GOLETA TRAIN DEPOT
27 SOUTH LA PATERA LANE
GOLETA, CALIFORNIA

STORMWATER CONTROL PLAN

SUBMITTED TO
Mr. Jim Keenan
Anil Verna Associates
444 South Flower Street
Los Angeles, CA 90071

PREPARED BY
ENGEO Incorporated

September 28, 2022

PROJECT NO.
16370.000.000

ENGEO
Expect Excellence

Project No.
16370.000.000

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Mr. Jim Keenan
Anil Verna Associates
444 South Flower Street
Los Angeles, CA 90071

Subject: Goleta Train Depot
27 South La Patera Lane
Goleta, California

STORMWATER CONTROL PLAN

Dear Mr. Keenan:

We are pleased to present this Stormwater Control Plan (SWCP) for the subject project, Goleta Train Depot, located at 27 South La Patera Lane in Goleta, California. This SWCP has been prepared according to the Santa Barbara County Stormwater Technical Guide standards.

If you have any questions regarding this report, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated

Randy Rettig

Randall Rettig

Jonathan D. Buck, GE

REGISTERED PROFESSIONAL ENGINEER
JONATHAN BUCK
No. 2958
GEOTECHNICAL
STATE OF CALIFORNIA

rr/jb/dt

Stormwater Control Plan
Goleta Train Depot Project
27 South La Patera Lane
Goleta, CA 93117
APN 073-050-033

Revised December 05, 2023

Prepared for:

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Table of Contents

Tables

Figures

Attachments

This Stormwater Control Plan was prepared using the Santa Barbara County Commercial Stormwater Control template dated January 2017.

I. Project Data

Table 1. Project Data

Project Name/Job Number	Goleta Train Depot/16370.000.000 APN 073-050-033
Project Location	27 South La Patera Lane, Goleta, CA 93117
Project Phase No.	Not Applicable
Project Type and Description	Demolition of existing warehouse and construction of an 8,500 square foot (SF) single-story train depot with a lobby, ticketing area, café, community room and improvements along railroad right-of-way and along South La Patera between Hollister Avenue and proposed depot.
Total Project Site Area (acres)	2.6 acres / 113,065 SF
Total New Impervious Surface Area	0 SF
Total Replaced Impervious Surface Area	102,955 SF
Total Pre-Project Impervious Surface Area	109,576 SF±
Total Post-Project Impervious Surface Area	102,955 SF
Reduced Impervious Area Credit	6,621 SF
Net Impervious Area	96,334 SF
Applicable Requirements	Tier 4
Watershed Management Zone	1
Design Storm Frequency and Depth	2.2 inches (95th percentile)
Urban Sustainability Area	The project is not in an Urban Sustainability Area

II. Setting

II.A. Project Location and Description

This project involves the demolition of an existing warehouse building and parking lot and replacement with a new train depot building, lobby, ticketing area, waiting room, café, community room, restrooms/showers, storage lockers, and parking lot. The parcel fronts an arterial roadway, as shown in Figure 1.

The proposed use is consistent with current commercial zoning.

Figure 1. 27 South La Patera Lane, Goleta, CA

II.B. Existing Site Features and Conditions

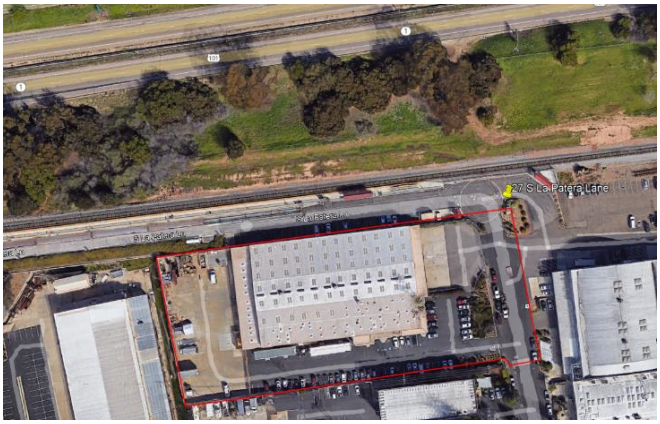


Figure 2. Existing Site Conditions

The rectangular, relatively flat site lies in a commercial region of Goleta, California, as shown on Figure 2. Most of the existing site is covered with a paved parking lot and warehouse. Based on a geotechnical study performed by ENGEO, on-site soil is silty clay, typical of the area. This soil is classified as Hydrologic Soil Group ("D") according to the United States Soil Conservation Service, with little ability to infiltrate stormwater. The existing on-site storm drainage system is connected to a municipal storm drain on South La Patera Lane along the north and east of the site.

II.C. Opportunities and Constraints for Stormwater Control

Constraints include low infiltration rate soil (Hydrologic Soil Group D), high intensity land use, expansive soil, and flat topography. Disposal of runoff to deep infiltration is not feasible on this site due to the low permeability of the on-site silty clay soil. High land values, the objective of creating a dense retail area, and parking requirements limit opportunities to reduce site imperviousness.

Stormwater controls for the project are to be included in the center and northwest corner of the site. The City storm drain system along South La Patera Lane is deep enough to provide sufficient hydraulic head to route runoff across the surface of the site to the proposed stormwater treatment facilities.

III. Low Impact Development Design Strategies

III.A. Site Design and Runoff Reduction

The site is densely developed infill within the existing urbanized area. The future train depot complex is proposed to include biofiltration regions for reducing stormwater runoff in general conformance with the Santa Barbara County Stormwater Technical Guide to address the County's stormwater requirements.

III.B. Site Constraints

Conventional Portland cement and asphalt concrete are to be used to construct the circulation and parking areas. Permeable pavements were considered but were not found to be cost-effective for this site, in part because the pavements overlie expansive clay soil. This condition would necessitate a very deep gravel base course, which would, in turn, require large quantities of excavation and offhaul.

IV. Documentation of Drainage Design

IV.A. Descriptions of Each Drainage Management Area

IV.A.1. Drainage Management Areas

Table 2. Drainage Management Areas (DMAs), as shown on Appendix A.

DMA Name	DMA Type	Area (SF)	Surface Type
DMA-1	Drains to SCM-1	68,889 SF	Paving/Roof
DMA-2	Drains to SCM-2	29,380 SF	Paving/Roof

IV.A.2. Drainage Management Area Descriptions

DMA 1, totaling 68,889 square feet, drains the perimeter of the parking areas, the full roof area of the train depot building, and a portion of a paved traffic island. DMA-1 drains to the Bioretention Facility SCM 1 in the northwestern corner of the property.

DMA 2, totaling 29,380 square feet, drains the central sections of the property. DMA-2 drains to the Bioretention Facility SCM 2 in the center of the property; all three planters are to be hydraulically connected via an 8-inch pipe.

IV.B. Stormwater Control Measures

Runoff from all impervious areas on the site, including roofs and paved areas, will be routed to two bioretention facilities (see Figure 4 in Appendix A). The facilities will be designed and constructed in accordance with the Santa Barbara County Project Clean Water Stormwater Technical Guide (February 2017). Design features will include:

- A perimeter concrete curb. Where adjacent to pavement, curbs will be thickened, and an impermeable vertical cutoff wall will be included.
- Each layer is built level, and to the elevations specified in the plans.
    - Bottom of Gravel Layer (BGL)
    - Top of Gravel Layer (TGL)
    - Top of Soil Layer (TSL)
    - Overflow Grate
    - Facility Rim

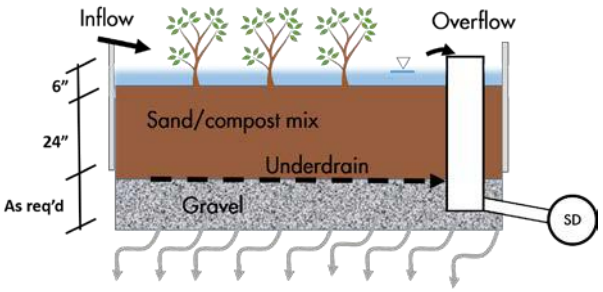


Figure 3. Bioretention Facility Cross-Section (Schematic)

- Caltrans Class 2 permeable per Caltrans Standard Specifications Section 68-2.02F (3), depth as specified in the Stormwater Control Measure Sizing Calculator output
- 24 inches sand/compost mix meeting BASMAA specifications
- 4-inch-diameter PVC SDR 35 perforated pipe underdrain, installed with the invert at the top of the Class 2 permeable layer with holes facing down, and connected to the overflow structure at that same elevation
- 6-inch-deep reservoir between top of soil and overflow grate

- Concrete drop inlet with frame overflow structure, with grate set to specified elevation, connected to storm drain in Main Street
- Vertical cutoff walls to protect adjacent pavement
- Plantings selected for water conservation
- Irrigation system on a separate zone, with drip emitters and “smart” irrigation controllers
- Sign identifying the facility as a stormwater treatment facility.

IV.C. Tabulation and Sizing Calculations

IV.C.1. Information Summary for LID Facility Design

See the entries and output from the Central Coast Region Stormwater Control Measure Sizing Calculator Spreadsheet in Appendix B.

IV.D. HydroCAD Calculation: Pre and Post Development Peak Flows

The Goleta Train Depot will be replacing 102,955 square feet of existing development, as shown in the Project Data summary. This places the Project under a Tier 4 classification as defined by the Santa Barbara County Stormwater Technical Guide. Santa Barbara County requires the utilization of software, such as HydroCAD, to demonstrate that peak flows from the 2-year through 100-year, 24-hour recurrence interval storms will be reduced in the post-project condition. Due to the incorporation of LID measures, the Project will result in lower peak flows than the predevelopment condition. HydroCAD calculation summary (pre and post development) are included in Appendix C; we provide a summary in Table 3.

Table 3. HydroCAD Summary of Pre and Post Development Peak Flows

	Design Storm					
	2-year 3.35in[1]	**5-year 4.29in[1]**	**10-year 5.04in[1]**	**25-year 6.02in[1]**	**50-year 6.76in[1]**	**100-year 7.49in[1]**
Pre-Project Peak Runoff (cfs)	1.30	1.68	1.98	2.37	2.65	2.95
Post-Project Peak Runoff (cfs)	1.27	1.65	1.96	2.35	2.64	2.94
Percent Reduction	2.31%	1.79%	1.01%	0.84%	0.38%	0.34%

[1]Source: Precipitation Frequency Data Server (PFDS) Frequency Interval per duration of 24 hours https://hdsc.nws.noaa.gov/hdsc/pfds/

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

On-site activities that could potentially produce stormwater pollutants include:

- Driveways and parking lots
- Food Service
- Trash Management

V.B. Potential Pollutant Sources and Source Control Measures

Table 4. Pollutant Sources and Source Control Measures

Potential Source of Runoff Pollutants	Permanent Source Control BMPs	Operational Source Control BMPs
Inlets (bioretention overflows)	All inlets will be marked with "No Dumping! Flows to Local Waterways" or similar	Markings will be regularly inspected and repainted or replaced as needed. Lessees will receive stormwater pollution prevention brochures. Lease agreements will include the following provision: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Indoor and Structural Pest Control		Owner will retain only companies that are certified in Integrated Pest Management (IPM) for on-site pest management.
Landscape Maintenance	Landscaping will minimize irrigation and runoff and be selected for pest resistance and will minimize the need for fertilizers and pesticides. Plants will be selected appropriate to site soil, slopes, climate, sun, wind rain, land use, air movement, ecological consistency, and plant interactions.	Landscaping will be maintained using minimum or no pesticides. IPM information will be provided to new owners, lessees, and operators.
Food Service	Café will include a floor sink for cleaning floor mats, containers, and equipment. The floor sink will be connected to a grease interceptor before discharging to the sanitary sewer.	
Refuse Area	Refuse and recycled materials will be handled in the refuse area. This area is to be roofed and bermed.	All dumpsters will be posted with signs stating "Do not dump hazardous materials here" or similar.
Plazas, Sidewalks, and Parking Lots		Trash receptacles to be provided in plaza area and on drive-through and emptied daily. Site to be regularly maintained for trash. Plazas, sidewalks, and parking lots will be swept regularly. Debris and wash water from periodic pressure washing will be collected and disposed of to the sanitary sewer.

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The owner accepts responsibility for the operation and maintenance of stormwater treatment and flow-control facilities for the life of the project until such time as this responsibility is formally transferred to subsequent owners. The facility maintenance for this project will be financed publicly and implemented by the City of Goleta in perpetuity for the life of the project. Any future change or alteration, or the failure to maintain any feature described herein can result in penalties including but not limited to fines, property liens, and other actions for enforcement of a civil judgment.

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

The two bioretention facilities will be maintained on the following minimum schedule. Details of maintenance responsibilities and procedures will be included in a Stormwater Facility Operation and Maintenance Plan to be submitted for approval, as required in the conditions of approval.

At no time will synthetic pesticides or fertilizers be applied, nor will any soil amendments, other than aged compost mulch or sand/compost mix, be introduced.

Daily: The facilities will be examined for visible trash during regular site inspections, and trash will be removed.

After Significant Rain Events: A significant rain event is one that produces approximately ½ inch or more rainfall in a 24-hour period. Within 24 hours after each such event, the following will be conducted.

- The surface of the facility will be observed to confirm there is no ponding.
- Inlets will be inspected, and any accumulations of trash or debris will be removed.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.

Prior to the Start of the Rainy Season: In September of each year, the facility will be inspected to confirm there is no accumulation of debris that would block flow, and that growth and spread of plantings does not block inlets or the movement of runoff across the surface of the facility.

Annual Landscape Maintenance: In December through February of each year, vegetation will be cut back, as needed, debris removed, and plants and mulch replaced, as needed. The concrete work will be inspected for damage. The elevation of the top of soil and mulch layer will be confirmed to be consistent with the 6-inch reservoir depth.

VII. Stormwater Control Plan/Construction Documents Cross-Checklist

See Appendix E for the Bioretention Construction Inspection Checklist and Table 5.

