APPENDIX 6b

WATER QUALITY MANAGEMENT PLAN

Water Quality Management Plan

For:

Planned Synagogue
Dovid Oved Retreat Center
3500 Seymour Road

RUNNING SPRINGS, CALIFORNIA

Prepared for:

West Coast Torah Retreat and Camp Center Inc.

11400 W. Olympic Blvd. 9th Floor

Los Angeles, CA, 90064

(310) 248-2450

Prepared by:

Transtech Engineers, Inc.

413 Mackay Drive

San Bernardino, CA 92408

(909) 384-7464

Submittal Date: March 8, 2022

Revision Date:

Approval Date: _____

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for **West Coast Torah Retreat and Camp Center Inc.** by **Transtech Engineers, Inc**. The WQMP is intended to comply with the requirements of the City Running Springs, County of San Bernardino and the NPDES Area-wide Storm water Program requiring the preparation of a WQMP. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

.

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	
Tract/Parcel Map Number(s):	Lots 195, 196 & 201 of Tract 2068 M.B. 30/6-9. **APN. 0296-211-67**	Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0296-211-67

Owner's Signature			
Owner Name:			
Title	Owner		
Company	West Coast Torah Retreat and Camp Center Inc.		
Address	11400 W. Olympic Blvd. 9th Floor, Los Angeles, CA 90064		
Email	mrosenbaum@wrslayers.com		
Telephone #	(310) 248-2450		
Signature		Date	

Preparer's Certification

Project Data				
Permit/Application Number(s):		Grading Permit Number(s):		
Tract/Parcel Map Number(s):	Lots 195, 196 & 201 of Tract 2068 M.B. 30/6-9. **APN. 0296-211-67**	Building Permit Number(s):		
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN:	0296-211-67

"The selection, sizing and design of storm water treatment and other storm water quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of the Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: Carlos Pineda, P.E.	
Title	Project Manager
Company	Transtech Engineers, Inc.
Address	413 Mackay Drive, San Bernardino, CA 92408
Email	Carlos.pineda@transech.org
Telephone #	909 595-8599
Signature	
Date	March 8, 2022

PE Stamp Below

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Section 1 Discretionary Permit(s)

Form 1-1 Project Information					
Project Name	Planned Synagogue Dovid Oved Retreat Center				
Project Owner Contact Name:					
Mailing Address:	11400 W. Olympic Blvd. 9th Floor, Los Angeles, CA 90064	E-mail Address:	mrosenbaum@wrslayers.com	Telephone:	(310) 248-2450
Permit/Application Number(s):		Tract/Parcel Map Number(s):	APN: 0296-211-67		
Additional Information/ Comments:	The proposed project is within Santa Ana River Reach 2, Prado Dam				
Description of Project:	The Project is located at the southeast corner of Cepu Road and Pine Manor Lane intersection in the City of Running Springs, County of San Bernardino, California. The Project is a proposed retreat center consisting of a 10,500 square foot single-story building. The building will have two rest rooms with a total of about 12 plumbing units, with a small kitchen and cleaning/ maintenance room. The property is about 3 acres in area and is under the **Hilltop/Resource Conservation (HT/RC) zoning.** The facility will make use of the existing parking slots located along Pine Manor Lane just west of the Project site.				

Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	There is NO Preliminary WQMP Report. With the City of Running Springs being a co-permittee of the San Bernardino County MS4 permit, Low Impact Development (LID) water quality design principles were required to be designed into the project for retention/infiltration of daily nuisance flows and 85th percentile storm event after the project is constructed and homes are occupied. The existing site drainage trends from east to west characterized by sheet flow with slopes of 2% to 12 %. The approximate 3.0 acre site currently drains westerly to northwesterly towards the existing streets, Cepu Road to the north and Pine Manor Lane to the west. There are no drainage improvements on the subject site. This project will address Site Design Hydrologic Source Control BMP and on-site LID BMPs as much as practical, such as Impervious Area Dispersion BMP, On-lot Infiltration BMPs. The project will provide retention/infiltration basins to intercept full Design Capture Volume from proposed development.

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

Form 2.1-1 Description of Proposed Project

1 Development Category (Select all that apply):

☐ Significant re-development involving the addition or replacement of 5,000 ft² or more of impervious surface on an already developed site	☒ New development involving the creation of 10,000 ft² or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☐ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft² or more
☐ Hillside developments of 5,000 ft² or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft² of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☐ Parking lots of 5,000 ft² or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft² or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project *May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements*.

2 Project Area (ft2):	14,700	**3** Number of Dwelling Units:	None	**4** SIC Code:	-

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

6 Does Project include roads? Yes ☐ No ☒ *If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project storm water facilities. Describe any lot-level storm water features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP storm water facilities:

The property is currently owned by **West Coast Torah Retreat and Camp Center Inc.** The owner will be responsible for the funding and implementation of all required BMPs. Upon completion of construction, the owner will continue to manage and use project. To assure long term maintenance of the water quality facilities, a Covenant and Agreement Regarding Water Quality Management Plan and Storm water Best Management Practices Tranfer, Access and Maintenance will be recorded. This document will be recorded and run with the property and will be subject to any future owners of the property.

The property owner or other designated entity will be responsible for the inspection and maintenance of structural BMPs.

The owner will maintain the private property and drainage systems.

2.3 Potential Storm water Pollutants

Determine and describe expected storm water pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern			
Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	The proliferation of bacteria and viruses is generally caused by the transport of animal or fecal waste within storm water runoff from a project site
Nutrients - Phosphorous	E ☒	N ☐	Primary source of nutrients and phosphorous are typically caused by excessive and careless use of fertilizers and eroded soils.
Nutrients - Nitrogen	E ☒	N ☐	Primary source of nutrients and nitrogen are typically caused by excessive and careless use of fertilizers and eroded soils.
Noxious Aquatic Plants	E ☒	N ☐	
Sediment	E ☒	N ☐	Total suspended solids
Metals	E ☒	N ☐	Aluminum, Cadnium, Copper, Lead, Zinc and Nickel
Oil and Grease	E ☒	N ☐	Hydrocarbons, Polycyclic Aromatic Hydrocarbons
Trash/Debris	E ☒	N ☐	Trash and other debris including paper, plastic, foam, aluminum, leaves, cut grass and food wastes, should be controlled with regular maintenance, inspection and cleanup.
Pesticides / Herbicides	E ☒	N ☐	Pesticides and herbicides are commonly used for landscaping and pest control around multifamily projects. Care should be taken to minimize their use as much as possible and apply accordingly to the manufacture's specifications.
Organic Compounds	E ☒	N ☐	Sources of organic compounds include waste handling areas and vehicle and landscape maintenance areas. Care should be taken to ensure that when cleaning and rinsing dirt, grease and grime from vehicles and equipment, cleaning fluids and rinse water is not discharged into storm drain.
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

Form 2.4-1 Water Quality Credits

1 Project Types that Qualify for Water Quality Credits: *Select all that apply*

☐ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]	Higher density development projects ☐ Vertical density [20%] ☐ 7 units/ acre [5%]	☐ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]	☐ Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]
☐ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]	☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]	☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]	☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]

2 Total Credit 0% (*Total all credit percentages up to a maximum allowable credit of 50 percent)*

Description of Water Quality Credit Eligibility (if applicable)	No credit available for this project.

Section 3 Site and Watershed Description

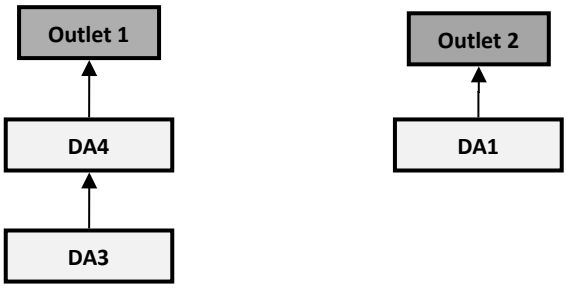
Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for storm water management, then complete additional versions of these forms for each DA / outlet.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate centre of site*	Latitude 34.190250	Longitude -117.097358	SEC Cepu Road and Pine Manor Lane, Running Springs See Section 6 for map

1 San Bernardino County climatic region: ☐ Valley ☒ Mountain

2 Does the site have more than one drainage area (DA): Yes☒ No☐ *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*



Example only – modify for project specific WQMP using additional form

Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
DA1 to Outlet 2	DMA 1 – 0.49 Ac*, drain into Basin
DA3 and DA4 to Outlet 1	DMA 2 – 0.54 Ac*, drain into Basin

(*) = drainage tributary areas, not total area of the project site

Form 3-2 Existing Hydrologic Characteristics

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	**DMA 1**	**DMA 2**	DMA C	DMA D
1 DMA drainage area (ft^2)	21,345	23,740		
2 Existing site impervious area (ft^2)	0	2,539		
3 Antecedent moisture condition *For mountain use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	3	3		
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	D	D		
5 Longest flow path length (ft)	341	294		
6 Longest flow path slope (ft/ft)	-0.08	-0.10		
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Woodland Less than 50% cover	Woodland Less than 50% cover		
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*	poor	poor		

