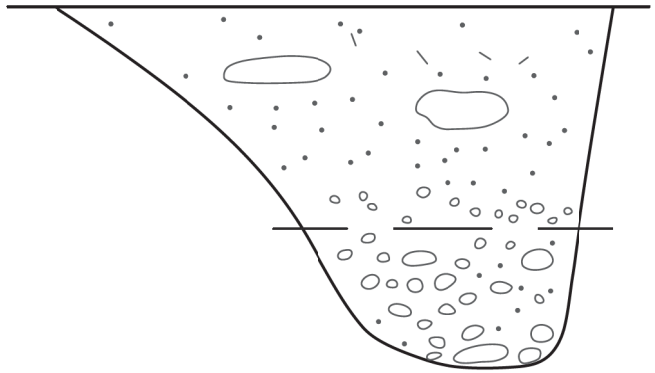
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-6' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt to gravelly, silty sand, loose, slightly moist, abundant cobble and trash consisting of debris and large concrete and metal | Logged from the surface due to caving hazard |
| 6-9.5' | Older Alluvium (Qf) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 9.5'



TP-2

# TEST PIT LOG 3

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

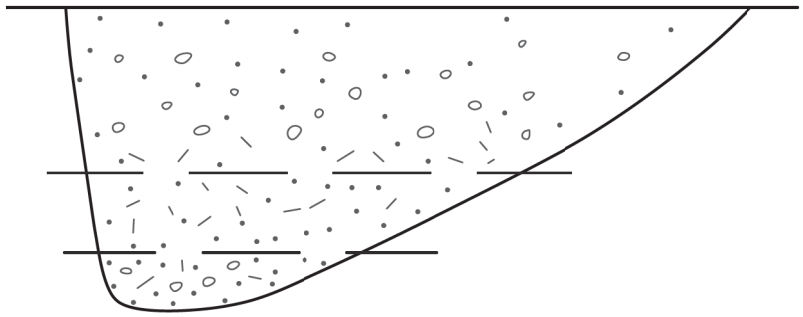
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-4.5' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 4.5-6.5' | Residual Soils (Rs) | Reddish brown, sandy clay, slightly moist, very stiff, dense | |
| 6.5-8.0' | Older Alluvium (Qf) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 8'



TP-3

# TEST PIT LOG 4

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

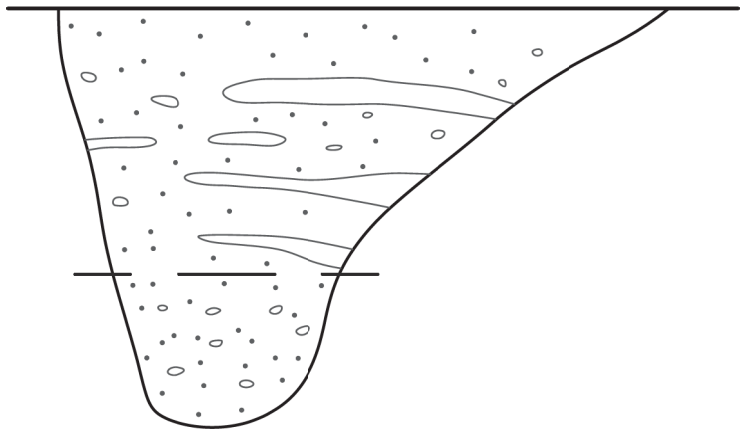
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-7' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 7-11' | Older Alluvium (Qt) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 11'



TP-4

# TEST PIT LOG 5

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

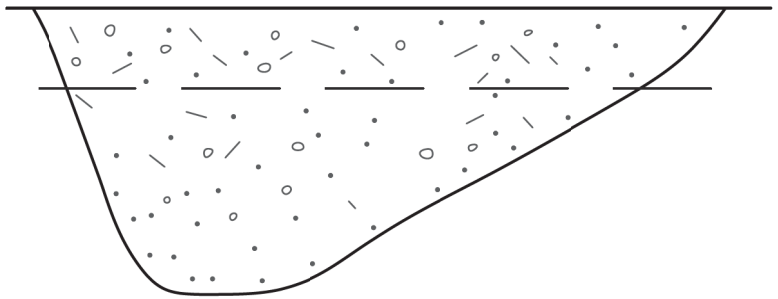
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-2' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 2-7.5' | Older Alluvium (Qt) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 7.5'



TP-5

# TEST PIT LOG 6

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

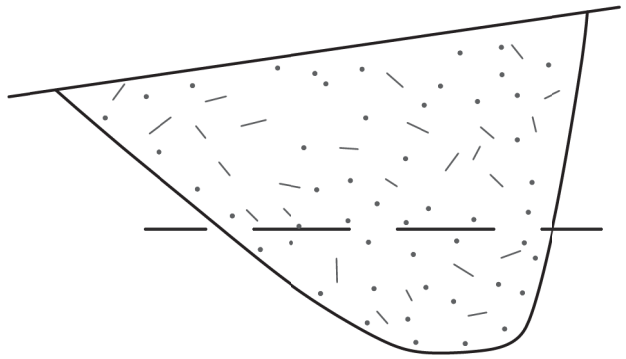
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-6' | Residual Soil (Rs) | Brown, sandy clay, dense, very stiff, slightly moist, some caliche present | |
| 6-9' | Older Alluvium (Qt) | Yellowish dark brown, sandy clay, dense, very stiff, slightly moist, caliche stringers present | Color changes in soil from borwn to greenish brown at 6' |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 9'



TP-6

# TEST PIT LOG 7

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

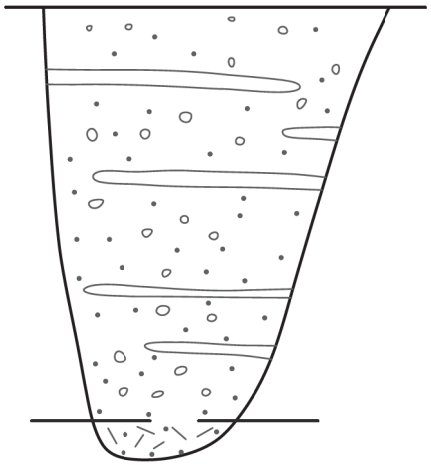
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-11' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 11-12' | Residual Soil (Rs) | Brown, sandy clay, dense, very stiff, slightly moist, some caliche present | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 12'



TP-7

# TEST PIT LOG 8

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

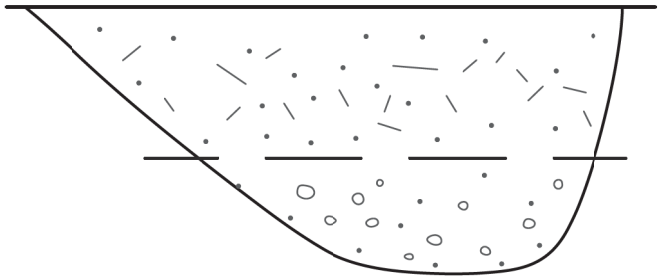
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-4' | Residual Soil (Rs) | Brown, sandy clay, dense, very stiff, slightly moist, some caliche present | |
| 4-7' | Older Alluvium (Qt) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 7'



TP-8

# TEST PIT LOG 9

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

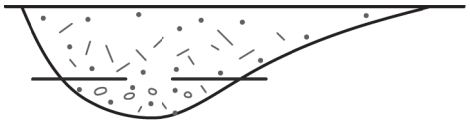
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-2' | Residual Soil (Rs) | Brown, sandy clay, dense, very stiff, slightly moist, some caliche present | |
| 2-3' | Older Alluvium (Qt) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 3'



TP-9

# TEST PIT LOG 10

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

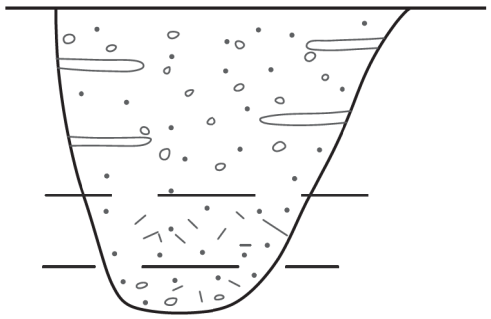
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-5' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 5-7' | Residual Soils (Rs) | Brown, sandy clay, dense, very stiff, slightly moist, some caliche present | |
| 7-8' | Older Alluvium (Qf) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 8'



TP-10

# TEST PIT LOG 11

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

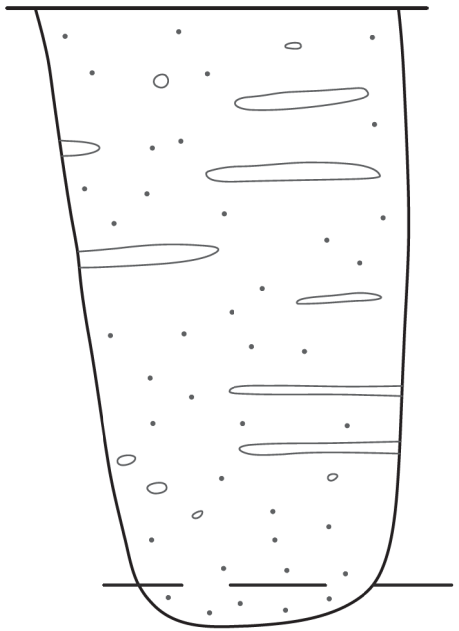
**LOGGED BY:** JM

**W.O.** 7588

**DATE:** 4/14/2021

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-15' | Artificial Fill (af) | Yellow brown, gravelly, sandy silt, moderately dense to dense, slightly moist, abundant cobble | |
| 15-16' | Older Alluvium (Qt) | Yellow brown, gravelly, sandy clay, dense, dry to slightly moist, well indurated, abundant caliche, abundant rounded cobble, slightly porous | |

**SCALE** **H:** **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 16'



TP-11

GeoSoils Consultants Inc.
GEOTECHNICAL ENGINEERING / ENGINEERING GEOLOGY

December 7, 2022
W.O. 7588

AMERICAN JEWISH UNIVERSITY
c/o Mr. Jon Friedman
Jemstreet Properties
612 Lone Oak Drive
Thousand Oaks, California 91362

Attention: Mr. Adrian Breitfeld

**Subject: Infiltration Testing for Proposed LID Locations, Brandeis-Bardin Campus, Simi Valley, California**

Dear Mr. Breitfeld:

At your request, GeoSoils Consultants, Inc. (GSC) has prepared this infiltration report for the proposed low impact development (LID) at the subject site.

Six hand dug test pits were excavated into the native alluvium on site to a depth as shown on the test pit logs. Test Pits TP-1 through TP-6 are shown on the Test Pit Location Map, Plate 1. A one-foot cubic excavation was excavated by hand at the bottom of each test pit.

In previous exploration by GeoConcepts, Inc. and GSC, groundwater was encountered in the borings. Based on the field exploration, the groundwater level is between 12 to 14 feet below grade.

Upon initial testing, none of the test pits drained completely within ten minutes and water remained in the one cubic foot excavation. The constant head method was used for all of the test pits. The results, utilizing the correction factor provided in the County of Ventura guidelines, are provided in Appendix A.

It is our professional opinion on-site infiltration will not be a hazard to potential development and the site is suitable for storm water infiltration.

MDN 23256

We hope this satisfies your requirements at this time. If you have any questions regarding the content of this report or any other aspects of the project, please do not hesitate to contact us.

Very truly yours,

GEOSOILS CONSULTANTS, INC.

KAREN L. MILLER
GE 2257

REGISTERED PROFESSIONAL ENGINEER
KAREN L. MILLER
No. 2257
Exp. 3/31/24
GEOTECHNICAL
STATE OF CALIFORNIA

JAMES L. VAN METER
CEG 2031

CERTIFIED ENGINEERING GEOLOGIST
JAMES L. VAN METER
No. 2031
Exp. 2/28/23
STATE OF CALIFORNIA

Encl: References
Plate 1, Test Pit Location Map
Appendix A, Test Pit Logs and Infiltration Test Data
Plates TP-1 to TP-6, Test Pit Logs
Infiltration Test Data

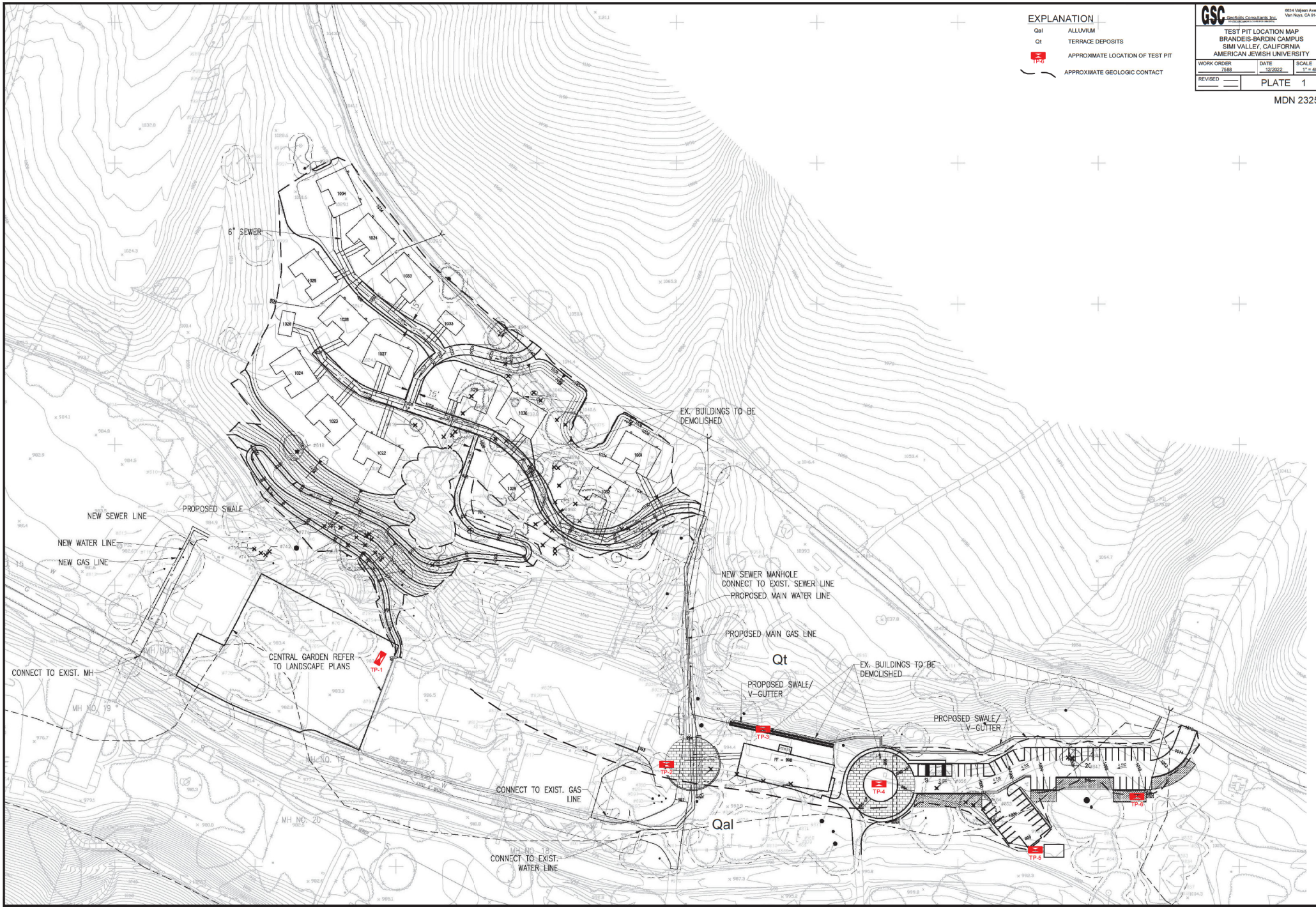
cc: (1) Addressee

## REFERENCES

1. GeoSoils Consultants, Inc. dated February 17, 2022, "Preliminary Geologic and Geotechnical Engineering Investigation, Proposed Cabins and Welcome Center, Brandeis-Bardin Campus, Simi Valley, California"