Table 5. Stormwater Control Plan/Construction Documents Cross-Checklist

Stormwater Control Plan Page #	Source Control or LID Facility	See Plan Sheet #s
3 and Exhibit	Drainage from DMAs 1 and 2 are retained by surrounding curbs.	
3 and Exhibit	DMA 1 drains to Bioretention Facility #1; facility is designed as specified	
3 and Exhibit	DMA 2 drains to Bioretention Facility #2; facility is designed as specified	
5	Bioretention Facility #1 and #2 overflows are marked with "No Dumping" message	
6	Café/food service facility is equipped with a floor sink connected to a grease interceptor and then to sanitary sewer	
6	Trash receptacles are located in plaza area and are accessible to drive-through lane	

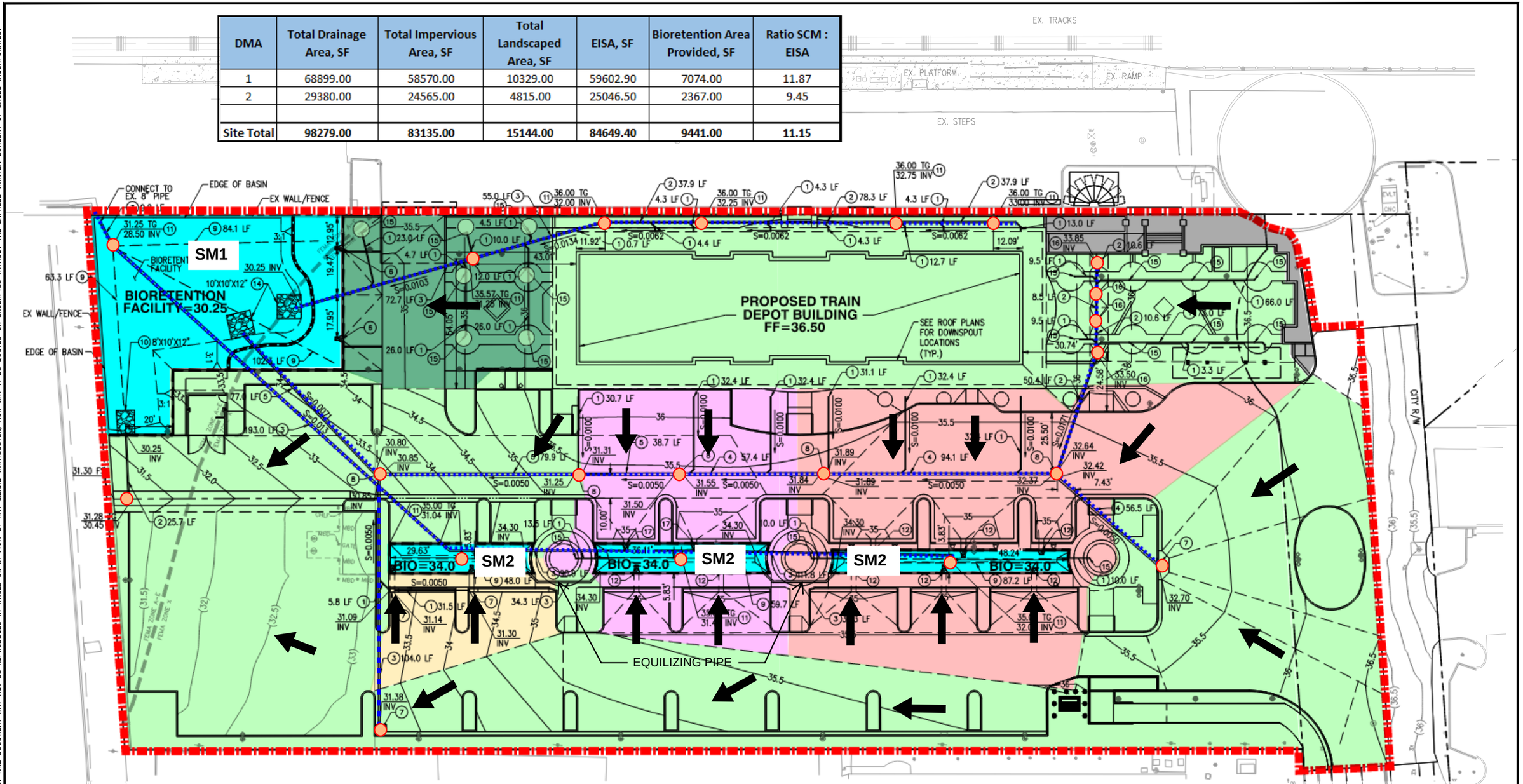
VIII. Certifications

The preliminary design of Stormwater Control Measures and other stormwater pollution control measures in this plan are in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide.

APPENDIX A

Stormwater Control Plan Exhibit

DMA	Total Drainage Area, SF	Total Impervious Area, SF	Total Landscaped Area, SF	EISA, SF	Bioretention Area Provided, SF	Ratio SCM : EISA
1	68899.00	58570.00	10329.00	59602.90	7074.00	11.87
2	29380.00	24565.00	4815.00	25046.50	2367.00	9.45
Site Total	**98279.00**	**83135.00**	**15144.00**	**84649.40**	**9441.00**	**11.15**



EXPLANATION

	ACREAGE / SF	SCM:EISA RATIO	Longest flow path
TOTAL SCM AREA	0.22 AC / 9,441 SF	-	
DMA - 1 NORTHWEST BIORETENTION AREA	1.58 AC / 68,824 SF	11.87	450 FT
DMA - 2 CENTRAL STRIP BIORETENTION AREA	0.68 AC / 37,750 SF	9.45	30 FT
OVERALL TOTAL	2.26 AC / 98,279 SF	11.15	

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

DIRECTION OF WATER FLOW

DRAIN INLET PROTECTION

BASE MAP SOURCE: RAIL PROS, 2021

N

0 40 FEET

ENGEO Expect Excellence

STORMWATER MANANGEMENT PLAN
GOLETA TRAIN DEPOT
GOLETA, CALIFORNIA

PROJECT NO.: 16370.000.000
SCALE: AS SHOWN
DRAWN BY: CC
CHECKED BY: JDB

FIGURE NO. 4

ORIGINAL FIGURE PRINTED IN COLOR

FILE PATH: \\engeo.com\files\Drafting\PROJECTS_16000 to 17999\16370\16370000000\STORMWATER-MGMT-0922\16370000000_STRM-WTR-MGMT_2_0922.dwg SAVE DATE: 9/27/2022 10:33:52 AM SAVED BY: llee

APPENDIX B

Central Coast Post-Construction Requirements Calculator Spreadsheet

Central Coast Region Stormwater Control Measure Sizing Calculator

1. Project Information

Project name:	Goleta Train Depot
Project location:	27 S La Patera Lane, Goleta, CA 93117
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	2.2
Total project area (ft2):	113576
Total DMA area (ft2):	113576
Total new impervious area (ft2):	0
Total replaced impervious within a USA (ft2):	0
Total replaced impervious not in a USA (ft2):	102955
Total pervious/landscape area (ft2):	10621
Total SCM area (ft2):	11159

Check Total DMA and SCM areas to ensure they match total proj

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
DMA 1	Drains to SCM	68889	Concrete or asphalt	Replaced	SCM 1
DMA 2	Drains to SCM	29380	Concrete or asphalt	Replaced	SCM 2

DMA Summary Area	
Total assigned DMA area (ft2):	113576
New impervious area (ft2):	0
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	113576
Total pervious/landscape area (ft2):	0

Check DMA table areas against plan sheet areas

Check DMA table areas against plan sheet areas

3. SCM Characterization

Name	SCM Type	Safety Factor	SCM Soil Type	Infilt. Rate (in/hr)	Area (ft2)
SCM 1	Bioretention	1	Site-Specific	0.15	7074
SCM 2	Bioretention	1	Site-Specific	0.15	2367

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

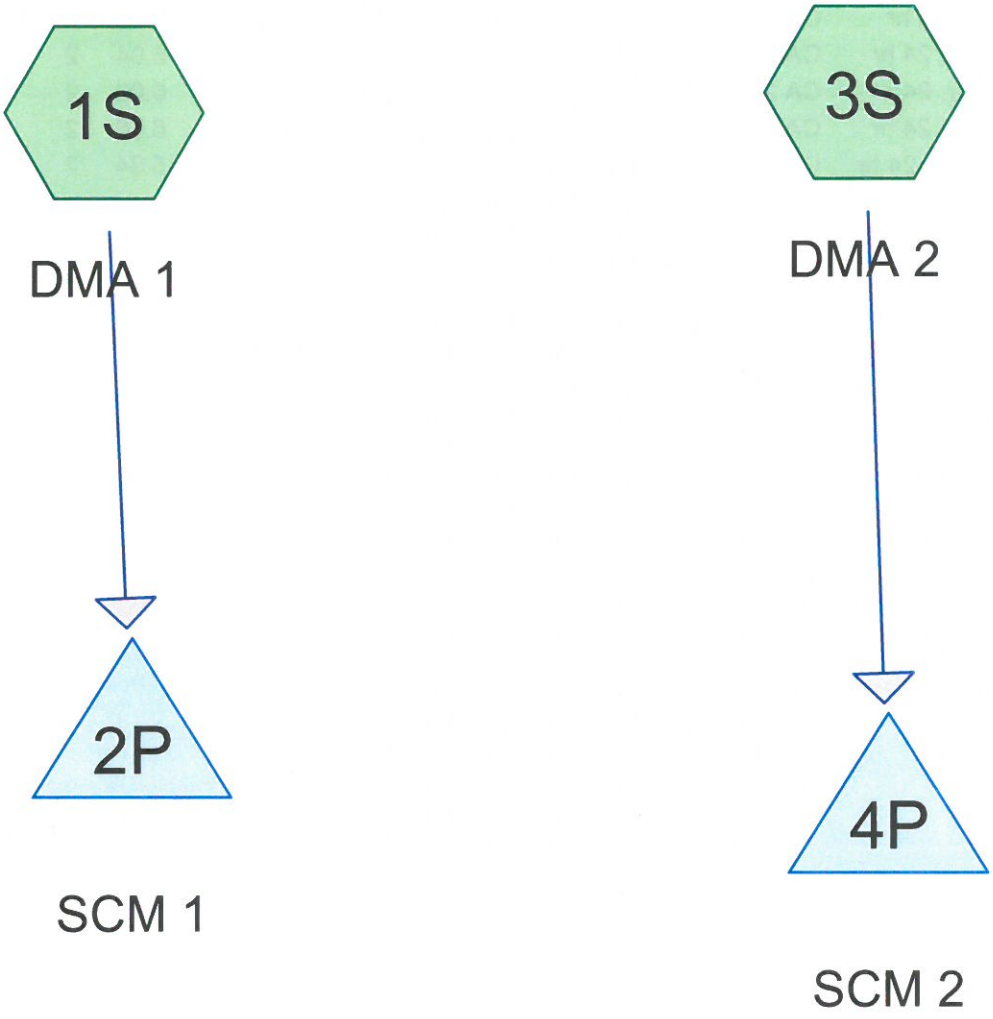
SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)	Orifice Diameter (in)
SCM 1	5960	2.23	59.6	
SCM 2	2505	2.18	58.0	

6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name(s)	Eff. Tributary DMA Area (ft2)	Effective Tributary / SRA Area Ratio

APPENDIX C

HydroCAD Calculation Summary, Pre and Post Development



Subcat Reach Pond Link

Routing Diagram for Goleta Train Depot
Prepared by {enter your company name here}, Printed 9/26/2022

Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

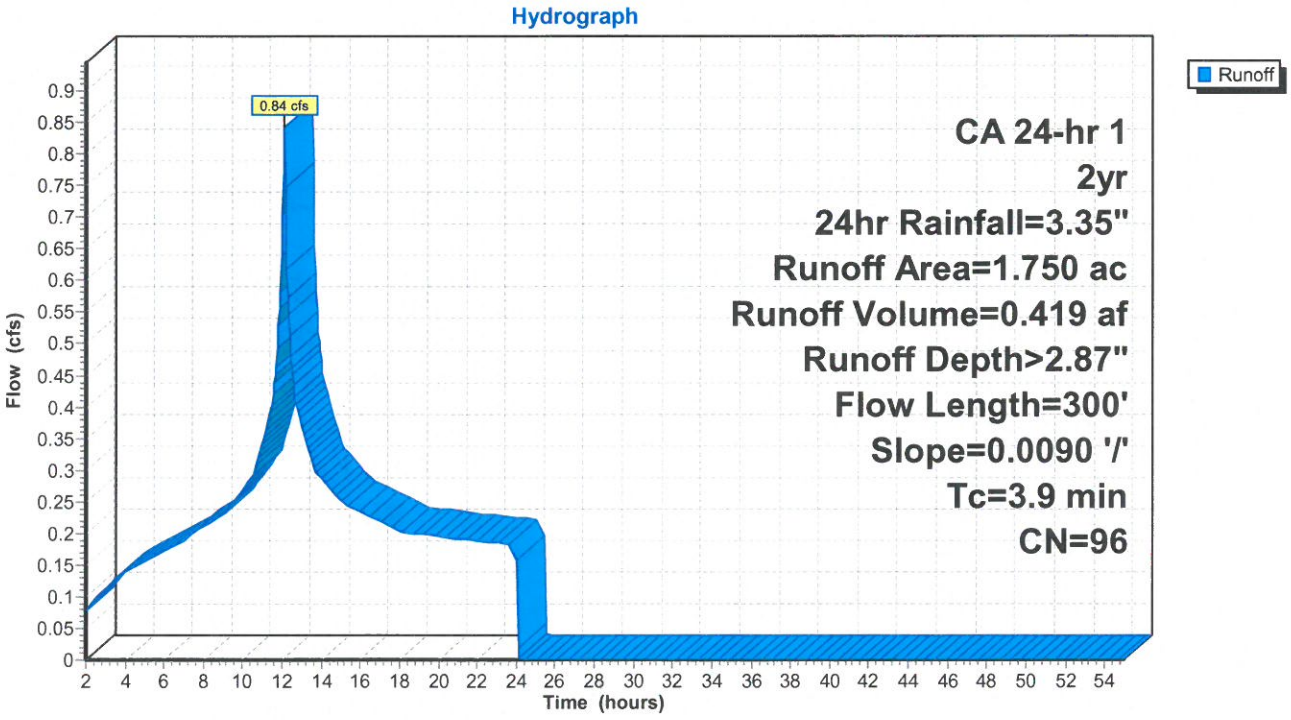
Runoff = 0.84 cfs @ 12.10 hrs, Volume= 0.419 af, Depth> 2.87"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 2yr, 24hr Rainfall=3.35"