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1 (use only as needed for additional DMA w/in DA 1)				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA E	DMA F	DMA G	DMA H
1 DMA drainage area (ft^2)	N/A			
2 Existing site impervious area (ft^2)				
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*				
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*				
5 Longest flowpath length (ft)				
6 Longest flowpath slope (ft/ft)				
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*				
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating*				

Form 3-3 Watershed Description for Drainage Area

Receiving waters *Refer to Watershed Mapping Tool - http://permitrack.sbcounty.gov/wap/ See 'Drainage Facilities" link at this website*	The Receiving Waters for the project site are Plunge Creek, Santa Ana River, Prado Dam and Pacific Ocean
Applicable TMDLs *Refer to Local Implementation Plan*	None
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/ and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	Plunge Creek No probable sources of impairment identified for this waterbody Waterbody condition: good
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	There are no Environmentally Sensitive and Special Biological Significant Areas designations adjacent to the project.
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	Fredalba Creek
Hydrologic Conditions of Concern	☒ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☐ No, the project total area is less or equal 1 Acre
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMP

4.1.1 Pollution Prevention

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Storm water BMPs	☒	☐	Educational materials and training will be provided to property owner, staff members including education materials and restrictions to reduce pollutants from reaching the storm drain system.
N2	Activity Restrictions	☒	☐	Encourage property owners with flyers explaining that not to wash vehicle and other equipment in the street areas. Prohibit maintenance or repair vehicle outdoors.
N3	Landscape Management BMPs	☒	☐	Landscape maintenance crews shall regularly clean and remove landscape waste and litter and prevent discharges of mowing, trimmings, cuttings, fertilizers and pesticides into the MS4.
N4	BMP Maintenance	☒	☐	Maintenance personnel shall maintain the non-structural BMPs as needed.
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Hazardous materials shall not be handled or store at this project site.
N6	Local Water Quality Ordinances	☒	☐	Shall be responsible for applying and complying with appropriate local water quality permits for storm water discharges, will include in CC&R.
N7	Spill Contingency Plan	☐	☒	Not applicable
N8	Underground Storage Tank Compliance	☐	☒	No underground Storage Tank
N9	Hazardous Materials Disclosure Compliance	☐	☒	No Hazardous Material storage in the project

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N10	Uniform Fire Code Implementation	☒	☐	Yes, included in plans.
N11	Litter/Debris Control Program	☒	☐	Landscape maintenance crews shall regularly clean and remove landscape waste and litter, otherwise City street sweeping will clean street bi-weekly.
N12	Employee Training	☒	☐	Educational materials and training will be provided to maintenance staff members including education materials and restrictions to reduce pollutants from reaching the storm drain system.
N13	Housekeeping of Loading Docks	☐	☒	No loading docks in the project
N14	Catch Basin Inspection Program	☐	☒	The City of Yucaipa Public Works Agency will inspect and clean all public catch basins within project. No catch basin is to be built in this Project.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☐	☒	Not applicable.
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	Private owned project
N17	Comply with all other applicable NPDES permits	☒	☐	Complied

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☐	☒	All storm drain inlets shall be placarded with an almetek stainless steel plaque (see attached) with the words “No Dumping - Drains to River”.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	No outdoor material storage
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	Dumpsters or other commercial type receptacles outdoors should be covered to prevent runon or run-off from area.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (State wide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	The irrigation system will include devices to prevent low head drainage, overspray and runoff through the use of pressure regulating devices, check valves, flow sensors, proper spacing and ET or weather based controllers. Recycled water shall be used to irrigate parks and parkways. Employ rain-trigger shutoff devices to prevent irrigation after precipitation. Design irrigation system to each landscape area's specific water requirements.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	All landscaped areas within the project shall be finish graded at 2" below pavement grade, adjacent to paved areas.
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	No dock areas
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	No Maintenance bays within the project site
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	No vehicle wash areas

S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	No Outdoor processing areas within the project site

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Not applicable
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	Not applicable
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☒	☐	
S14	Wash water control for food preparation areas	☐	☒	No wash water control for food preparation areas within the project site
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	Not applicable, no car wash racks

4.1.2 Preventative LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydro modification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventative LID Site Design Practices Checklist

Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets*
Minimize impervious areas: Yes ☒ No ☐ Explanation: *The proposed project includes landscape areas. Proposed project will create more pervious areas than the existing.*
Maximize natural infiltration capacity: Yes ☒ No ☐ Explanation: *In order to encourage evapotranspiration of storm water runoff, the proposed project incorporates depressed landscape areas which provide ponding areas and promote infiltration/evapotranspiration as well.*
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: *The drainage system is following the existing drainage patterns as much as practical.*
Disconnect impervious areas: Yes ☒ No ☐ Explanation: *Downspout disconnect and landscape.*
Protect existing vegetation and sensitive areas: Yes ☒ No ☐ Explanation: *Protect existing trees outside of building footprint*
Re-vegetate disturbed areas: Yes ☒ No ☐ Explanation: *Proposed landscape areas*
Minimize unnecessary compaction in storm water retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: *In order to encourage evapotranspiration of storm water runoff, the proposed project incorporates underground infiltration/retention which provide ponding areas and promote infiltration/evapotranspiration as well.*
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☒ No ☐ Explanation: *Yes, in proposed landscape areas. Encourage to provide vegetated swales as part of the property owner landscape*
Stake off areas that will be used for landscaping to minimize compaction during construction : Yes ☒ No ☐ Explanation: *Yes, in proposed landscape areas.*

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. ***If the project has more than one outlet for storm water runoff, then complete additional versions of these forms for each DA / outlet.***

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Storm water Program requires use of the P_6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1
- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Storm water Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)

1 Project area DA 1 (ft^2): **21,344**	**2** Imperviousness after applying preventative site design practices (Imp%): 37**%**	**3** Runoff Coefficient (Rc): **0.26** *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): **0.78** *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): **1.489** *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): **1,352** *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)

1 Project area DA 1 (ft^2): **23,740**	**2** Imperviousness after applying preventative site design practices (Imp%): 44**%**	**3** Runoff Coefficient (Rc): **0.30** *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%) +0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): **0.78** *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): **1.489** *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24-hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): **1,735** *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Here are the Area Calculations per our Site Plan:

A. Original Gross Site Area = **132,900 sf** (3.05 Ac) +/- (Total area of property)
B. Grades Area = A1 + A2= 21,344 sf. + 23,740 = 45,084 sf.
C. No right of way takes.

Proposed Imp. Area:

Building Footprint: 11,853 sf (8.9%)

Concrete/ Sidewalk Colonnade Area: 4,283 sf (3.2%)

Parking/ Driveway Area: 0 (0%) [Parking is existing along the street]

Total Area: 16,136 sf

Imperviousness based on graded (disturbed) area: 16,136 sf. / 45,084 sf. = 0.36, 36%

Proposed Pervious Area:

Landscape and Basin Area: 27,376 sf (21%) (Estimate)

DOVID OVED RETREAT CENTER
City of Running Springs, California
San Bernardino Volume-Based BMP Design Calculations

Area No. 1

Composite Runoff Coefficient C_{BMP}

Drainage Area	DMA-A
Acres Ac)	0.49
% Impervious	37
Impervious ratio, i=	0.37
C_{BMP} =	0.263

21,344sf.

C_{BMP}=0.858i^3 – 0.78i^2 + 0.774i + 0.04

Regression Coefficient

Region	Mountain
Regression Coeff.	1.909

Valley	1.4807
Mountain	1.909
Desert	1.2371

Area-Averaged 6-Hour Mean Storm Rainfall (P_6)

2-Yr, 1-Hr Isohyet	0.78
P_6 =	1.489

24-Hr	1.582
48-Hr	1.963

P_6 = (2-Yr 1-Hr Isohyet) x Regression Coefficient

Maximized Detention Volume (P_0)

Drawdown time	48
Regression Constant (a)	1.963
P_0 (inches)	0.769

i =

Valley	0.2787
Mountain	0.3614
Desert	0.325

$P_0 = a * C_{BMP} * P_6$

Target Capture Volume (V_0)

V_0 (A in acres) =	0.0534	Acre-ft
V_0 =	1,789	Cu-ft

$V_0 = P_0 * A$

DOVID OVED RETREAT CENTER
City of Running Springs, California
San Bernardino Volume-Based BMP Design Calculations

Area No. 2

Composite Runoff Coefficient C_{BMP}

Drainage Area	DMA-A	
Acres Ac)	0.545	23,740sf.
% Impervious	44	
i=	0.44	
C_{BMP} =	0.303	

C_{BMP}=0.858i^3 – 0.78i^2 + 0.774i + 0.04

Regression Coefficient

Region	Mountain
Regression Coeff.	1.909

Valley	1.4807
Mountain	1.909
Desert	1.2371

Area-Averaged 6-Hour Mean Storm Rainfall (P_6)