2. GeoSoils Consultants, Inc. dated July 12, 2022, "Response to County of Ventura Geology Portion of the Incompleteness Letter dated April 22, 2022, Proposed Cabins and Welcome Center, Brandeis-Bardin Campus, Simi Valley, California"

3. GeoConcepts, Inc, dated April 18, 2003, "Preliminary Geologic and Sols Engineering Investigation, Proposed Camp Alonim Dining Hall and Dance Pavilion, 1101 Peppertree Lane, Simi Valley




GSC GeoSoils Consultants Inc.
6634 Valjean Avenue
Van Nuys, CA 91406

TEST PIT LOCATION MAP
BRANDEIS-BARDIN CAMPUS
SIMI VALLEY, CALIFORNIA
AMERICAN JEWISH UNIVERSITY

| WORK ORDER | DATE | SCALE |
|---|---|---|
| 7588 | 12/2022 | 1" = 40' |

REVISED

PLATE 1

MDN 23256

Note:

Revision By Appd YYYY.MM.DD

Issued By Appd YYYY.MM.DD

Permit/Seal

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Consultant

Stantec

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www.stantec.com

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Client/Project Logo

Client/Project
AMERICAN JEWISH UNIVERSITY-
BRANDEIS-BARDIN CAMPUS

CAMP ALONIM
MODIFICATION TO C.U.P. 1776

1101 PEPPERTREELANE, BRANDEIS, CA 93064

File Name: 61400DC-EX7008 Dwn. Dsgn. Chkd. 03/17/2022 YYYY.MM.DD

Title
PRELIMINARY SITE GRADING PLAN

Project No. 000000000
Scale
Revision
Sheet 1 of 1
Drawing No.

X:\2001 w.o\gsc-cad\7588\12-6-22\CURRENT\PLATES 12-12-22.dwg, 12/12/2022 2:47:48 PM, AutoCAD PDF (High Quality Print).pc3

December 7, 2022
W.O. 7588

# APPENDIX A

# TEST PIT LOGS AND INFILTRATION TEST DATA

# TEST PIT LOG 1

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

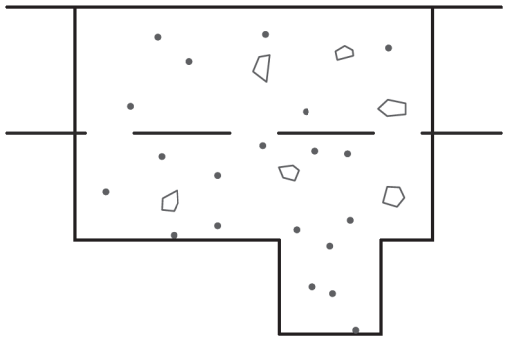
**LOGGED BY:** JLV

**W.O.** 7588

**DATE:** 11/28/2022

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-1.5' | Fill (af) | Medium brown, silty, fine to medium sand with rock fragments, slighty moist, firm | |
| 1.5-3.5' | Alluvium (Qal) | Light to medium brown, silty, fine to medium sand with occasional rock fragments, moderately moist, moderately dense | |

**SCALE** **H:** 1"=2' **V:** 1"=2' **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 3.5'



TP-1

# TEST PIT LOG 2

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

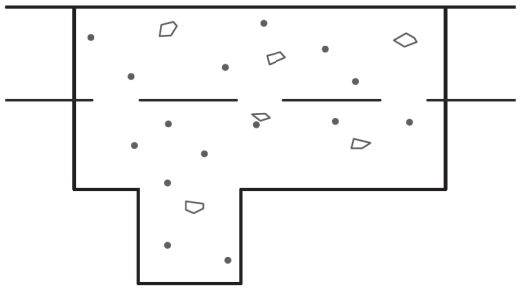
**LOGGED BY:** JLV

**W.O.** 7588

**DATE:** 11/28/2022

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-1' | Fill (af) | Medium brown, silty, fine to medium sand with rock fragments, moderately moist, moderately firm | |
| 1-3' | Alluvium (Qal) | Light to medium brown, silty, fine to medium sand with occasional rock fragments, moderately moist, moderately dense | |

**SCALE** **H:** 1"=2' **V:** 1"=2' **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 3'



TP-2

# TEST PIT LOG 3

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

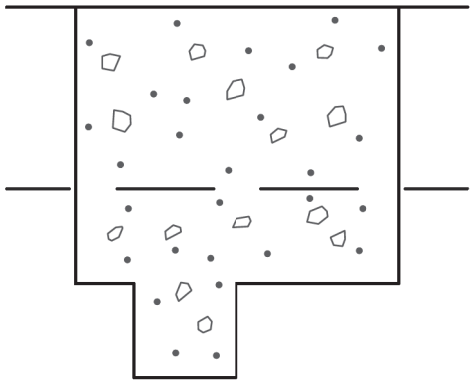
**LOGGED BY:** JLV

**W.O.** 7588

**DATE:** 11/28/2022

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-2' | Fill (af) | Medium to dark brown, silty, fine to medium sand with rock fragments, slightly moist, slightly to moderately firm | |
| 2-4' | Alluvium (Qal) | Medium brown, silty, fine to coarse sand with abundant rock fragments, slightly moist, moderately dense | |

**SCALE** **H:** 1"=2' **V:** 1"=2' **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 4'



TP-3

# TEST PIT LOG 4

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

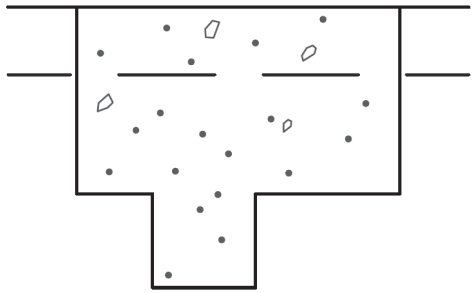
**LOGGED BY:** JLV

**W.O.** 7588

**DATE:** 11/28/2022

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-8" | Fill (af) | Medium brown, silty, fine to medium sand with rock fragments, slightly moist, firm | |
| 8"-3' | Alluvium (Qal) | Light brown, silty, fine to medium sand with occasional rock fragments, slightly moist, moderately dense | |

**SCALE** **H:** 1"=2' **V:** 1"=2' **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 3'



TP-4

# TEST PIT LOG 5

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

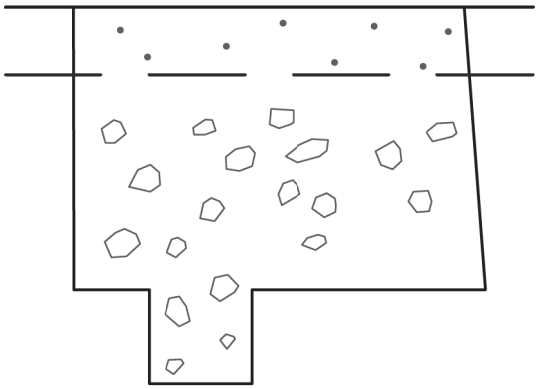
**LOGGED BY:** JLV

**W.O.** 7588

**DATE:** 11/28/2022

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-1' | Fill (af) | Medium brown, silty, fine to medium sand with rock fragments, slightly moist, firm | |
| 1-4' | Alluvium (Qal) | Light brown, silty, fine to coarse sand with abundant rock fragments, slightly moist, moderately dense to dense | |

**SCALE** **H:** 1"=2' **V:** 1"=2' **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 4'



TP-5

# TEST PIT LOG 6

GeoSoils Consultants, Inc.

**CLIENT:** American Jewish University

**ELEVATION:**

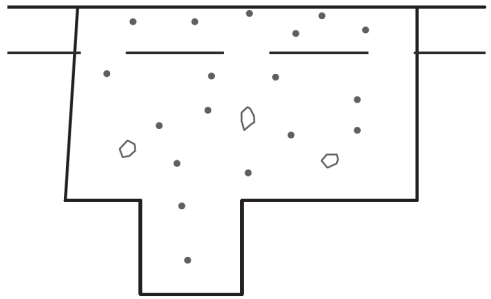
**LOGGED BY:** JLV

**W.O.** 7588

**DATE:** 11/28/2022

| DEPTH | MATERIAL | DESCRIPTION | COMMENTS |
|---|---|---|---|
| 0-6" | Fill (af) | Light brown, silty, fine to medium sand, slightly moist, slightly firm | |
| 6"-3' | Alluvium (Qal) | Light brown, silty, fine to medium sand with occasional rock fragments, slightly moist, moderately dense | |

**SCALE** **H:** 1"=2' **V:** 1"=2' **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 3'



TP-6

# Percolation Test Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | American Jewish University | | | | Project No. | 7588 | Date: 12/8/2022 |
| Test Hole No. | TP-1 | Tested By: | JLV | Dug By: | JLV | | |
| Depth of Boring, H (ft): | 1 | USCS Soil Classification | | | Aggregate Correction, e (Void Ratio) | | N/A |
| Test Hole Dimensions (foot) | | Length (if rectangular): | | 1 | Width (if rectangular): | 1 | |

| Trial No. | Δt, Time Interval (min.) | Hi, Initial Depth to Water (in.) | Hf, Final Depth to Water (in.) | ΔHw, Change in Water Level (in.) | Flow Rate (in^3/hr.) | Wet Surface Area (in^2) | Infiltration Rate (in/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 30 | 0 | 5.50 | 5.50 | 1584.00 | 588.00 | 2.69 |
| 2 | 30 | 0 | 5.25 | 5.25 | 1512.00 | 594.00 | 2.55 |
| 3 | 30 | 0 | 5.00 | 5.00 | 1440.00 | 600.00 | 2.40 |
| 4 | 30 | 0 | 5.00 | 5.00 | 1440.00 | 600.00 | 2.40 |
| 5 | 30 | 0 | 5.00 | 5.00 | 1440.00 | 600.00 | 2.40 |
| 6 | 30 | 0 | 5.00 | 5.00 | 1440.00 | 600.00 | 2.40 |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

## CALCULATION:

| | | | | | |
|---|---|---|---|---|---|
| Falling Head Flow Rate= ΔHw*(L*W)/(Δt) | | | | Wet Surface Area* = (W+L)*2*(H-(Hi+Hf)/2)+(W*L) | |
| Infiltration Rate=Falling Head Flow Rate/Wet Surface Area | | | | Percolation Rate= Infiltration Rate/Reduction Factor | |
| Average Infiltration Rate= | 2.40 | in/hr | Reduction Factor**= | 3.06 | |

| | | |
|---|---|---|
| Percolation Rate= | **0.78** | in/hr |
| >0.5? | **Yes** | |

**Reduction Factor is the result of the Infiltration Safety Factor Determination Worksheet

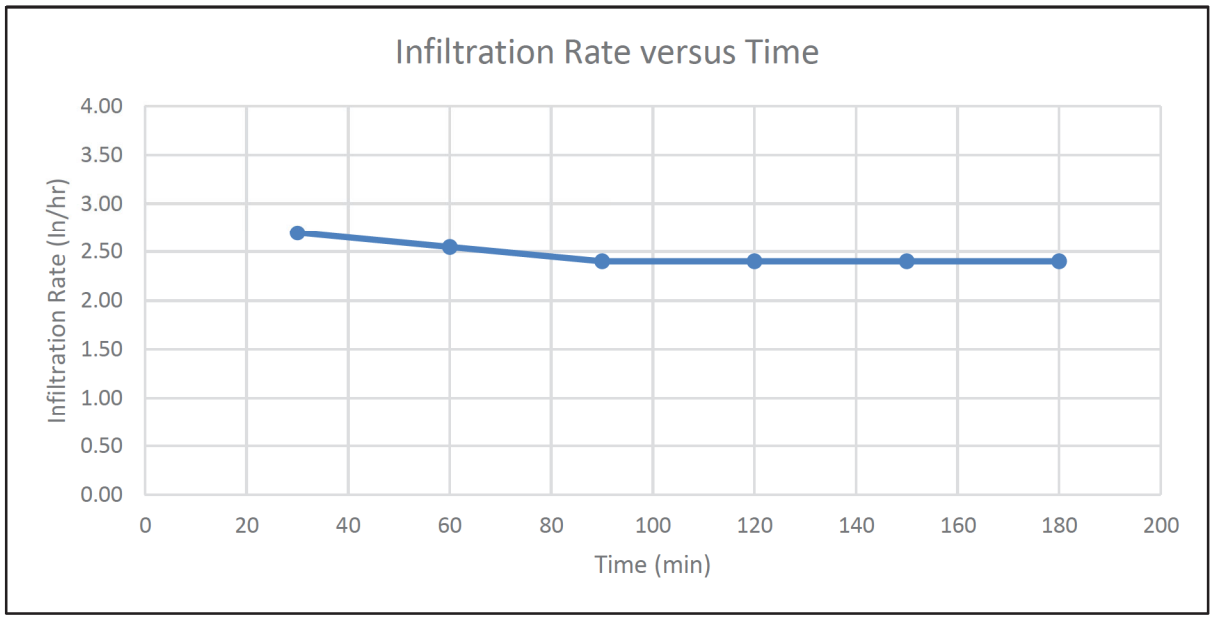



Plate P-1

## Percolation Test Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | American Jewish University | | | | Project No. | 7588 | Date: 12/8/2022 |
| Test Hole No. | TP-2 | Tested By: | JLV | Dug By: | JLV | | |
| Depth of Boring, H (ft): | 1 | USCS Soil Classification | | | Aggregate Correction, e (Void Ratio) | | N/A |
| Test Hole Dimensions (foot) | | Length (if rectangular): | | 1 | Width (if rectangular): | 1 | |

| Trial No. | Δt, Time Interval (min.) | Hi, Initial Depth to Water (in.) | Hf, Final Depth to Water (in.) | ΔHw, Change in Water Level (in.) | Flow Rate (in^3/hr.) | Wet Surface Area (in^2) | Infiltration Rate (in/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 30 | 0 | 11.75 | 11.75 | 3384.00 | 438.00 | 7.73 |
| 2 | 30 | 0 | 11.25 | 11.25 | 3240.00 | 450.00 | 7.20 |
| 3 | 30 | 0 | 10.75 | 10.75 | 3096.00 | 462.00 | 6.70 |
| 4 | 30 | 0 | 10.50 | 10.50 | 3024.00 | 468.00 | 6.46 |
| 5 | 30 | 0 | 10.50 | 10.50 | 3024.00 | 468.00 | 6.46 |
| 6 | 30 | 0 | 10.50 | 10.50 | 3024.00 | 468.00 | 6.46 |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