Area (ac)	CN	Description
1.570	98	Paved parking, HSG D
0.180	76	Woods/grass comb., Fair, HSG C
1.750	96	Weighted Average
0.180		10.29% Pervious Area
1.570		89.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

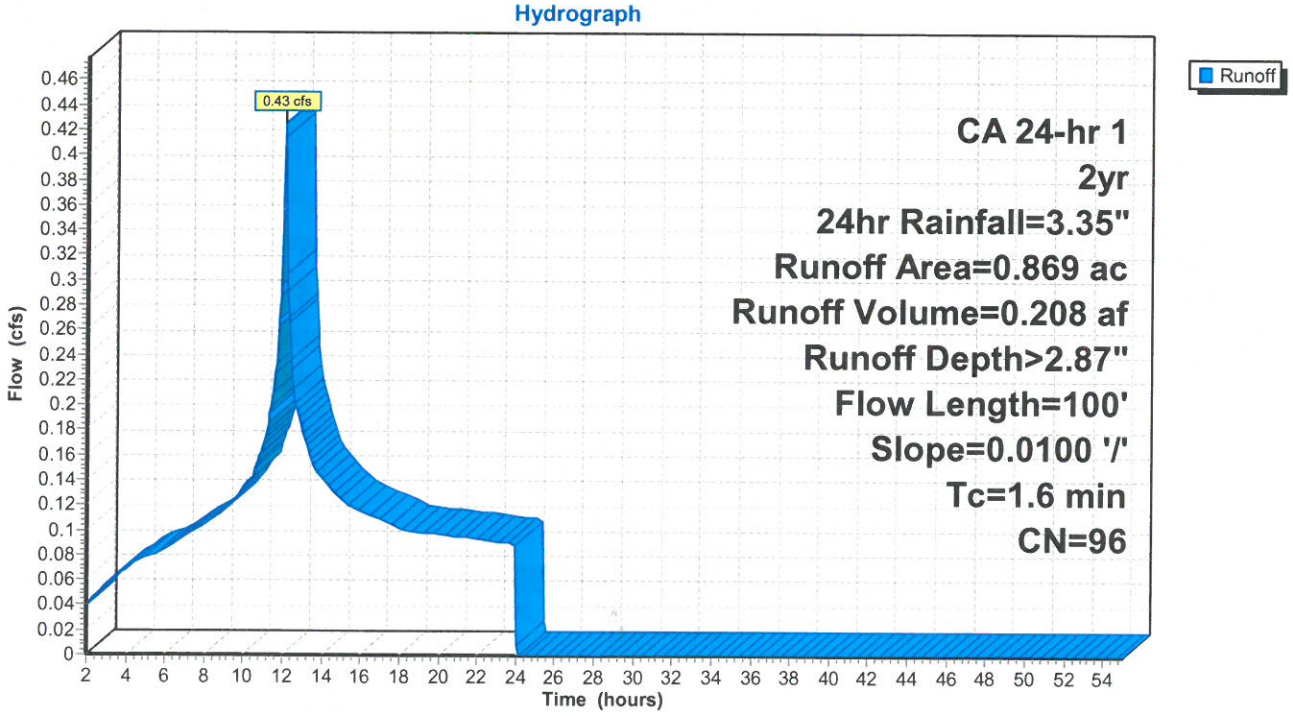
Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.208 af, Depth> 2.87"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 2yr, 24hr Rainfall=3.35"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.069	72	Woods/grass comb., Good, HSG C
0.869	96	Weighted Average
0.069		7.94% Pervious Area
0.800		92.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

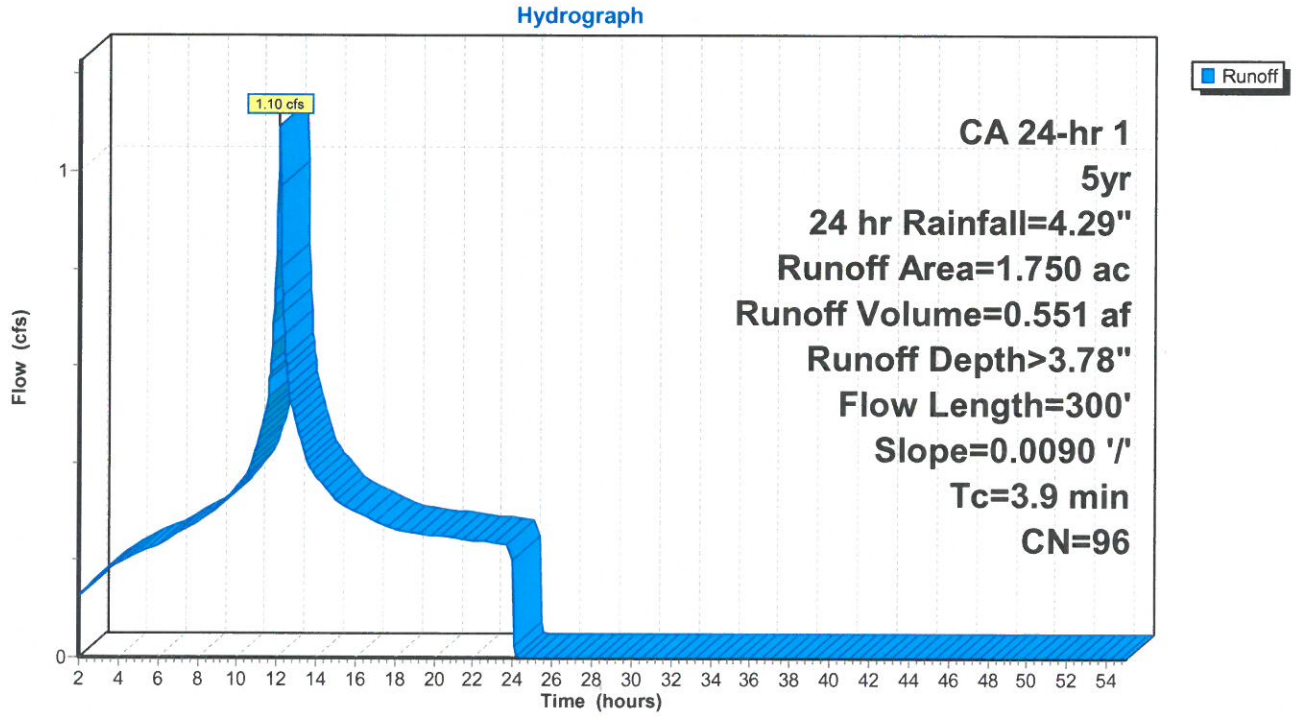
Runoff = 1.10 cfs @ 12.10 hrs, Volume= 0.551 af, Depth> 3.78"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 5yr, 24 hr Rainfall=4.29"

Area (ac)	CN	Description
1.570	98	Paved parking, HSG D
0.180	76	Woods/grass comb., Fair, HSG C
1.750	96	Weighted Average
0.180		10.29% Pervious Area
1.570		89.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

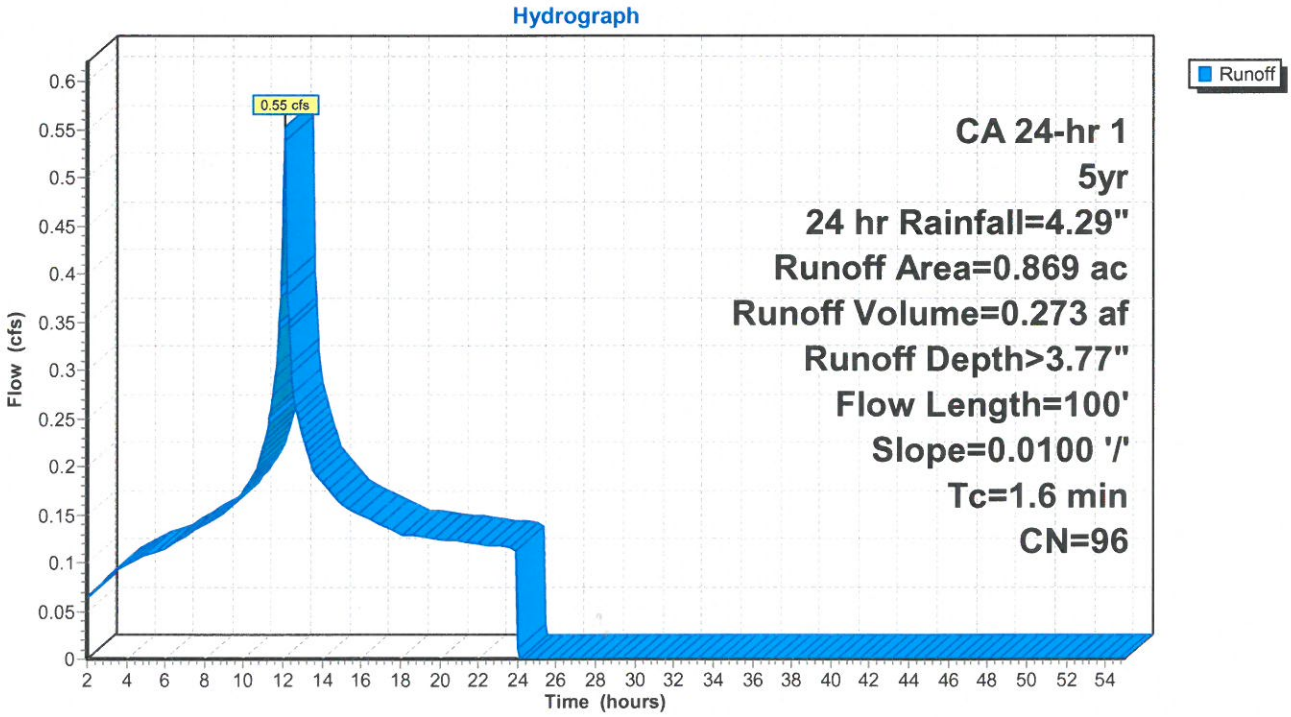
Runoff = 0.55 cfs @ 12.07 hrs, Volume= 0.273 af, Depth> 3.77"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 5yr, 24 hr Rainfall=4.29"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.069	72	Woods/grass comb., Good, HSG C
0.869	96	Weighted Average
0.069		7.94% Pervious Area
0.800		92.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

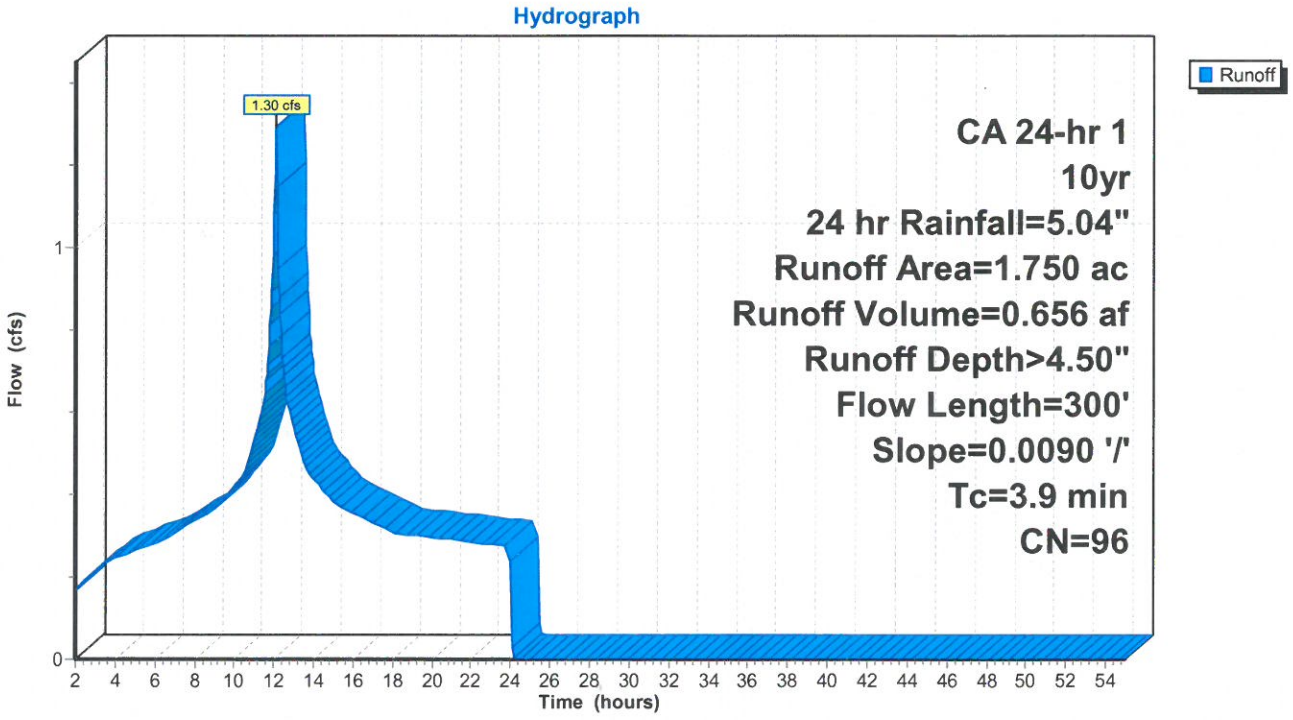
Runoff = 1.30 cfs @ 12.10 hrs, Volume= 0.656 af, Depth> 4.50"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 10yr, 24 hr Rainfall=5.04"

Area (ac)	CN	Description
1.570	98	Paved parking, HSG D
0.180	76	Woods/grass comb., Fair, HSG C
1.750	96	Weighted Average
0.180		10.29% Pervious Area
1.570		89.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