2-Yr, 1-Hr Isohyet	0.78
P_6 =	1.489

24-Hr	1.582
48-Hr	1.963

P_6 = (2-Yr 1-Hr Isohyet) x Regression Coefficient

Maximized Detention Volume (P_0)

Drawdown time	48
Regression Constant (a)	1.963
P_0 (inches)	0.885

i =

Valley	0.2787
Mountain	0.3614
Desert	0.325

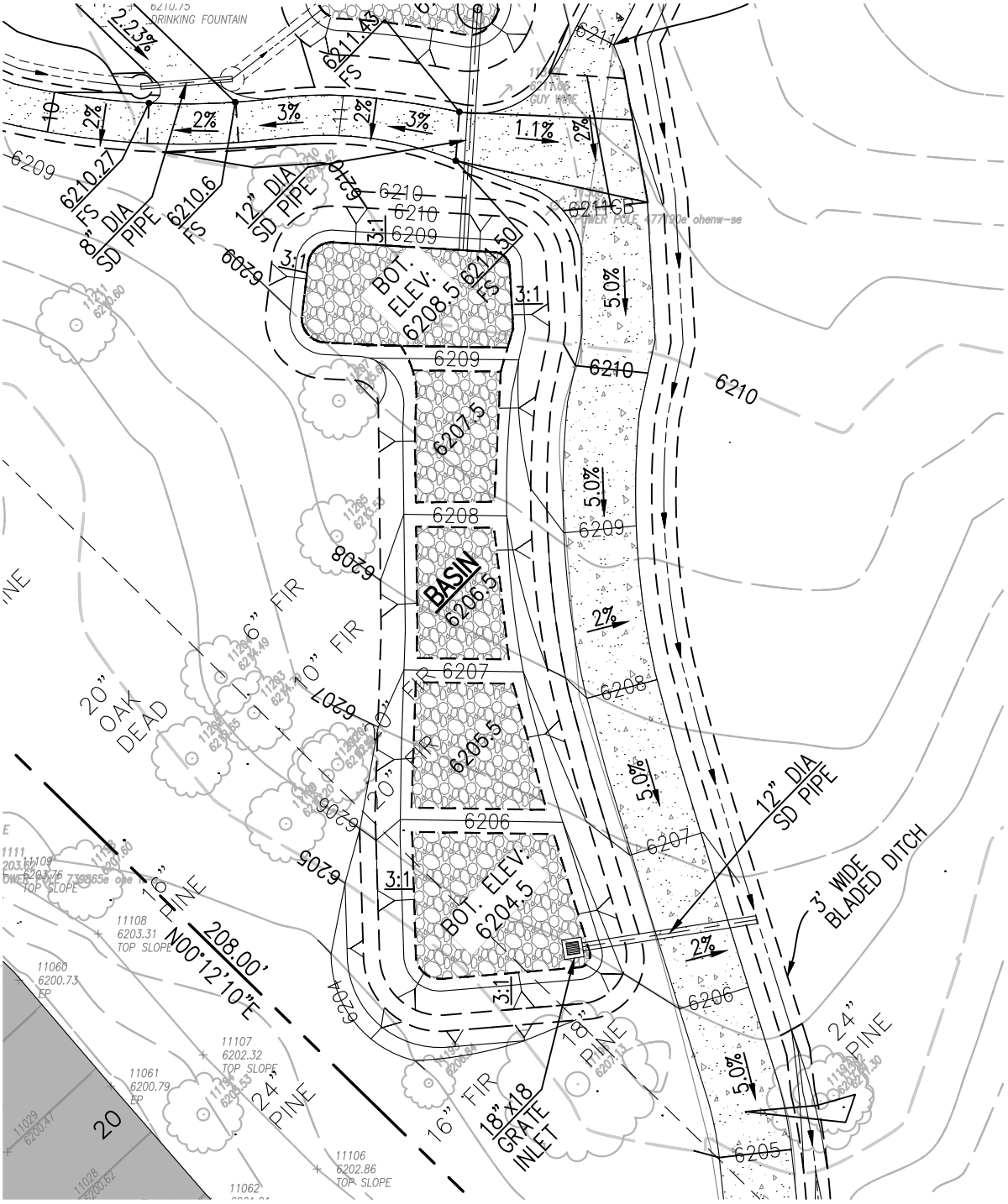
$P_0 = a * C_{BMP} * P_6$

Target Capture Volume (V_0)

V_0 (A in acres) =	0.0592	Acre-ft
V_0 =	2,282	Cu-ft

$V_0 = P_0 * A$

INFILTRATION BASIN



INFILTRATION BASIN

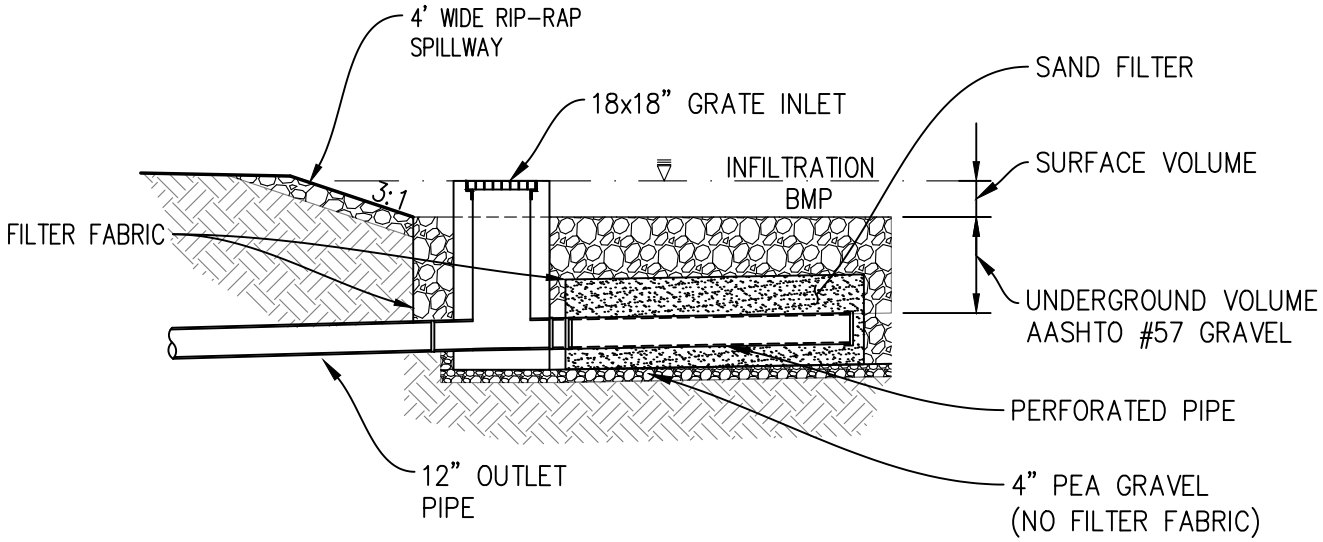
NOT TO SCALE

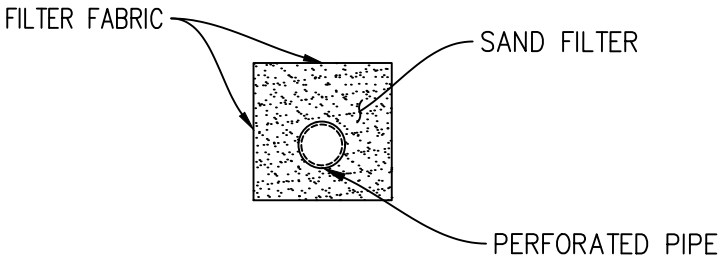
RUNNING SPRINGS RETREAT

Running Springs, CA

TRANSTECH
www.transtech.org
TT-JN 20241 03-21-2022

INFILTRATION BASIN OUTLET PIPE DETAIL





INFILTRATION BASIN/ TRENCH WITH ELEVATED OUTLET

NOT TO SCALE

RUNNING SPRINGS
RETREAT
Running Springs, CA

TRANSTECH
www.transtech.org
TT-JN 20241 03-21-2022

Catch Basin Insert: Use Flo-Gard or approved equal

Innovative stormwater management products

KRISTAR

FloGard® +PLUS

Catch Basin Insert Filter

FloGard®+PLUS Catch Basin Insert Filter

GENERAL FILTER CONFIGURATION

FloGard®+PLUS catch basin insert filter shall provide solids filtration through a filter screen or filter liner, and hydrocarbon capture shall be effected using a non-leaching absorbent material contained in a pouch or similar removable restraint. Hydrocarbon absorbent shall not be placed at an exposed location at the entry to the filter that would allow blinding by debris and sediment without provision for self-cleaning in operation.

Filter shall conform to the dimensions of the inlet in which it is applied, allow removal and replacement of all internal components, and allow complete inspection and cleaning in the field.