**CALCULATION:**

| | | | | | |
|---|---|---|---|---|---|
| Falling Head Flow Rate= ΔHw*(L*W)/(Δt) | | | | Wet Surface Area* = (W+L)*2*(H-(Hi+Hf)/2)+(W*L) | |
| Infiltration Rate=Falling Head Flow Rate/Wet Surface Area | | | | Percolation Rate= Infiltration Rate/Reduction Factor | |
| Average Infiltration Rate= | 6.46 | in/hr | Reduction Factor**= | 3.06 | |

| | | |
|---|---|---|
| Percolation Rate= | **2.11** | in/hr |
| > 0.5? | **Yes** | |

**Reduction Factor is the result of the Infiltration Safety Factor Determination Worksheet

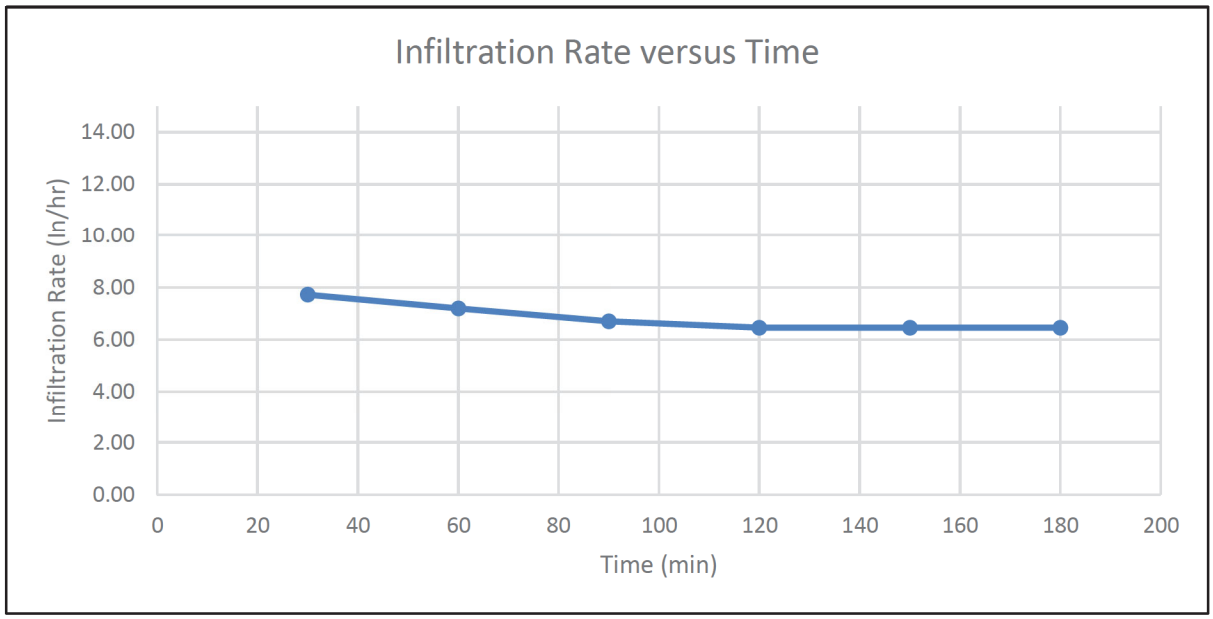



Plate P-2

# Percolation Test Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | American Jewish University | | | | Project No. | 7588 | Date: 12/8/2022 |
| Test Hole No. | TP-3 | Tested By: | JLV | Dug By: | JLV | | |
| Depth of Boring, H (ft): | 1 | USCS Soil Classification | | | Aggregate Correction, e (Void Ratio) | | N/A |
| Test Hole Dimensions (foot) | | Length (if rectangular): | | 1 | Width (if rectangular): | 1 | |

| Trial No. | Δt, Time Interval (min.) | Hi, Initial Depth to Water (in.) | Hf, Final Depth to Water (in.) | ΔHw, Change in Water Level (in.) | Flow Rate (in^3/hr.) | Wet Surface Area (in^2) | Infiltration Rate (in/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 23.54 | 0 | 12.00 | 12.00 | 4404.42 | 432.00 | 10.20 |
| 2 | 26.34 | 0 | 12.00 | 12.00 | 3936.22 | 432.00 | 9.11 |
| 3 | 29.26 | 0 | 12.00 | 12.00 | 3543.40 | 432.00 | 8.20 |
| 4 | 29.37 | 0 | 12.00 | 12.00 | 3530.13 | 432.00 | 8.17 |
| 5 | 29.27 | 0 | 12.00 | 12.00 | 3542.19 | 432.00 | 8.20 |
| 6 | 29.33 | 0 | 12.00 | 12.00 | 3534.95 | 432.00 | 8.18 |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

**CALCULATION:**

| | | | | | |
|---|---|---|---|---|---|
| Falling Head Flow Rate= ΔHw*(L*W)/(Δt) | | | | Wet Surface Area* = (W+L)*2*(H-(Hi+Hf)/2)+(W*L) | |
| Infiltration Rate=Falling Head Flow Rate/Wet Surface Area | | | | Percolation Rate= Infiltration Rate/Reduction Factor | |
| Average Infiltration Rate= | 8.19 | in/hr | Reduction Factor**= | 3.06 | |

| | | |
|---|---|---|
| Percolation Rate= | **2.68** | in/hr |
| > 0.5? | **Yes** | |

**Reduction Factor is the result of the Infiltration Safety Factor Determination Worksheet

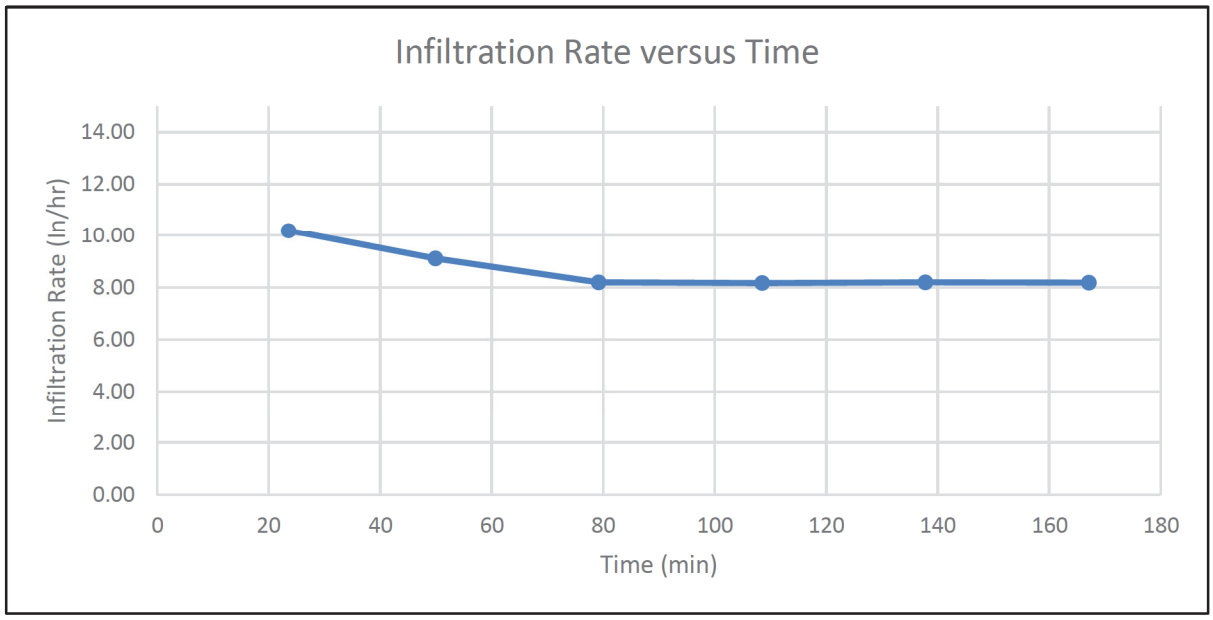



Plate P-3

# Percolation Test Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | American Jewish University | | | | Project No. | 7588 | Date: 12/8/2022 |
| Test Hole No. | TP-4 | Tested By: | JLV | Dug By: | JLV | | |
| Depth of Boring, H (ft): | 1 | USCS Soil Classification | | | Aggregate Correction, e (Void Ratio) | | N/A |
| Test Hole Dimensions (foot) | | Length (if rectangular): | | 1 | Width (if rectangular): | 1 | |

| Trial No. | Δt, Time Interval (min.) | Hi, Initial Depth to Water (in.) | Hf, Final Depth to Water (in.) | ΔHw, Change in Water Level (in.) | Flow Rate (in^3/hr.) | Wet Surface Area (in^2) | Infiltration Rate (in/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 26.5 | 0 | 12.00 | 12.00 | 3912.45 | 432.00 | 9.06 |
| 2 | 29.01 | 0 | 12.00 | 12.00 | 3573.94 | 432.00 | 8.27 |
| 3 | 29.36 | 0 | 12.00 | 12.00 | 3531.34 | 432.00 | 8.17 |
| 4 | 29.45 | 0 | 12.00 | 12.00 | 3520.54 | 432.00 | 8.15 |
| 5 | 30 | 0 | 12.00 | 12.00 | 3456.00 | 432.00 | 8.00 |
| 6 | 30 | 0 | 12.00 | 12.00 | 3456.00 | 432.00 | 8.00 |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

## CALCULATION:

| | | | | | |
|---|---|---|---|---|---|
| Falling Head Flow Rate= ΔHw*(L*W)/(Δt) | | | | Wet Surface Area* = (W+L)*2*(H-(Hi+Hf)/2)+(W*L) | |
| Infiltration Rate=Falling Head Flow Rate/Wet Surface Area | | | | Percolation Rate= Infiltration Rate/Reduction Factor | |
| Average Infiltration Rate= | 8.00 | in/hr | Reduction Factor**= | 3.06 | |

| | | |
|---|---|---|
| Percolation Rate= | **2.61** | in/hr |
| > 0.5? | **Yes** | |

**Reduction Factor is the result of the Infiltration Safety Factor Determination Worksheet

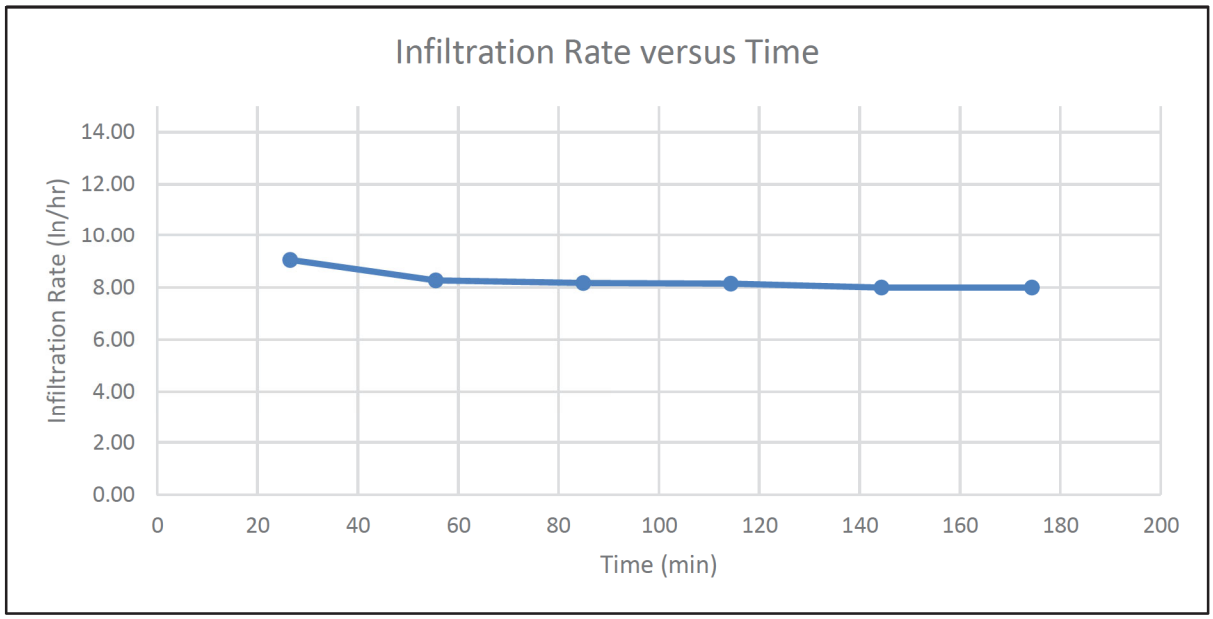



Plate P-4

# Percolation Test Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | American Jewish University | | | | Project No. | 7588 | Date: 12/8/2022 |
| Test Hole No. | TP-5 | Tested By: | JLV | Dug By: | JLV | | |
| Depth of Boring, H (ft): | 1 | USCS Soil Classification | | | Aggregate Correction, e (Void Ratio) | | N/A |
| Test Hole Dimensions (foot) | | Length (if rectangular): | | 1 | Width (if rectangular): | 1 | |

| Trial No. | Δt, Time Interval (min.) | Hi, Initial Depth to Water (in.) | Hf, Final Depth to Water (in.) | ΔHw, Change in Water Level (in.) | Flow Rate (in^3/hr.) | Wet Surface Area (in^2) | Infiltration Rate (in/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 18.23 | 0 | 12.00 | 12.00 | 5687.33 | 432.00 | 13.17 |
| 2 | 19.25 | 0 | 12.00 | 12.00 | 5385.97 | 432.00 | 12.47 |
| 3 | 19.31 | 0 | 12.00 | 12.00 | 5369.24 | 432.00 | 12.43 |
| 4 | 19.25 | 0 | 12.00 | 12.00 | 5385.97 | 432.00 | 12.47 |
| 5 | 20.51 | 0 | 12.00 | 12.00 | 5055.10 | 432.00 | 11.70 |
| 6 | 21.06 | 0 | 12.00 | 12.00 | 4923.08 | 432.00 | 11.40 |
| 7 | 21.31 | 0 | 12.00 | 12.00 | 4865.32 | 432.00 | 11.26 |
| 8 | 21.34 | 0 | 12.00 | 12.00 | 4858.48 | 432.00 | 11.25 |
| 9 | 21.36 | 0 | 12.00 | 12.00 | 4853.93 | 432.00 | 11.24 |
| 10 | 21.36 | 0 | 12.00 | 12.00 | 4853.93 | 432.00 | 11.24 |