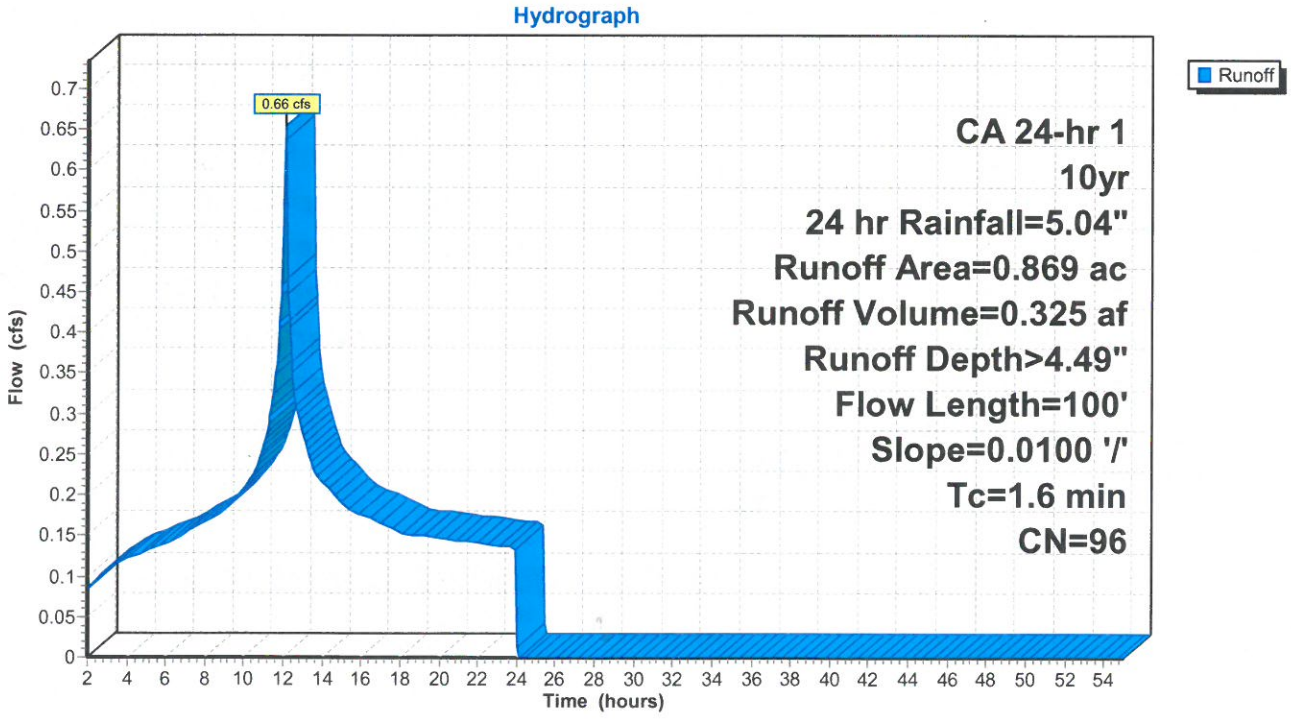
Runoff = 0.66 cfs @ 12.07 hrs, Volume= 0.325 af, Depth> 4.49"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 10yr, 24 hr Rainfall=5.04"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.069	72	Woods/grass comb., Good, HSG C
0.869	96	Weighted Average
0.069		7.94% Pervious Area
0.800		92.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

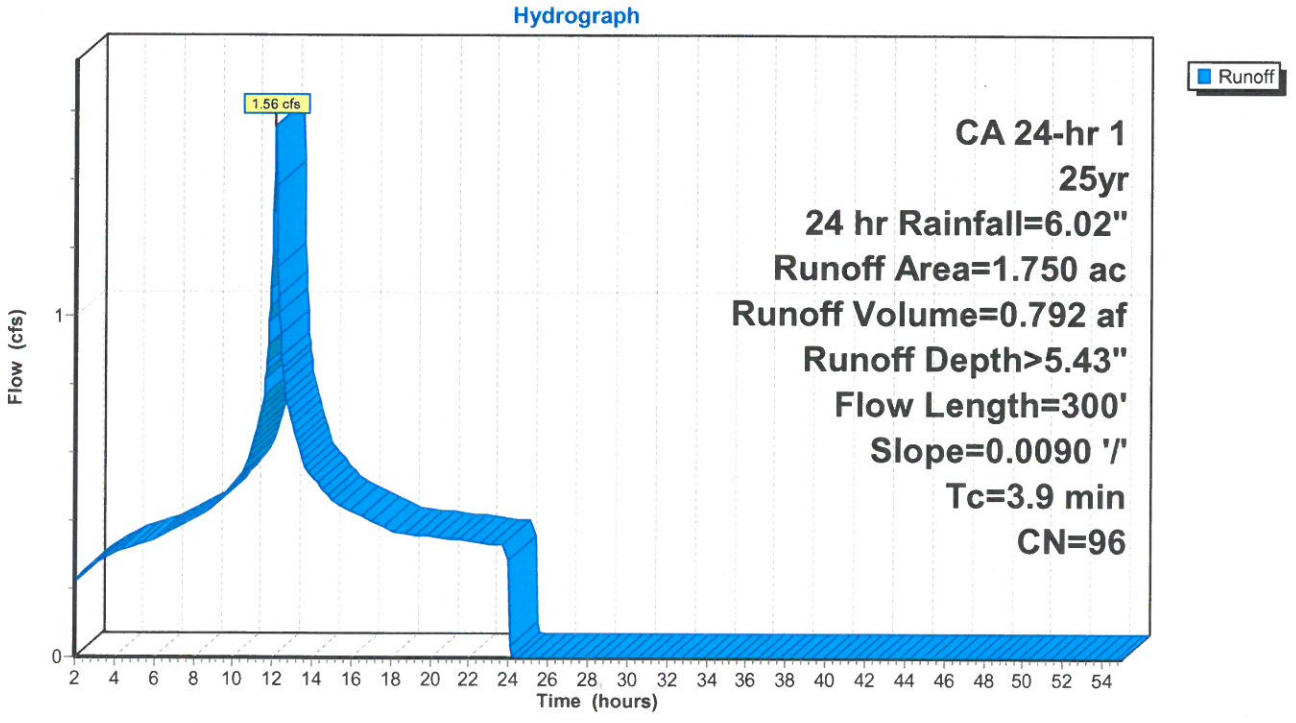
Runoff = 1.56 cfs @ 12.10 hrs, Volume= 0.792 af, Depth> 5.43"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 25yr, 24 hr Rainfall=6.02"

Area (ac)	CN	Description
1.570	98	Paved parking, HSG D
0.180	76	Woods/grass comb., Fair, HSG C
1.750	96	Weighted Average
0.180		10.29% Pervious Area
1.570		89.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

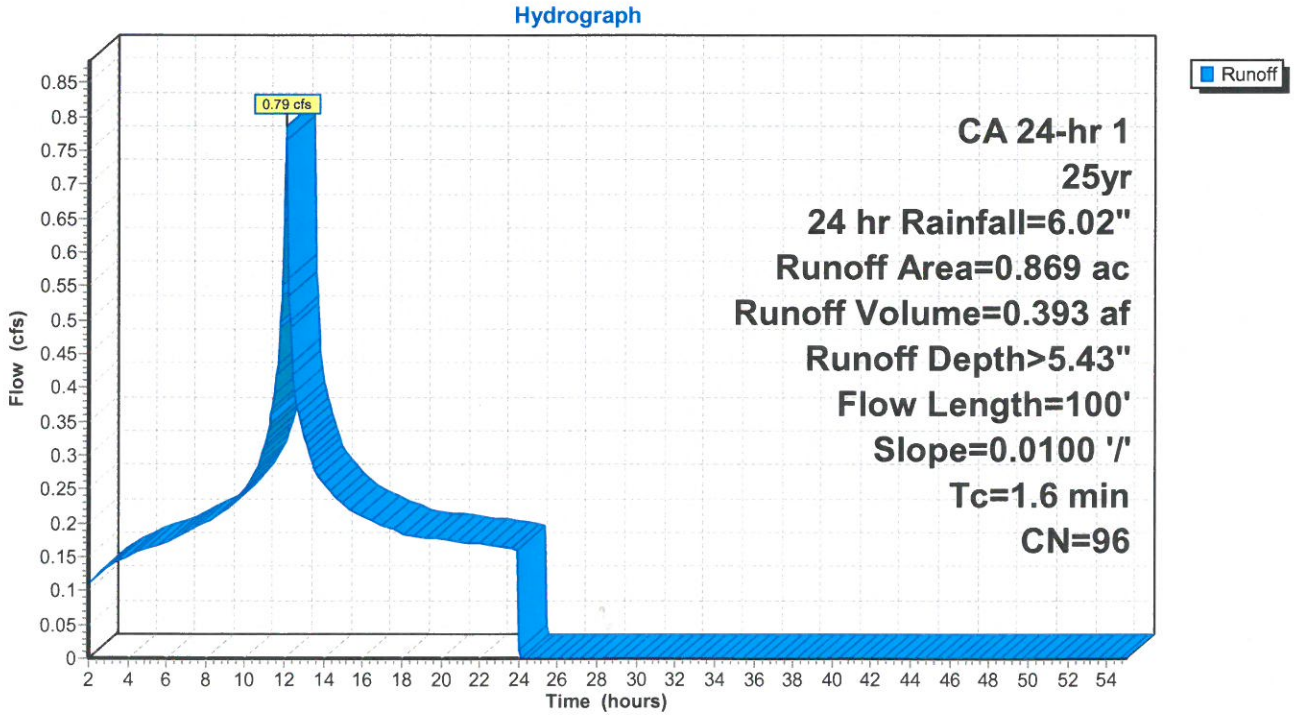
Runoff = 0.79 cfs @ 12.07 hrs, Volume= 0.393 af, Depth> 5.43"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 25yr, 24 hr Rainfall=6.02"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.069	72	Woods/grass comb., Good, HSG C
0.869	96	Weighted Average
0.069		7.94% Pervious Area
0.800		92.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

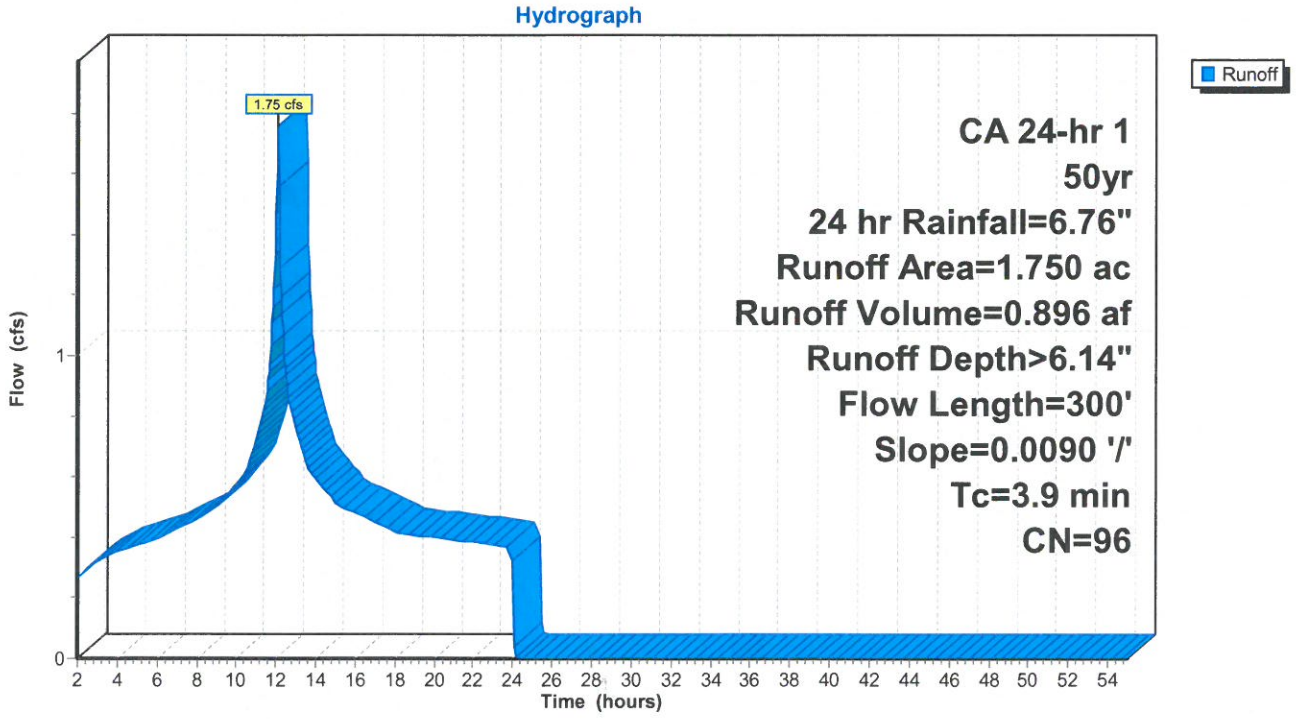
Runoff = 1.75 cfs @ 12.10 hrs, Volume= 0.896 af, Depth> 6.14"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 50yr, 24 hr Rainfall=6.76"

Area (ac)	CN	Description
1.570	98	Paved parking, HSG D
0.180	76	Woods/grass comb., Fair, HSG C
1.750	96	Weighted Average
0.180		10.29% Pervious Area
1.570		89.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