FLOW CAPACITY

Filter shall provide two internal high-flow bypass locations that in total exceed the inlet peak flow capacity. Filter shall provide filtered flow capacity in excess of the required "first flush" treatment flow. Unit shall not impede flow into or through the catch basin when properly sized and installed.

MATERIALS

Filter support frame shall be constructed of type 304 stainless steel. Filter screen, when used in place of filter liner, shall be type 304 or 316 stainless steel, with an apparent opening size of not less than 4 U.S. mesh. Filter liner, when used in place of filter screen, shall be woven polypropylene geotextile fabric liner with an apparent opening size (AOS) of not less than 40 U.S. mesh as determined by ASTM D 4751. Filter liner shall include a support basket of polypropylene geogrid with stainless steel cable reinforcement.

Filter frame shall be rated at a minimum 25-year service life. All other materials, with the exception of the hydrocarbon absorbent, shall have a rated service life in excess of 2 years.

FloGard®+PLUS TEST RESULTS SUMMARY

Testing Agency	% TSS Removal	% Oil and Grease Removal	% PAH Removal
UCLA	80	70 to 80	
U of Auckland Tonking & Taylor Ltd. (for city of Auckland)	78 to 95		
U of Hawaii (for city of Honolulu)	80		20 to 40

FEATURES

- Easy to install, inspect and maintain
- Can be retrofitted to existing drain catch basins – or used in new projects
- Economical and efficient
- Catches pollutants where they are easiest to catch (at the inlet)
- No standing water – minimizes vector, bacteria and odor problems
- Can be incorporated as part of a "Treatment Train"

BENEFITS

- Lower installation, inspection and maintenance costs
- Versatile installation applications
- Higher return on investment
- Allows for installation on small and confined sites
- Minimizes vector, bacteria and odor problems
- Allows user to target specific pollutants

Innovative stormwater management products

FloGard® +PLUS Catch Basin Insert Filter

KRISTAR

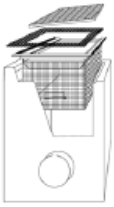
INSTALLATION AND MAINTENANCE

Filter shall be installed and maintained in accordance with manufacturer's general instructions and recommendations.

PERFORMANCE

Filter shall provide 80% removal of total suspended solids (TSS) from treated flow with a particle size distribution consistent with typical urban street deposited sediments. Filter shall capture at least 70% of oil and grease and 40% of total phosphorus (TP) associated with organic debris from treated flow. Unit shall provide for isolation of trapped pollutants, including debris, sediments, and floatable trash and hydrocarbons, from bypass flow such that re-suspension and loss of pollutants is minimized during peak flow events.

FloGard+PLUS Combination Inlet



FloGard+PLUS Flat Grate

FloGard+PLUS Round Gated Inlet

FloGard®+PLUS COMPETITIVE FEATURE COMPARISON

Evaluation of FloGard+PLUS Units (Based on flow-comparable units) (Scale 1-10, 10 being best)	FloGard+PLUS	Other Insert Filter Types**
Flow Rate	10	7
Removal Efficiency*	80%	45%
Capacity – Sludge and Oil	7	7
Service Life	10	3
Installation – Ease of Handling / Installation	8	6
Ease of Inspections & Maintenance	7	7
Value	**10**	**2**

*approximate, based on field sediment removal testing in urban street application **average

Long-Term Cost Comparison (Scale 1-10, 10 being lowest cost, higher number being best)	FloGard+PLUS	Other Insert Filter Types
Unit cost — initial ($/cfs treated)	10	4
Installation cost ($/cfs treated)	10	7
Adsorbent replacement (annual avg $/cfs treated)	10	2
Unit materials replacement (annual avg $/cfs treated)	10	10
Maintenance cost (annual avg $/cfs treated)	10	7
Total first yr ($/cfs treated)	10	5
Total Annual Avg ($/cfs treated, avg over 20 yrs)*	**10**	**5**

*assumes 3% annual inflation

Captured debris from FloGard+PLUS, Dana Point, CA

KriStar Enterprises, Inc.
360 Sutton Place
Santa Rosa, CA 95407

PH: 800-579-8819
FAX: 707-524-8186
www.kristar.com

Hydromodification

A.1 Hydrologic Conditions of Concern (HCOC) Analysis

HCOC Exemption:

Form 4.2-2 Summary of HCOC Assessment (DA 1 and 2)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☒ No ☐

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 11,527 *Form 4.2-3 Item 12*	**2** *Form 4.2-4 Item 13*	**3** *Form 4.2-5 Item 10*
Post-developed	**4** 13,529 *Form 4.2-3 Item 13*	**5** *Form 4.2-4 Item 14*	**6** *Form 4.2-5 Item 14*
Difference	**7** 2,002 *Item 4 – Item 1*	**8** *Item 2 – Item 5*	**9** *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** *17.4%* *Item 7 / Item 1*	**11** *%* *Item 8 / Item 2*	**12** *%* *Item 9 / Item 3*

Less than One Acre: The Priority Development Project disturbs less than one acre. The Co-permittee has the discretion to require a Project Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The project disturbs less than one acre and is not part of a common plan of development.

Total project area = 45,085 sf = 1.035 Ac

Form 4.2-3 HCOC Assessment for Runoff Volume

Weighted Curve Number Determination for: Pre-developed DA	**DMA 1**	**DMA 2**	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Woodland	Woodland						
2a Hydrologic Soil Group (HSG)	D	D						
3a DMA Area, ft² *sum of areas of DMA should equal area of DA*	21,344	23,740						
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								
Weighted Curve Number Determination for: Post-developed DA	**DMA 1**	**DMA 2**	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	Woodland	Woodland						
2b Hydrologic Soil Group (HSG)	D	D						
3b DMA Area, ft² *sum of areas of DMA should equal area of DA*	21,344	23,740						
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*								

5 Pre-Developed area-weighted CN: **80**	**7** Pre-developed soil storage capacity, S (in): **2.50** *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): **0.50** *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: **87**	**8** Post-developed soil storage capacity, S (in): **1.49** *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): **0.30** *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in): Value = 5.2 inches
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft³): **11,527**
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft³): **12,529**
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft³): **376**
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 1, Areas 1 & 2)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	**Pre-developed** *Use additional forms if there are more than 4 DMA*				**Post-developed** *Use additional forms if there are more than 4 DMA*			
	DMA 1	**DMA 2**			**DMA 1**	**DMA 2**		
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	341	294			305	245		
2 Change in elevation (ft)	24.3	29			17	9		
3 Slope (ft/ft), S_o = *Item 2 / Item 1*	-.071	-0.099			-0.056	-0.037		
4 Land cover	Woodland	Woodland			Woodland	Woodland		
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	12	11			8.6	7.2		
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0	0			0	0		
7 Cross-sectional area of channel (ft^2)								
8 Wetted perimeter of channel (ft)								
9 Manning's roughness of channel (n)								
10 Channel flow velocity (ft/sec) V_{fps} = *(1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*								
11 Travel time to outlet (min) T_t = *Item 6 / (Item 10 * 60)*	0	0			0	0		
12 Total time of concentration (min) T_c = *Item 5 + Item 11*	12	11			8.6	7.2		

13 Pre-developed time of concentration: *Minimum of Item 12 pre-developed DMA* **DMA 1 = 12 min; DMA 2 = 11 min**

14 Post-developed time of concentration (min): *Minimum of Item 12 post-developed DMA* **DMA 1 = 8.6 min; DMA 2 = 7.2 min**

15 Additional time of concentration needed to meet HCOC requirement (min): $T_{C\text{-}HCOC}$ = *(Item 13 * 0.95) – Item 14* **DMA1=2.8; DMA2=3.25**

Form 4.2-5 HCOC Assessment for Peak Runoff

Compute peak runoff for pre- and post-developed conditions

Variables		**Pre-developed** DA to Project Outlet (*Use additional forms if more than 3 DMA)*			**Post-developed** DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA 1	**DMA 2**		**DMA 1**	**DMA 2**	
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*		2.05	2.16		2.50	2.78	
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.49	0.545		0.49	0.545	
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		1.00	0.92		0.63	0.56	
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*		0.17	0.16		0.12	0.095	
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.17	0.15		0.08	0.05	
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*		0.83	0.98		1.20	1.34	
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA 1	1			1		
	DMA 2		1			1	
				n/a			*n/a*

8 Pre-developed Q_p at T_c for **DMA 1**: **1.29** *Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*	**9** Pre-developed Q_p at T_c for **DMA 2**: **1.42** *Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/2}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*	**10** Pre-developed Q_p at T_c for DMA C: *Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*

10 Peak runoff from pre-developed condition confluence analysis (cfs): **N/A** (*NOT CONFLUENCING, SEPARATE FLOWS)*

11 Post-developed Q_p at T_c for **DMA 1**: **1.80** *Same as Item 8 for post-developed values*	**12** Post-developed Q_p at T_c for **DMA 2**: **2.01** *Same as Item 9 for post-developed values*	**13** Post-developed Q_p at T_c for DMA C: *Same as Item 10 for post-developed values*

14 Peak runoff from post-developed condition confluence analysis (cfs): **N/A** *(NOT CONFLUENCING) Maximum of Item 11, 12, and 13 (including additional forms as needed)*

15 Peak runoff reduction needed to meet HCOC Requirement (cfs): *$Q_{p\text{-}HCOC}$ = (Item 14 * 0.95) – Item 10* (NOT CONFLUENCING)

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Bio-treatment (Form 4.3-5).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then bio-treatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2). **Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment**.