**CALCULATION:**

| | | | | | |
|---|---|---|---|---|---|
| Falling Head Flow Rate= ΔHw*(L*W)/(Δt) | | | | Wet Surface Area* = (W+L)*2*(H-(Hi+Hf)/2)+(W*L) | |
| Infiltration Rate=Falling Head Flow Rate/Wet Surface Area | | | | Percolation Rate= Infiltration Rate/Reduction Factor | |
| Average Infiltration Rate= | 11.45 | in/hr | Reduction Factor**= | 3.06 | |

| | | |
|---|---|---|
| Percolation Rate= | **3.74** | in/hr |
| > 0.5? | **Yes** | |

**Reduction Factor is the result of the Infiltration Safety Factor Determination Worksheet

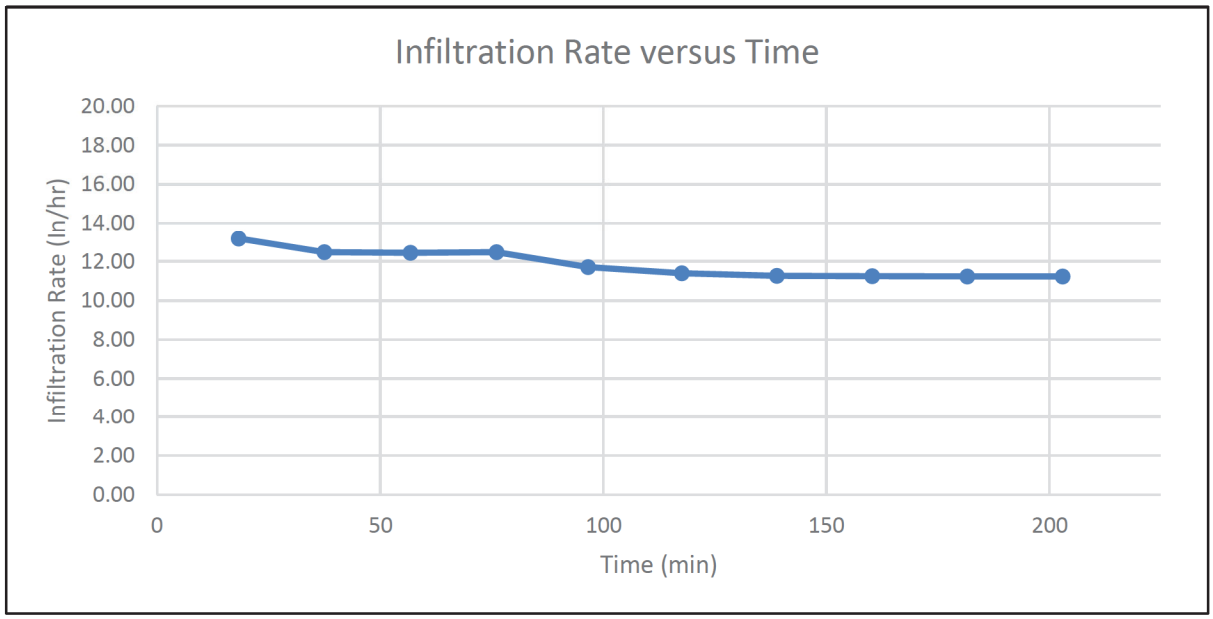



Plate P-5

# Percolation Test Data Sheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project | American Jewish University | | | | Project No. | 7588 | Date: 12/8/2022 |
| Test Hole No. | TP-6 | Tested By: | JLV | Dug By: | JLV | | |
| Depth of Boring, H (ft): | 1 | USCS Soil Classification | | | Aggregate Correction, e (Void Ratio) | | N/A |
| Test Hole Dimensions (foot) | | Length (if rectangular): | | 1 | Width (if rectangular): | 1 | |

| Trial No. | Δt, Time Interval (min.) | Hi, Initial Depth to Water (in.) | Hf, Final Depth to Water (in.) | ΔHw, Change in Water Level (in.) | Flow Rate (in^3/hr.) | Wet Surface Area (in^2) | Infiltration Rate (in/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 30 | 0 | 10.00 | 9.50 | 2736.00 | 480.00 | 5.70 |
| 2 | 30 | 0 | 9.50 | 9.50 | 2736.00 | 492.00 | 5.56 |
| 3 | 30 | 0 | 9.50 | 9.25 | 2664.00 | 492.00 | 5.41 |
| 4 | 30 | 0 | 9.25 | 9.25 | 2664.00 | 498.00 | 5.35 |
| 5 | 30 | 0 | 9.25 | 9.25 | 2664.00 | 498.00 | 5.35 |
| 6 | 30 | 0 | 9.25 | 9.25 | 2664.00 | 498.00 | 5.35 |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

**CALCULATION:**

| | | | | | |
|---|---|---|---|---|---|
| Falling Head Flow Rate= ΔHw*(L*W)/(Δt) | | | | Wet Surface Area* = (W+L)*2*(H-(Hi+Hf)/2)+(W*L) | |
| Infiltration Rate=Falling Head Flow Rate/Wet Surface Area | | | | Percolation Rate= Infiltration Rate/Reduction Factor | |
| Average Infiltration Rate= | 5.35 | in/hr | Reduction Factor**= | 3.06 | |

| | | |
|---|---|---|
| Percolation Rate= | **1.75** | in/hr |
| > 0.5? | **Yes** | |

**Reduction Factor is the result of the Infiltration Safety Factor Determination Worksheet

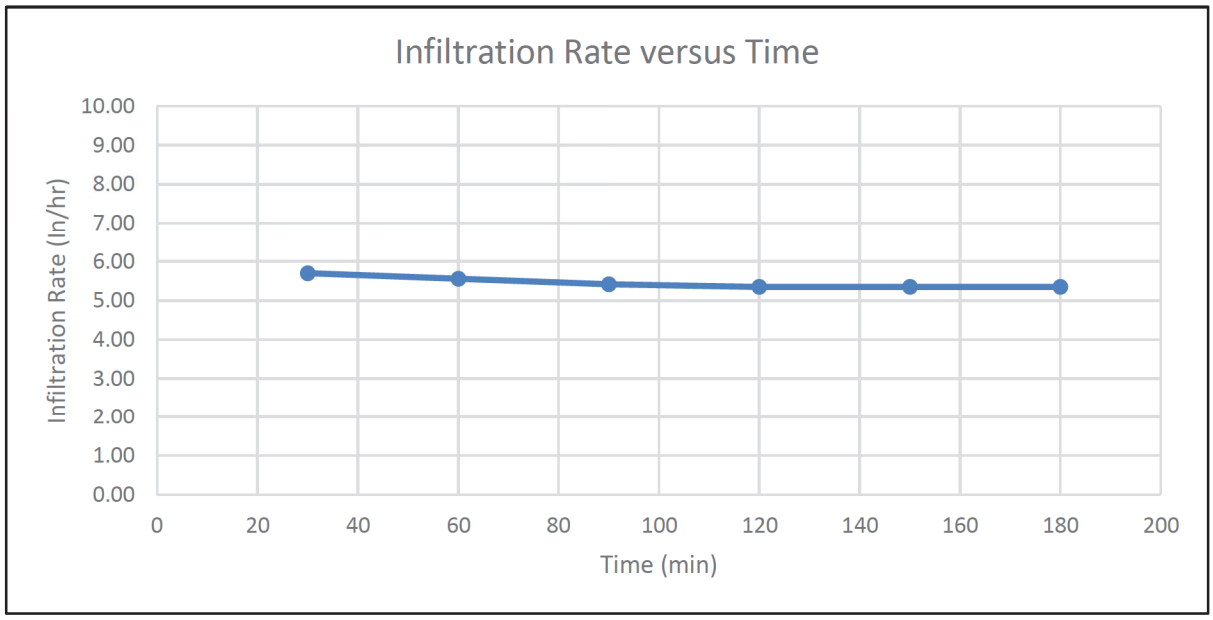



Plate P-6

| Infiltration Safety Factor Determination Table | | | | | Date<br>8-Dec<br>W.O.<br>7588 |
|---|---|---|---|---|---|
| **Factor Category** | | **Factor Description** | **Assigned Weight (w)** | **Factor Value (v)** | **Product (p) p=w*v** |
| **A** | **Suitability Assessment** | Soil assessment methods | 0.25 | 1 | 0.25 |
| | | Predominant soil texture | 0.25 | 2 | 0.5 |
| | | Site soil variability | 0.25 | 2 | 0.5 |
| | | Depth to groundwater / impervious layer | 0.25 | 2 | 0.5 |
| | | Suitability Assessment Safety Factor, $S_A = \sum p$ | | | 1.75 |
| **B** | **Design** | Tributary area size | 0.25 | 2 | 0.5 |
| | | Level of pre-treatment / expected sediment loads | 0.25 | 2 | 0.5 |
| | | Redundancy | 0.25 | 1 | 0.25 |
| | | Compaction during construction | 0.25 | 2 | 0.5 |
| | | Design Safety Factor $S_A = \sum p$ | | | 1.75 |
| | | **Combined Safety Factor = $S_A$ x $S_B$** | | | **3.06** |

GeoSoils Consultants Inc.
GEOTECHNICAL ENGINEERING / ENGINEERING GEOLOGY

June 15, 2023
W.O. 7588

AMERICAN JEWISH UNIVERSITY
c/o Mr. Jon Friedman
Jemstreet Properties
612 Lone Oak Drive
Thousand Oaks, California 91362

Attention: Mr. Adrian Breitfeld

**Subject: Response to Geotechnical Engineering Portion of County Stormwater Program Section Third Submittal Review – PL22-0032, Brandeis Bardin Campus, 1101 Peppertree Lane (APN 685-0-051-040, -050, -140, -190, -210), dated May 22, 2023**

Dear Mr. Breitfeld,

As requested, GeoSoils Consultants, Inc. (GSC) has prepared this response to the geotechnical engineering portion of the subject review letter (copy attached). The following comment is addressed:

The applicant is required to submit a geotechnical report, including infiltration testing results or technical infeasibility analysis, as defined in the TGM. It is noted that the applicant submitted infiltration testing results; however, infiltration testing appears to have been completed to a maximum depth of four feet below the existing ground surface. The TGM requires infiltration testing to extend 11 feet beneath the invert elevation of proposed infiltration BMPs. The applicant may submit additional documentation of infiltration testing or adjust accordingly in the Infiltration Safety Factor Worksheet.

The infiltration testing included in the referenced report was performed in shallow test pits using the 1'x1'x1' method near the bottom of the proposed BMP. Testing to a depth of 11 feet would have required a very large excavation for this method. Previously borings excavated nearby encountered refusal due to a high number of cobbles and boulders within the alluvial soils; therefore, the boring method of testing was not performed. Review of



6634 Valjean Avenue, Van Nuys, California 91406 Phone: (818) 785-2158 Fax: (818) 785-1548

Borings B-1 through B-4 (Plates A-1 through A-4) excavated in the subject area (Plate 1) encountered similar soil to the maximum depth of the excavations. As a result, the infiltration rates within the referenced report are considered appropriate for the site.

We appreciate this opportunity to be of service to you. If you have any questions regarding the content of this report or any other aspects of the project, please do not hesitate to contact us.

Sincerely,

GEOSOILS CONSULTANTS, INC.

RUDY F. RUBERTI
CEG 1708

KAREN L. MILLER
GE 2257

Encl: References
County of Ventura Response Letter dated May 22, 2023
Plate 1, Test Pit Location Map
Plates A-1 through A-4, Boring Logs dated March 21, 2022

cc: (1) Addressee

MDN 23593

## REFERENCES

1. GeoSoils Consultants, Inc., dated March 31, 2022, "Geologic and Geotechnical Engineering Investigation, Proposed Cabins and Welcome Center, Brandeis-Bardin Campus, Simi Valley, California"

2. GeoSoils Consultants, Inc., dated July 12, 2022, "Response to County of Ventura Geology Portion of the Incompleteness Letter dated April 22, 2022, Proposed Cabins and Welcome Center, Brandeis-Bardin Campus, Simi Valley, California"

3. GeoSoils Consultants, Inc., dated December 7, 2022, "Infiltration Testing for Proposed LID Locations, Brandeis-Bardin Campus, Simi Valley, California"

**Ventura County Public Works Agency**
**Watershed Protection**
**County Stormwater Program**

**MEMORANDUM**

---

**DATE:** **May 22, 2023**

**TO:** **Michael Conger, Planning Division**

**FROM:** **Hayley Luna, Water Quality Engineer** HL

**SUBJECT:** **County Stormwater Program Section Third Submittal Review – PL22-0032, Brandeis Bardin Campus, 1101 Peppertree Lane (APN 685-0-051-040, -050, -140, -190, -210)**

The County Stormwater Program has reviewed the third submittal materials and provides the following comments.

The application is for the modification of Conditional Use Permit (CUP) 1776 for the Brandeis Bardin Campus located at 1101 Peppertree Lane, adjacent to the City of Simi Valley and the Santa Susanna Knowles Area. The proposed project included the construction of thirteen new camper cabins, three new counselor cabins, a new welcome center with a parking lot, an art pavilion addition, and a covered patio. Some demolition work will also occur. This submittal included a Drainage Report, Stormwater Quality Analysis, and Low Impact Development, prepared by Stantec Consulting Services, Inc., and a Meier Canyon Creek Floodplain Study, prepared by Stantec Consulting Services.

The project is not located within the unincorporated urban area or a high-risk area. The application did not include a total for estimated disturbed acreage or total proposed impervious surface; however, the disturbed and impervious areas appear to exceed one acre.

## APPLICATION COMPLETENESS

**INCOMPLETE**

## DISCRETIONARY REVIEW CHECKLIST

☒ Project location

☒ Project description, including indication of the purpose of the facility and if the project is new development or redevelopment, as defined by the Ventura County Technical Guidance Manual for Stormwater Quality Control Measures (TGM)

☐ Disturbed area for construction (total)

☐ Amount of existing impervious surface, as defined by the TGM, and proposed impervious surface to be created/added/replaced

☐ Average existing slopes on-site to be graded

☐ Geotechnical report, including infiltration testing results or technical infeasibility analysis, as defined in the TGM

☒ Conceptual site plans that include drainage areas, environmentally sensitive areas, open space preservation areas, impervious areas, natural hydrologic features, locations of discharges, topography, potential pollutant areas, and location and types of post-construction control measures

☐ PCSMP output from the applicable sections of the TGM Tool

- It is noted that a spreadsheet error exists in Step 5e of the TGM Tool available for download at vcstormwater.org. A corrected version of the TGM Tool is available from the Ventura County Public Works Agency – County Stormwater Program upon request; please contact Hayley Luna at Hayley.Luna@ventura.org to request a copy of this version of the TGM Tool.