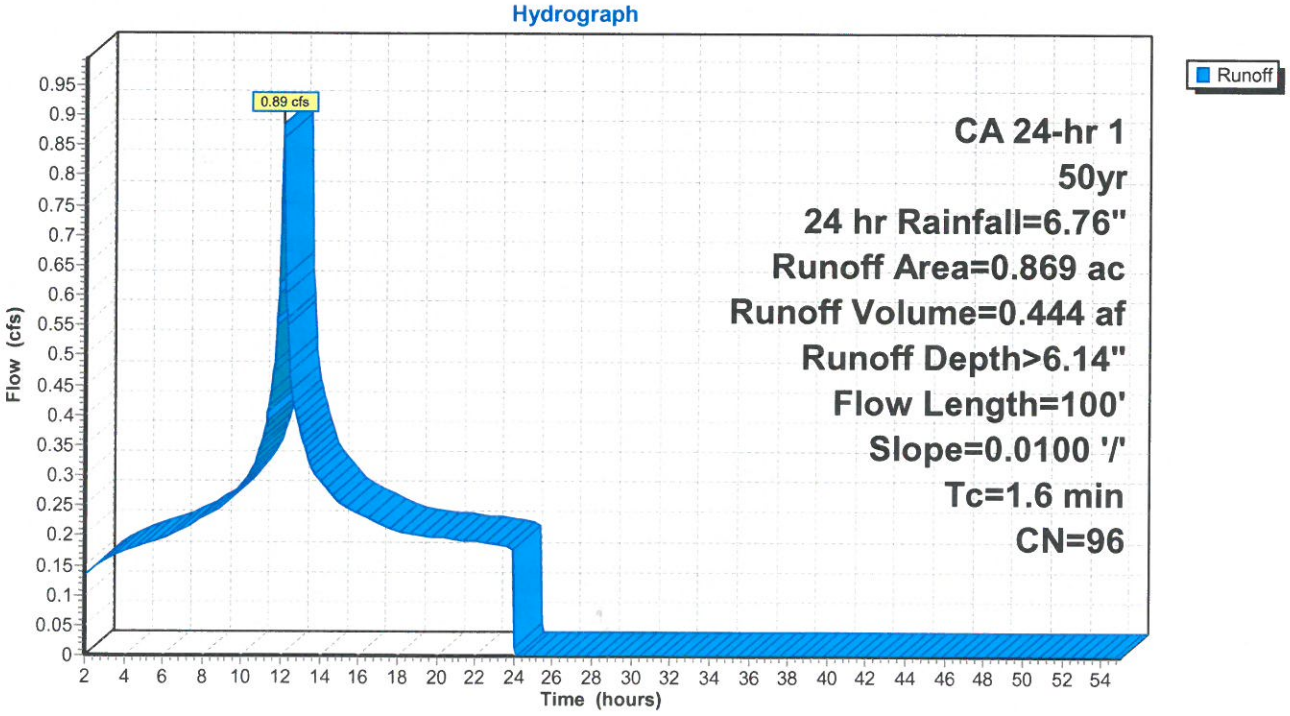
Runoff = 0.89 cfs @ 12.07 hrs, Volume= 0.444 af, Depth> 6.14"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 50yr, 24 hr Rainfall=6.76"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG D
0.069	72	Woods/grass comb., Good, HSG C
0.869	96	Weighted Average
0.069		7.94% Pervious Area
0.800		92.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

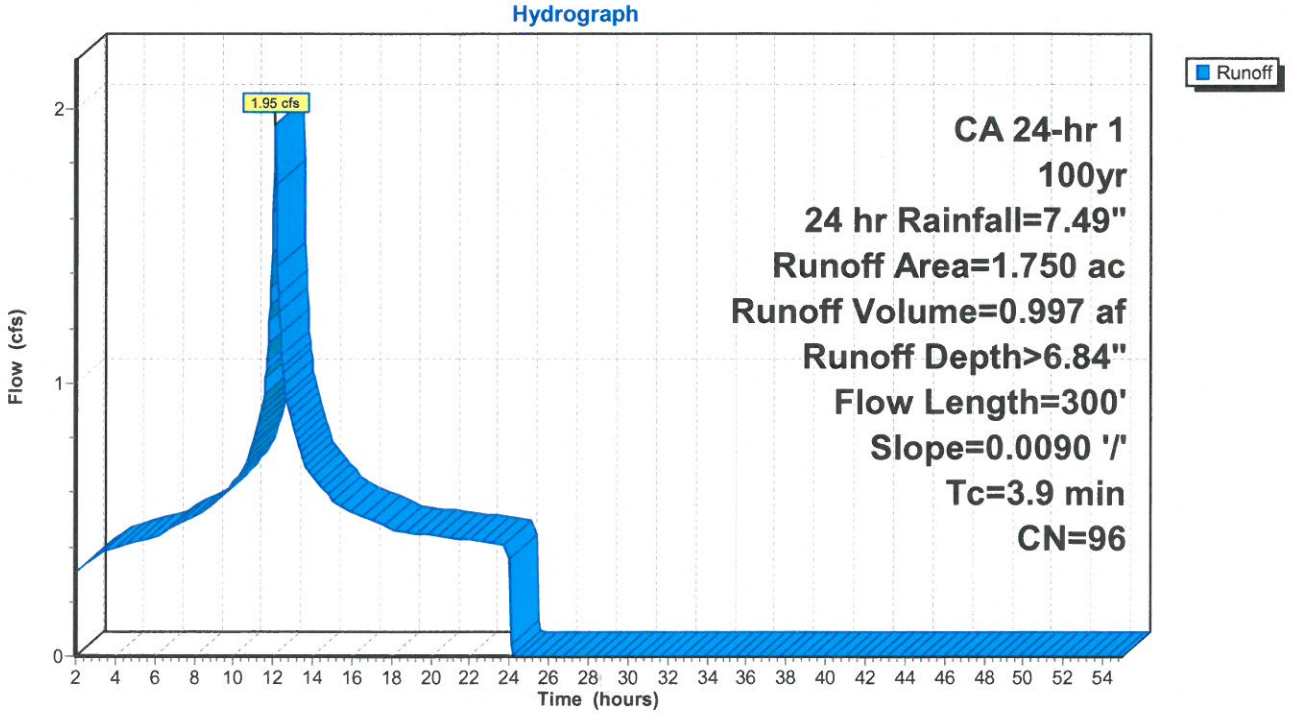
Runoff = 1.95 cfs @ 12.10 hrs, Volume= 0.997 af, Depth> 6.84"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 100yr, 24 hr Rainfall=7.49"

Area (ac)	CN	Description
1.570	98	Paved parking, HSG D
0.180	76	Woods/grass comb., Fair, HSG C
1.750	96	Weighted Average
0.180		10.29% Pervious Area
1.570		89.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

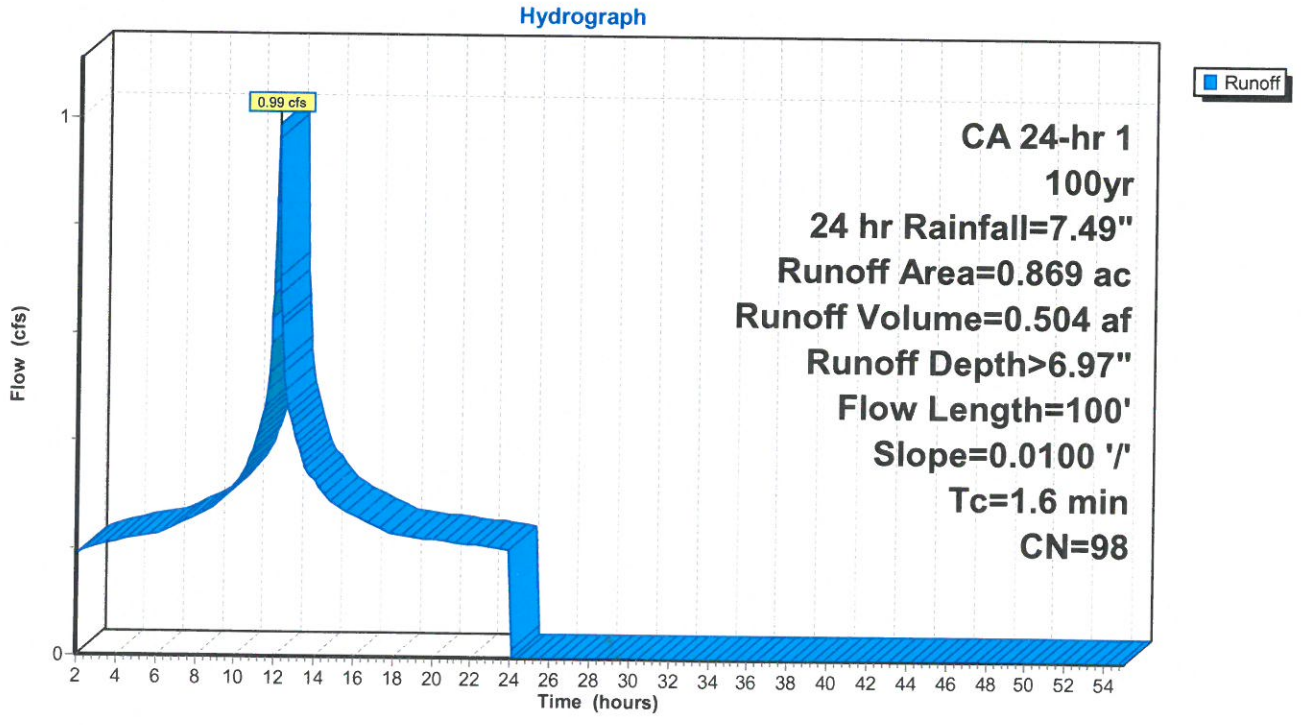
Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.504 af, Depth> 6.97"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 100yr, 24 hr Rainfall=7.49"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

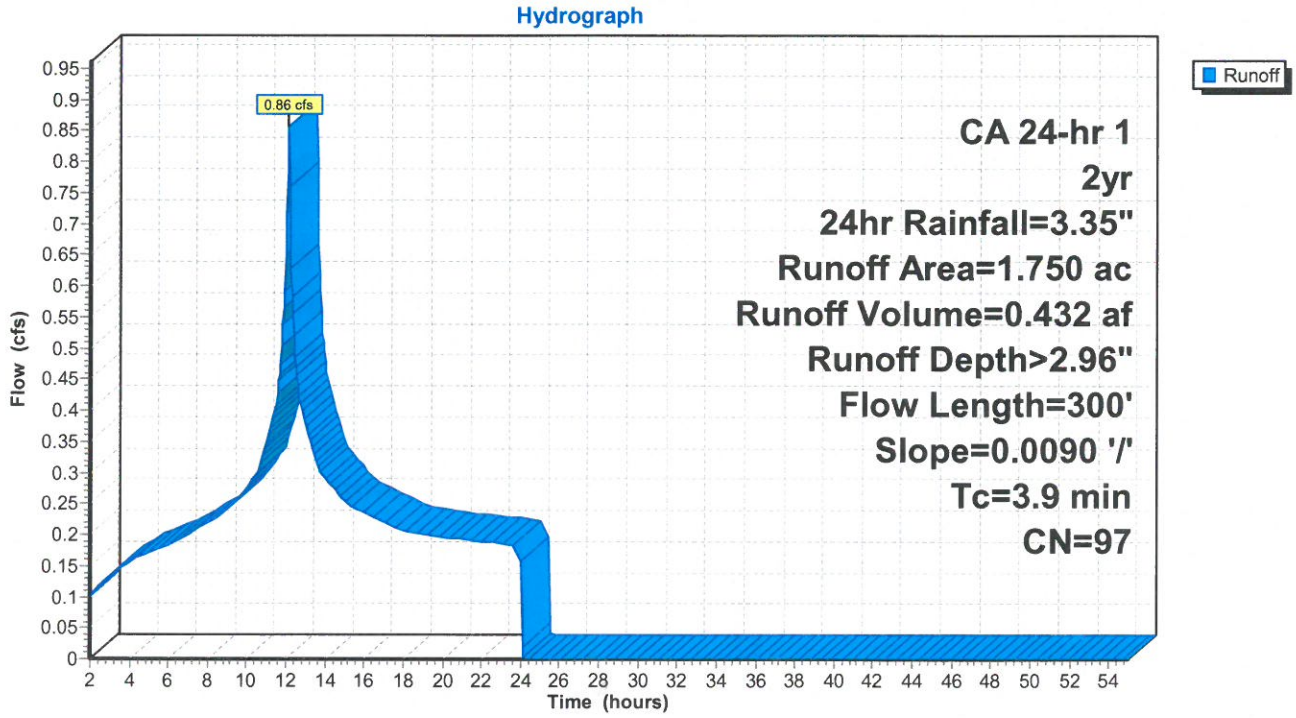
Runoff = 0.86 cfs @ 12.10 hrs, Volume= 0.432 af, Depth> 2.96"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 2yr, 24hr Rainfall=3.35"

Area (ac)	CN	Description
1.655	98	Paved parking, HSG D
0.095	76	Woods/grass comb., Fair, HSG C
1.750	97	Weighted Average
0.095		5.43% Pervious Area
1.655		94.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

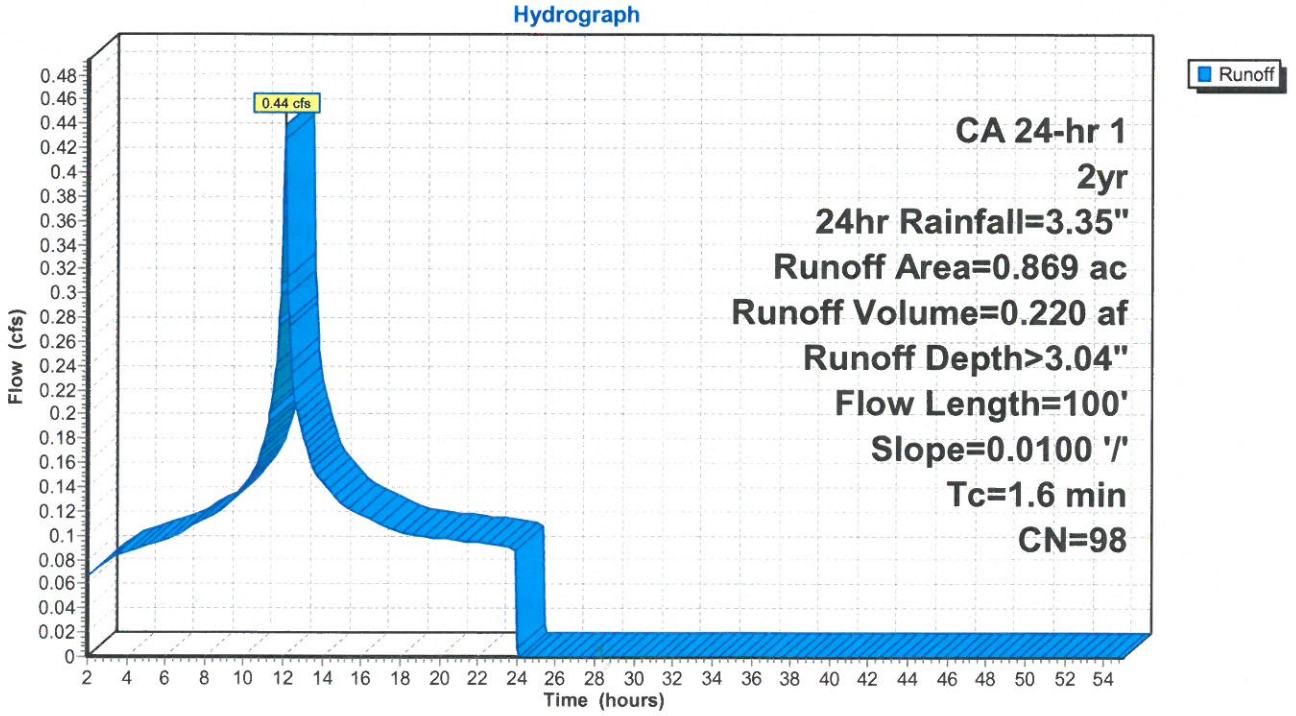
Runoff = 0.44 cfs @ 12.07 hrs, Volume= 0.220 af, Depth> 3.04"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 2yr, 24hr Rainfall=3.35"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