Form 4.3-1 Infiltration BMP Feasibility (DA 1)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that storm water infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) **D soils** or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? N/A Yes ☐ No ☒

If Yes, provide basis: (Refer to Attached Fig. C-14, SBC Hydrology Manual)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? **INFILTRATION NOT CONSIDERED IN THIS PROJECT** Yes ☐ No ☐

If Yes, Provide basis: (attach) per soil infiltration test across the project, the infiltration rate = N/A

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☒ No ☐
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

4.3.1 Site Design Hydrologic Source Control BMP

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☒ No ☐ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA **1** BMP Type Total TA = 21,340 sf	DA **2** BMP Type Total TA= 23,740 sf	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)	**7,840**	**10,454**	
3 Ratio of pervious area receiving runoff to impervious area	**1.72**	**1.27**	
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*	**562**	**553**	
5 Sum of retention volume achieved from impervious area dispersion (ft^3): **1,115** *$V_{retention}$ =Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) *$V_{retention}$ = (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			

13 Runoff volume retention from on-lot infiltration (ft^3): **0** $V_{retention}$ *=Sum of Item 12 for all BMPs*

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 1)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) $V_{retention}$ *= Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): **0** $V_{retention}$ *=Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) $V_{retention}$ *= Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): $V_{retention}$ *= Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes ☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) $V_{retention}$ *= Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): 0 $V_{retention}$ *=Sum of Item 28 for all BMPs*			

30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: **1,115 cf** *Sum of Items 5, 13, 20, 25 and 29*

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

BASIN SURFACE VOLUME CALCULATIONS:						
Part 1 - Basin Surface Volume, DA-1 Basin 1						
	Elev.	Area (sf)	Depth (ft		Vol. (cf)	
	6208.5	302				
	6209.0	408	0.5		177.5	
Part 2 - Basin Surface Volume, DA-1 Basin 2						
	Elev.	Area (sf)	Depth (ft		Vol. (cf)	
	6204.5	1370				
	6205.0	1754	0.5		781.0	
Part 3 - Basin Surface Volume, DA-2 Basin 1						
	Elev.	Area (sf)	Depth (ft		Vol. (cf)	
	6200.0	808				
	6201.0	1210	1		1009.0	
BASIN UNDERGROUND (GRAVEL) VOLUME:						
		Bot. Area (sf)	Porosity	Depth (ft)	Vol. (cf)	
	DA1 Basin 1	302	0.4	2.5	302.0	
	DA1 Basin 2	1370	0.4	2.5	1370.0	
	DA2 Basin 1	308	0.4	2.5	308.0	
				TOTAL BMP VOLUME=	3947.5	cu. Ft.
		(Refer to Form 4.2-1)		DCV=	3087.0	cu. Ft.
				BMP Vol. > DCV - OK		

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): **0.0** *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA A BMP Type Infiltration	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	n/a	n/a	
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*			
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*			
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*			
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*			
8 Infiltrating surface area, *SA_{BMP}* (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*			
9 Amended soil depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	0		
10 Amended soil porosity			
11 Gravel depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	2.5	2.5	
12 Gravel porosity	0.4	0.4	
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3 hrs	3 hrs	
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	959	1009	
15 Underground Retention Volume (ft^3) *Volume determined using manufacturer's specifications and calculations*	1672	308	

16 Total Retention Volume from LID Infiltration BMPs: *(Sum of Items 14 and 15 for all infiltration BMP included in plan)* 3,948

17 Fraction of DCV achieved with infiltration BMP: *Retention% = Item 16 / Form 4.2-1 Item 7* 100%

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and use BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs.

Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured storm water. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of storm water (Section 5.5.4 of the TGD for WQMP).

Form 4.3-4 Harvest and Use BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3)**: N/A** *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested storm water (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
9 Total Retention Volume (ft^3) from Harvest and Use BMP *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☐ No ☐ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV w. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 1)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): **N/A** *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
	☒ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-6 Volume Based Biotreatment (DA 1) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type **N/A** *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA N/A DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity, *n*			
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment (DA 1) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type **N/A** *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA N/A DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} *= Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ *=(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V *=Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} *= (Item* $8_{forebay}$ *+ Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ *= (Item* $8_{forebay}$ *+ Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-8 Flow Based Biotreatment (DA 1)

Biotreatment BMP Type **N/A** *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA N/A DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) *b_w = (Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) *SA_{top} = (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 2476 *Copy Item 7 in Form 4.2-1* 3,087 cu. Ft.

2 On-site retention with site design hydrologic source control LID BMP (ft^3): N/A *Copy Item 30 in Form 4.3-2* 3,948 cu.ft.

3 On-site retention with LID infiltration BMP (ft^3): *Copy Item 16 in Form 4.3-3* 3948 cu ft

4 On-site retention with LID harvest and use BMP (ft^3): **N/A** *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): N/A *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☒ No ☐
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☒ No ☐
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for HCOC performance criteria (ft^3): **N/A** *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☐
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☐

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☐
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N1. Education For Property Owner	Property Owner	Educational materials and training will be provided to property owner, staff members and contracted maintenance crews if any, including education materials and restrictions to reduce pollutants from reaching the storm drain system.	Training and education program must be provided within 1 month of hire date and annually thereafter. Materials are included in the Project WQMP.
N2. Activity Restriction	Property Owner	The project will establish the following policies prohibiting activities during operations: - Prohibit discharge of fertilizer, pesticide, or animal waste to street or storm drain. - Prohibit blowing or sweeping of debris (leaf litter, grass clippings, litter, etc.) into street or storm drain. - Require trash bin lid to be closed at all times. - Prohibit discharge of paint or masonry waste to street or storm drain. - Prohibit vehicle maintenance or repair outdoors.	Daily management of Operation
N3. Common Area	Property Owner	The owner shall direct maintenance staff to employ landscaping practices consistent with the	Quarterly, as seasonal changes.

Landscape Management		CASQA BMP SC-41 requirements for use of fertilizer, pesticides, and City ordinances for water conservation.	
N4. BMP Maintenance	Property Owner	The following BMPs and practices shall be employed and regularly maintained: Site Design BMPs: - SD-10 Site Design & Landscape Planning. - SD-12 Efficient Irrigation. - SD-13 Storm Drain Signage. - SD-32 Trash Storage Areas. Source Control BMPs: - SC-10 Non-Storm water Discharges. - SC 41 Buildings & Grounds Maintenance. - SC-44 Drainage System Maintenance.	Varies by BMP.
N11. Common Area Litter Control	Property Owner	The owner shall direct maintenance staff to implement trash management and litter control procedures in common areas aimed to reduce pollution of drainage water. Activities entail litter patrol, emptying of trash receptacles, noting trash disposal violations and reporting violation for investigation.	Daily / Weekly
N12. Employee Training	Property Owner	The owner shall provide employee training for protection of storm water. Employee training shall be provided within 30 days of employment and annually thereafter. Training materials will entail review of WQMP information and BMP fact sheets.	Upon initial employment, Annually thereafter
N14. Catch Basin Inspection	Property Owner	Catch basins shall be inspected, cleaned, and maintained frequently. Cleaning shall be conducted prior to rainy season (October 1 through April 30). Drainage facilities include catch basins / storm drain inlets.	Before rainy season. As needed during rainy season.