☐ Post-construction control measure sizing calculations

Note:
☒ submitted
☐ missing/incomplete

## COMMENTS

- It is noted that Table 2 of the submitted Drainage Report indicated the proposed disturbed and impervious areas; however, the units presented in the table appear to be incorrect. It is assumed that the values presented as square feet actually represent acres proposed.
- The applicant shall provide the average existing slopes on-site in the area to be graded.
- The applicant is required to submit a geotechnical report, including infiltration testing results or technical infeasibility analysis, as defined in the TGM. It is noted that the applicant submitted infiltration testing results; however, infiltration testing appears to have been completed to a maximum depth of four feet below the existing ground surface. The TGM requires infiltration testing to extend 11 feet beneath the invert elevation of proposed infiltration BMPs. The applicant may submit additional documentation of infiltration testing or adjust accordingly in the Infiltration Safety Factor Worksheet.
- The applicant appears to propose a biofiltration BMP (e.g., bioswale) to treat part of the proposed development; however, documentation of technical infeasibility was not provided. The applicant is required to implement infiltration/retention BMPs unless the project meets the technical infeasibility criteria defined by the TGM. It is noted that biofiltration BMPs must be sized to 150% of the SQDV/SQDF.
- The applicant does not appear to propose treatment of the allowable EIA. It is noted that the TGM requires treatment of the allowable EIA; however, treatment control measures appropriate for the expected pollutant loading are acceptable.
- The applicant shall submit PCSMP output from the applicable sections of the TGM Tool.
    - It is noted that a spreadsheet error exists in Step 5e of the TGM Tool available for download at vcstormwater.org. A corrected version of the TGM Tool is available from the Ventura County Public Works Agency – County Stormwater Program upon request; please contact Hayley Luna at Hayley.Luna@ventura.org to request a copy of this version of the TGM Tool.
- The applicant submitted post-construction stormwater control measure sizing calculations, per the guidance in the TGM. The following comments are provided on the sizing calculations:
    - Data presented in the LID Summary Table does not match all of the data used in the sizing calculations (e.g., area for 1B, SQDF for 7A, etc.).

- Rainwater harvesting volume appears to be calculated as a total for multiple areas and proposed cisterns; however, the applicant will need to demonstrate that each cistern is properly sized for the required volume for the impervious area that it treats.
- Given the surrounding terrain, the mountainous region constant drawdown figure may be more appropriate for the rainwater harvesting calculations.
- Estimated daily demand for use of water harvested shall be addressed, on a conceptual level, and the applicant shall clarify alternative BMPs that will be used, if demand is later shown to be insufficient.
- Pretreatment for each of the infiltration BMPs does not appear to be addressed; however, it is required by the TGM for all infiltration BMPs.
- The proposed bioswale slope appears to exceed that allowable by the TGM's design standards. The TGM's design standards apply to all proposed BMPs.
- The Infiltration Safety Factor Worksheet indicates a high level of redundancy in the proposed design, but it is unclear which aspect of the design achieves this redundancy.
- There appear to be multiple miscalculations throughout the sizing calculations. It is unclear if the proposed BMPs are properly sized.
- It is noted that the applicant shall use a runoff coefficient of 0.95 for impervious areas. If the applicant uses a composite runoff coefficient for SQDV/SQDV, the pervious areas must be included in the area.

Please contact Jill Jennings with any questions at (805) 645-5051 or Jill.Jennings@ventura.org.

# GEOTECHNICAL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME** | **American Jewish University** | | | **W.O.** | **7588** |
| DRILLING COMPANY | Choice Drillig | DATE STARTED | 3/21/2022 | BORING NO. | B-1 |
| TYPE OF DRILL RIG | Truck Mounted | LOGGED BY | JM | SHEET | |
| DRILLING METHOD | Hollow Stem | HAMMER WT (lbs) | 140 | GROUND ELEV. | |
| DIAMETER OF HOLE (IN) | 8 | DROP (IN) | 30 | GW ELEV. | |

Boring Location:

| Depth (ft) | Sample Type | Blows / 6" | GEOTECHNICAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | Other Tests |
|---|---|---|---|---|---|---|
| 0 | | | **0-5', OLDER ALLUVIUM** | | | |
| | | 22/35/23 | 2.5', No recovery | | | |
| 5 | | 50 for 5" | 5', Gray brown, dobble and sandy gravel, dry, likely disturbed | | | |
| | | | TD=5' | | | |
| | | | Refusal | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

**LEGEND**

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE: Grain Size Analysis
MAX: Maximum Dry Density
DS: Direct Shear
CONS: Consolidation
HYDR: Hydrometer Analysis
EXPAN: Expansion Index
CHEM: Chemical Tests

PLATE **A-1**

GSC GeoSoils Consultants Inc.
GEOTECHNICAL · GEOLOGIC · ENVIRONMENTAL

# GEOTECHNICAL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME** | **American Jewish University** | | | **W.O.** | **7588** |
| DRILLING COMPANY | Choice Drillig | DATE STARTED | 3/21/2022 | BORING NO. | B-2 |
| TYPE OF DRILL RIG | Truck Mounted | LOGGED BY | JM | SHEET | |
| DRILLING METHOD | Hollow Stem | HAMMER WT (lbs) | 140 | GROUND ELEV. | |
| DIAMETER OF HOLE (IN) | 8 | DROP (IN) | 30 | GW ELEV. | |

Boring Location:

| Depth (ft) | Sample Type | Blows / 6" | GEOTECHNICAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | Other Tests |
|---|---|---|---|---|---|---|
| 0 | | | **0-10', OLDER ALLUVIUM** | | | |
| 5 | | 7/15/12 | 5', Gray brown, fine, gravelly, silty sand, dry, medium dense | | | |
| | | 6/9/15 | 7.5', Gray brown, fine, gravelly, silty sand, dry, medium dense | | | |
| 10 | | 22/50 | 10', Gray, sandy gravel and cobble, dry, medium dense | | | |
| | | | TD=10' | | | |
| | | | Refusal | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

**LEGEND**

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE: Grain Size Analysis
MAX: Maximum Dry Density
DS: Direct Shear
CONS: Consolidation
HYDR: Hydrometer Analysis
EXPAN: Expansion Index
CHEM: Chemical Tests

PLATE **A-2**

GSC GeoSoils Consultants Inc.
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# GEOTECHNICAL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME** | **American Jewish University** | | | **W.O.** | **7588** |
| DRILLING COMPANY | Choice Drillig | DATE STARTED | 3/21/2022 | BORING NO. | B-3 |
| TYPE OF DRILL RIG | Truck Mounted | LOGGED BY | JM | SHEET | |
| DRILLING METHOD | Hollow Stem | HAMMER WT (lbs) | 140 | GROUND ELEV. | |
| DIAMETER OF HOLE (IN) | 8 | DROP (IN) | 30 | GW ELEV. | |

Boring Location:

| Depth (ft) | Sample Type | Blows / 6" | GEOTECHNICAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | Other Tests |
|---|---|---|---|---|---|---|
| 0 | | | 2.5', Refusal due to cobble | | | |
| | | | TD=2.5' | | | |
| 5 | | | | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

**LEGEND**

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE: Grain Size Analysis
MAX: Maximum Dry Density
DS: Direct Shear
CONS: Consolidation
HYDR: Hydrometer Analysis
EXPAN: Expansion Index
CHEM: Chemical Tests

PLATE **A-3**

GSC GeoSoils Consultants Inc.
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# GEOTECHNICAL BORING LOG

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT NAME** | **American Jewish University** | | | **W.O.** | **7588** |
| DRILLING COMPANY | Choice Drillig | DATE STARTED | 3/21/2022 | BORING NO. | B-4 |
| TYPE OF DRILL RIG | Truck Mounted | LOGGED BY | JM | SHEET | |
| DRILLING METHOD | Hollow Stem | HAMMER WT (lbs) | 140 | GROUND ELEV. | |
| DIAMETER OF HOLE (IN) | 8 | DROP (IN) | 30 | GW ELEV. | |

Boring Location:

| Depth (ft) | Sample Type | Blows / 6" | GEOTECHNICAL DESCRIPTION | Moisture Content (%) | Dry Density (pcf) | Other Tests |
|---|---|---|---|---|---|---|
| 0 | | | | | | |
| 5 | | | 5', Refusal due to cobble | | | |
| | | | TD=5' | | | |
| 10 | | | | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25 | | | | | | |
| 30 | | | | | | |

**LEGEND**

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE: Grain Size Analysis
MAX: Maximum Dry Density
DS: Direct Shear
CONS: Consolidation
HYDR: Hydrometer Analysis
EXPAN: Expansion Index
CHEM: Chemical Tests

PLATE **A-4**

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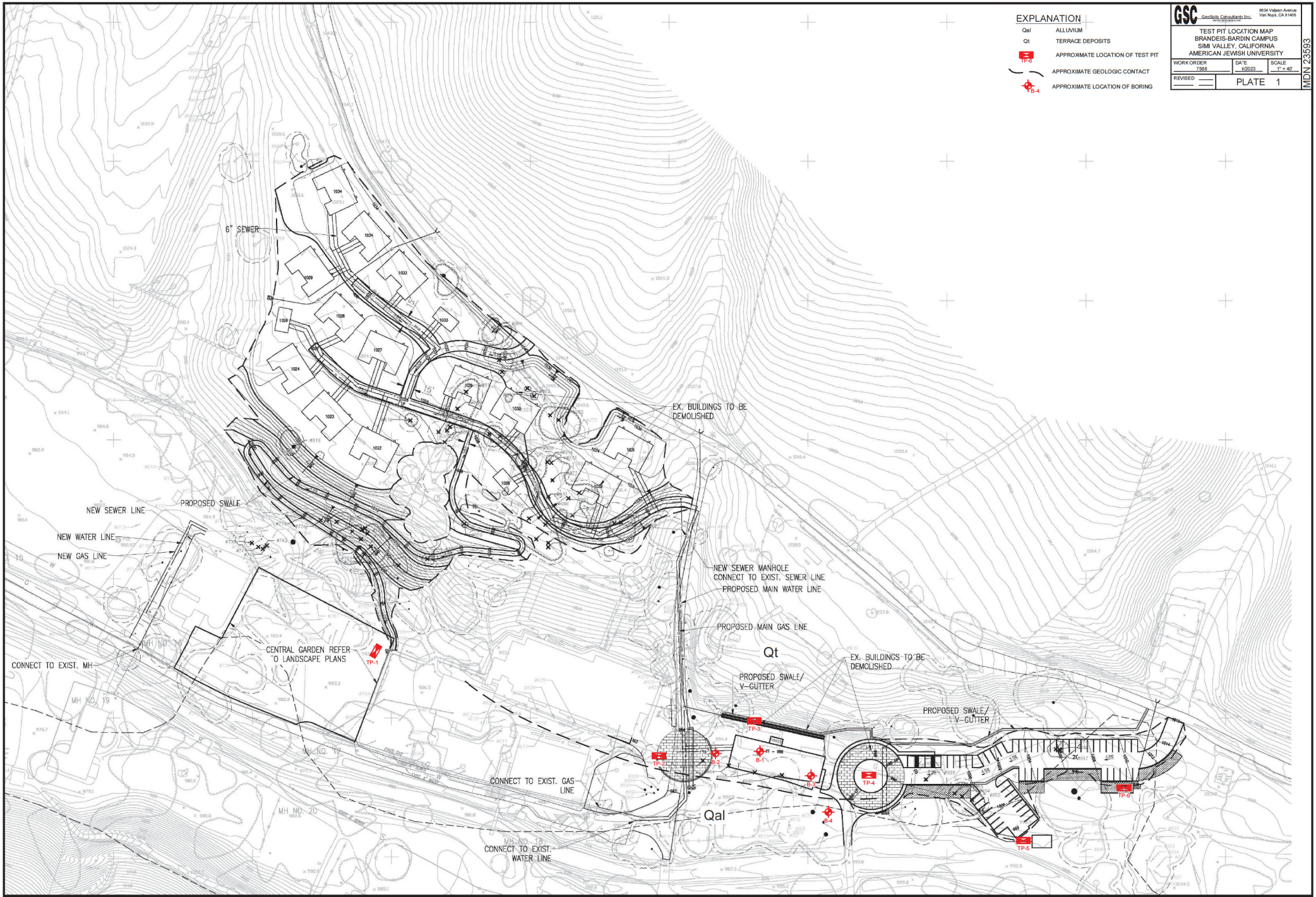


GSC GeoSoils Consultants Inc.
6634 Valjean Avenue
Van Nuys, CA 91406

TEST PIT LOCATION MAP
BRANDEIS-BARDIN CAMPUS
SIMI VALLEY, CALIFORNIA
AMERICAN JEWISH UNIVERSITY

| WORK ORDER | DATE | SCALE |
|---|---|---|
| 7588 | 1/2023 | 1" = 40' |

REVISED

PLATE 1

MDN 23593

Note

Revision By Appd YYYY.MM.DD

Issued By Appd YYYY.MM.DD

Permit/Seal

**PRELIMINARY NOT FOR CONSTRUCTION**

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Consultant

Stantec

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Tel: (626) 796-9141
www.stantec.com

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Client/Project Logo

Client/Project
AMERICAN JEWISH UNIVERSITY-
BRANDEIS-BARDIN CAMPUS

CAMP ALONIM
MODIFICATION TO C.U.P. 1776

1101 PEPPERTREELANE, BRANDEIS, CA 93064

File Name: d:\4000C-XX\7088 Dwn. Dsgn. Chkd. 03/17/2022 YYYY.MM.DD

Title
PRELIMINARY SITE GRADING PLAN

Project No. 000000000
Scale

Revision Sheet 1 of 1
Drawing No.

X:\2001 to Ongoing\7088C-19-21\Grading\PLATES 0-19-21\Dwg-PLT\5-2023 12:12:06 PM, AutoCAD PDF (General Documentation).pc3

# APPENDIX G

## PCSMP OUTPUT

**VENTURA COUNTYWIDE STORMWATER QUALITY PROGRAM**
**POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN (PCSMP)**

## INSTRUCTIONS

► The following set of spreadsheets are intended to assist project applicants in meeting the Planning and Land Development requirements contained in Part 4, Section E of the Los Angeles Regional Water Quality Control Board's municipal separate storm sewer system (MS4) permit (Order R4-2010-0108) for new development and redevelopment projects.

► The spreadsheets are not intended to replace the Technical Guidance Manual (TGM). The TGM is referenced in multiple locations and should be consulted for additional guidance on complying with the Planning and Land Development requirements. Specifically, definitions and details on site assessment and BMP selection can be found in the TGM.

► The 0.75-inch storm event (TGM Methodology #3) is used as the stormwater quality design volume (SQDV) throughout the workbook; applicants should not use this workbook if using a methodology other than Methodology #3.

► Project applicants should fill out each applicable spreadsheet; when complete, make sure to print "entire workbook."

► A few additional tips:
- All green boxes denote a numeric input.
- Blue cells indicate that text should be included.
- Follow prompts where applicable.
- When finished filling out the applicable steps, go to "Submittal List" for additional required project submittals.
- The spreadsheet is locked, restricting input only to certain cells. Unlocking the spreadsheet is not recommended and may lead to errors, but if necessary, the password to unlock all sheets is "PCSMP" (case sensitive).

**VENTURA COUNTYWIDE STORMWATER QUALITY PROGRAM**
**POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN (PCSMP)**
**FOR**
**Camp Alonim Modification**
**PARCEL #:** [redacted]

**Project Name:** Camp Alonim Modification

**Preparation/Revision Date:** **8/17/2023**

**Prepared for:**

Name of Owner/Developer: American Jewish University, Brandeis-Bardin Ca
Stress Address: 1101 Peppertree Lane
City, State, Zip Code: Brandeis, CA, 93064
Telephone: [redacted]

**Prepared by:**

Name and Title of Preparer: Pierre Augustin, EIT
Company Name: Stantec Consulting
Stress Address: 300 N Lake Ave, Suite 400
City, State, Zip Code: Pasadena, CA, 91101
Telephone: 6267969141

I hereby certify that the information provided in this Application is correct.

Application Prepared by: Shawn Blanton
Print Name and Firm

Signed _____
Signature of Project Engineer in the Firm Named Above

Title _____
Affix Professional registration stamp of the person named above with signature and expiration date

**Project Name:** Camp Alonim Modification

**STEP 1: DETERMINE PROJECT APPLICABILITY**

*Instructions:*
*For new development projects, answer yes, no, or NA to questions (1) - (10) below.*
*For redevelopment projects , answer yes, no, or NA to questions (11) - (13) below.*

| **NEW DEVELOPMENT PROJECTS** | |
|---|---|
| *Does the new development project fall within categories (1) - (10) below?* | |
| **Project Type and/or Characteristics** | **Y/N/NA** |
| 1) Development projects equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area<br>**→go to Step 2** | Y |
| 2) Industrial parks with 10,000 square feet or more of total altered surface area<br>**→go to Step 2** | N/A |
| 3) Commercial strip malls with 10,000 square feet or more of impervious surface area<br>**→go to Step 2** | N/A |
| 4) Retail gasoline outlets with 5,000 square feet or more of total altered surface area<br>**→go to Step 2** | N/A |
| 5) Restaurants (Standard Industrial Classification (SIC) of 5812) with 5,000 square feet or more of total altered surface area<br>**→go to Step 2** | N/A |
| 6) Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces<br>**→go to Step 2** | Y |
| 7) Streets, roads, highways, and freeway construction of 10,000 square feet or more of impervious surface area<br>**→ go to Roadway Projects** | Y |
| 8) Automotive service facilities (Standard Industrial Classification (SIC) of 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) of 5,000 square feet or more of total altered surface area<br>**→go to Step 2** | N/A |
| 9) Projects located in or directly adjacent to, or discharging directly to an Environmentally Sensitive Area (ESA), where the development will:<br>a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and<br>b. Create 2,500 square feet or more of impervious surface area<br>**→go to Step 2** | Y |
| 10) Single-family hillside homes (see Section 2 of the TGM for specific requirements)<br>**→go to SF Hillside** | N |

**Project Name:** Camp Alonim Modification

**PROJECT APPLICABILITY, CONT.**

| **REDEVELOPMENT PROJECTS** | |
|---|---|
| *For redevelopment projects that fall within categories (1) through (9) above, and that conduct land-disturbing activities that result in the creation, or addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site, answer questions 11-13 below.Existing single-family dwelling and accessory structures are exempt from redevelopment projects unless such projects create, add, or replace 10,000 square feet of impervious surface area.* | |
| **Project Type and/or Characteristics** | **Y/N/NA** |
| 11) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to the post development stormwater quality control requirements of Board Order 00-108, these projects must mitigate the entire redevelopment project area<br>**→go to Step 2** | N |
| 12) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to the post development stormwater quality control requirements of Board Order 00-108, the project must mitigate only the altered portion of the redevelopment project area and not the entire project area<br>**→go to Step 2** | N/A |
| 13) Projects where redevelopment results in an alteration of less than fifty percent of impervious surfaces of a previously existing development these projects must mitigate only the altered portion of the redevelopment project area and not the entire project area<br>**→go to Step 2** | N/A |

**Project Name:** Camp Alonim Modification

**STEP 2: ASSESS SITE CONDITIONS**

*Provide an assessment of the project site using the following tables*

**New Development Project General Characteristics**

| General Project Characteristics | Area (acres) |
|---|---|
| Total Project Site Area | 7.00 |
| Total Disturbed Area | 7.00 |
| Total Existing (Pre-Project) Impervious Area | 0.48 |
| Post-Project Impervious Area [1] | 2.47 |
| Area of Green Roof (ET-1) [1] | 0.00 |
| Area Draining to Hydrologic Source Controls (ET-2) [1] | 0.00 |
| Revised Post-Project Impervious Area | 2.47 |
| Project Imperviousness (%) | 35.29% |

**Redevelopment Project General Characteristics**

| General Project Characteristics | Area (acres) |
|---|---|
| Total Project Site Area | |
| Total Altered Area [6] | |
| Total Existing (Pre-Project) Impervious Area | |
| Was existing (pre-project) impervious area subject to post-development stormwater quality control requirements? [2] | |
| Amount of Existing Impervious Area Altered [3] | |
| Amount of Impervious Area Added | |
| % Alteration of Existing Impervious Area [4] | N/A |
| Post-Project Impervious Area (Impervious Area to be Mitigated) [1], [4] | 0.00 |
| Area of Green Roof (ET-1) [1] | |
| Area Draining to Hydrologic Source Controls (ET-2) [1] | |
| Revised Post-Project Impervious Area | 0.00 |
| Project Imperviousness (%) [5] | |

**Project Name:** Camp Alonim Modification

**Project Description**

| Briefly describe project: |
|---|
| The project will be the construction of cabins, visitor center building, parking lot, new dry and wet utilities installations, grading of existing site, proposed pathways and roadways. |
| Describe current and proposed zoning and land use designation: |
| The project will have no prospoed change to land use designation and zoning. The existing land use is "Rural" and the exisitng zoning is "RA" |
| Describe topography of project area. Identify low and high points and the location of steep slopes (provide a range of grades): |
| The project will have two improvements in two differnet locations, the west and the east. The western existing condition is mostly a barren land with an avergae slope of 10%. There are currently existing building on the land that will be demolished. The eastern location is also mostly a barren land on a mroe flat grade juts north of an existing creek. The highets elevation of the project is approximately around 1040 and the lowest around 995. |
| Describe the site's soil types (A, B, C, D) and geological conditions |
| The geotechnical report prepared by GeoSoils in 2021 have concluded that the site has site class D. The report also concluded that mainly ar<br>*Attach soil type information* |

**Project Name:** Camp Alonim Modification

**Project Description, cont'd**

| Describe the site's groundwater conditions (e.g. depth to seasonal high groundwater): |
|---|
| An infiltration test and report prepared by GeoSoils has concluded that groundwater level is between 12-14 feet below grade. They also tested that test pits were drained within 10 minutes and concluded that on-site infiltration is suitable. |

| Is there offsite drainage on the site? If so, identify the location(s) and source(s) of offsite drainage and the volume of water running onto the site: |
|---|
| All offsite drainage are coming from the upper stream watersheds. Proposed bypass inlet culverts are to be placed to catch the off-site runoff, they are located at the low points of the watershed streams north of High Rd. Please see the hydrology map preapred along with the hydrology report for locations and calculations. The bypass will eventually route the runoff to the existin creek on the south. This followed the existing runoff path. |
| Describe any existing utilities within the project area that would limit the possible locations of certain BMPs: |
| Existing utilities were not In conflict of any proposed BMP's locations. All existing utilities were on an existing road and some were abandoned. |
| Describe any environmentally sensitive areas (e.g. riparian areas, wetlands) within the project area: |
| The only sensitive area on the site project is the existing creek (Meier Canyon Creek) to the south of the improvements. There are also protected trees that limited the amount of space and grading of the project. |

| **Geotechnical considerations:** | |
|---|---|
| *Does the site contain any of the following characteristics:* | **Y/N/NA** |
| Collapsible Soil | N/A |
| Expansion Soil | N/A |
| Potential for seismically-inducted soil liquefaction | N |
| Additional considerations: | |
| | |
| *Attach relevant geotechnical information* | |

**Project Name:** Camp Alonim Modification

**STEP 2: POLLUTANTS OF CONCERN**

**Pollutants of Concern (See Section 3.3 of TGM)**

| Activity / Potential Land Uses | Potential Pollutant* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sediment | Nutrients | Metals | Pesticides | Oxygen Demanding Substances | Toxic Organics | Oil & Grease | Bacteria | Trash and Debris |
| Parking Lots | X | | X | | X | X | | | X |
| Street, road, or highway | X | | X | | X | X | | | X |
| Projects Located Within or Directly Adjacent to, or Dischargin | X | X | X | | X | X | | X | X |
| Other [fill in if necessary] | | | | | | | | | |
| Other [fill in if necessary] | | | | | | | | | |

*Denote potential pollutant with "x"

**Receiving Waterbody Listings (see Section 3.3. of TGM)**

| **Receiving Waterbody** (watershed indicated in parentheses) | **Constituent Group [7]** | **Distance to Project (ft)** |
|---|---|---|
| | | |
| | | |
| Rainwater down from the canyon on the north | | |

[1] Applicant should enter post-project impervious cover prior to accounting for green roof and hydrologic source control (HSC) credits. Volume reduction provided by green roofs and HSCs are accounted for implicitly in the sizing calcuations for BMPs by assuming the roof area covered by a green roof or the area draining to a HSC is pervious rather than impervious when caluclating the runoff coefficient for the site. Green roofs and HSCs are not required to be considered for all project locations and types. In order to obtain credit, Green Roofs and HSCs must be designed as specified in the TGM. Additional detail on Green Roofs (ET-1) and HSCs (ET-2) can be found in Section 6 of the TGM.

[2] Land-disturbing activity that results in the creation or addition or replacement of less than 5,000 square feet of impervious surface area on an already developed site, or that results in a decrease in impervious area which was subject to the post development stormwater quality control requirements of Board Order 00-108, is not subject to mitigation unless so directed by the local permitting agency

[3] Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of the facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, that does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Redevelopment also does not include the repaving of existing roads to maintain original line and grade.

[4] "% Alteration of Existing Impervious Area" determines the 50% threshold which is key in determining portion of site that must comply with post-construction requirements - see Step 1 redevelopment categories for more detail. The amount of "Post Project Impervious Area" that must adhere to post-construction requirements is dependant on 50% threshold

[5] "Project Imperviousness" is calculated using the "Total Project Area" except when redevelopment projects that must mitigate only the altered portion of the redevelopment project area. In this case, the "Total Disturbed Area" is used to calculate "Project Imperviousness"

[6] For the purposes of this calculation, Total Altered Area shall mean any area that is altered as a result of land disturbance, such as clearing, grading, grubbing, and excavation. This excludes areas used exclusively for temporary stockpiling.

[7] If a waterbody is listed for "toxicity" and the cause and/or contribution to toxicity is known, then the consituent group known to contribute to toxicity are listed here (in lieu of listing "toxicity")

**Project Name:** Camp Alonim Modification

## STEP 3: APPLY SITE DESIGN PRINCIPLES AND TECHNIQUES

*Provide a brief description of site design principles and techniques included within the proposed project site.*

| Site Design Measures [1] | Included? Y/N/NA | Brief Description of the Site Design Measure |
|---|---|---|
| Site Planning | Y | Site planning design of the proposed cabin, pathways, and parking lot were carefully placed to minimize existing land disturbances and removal of existing trees. |
| Protect and Restore Natural Areas | Y | The new proposed improvements will stay away and protect majority of the protected/heritage trees while also avoiding any disturbances on the existing creek to the south. |
| Minimize Land Disturbance | Y | Proposed improvements and design will minimize existing land disturbances, proposed grading and daylight lines were carefully designed with minimal disturbances. |
| Minimize Impervious Cover | N/A | |
| Apply LID at Various Scales | Y | LID BMP's are proposed at various locations of the proposed site to mitigate water from the increased impervious areas. Proposed BMP's will have pre-treatment system before infiltration. |
| Implement Integrated Water Resource Management Practices | Y | |

[1] Refer to Section 4.2 - 4.7 of the TGM for applicable Design Criteria.

**Project Name:** Camp Alonim Modification

## STEP 4: APPLY SOURCE CONTROL MEASURES

*Provide a brief description of the source control measures included in the proposed project site.*

| Site-Specific Source Control Measures[1] | Included? Y/N/NA | Brief Description of the Source Control Measure |
|---|---|---|
| S-1: Storm Drain Message and Signage | Y | Storm drain warnings and messasges will be applied on all proposed inlets and trench drain catch basins. Message/signage will be stenciled informing the prohibition of waste dumping into the inlets. |
| S-2: Outdoor Material Storage Area Design | N/A | |
| S-3: Outdoor Trash Storage and Waste Handling Area Design | Y | Screens and filters will be provided on all catch basins to screen out loose trash. Sigange informing to not dump hazardous materials will be posted on various locations. Owners will conduct debris cleanup maintenance often. |
| S-4: Outdoor Loading/Unloading Dock Area Design | N/A | |
| S-5: Outdoor Repair/Maintenance Bay Design | N/A | |
| S-6: Outdoor Vehicle /Equipment/ Accessory Washing Area Design | N/A | |
| S-7: Fueling Area Design | N/A | |
| S-8: Proof of Control Measure Maintenance | Y | |

[1] Refer to Fact Sheets in Section 5 of the TGM for detailed information and design criteria

**Project Name:** Camp Alonim Modification

**STEP 5: APPLY BMPS TO REDUCE EIA TO <=5%**

*New development and redevelopment projects (Categories 1-6, 8, and 9) must reduce EIA to <=5%*

**Step 5a: Calculate Allowable EIA**

EIA is defined as impervious area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume.

The allowable "EIA" for a project is calculated as:

$$EIA_{allowable} = (A_{project})*(\%_{allowable}) \quad \text{Equation 2-1}$$

Where:

$EIA_{allowable}$ = The maximum impervious area from which runoff can be treated and discharged offsite (and not retained onsite) [acres]

$A_{project}$ = The total project area [acres] [1]

$\%_{allowable}$ = 5 percent

| Input: | | Units |
|---|---|---|
| $A_{project}$ [1] | 7.00 | Acres |
| $\%_{allowable}$ | 5.00% | Percent |
| $EIA_{allowable}$ | **0.35** | Acres |

**Step 5b: Calculate Impervious Area to be Retained**

The impervious area from which runoff must be retained onsite is the total impervious area minus the EIA allowable, which should be calculated as follows:

$$A_{retain} = TIA - EIA_{allowable} = (IMP*A_{project}) - EIA_{allowable} \quad \text{Equation 2-2}$$

Where:

$A_{retain}$ = the drainage area from which runoff must be retained [acres]

TIA = total impervious area [acres]

IMP = imperviousness of project area (%)

| Input: | | Units |
|---|---|---|
| Imperviousness | 35.29% | |
| $A_{project}$ [1] | 7.00 | Acres |
| $EIA_{allowable}$ | 0.35 | Acres |
| $A_{retain}$ | **2.12** | Acres |

**Project Name:** Camp Alonim Modification

**BMPS TO REDUCE EIA TO <=5%, CONT.**

**Step 5c: Calculate the Volume to be Retained (SQDV)**

The runoff volume that is to be retained onsite should be calculated using Equation 2-3 below:

$$V_{retain} = C*(0.75/12)*A_{retain} \qquad \text{Equation 2-3}$$

Where:

$V_{retain}$ = The stormwater quality design volume (SQDV) that must be retained onsite [ac-ft]

C = runoff coefficient (equals 0.95 for impervious surfaces)

| Input: | | Units |
|---|---|---|
| C | 0.95 | |
| $A_{retain}$ | 2.12 | Acres |
| $V_{retain}$ | 0.126 | ac-ft |
| | 41,016.8 | gallons |
| | 5,483.1 | cu.ft. |

*Continue to Step 5d*

**Project Name:** Camp Alonim Modification

**STEP 5d: SELECT RETENTION BMPs**

*Select and size Retention BMPs to meet the 5% EIA Requirement. Retention BMPs include INF1-6, RWH-1, and ET 1 and 2. See TGM, Section 6 for more information.*

| Retention BMPs | Included? Y/N | Drainage Area Retained (acres) [2] | Drainage Area Runoff Coefficient | Volume Retained (SQDV) (ac-ft) [1],[2] | If not applicable, state brief reason |
|---|---|---|---|---|---|
| *Infiltration BMPs* | | | | | |
| INF-1: Infiltration Basin | Y | 1.90 | 0.95 | 0.113 | |
| INF-2: Infiltration Trench | N | | 0.95 | | |
| INF-3: Bioretention | N | | 0.95 | | |
| INF-4: Drywell | N | | 0.95 | | |
| INF-5: Permeable Pavement | Y | 0.91 | 0.95 | 0.054 | |
| INF-6: Proprietary Infiltration | N | | 0.95 | | |
| INF-7: Bioinfiltration | N | | 0.95 | | |
| *Rainwater Harvesting BMPs* | | | | | |
| RWH-1: Rainwater Harvesting | N | 0.00 | 2 | | |
| | | | TOTAL Volume Retained | 0.167 | ac-ft |
| | | | | 54,366.6 | gallons |
| | | | | 7,267.7 | cu.ft. |
| | | | REMAINING Volume to meet 5% EIA requirement | -0.041 | ac-ft |
| | | | | -13,350 | gallons |
| | | | | -1,785 | cu.ft. |

[1] SQDV Methodology #3 used here.

[2] If a Retention BMP is used more than once on a site (i.e., 2 Infiltration Trenches implemented on one site) then drainage area and volume retained shown here should be additive. A separate BMP sizing worksheet (see Appendix E of the TGM) should be submitted for each BMP.

If onsite Retention BMPs cannot feasibly be used to meet the 5% EIA Requirement, move onto Step 5e; if 5%EIA Requirement is met go to Step 7

| | Y/N/NA |
|---|---|
| | |

| | |
|---|---|
| A completed copy of the applicable "BMP Sizing Worksheet(s)" for the project's Retention BMPs from Appendix E of the TGM is included as an attachment. BMPs must be sized to meet the SQDV or SQDF (See Section 2 Step 7 of the TGM). | Y |

**Project Name:** Camp Alonim Modification

**STEP 5e: SELECT AND SIZE BIOFILTRATION BMPS TO REDUCE EIA TO <=5%**

*New development and redevelopment projects that demonstrate technical infeasibility (see Section 3.2 of TGM) for reducing EIA to <= 5% using Retention BMPs are eligible to use Biofiltration BMPs to achieve the 5% EIA Requirement.*

| | Y/N |
|---|---|
| Is it technically infeasible for Retention BMPs to meet the 5% EIA Requirement? | N |
| If yes, volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs. | |

The onsite biofiltered volume ($V_{biofilter}$), should be calculated as follows:

$$V_{biofilter} = (V_{retain} - V_{achieved}) * 1.5 \qquad \text{Equation 2-4}$$

Where:

$V_{biofilter}$ = the volume that must be captured and treated in a Biofiltration BMP [ac-ft]

$V_{retain}$ = the stormwater quality design volume (SQDV) that must be retained [ac-ft]

$V_{achieved}$ = the volume retained onsite using Retention BMPs [ac-ft]

| Input | | Units |
|---|---|---|
| $V_{achieved}$ | 0.167 | ac-ft |
| $V_{retain}$ | 0.126 | ac-ft |
| $V_{biofilter}$ | **-0.061** | ac-ft |
| | **(20,025)** | gallons |
| | **(2,677)** | cu.ft. |

**BIOFILTRATION BMPs, CONT.**

| Biofiltration BMPs | Included? Y/N | Drainage Area Biofiltered (acres) [3] | Drainage Area Runoff Coefficient | Volume Biofiltered (1.5xSQDV) (ac-ft) [2],[3] | If not applicable, state brief reason |
|---|---|---|---|---|---|
| BIO-1: Bioretention with Underdrain | N | 0.00 | 0.95 | | |
| BIO-2: Planter Box | | | 0.95 | | |
| BIO-3: Vegetated Swale [1] | N | 0.00 | 0.95 | | |
| BIO-4: Vegetated Filter Strip [1] | N | 0.00 | 0.95 | | |
| BIO-5: Proprietary Biotreatment [1] | | | 0.95 | | |
| TOTAL Volume Biofiltered | | | | 0.000 | ac-ft |
| | | | | 0.0 | gallons |
| | | | | 0.0 | cu.ft |
| REMAINING Volume to be addressed by Alternative Compliance | | | | 0.126 | ac-ft |
| | | | | 41,016.8 | gallons |
| | | | | 5,483.1 | cu.ft |

[1] BIO-3 and BIO-4 are flow-based and should be calculated using SQDF for sizing (see Table 2-1 of the TGM for the applicable design criteria for sizing). The SQDV is shown here for 5% EIA Requirement compliance purposes only.

[2] SQDV Methodology #3 used here.

[3] If a Biofiltration BMP is used more than once on a site (e.g., 2 Planter Boxes implemented on one site) then drainage area and volume biofiltered shown here be additive. A separate BMP sizing worksheet (see Appendix E of the TGM) should be submitted for each BMP.

***ADDITIONAL INSTRUCTIONS: Certain new development and redevelopment project types are eligible for alternative compliance measures if onsite Retention and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA requirement. Infeasibility is described in Section 3.2 of the TGM. A technical feasability site-specific analysis must be submitted. Projects that cannot prove infesibility must reduce EIA to <=5%.***

If onsite Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard, move onto Step 6, otherwise, skip Step 6.

| | Y/N/NA |
|---|---|
| A completed a copy of the applicable "BMP Sizing Worksheet(s)" for the project's Biofiltration BMPs from Appendix E of the TGM is included as an attachment.. BMPs must be sized to meet the 1.5 times SQDV or SQDF (see Section 2, Step 7 of the TGM) requirement. Guidance on flow based design for 150% sizing provided in Table 2-1 of the TGM. | N |

**Project Name:** Camp Alonim Modification

**STEP 6: ALTERNATIVE COMPLIANCE [1], [2]**
**Mitigation Volume**

► *Alternative compliance options will be based on the "mitigation volume." The mitigation volume is the difference between the volume of runoff associated with 5% EIA and the volume of runoff associated with the actual EIA achieved onsite less than or equal to 30% EIA.*
► *The offsite mitigation requirement for EIA is excess of 30% (>30%) is 1.5 times the amount of stormwater not managed onsite.*
► *Applicants must contact the local approval agency before proceeding with Alternative Compliance*

***6a) Determine the volume of runoff that is retained and biofiltered onsite ($V_{ret/bio}$) using the equation below:***

$$V_{ret/bio} = (V_{achieved} + (V_{biofiltered}/1.5)) \quad \text{Equation 2-5}$$

Where:

$V_{ret/bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs [ac-ft]
$V_{achieved}$ = the runoff volume retained onsite [ac-ft]
$V_{biofiltered}$ = the runoff volume biofiltered onsite [ac-ft]

| **Eqn. 2-5** | | **Units** |
|---|---|---|
| $V_{achieved}$ | 0.167 | ac-ft |
| $V_{biofiltered}$ | 0.000 | ac-ft |
| $V_{ret/bio}$ | **0.167** | ac-ft |
| | **54,366.6** | gallons |
| | **7,267.7** | cu.ft. |

***6b) Determine the Mitigation Volume ($V_{mitigation}$) @ 1:1 ratio, using the equation below:***

$$V_{mitigation} = V_{retain} - V_{ret/bio} \quad \text{Equation 2-6}$$

Where:
$V_{mitigation}$ = the volume of runoff that must be mitigated offsite [ac-ft]
$V_{retain}$= the SQDV that must be retained onsite per the 5% EIA requirement calculated in Equation 2-3 [ac-ft]

$V_{ret/bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs calculated in Equation 2-5 [ac-ft]

| **Eqn. 2-6** | | **Units** |
|---|---|---|
| $V_{retain}$ | 0.126 | ac-ft |
| $V_{ret/bio}$ | 0.167 | ac-ft |
| $V_{mitigation}$ | **-0.041** | ac-ft |
| | **-13,349.8** | gallons |
| | **-1,784.6** | cu.ft. |

**Project Name:** Camp Alonim Modification

**ALTERNATIVE COMPLIANCE, CONT.**

***6c) Determine whether EIA is reduced to <= 30% EIA***

*6c-1: Calculate area associated with 30% EIA ($A_{30\%eia}$)*

$$A_{30\%eia} = (IMP*A_{project}) - (30\%*A_{project})$$ Equation 2-7

Where:

$A_{30\%eia}$ = the impervious portion of the drainage area retained or biofiltered at 30% EIA [acres]

IMP = total imperviousness of project area (%)

$A_{project}$ = the total project area [acres]

| **Eqn. 2-7** | | **Units** |
|---|---|---|
| IMP | 35% | |
| $A_{project}$ | 7.00 | acres |
| $A_{30\%eia}$ | **0.37** | acres |

*6c-2:Calculate volume retained or biofiltered onsite at 30% EIA ($V_{30\%eia}$):*

$$V_{30\%eia} = C*(0.75/12)*A_{30\%eia}$$ Equation 2-8

Where:

$V_{30\%eia}$ = SQDV retained or biofiltered at 30% EIA [ac-ft]

(note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)

C = runoff coefficient (equals 0.95 for impervious surfaces)

$A_{30\%eia}$ = the impervious area from which runoff would have been retained or biofiltered at 30% EIA [acres]

| **Eqn. 2-8** | | **Units** |
|---|---|---|
| C | 0.95 | |
| $A_{30\%eia}$ | 0.37 | acres |
| $V_{30\%eia}$ | **0.022** | ac-ft |
| | **7,158.6** | gallons |
| | **957.0** | cu.ft. |

**Project Name:** Camp Alonim Modification

**ALTERNATIVE COMPLIANCE, CONT.**

***6d) Determine if the project's current EIA is greater than, equal to, or less than the volume at 30% EIA ($V_{30\%eia}$)***

$V_{ret/bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs [ac-ft]
$V_{30\%eia}$ = SQDV retained or biofiltered at 30% EIA [ac-ft]

| | | |
|---|---|---|
| $V_{30\%eia}$ | 0.022 | ac-ft |
| $V_{ret/bio}$ | 0.167 | ac-ft |
| Your project's EIA is | **LESS THAN** | 30% |

**Less than or equal to (<=) 30% EIA → go to Step 6e**

**Greater than (>) 30% EIA → go to Step 6f-g**

[1] In order to simplify the use of the spreadsheet, these steps deviate from those presented in the 2011 TGM
[2] References to equations (e.g., Equation 2-5) refer to equations contained within the 2011 TGM

## Projects w/ EIA<=30%

***6e) Pursue Alternative Compliance for $V_{mitigation}$ at 1:1 Ratio***

$V_{mitigation}$ = the volume of runoff that must be mitigated offsite [ac-ft] calculated in Equation 2-6

| | | |
|---|---|---|
| $V_{mitigation}$ | **-0.041** | ac-ft |
| | **-13,349.8** | gallons |
| | **-1,784.6** | cu.ft. |

**The site is required to mitigate the following volume:**

| | |
|---|---|
| **-0.041** | ac-ft |
| **-13,349.8** | gallons |
| **-1,784.6** | cu.ft. |

*Continue to Step 7*

**Project Name:** Camp Alonim Modification

**ALTERNATIVE COMPLIANCE, CONT.**

## Projects with EIA > 30%

*When the EIA of the project exceeds 30% due to infeasibility, the runoff volume associated with the EIA up to 30% must be mitigated offsite at a one-to-one ratio and the runoff volume associated with the EIA greater than 30% must be mitigated offsite at 1.5 times the volume.*

***6f) Determine the Mitigation Volume for 30% EIA ($V_{mitigation30\%}$), using the equation below:***

$$V_{mitigation30\%} = V_{Retain} - V_{30\%EIA} \qquad \text{Equation 2-11}$$

Where:

$V_{mitigation30\%}$ = the mitigation volume for 30% EIA [ac-ft]

$V_{retain}$ = the SQDV that must be retained onsite per the 5% EIA requirement calculated in Equation 2-3 [ac-ft]

$V_{30\%eia}$ = SQDV at 30% EIA [ac-ft]

| | | Units |
|---|---|---|
| $V_{retain}$ | N/A | ac-ft |
| $V_{30\%eia}$ | N/A | ac-ft |
| $V_{mitigation30\%}$ | **N/A** | ac-ft |
| | | gallons |
| | | cu.ft. |

***6g) Determine the Mitigation Volume for >30% EIA ($V_{mitigation>30\%}$), using the equation below:***

$$V_{mitigation>30\%} = (V_{30\%eia} - V_{ret/bio})*1.5$$

Where:

$V_{mitigation>30\%}$ = the mitigation volume for >30% EIA [ac-ft]

$V_{30\%eia}$ = SQDV at 30% EIA [ac-ft]

$V_{ret/bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs calculated

| | | Units |
|---|---|---|
| $V_{30\%eia}$ | N/A | ac-ft |
| $V_{ret/bio}$ | N/A | ac-ft |
| $V_{mitigation>30\%}$ | **N/A** | ac-ft |
| | | gallons |
| | | cu.ft. |

***6h) Determine the Total Mitigation Volume ($V_{mitigationtotal}$), using the equation below:***

$$V_{mitigationtotal} = V_{mitigation>30\%} + V_{mitigation30\%} \quad \text{Equation 2-13}$$

Where:

$V_{mitigationtotal}$ = the total mitigation volume for 30% EIA [ac-ft]

$V_{mitigation>30\%}$ = the mitigation volume for >30% EIA, calculated using Equation 2-11 [ac-ft]

$V_{mitigation30\%}$ = the mitigation volume for 30% EIA calculated using Equation 2-10 [ac-ft]

| **Eqn. 2-13** | | **Units** |
|---|---|---|
| $V_{mitigation30\%}$ | N/A | ac-ft |
| $V_{mitigation>30\%}$ | N/A | ac-ft |
| $V_{mitigationtotal}$ | **N/A** | ac-ft |
| | | gallons |
| | | cu.ft. |

**The site is required to mitigate the following volume:**

| **N/A** | ac-ft |
|---|---|
| | gallons |
| | cu.ft. |

*Continue to Step 7*

**Project Name:** Camp Alonim Modification

**STEP 7: APPLY TREATMENT CONTRL MEASURES**

► *Stormwater runoff from EIA and developed pervious surfaces must be mitigated using Retention BMPs, Biofiltration BMPs, or Treatment Control Measures (See Chapter 6 of TGM).*
► *Treatment Control Measures should be selected per the BMP selection process outlined in Section 3.3 of the TGM.*
► *BMPs must be sized to meet the SQDV or SQDF. See Section 2, Step 7 of the for guidance on calculating the SQDV and SQDF.*

| | **Y/N** |
|---|---|
| Completed copy of the applicable "BMP Sizing Worksheet(s)" for the project's stormwater BMP(s) from Appendix E of the Technical Guidance Manual is included. | N |

**Project Name:** Camp Alonim Modification

**SINGLE FAMILY HILLSIDE HOMES: ASSESS SITE CONDITIONS**

► *This tab only applies to projects proposing the development of a Single Family Hillside Home*
► *Provide an assessment of the project site using the following tables*

**General Characteristics**

| General Project Characteristics | Area (acres) |
|---|---|
| Total Project Site Area | |
| Estimated Disturbed Area | |
| Total Pre-Project Impervious Area | |
| Post-Project Impervious Area [1] | |
| Area of Green Roof (ET-1) [1] | |
| Area Draining to Hydrologic Source Controls (ET-2) [1] | |
| Revised Post-Project Impervious Area | 0.00 |
| Project Imperviousness (%) | |

**Project Description**

| |
|---|
| Briefly describe project: |
| |
| Describe current and proposed zoning and land use designation: |
| |
| Describe topography of project area. Identify low and high points and the location of steep slopes (provide a range of grades): |
| |
| Describe the site's soil types (A, B, C, D) and geological conditions: |
| |
| *Attach soil type information* |
| Describe the site's groundwater conditions (e.g. depth to seasonal high groundwater): |
| |
| *Attach source of groundwater information* |

**Project Name:** Camp Alonim Modification

**SINGLE FAMILY HILLSIDE HOMES: ASSESS SITE CONDITIONS, CONT.**

| |
|---|
| Is there offsite drainage on the site? If so, identify the location(s) and source(s) of offsite drainage and the volume of water running onto the site: |
| |
| Describe any existing utilities within the project area that would limit the possible locations of certain BMPs: |
| |
| Describe any environmentally sensitive areas (e.g. riparian areas, wetlands) within the project area: |
| |

| **Geotechnical considerations:** | |
|---|---|
| *Does the site contain any of the following characteristics:* | **Y/N/NA** |
| Collapsible Soil | |
| Expansion Soil | |
| Potential for seismically-inducted soil liquefaction | |
| Additional considerations: | |
| | |
| *Attach relevant geotechnical information* | |

**Project Name:** Camp Alonim Modification

**SINGLE FAMILY HILLSIDE HOMES: POLLUTANTS OF CONCERN**

*Identify pollutants of concern using the tables below*

**Pollutants of Concern (See Section 3.3 of TGM)**

| Activity / Potential Land Uses | Potential Pollutant* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sediment | Nutrients | Metals | Pesticides | Oxygen Demanding Substances | Toxic Organics | Oil & Grease | Bacteria | Trash and Debris |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| [fill in if necessary] | | | | | | | | | |
| [fill in if necessary] | | | | | | | | | |

* Denote potential pollutant with "x"

**Receiving Waterbody Listings (see Section 3.3. of TGM)**

| Receiving Water Body (watershed indicated in parentheses) | Constituent Grouping [2] | Distance to Project (ft) |
|---|---|---|
| | | |
| | | |
| [fill in if necessary] | | |

**Project Name:** Camp Alonim Modification

**SINGLE FAMILY HILLSIDE HOMES: PERFORMANCE STANDARDS**

► *The following measures are required and should be included in the lot layout, consistent with applicable local policies and if appropriate/feasible with the given site conditions.*

► *Additional gudiance on performance standards can be found in Section 2.2 of the TGM.*

► *Identify and describe the performance standards included within the proposed site in the table below.*

| Performance Standard | Included? Y/N/NA | Brief description of Performance Standard |
|---|---|---|
| **Conserve Natural Areas** | | |
| Improvements are clustered on the least-sensitive portions of the lot | | |
| Clearing and grading of native vegetation is limited | | |
| Trees and other vegetation at the site are maximized | | |
| **Protect Slopes** | | |
| Slopes are protected from erosion by safely conveying runoff from the tops of slopes | | |
| Native and drought-tolerant species are considered | | |
| **Protect Channels** | | |
| Natural drainage systems are used to the maximum extent practicable, but runoff discharge is minimized to the maximum extent practicable | | |
| Permanent channel crossings are stabilized | | |
| Energy dissipaters are installed at the outlets that discharge into unlined channels | | |
| **Provide Storm Drain System Stenciling and Signage** | | |
| Storm drain inlets within the project boundary include storm drain message markers or placards | | |
| **Divert Roof Runoff and Surface Flows to Vegetated Area(s) or Collection System(s)** | | |
| Disconnected downspouts divert water to (1) vegetated pervious areas of the site in order to allow for infiltration, storage, evapotranspiration, and treatment, or (2) a rainwater collection system | | |
| Runoff diversion(s) meet the requirements as specified in Step 1b of TGM (e.g., vegetated flow paths are 25 ft or more in length) | | |

[1] Applicant should enter post-project impervious cover prior to accounting for green roof and hydrologic source control (HSC) credits. Volume reduction provided by green roofs and HSCs are accounted for implicitly in the sizing calcuations for BMPs by assuming the roof area covered by a green roof or the area draining to a HSC is pervious rather than impervious when caluclating the runoff coefficient for the site. Green roofs and HSCs are not required to be considered for all project locations and types. In order to obtain credit, Green Roofs and HSCs must be designed as specified in the TGM. Additional detail on Green Roofs (ET-1) and HSCs (ET-2) can be found in Section 6 of the TGM.

[2] If a waterbody is listed for "toxicity" and the cause and/or contribution to toxicity is known, then the consituent group known to contribute to toxicity are listed here (in lieu of listing "toxicity")

**Project Name:** Camp Alonim Modification

**ROADWAY PROJECTS: ASSESS SITE CONDITIONS**

► *This tab only applies to Roadway Projects*
► *Provide an assessment of the project site using the following tables*

**General Characteristics**

| General Project Characteristics | Area (acres) |
|---|---|
| Total Project Site Area | |
| Estimated Disturbed Area | |
| Total Pre-Project Impervious Area | |
| Post-Project Impervious Area [1] | |
| Area Draining to Hydrologic Source Controls (ET-2) [1] | |
| Revised Post-Project Impervious Area | 0.00 |
| Project Imperviousness (%) | |

**Project Description**

| |
|---|
| Briefly describe project: |
| |
| Describe current and proposed zoning and land use designation: |
| |
| Describe topography of project area. Identify low and high points and the location of steep slopes (provide a range of grades): |
| |
| Describe the site's soil types (A, B, C, D) and geological conditions: |
| |
| *Attach soil type information* |
| Describe the site's groundwater conditions (e.g. depth to seasonal high groundwater): |
| |
| *Attach source of groundwater information* |

**Project Name:** Camp Alonim Modification

**ROADWAY PROJECTS: ASSESS SITE CONDITIONS, CONT.**

| Is there offsite drainage on the site? If so, identify the location(s) and source(s) of offsite drainage and the volume of water running onto the site: |
|---|
| |
| Describe any existing utilities within the project area that would limit the possible locations of certain BMPs: |
| |
| Describe any environmentally sensitive areas (e.g. riparian areas, wetlands) within the project area: |
| |

| **Geotechnical considerations:** | |
|---|---|
| *Does the site contain any of the following characteristics:* | **Y/N/NA** |
| Collapsible Soil | |
| Expansion Soil | |
| Potential for seismically-inducted soil liquefaction | |
| Additional considerations: | |
| | |
| *Attach relevant geotechnical information* | |

**Project Name:** Camp Alonim Modification

**ROADWAY PROJECTS: POLLUTANTS OF CONCERN**

*Identify pollutants of concern using the tables below*

**Pollutants of Concern Assoc. with Project Activities (See Section 3.3 of TGM)**

| Activity / Potential Land Uses | Potential Pollutant* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sediment | Nutrients | Metals | Pesticides | Oxygen Demanding Substances | Toxic Organics | Oil & Grease | Bacteria | Trash and Debris |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| [fill in if necessary] | | | | | | | | | |
| [fill in if necessary] | | | | | | | | | |

*Denote potential pollutant with "x"

**Receiving Waterbody Listings (See Section 3.3 of TGM)**

| Receiving Water Body (watershed indicated in parentheses) | Constituent Grouping [2] | Distance to Project (ft) |
|---|---|---|
| | | |
| | | |
| [fill in if necessary] | | |

**Project Name:** Camp Alonim Modification

## ROADWAY PROJECTS: PERFORMANCE STANDARDS

► *Street, roadway, highway,and freeway projects that construct 10,000 square feet or more of impervious surface area must incorporate the USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets", to the maximum extent practicable.*
► *Identify and describe the performance standards included within the proposed site in the table below.*

| Performance Standard [1] | Included? Y/N/NA | Brief description of Performance Standard |
|---|---|---|
| Retention and/or biofiltration BMPs are sized to capture and treat SQDV or the SQDF. **Also see BMP Sizing below** | | |
| Street width is minimized | | |
| Porous pavement or pavers are used for low traffic roadways, on-street parking, shoulders or sidewalks | | |
| Tree canopy is added by planting or preserving trees and shrubs | | |

[1] Additional gudiance on performance standards can be found in Section 2.2 of the TGM.

**Project Name:** Camp Alonim Modification

## ROADWAY PROJECTS: BMP SIZING

*Roadway projects must utilize retention or biofiltration BMPs as specified in the TGM (INF-1-7, RWH-1, ET 1- 2, or BIO-1-5). BMPs must be sized to meet the SQDV or SQDF. See Section 2, Step 7 of the for guidance on calculating the SQDV and SQDF.*

| BMP Sizing | Y/N |
|---|---|
| A completed copy of the applicable "BMP Sizing Worksheet(s)" for the project's stormwater BMP(s) from Appendix E of the Technical Guidance Manual is included as an attachment. | |

[1] Applicant should enter post-project impervious cover prior to accounting for green roof and hydrologic source control (HSC) credits. Volume reduction provided by green roofs and HSCs are accounted for implicitly in the sizing calcuations for BMPs by assuming the roof area covered by a green roof or the area draining to a HSC is pervious rather than impervious when caluclating the runoff coefficient for the site. Green roofs and HSCs are not required to be considered for all project locations and types. In order to obtain credit, Green Roofs and HSCs must be designed as specified in the TGM. Additional detail on Green Roofs (ET-1) and HSCs (ET-2) can be found in Section 6 of the TGM.

[2] If a waterbody is listed for "toxicity" and the cause and/or contribution to toxicity is known, then the consituent group known to contribute to toxicity are listed here (in lieu of listing "toxicity")

**Project Name:** Camp Alonim Modification

**ADDITIONAL REQUIRED SUBMITTALS**

| | |
|---|---|
| **Yes** | **Site map** that includes:<br>o Property boundary<br>o Major roadways or landmarks<br>o Scale and north arrow<br>o Drainage areas<br>o Surrounding land uses<br>o Presence of Environmentally Sensitive Areas<br>o Open space preservation areas<br>o Impervious areas<br>o Natural hydrologic features<br>o Location of discharge(s)<br>o Existing and planned utilities<br>o Topography (including steep slopes)<br>o Key activities such as outdoor material storage, parking, food preparation, etc.<br>o Potential pollutant areas (e.g., fueling island)<br>o Location of nearby (within 2,000 ft of development project) bus or train station(s)<br>o Location and type of source control measures<br>o Location and type of stormwater BMPs |
| **Yes** | **BMP Sizing Worksheet(s) (see Appendix E of TGM); design specifiations and details must also be provided for Green Roofs and Hydrologic Source Controls (ET-1 & 2)** |
| **Yes** | Stormwater Treatment Device Access and Maintenance Agreement (see Appendix H of TGM for template) |
| **Yes** | Maintenance Plan (See Appendix I of TGM for guidance) |
| | Technical Infeasibility Analysis – if Retention BMPs cannot be used, the applicant must submit a site-specific analysis showing technical infeasibility as described in Section 3.2 of the TGM. Technical infeasibility may include some (or all) of the components submitted with soil, groundwater and/or geotechnical reports. Technical infeasibility must also account for Rainwater Harvesting. Rainwater Harvesting is not required to be used if the available demands do not meet the volume required for 80% capture using a 72-hour drawndown time (See RWH-1 in Section 6 of the TGM for more detail). |
| **Yes** | **Soil Type Information** (may include site specific analyses, available geologic or geotechnical reports and/ or the Ventura Hydrology Manual Soil Map zoomed into site level) |
| **Yes** | **Groundwater Information** (may include available groundwater data, site specific redoximorphic analytical/groundwater monitoring results, or known groundwater impacts such as contaminated sites registered with the State Water Board) |
| | **Geotechnical Reports** (may include site specific analyses with information on collapsible soils, expansive soil, liquefaction, or groundwater mounding analysis) |
| | **Rainwater Harvesting - Include calculations and justification for rainwater harvesting demand. Section 3.2 for guidance of the TGM.** |