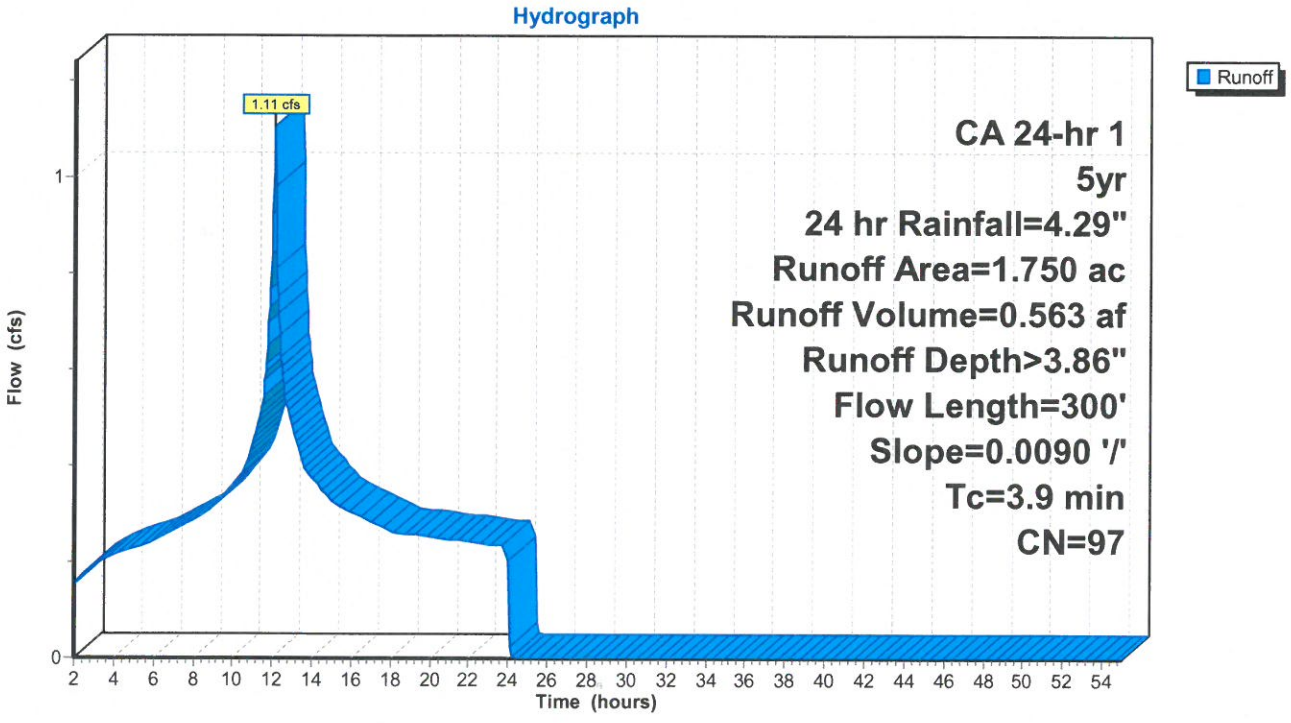
Runoff = 1.11 cfs @ 12.10 hrs, Volume= 0.563 af, Depth> 3.86"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 5yr, 24 hr Rainfall=4.29"

Area (ac)	CN	Description
1.655	98	Paved parking, HSG D
0.095	76	Woods/grass comb., Fair, HSG C
1.750	97	Weighted Average
0.095		5.43% Pervious Area
1.655		94.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

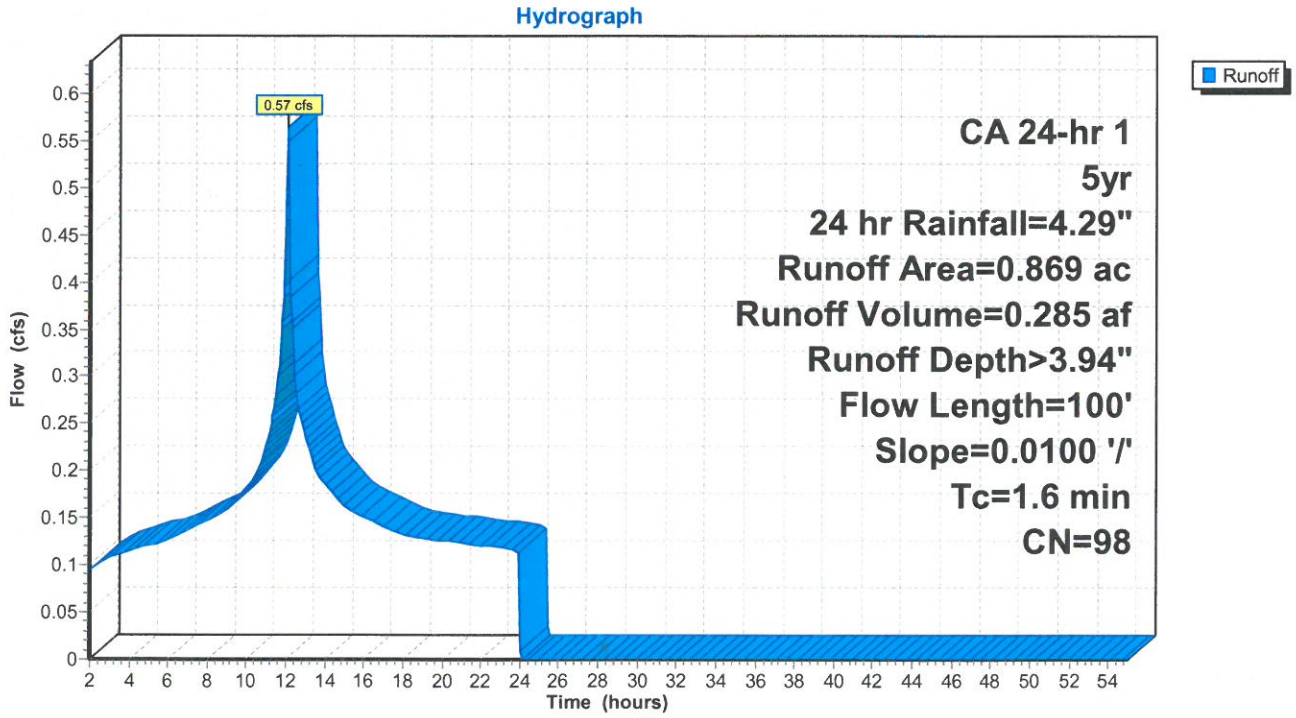
Runoff = 0.57 cfs @ 12.07 hrs, Volume= 0.285 af, Depth> 3.94"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 5yr, 24 hr Rainfall=4.29"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

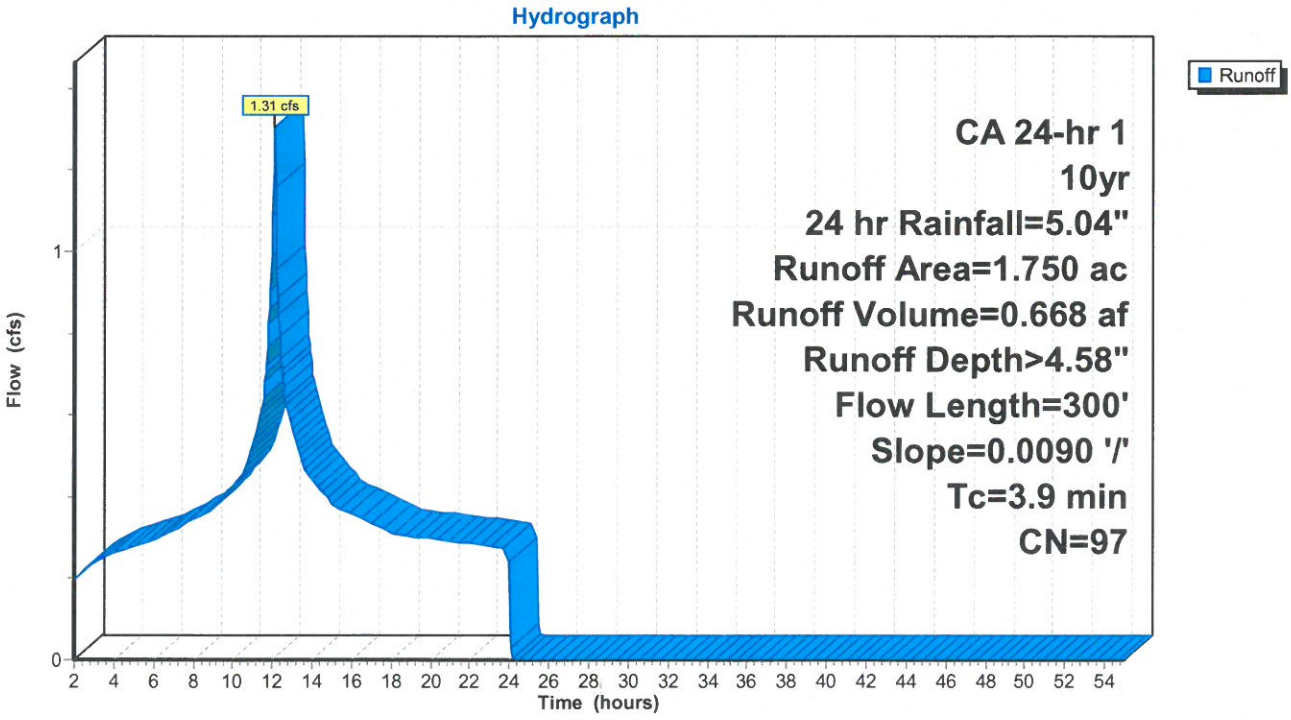
Runoff = 1.31 cfs @ 12.10 hrs, Volume= 0.668 af, Depth> 4.58"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 10yr, 24 hr Rainfall=5.04"

Area (ac)	CN	Description
1.655	98	Paved parking, HSG D
0.095	76	Woods/grass comb., Fair, HSG C
1.750	97	Weighted Average
0.095		5.43% Pervious Area
1.655		94.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

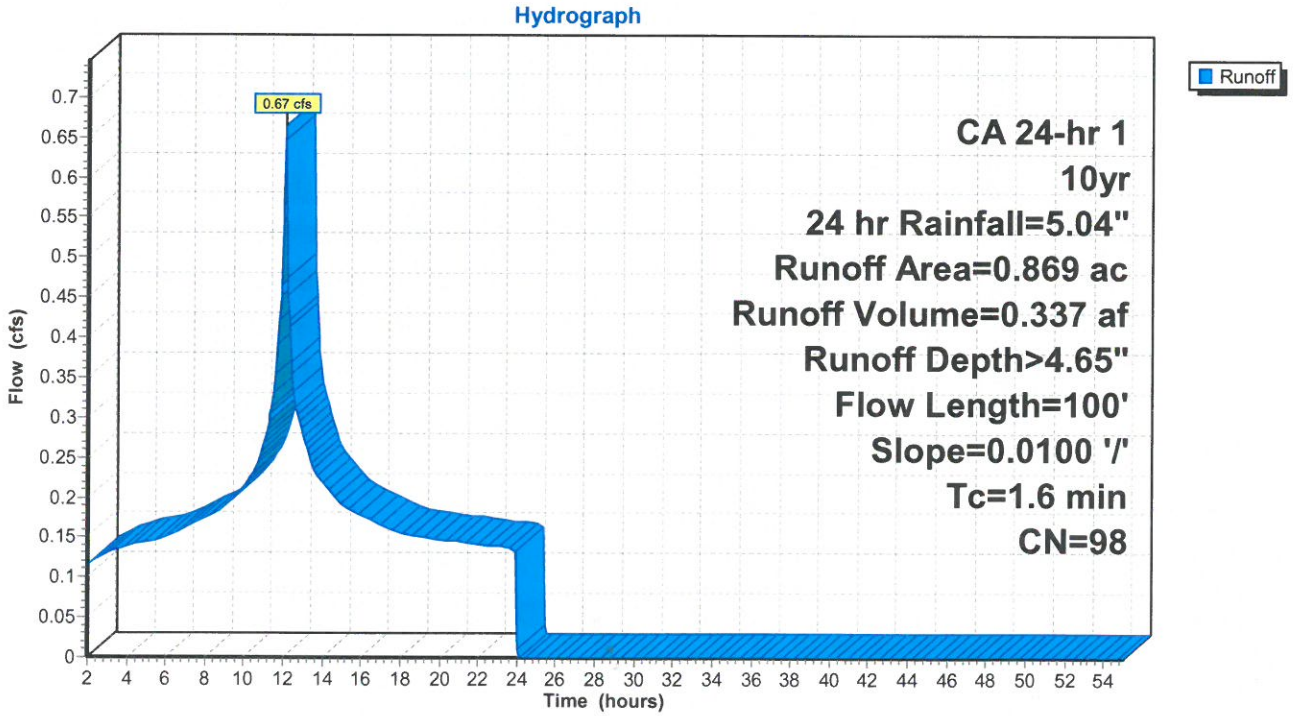
Runoff = 0.67 cfs @ 12.07 hrs, Volume= 0.337 af, Depth> 4.65"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 10yr, 24 hr Rainfall=5.04"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