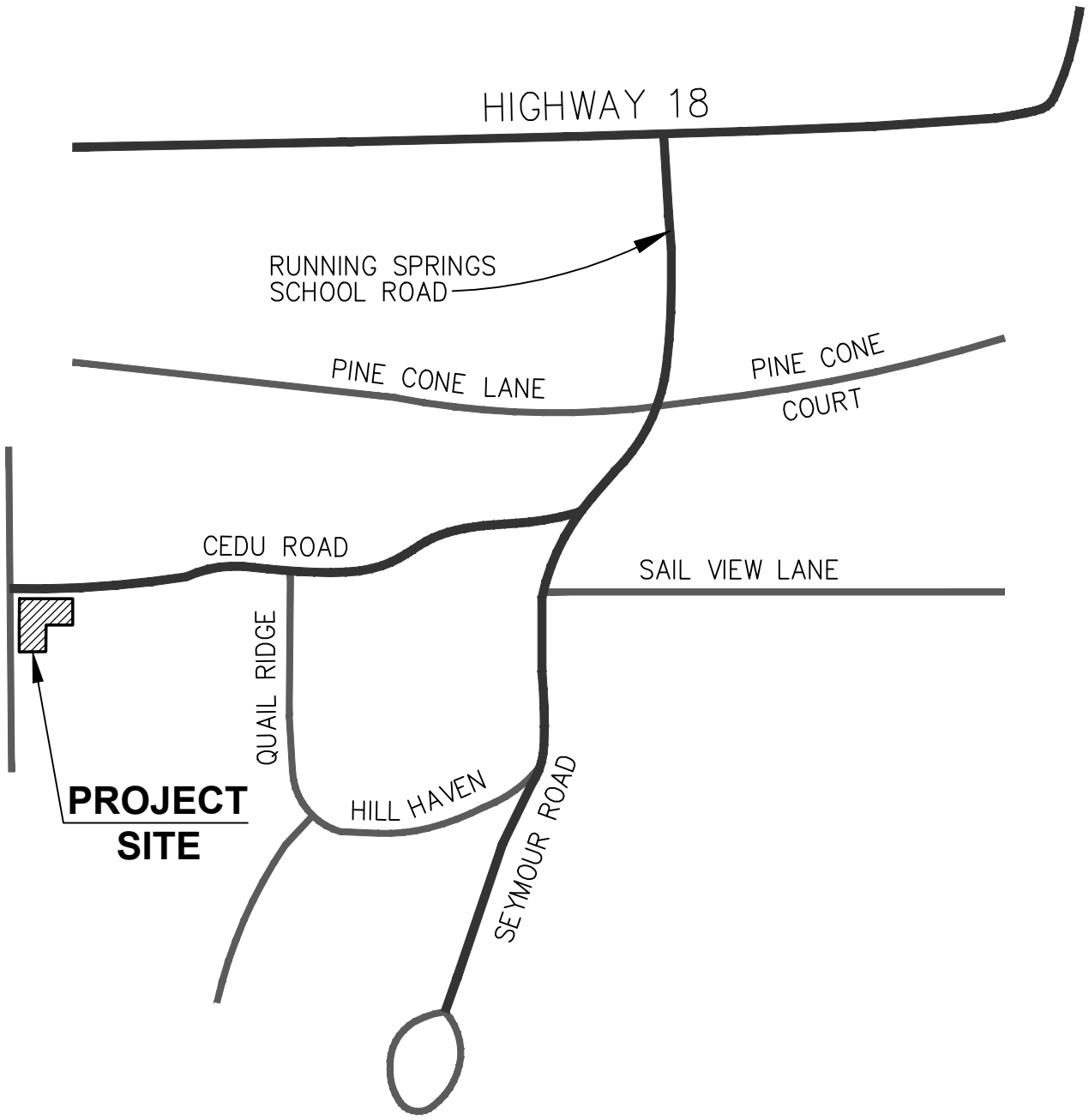
Retention/ Infiltration BMP	Property Owner	Inspect semiannually for beginning (October) and end of the wet season (April).	Maintenance personnel shall repair filtration surface as needed and remove debris/sediments if necessary.
Catch Basin Insert	Property Owner	Catch basins shall be inspected, cleaned, and maintained seasonally. Cleaning shall be conducted prior to rainy season (October 1 through April 30). Drainage facilities include catch basins / storm drain inlets.	Before rainy season. As needed during rainy season.

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

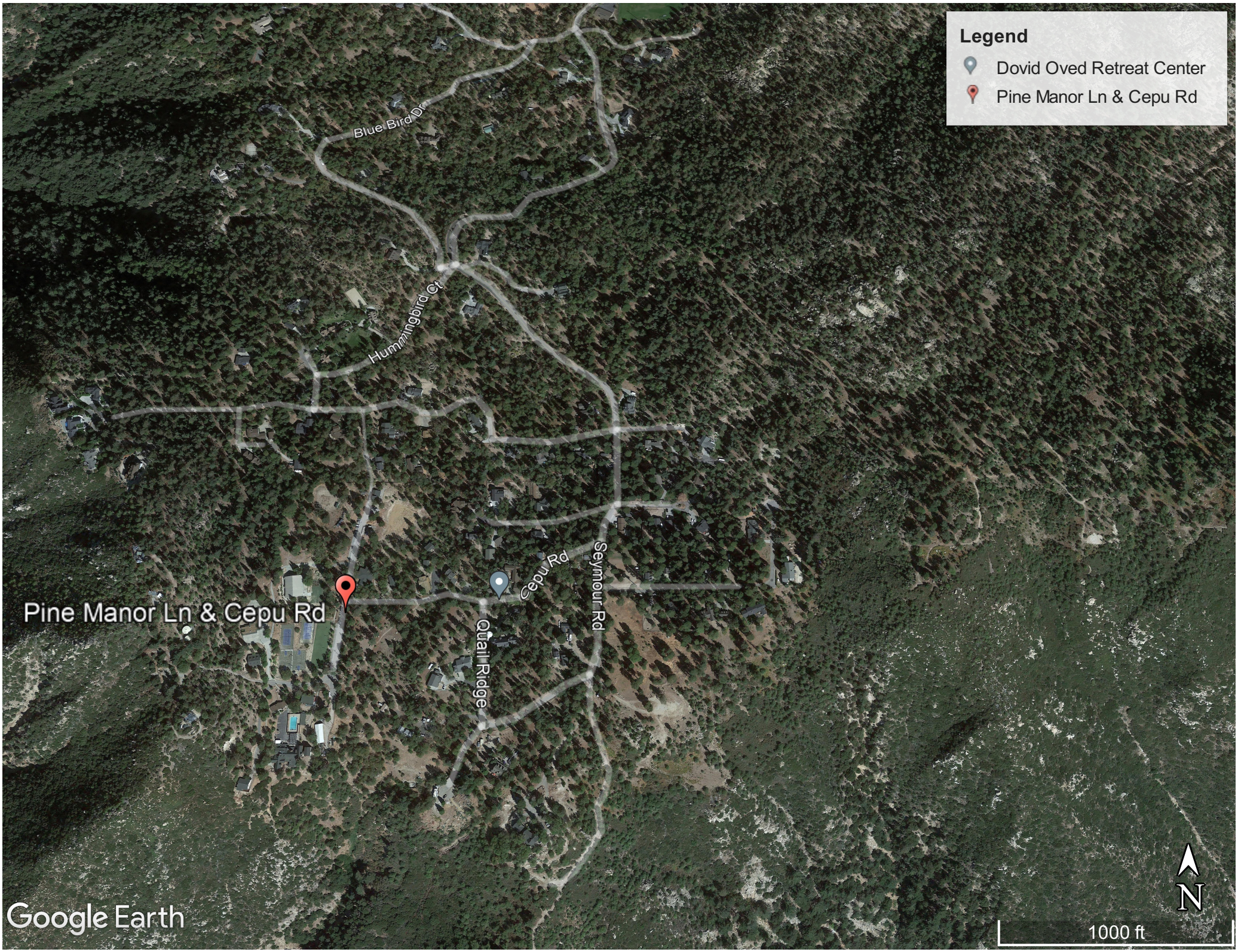
- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections



VICINITY MAP

3500 Seymour Road,
Running Springs, CA

TRANSTECH
www.transtech.org
TT-JN 20241 02-17-2022


Legend
Dovid Oved Retreat Center
Pine Manor Ln & Cepu Rd
Blue Bird Dr
Hummingbird Ct
Cepu Rd
Seymour Rd
Quail Ridge
Pine Manor Ln & Cepu Rd
Google Earth
N
1000 ft

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.112 (0.093-0.136)	0.143 (0.119-0.174)	0.186 (0.154-0.227)	0.223 (0.183-0.273)	0.274 (0.218-0.349)	0.316 (0.246-0.411)	0.361 (0.274-0.481)	0.409 (0.301-0.560)	0.478 (0.338-0.684)	0.535 (0.365-0.793)
10-min	0.160 (0.133-0.194)	0.205 (0.171-0.249)	0.267 (0.221-0.325)	0.319 (0.262-0.392)	0.393 (0.313-0.500)	0.453 (0.353-0.589)	0.517 (0.392-0.689)	0.586 (0.432-0.803)	0.685 (0.484-0.980)	0.767 (0.523-1.14)
15-min	0.194 (0.161-0.235)	0.248 (0.206-0.302)	0.323 (0.268-0.393)	0.386 (0.317-0.474)	0.476 (0.378-0.605)	0.548 (0.426-0.712)	0.625 (0.474-0.833)	0.709 (0.522-0.972)	0.829 (0.585-1.19)	0.928 (0.633-1.38)
30-min	0.288 (0.240-0.350)	0.370 (0.307-0.449)	0.481 (0.398-0.585)	0.574 (0.472-0.706)	0.708 (0.563-0.900)	0.816 (0.635-1.06)	0.931 (0.706-1.24)	1.06 (0.778-1.45)	1.23 (0.871-1.77)	1.38 (0.942-2.05)
60-min	0.419 (0.349-0.508)	0.537 (0.446-0.652)	0.698 (0.579-0.850)	0.834 (0.686-1.02)	1.03 (0.817-1.31)	1.19 (0.922-1.54)	1.35 (1.03-1.80)	1.53 (1.13-2.10)	1.79 (1.27-2.56)	2.01 (1.37-2.97)
2-hr	0.604 (0.503-0.732)	0.770 (0.640-0.935)	0.994 (0.824-1.21)	1.18 (0.972-1.45)	1.45 (1.15-1.84)	1.66 (1.29-2.15)	1.88 (1.42-2.50)	2.11 (1.56-2.90)	2.44 (1.73-3.50)	2.71 (1.85-4.01)
3-hr	0.752 (0.626-0.912)	0.957 (0.796-1.16)	1.23 (1.02-1.50)	1.46 (1.20-1.80)	1.78 (1.42-2.27)	2.04 (1.59-2.65)	2.30 (1.75-3.07)	2.58 (1.91-3.54)	2.98 (2.10-4.26)	3.29 (2.24-4.88)
6-hr	1.10 (0.914-1.33)	1.40 (1.16-1.70)	1.79 (1.49-2.19)	2.12 (1.75-2.61)	2.58 (2.05-3.28)	2.94 (2.29-3.82)	3.31 (2.51-4.41)	3.70 (2.73-5.07)	4.24 (3.00-6.07)	4.67 (3.18-6.92)
12-hr	1.50 (1.25-1.82)	1.91 (1.59-2.33)	2.47 (2.05-3.00)	2.92 (2.40-3.59)	3.55 (2.82-4.51)	4.03 (3.14-5.24)	4.53 (3.44-6.03)	5.05 (3.72-6.92)	5.76 (4.07-8.24)	6.32 (4.31-9.36)
24-hr	2.02 (1.79-2.33)	2.61 (2.31-3.01)	3.38 (2.98-3.91)	4.02 (3.51-4.68)	4.89 (4.14-5.89)	5.56 (4.61-6.83)	6.24 (5.06-7.86)	6.95 (5.48-9.00)	7.92 (6.00-10.7)	8.68 (6.35-12.1)
2-day	2.48 (2.20-2.86)	3.25 (2.88-3.75)	4.28 (3.78-4.96)	5.14 (4.50-6.00)	6.34 (5.37-7.63)	7.28 (6.04-8.95)	8.25 (6.69-10.4)	9.28 (7.31-12.0)	10.7 (8.10-14.4)	11.8 (8.66-16.5)
3-day	2.66 (2.35-3.07)	3.53 (3.13-4.08)	4.73 (4.17-5.48)	5.75 (5.03-6.70)	7.19 (6.09-8.66)	8.35 (6.93-10.3)	9.58 (7.76-12.1)	10.9 (8.59-14.1)	12.8 (9.66-17.2)	14.3 (10.4-19.9)
4-day	2.88 (2.55-3.32)	3.85 (3.41-4.44)	5.20 (4.58-6.02)	6.35 (5.56-7.41)	8.00 (6.78-9.64)	9.35 (7.76-11.5)	10.8 (8.73-13.6)	12.3 (9.71-15.9)	14.5 (11.0-19.6)	16.3 (11.9-22.8)
7-day	3.29 (2.92-3.80)	4.42 (3.91-5.10)	5.97 (5.26-6.91)	7.29 (6.38-8.51)	9.18 (7.78-11.1)	10.7 (8.89-13.2)	12.3 (9.99-15.5)	14.1 (11.1-18.2)	16.6 (12.5-22.3)	18.6 (13.6-25.9)
10-day	3.59 (3.18-4.14)	4.82 (4.26-5.56)	6.52 (5.75-7.54)	7.96 (6.97-9.28)	10.0 (8.49-12.1)	11.7 (9.70-14.4)	13.4 (10.9-16.9)	15.3 (12.1-19.8)	18.0 (13.6-24.3)	20.2 (14.8-28.2)
20-day	4.43 (3.93-5.11)	5.98 (5.29-6.91)	8.11 (7.15-9.39)	9.92 (8.68-11.6)	12.5 (10.6-15.1)	14.6 (12.1-17.9)	16.8 (13.6-21.1)	19.1 (15.1-24.7)	22.4 (17.0-30.2)	25.1 (18.4-35.0)
30-day	5.26 (4.66-6.07)	7.11 (6.29-8.21)	9.65 (8.51-11.2)	11.8 (10.3-13.8)	14.9 (12.6-17.9)	17.4 (14.4-21.3)	20.0 (16.2-25.1)	22.8 (17.9-29.5)	26.7 (20.2-36.0)	29.9 (21.9-41.7)
45-day	6.33 (5.60-7.29)	8.54 (7.56-9.86)	11.6 (10.2-13.4)	14.2 (12.4-16.5)	17.9 (15.1-21.5)	20.8 (17.3-25.6)	24.0 (19.4-30.2)	27.3 (21.5-35.3)	32.0 (24.3-43.2)	35.9 (26.3-50.0)
60-day	7.34 (6.50-8.46)	9.89 (8.74-11.4)	13.4 (11.8-15.5)	16.4 (14.3-19.1)	20.6 (17.4-24.8)	24.0 (19.9-29.5)	27.6 (22.4-34.8)	31.4 (24.8-40.7)	36.9 (27.9-49.7)	41.3 (30.2-57.6)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

AREA 1
A=0.49 Ac

AREA 2
A=0.545 Ac

AREA 3
A=0.82 Ac

AREA 1B
15750.69 SF
0.36 Ac

IMPERVIOUS = 0.30 Ac
PERVIOUS = 0.10 Ac

IMPERVIOUS = 0.14 Ac
PERVIOUS = 0.13 Ac

IMPERVIOUS = 0.01 Ac
PERVIOUS = 0.10 Ac

IMPERVIOUS = 0.01 Ac
PERVIOUS = 0.10 Ac

IMPERVIOUS = 0.21 Ac
LS = 0.03 Ac
PERVIOUS = 0.19 Ac

IMPERVIOUS = 0.03 Ac
PERVIOUS = 0.35 Ac

IMPERVIOUS = 0.02 Ac
PERVIOUS = 0.31 Ac

IMPERVIOUS = 0.08 Ac
PERVIOUS = 0.03 Ac

SINGLE STORY
RETREAT HOUSE

ENTRY DECK

LS
AREA

BASIN
BOTTOM
ELEV:
6200.0

BASIN
BOTTOM
ELEV:
6208.5

BOT.
ELEV:
6206.5

BOT.
ELEV:
6207.5

BASIN
E206.5

BOT.
ELEV:
6204.5

L=45'
L=126'
L=152'
L=117'
L=17'
L=186'
L=96'
L=191'
L=157'
L=334'

304
303
202
305
302
301
402
203
401
201
403
404
204

EXIST. DG TRAIL

VIEW D/C TRAIL

EXIST SPLIT RAIL WOOD FENCE

EXISTING A.C. PAVEMENT

WEST COAST TORAH RETREAT
RECREATION AREA

HC

HC

LEGEND:

- (MAIN) TRIBUTARY AREA BOUNDARY
- SUB-AREA TRIBUTARY AREA BOUNDARY
- 201 NODE NUMBERS

NORTH
SCALE: 1" = 20'

20' 0' 20' 40' 60'
GRAPHIC SCALE: 1" = 20'