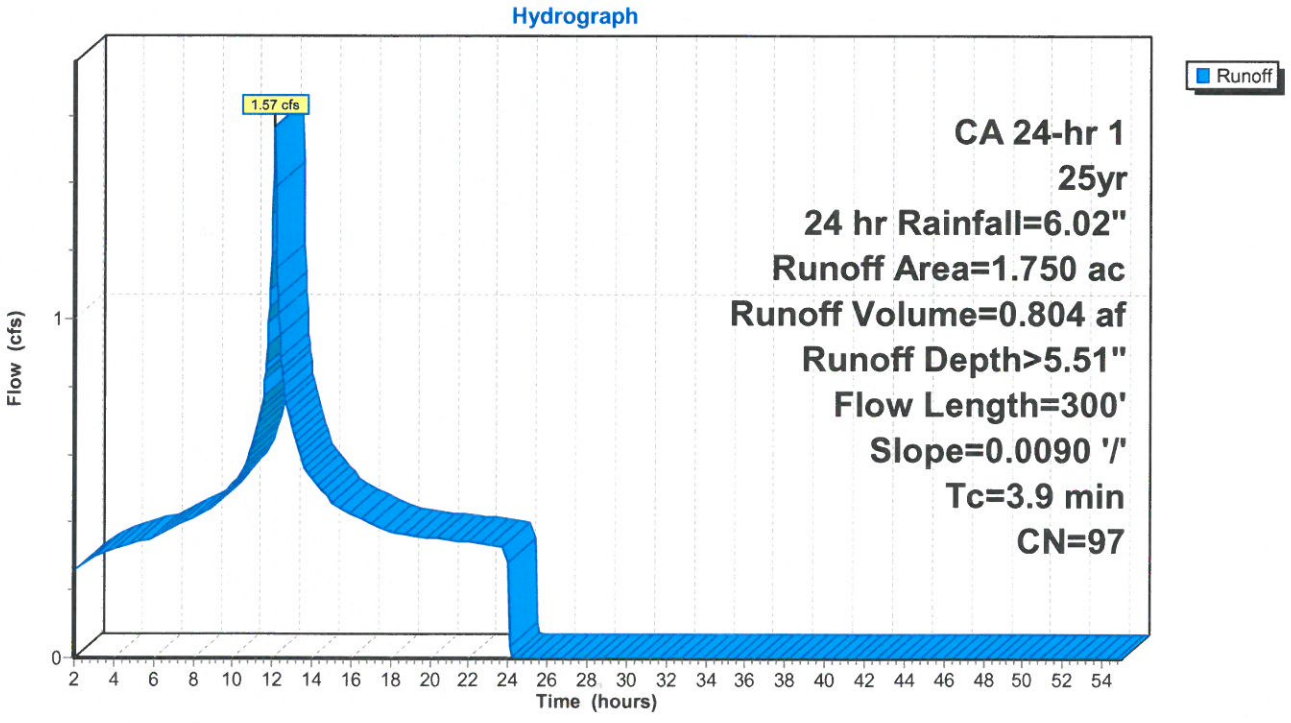
Runoff = 1.57 cfs @ 12.10 hrs, Volume= 0.804 af, Depth> 5.51"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 25yr, 24 hr Rainfall=6.02"

Area (ac)	CN	Description
1.655	98	Paved parking, HSG D
0.095	76	Woods/grass comb., Fair, HSG C
1.750	97	Weighted Average
0.095		5.43% Pervious Area
1.655		94.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

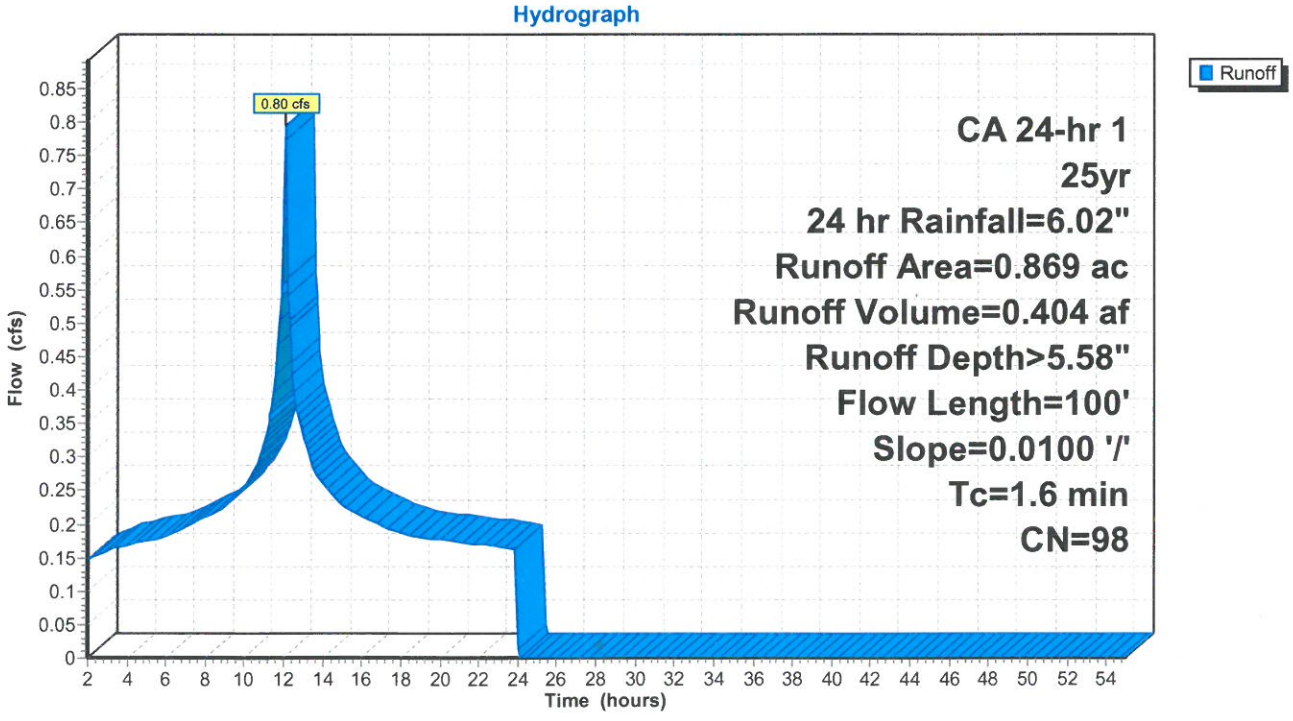
Runoff = 0.80 cfs @ 12.07 hrs, Volume= 0.404 af, Depth> 5.58"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 25yr, 24 hr Rainfall=6.02"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

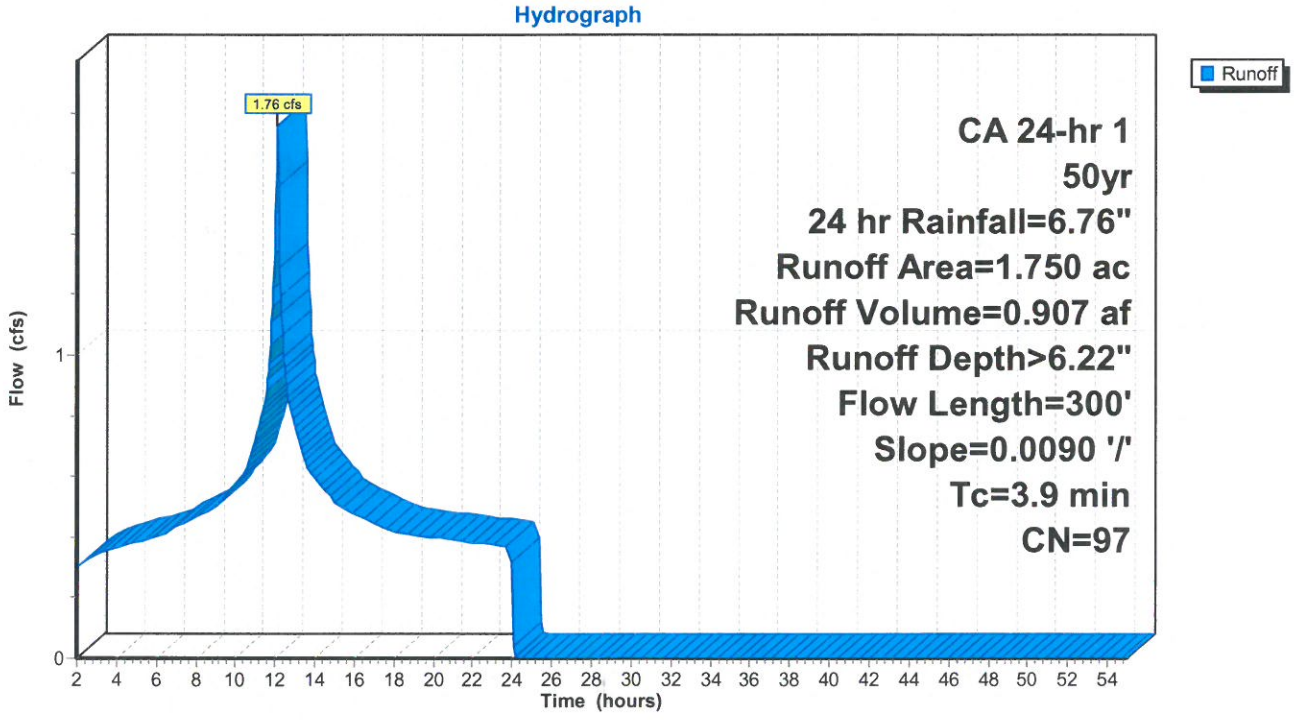
Runoff = 1.76 cfs @ 12.10 hrs, Volume= 0.907 af, Depth> 6.22"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 50yr, 24 hr Rainfall=6.76"

Area (ac)	CN	Description
1.655	98	Paved parking, HSG D
0.095	76	Woods/grass comb., Fair, HSG C
1.750	97	Weighted Average
0.095		5.43% Pervious Area
1.655		94.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

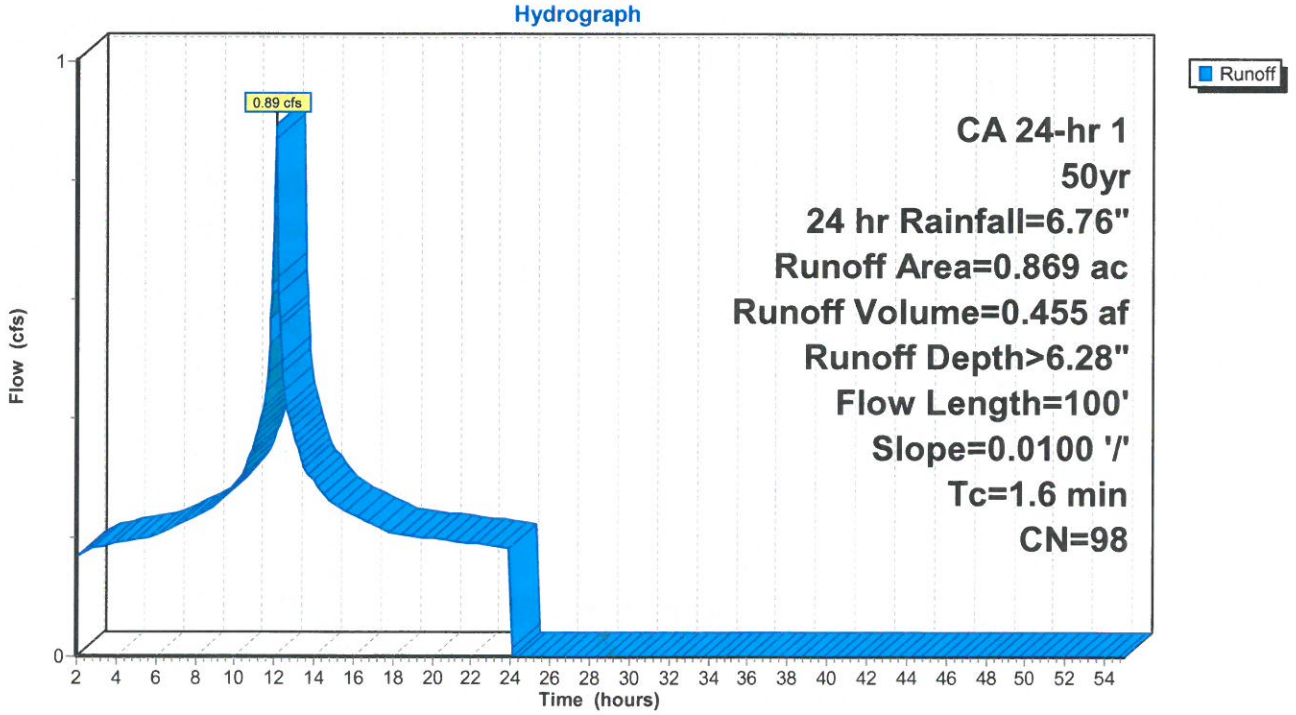
Runoff = 0.89 cfs @ 12.07 hrs, Volume= 0.455 af, Depth> 6.28"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 50yr, 24 hr Rainfall=6.76"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



Summary for Subcatchment 1S: DMA 1

[49] Hint: Tc<2dt may require smaller dt

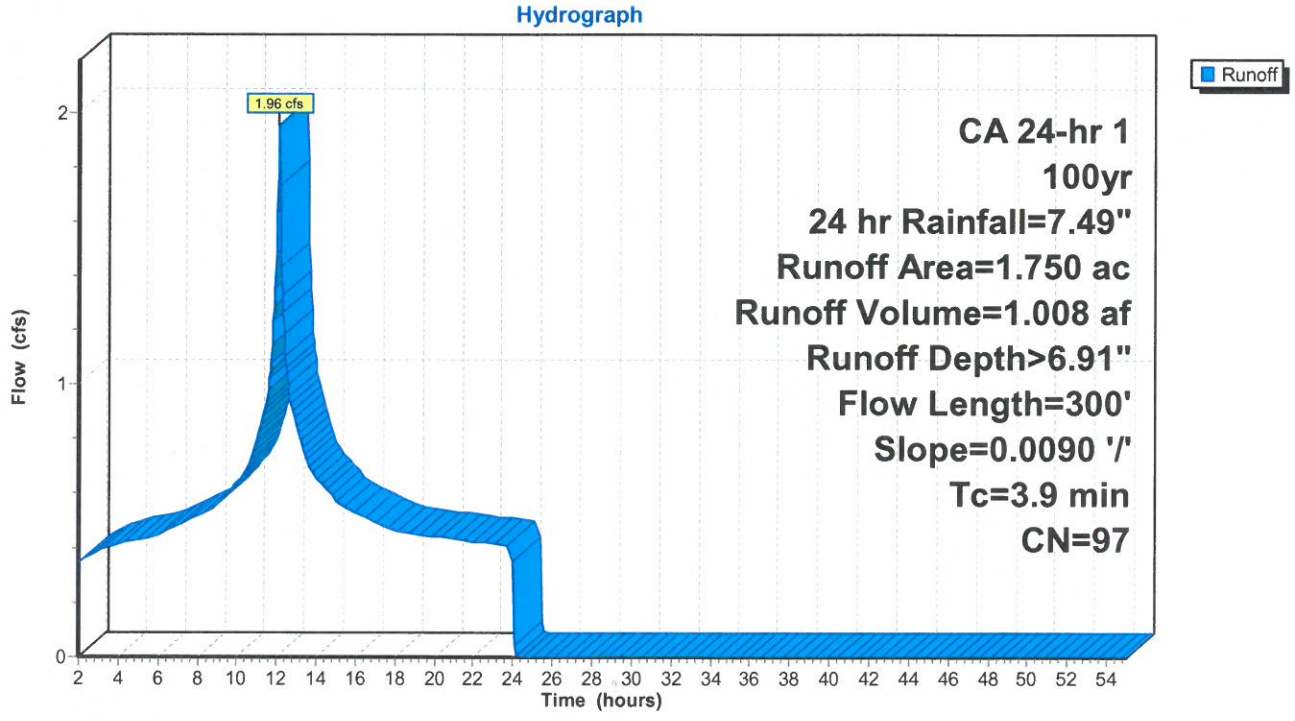
Runoff = 1.96 cfs @ 12.10 hrs, Volume= 1.008 af, Depth> 6.91"
Routed to Pond 2P : SCM 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 100yr, 24 hr Rainfall=7.49"

Area (ac)	CN	Description
1.655	98	Paved parking, HSG D
0.095	76	Woods/grass comb., Fair, HSG C
1.750	97	Weighted Average
0.095		5.43% Pervious Area
1.655		94.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	300	0.0090	1.27		**Sheet Flow, DMA 1 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 1S: DMA 1



Summary for Subcatchment 3S: DMA 2

DMA 2 Drains to SCM Bioinfiltration Facility #2

[49] Hint: Tc<2dt may require smaller dt

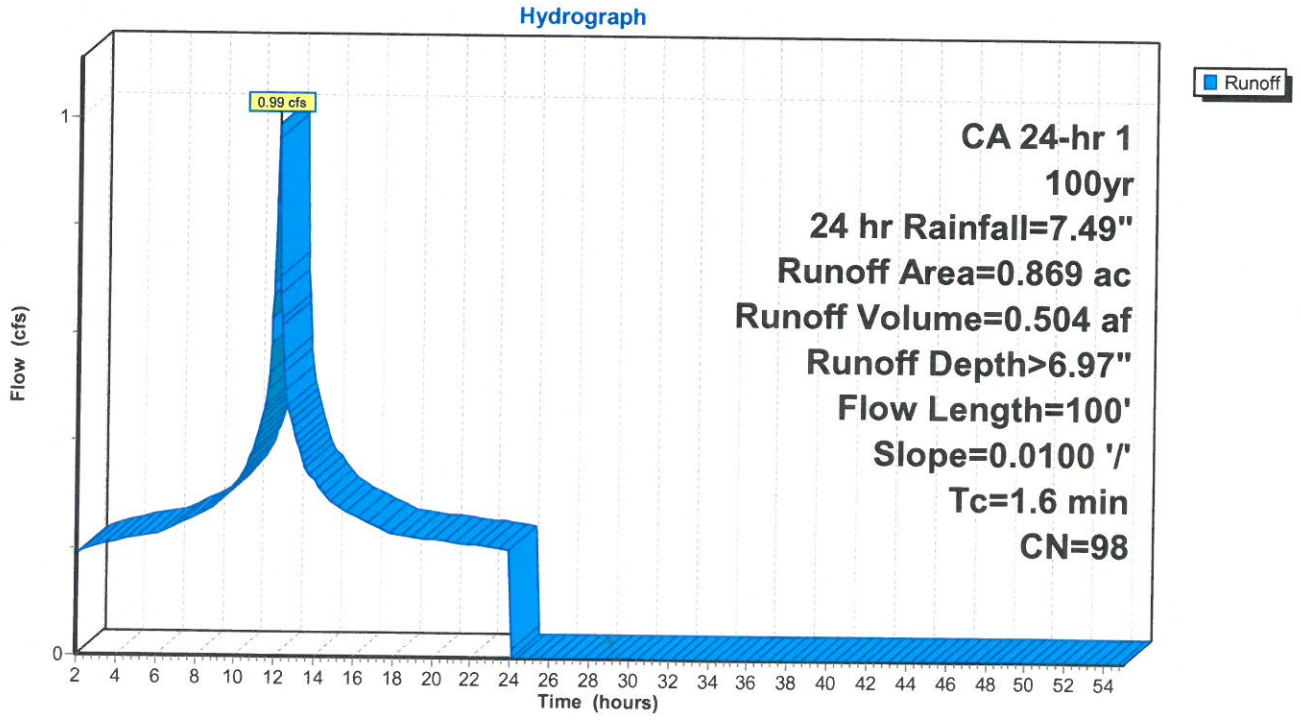
Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.504 af, Depth> 6.97"
Routed to Pond 4P : SCM 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-55.00 hrs, dt= 0.05 hrs
CA 24-hr 1 100yr, 24 hr Rainfall=7.49"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG D
0.000	72	Woods/grass comb., Good, HSG C
0.869	98	Weighted Average
0.869		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	100	0.0100	1.07		**Sheet Flow, DMA 2 Depot Sheet Flow** Smooth surfaces n= 0.011 P2= 3.35"

Subcatchment 3S: DMA 2



APPENDIX D

Stormwater Control Measure Inspection and Maintenance Log

Appendix D. Stormwater Pollutant Sources/Source Controls Checklist

How to use this worksheet (also see instructions on page 3-6 of the *Stormwater Technical Guide*):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Stormwater Control Plan drawings.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Stormwater Control Plan. Use the format shown in Table 3-1 on page 3-6 of the *Stormwater Technical Guide*. Describe your specific BMPs in an accompanying narrative and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
■ **A.** On-site storm drain inlets (unauthorized non-stormwater discharges and accidental spills or leaks)	■ Locations of inlets.	■ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	■ Maintain and periodically repaint or replace inlet markings. ■ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ■ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **B.** Interior floor drains and elevator shaft sump pumps		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D_1.** Need for future indoor & structural pest control		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.
■ **D_2.** Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance	❑ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ■ Show stormwater treatment and retention SCMs. (See instructions in Chapter 4.)	State that final landscape plans will accomplish all of the following. ❑ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ■ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ■ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	■ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ■ Provide IPM information to new owners, lessees, and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
■ **F.** Food service	■ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	
■ **G.** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ■ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	■ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. ❑ Where appropriate, reference documentation of compliance with the requirements of programs for: Hazardous Waste Generation Hazardous Materials Release Response and Inventory California Accidental Release (CalARP) Aboveground Storage Tank Uniform Fire Code Article 80 Section 103(b) & (c) 1991 Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **J.** Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle/ equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Wash water from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinse water from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid unless such containers are in use or in an area of secondary containment.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **L.** Fuel Dispensing Areas	❑ Fueling areas1 shall have impermeable floors (i.e., Portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[1] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **M.** Loading Docks	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer or diverted and collected for ultimate discharge to the sanitary sewer. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **N.** Fire Sprinkler Test Water		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Structural/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
O. Miscellaneous Drain or Wash Water or Other Sources ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim. ❑ Other sources		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. ❑ Include controls for other sources as specified by local reviewer.	
■ **P.** Plazas, sidewalks, and parking lots.			■ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

APPENDIX E

Bioretention Construction Inspection Checklist

Appendix E. Bioretention Construction Inspection Checklist

Layout (to be confirmed prior to beginning excavation)

- ❒ Square footage of the facility meets or exceeds minimum shown in Stormwater Control Plan
- ❒ Site grading and grade breaks are consistent with the boundaries of the tributary Drainage Management Area(s) (DMAs) shown in the Stormwater Control Plan
- ❒ Inlet elevation of the facility is low enough to receive drainage from the entire tributary DMA
- ❒ Locations and elevations of overland flow or piping, including roof leaders, from impervious areas to the facility have been laid out and any conflicts resolved
- ❒ Rim elevation of the facility is laid out to be level all the way around, or elevations are consistent with a detailed cross-section showing location and height of interior dams
- ❒ Locations for vaults, utility boxes, and light standards have been identified so that they will not conflict with the facility
- ❒ Location for signage is identified
- ❒ Facility is protected as needed from construction-phase runoff and sediment

Excavation (to be confirmed prior to backfilling or pipe installation)

- ❒ Excavation conducted with materials and techniques to minimize compaction of soils within the facility area
- ❒ Excavation is to accurate area and depth
- ❒ Slopes or side walls protect from sloughing of native soils into the facility
- ❒ Vertical moisture barrier, if specified, has been added to protect adjacent pavement or structures.
- ❒ Native soils at bottom of excavation are ripped or loosened to promote infiltration

Overflow or Surface Connection to Storm Drainage
(to be confirmed prior to backfilling with any materials)

- ❒ Overflow is at specified elevation
- ❒ No knockouts or side inlets are in overflow riser
- ❒ Overflow location selected to minimize surface flow velocity (near, but offset from, inlet recommended)
- ❒ Grating excludes mulch and litter (beehive or atrium-style grates with ¼" openings recommended)
- ❒ Overflow is connected to storm drain via appropriately sized piping

Underground connection to storm drain/outlet orifice
(to be confirmed prior to backfilling with any materials)

- ❒ Perforated pipe underdrain (PVC SDR 35 or approved equivalent) is installed with holes facing down
- ❒ Perforated pipe is connected to storm drain at specified elevation (typ. bottom of soil elevation)
- ❒ Cleanouts are in accessible locations and connected via sweep bends
- ❒ Monitoring well, if required, is installed.
- ❒ Structures (arches or large diameter pipes) for additional surface storage are installed as shown in plans and specifications and have the specified volume

Drain Rock/Subdrain (to be confirmed prior to installation of soil mix)

- ❒ Rock is installed as specified. Class 2 permeable, Caltrans specification 68-2.02(F)(3) recommended, or 4"-6" depth of pea gravel is installed at the top of the crushed rock layer to prevent migration of fines into gravel layer
- ❒ Rock is smoothed to a level top elevation. Depth and top elevation are as shown in plans
- ❒ Slopes or side walls protect from sloughing of native soils into the facility
- ❒ No filter fabric is placed between the subdrain and soil mix layers

Soil Mix

- ❒ Soil mix is as specified.
- ❒ Mix installed in lifts not exceeding 12"
- ❒ Mix is not compacted during installation but may be thoroughly wetted to encourage consolidation
- ❒ Mix is smoothed to a level top elevation. Depth of mix (24" min.) and top elevation are as shown in plans, accounting for depth of mulch to follow and required reservoir depth

Irrigation

- ❒ Irrigation system is installed so it can be controlled separately from other landscaped areas. Smart irrigation controllers and drip emitters are recommended
- ❒ Spray heads, if any, are positioned to avoid direct spray into outlet structures

Planting

- ❒ Plants are installed consistent with approved planting plan
- ❒ Any trees and large shrubs are staked securely
- ❒ No fertilizer is added; compost tea may be used
- ❒ No native soil or clayey material are imported into the facility with plantings
- ❒ 1"-2" mulch may be applied following planting; mulch selected to avoid floating
- ❒ Final elevation of soil mix maintained following planting
- ❒ Curb openings are free of obstructions

Final Engineering Inspection

- ❒ Drainage Management Area(s) are free of construction sediment and landscaped areas are stabilized
- ❒ Inlets are installed to ensure entry of runoff from adjoining pavement, have sufficient reveal (drop from the adjoining pavement to the top of the mulch or soil mix, and are not blocked
- ❒ Rock or other energy dissipation at piped or surface inlets is adequate
- ❒ Inflows from roof leaders and pipes are connected and operable
- ❒ Temporary flow diversions are removed
- ❒ Overflow outlets are configured to allow the facility to flood and fill to near rim before overflow
- ❒ Plantings are healthy and becoming established
- ❒ Irrigation is operable
- ❒ Facility drains rapidly; no surface ponding is evident
- ❒ Any accumulated construction debris, trash, or sediment is removed from facility
- ❒ Permanent signage is installed and is visible to site users and maintenance personnel

APPENDIX F

Technical Criteria for Non-LID Treatment Facilities

Appendix C. Technical Criteria for Non-LID Treatment Facilities

Non-LID Treatment Facilities may be either tree-box-type high-flowrate biofilters or vault-based high-flowrate media filters.

General

- Design inflow rate is that generated by a continuous rainfall intensity of 0.2 inches per hour.
- Landscape and non-impervious surfaces should be made self-treating or self-retaining and not drain to treatment facilities, if feasible.
- Use the runoff factors in Table 4-1 (on p. 4-4) of the *Stormwater Technical Guide.*
- The applicant's Stormwater Control Plan (Plan) must include, as an attachment, a letter from the manufacturer stating the manufacturer has reviewed the Plan, the proposed device meets these technical criteria, and the manufacturer will provide a warranty for two years following activation of the facility.

High-Flowrate Tree-Box-Type Biofilters

- Maximum design surface loading rate of 50 inches per hour.
- Precast concrete construction.
- Inlet design to capture flows at least up to the maximum design surface loading rate and to bypass high flows.
- Minimum media depth of 1.8 feet (may be reduced, but maintaining the same media volume, if required because of inadequate head to discharge point).
- Media and facility configuration supports a healthy tree or other vegetation.

Vault-Based High-Flowrate Media Filters

- Replaceable cartridge filters.
- Maximum design filter surface loading rate (to cartridge filters) of 1 gpm/ft2
- Storage volume detains runoff and allows settling of coarse solids prior to filtration.
- Flow through the cartridge filters is controlled by an orifice or other device so that the design surface loading rate is not exceeded.

Alternatively, applicants may specify treatment systems that have received a General Use Level Designation (GULD) for Basic Treatment from the Washington State Department of Ecology based on independently verified field testing following the Technical Assessment Protocol – Ecology (TAPE). Treatment systems must be sized to treat the water quality flow rate at the design operating rate for which they received TAPE GULD certification for Basic Treatment.

Media filters and high flow rate tree well filters currently holding this certification can be found at the following link:
http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html