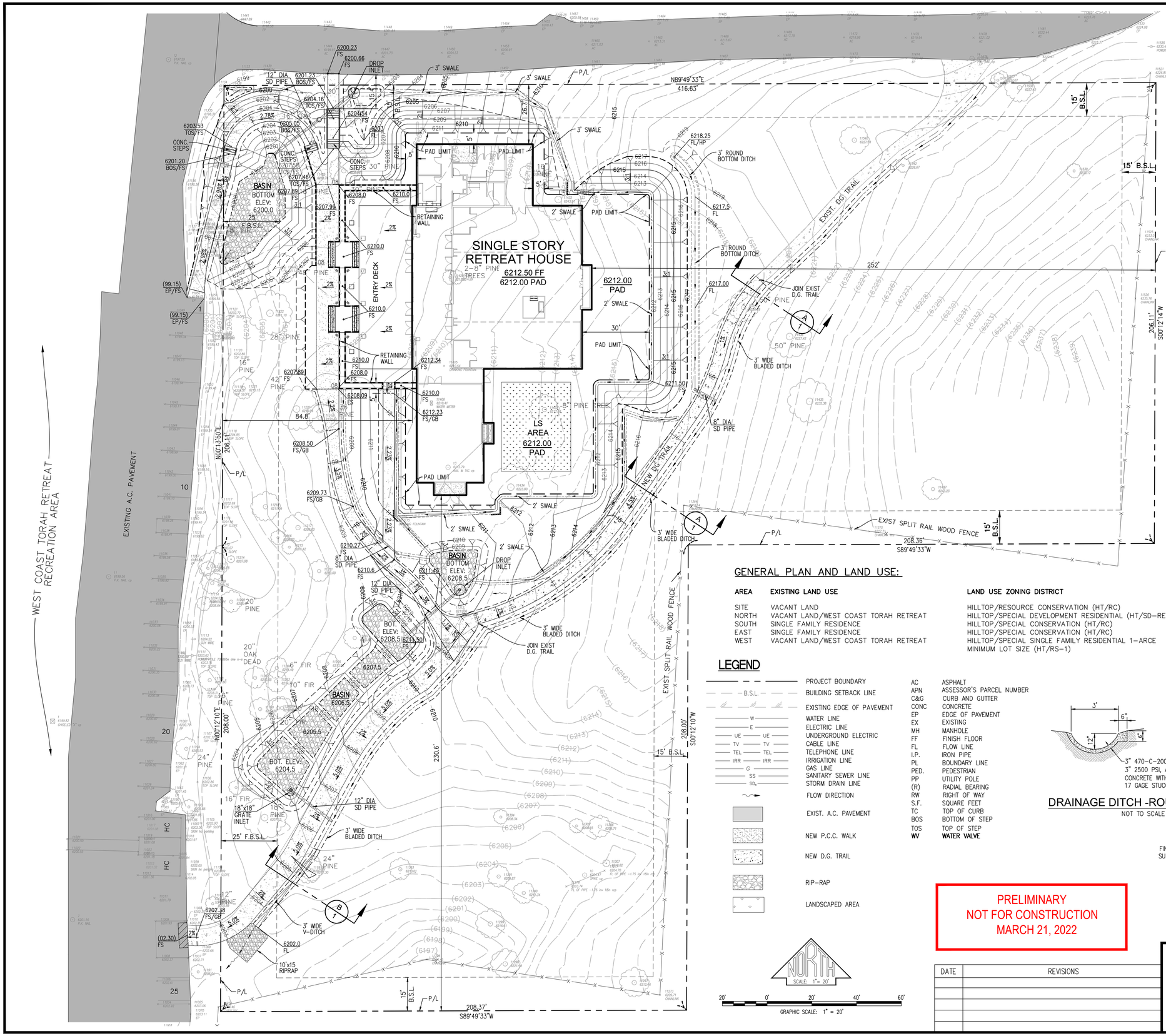
DATE	REVISIONS

TRANSTECH
413 MACKAY DRIVE.
SAN BERNARDINO, CA. 92408
(909) 384-7464

SAN BERNARDINO COUNTY

PRELIMINARY HYDROLOGY MAP
PROPOSED CONDITION
RUNNING SPRINGS RETREAT
RUNNING SPRINGS, CALIFORNIA

DRAWN BY:	DATE:	SCALE:	SHEET:	JOB NO.
G.A./A.C.	03-21-2022	AS SHOWN	1 OF 1	19091



LEGAL DESCRIPTION:
LOTS 195, 196 & 201 TRACT 2068 M.B. 30/6-9

ASSESSOR'S PARCEL NUMBER:
0296-211-67

ZONING/ GP:
HILLTOP/RESOURCE CONSERVATION (HT/RC)

UTILITIES:

GAS:
PROPANE

WATER:
RUNNING SPRINGS WATER DISTRICT
31242 HILLTOP BLVD.
RUNNING SPRINGS, CA. 92382
PH: (909) 867-2766

ELECTRIC
SOUTHERN CALIFORNIA EDISON

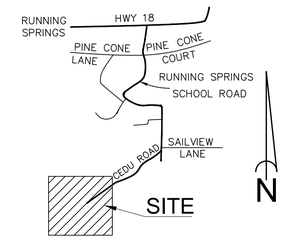
SEWER:
ON-SITE PACKAGE SYSTEM (PRIVATE)

FIRE::
RUNNING SPRINGS FIRE DEPARTMENT
FIRE STATION 51
31250 HILLTOP BLVD.
RUNNING SPRINGS, CA. 92382
PH: (909) 867-2630

OWNER / APPLICANT:
WEST COAST TORAH RETREAT AND CAMP CENTER INC., A CALIFORNIA CORPORATION
11400 W. OLYMPIC BLVD. 9TH FLOOR
LOS ANGELES, CA. 90064
(310) 248-2450
mrosenbaum@wrslayers.com
amatanky@moshavaalevy.org

ENGINEER / SURVEYOR:
TRANSTECH
413 MACKAY DRIVE
SAN BERNARDINO, CA 92408
(909) 384-7464

ARCHITECT:
MILLER ARCHITECTURE CORP.
1177 IDAHO STREET
SUITE 200
REDLANDS, CA. 92374
(909) 335-7400



VICINITY MAP
NO SCALE

SETBACKS:

	MINIMUM	PROPOSED
FRONT	25 FT.	85 FT.
SIDE	15 FT.	27 FT. / 231 FT.
REAR	15 FT.	252 FT.

BUILDING HEIGHT

MAX.	PROPOSED
35'	30'

PARKING:

RETREAT CENTER CONTAINS THE FOLLOWING PARKING SPACES

83 PEDESTRIAN VEHICLES
8 ADA
91 TOTAL SPACES

TREES:

TOTAL OF FIVE (5) TREES TO BE REMOVED AS A RESULT OF PROPOSED CONSTRUCTION ACTIVITIES.

PINE 3 – 8 INCH
1 – 30 INCH
1 – 16 INCH

GENERAL PLAN AND LAND USE:

AREA	EXISTING LAND USE	LAND USE ZONING DISTRICT
SITE	VACANT LAND	HILLTOP/RESOURCE CONSERVATION (HT/RC)
NORTH	VACANT LAND/WEST COAST TORAH RETREAT	HILLTOP/SPECIAL DEVELOPMENT RESIDENTIAL (HT/SD-RES)
SOUTH	SINGLE FAMILY RESIDENCE	HILLTOP/SPECIAL CONSERVATION (HT/RC)
EAST	SINGLE FAMILY RESIDENCE	HILLTOP/SPECIAL CONSERVATION (HT/RC)
WEST	VACANT LAND/WEST COAST TORAH RETREAT	HILLTOP/SPECIAL SINGLE FAMILY RESIDENTIAL 1-ARCE MINIMUM LOT SIZE (HT/RS-1)

LEGEND

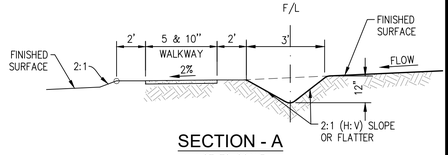
- PROJECT BOUNDARY
- B.S.L. — BUILDING SETBACK LINE
- EXISTING EDGE OF PAVEMENT
- W — WATER LINE
- E — ELECTRIC LINE
- UE — UNDERGROUND ELECTRIC
- TV — CABLE LINE
- TEL — TELEPHONE LINE
- IRR — IRRIGATION LINE
- G — GAS LINE
- SS — SANITARY SEWER LINE
- SD — STORM DRAIN LINE
- FLOW DIRECTION
- EXIST. A.C. PAVEMENT
- NEW P.C.C. WALK
- NEW D.G. TRAIL
- RIP-RAP
- LANDSCAPED AREA

AC	ASPHALT
APN	ASSESSOR'S PARCEL NUMBER
C&G	CURB AND GUTTER
CONC	CONCRETE
EP	EDGE OF PAVEMENT
EX	EXISTING
MH	MANHOLE
FF	FINISH FLOOR
FL	FLOW LINE
I.P.	IRON PIPE
PL	BOUNDARY LINE
PED.	PEDESTRIAN
PP	UTILITY POLE
(R)	RADIAL BEARING
RW	RIGHT OF WAY
S.F.	SQUARE FEET
TC	TOP OF CURB
BOS	BOTTOM OF STEP
TOS	TOP OF STEP
WV	WATER VALVE

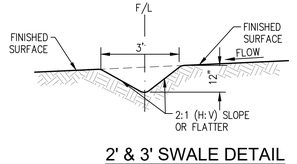
NORTH
SCALE: 1"= 20'
20' 0' 20' 40' 60'
GRAPHIC SCALE: 1" = 20'

3" 470-C-2000 CONCRETE OR 3" 2500 PSI, AIR PLACED CONCRETE WITH 1 1/2"x1 1/2" 17 GAGE STUCCO NETTING.

DRAINAGE DITCH -ROUND BOTTOM
NOT TO SCALE



SECTION - A
NOT TO SCALE



2' & 3' SWALE DETAIL
NOT TO SCALE

NOTES:
1. STABILIZE INLET, OUTLETS AND SLOPES
2. PROPERLY COMPACT THE SUBGRADE.

PRELIMINARY
NOT FOR CONSTRUCTION
MARCH 21, 2022

DATE	REVISIONS

TRANSTECH
413 MACKAY DRIVE.
SAN BERNARDINO, CA. 92408
(909) 384-7464

SAN BERNARDINO COUNTY

PRELIMINARY GRADING & SITE PLAN
RUNNING SPRINGS RETREAT
RUNNING SPRINGS, CALIFORNIA
APN 0296-211-67

DRAWN BY:	DATE:	SCALE:	SHEET:	JOB NO.
G.A./A.C.	03-21-2022	AS SHOWN	1 OF 1	19091

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements