County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

Olde Highway 80 Site Plan
PDS2018-STP-98-031W1

15229 & 15247 Olde Highway 80
El Cajon, CA 92021

ASSESSOR'S PARCEL NUMBER(S):
396-111-10 & 17

ENGINEER OF WORK:

REGISTERED PROFESSIONAL ENGINEER
LAWRENCE W. WALSH
No. 46316
CIVIL
STATE OF CALIFORNIA

Lawrence W. Walsh 7/22/22

Lawrence W. Walsh, RCE 46316

PREPARED FOR:

Archie Maurice Ortega
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619-719-8710

PDP SWQMP PREPARED BY:

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607 Aldwych Road
El Cajon, CA 92020
619-588-6747

DATE OF SWQMP:
April 29, 2022

PLANS PREPARED BY:
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SWQMP APPROVED BY:

APPROVAL DATE:

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Table of Contents

Attachments

Acronyms

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
BMP DM	Best Management Practice Design Manual
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NRCS	Natural Resources Conservation Service
PDCI	Private Development Construction Inspection Section
PDP	Priority Development Project
PDS	Planning and Development Services
PE	Professional Engineer
RPO	Resource Protection Ordinance
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWQMP	Storm Water Quality Management Plan
WMAA	Watershed Management Area Analysis
WPO	Watershed Protection Ordinance
WQIP	Water Quality Improvement Plan

PDP SWQMP Preparer's Certification Page

Project Name: Olde Highway 80 Site Plan
Permit Application Number: PDS2018-STP-98-031W1

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the County of San Diego BMP Design Manual, which is a design manual for compliance with local County of San Diego Watershed Protection Ordinance (Sections 67.801 et seq.) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the County of San Diego has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the BMP Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by County staff is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

Lawrence W. Walsh
Engineer of Work's Signature, PE Number & Expiration Date

Lawrence W. Walsh, RCE 46316, Exp. 12-31-22
Print Name

Walsh Engineering & Surveying, Inc.
Company

7/22/22
Date

Engineer's Seal:

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Submittal Record

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In column 4 summarize the changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck comments behind this page.

Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	07/23/18	Initial Submittal
2	5/2/19	Address Comments
3	1/17/20	Address Comments
4 5	10/13/21 4/19/22	Address Comments Address Comments

Final Design

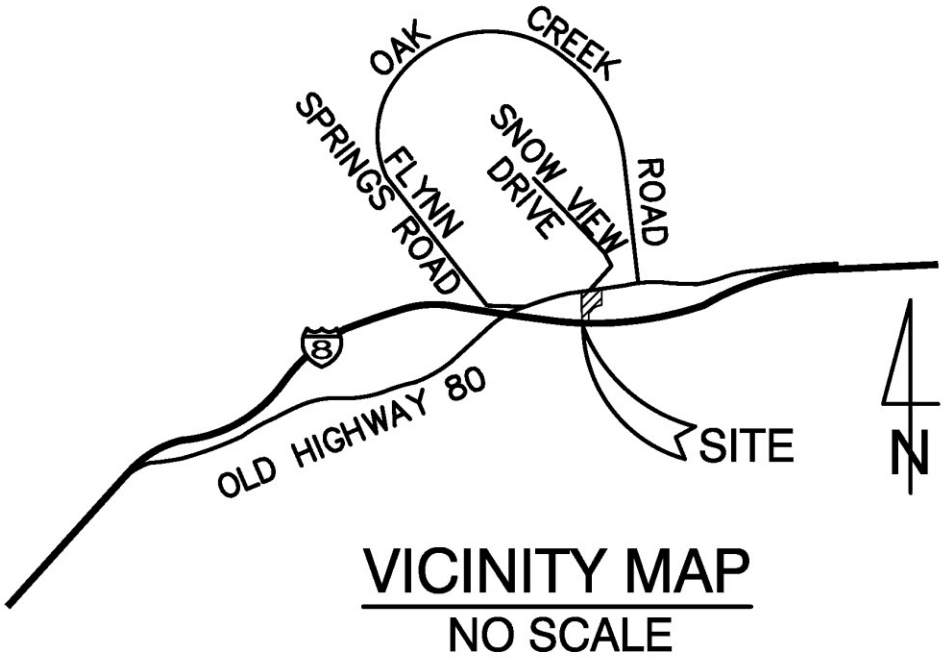
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Project Vicinity Map

Project Name: Olde Highway 80 Site Plan
Record ID: PSD2018-STP-031W1



Step 1: Project type determination (Standard or Priority Development Project)

Is the project part of another Priority Development Project (PDP)? (☐Yes ☒ No If so, a PDP SWQMP is required. Go to Step 2.			
The project is (select one): ☐ New Development ☒ Redevelopment[1]			
The total proposed newly created or replaced impervious area is: 26,000 ft^2			
The total existing (pre-project) impervious area is: 69,706 ft^2			
The total area disturbed by the project is: 67,605 ft^2			
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: _TBD during final engineering__			
Is the project in any of the following categories, (a) through (f)?[2]			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces [3](collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

[1] Redevelopment is defined as: The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways; new sidewalks construction; pedestrian ramps; or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

[2] Applicants should note that any development project that will create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site) is considered a new development.

[3] For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.

Project type determination (continued)

Yes ☒	No ☐	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See BMP Design Manual Section 1.4.2 for additional guidance.*

Does the project meet the definition of one or more of the Priority Development Project categories (a) through (f) listed above?

☐ No – the project is not a Priority Development Project (Standard Project).

☒ Yes – the project is a Priority Development Project (PDP).

Further guidance may be found in Chapter 1 and Table 1-2 of the BMP Design Manual.

The following is for **redevelopment PDPs only**:

The area of existing (pre-project) impervious area at the project site is:	69,706	ft^2 (A)
The total proposed newly created or replaced impervious area is	26,000	ft^2 (B)
Percent impervious surface created or replaced (B/A)*100:	37	%

The percent impervious surface created or replaced is (select one based on the above calculation):

☒ less than or equal to fifty percent (50%) – **only newly created or replaced impervious areas are considered a PDP and subject to stormwater requirements**

OR

☐ greater than fifty percent (50%) – **the entire project site is considered a PDP and subject to stormwater requirements**

Step 1.1: Storm Water Quality Management Plan requirements

Step	Answer	Progression
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the BMP Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Standard Project SWQMP.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete PDP SWQMP.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Is the project exempt from PDP definitions based on either of the following:	If so:
☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure;	Standard Project requirements apply, AND any additional requirements specific to the type of project. County concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.* **Complete Standard Project SWQMP**
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Guidance on Green Infrastructure.	**Complete Green Streets PDP Exempt SWQMP.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 2: Construction Storm Water BMP Checklist

Minimum Required Standard Construction Storm Water BMPs		
If you answer "Yes" to any of the questions below, your project is subject to Table 1 on the following page (Minimum Required Standard Construction Stormwater BMPs). As noted in Table 1, please select at least the minimum number of required BMPs, or as many as are feasible for your project. If no BMP is selected, an explanation must be given in the box provided. The following questions are intended to aid in determining construction BMP requirements for your project. **Note: All selected BMPs below must be included on the BMP plan incorporated into the construction plan sets.**		
1. Will there be soil disturbing activities that will result in exposed soil areas? (This includes minor grading and trenching.) **Reference Table 1 Items A, B, D, and E** Note: Soil disturbances NOT considered significant include, but are not limited to, change in use, mechanical/electrical/plumbing activities, signs, temporary trailers, interior remodeling, and minor tenant improvement.	☒Yes	☐No
2. Will there be asphalt paving, including patching? **Reference Table 1 Items D and F**	☒Yes	☐No
3. Will there be slurries from mortar mixing, coring, or concrete saw cutting? **Reference Table 1 Items D and F**	☒Yes	☐No
4. Will there be solid wastes from concrete demolition and removal, wall construction, or form work? **Reference Table 1 Items D and F**	☒Yes	☐No
5. Will there be stockpiling (soil, compost, asphalt, concrete, solid waste) for over 24 hours? **Reference Table 1 Items D and F**	☒Yes	☐No
6. Will there be dewatering operations? **Reference Table 1 Items C and D**	☒Yes	☐No
7. Will there be temporary on-site storage of construction materials, including mortar mix, raw landscaping and soil stabilization materials, treated lumber, rebar, and plated metal fencing materials? **Reference Table 1 Items E and F**	☒Yes	☐No
8. Will trash or solid waste product be generated from this project? **Reference Table 1 Item F**	☒Yes	☐No
9. Will construction equipment be stored on site (e.g.: fuels, oils, trucks, etc.?) **Reference Table 1 Item F**	☒Yes	☐No
10. Will Portable Sanitary Services ("Porta-potty") be used on the site? **Reference Table 1 Item F**	☒Yes	☐No

Table 1. Construction Storm Water BMP Checklist

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook[4] Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
A. Select Erosion Control Method for Disturbed Slopes (choose at least one for the appropriate season)			
Vegetation Stabilization Planting[5] (Summer)	SS-2, SS-4	☐	
Hydraulic Stabilization Hydroseeding[2] (Summer)	SS-4	☒	
Bonded Fiber Matrix or Stabilized Fiber Matrix[6] (Winter)	SS-3	☒	
Physical Stabilization Erosion Control Blanket[3] (Winter)	SS-7	☐	
B. Select erosion control method for disturbed flat areas (slope < 5%) (choose at least one)			
County Standard Lot Perimeter Protection Detail	PDS 659[7], SC-2	☐	
Will use erosion control measures from Item A on flat areas also	SS-3, 4, 7	☐	
County Standard Desilting Basin (must treat all site runoff)	PDS 660[8], SC-2	☐	
Mulch, straw, wood chips, soil application	SS-6, SS-8	☒	

4 State of California Department of Transportation (Caltrans). 2003. Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual. March. Available online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm.

5 If Vegetation Stabilization (Planting or Hydroseeding) is proposed for erosion control it may be installed between May 1st and August 15th. Slope irrigation is in place and needs to be operable for slopes >3 feet. Vegetation must be watered and established prior to October 1st. The owner must implement a contingency physical BMP by August 15th if vegetation establishment does not occur by that date. If landscaping is proposed, erosion control measures must also be used while landscaping is being established. Established vegetation must have a subsurface mat of intertwined mature roots with a uniform vegetative coverage of 70 percent of the natural vegetative coverage or more on all disturbed areas.

6 All slopes over three feet must have established vegetative cover prior to final permit approval.

7 County of San Diego, Planning & Development Services. 2012. Standard Lot Perimeter Protection Design System. Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds659.pdf.

8 County of San Diego, Planning & Development Services. 2012. County Standard Desilting Basin for Disturbed Areas of 1 Acre or Less Building Division. PDS 659. Available online at http://www.sandiegocounty.gov/pds/docs/pds660.pdf.

Table 1. Construction Storm Water BMP Checklist (continued)

Minimum Required Best Management Practices (BMPs)	CALTRANS SW Handbook Detail or County Std. Detail	✔ BMP Selected	Reference sheet No.'s where each selected BMP is shown on the plans. If no BMP is selected, an explanation must be provided.
C. If runoff or dewatering operation is concentrated, velocity must be controlled using an energy dissipater			
Energy Dissipater Outlet Protection[9]	SS-10	☒	
D. Select sediment control method for all disturbed areas (choose at least one)			
Silt Fence	SC-1	☒	
Fiber Rolls (Straw Wattles)	SC-5	☒	
Gravel & Sand Bags	SC-6 & 8	☒	
Dewatering Filtration	NS-2	☐	
Storm Drain Inlet Protection	SC-10	☒	
Engineered Desilting Basin (sized for 10-year flow)	SC-2	☐	
E. Select method for preventing offsite tracking of sediment (choose at least one)			
Stabilized Construction Entrance	TC-1	☒	
Construction Road Stabilization	TC-2	☐	
Entrance/Exit Tire Wash	TC-3	☐	
Entrance/Exit Inspection & Cleaning Facility	TC-1	☐	
Street Sweeping and Vacuuming	SC-7	☐	
F. Select the general site management BMPs			
F.1 Materials Management			
Material Delivery & Storage	WM-1	☒	
Spill Prevention and Control	WM-4	☒	
F.2 Waste Management[10]			
Waste Management Concrete Waste Management	WM-8	☒	
Solid Waste Management	WM-5	☒	
Sanitary Waste Management	WM-9	☒	
Hazardous Waste Management	WM-6	☒	

Note: The Construction General Permit (Order No. 2009-0009-DWQ) also requires all projects not subject to the BMP Design Manual to comply with runoff reduction requirements through the implementation of post-construction BMPs as described in Section XIII of the order.

[9] Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

[10] Not all projects will have every waste identified. The applicant is responsible for identifying wastes that will be onsite and applying the appropriate BMP. For example, if concrete will be used, BMP WM-8 must be selected.

Step 3: County of San Diego PDP SWQMP Site Information Checklist

Step 3.1: Description of Existing Site Condition

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	907.14 San Diego River Watershed, Lower San Diego HA, Coches HSA

Current Status of the Site (select all that apply):

☒ Existing development
☐ Previously graded but not built out
☒ Demolition completed without new construction
☐ Agricultural or other non-impervious use
☐ Vacant, undeveloped/natural

Description / Additional Information:
On the westerly parcel, the existing home has been demolished. On the easterly parcel, there is an existing development consisting of a few temporary buildings and parking area.

Existing Land Cover Includes (select all that apply and provide each area on site):

☐ Vegetative Cover _____ Acres (_____ Square Feet)
☒ Non-Vegetated Pervious Areas 3.80 Acres (165,389 Square Feet)
☒ Impervious Areas 1.60 Acres (69,706 Square Feet)

Description / Additional Information:
Landscaping and office

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):

☐ NRCS Type A
☐ NRCS Type B
☐ NRCS Type C
☒ NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used):

☐ GW Depth < 5 feet
☐ 5 feet < GW Depth < 10 feet
☒ 10 feet < GW Depth < 20 feet
☐ GW Depth > 20 feet

Existing Natural Hydrologic Features (select all that apply):

☒ Watercourses
☐ Seeps
☐ Springs
☐ Wetlands
☐ None
☐ Other

Description / Additional Information:
Los Coches Creek runs along the south of the property

Step 3.2: Description of Existing Site Drainage Patterns

How is storm water runoff conveyed from the site? At a minimum, this description should answer:

(1) Whether existing drainage conveyance is natural or urban;
(2) Is runoff from offsite conveyed through the site? if yes, quantify all offsite drainage areas, design flows, and locations where offsite flows enter the project site, and summarize how such flows are conveyed through the site;
(3) Provide details regarding existing project site drainage conveyance network, including any existing storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels; and
(4) Identify all discharge locations from the existing project site along with a summary of conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.

Describe existing site drainage patterns:

On the easterly parcel, there are existing storm drain inlets that collect runoff and outlet to the south into Los Coches Creek. There exists a wall along the east property line which prevents offsite run on from entering the property. Said runoff is also conveyed to Los Coches Creek.

On the westerly parcel, runoff naturally sheets from east to west into the existing mobile home park. The POC is located along the west property line. See Drainage Study associated with this project.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
Construction of building and porous parking lot, a covered storage area.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
Building and porous pavement for parking, covered storage area.

List/describe proposed pervious features of the project (e.g., landscape areas):
Landscaping and biofiltration basin

Does the project include grading and changes to site topography?

☒Yes

☐No

Description / Additional Information:
Grading for proposed building, parking lot, and biofiltration basin.

Insert acreage or square feet for the different land cover types in the table below:

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation			
Pervious (non-vegetated)	165,389	131,332	- 20
Impervious	69,706	95,706	+27

Step 3.4: Description of Proposed Site Drainage Patterns

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☒Yes

☐No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural or constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre- and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Describe proposed site drainage patterns:

On the westerly parcel, runoff will sheet over the proposed parking lot into a storm drain system where it will discharge into a biofiltration basin on the west side of the property. To the east, a tree well per SD-A will be used to treat runoff from the existing covered storage. Some offsite run on from the east will bypass the basin and outlet at the POC. See Drainage Study associated with this project for more information.

Step 3.5: Potential Pollutant Source Areas

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply). Select "Other" if the project is a phased development and provide a description:

- ☒ On-site storm drain inlets
- ☒ Interior floor drains and elevator shaft sump pumps
- ☐ Interior parking garages
- ☐ Need for future indoor & structural pest control
- ☒ Landscape/Outdoor Pesticide Use
- ☐ Pools, spas, ponds, decorative fountains, and other water features
- ☐ Food service
- ☐ Refuse areas
- ☒ Industrial processes
- ☒ Outdoor storage of equipment or materials
- ☒ Vehicle and Equipment Cleaning
- ☒ Vehicle/Equipment Repair and Maintenance
- ☐ Fuel Dispensing Areas
- ☐ Loading Docks
- ☒ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☒ Plazas, sidewalks, and parking lots
- ☐ Other (provide description)

Description / Additional Information:

Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable): Runoff from the project site sheet flows through the neighboring mobile home park into Los Coches Creek where it then confluences with the San Diego River and then discharges into the Pacific Ocean.

List any 303(d) impaired water bodies[11] within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
Los Coches Creek	*Selenium*	*Indicator Bacteria*
Lower San Diego River	*Enterococcus, Fecal Coliform, Low Dissolved Oxygen, Manganese, Nitrogen, Phosphorous, Total Dissolved Solids, Toxicity*	*Indicator Bacteria*

Identification of Project Site Pollutants*

*Identification of project site pollutants below is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs. Note the project must also participate in an alternative compliance program (unless prior lawful approval to meet earlier PDP requirements is demonstrated).

Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	☐	☐	☐
Nutrients	☐	☐	☐
Heavy Metals	☐	☐	☐
Organic Compounds	☐	☐	☐
Trash & Debris	☐	☐	☐
Oxygen Demanding Substances	☐	☐	☐
Oil & Grease	☐	☐	☐

[11] The current list of Section 303(d) impaired water bodies can be found at http://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/#impaired

Bacteria & Viruses	☐	☐	☐
Pesticides	☐	☐	☐

Step 3.7: Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☒Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.

☐No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA[12] for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

[12] The Watershed Management Area Analysis (WMAA) is an optional element for inclusion in the Water Quality Improvement Plans (WQIPs) described in the 2013 MS4 Permit [Provision B.3.b.(4)]. It is available online at the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=248

Step 3.7.1: Critical Coarse Sediment Yield Areas*

***This Section only required if hydromodification management requirements apply**

Projects must satisfy critical coarse sediment yield area (CCSYA) requirements by characterizing the project as one of the scenario-types presented below and satisfying associated criteria. Projects must appropriately satisfy all requirements for identification, avoidance, and bypass, OR may alternatively elect to demonstrate no net impact.

☐ **Scenario 1**: Project is subject to and in compliance with RPO requirements *(without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3) that result in impacts to more than 15% of the project-scale CCSYAs)*.

- ☐ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND,
- ☐ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water.

☐ **Scenario 2**: Project is entirely exempt/not subject to RPO requirements without utilization of RPO exemptions 86.604(e)(2)(cc) or 86.604(e)(3).

- ☐ Identify: Project has identified upstream CCSYAs that are coarse, ≥25% slope, and ≥50' tall. *(Optional refinement methods may be performed per guidance in Section H.1.2). AND,*
- ☐ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND,
- ☐ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,
- ☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. *(Skip to next row).*

☐ **Scenario 3**: Project utilizes exemption(s) via RPO Section 86.604(e)(2)(cc) or 86.604(e)(3) and impacts more than 15% of the project-scale CCSYAs.

- ☐ No Net Impact: Project is not eligible for traditional methods of identification, avoidance, and bypass. Project must demonstrate no net impact to the receiving water.

Critical Coarse Sediment Yield Areas Continued
Demonstrate No Net Impact
If the project elects to satisfy CCSYA criteria through demonstration of no net impact to the receiving water. Applicants must identify the methods utilized from the list below and provide supporting documentation in Attachment 2c of the SWQMP. Check all that are applicable. ☐ N/A, the project appropriately identifies, avoids, and bypasses CCSYAs. ☐ Project has performed additional analysis to demonstrate that impacts to CCSYAs satisfy the no net impact standard of Ep/Sp≤1.1. ☒ Project has provided alternate mapping of CCSYAs. ☐ Project has implemented additional onsite hydromodification flow control measures. ☐ Project has implemented an offsite stream rehabilitation project to offset impacts. ☐ Project has implemented other applicant-proposed mitigation measures.

Step 3.7.2: Flow Control for Post-Project Runoff*

*This Section only required if hydromodification management requirements apply
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. POC 1 is located along the westerly edge of the project site.
Has a geomorphic assessment been performed for the receiving channel(s)? ☒ No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐ Yes, the result is the low flow threshold is 0.1Q2 ☐ Yes, the result is the low flow threshold is 0.3Q2 ☐ Yes, the result is the low flow threshold is 0.5Q2 *If a geomorphic assessment has been performed, provide title, date, and preparer:* *Discussion / Additional Information: (optional)*

Step 3.8: Other Site Requirements and Constraints

When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.

Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

Step 4: Source Control BMP Checklist

Source Control BMPs			
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.4 not implemented:			

Source Control Requirement	Applied?		
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
Discussion / justification if 4.2.5 not implemented:			
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☒ B. Interior floor drains and elevator shaft sump pumps	☒Yes	☐No	☐N/A
☐ C. Interior parking garages	☐Yes	☐No	☒N/A
☐ D. Need for future indoor & structural pest control	☐Yes	☐No	☒N/A
☒ E. Landscape/outdoor pesticide use	☒Yes	☐No	☐N/A
☐ F. Pools, spas, ponds, fountains, and other water features	☐Yes	☐No	☒N/A
☐ G. Food service	☐Yes	☐No	☒N/A
☐ H. Refuse areas	☐Yes	☐No	☒N/A
☒ I. Industrial processes	☒Yes	☐No	☐N/A
☒ J. Outdoor storage of equipment or materials	☒Yes	☐No	☐N/A
☒ K. Vehicle and equipment cleaning	☒Yes	☐No	☐N/A
☒ L. Vehicle/equipment repair and maintenance	☒Yes	☐No	☐N/A
☒ M. Fuel dispensing areas	☒Yes	☐No	☐N/A
☐ N. Loading docks	☐Yes	☐No	☒N/A
☒ O. Fire sprinkler test water	☒Yes	☐No	☐N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☒ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Note: Show all source control measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 5: Site Design BMP Checklist

Site Design BMPs
All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist. Answer each category below pursuant to the following: • "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.1 not implemented:			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.2 not implemented:			
4.3.3 Minimize Impervious Area	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.4 not implemented:			
4.3.5 Impervious Area Dispersion	☐Yes	☒No	☐N/A
Discussion / justification if 4.3.5 not implemented: Impervious area dispersion is not feasible due to constraints which includes the narrowness of the lot, parking requirements, Type D soil, and Los Coches Creek flowing through the site.			

Site Design Requirement	Applied?		
4.3.6 Runoff Collection	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.6 not implemented:			
4.3.7 Landscaping with Native or Drought Tolerant Species	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐Yes	☐No	☒N/A
Discussion / justification if 4.3.8 not implemented: Harvesting and use is unfeasible. See feasibility category in worksheet B.3-1 in attachment 1a.			

Note: Show all site design measures described above that are included in design capture volume calculations in the plan sheets of Attachment 5.

Step 6: PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the County at the completion of construction. This may include requiring the project owner or project owner's representative and engineer of record to certify construction of the structural BMPs (see Section 1.12 of the BMP Design Manual). PDP structural BMPs must be maintained into perpetuity, and the County must confirm the maintenance (see Section 7 of the BMP Design Manual).

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [Step 6.2] as many times as needed to provide summary information for each individual structural BMP).

Step 6.1: Description of structural BMP strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate. At the end of this discussion provide a summary of all the structural BMPs within the project including the type and number.

A biofiltration basin (BMP A) has been selected due to inadequate infiltration rates onsite. The biofiltration basin and tree well has been designed per BMP fact sheet BF-1 & SD-A and will be used for pollutant and hydromodification flow control per the guidelines in Appendix E of the BMP Manual.

(Continue on following page as necessary.)

Description of structural BMP strategy continued (Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from previous page)

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. BMP A	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☒ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Walsh Engineering & Surveying, Inc. 607 Aldwych Road, El Cajon CA 92020 619-588-6747
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	CAT II
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. BMP A	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☒Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☒ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☐ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Walsh Engineering & Surveying, Inc. 607 Aldwych Road, El Cajon CA 92020 619-588-6747
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	CAT II
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. BMP C	
Construction Plan Sheet No.	
Type of structural BMP: ☐ Retention by harvest and use (HU-1) ☐ Retention by infiltration basin (INF-1) ☐ Retention by bioretention (INF-2) ☐ Retention by permeable pavement (INF-3) ☐ Partial retention by biofiltration with partial retention (PR-1) ☐ Biofiltration (BF-1) ☐ Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐ Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐ Detention pond or vault for hydromodification management ☒ Other (describe in discussion section below)	
Purpose: ☐ Pollutant control only ☐ Hydromodification control only ☒ Combined pollutant control and hydromodification control ☐ Pre-treatment/forebay for another structural BMP ☐ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Walsh Engineering & Surveying, Inc. 607 Aldwych Road, El Cajon CA 92020 619-588-6747
Who will be the final owner of this BMP?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
Who will maintain this BMP into perpetuity?	☐ HOA ☒ Property Owner ☐ County ☐ Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	CAT II
Discussion (as needed): Tree well per SD-A *(Continue on subsequent pages as necessary)*	

Step 6.3: Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐ Yes ☐ No	Will your ACP project be completed prior to the completion of the PDP? ☐ Yes ☐ No
Does your ACP account for all Deficits generated by the PDP? ☐ Yes ☐ No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits)

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	449	cubic-feet
	1	Proposed Development Type	Industrial	unitless
	2	Number of Residents or Employees at Proposed Development	26	#
	3	Total Planted Area within Development	6,626	sq-ft
	4	Water Use Category for Proposed Planted Areas	Low	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate ≤0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate ≤0.010 Inches per Hour?	No	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	No	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.10	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	29	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	8	cubic-feet
	13	Total Anticipated Use Over 36 Hours	37	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.08	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.

B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.

C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.

D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.

E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.

F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at ≥3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.

H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

Automated Worksheet B.1-1: Calculation of Design Capture Volume (V1.3)

Category	#	Description	*i*	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	A	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.60	inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.020	in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)		sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)		sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)		sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)		sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)		sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)		sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)		sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	Yes	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)	26,000	sq-ft
	13	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)		sq-ft
	14	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)	20,240	sq-ft
	15	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)		sq-ft
	16	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)		sq-ft
	17	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)		sq-ft
	18	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)	13,686	sq-ft
	19	Number of Tree Wells Proposed per SD-A		#
	20	Average Mature Tree Canopy Diameter		ft
	21	Number of Rain Barrels Proposed per SD-E		#
	22	Average Rain Barrel Size		gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in Downstream Drainage?	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series		unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas		percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	59,926	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.49	unitless
	31	Initial Weighted Runoff Factor	0.49	unitless
	32	Initial Design Capture Volume	1,468	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	26,000	sq-ft
	34	Total Pervious Dispersion Area	33,926	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	0.80	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	0.31	ratio
	37	Runoff Factor After Dispersion Techniques	0.15	unitless
	38	Design Capture Volume After Dispersion Techniques	449	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.15	unitless
	42	Final Effective Tributary Area	8,989	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	1,019	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	449	cubic-feet

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes for up to 10 drainage areas. User input must be provided for yellow shaded cells, values for all other cells will be automatically generated, errors/notifications will be highlighted in red and summarized below. Upon completion of this worksheet, proceed to the appropriate BMP Sizing worksheet(s).

Automated Worksheet B.5-1: Sizing Lined or Unlined Biofiltration BMPs (V1.3)

Category	#	Description	*i*	Units
BMP Inputs	0	Drainage Basin ID or Name	A	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.020	in/hr
	2	Effective Tributary Area	8,989	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	ratio
	4	Design Capture Volume Tributary to BMP	449	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	unitless
	6	Provided Biofiltration BMP Surface Area	2,025	sq-ft
	7	Provided Surface Ponding Depth	6	inches
	8	Provided Soil Media Thickness	18	inches
	9	Provided Depth of Gravel Above Underdrain Invert	3	inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	0.75	inches
	11	Provided Depth of Gravel Below the Underdrain	3	inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	unitless
	15	Effective Retention Depth	0.90	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	hours
	17	Volume Retained by BMP	152	cubic-feet
	18	Fraction of DCV Retained	0.34	ratio
	19	Portion of Retention Performance Standard Satisfied	0.34	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.19	ratio
	21	Design Capture Volume Remaining for Biofiltration	364	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.0220	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.47	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.47	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	2.82	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	unitless
	28	Effective Depth of Biofiltration Storage	10.80	inches
	29	Drawdown Time for Surface Ponding	13	hours
	30	Drawdown Time for Effective Biofiltration Depth	23	hours
	31	Total Depth Biofiltered	13.62	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	546	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	546	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	273	cubic-feet
	35	Option 2 - Provided Storage Volume	273	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	unitless
	40	**Deficit of Effectively Treated Stormwater**	**0**	cubic-feet

Worksheet B.5-1 General Notes:

A. Applicants may use this worksheet to size Lined or Unlined Biofiltration BMPs (BF-1, PR-1) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully

Summary of Stormwater Pollutant Control Calculations (V1.3)

Category	#	Description	*i*	Units
General Info	0	Drainage Basin ID or Name	A	unitless
	1	85th Percentile Storm Depth	0.60	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.020	in/hr
	3	Total Tributary Area	59,926	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	2,996	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.49	unitless
	6	Initial Design Capture Volume	1,468	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	1,019	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	8,989	square feet
	10	Final Design Capture Volume Tributary to BMP	449	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	85	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.75	fraction
	14	Percent of Average Annual Runoff Retention Provided	69.9%	%
	15	Percent of Average Annual Runoff Retention Required	10.3%	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange

-Congratulations, all specified drainage basins and BMPs are in compliance with stormwater pollutant control requirements. Include 11x17 color prints of this summary sheet and supporting worksheet calculations as part of the

False

Categorization of Infiltration Feasibility Condition	Form I-8

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

See soils report

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

See soils report

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-8 Page 2 of 4			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: See soils report Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: See soils report Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result *	If all answers to rows 1 - 4 are "**Yes**" a full infiltration design is potentially feasible. The feasibility screening category is **Full Infiltration** If any answer from row 1-4 is "**No**", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		Full infiltration is infeasible

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

See soils report

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis:

See soils report

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: See soils report Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis: See soils report Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		No infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

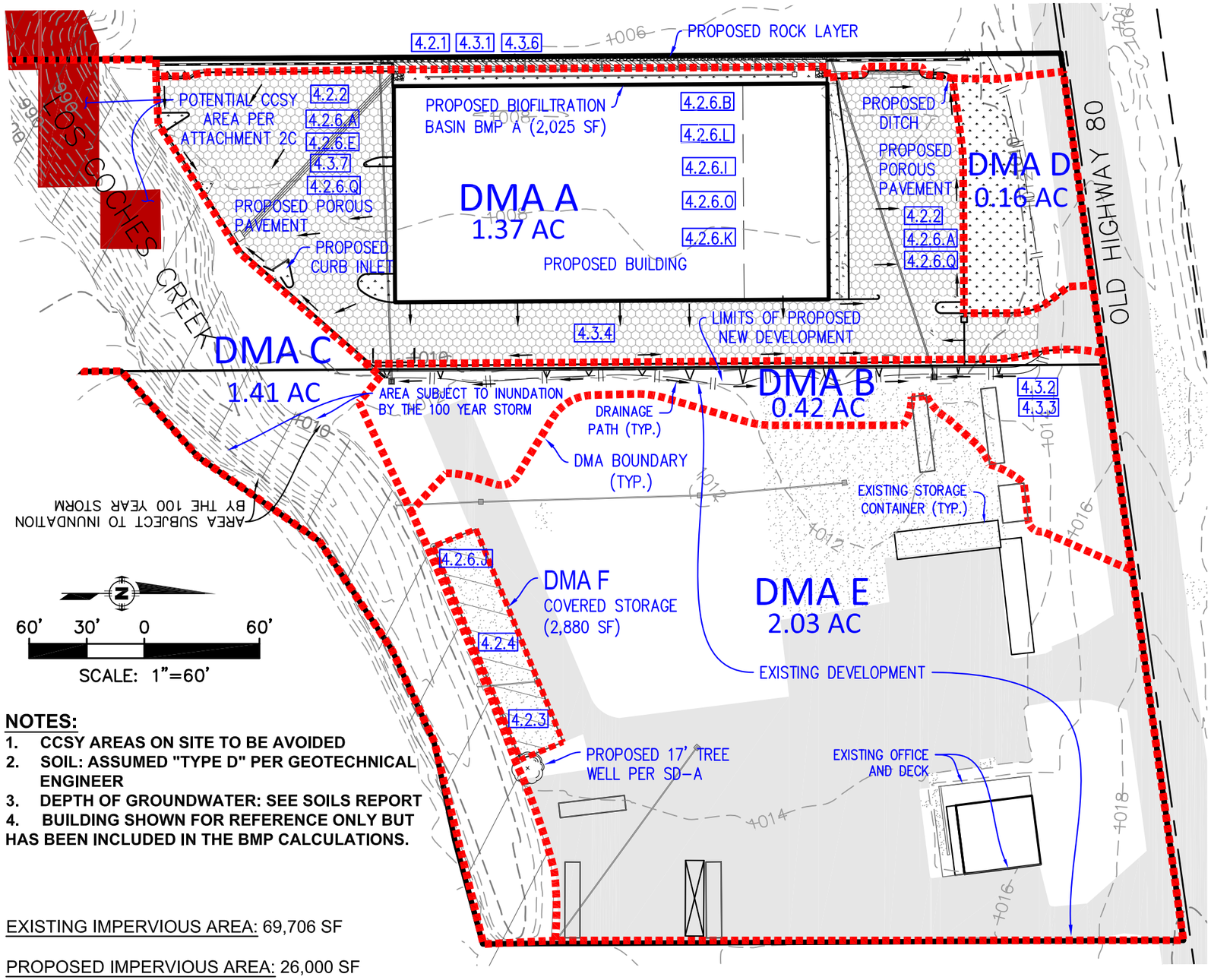
Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography and impervious areas
☒ Existing and proposed site drainage network and connections to drainage offsite
☐ Proposed demolition
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☒ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☒ Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)

DRAINAGE MANAGEMENT AREA MAP

15229 & 15247 OLDE HIGHWAY 80, EL CAJON CA 92021



NOTES:

1. **CCSY AREAS ON SITE TO BE AVOIDED**
2. **SOIL: ASSUMED "TYPE D" PER GEOTECHNICAL ENGINEER**
3. **DEPTH OF GROUNDWATER: SEE SOILS REPORT**
4. **BUILDING SHOWN FOR REFERENCE ONLY BUT HAS BEEN INCLUDED IN THE BMP CALCULATIONS.**

EXISTING IMPERVIOUS AREA: 69,706 SF

PROPOSED IMPERVIOUS AREA: 26,000 SF

PROPOSED POROUS PAVEMENT: 28,500 SF

DMA TABLE			
NAME	AREA	DESCRIPTION	TYPE
A	1.37 AC	WAREHOUSE & PARKING	BIOFILTRATION/ PERMEABLE PAVEMENT
B	0.42 AC	SLOPES AND EXISTING OPEN AREA	SELF-RETAINING
C	1.41 AC	LANDSCAPING	SELF-MITIGATING
D	0.16 AC	EXISTING OLDE HIGHWAY 80	SELF-MITIGATING
E	2.03 AC	EXISTING DEVELOPMENT	–
F	0.07 AC	COVERED STORAGE AREA	TREE WELL

BMP LEGEND

SOURCE CONTROL BMPS:

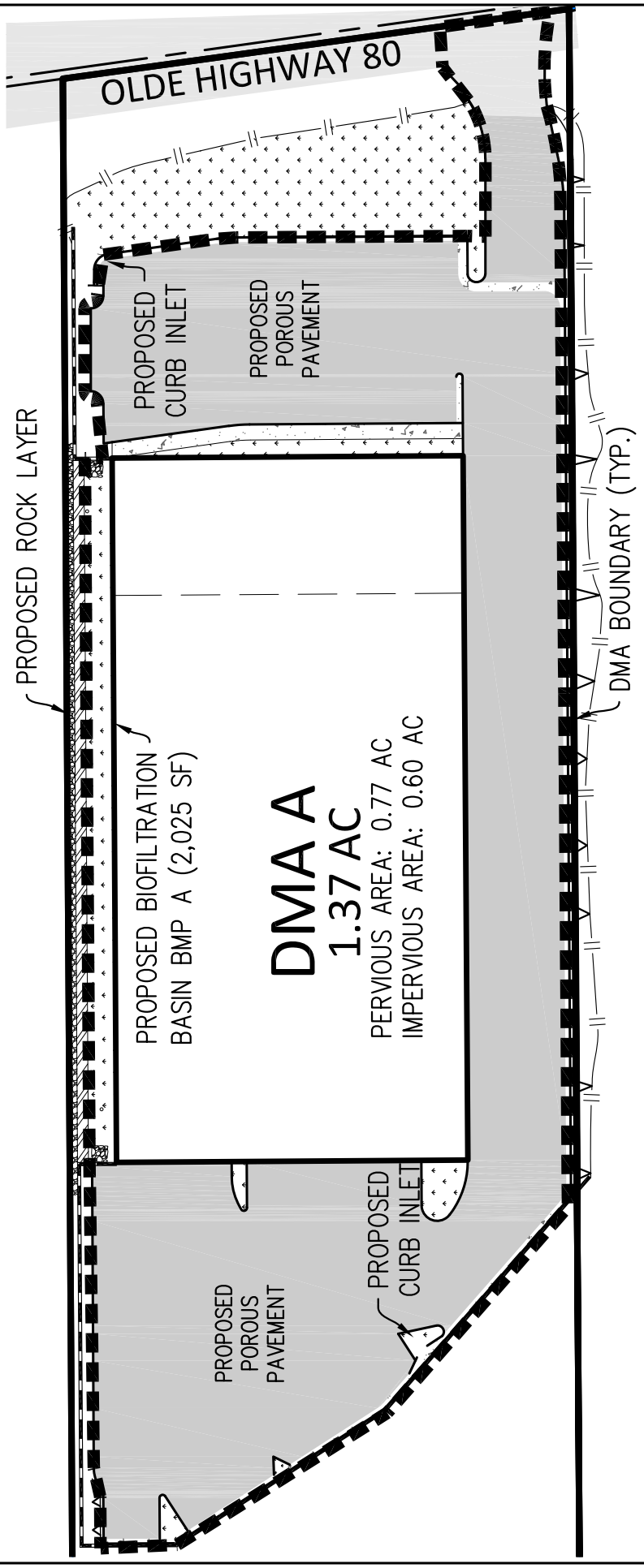
- 4.2.1 PREVENTION OF ILLICIT DISCHARGES INTO THE MS4
- 4.2.2 STORM DRAIN STENCILING OR SIGNAGE
- 4.2.3 PROTECT OUTDOOR MATERIALS STORAGE AREAS FROM RAINFALL, RUN-ON, AND WIND DISPERSAL
- 4.2.4 PROTECT MATERIALS STORED IN OUTDOOR WORK AREAS FROM RAINFALL, RUN-ON, RUNOFF, AND WIND DISPERSAL
- 4.2.6.A ONSITE STORM DRAIN INLETS
- 4.2.6.B INTERIOR FLOOR DRAINS
- 4.2.6.E LANDSCAPE/OUTDOOR PESTICIDE USE
- 4.2.6.I INDUSTRIAL PROCESSES
- 4.2.6.J OUTDOOR STORAGE OF EQUIPMENT OR MATERIALS
- 4.2.6.K VEHICLE AND EQUIPMENT CLEANING
- 4.2.6.L VEHICLE/EQUIPMENT REPAIR AND MAINTENANCE
- 4.2.6.O FIRE SPRINKLER TEST WATE
- 4.2.6.Q PLAZAS, SIDEWALKS AND PARKING LOTS

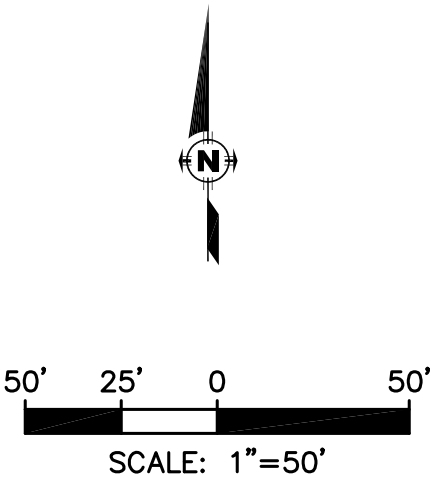
SITE DESIGN BMPS:

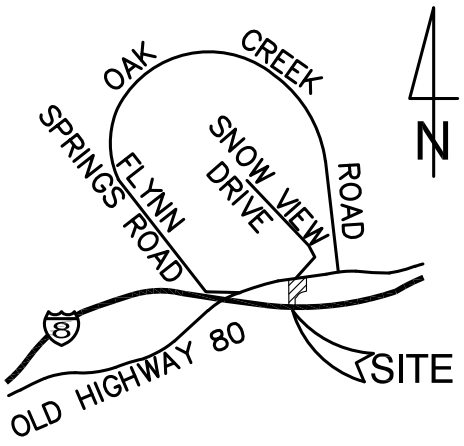
- 4.3.1 MAINTAIN NATURAL DRAINAGE PATHWAYS AND HYDROLOGIC FEATURES
- 4.3.2 CONSERVE NATURAL AREAS, SOILS, AND VEGETATION
- 4.3.3 MINIMIZE IMPERVIOUS AREA
- 4.3.4 MINIMIZE SOIL COMPACTION
- 4.3.6 RUNOFF COLLECTION
- 4.3.7 LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

BMP A MAPBOOK

ATTACHMENT 1D







VICINITY MAP

NO SCALE

ATTACHMENT 2

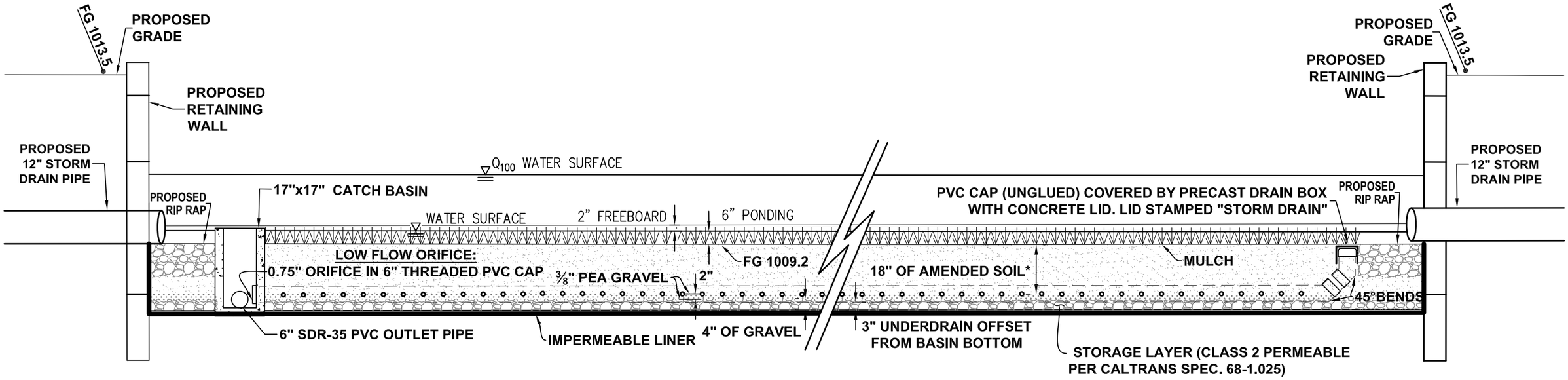
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	**Contents**	**Checklist**
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☒ Included ☐ Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☒ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the BMP Design Manual.	☒ Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped by Regional or Jurisdictional approaches outlined in Appendix H.1 AND, ☒ Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment per approaches outlined in Appendix H.2 and H.3. OR, ☐ Demonstration that project does not generate a net impact on the receiving water per approaches outlined in Appendix H.4.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☒ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☒ Not required because BMPs will drain in less than 96 hours



BIOFILTRATION BASIN DETAIL

SCALE: H:1"=3'
V:1"=3'

*AMENDED SOIL MIX BY VOLUME:
- 65% SAND
- 20% SANDY LOAM
- 15% COMPOST

PERCOLATION RATE 5-10 IN/HR MIN SUSTAINED

General Model Information

Project Name:	SDHM 7-10-18
Site Name:	16921 Old Highway 80
Site Address:	15229 & 15247 Old Highway 80
City:	El Cajon
Report Date:	7/18/2022
Gage:	FLINN SP
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2020/04/07

POC Thresholds

Low Flow Threshold for POC1:	10 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1A

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Flat	1.96
Pervious Total	1.96
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.96

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1B

Bypass:	Yes
GroundWater:	No
Pervious Land Use	acre
D,NatVeg,Flat	0.3
Pervious Total	0.3
Impervious Land Use	acre
IMPERVIOUS-FLAT	0.12
Impervious Total	0.12
Basin Total	0.42

Element Flows To:

Surface	Interflow	Groundwater

Basin 1A

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,NatVeg,Flat	0.13
Pervious Total	0.13

Impervious Land Use	acre
IMPERVIOUS-FLAT	0.59
Impervious Total	0.59
Basin Total	0.72

Element Flows To:

Surface	Interflow	Groundwater
Surface	Surface	

Basin 1C

Bypass:	Yes
GroundWater:	No

Pervious Land Use	acre
D,NatVeg,Flat	0.13
Pervious Total	0.13

Impervious Land Use	acre
IMPERVIOUS-FLAT	0.03
Impervious Total	0.03
Basin Total	0.16

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Bottom Length:	226.00 ft.
Bottom Width:	8.60 ft.
Material thickness of first layer:	0.25
Material type for first layer:	Mulch
Material thickness of second layer:	1.5
Material type for second layer:	ESM
Material thickness of third layer:	0.5
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.5
Orifice Diameter (in.):	0.75
Offset (in.):	3
Flow Through Underdrain (ac-ft.):	119.1
Total Outflow (ac-ft.):	120.588
Percent Through Underdrain:	98.77
Discharge Structure	
Riser Height:	1.83 ft.
Riser Diameter:	19 in.
Notch Type:	Rectangular
Notch Width:	0.000 ft.
Notch Height:	0.000 ft.
Element Flows To:	
Outlet 1	Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0446	0.0000	0.0000	0.0000
0.0476	0.0446	0.0006	0.0000	0.0000
0.0952	0.0446	0.0013	0.0000	0.0000
0.1427	0.0446	0.0019	0.0000	0.0000
0.1903	0.0446	0.0025	0.0000	0.0000
0.2379	0.0446	0.0032	0.0000	0.0000
0.2855	0.0446	0.0038	0.0000	0.0000
0.3331	0.0446	0.0045	0.0000	0.0000
0.3807	0.0446	0.0051	0.0000	0.0000
0.4282	0.0446	0.0057	0.0000	0.0000
0.4758	0.0446	0.0064	0.0000	0.0000
0.5234	0.0446	0.0070	0.0000	0.0000
0.5710	0.0446	0.0076	0.0000	0.0000
0.6186	0.0446	0.0083	0.0000	0.0000
0.6662	0.0446	0.0089	0.0000	0.0000
0.7137	0.0446	0.0096	0.0000	0.0000
0.7613	0.0446	0.0102	0.0000	0.0000
0.8089	0.0446	0.0108	0.0000	0.0000
0.8565	0.0446	0.0115	0.0000	0.0000
0.9041	0.0446	0.0121	0.0000	0.0000
0.9516	0.0446	0.0127	0.0000	0.0000
0.9992	0.0446	0.0134	0.0000	0.0000
1.0468	0.0446	0.0140	0.0000	0.0000
1.0944	0.0446	0.0146	0.0000	0.0000
1.1420	0.0446	0.0153	0.0000	0.0000
1.1896	0.0446	0.0159	0.0000	0.0000

1.2371	0.0446	0.0166	0.0000	0.0000
1.2847	0.0446	0.0172	0.0004	0.0000
1.3323	0.0446	0.0178	0.0006	0.0000
1.3799	0.0446	0.0185	0.0016	0.0000
1.4275	0.0446	0.0191	0.0021	0.0000
1.4751	0.0446	0.0197	0.0028	0.0000
1.5226	0.0446	0.0204	0.0031	0.0000
1.5702	0.0446	0.0210	0.0037	0.0000
1.6178	0.0446	0.0217	0.0039	0.0000
1.6654	0.0446	0.0223	0.0044	0.0000
1.7130	0.0446	0.0229	0.0046	0.0000
1.7605	0.0446	0.0238	0.0050	0.0000
1.8081	0.0446	0.0247	0.0052	0.0000
1.8557	0.0446	0.0256	0.0056	0.0000
1.9033	0.0446	0.0265	0.0057	0.0000
1.9509	0.0446	0.0273	0.0061	0.0000
1.9985	0.0446	0.0282	0.0062	0.0000
2.0460	0.0446	0.0291	0.0065	0.0000
2.0936	0.0446	0.0300	0.0067	0.0000
2.1412	0.0446	0.0309	0.0070	0.0000
2.1888	0.0446	0.0317	0.0072	0.0000
2.2364	0.0446	0.0326	0.0072	0.0000
2.2500	0.0446	0.0329	0.0216	0.0000

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.2500	0.0446	0.0329	0.0000	0.2250	0.0000
2.2976	0.0446	0.0350	0.0000	0.2250	0.0000
2.3452	0.0446	0.0371	0.0000	0.2767	0.0000
2.3927	0.0446	0.0392	0.0000	0.2839	0.0000
2.4403	0.0446	0.0414	0.0000	0.2910	0.0000
2.4879	0.0446	0.0435	0.0000	0.2981	0.0000
2.5355	0.0446	0.0456	0.0000	0.3053	0.0000
2.5831	0.0446	0.0477	0.0000	0.3124	0.0000
2.6307	0.0446	0.0499	0.0000	0.3195	0.0000
2.6782	0.0446	0.0520	0.0000	0.3267	0.0000
2.7258	0.0446	0.0541	0.0000	0.3338	0.0000
2.7734	0.0446	0.0562	0.0000	0.3409	0.0000
2.8210	0.0446	0.0584	0.0000	0.3481	0.0000
2.8686	0.0446	0.0605	0.0000	0.3552	0.0000
2.9162	0.0446	0.0626	0.0000	0.3623	0.0000
2.9637	0.0446	0.0647	0.0000	0.3695	0.0000
3.0113	0.0446	0.0668	0.0000	0.3766	0.0000
3.0589	0.0446	0.0690	0.0000	0.3838	0.0000
3.1065	0.0446	0.0711	0.0000	0.3909	0.0000
3.1541	0.0446	0.0732	0.0000	0.3980	0.0000
3.2016	0.0446	0.0753	0.0000	0.4052	0.0000
3.2492	0.0446	0.0775	0.0000	0.4123	0.0000
3.2968	0.0446	0.0796	0.0000	0.4194	0.0000
3.3444	0.0446	0.0817	0.0000	0.4266	0.0000
3.3920	0.0446	0.0838	0.0000	0.4337	0.0000
3.4396	0.0446	0.0860	0.0000	0.4408	0.0000
3.4871	0.0446	0.0881	0.0000	0.4480	0.0000
3.5347	0.0446	0.0902	0.0000	0.4551	0.0000
3.5823	0.0446	0.0923	0.0000	0.4623	0.0000
3.6299	0.0446	0.0944	0.0000	0.4694	0.0000
3.6775	0.0446	0.0966	0.0000	0.4765	0.0000
3.7251	0.0446	0.0987	0.0000	0.4837	0.0000

3.7726	0.0446	0.1008	0.0000	0.4908	0.0000
3.8202	0.0446	0.1029	0.0000	0.4979	0.0000
3.8678	0.0446	0.1051	0.0000	0.5051	0.0000
3.9154	0.0446	0.1072	0.0000	0.5122	0.0000
3.9630	0.0446	0.1093	0.0000	0.5193	0.0000
4.0105	0.0446	0.1114	0.0000	0.5265	0.0000
4.0581	0.0446	0.1136	0.0000	0.5336	0.0000
4.1057	0.0446	0.1157	0.0693	0.5407	0.0000
4.1533	0.0446	0.1178	0.3330	0.5479	0.0000
4.2009	0.0446	0.1199	0.7039	0.5550	0.0000
4.2485	0.0446	0.1220	1.1534	0.5622	0.0000
4.2960	0.0446	0.1242	1.6628	0.5693	0.0000
4.3300	0.0446	0.1257	2.2158	0.5744	0.0000

Surface

Element Flows To:

Outlet 1	Outlet 2

Porous Pavement 1

Pavement Area:0.6538 acre.Pavement Length:356.00 ft.

Pavement Width:	80.00 ft.
	Pavement slope 1:0.02 To 1
Pavement thickness:	0.5
Pour Space of Pavement:	0.3
Material thickness of second layer:	0.5
Pour Space of material for second layer:	0.3
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	0.02
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	19.317
Total Volume Through Riser (ac-ft.):	0.118
Total Volume Through Facility (ac-ft.):	19.435
Percent Infiltrated:	99.39
Total Precip Applied to Facility:	0
Total Evap From Facility:	3.212
Element Flows To:	
Outlet 1	Outlet 2
Surface	

Porous Pavement Hydraulic Table

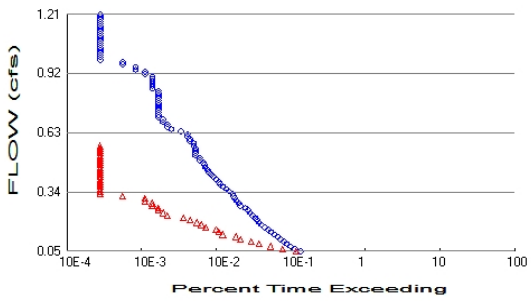
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.653	0.000	0.000	0.000
0.0144	0.653	0.002	0.000	0.013
0.0289	0.653	0.005	0.000	0.013
0.0433	0.653	0.008	0.000	0.013
0.0578	0.653	0.011	0.000	0.013
0.0722	0.653	0.014	0.000	0.013
0.0867	0.653	0.017	0.000	0.013
0.1011	0.653	0.019	0.000	0.013
0.1156	0.653	0.022	0.000	0.013
0.1300	0.653	0.025	0.000	0.013
0.1444	0.653	0.028	0.000	0.013
0.1589	0.653	0.031	0.000	0.013
0.1733	0.653	0.034	0.000	0.013
0.1878	0.653	0.036	0.000	0.013
0.2022	0.653	0.039	0.000	0.013
0.2167	0.653	0.042	0.000	0.013
0.2311	0.653	0.045	0.000	0.013
0.2456	0.653	0.048	0.000	0.013
0.2600	0.653	0.051	0.000	0.013
0.2744	0.653	0.053	0.000	0.013
0.2889	0.653	0.056	0.000	0.013
0.3033	0.653	0.059	0.000	0.013
0.3178	0.653	0.062	0.000	0.013
0.3322	0.653	0.065	0.000	0.013
0.3467	0.653	0.068	0.000	0.013
0.3611	0.653	0.070	0.000	0.013
0.3756	0.653	0.073	0.000	0.013
0.3900	0.653	0.076	0.000	0.013
0.4044	0.653	0.079	0.000	0.013
0.4189	0.653	0.082	0.000	0.013

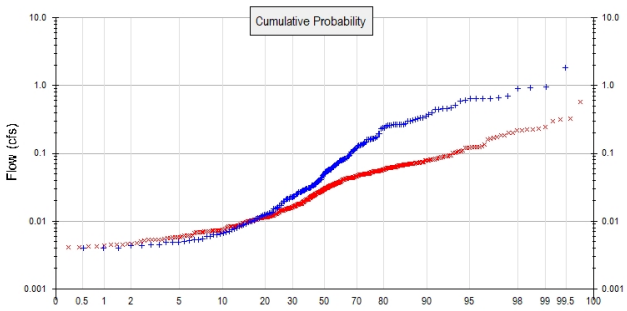
0.4333	0.653	0.085	0.000	0.013
0.4478	0.653	0.087	0.000	0.013
0.4622	0.653	0.090	0.000	0.013
0.4767	0.653	0.093	0.000	0.013
0.4911	0.653	0.096	0.000	0.013
0.5056	0.653	0.099	0.000	0.013
0.5200	0.653	0.102	0.000	0.013
0.5344	0.653	0.104	0.000	0.013
0.5489	0.653	0.107	0.000	0.013
0.5633	0.653	0.110	0.000	0.013
0.5778	0.653	0.113	0.000	0.013
0.5922	0.653	0.116	0.000	0.013
0.6067	0.653	0.119	0.000	0.013
0.6211	0.653	0.121	0.000	0.013
0.6356	0.653	0.124	0.000	0.013
0.6500	0.653	0.127	0.000	0.013
0.6644	0.653	0.130	0.000	0.013
0.6789	0.653	0.133	0.000	0.013
0.6933	0.653	0.136	0.000	0.013
0.7078	0.653	0.138	0.000	0.013
0.7222	0.653	0.141	0.000	0.013
0.7367	0.653	0.144	0.000	0.013
0.7511	0.653	0.147	0.000	0.013
0.7656	0.653	0.150	0.000	0.013
0.7800	0.653	0.153	0.000	0.013
0.7944	0.653	0.155	0.000	0.013
0.8089	0.653	0.158	0.000	0.013
0.8233	0.653	0.161	0.000	0.013
0.8378	0.653	0.164	0.000	0.013
0.8522	0.653	0.167	0.000	0.013
0.8667	0.653	0.170	0.000	0.013
0.8811	0.653	0.172	0.000	0.013
0.8956	0.653	0.175	0.000	0.013
0.9100	0.653	0.178	0.000	0.013
0.9244	0.653	0.181	0.000	0.013
0.9389	0.653	0.184	0.000	0.013
0.9533	0.653	0.187	0.000	0.013
0.9678	0.653	0.189	0.000	0.013
0.9822	0.653	0.192	0.000	0.013
0.9967	0.653	0.195	0.000	0.013
1.0111	0.653	0.204	0.031	0.013
1.0256	0.653	0.214	0.108	0.013
1.0400	0.653	0.223	0.213	0.013
1.0544	0.653	0.233	0.338	0.013
1.0689	0.653	0.242	0.481	0.013
1.0833	0.653	0.252	0.640	0.013
1.0978	0.653	0.261	0.814	0.013
1.1122	0.653	0.271	1.001	0.013
1.1267	0.653	0.280	1.201	0.013
1.1411	0.653	0.290	1.412	0.013
1.1556	0.653	0.299	1.634	0.013
1.1700	0.653	0.308	1.867	0.013
1.1844	0.653	0.318	2.110	0.013
1.1989	0.653	0.327	2.362	0.013
1.2133	0.653	0.337	2.625	0.013
1.2278	0.653	0.346	2.896	0.013
1.2422	0.653	0.356	3.175	0.013
1.2567	0.653	0.365	3.464	0.013

1.2711	0.653	0.375	3.760	0.013
1.2856	0.653	0.384	4.065	0.013

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.96
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.56
Total Impervious Area: 1.393811

Flow Frequency Method: Cunnane

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.350522
5 year	0.638737
10 year	0.862279
25 year	1.125158

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.12522
5 year	0.221292
10 year	0.282664
25 year	0.376428

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0537	491	421	85	Pass
0.0653	415	280	67	Pass
0.0770	356	193	54	Pass
0.0887	318	135	42	Pass
0.1004	291	106	36	Pass
0.1121	260	76	29	Pass
0.1238	240	66	27	Pass
0.1355	217	44	20	Pass
0.1472	196	39	19	Pass
0.1589	178	36	20	Pass
0.1706	160	26	16	Pass
0.1823	145	23	15	Pass
0.1939	135	20	14	Pass
0.2056	128	16	12	Pass
0.2173	120	13	10	Pass
0.2290	110	8	7	Pass
0.2407	104	7	6	Pass
0.2524	97	6	6	Pass
0.2641	88	6	6	Pass
0.2758	76	5	6	Pass
0.2875	73	5	6	Pass
0.2992	68	4	5	Pass
0.3109	64	4	6	Pass
0.3225	62	2	3	Pass
0.3342	60	1	1	Pass
0.3459	54	1	1	Pass
0.3576	50	1	2	Pass
0.3693	44	1	2	Pass
0.3810	41	1	2	Pass
0.3927	39	1	2	Pass
0.4044	36	1	2	Pass
0.4161	33	1	3	Pass
0.4278	31	1	3	Pass
0.4395	29	1	3	Pass
0.4511	28	1	3	Pass
0.4628	26	1	3	Pass
0.4745	25	1	4	Pass
0.4862	24	1	4	Pass
0.4979	22	1	4	Pass
0.5096	22	1	4	Pass
0.5213	19	1	5	Pass
0.5330	19	1	5	Pass
0.5447	19	1	5	Pass
0.5564	19	1	5	Pass
0.5681	18	1	5	Pass
0.5797	18	0	0	Pass
0.5914	16	0	0	Pass
0.6031	16	0	0	Pass
0.6148	15	0	0	Pass
0.6265	15	0	0	Pass
0.6382	12	0	0	Pass
0.6499	9	0	0	Pass
0.6616	8	0	0	Pass

0.6733	8	0	0	Pass
0.6850	7	0	0	Pass
0.6967	7	0	0	Pass
0.7083	6	0	0	Pass
0.7200	6	0	0	Pass
0.7317	6	0	0	Pass
0.7434	6	0	0	Pass
0.7551	6	0	0	Pass
0.7668	6	0	0	Pass
0.7785	6	0	0	Pass
0.7902	6	0	0	Pass
0.8019	6	0	0	Pass
0.8136	6	0	0	Pass
0.8253	6	0	0	Pass
0.8369	6	0	0	Pass
0.8486	5	0	0	Pass
0.8603	5	0	0	Pass
0.8720	5	0	0	Pass
0.8837	5	0	0	Pass
0.8954	5	0	0	Pass
0.9071	5	0	0	Pass
0.9188	4	0	0	Pass
0.9305	4	0	0	Pass
0.9422	3	0	0	Pass
0.9539	3	0	0	Pass
0.9655	2	0	0	Pass
0.9772	2	0	0	Pass
0.9889	1	0	0	Pass
1.0006	1	0	0	Pass
1.0123	1	0	0	Pass
1.0240	1	0	0	Pass
1.0357	1	0	0	Pass
1.0474	1	0	0	Pass
1.0591	1	0	0	Pass
1.0708	1	0	0	Pass
1.0825	1	0	0	Pass
1.0941	1	0	0	Pass
1.1058	1	0	0	Pass
1.1175	1	0	0	Pass
1.1292	1	0	0	Pass
1.1409	1	0	0	Pass
1.1526	1	0	0	Pass
1.1643	1	0	0	Pass
1.1760	1	0	0	Pass
1.1877	1	0	0	Pass
1.1994	1	0	0	Pass
1.2111	1	0	0	Pass

Water Quality

Drawdown Time Results

Pond:

Days	Stage(feet)	Percent of Total Run Time
1	1.861	2.8378
2	0.000	N/A
3	0.000	N/A
4	0.000	N/A
5	0.000	N/A

Maximum Stage: 2.000 Drawdown Time: 01 02:03:60

Pond: Surface

Days	Stage(feet)	Percent of Total Run Time
1	N/A	N/A
2	N/A	N/A
3	N/A	N/A
4	N/A	N/A
5	N/A	N/A

Maximum Stage: 1.830 Drawdown Time: Less than 1 day

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

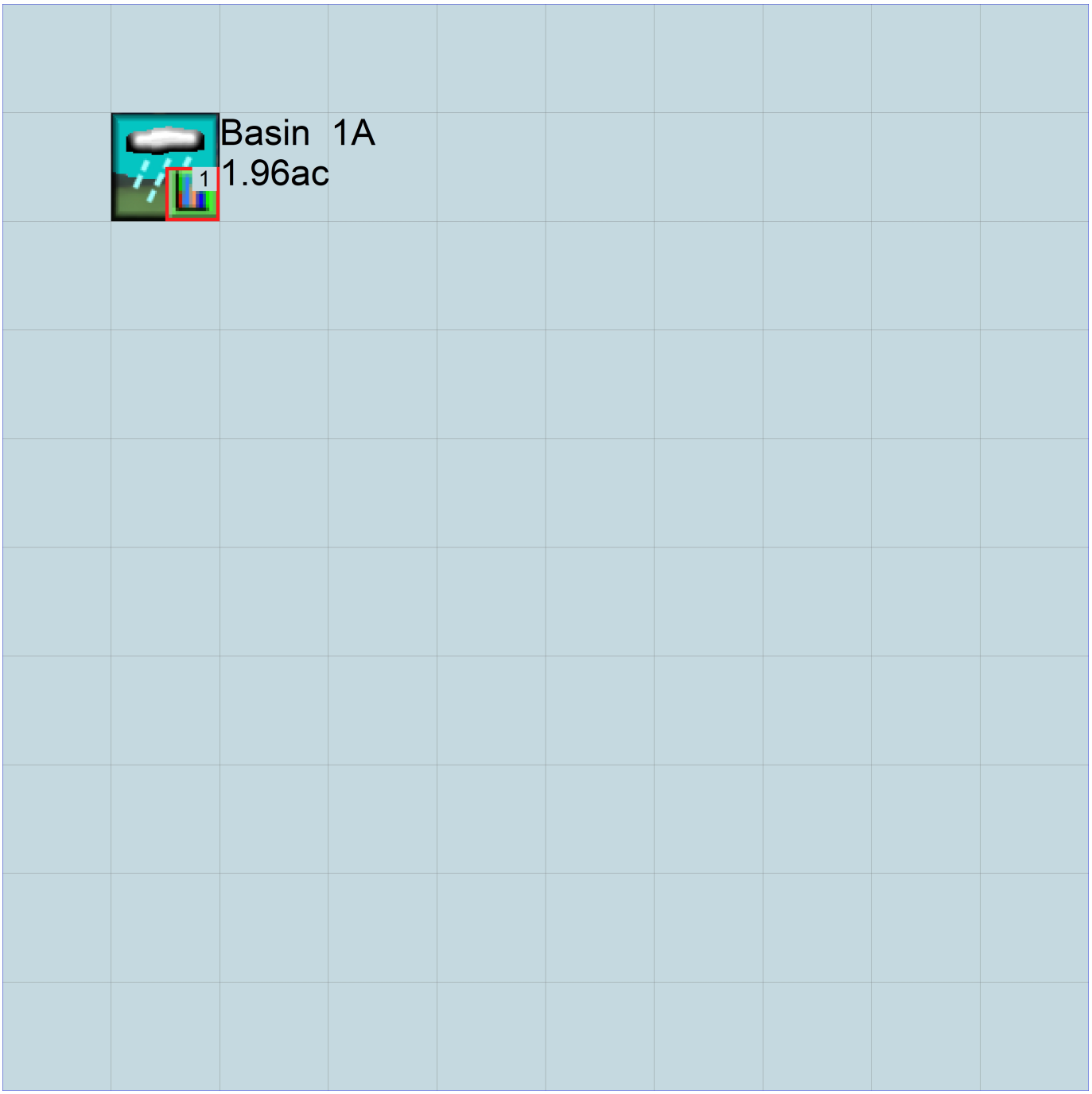
PERLND Changes

No PERLND changes have been made.

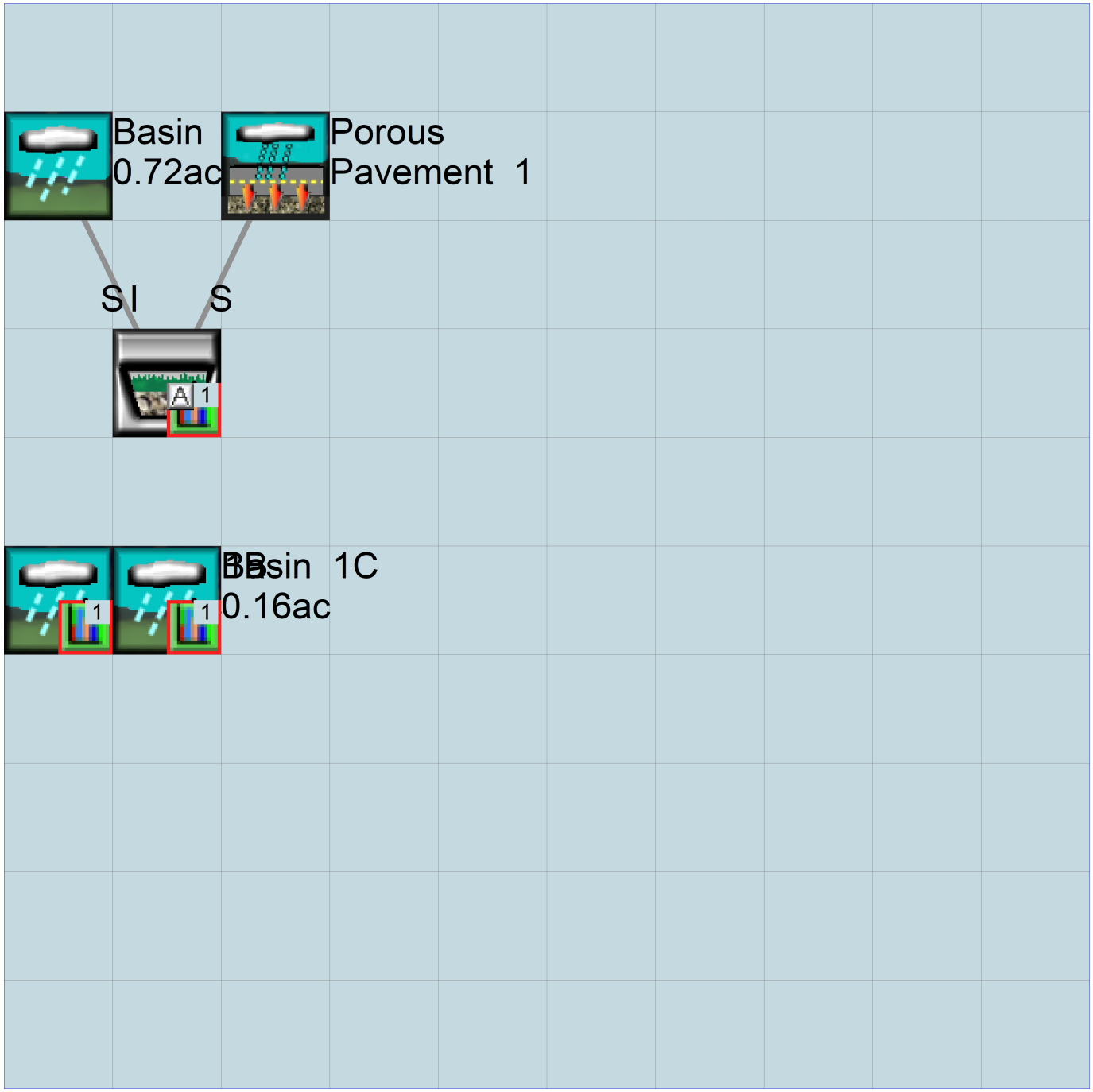
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



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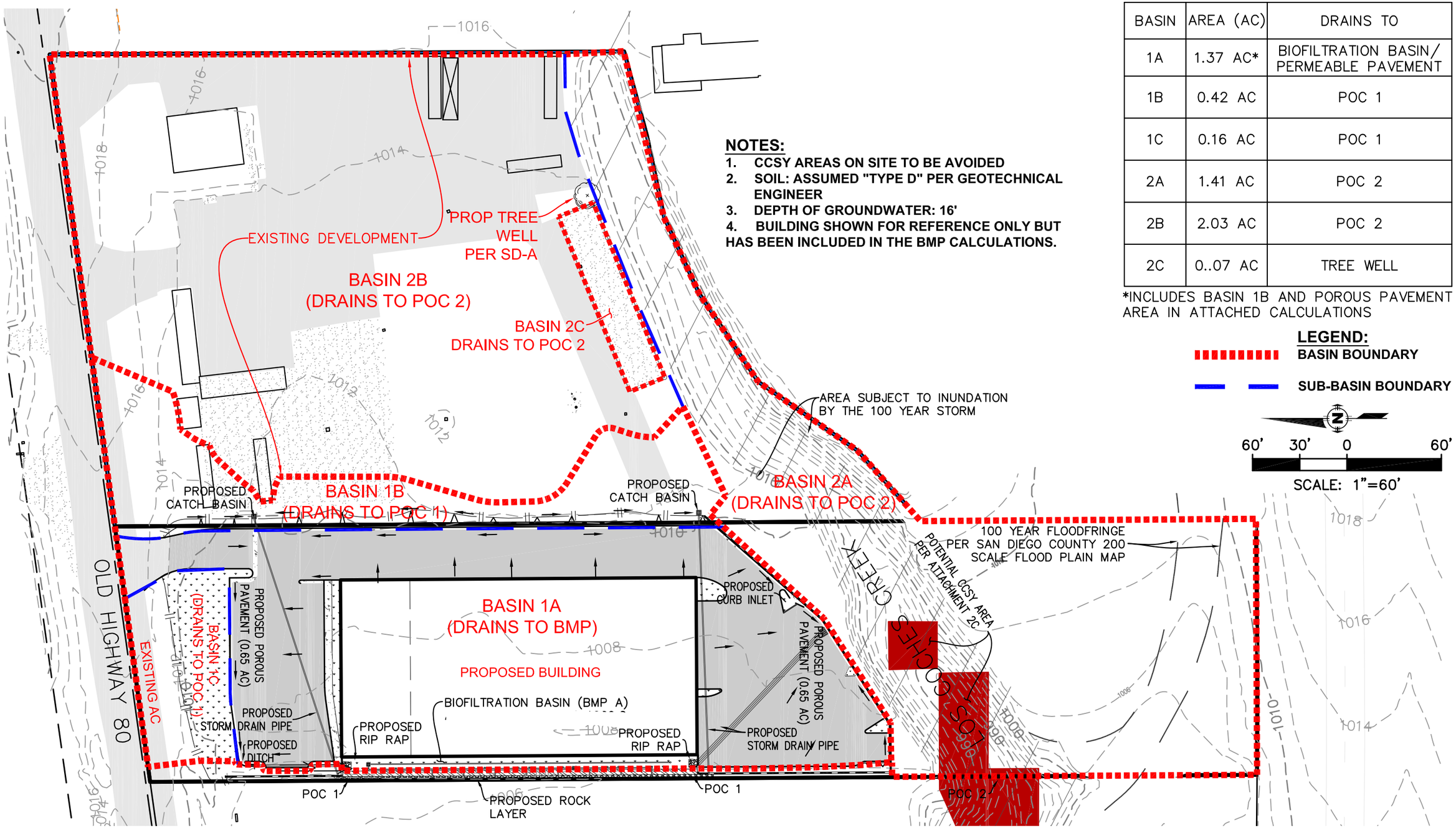
Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

☒ Underlying hydrologic soil group
☒ Approximate depth to groundwater
☒ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
☒ Critical coarse sediment yield areas to be protected
☒ Existing topography
☒ Existing and proposed site drainage network and connections to drainage offsite
☒ Proposed grading
☒ Proposed impervious features
☒ Proposed design features and surface treatments used to minimize imperviousness
☒ Point(s) of Compliance (POC) for Hydromodification Management
☒ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
☒ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

HYDROMODIFICATION EXHIBIT

15229 & 15247 OLDE HIGHWAY 80, EL CAJON CA 92021



NOTES:

1. CCSY AREAS ON SITE TO BE AVOIDED
2. SOIL: ASSUMED "TYPE D" PER GEOTECHNICAL ENGINEER
3. DEPTH OF GROUNDWATER: 16'
4. BUILDING SHOWN FOR REFERENCE ONLY BUT HAS BEEN INCLUDED IN THE BMP CALCULATIONS.

BASIN	AREA (AC)	DRAINS TO
1A	1.37 AC*	BIOFILTRATION BASIN/ PERMEABLE PAVEMENT
1B	0.42 AC	POC 1
1C	0.16 AC	POC 1
2A	1.41 AC	POC 2
2B	2.03 AC	POC 2
2C	0..07 AC	TREE WELL

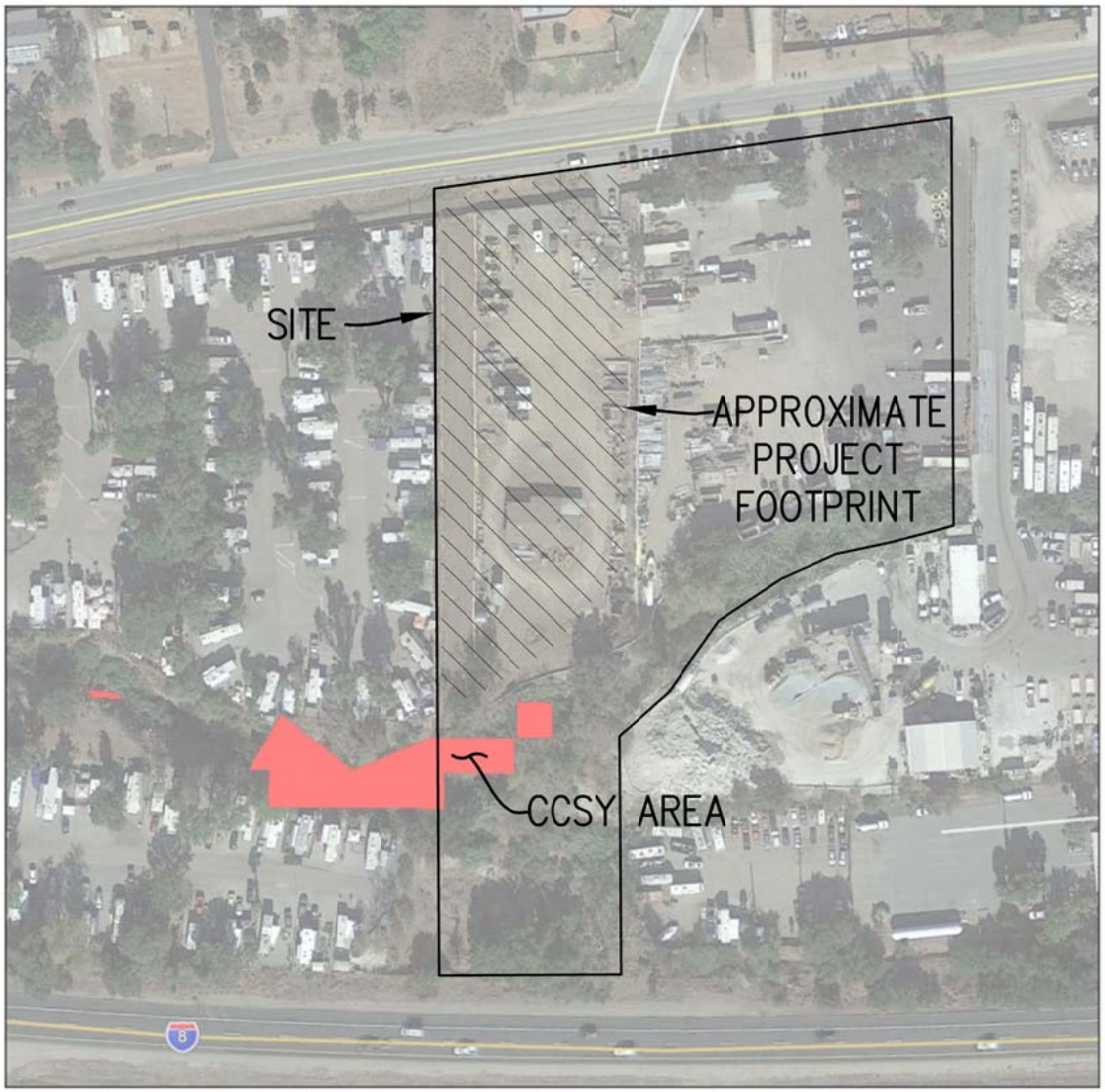
*INCLUDES BASIN 1B AND POROUS PAVEMENT AREA IN ATTACHED CALCULATIONS

LEGEND:

BASIN BOUNDARY

SUB-BASIN BOUNDARY

CRITICAL COARSE SEDIMENT YIELD MAP



POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREA

(SOURCE: 2015 SAN DIEGO RIVER WATERSHED MANAGEMENT AREA ANALYSIS)

ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☒ Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	☒ Included ☐ Not Applicable

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Attachment 3a must identify:

- ☒ Specific maintenance indicators and actions for proposed structural BMP(s). This must be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☒ How to access the structural BMP(s) to inspect and perform maintenance
- ☒ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☒ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☒ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☒ Recommended equipment to perform maintenance
- ☒ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the County's standard format depending on the Category (PDP applicant to contact County staff to obtain the current maintenance agreement forms). Refer to Section 7.3 in the BMP Design Manual for a description of the different categories.

6.0 General Requirements

- Use this attachment to document all proposed (1) self-mitigating, (2) de minimis, and (3) self-retaining DMAs. Indicate under "DMA Compliance Option" below which design options will be used to satisfy structural performance requirements for one or more DMA.

DMA Compliance Option	Required Sub-attachments or Printouts	BMPDM Design Resources
☒ **Self-mitigating**	• Sub-attachment 6.1	• BMPDM Section 5.2.1
☐ **De minimis**	• Sub-attachment 6.2	• BMPDM Section 5.2.2
☒ **Self-retaining**[1]	• Sub-attachment 6.3	• BMPDM Section 5.2.3 (all options)
SSD-BMP Type(s)		
☐ **Impervious Area Dispersion**	• DCV calculations from SSD-BMP tool • Dispersion Areas calculations from SSD-BMP tool	• Fact Sheet SD-B (Appendix E.8) • Appendix I
☒ **Tree Wells**	• DCV calculations from SSD-BMP tool • Tree Well calculations from SSD-BMP tool	• Fact Sheet SD-A (Appendix E.7) • Appendix I

- Submit this cover page and all "Required Sub-attachments or Printouts" listed for each selected DMA compliance option.
- See the BMPDM sections and appendices listed under "BMPDM Design Resources" for additional explanation of design requirements. Each constructed feature must fully satisfy the requirements described in these resources, and any other guidance identified by the County.
- DMA Exhibits and Construction Plans: DMAs, features, and BMPs identified and described in this attachment must be shown on DMA Exhibits and all applicable construction plans submitted for the project. See Attachment 2 for additional instruction on exhibits and plans.

[1] If "Self-retaining" is selected, also choose the types of Significant Site Design BMPs (SSD-BMPs) to be used. SSD-BMPs are Site Design BMPs that are sized and constructed to fully satisfy all applicable Structural Performance Standards for a DMA.

6.1 Self-mitigating DMAs (complete this page once for ALL self-mitigating DMAs)

Self-mitigating DMAs consist of natural or landscaped areas that drain directly offsite or to the public storm drain system. These DMAs are excluded from DCV calculations.

- Provide the information requested below for each proposed self-mitigating DMA. Add rows or copy the table if additional entries are needed.

DMA #	***a. DMA Area (ft^2)***	***Incidental Impervious Area***		***Permit # and Sheet #***
		b. Size(ft^2)	***c. % (b/a*100)***	
C	7,288			PGP
D	61,470			PGP

- "DMA #", "DMA Area", and "Permit # and Sheet #" are required for all DMAs listed.
- "Incidental Impervious Area" calculations are required only where applicable (see below).
- Each self-mitigating DMA must <u>fully</u> satisfy all design requirements and restrictions described in BMPDM Section 5.2.1 and any other guidance or instruction identified by the County. Check the boxes below to confirm that all required conditions are satisfied <u>for every DMA listed</u>.

☐ Each DMA is hydraulically separate from other DMAs that contain permanent storm water pollutant control BMPs.

<u>Natural and Landscaped Areas</u>

☐ Each DMA consists solely of natural or landscaped areas, except for incidental impervious areas (see below).

☐ Each area drains directly offsite or to the public storm drain system.

☐ Soils are undisturbed native topsoil, or disturbed soils that have been amended and aerated to promote water retention characteristics equivalent to undisturbed native topsoil.

☐ Vegetation is native and/or non-native/non-invasive drought tolerant species that do not require regular application of fertilizers and pesticides.

<u>Incidental Impervious Areas (if applicable; see above)</u>

Minor impervious areas may be permitted within the DMA if they satisfy the following criteria:

☐ They are not hydraulically connected to other impervious areas (unless it is a storm water conveyance system such as a brow ditch).

☐ They comprise less than 5% of the total DMA. Calculate the % incidental impervious area in the table above (c= b/a). DMAs are <u>not</u> self-mitigating if this area is 5% or greater.

6.2 De Minimis DMAs (complete this page once for ALL de minimis DMAs)

De minimis DMAs consist of areas too small to be considered significant contributors of pollutants and not practicable to drain to a BMP. They are excluded from DCV calculations. Examples include driveway aprons connecting to existing streets, portions of sidewalks, retaining walls, and similar features at the external boundaries of a project.

- Provide the information requested below for each proposed de minimis DMA. Add rows or copy the table if additional entries are needed.

DMA #	***DMA Area (ft^2)***	***Permit # and Sheet #***

- "DMA #", "DMA Area", and "Permit # and Sheet #" are required.
- Check the boxes below to confirm that each required condition is satisfied for ALL de minimis DMAs on the site.

  ☐ Each DMA listed is less than 250 square feet and not adjacent or hydraulically connected to each other.

  ☐ Each DMA listed <u>fully</u> satisfies all design requirements and restrictions described in BMPDM Section 5.2.2 De Minimis DMAs.

6.3 Self-retaining DMAs using Significant Site Design BMPs

Self-retaining DMAs use Site Design BMPs to fully-retain the entire DCV, at a minimum. Site Design BMPs that fully retain the DCV, at a minimum, therefore replacing the need for a Structural BMP (S-BMP), are classified as Significant Site Design BMPs (SSD-BMPs). To satisfy pollutant control requirements only, self-retaining means retention of the entire DCV. However, under some circumstances, a self-retaining DMA can also satisfy hydromodification management requirements by implementing BMPs that retain a greater volume of runoff.

- Provide the information requested below for each proposed self-retaining DMA. Add rows or copy the table if additional entries are needed.

DMA #	DMA Area (ft^2)	**BMP Type** (choose one per DMA)		*Permit # and Sheet #*
		Dispersion Area (Att. 6.3.1)	**Tree Wells (Att. 6.3.2)**	
F	2,880	☐	☒	PGP
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

Copy and Paste table here for additional DMAs

- "DMA #", "DMA Area", and "Permit # and Sheet #" are required.
- Select one BMP Type per DMA. Provide detailed documentation for each DMA in Attachments 6.3.1 (Impervious Dispersion Areas) and/or 6.3.2 (Tree Wells) below.
- Each self-retaining DMA must <u>fully</u> satisfy all design requirements and restrictions described in BMPDM Section 5.2.3, applicable BMPDM Appendix E Fact Sheets, BMPDM Appendix I, and any other guidance or instruction identified by the County.

6.3.1 Self-retaining DMAs with Impervious Dispersion Areas

Impervious area dispersion (dispersion) refers to the practice of effectively disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops (through downspout disconnection), walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges and reduce volumes. Dispersion with partial or full infiltration results in significant volume reduction by means of infiltration and evapotranspiration. When adequately sized, dispersion can also be used to satisfy both the pollutant control and hydromodification management structural performance standards for a DMA.

- Each self-retaining DMA with impervious area dispersion must fully satisfy all design requirements and restrictions described in BMPDM Section 5.2.3, Fact Sheet SD-B: Impervious Area Dispersion, and any other guidance or instruction identified by the County.
- Documentation of compliance with all applicable conditions must be submitted with this sub-attachment using the ***Summary Sheet for DMAs with Impervious Area Dispersion*** on the next page. One version of this Summary Sheet must be completed for each applicable DMA.
- Applicants are responsible to comply with all other applicable requirements, regardless of whether they are included in the summary sheet.
- The following applies if the dispersion area is **native soil** (SD-B in Appendix E):
    - For pollutant control only, the DMA is considered self-retaining if the impervious to pervious ratio is:
        - 2:1 when the pervious area is composed of Hydrologic Soil Group A
        - 1:1 when the pervious area is composed of Hydrologic Soil Group B
- The following applies if the dispersion area includes **amended soil** (SD-B in Appendix E):
    - DMAs using impervious area dispersion can be considered to meet both pollutant control and hydromodification flow control requirements if the impervious to pervious area ratio is 1:1 or less and all other design requirements of SD-B are satisfied, including 11 inches of amended soil.

SSD-BMP Automated Worksheet I-1: Step 1. Calculation of Design Capture Volume (V1.0)				
Category	**#**	**Description**	***i***	**Units**
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	F	unitless
	2	85th Percentile 24-hr Storm Depth	0.60	inches
	3	Is Hydromodification Control Applicable?	No	yes/no
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	2,880	sq-ft
	5	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)		sq-ft
	6	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)		sq-ft
	7	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)		sq-ft
	8	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)		sq-ft
	9	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)		sq-ft
	10	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)		sq-ft
SSD-BMPs Proposed	11	Does Tributary Incorporate Dispersion and/or Rain Barrels?	No	yes/no
	12	Does Tributary Incorporate Tree Wells?	Yes	yes/no
Dispersion Area & Rain Barrel Inputs (Optional)	13	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)		sq-ft
	14	Semi-Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.30)		sq-ft
	15	Engineered Pervious Surfaces **Serving as Dispersion Area** per SD-B (Ci=0.10)		sq-ft
	16	Natural Type A Soil **Serving as Dispersion Area** per SD-B (Ci=0.10)		sq-ft
	17	Natural Type B Soil **Serving as Dispersion Area** per SD-B (Ci=0.14)		sq-ft
	18	Natural Type C Soil **Serving as Dispersion Area** per SD-B (Ci=0.23)		sq-ft
	19	Natural Type D Soil **Serving as Dispersion Area** per SD-B (Ci=0.30)		sq-ft
	20	Number of Rain Barrels Proposed per SD-E		#
	21	Average Rain Barrel Size		gal
Initial Runoff Factor Calculation	22	Total Tributary Area	2,880	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.90	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	unitless
	25	Initial Weighted Runoff Factor	0.90	unitless
	26	Initial Design Capture Volume	130	cubic-feet
Dispersion Area Adjustment & Rain Barrel Adjustment	27	Total Impervious Area Dispersed to Pervious Surface	0	sq-ft
	28	Total Pervious Dispersion Area	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area for DCV Reduction	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.90	unitless
	32	Design Capture Volume After Dispersion Techniques	130	cubic-feet
	33	Total Rain Barrel Volume Reduction	0	cubic-feet
Results	34	Final Adjusted Runoff Factor	0.90	unitless
	35	Final Effective Tributary Area	2,592	sq-ft
	36	Initial Design Capture Volume Retained by Dispersion Area and Rain Barrel(s)	0	cubic-feet
	37	Remaining Design Capture Volume Tributary to Tree Well(s)	130	cubic-feet

No Warning Messages

6.3.2 Self-retaining DMAs with Tree Wells

Trees wells can provide a variety of benefits such as interception and increased infiltration of rainfall, reduced erosion, energy conservation, air quality improvement, and aesthetic enhancement. They can also be used to satisfy both pollutant control and hydromodification management performance standards for a DMA.

- Each self-retaining DMA with tree wells must fully satisfy all design requirements and restrictions described in BMPDM Section 5.2.3, Fact Sheet SD-A: Tree Wells, and any other guidance or instruction identified by the County.
- For pollutant control only, the DMA must retain the entire DCV. For hydromodification management, an additional volume must be retained in accordance with the sizing requirements presented in the DCV multiplier table in Fact Sheet SD-A.
- Documentation of compliance with applicable conditions must be submitted using the ***Summary Sheet for Self-retaining DMAs with Tree Wells*** on the next page. One version of this Summary Sheet must be completed for each applicable DMA.
- If both pollutant control and hydromodification standards apply, the soil depth of all tree wells in the DMA must be selected before determining the Required Retention Volume (RRV). Each tree well must be constructed to the selected depth. For pollutant control only, tree wells within a DMA may be constructed to different soil depths.
- In most cases tree wells must use Amended Soil per Fact Sheet SD-F. However, Structural Soil is required in some cases (e.g., placing the tree well next to a curb). See ***Structural Requirements for Confined Tree Well Soil Volume*** in Fact Sheet SD-A for additional explanation. If applicable, list the DMAs and Tree Well #s below for all tree wells requiring Structural Soil.

DMA #	**Tree Wells Requiring Structural Soil (list Tree Well #s)**
F	1

- The Design Capture Volume (DCV) must be known for each DMA in order to determine the volume to be mitigated by the tree wells. Instructions for DCV calculation are provided in BMPDM Appendix I.1. An automated version of Worksheet I.1 (Calculation of Design Capture Volume) is available at www.sandiegocounty.gov/stormwater under the Development Resources tab.

SSD-BMP Automated Worksheet I-3: Step 3. Tree Well Sizing (V1.0)

Category	#	Description	*i*	Units
Standard Tree Well Inputs	1	Drainage Basin ID or Name	F	unitless
	2	Design Capture Volume Tributary to BMP	130	cubic-feet
	3	Is Hydromodification Control Applicable?	No	yes/no
	4	Predominant NRCS Soil Type Within Tree Well(s) Location		unitless
	5	Select a Tree Species for the Tree Well(s) Consistent with SD-A Tree Palette Table Note: Numbers shown in list are Tree Species Mature Canopy Diameters	20' - Strawberry Tree	unitless
	6	Tree Well(s) Soil Depth (Installation Depth) Must be 30, 36, 42, or 48 Inches; Select from Standard Depths**	36	inches
	7	Number of Identical* Tree Wells Proposed for this DMA	1	trees
	8	Proposed Width of Tree Well(s) Soil Installation for One (1) Tree	14.0	feet
	9	Proposed Length of Tree Well(s) Soil Installation for One (1) Tree	15.0	feet
Tree Data	10	Botanical Name of Tree Species	Arbutus Unedo	unitless
	11	Tree Species Mature Height per SD-A	30	feet
	12	Tree Species Mature Canopy Diameter per SD-A	20	feet
	13	Minimum Soil Volume Required In Tree Well (2 Cubic Feet Per Square Foot of Mature Tree Canopy Projection Area)	628	cubic-feet
	14	Credit Volume Per Tree	180	cubic-feet
Tree Well Sizing Calculations	15	DCV Multiplier To Meet Flow Control Requirements	n/a	unitless
	16	Required Retention Volume (RRV) To Meet Flow Control Requirements	n/a	cubic-feet
	17	Number of Trees Required	1	trees
	18	Total Area of Tree Well Soil Required for Each Tree	209	sq-ft
	19	Approximate Required Width of Tree Well Soil Area for Each Tree	15	feet
	20	Approximate Required Length of Tree Well Soil Area for Each Tree	15	feet
	21	Number of Trees Proposed for this DMA	1	trees
	22	Total Area of Tree Well Soil Proposed for Each Tree	210	sq-ft
	23	Minimum Spacing Between Multiple Trees To Meet Soil Area Requirements (when applicable)***	n/a	feet
Results	24	Are Tree Well Soil Installation Requirements Met?	Yes	yes/no
	25	Is Remaining DCV Requirement Fully Satisfied by Tree Well(s)?	Yes	yes/no
	26	Is Hydromodification Control Requirement Satisfied by Tree Well(s)?	n/a	yes/no

No Warning Messages

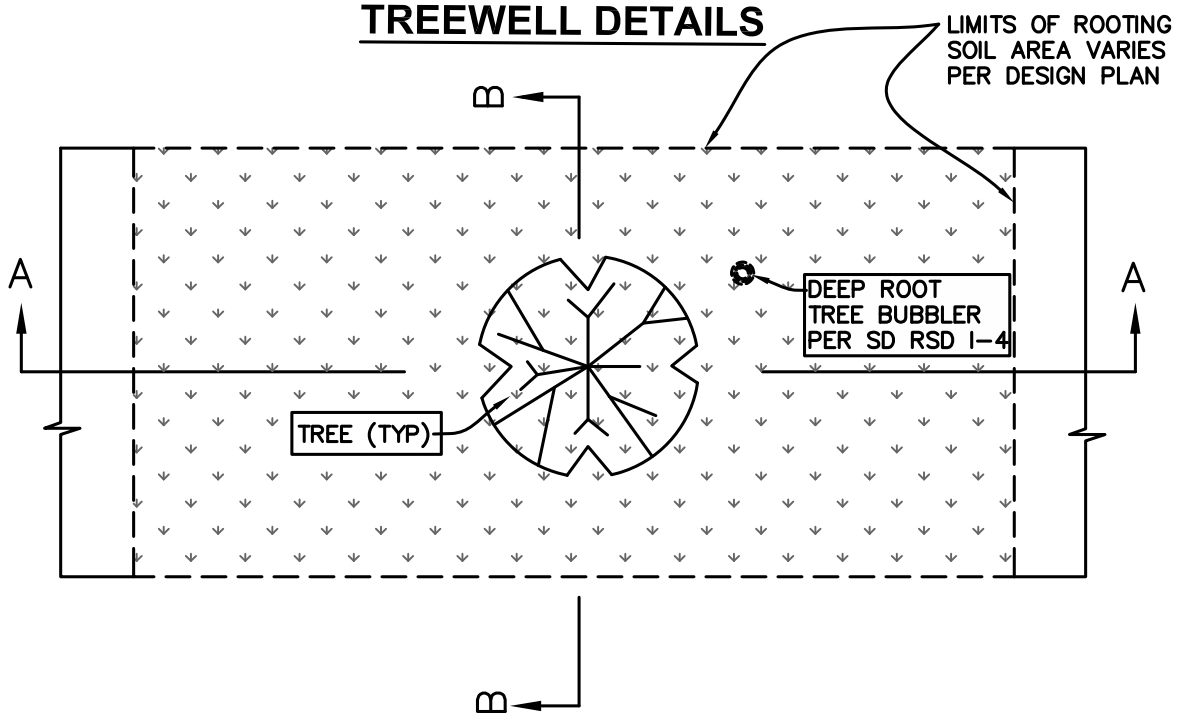
Notes:

*If using more than one mature canopy diameter within the same DMA, only the smallest mature canopy diameter should be entered. Alternatively, if more than one ma

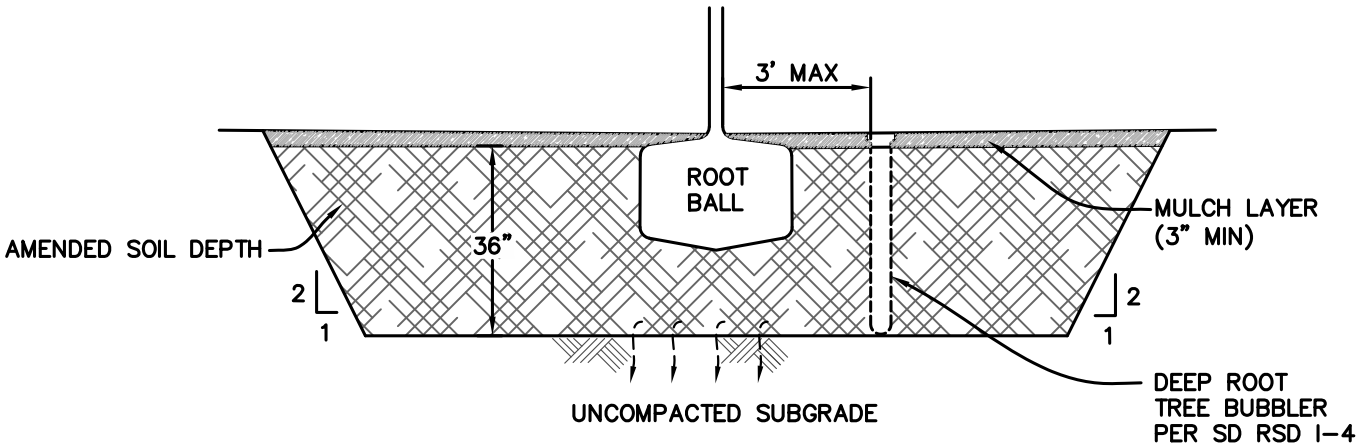
**If the actual proposed installation depth is not available in the table of standard depths, select the next lower depth.

***Tree Canopy or Agency Requirements May Also Influence the Minimum Spacing of Trees.

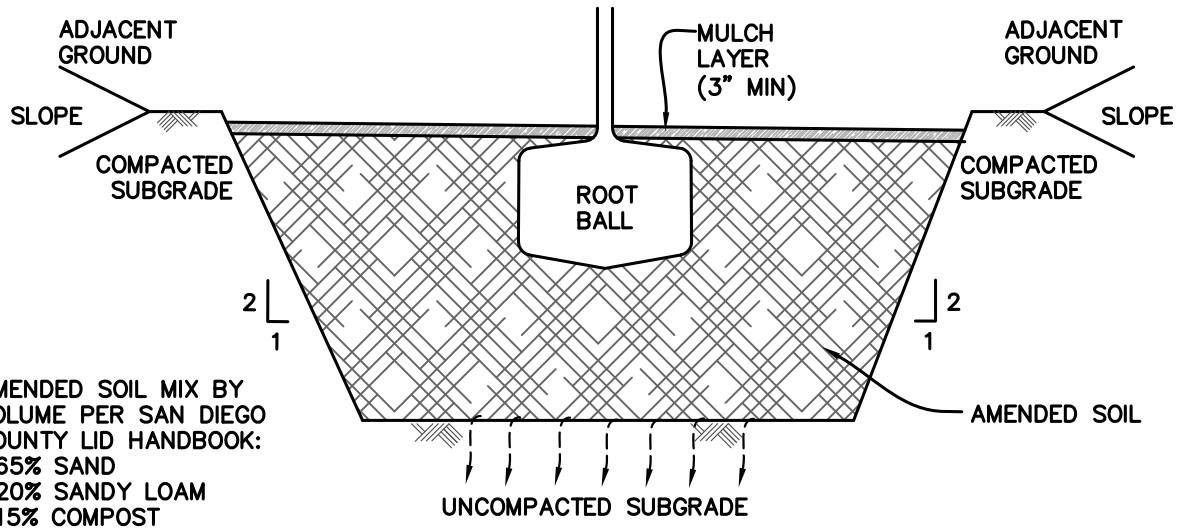
TREEWELL DETAILS



PLAN VIEW



SECTION A-A



AMENDED SOIL MIX BY VOLUME PER SAN DIEGO COUNTY LID HANDBOOK:
- 65% SAND
- 20% SANDY LOAM
- 15% COMPOST

PERCOLATION RATE 5-10 IN/HR MIN SUSTAINED

SECTION B-B

11.0 Cover Sheet and General Requirements

- All Structural BMPs must have a plan and mechanism to ensure on-going maintenance. Use the table below to document the types of agreements to be submitted for the PDP and submit them under cover of this sheet.
- See BMPDM Section 7.3 for a description of maintenance categories and responsibilities. Note that since Category 3 and 4 BMPs are County-maintained, they do not require maintenance agreements.

a. Applicability of Maintenance Agreements

Check the boxes below to indicate which types of agreements are included with this attachment.

☐ Maintenance Notification (Category 1 BMPs)

- Exhibit A: Project Site Vicinity; Project Site Map; and a map for each BMP and its Drainage Management Area
- Exhibit B: BMP Maintenance Plan (see below)

☒ Stormwater Maintenance Agreement (Category 2 BMPs)

- Exhibit A: Legal Description of Property
- Exhibit B: BMP Maintenance Plan (see below)
- Exhibit C: Project Site Vicinity Map

Maintenance agreement templates and instructions are provided on the County's website:

www.sandiegocounty.gov/stormwater under the Development Resources tab.

PDP applicants contact County staff to ensure they have the most current forms.

b. Maintenance Plan Requirements

Use this checklist to confirm that each maintenance plan includes the following that as applicable.

☒ Specific **maintenance indicators and actions** for proposed structural BMP(s). These must be based on based on maintenance indicators presented in BMP Design Fact Sheets in Appendix E and enhanced to reflect actual proposed components of the structural BMP(s).

☒ **Access** to inspect and perform maintenance on the structural BMP(s).

☒ Features to **facilitate inspection** (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds).

☒ Manufacturer and part number for **proprietary parts** of structural BMP(s) when applicable.

☒ **Maintenance thresholds** specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP).

☒ Recommended **equipment** to perform maintenance.

☐ When applicable, necessary special **training or certification** requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management.

LEGAL DESCRIPTION

The land referred to herein is situated in the State of California, County of San Diego Unincorporated and described as follows:

PARCEL A:

ALL THAT PORTION OF LOT 51 OF THE SUBDIVISION OF THE “S" TRACT OF THE RANCHO EL CAJON, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE MAP THEREOF IN BOOK 170, PAGE 71 OF DEEDS, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THAT IS NORTH 82°30'00" EAST 319.93 FEET FROM A POINT THAT IS NORTH 42.90 FEET FROM THE NORTHEAST CORNER OF THE FLINN TRACT, BEING A POINT IN THE CENTER OF COUNTY ROAD FROM EL CAJON TO VALLEY DE LAS VIEJAS, BEING ALSO THE NORTHEASTERLY CORNER OF LAND DESCRIBED IN DEED TO JACK RINK RECORDED APRIL 18, 1967 AS FILE NO. 53429 OF OFFICIAL RECORDS; THENCE ALONG THE EASTERLY LINE OF SAID LAND THE SOUTHERLY PROLONGATION THEREOF SOUTH 706.58 FEET TO THE NORTHERLY LINE OF CALIFORNIA STATE HIGHWAY XI-SD-12-C AS DESCRIBED IN DEED TO THE STATE OF CALIFORNIA RECORDED APRIL 2, 1964 AS FILE NO. 59335 OF OFFICIAL RECORDS; THENCE EASTERLY ALONG SAID NORTHERLY LINE OF A DISTANCE OF 162.42 FEET; THENCE NORTH 728.62 FEET TO THE CENTER LINE OF SAID COUNTY ROAD; THENCE WESTERLY ALONG SAID CENTER LINE TO THE POINT OF BEGINNING.

PARCEL A-1:

AN EASEMENT FOR VEHICULAR INGRESS AND EGRESS THROUGH THE COUNTY CREEK RV RESORT AS DESCRIBED AND SHOWN BY A EASEMENT RECORDED JULY 5, 2007 AS FILE NO. 2007-0449584 OF OFFICIAL RECORDS.

PARCEL B;

PARCEL 1 OF PARCEL MAP 2836, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 11, 1974 AS FILE NO. 74-186266 OF OFFICIAL RECORDS.

BF-1
Biofiltration

BMP MAINTENANCE FACT SHEET
FOR
STRUCTURAL BMP BF-1 BIOFILTRATION

Biofiltration facilities are vegetated surface water systems that filter water through vegetation, and soil or engineered media prior to discharge via underdrain or overflow to the downstream conveyance system. Biofiltration facilities have limited or no infiltration. They are typically designed to provide enough hydraulic head to move flows through the underdrain connection to the storm drain system. Typical biofiltration components include:

- Inflow distribution mechanisms (e.g., perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Shallow surface ponding for captured flows
- Side slope and basin bottom vegetation selected based on climate and ponding depth
- Non-floating mulch layer
- Media layer (planting mix or engineered media) capable of supporting vegetation growth
- Filter course layer consisting of aggregate to prevent the migration of fines into uncompacted native soils or the aggregate storage layer
- Aggregate storage layer with underdrain(s)
- Impermeable liner or uncompacted native soils at the bottom of the facility
- Overflow structure

Normal Expected Maintenance

Biofiltration requires routine maintenance to: remove accumulated materials such as sediment, trash or debris; maintain vegetation health; maintain infiltration capacity of the media layer; replenish mulch; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

Non-Standard Maintenance or BMP Failure

If any of the following scenarios are observed, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required.

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.
- Sediment, trash, or debris accumulation greater than 25% of the surface ponding volume within one month. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require pretreatment measures within the tributary area draining to the BMP to intercept the materials. Pretreatment components, especially for sediment, will extend the life of components that are more expensive to replace such as media, filter course, and aggregate layers.
- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

Other Special Considerations

Biofiltration is a vegetated structural BMP. Vegetated structural BMPs that are constructed in the vicinity of, or connected to, an existing jurisdictional water or wetland could inadvertently result in creation of expanded waters or wetlands. As such, vegetated structural BMPs have the potential to come under the jurisdiction of the United States Army Corps of Engineers, SDRWQCB, California Department of Fish and Wildlife, or the United States Fish and Wildlife Service. This could result in the need for specific resource agency permits and costly mitigation to perform maintenance of the structural BMP. Along with proper placement of a structural BMP, **routine maintenance is key to preventing this scenario**.

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Biofiltration

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR BF-1 BIOFILTRATION		
The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district. Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.		
Threshold/Indicator	**Maintenance Action**	**Typical Maintenance Frequency**
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation or compaction of the media layer.	• Inspect monthly. If the BMP is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Obstructed inlet or outlet structure	Clear blockage.	• Inspect monthly and after every 0.5-inch or larger storm event. • Remove any accumulated materials found at each inspection.
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable	• Inspect annually. • Maintenance when needed.
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintenance when needed.
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	• Inspect monthly. • Maintenance when needed.
Overgrown vegetation	Mow or trim as appropriate.	• Inspect monthly. • Maintenance when needed.
2/3 of mulch has decomposed, or mulch has been removed	Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches.	• Inspect monthly. • Replenish mulch annually, or more frequently when needed based on inspection.

*"25% full" is defined as ¼ of the depth from the design bottom elevation to the crest of the outflow structure (e.g., if the height to the outflow opening is 12 inches from the bottom elevation, then the materials must be removed when there is 3 inches of accumulation – this should be marked on the outflow structure).

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR BF-1 BIOFILTRATION (Continued from previous page)		
Threshold/Indicator	**Maintenance Action**	**Typical Maintenance Frequency**
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	• Inspect monthly. • Maintenance when needed.
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.	• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintenance when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.
Standing water in BMP for longer than 24 hours following a storm event Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils.	• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintenance when needed.
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology	If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.	• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event. • Maintenance when needed.
Underdrain clogged	Clear blockage.	• Inspect if standing water is observed for longer than 24-96 hours following a storm event. • Maintenance when needed.

References

American Mosquito Control Association.
http://www.mosquito.org/
California Storm Water Quality Association (CASQA). 2003. Municipal BMP Handbook.
https://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook
County of San Diego. 2014. Low Impact Development Handbook.
http://www.sandiegocounty.gov/content/sdc/dpw/watersheds/susmp/lid.html
San Diego County Copermittees. 2016. Model BMP Design Manual, Appendix E, Fact Sheet BF-1.
http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=250&Itemid=220

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BF-1
Biofiltration

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	
Property / Development Name:	Responsible Party Name and Phone Number:	
Property Address of BMP:	Responsible Party Address:	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 1 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Accumulation of sediment, litter, or debris Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Remove and properly dispose of accumulated materials, without damage to the vegetation ☐ If sediment, litter, or debris accumulation exceeds 25% of the surface ponding volume within one month (25% full*), add a forebay or other pre-treatment measures within the tributary area draining to the BMP to intercept the materials. ☐ Other / Comments:		
Poor vegetation establishment Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Re-seed, re-plant, or re-establish vegetation per original plans ☐ Other / Comments:		

*"25% full" is defined as ¼ of the depth from the design bottom elevation to the crest of the outflow structure (e.g., if the height to the outflow opening is 12 inches from the bottom elevation, then the materials must be removed when there is 3 inches of accumulation – this should be marked on the outflow structure).

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 2 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Dead or diseased vegetation Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans ☐ Other / Comments:		
Overgrown vegetation Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Mow or trim as appropriate ☐ Other / Comments:		
2/3 of mulch has decomposed, or mulch has been removed Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches ☐ Other / Comments:		

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 3 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Erosion due to concentrated irrigation flow Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair/re-seed/re-plant eroded areas and adjust the irrigation system ☐ Other / Comments:		
Erosion due to concentrated storm water runoff flow Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan ☐ If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction ☐ Other / Comments:		

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Biofiltration

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 4 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Obstructed inlet or outlet structure Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Clear blockage ☐ Other / Comments:		
Underdrain clogged (inspect underdrain if standing water is observed for longer than 24-96 hours following a storm event) Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Clear blockage ☐ Other / Comments:		
Damage to structural components such as weirs, inlet or outlet structures Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair or replace as applicable ☐ Other / Comments:		

BF-1
Biofiltration

Date:	Inspector:	BMP ID No.:
Permit No.:	APN(s):	

INSPECTION AND MAINTENANCE CHECKLIST FOR BF-1 BIOFILTRATION PAGE 5 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
Standing water in BMP for longer than 24-96 hours following a storm event* Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils ☐ Other / Comments:		
Presence of mosquitos/larvae For images of egg rafts, larva, pupa, and adult mosquitos, see http://www.mosquito.org/biology Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Apply corrective measures to remove standing water in BMP when standing water occurs for longer than 24-96 hours following a storm event.** ☐ Other / Comments:		

*Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the media layer, filter course, aggregate storage layer, underdrain, or outlet structure. The specific cause of the drainage issue must be determined and corrected.

**If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.

ATTACHMENT 4

County of San Diego PDP Structural BMP Verification for Permitted Land Development Projects

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County of San Diego PDP-IVF:

Installation Verification Form for Priority Development Projects (PDPs)

This form must be accepted by the County prior to the release of construction permits or granting of occupancy for applicable portions of a Priority Development Project (PDP). Applicants are responsible for providing all requested information. Do not leave any fields blank; indicate *N/A* for any requested item that is not applicable.

PART 1 General Project and Applicant Information

Table 1: Project and Applicant Information

A. Project Summary Information	**ID No. IVF-20__-____ To be assigned by DPW-WPP**
Project Name	***Ortega Site Plan***
Record ID (e.g., grading/improvement plan number, building permit)	N/A
Project Address	***15229 & 15247 Old Highway 80***
Assessor's Parcel Number(s) APN(s))	396-111-10 & 17
Project Watershed (complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	907.14 San Diego River Watershed, Lower San Diego HA, Coches HSA
B. Owner Information	
Name	***Archie Maurice Ortega, Trustee, Ortega Family Trust***
Address	***10125 Channel Road, Lakeside CA, 92040***
Email Address	***mortega@amortega.com***
Phone Number	***619-719-8710***

Document previously verified BMPs for the PDP in **Table 2**. Include the Verification Form ID No. from **Page 1** if one was issued.

****** DO NOT INCLUDE THIS PAGE UNLESS THIS IS A PARTIAL RECORD PLAN VERIFICATION ******

Table 2: Information on Verifications for Partial Record Plans Only

A: Previous Submittals

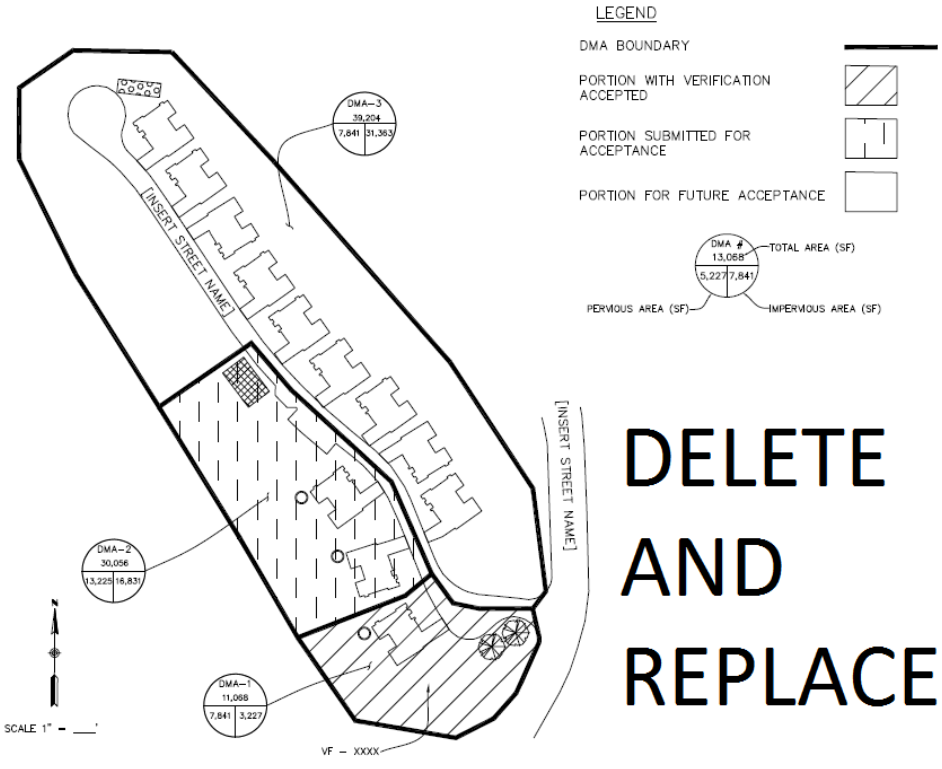
Previous Submittals	Submittal Date	Installation Verification Form ID No. if applicable (e.g., 2016-001)
1	N/A	N/A
2		
3		
4		
5		

Add rows as needed

B: DMA and BMP Map

Please attach a map showing (1) all DMAs for the project site, (2) the DMAs and/or lots accepted under previous Verification Forms, and (3) the locations of Structural BMPs and Significant Site Design BMPs previously accepted OR listed in **Table 3** of this Verification Form.

SAMPLE DMA MAP



PART 2 DMA and BMP Inventory Information

Use this table to document Structural BMPs (S-BMPs) and Significant Site Design BMPs (SSD-BMPs) for the PDP. All DMAs are required to have at least one Structural BMP or Significant Site Design BMP.

- In **Part A**, list all Structural BMPs (including both Pollutant Control and/or Hydromodification as applicable) by DMA.
- Complete **Part B** for all DMAs that contain only Significant Site Design BMPs. SSD-BMPs are Site Design BMPs credited in **Worksheet B-1.1** of the BMP Design Manual for Design Capture Volume (DCV) reductions. Only Tree Wells and Dispersion Areas should be included in this inventory.
- For any DMA that contains both S-BMPs and SD-BMPs, document only the S-BMPs; you do not need to include the SD-BMPs.
- The information provided for each BMP in the table must match that provided in the Stormwater Quality Management Plan (SWQMP), construction plans, maintenance agreements, and other relevant project documentation.

Table 3: Required Information for Structural BMPs and Significant Site Design BMPs

DMA #	BMP Information			Maintenance Category	Maintenance Agreement or Maintenance Notification Recorded Doc. #	Construction Plan Sheet #	Landscape Plan # & Sheet # (For Vegetated BMPs Only)	FOR DPW-WPP USE ONLY *Reviewer concurs that the BMP(s) may be accepted into inventory (date and initial)*
	Quantity	Description/Type of Structural BMP	BMP ID #(s)					
Part A Structural BMPs								
A	1	Biofiltration BF-1	A	CAT II	N/A	TBD	TBD	
Add rows as needed								
Part B Significant Site Design BMPs								
		Choose an item.						
		Choose an item.						
		Choose an item.						
Add rows as needed								

PART 3 Required Attachments for All BMPs Listed in Table 3

For ALL projects, submit the following to the County inspector (check all that are attached):

☐ Photographs: A photograph of each fully constructed S-BMP or SSD-BMP (or group of BMPs).

☐ Maintenance Agreements: Copies of all approved and recorded Storm Water Maintenance Agreements (SWMAs) or Maintenance Notifications (MNs) for all S-BMPs.

Note: All BMPs proposed for County ownership will remain the responsibility of the owner listed on **Page 1** until a signed Letter of Acceptance of Completion is received by the DPW Watershed Protection Program.

For Grading and Improvement projects only, ALSO submit:

☐ Landscape Plans: An 11" X 17" copy of the most current applicable Landscape Plan sheets where the BMPs are required to be vegetated, including:

- ☐ The Certification of Completion (Form 407), AND
- ☐ The Certificate of Approval from PDS Landscape Architect

Note: For each Landscape Plan, the sheets submitted must show the location of each verified as-built BMP.

☐ Construction Plans: An 11" X 17" copy of the most current applicable approved Construction Plan sheets:

- ☐ Grading Plans, AND/OR
- ☐ Improvement Plans, AND/OR
- ☐ Precise Grading Plan(s) (only for residential subdivisions with tract homes), AND/OR
- ☐ Other (Please specify) Click here to enter text.

Note: For each Construction Plan, the sheets submitted must incorporate all of the following:

- ☐ A BMP Table, AND
- ☐ A plan/cross-section of each verified as-built BMP, AND
- ☐ The location of each verified as-built BMP

Required only for Verifications for Partial Record Plans

☐ If this is a partial record plan verification, please include the following:

- ☐ A list of previously submitted Verification Forms (**Table 2, part A**)
- ☐ A map of DMAs and BMPs (**Table 2, part B**)

PART 4 Engineer of Work Certification

By signing below, I certify that the BMP(s) listed in Table 3 of this Verification Form have been constructed and all are in substantial conformance with the approved plans and applicable regulations. I understand the County reserves the right to inspect the above BMPs to verify compliance with the approved plans and Watershed Protection Ordinance (WPO). Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign and provide your seal below.

[SEAL]

Professional Engineer's Printed Name:

____Click here to enter text._____

Email: _Click here to enter text._____

Phone Number: _Click here to enter text._____

Professional Engineer's Signed Name:

_____

Date: _Click here to enter text._____

COUNTY - OFFICIAL USE ONLY:

For County Inspectors

County Department: _____

Date verification received from EOW: _____

By signing below, County Inspector concurs that every noted BMP has been installed per plan.

Inspector Name: _____

Inspector's Signature: _____ Date: _____

For Building Division Only

Inspection Supervisor Name: _____

Inspector Supervisor's Signature: _____ Date: _____

PDCI & Building, along with the rest of this package, please provide to DPW WPP:

☐ A copy of the final accepted SWQMP and any accepted addendum

For Watershed Protection Program Only

Date Received: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the BMPs accepted in **Part 2** above may be entered into inventory.

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

Copy of Plan Sheets Showing Permanent Storm Water BMPs, Source Control, and Site Design

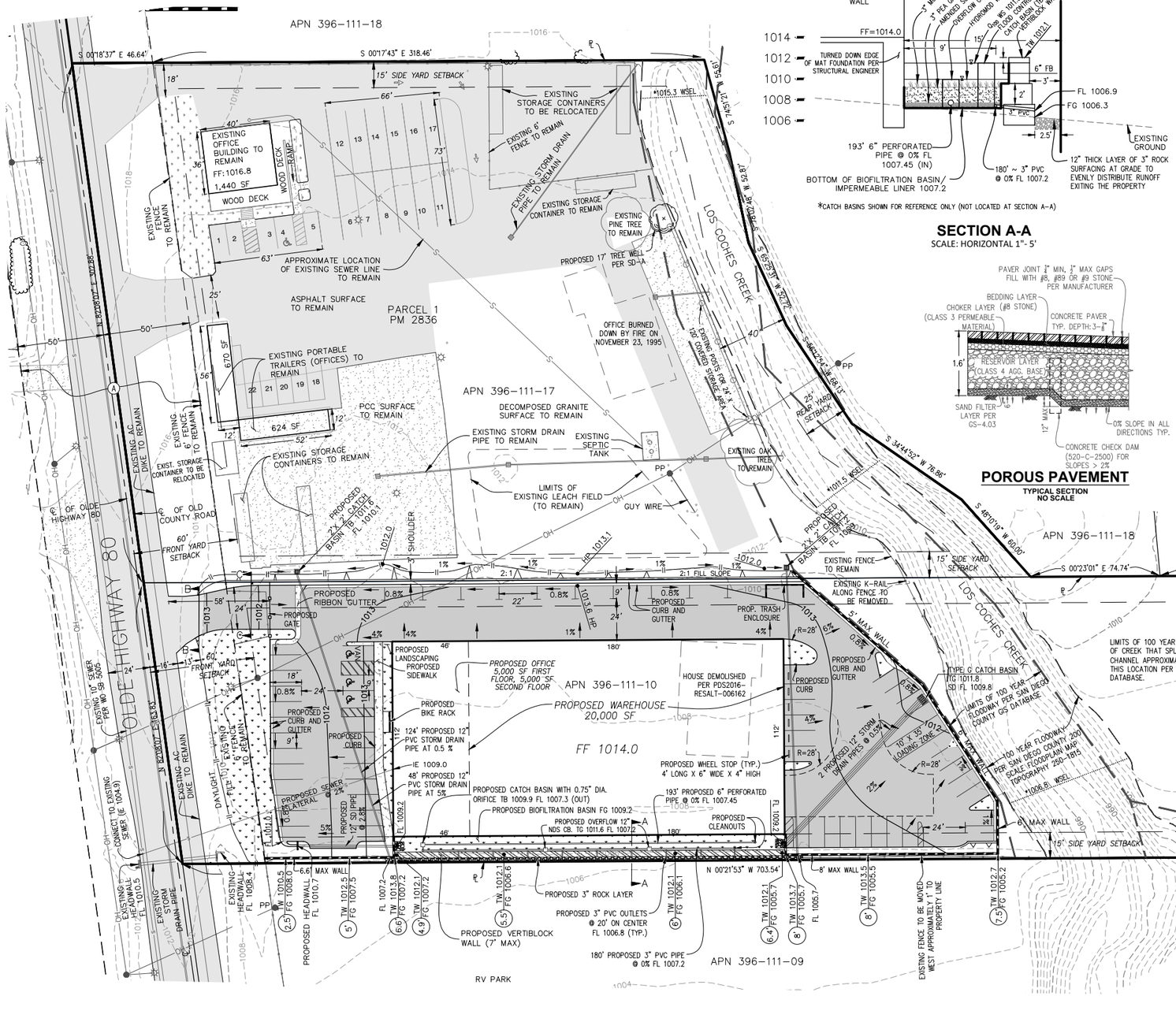
This is the cover sheet for Attachment 5.

Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Step 6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by County staff
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
- ☐ Include all source control and site design measures described in Steps 4 and 5 of the SWQMP. Can be included as a separate exhibit as necessary.

PRELIMINARY GRADING PLAN



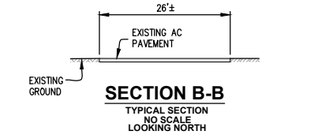
*CATCH BASINS SHOWN FOR REFERENCE ONLY (NOT LOCATED AT SECTION A-A)

SECTION A-A

SCALE: HORIZONTAL 1"= 5'

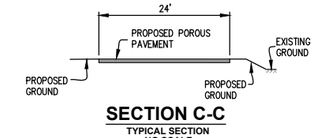
POROUS PAVEMENT

TYPICAL SECTION
NO SCALE



SECTION B-B

TYPICAL SECTION
NO SCALE
LOOKING NORTH



SECTION C-C

TYPICAL SECTION
NO SCALE
LOOKING NORTH

EASEMENT NOTES:

EASEMENTS PLOTTED PER PRELIMINARY REPORT PREPARED BY STEWART TITLE COMPANY AS ORDER NO. 18000480408 DATED 03/20/18.

(A) 100' HIGHWAY EASEMENT PER DOCUMENT RECORDED 01/29/1932 BOOK 85, PAGE 194 OF OFFICIAL RECORDS.

EASEMENT FOR PUBLIC ROAD PURPOSES PER DOCUMENT RECORDED 01/22/1912 IN BOOK 505, PAGE 33 OF DEEDS – NOT PLOTTABLE.

EASEMENT FOR PUBLIC ROAD PURPOSES PER DOCUMENT RECORDED 02/24/1916 IN BOOK 702, PAGE 373 OF DEEDS – NOT PLOTTABLE.

EASEMENT FOR CABLE TELEVISION PURPOSES DOC. NO. 1984-444187 RECORDED 11/28/1984 – NOT PLOTTABLE.

EASEMENT FOR ELECTRICAL SERVICE PURPOSES PER DOC. NO. 2007-0449585 RECORDED 07/05/2007 – NOT PLOTTABLE.

EASEMENT FOR PUBLIC UTILITIES PER DOCUMENT RECORDED 12/12/1929 IN BOOK 1713 PAGE 366 OF DEEDS – NOT PLOTTABLE.

SDG&E EASEMENT FOR PUBLIC UTILITIES PER DOC. NO. 2011-0221395 RECORDED 04/28/2011 – NOT PLOTTABLE.

GRADING:

CUT= 0 C.Y.
FILL= 10,000 C.Y.
IMPORT= 10,000 C.Y.
EXPORT= 0 C.Y.

LEGEND:

- PROPERTY BOUNDARY
- 1010 — EXISTING CONTOUR
- EXISTING PCC
- EXISTING AC PAVEMENT
- PROPOSED POROUS PAVEMENT
- PROPOSED PCC
- EXISTING 6" PVC STORM DRAIN PIPE
- EXISTING 2' BY 2' CATCH BASIN
- EXISTING LIGHT
- PP EXISTING POWER POLE
- PROPOSED STORM DRAIN PIPE
- PROPOSED TYPE G CATCH BASIN PER RSD D-08
- PROPOSED 2' X 2' CATCH BASIN
- PROPOSED ROCK/GRAVEL
- PROPOSED VERTIBLOCK WALL
- PROPOSED RETAINING WALL
- BUILDING SETBACK
- OH EXISTING OVERHEAD LINE

NOTES:

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

* 100 YEAR WSEL (WATER SURFACE ELEVATION) ADJUSTED 2.1' TO CONVERT FROM THE NGVD 29 DATUM USED ON THE COUNTY OF SAN DIEGO FLOODPLAIN MAP 250-1815 TO THIS PLAN'S TOPOGRAPHY WHICH USES THE NAVD 88 DATUM. 100 YEAR FLOODWAY LIMITS ON THIS PLAN CORRESPOND TO THE EXISTING TOPOGRAPHY.

ASSESSOR PARCEL NUMBERS:

396-111-10 & 17

TOPOGRAPHY:

TOPOGRAPHY PROVIDED BY PHOTOGEODETIC, INC.
DATE FLOWN: 02-15-18.

SITE ADDRESS:

15247 AND 15229 OLDE HIGHWAY 80
EL CAJON, CA 92021

BASIS OF ELEVATIONS:

DESCRIPTION: 3" BRASS DISC IN WELL MONUNMENT STAMPED "RCE 19377"

LOCATION: 300 FEET SOUTHERLY OF CUL-DE-SAC ON MARINA SPRINGS LANE.

ELEVATION: 933.5 (NAVD 88)

SOURCE: SAN DIEGO COUNTY VERTICAL CONTROL (ROS 17957)

VICINITY MAP

NO SCALE

OWNER:

ARCHIE MAURICE ORTEGA DATE
TRUSTEE OF THE ORTEGA FAMILY TRUST DATED MARCH 1, 1988
10125 CHANNEL ROAD
LAKESIDE, CA 92040
(619) 719-8710

30' 15' 0 30' 60' 90'

SCALE: 1"= 30'

REGISTERED PROFESSIONAL ENGINEER LAWRENCE W. WALSH 46316 CIVIL STATE OF CALIFORNIA

LAWRENCE W. WALSH DATE
Walsh Engineering & Surveying, Inc.
607 Aldwych Road, El Cajon, CA 92020
(619) 588-6747 (619) 792-1232 Fax

L:\PROJECTS 3D\16921-OLD HIGHWAY 80\PRODUCTION DRAWINGS\DELIVERABLES\PGP.DWG July 22, 2022 – 5:00pm

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ATTACHMENT 6

Copy of Project's Drainage Report

This is the cover sheet for Attachment 6.

If hardcopy or CD is not attached, the following information should be provided:

Title: Ortega Site Plan Drainage Study
Prepared By: Walsh Engineering & Surveying, Inc.
Date: 07/2018

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ATTACHMENT 7

Copy of Project's Geotechnical and Groundwater Investigation Report

This is the cover sheet for Attachment 7.

If hardcopy or CD is not attached, the following information should be provided:

Title:
Prepared By:
Date:

This page was left intentionally blank.

CHRISTIAN WHEELER
ENGINEERING

April 7, 2021

A.M. Ortega
10125 Channel Road
Lakeside, California 92040
Attention: Maurice Ortega

CWE 2180227.02

Subject: **Addendum to Report of Preliminary Geotechnical Investigation**
Proposed Office/Warehouse Building, 15229 Olde Highway 80
San Diego County, California

References:
1) Walsh Engineering & Surveying, Inc., Preliminary Grading Plan, 15247 and 15229 Olde Highway 80, El Cajon, CA 92021, scale 1"=30', print date April 6, 2021.

2) Christian Wheeler Engineering, "Report of Preliminary Geotechnical Investigation, Proposed Office/Warehouse Building, 15229 Olde Highway 80, San Diego County, California", CWE Report 2180227.01, dated May 3, 2019.

3) County of San Diego, First Iteration Review of Initial Studies/Information, Ortega Construction Yard Expansion, Record ID: PDS2018-STP-98-031W1, dated August 21, 2019.

Ladies and Gentlemen:

In accordance with the request of the project civil engineer, we have prepared this addendum to our referenced Report of Preliminary Geotechnical Investigation to address the potential for on-site storm water infiltration within areas of the site proposed to be overlain with porous pavement and to address the location of the proposed biofiltration basin adjacent to the west side of the proposed office/warehouse building. Unless specifically modified herein, all of the findings and recommendations presented in our referenced geotechnical report (CWE 2180227.01) remain applicable.

As part of our services, we have reviewed the referenced County review letter dated August 21, 2019 and have discussed multiple options for site development, foundation design, and storm water management for the proposed project with the project civil engineer. Based on the geotechnical conditions of the site (see CWE 2180227.01), our review of project data, and extensive corroboration with the project civil engineer, the following presents our recommendations and amendments to our referenced report, which address the proposed use of porous pavements and the siting of the proposed biofiltration basin. Where applicable, the specific PDS

Comment numbers from the referenced Country Review Letter, which apply to the following recommendations, are presented.

POUROUS PAVEMENTS

Provided all areas to be underlain by porous pavements are sloped such that they drain away from the proposed office/warehouse structure in accordance with the recommendations contained in our referenced report (see page 10), the use of impermeable liners beneath the porous pavement is not considered necessary and the porous pavement section can be considered suitable to support a partial infiltration condition.
(PDS Comments 4-13 and 4-30)

Maintenance of the proposed porous pavement should be conducted over the lifetime of the pavement section in accordance with the manufacturer's and installer's recommendations. The client should also recognize that even with regular maintenance, the design life of the porous pavement will likely not be that of standard asphaltic concrete and Portland cement concrete paving sections and that, by definition, the porosity of the pavement and intended partial infiltration will affect the pavement subgrade.

BIOFILTRATION BASIN

After correspondence with the project civil engineer, it is our professional opinion and judgment that the currently proposed location of the bio-filtration basin adjacent to the east side of the proposed office/warehouse building is acceptable from a geotechnical perspective provided the following conditions are met and concepts are incorporated into the design of the office/warehouse structure's foundation system and the basin itself:
(PDS Comments 3-6, 4-17, 4-19, and 5-9)

- The proposed biofiltration basin should be designed for a No-Infiltration Condition and as such should include an impermeable liner. If such liner is exposed to the elements, it will need to be monitored and periodically replaced/repaired.
- Surface water should not be allowed to infiltrate into the soils supporting the proposed office/warehouse building nor should it be allowed to seep under or through the building's foundation.
- Discharge from the biofiltration basin should be directed away from the proposed building and outlet at least 10 feet from the building.
- Review of section A-A on the referenced Preliminary Grading Plan indicates that the western perimeter of the building's structural mat foundation that will abut the biofiltration basing will have a turned down edge and serve as a retaining wall to support the proposed structure. Such configuration will need to be designed by a qualified structural engineer. Depending on the final structural design, a concrete cut off

wall may be required below the impermeable liner at the bottom of the basing to prevent discharged waters from migrating under the proposed structure.

Addressing the necessity of interior slopes within the biofiltration basin, the stability of the currently proposed Vertiblock Wall® along the west side of the basin, and site safety associated with the vertical relief of the proposed basin is outside of our scope of expertise and purview.
(PDS Comment 4-19)

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

Daniel B. Adler, RCE #36037

David R. Russell, CEG #2215

DRR:dba
ec: miguel@walsh-engineering.com

CHRISTIAN WHEELER
ENGINEERING

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

PROPOSED OFFICE/WAREHOUSE BUILDING
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

SUBMITTED TO

AM ORTEGA
10125 CHANNEL ROAD
LAKESIDE, CALIFORNIA 92040

PREPARED BY

CHRISTIAN WHEELER ENGINEERING
3980 HOME AVENUE
SAN DIEGO, CALIFORNIA 92105

CHRISTIAN WHEELER
ENGINEERING

May 3, 2019

A.M. Ortega
10125 Channel Road
Lakeside, California 92040
Attention: Maurice Ortega

CWE 2180227.01

Subject: **Report of Preliminary Geotechnical Investigation**
Proposed Office/Warehouse Building, 15229 Olde Highway 80
San Diego County, California

Dear Mr. Ortega:

In accordance with your request and our proposal dated May 1, 2017, we have completed a preliminary geotechnical investigation for the proposed Office/Warehouse structure to be constructed at the subject site. Our findings and recommendations are provided in the attached report.

In general, our findings indicate that, from a geologic and geotechnical perspective, the subject property is suitable for the proposed construction provided the recommendations presented in the attached report are implemented. The main geotechnical condition affecting the subject project is the liquefaction potential of some of the soils underlying the site. This condition will require special foundation consideration as described in the attached report.

If you have any questions after reviewing this report, please do not hesitate to contact our office. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,

CHRISTIAN WHEELER ENGINEERING

Daniel B. Adler, RCE # 36037
DBA:drr
ec: miguel@walsh-engineering.com

REGISTERED PROFESSIONAL ENGINEER
DANIEL B. ADLER
No. 36037
Exp. 6-30-20
CIVIL
STATE OF CALIFORNIA

CERTIFIED ENGINEERING GEOLOGIST
DAVID R. RUSSELL
No. 2215
STATE OF CALIFORNIA

David R. Russell, CEG # 2215

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REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

PROPOSED OFFICE/WAREHOUSE BUILDING
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

INTRODUCTION AND PROJECT DESCRIPTION

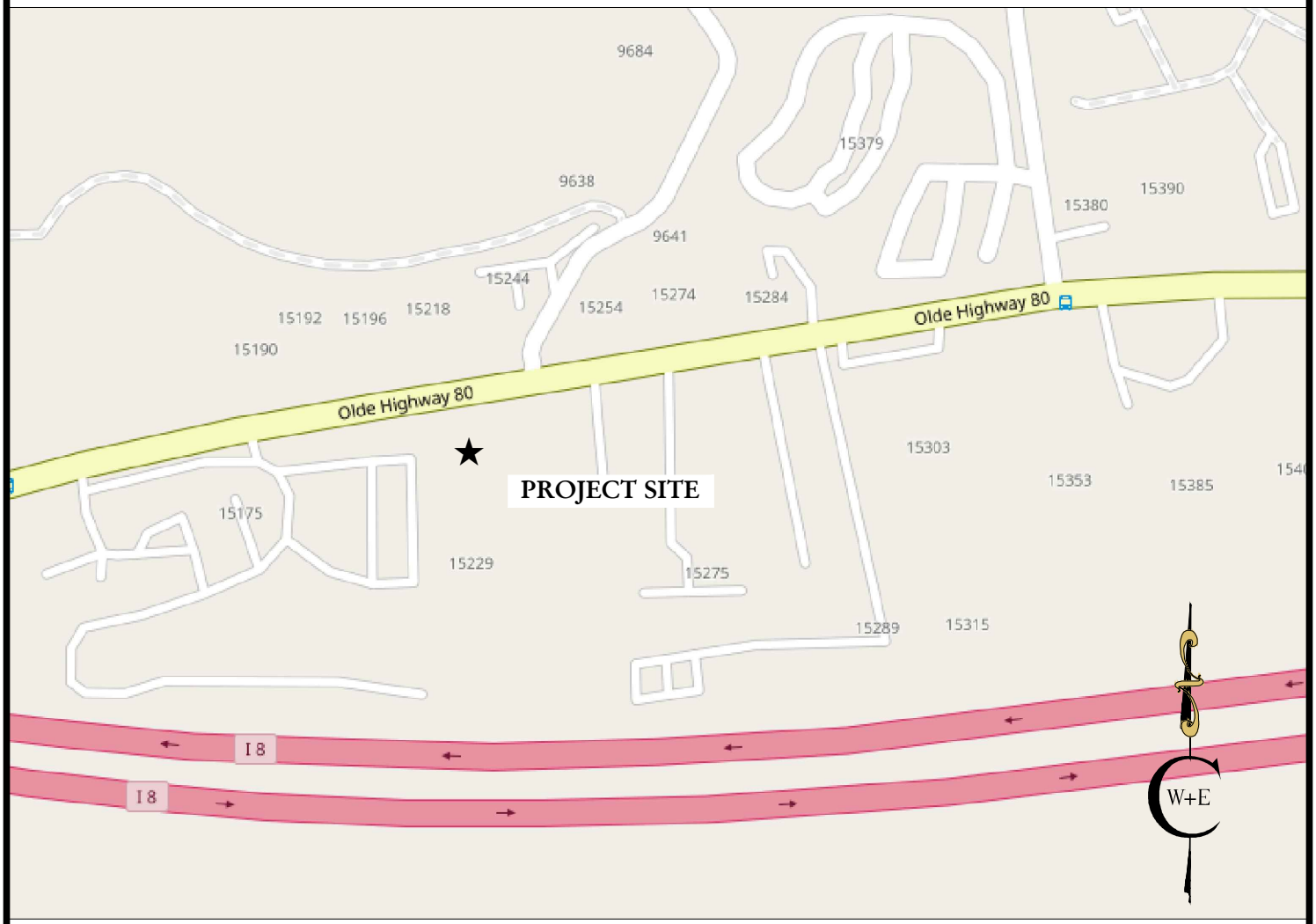
This report presents the results of our geotechnical investigation and infiltration feasibility study for a proposed office/warehouse structure to be constructed at 15229 Olde Highway 80, San Diego County, California. The location of the project site is shown on the following Figure Number 1.

We understand that it is proposed to construct an approximately 25,000 square foot office/warehouse building and new parking and drive areas, as well as a bio-filtration basin within the western portion of the site (APN 396-111-10). Additionally, an approximately 2,880 square foot carport is proposed within the southeast portion of the site (APN 396-111-17), and a 6-foot maximum masonry retaining wall will be constructed south from the proposed building. We anticipate that the proposed office/warehouse structure will be supported by a structural mat foundation and that the associated improvements will be supported by drilled cast-in-place concrete piers. Grading to accommodate the proposed improvements is expected to consist of fills of up to approximately 6 feet from existing grades.

To assist in the preparation of this report, we were provided with a preliminary grading plan, dated February 25, 2019, prepared by Walsh Engineering & Surveying, Inc. A copy of the grading plan was used as a base map for our Site Plan and Geologic Map, and is included herein as Plate No. 1.

This report has been prepared for the exclusive use of A. M. Ortega, and its design consultants for specific application to the project described herein. Should the project be modified, the conclusions and recommendations presented in this report should be reviewed by Christian Wheeler Engineering

SITE VICINITY



A.M. ORTEGA WAREHOUSE
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SRD	FIGURE NO.:	1

CHRISTIAN WHEELER
ENGINEERING

for conformance with our recommendations and to determine if any additional subsurface investigation, laboratory testing and/or recommendations are necessary. Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, express or implied.

PROJECT SCOPE

Our preliminary geotechnical investigation consisted of surface reconnaissance, subsurface exploration, obtaining representative soil samples, laboratory testing, analysis of the field and laboratory data, and review of relevant geologic literature. Our scope of service did not include assessment of hazardous substance contamination, recommendations to prevent floor slab moisture intrusion or the formation of mold within the structure, evaluation or design of storm water infiltration facilities, or any other services not specifically described in the scope of services presented below. Specifically, the intent of our proposed investigation was to:

- Obtain a boring permit from the County of San Diego Department of Environmental Health to conduct the proposed subsurface investigation.
- Drill 3 exploratory borings with a conventional, truck mounted drill rig to explore existing soil conditions and obtain soil samples for laboratory testing.
- Drill 5 exploratory borings with a conventional, truck mounted drill rig to explore existing soil conditions and to facilitate the testing of percolation rates (which were converted to infiltration rates) of the near surface soils in the area of the proposed storm water bio-filtration basin.
- Conduct percolation testing in five locations within the vicinity of the proposed storm water bio-filtration basin.
- Backfill the boring holes using a grout or a grout/bentonite mix as required by the County of San Diego Department of Environmental Health.
- Evaluate, by laboratory tests and our past experience with similar soil types, the engineering properties of the various soil strata that may influence the proposed construction, including bearing capacities, expansive characteristics and settlement potential.

- Describe the general geology at the site, including possible geologic hazards that could have an effect on the proposed construction, and provide the seismic design parameters in accordance with the 2016 edition of the California Building Code.
- Discuss potential construction difficulties that may be encountered due to soil conditions, groundwater or geologic hazards, and provide geotechnical recommendations to mitigate identified construction difficulties.
- Quantitatively address the potential for soil liquefaction and dynamic settlement at the site in the event of a major, proximal seismic event, if required.
- Provide site preparation and grading recommendations for the anticipated work.
- Provide foundation recommendations for the type of construction anticipated and develop soil engineering design criteria for the recommended foundation designs.
- Provide a preliminary geotechnical report presenting the results of our investigation, including a plot plan showing the location of our subsurface explorations, excavation logs, laboratory test results, infiltration feasibility, and our conclusions and recommendations for the proposed project.

Although a test for the presence of soluble sulfates within the soils that may be in contact with reinforced concrete was performed as part of our scope of services, it should be understood Christian Wheeler Engineering does not practice corrosion engineering. If a corrosivity analysis is considered necessary, we recommend that the client retain an engineering firm that specializes in this field to consult with them on this matter. The results of our sulfate testing should only be used as a guideline to determine if additional testing and analysis is necessary.

FINDINGS

SITE DESCRIPTION

The subject site consists of two adjacent lots identified as Assessor's Parcel Numbers 396-111-10 and 396-111-07 that are located along the south side of Olde Highway 80 in the Flinn Springs area of San Diego County, California. The site currently supports a construction yard that includes several single-story buildings and sheds, asphalt and Portland cement concrete drive and parking areas, and equipment and materials storage areas. The site is bounded to the east and southeast by additional

construction yard areas and a batch plant, a recreational vehicle (RV) camping site to the west, Olde Highway 80 to the north, and Interstate 8 to the south. A portion of a former segment of the Los Coches Creek bed flows in a southwesterly direction along the southern portion of the site. No new development or grading is proposed within the former creek bed area. Topographically, the site majority of the site slopes gently to the southwest with elevations ranging from about 1020 feet at the northeastern corner of the property to about 994 feet were the Los Coches Creek exits the western property line. Slopes associated with the creek are about 15 feet high with an approximate 3:1 (horizontal to vertical) inclination.

GENERAL GEOLOGY AND SUBSURFACE CONDITIONS

GEOLOGIC SETTING AND SOIL DESCRIPTION: The project site is located in the Coastal Plains Physiographic Province of San Diego County and is underlain by artificial fill, younger alluvium, older alluvium, and granitic rock. These materials are described below:

ARTIFICIAL FILL (Qaf): Artificial fill was encountered underlying the area of the site investigated site. As encountered in the borings, the fill soils extend to a maximum depth of about 5 feet below existing grade (boring B-2). Deeper fill soils may exist in areas of the site not investigated. The fill material generally consists of brown, dry, loose and medium dense, silty sand (SM). The fill material was judged to possess a very low expansion index (EI < 20).

YOUNGER ALLUVIUM (Qyal): Younger alluvial deposits were encountered underlying the artificial fill. As encountered in boring B-1, these materials extend to depth of about 30 feet below existing grade. In general, these deposits consist of brown, damp to saturated, loose to medium dense and medium dense, silty sand and silty sand with clay (SM). A 1-foot-thick layer of moist to wet, clayey sand (SC) was encountered in boring B-1 at a depth of about 15 feet below existing grade. The younger alluvium was judged to possess a very low expansion index (EI < 20).

OLDER ALLUVIUM (Qoal): Older alluvial deposits were encountered underlying the younger alluvium in boring B-1 at a depth of about 30 feet below existing grade. In general, these deposits consist of tan to brown, saturated, dense to very dense, poorly graded sand with silt (SP-SM). The older alluvium was judged to possess a very low expansion index (EI < 20).

GRANITIC ROCK (Kcm): Early Cretaceous-age granitic materials associated with the Southern California Batholith and which are locally referred to as the Corte Madre Monzogranite were encountered in boring B-1 at a depth of about 40 feet below existing grade. As encountered in the boring, this material consisted of tan to brown, wet, very dense, well graded sand (SW). The granitic rock judged to possess a very low expansion index (EI < 20).

GROUNDWATER: Groundwater was encountered in boring B-1 at a depth of about 16 feet below existing grade. Due to its depth, it is our opinion that groundwater will not affect the proposed improvements after construction. However, groundwater is expected to be encountered during the drilling of deep foundations and it should also be recognized that minor groundwater seepage problems might occur after construction and landscaping are completed, even at a site where none were present before construction. These are usually minor phenomena and are often the result of an alteration in drainage patterns and/or an increase in irrigation water. Based on the anticipated construction and the permeability of the on-site soils, it is our opinion that any seepage problems that may occur will be minor in extent. It is further our opinion that these problems can be most effectively corrected on an individual basis if and when they occur.

TECTONIC SETTING: No active or potentially active faults are known to traverse the subject site. However, it should be noted that much of Southern California, including the San Diego County area, is characterized by a series of Quaternary-age fault zones that consist of several individual, en echelon faults that generally strike in a northerly to northwesterly direction. Some of these fault zones (and the individual faults within the zone) are classified as "active" according to the criteria of the California Division of Mines and Geology. Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years). The Division of Mines and Geology used the term "potentially active" on Earthquake Fault Zone maps until 1988 to refer to all Quaternary-age (last 1.6 million years) faults for the purpose of evaluation for possible zonation in accordance with the Alquist-Priolo Earthquake Fault Zoning Act and identified all Quaternary-age faults as "potentially active" except for certain faults that were presumed to be inactive based on direct geologic evidence of inactivity during all of Holocene time or longer. Some faults considered to be "potentially active" would be considered to be "active" but lack specific criteria used by the State Geologist, such as *sufficiently active* and *well-defined*. Faults older than Quaternary-age are not specifically defined in Special Publication 42, Fault Rupture Hazard Zones in California, published by

the California Division of Mines and Geology. However, it is generally accepted that faults showing no movement during the Quaternary period may be considered to be "inactive".

The active Rose Canyon Fault Zone is located approximately 21 miles west of the subject site. Other active fault zones in the region that could possibly affect the site include the Coronado Bank and San Clemente Fault Zones to the west, the Newport-Inglewood and Palos Verdes Fault Zones to the northwest, and the Elsinore, Earthquake Valley, San Jacinto, and San Andreas Fault Zones to the northeast.

GEOLOGIC HAZARDS

GENERAL: The site is located within an area that possesses a low to moderate potential for soil liquefaction due to such factors as shallow groundwater, and the presence of loose to medium dense, cohesionless sediments. As such, a liquefaction analysis has been performed to address the potential for liquefaction at the site. A discussion of the results of our analysis of the liquefaction potential at the site is presented below in the "Liquefaction" section of this report.

It is our professional opinion that the site should be safe from geologic hazards at the conclusion of construction, provided the recommendations contained herein are implemented and sound construction practices are followed.

LIQUEFACTION: The subject site is in an area considered susceptible to liquefaction. In order to be subject to liquefaction, three general conditions must be present: loose, sandy and silty deposits of a specified plasticity; shallow groundwater; and earthquake shaking of sufficient magnitude and duration. Based on our site-specific study, it appears that shallow groundwater is present at the site and strong earthquake shaking may affect the site. Additionally, as described in the "Geologic Setting and Soil Description" section of this report above, the materials below the water table contain poorly graded sands (SP) which are expected to possess consistencies and plasticities conducive to liquefaction. As such, we have evaluated the potential for liquefaction at the site.

It should be noted that our analysis is in no way a guarantee that the analyses will accurately predict the liquefaction potential at the site. The analysis provides general information only on the site

liquefaction potential. It should again be noted that many of the parameters used in liquefaction evaluations are subjective and open to interpretation, and that much is yet unknown about both the seismicity of the San Diego County area and the phenomenon of liquefaction. The site preparation and foundation recommendations contained in this report are intended to address this situation and provide a life-safety performance level for the proposed structures. Our recommendations do not, however, preclude the possibility of structural damage and settlement of the proposed improvements occurring, even to the extent that it they become uninhabitable, as a result of a major seismic event, regardless of the mitigation measures taken.

EARTHQUAKE PARAMETERS: Our analysis, which was performed in accordance with the procedure recommended by the National Center for Earthquake Engineering Research (NCEER, 1997) and Youd et. al. (2001), incorporates the geotechnical data obtained from the ground surface to a depth where non-liquefiable material was encountered within the older alluvium and underlying granitic materials (Boring B-1). As permitted in Section 1803.5.12 of the California Building Code, our calculations were performed using a peak ground acceleration (PGA_M = 0.40g) as determined using the procedures set forth in Section 11.8.3 of ASCE 7-10. An earthquake magnitude of 6.9 was used in our liquefaction analysis.

POTENTIAL FOR LIQUEFACTION: The results of our analysis indicate that portions of the uppermost 14 feet of soil mass beneath the water table (taken at 16 feet below existing site grades) at the subject site have the potential to liquefy as a result of the code-based peak ground acceleration. The average calculated factors-of-safety against soil liquefaction ranged from approximately 1.02 to 0.75, which is less than the minimum FOS of 1.3 and are therefore considered liquefiable. A printout of the results of our analyses is presented in Appendix E of this report.

LIQUEFACTION INDUCED SETTLEMENTS: The estimated liquefaction-induced settlements of the site in its present condition are presented in Appendix E. Our analysis of the data obtained from boring B-1 indicates that the site has a potential for up to approximately 1.9 inches of seismically-induced, total settlement as the result of soil liquefaction caused by the design seismic event.

In terms of differential settlement, CGS Special Publication 117 notes that considerable difficulty exists in trying to “reliably estimate” the amount of differential settlement at a site caused by soil

liquefaction. As such, a conservative estimate of differential settlement at any given site can be assumed to be two-thirds of the total liquefaction-induced settlement (CGS, 2008). Using this criterion, without any deep ground modification procedures, the subject project area may be assumed to be subject to approximately 1.3 inches of liquefaction-induced, differential settlement.

LATERAL GROUND SPREADING: Another concern is the possible lateral ground spreading that could occur at the site. Lateral ground spreading can occur when viscous liquefied soils flow downslope, usually towards a river channel or shoreline. The project area is located in close proximity to Los Coches Creek and thus may be subject to a few feet of lateral displacement in the event of a major, proximal seismic event. The recommendation contained herein to found the proposed habitable improvement (the office/warehouse building) on a structural mat foundation was provided to mitigate the life safety hazard as a result of this condition.

SURFACE RUPTURE: No active or potentially active faults are known to underlie the subject site. As such, the site is not considered subject to surface rupture.

SLOPE STABILITY: Based on our findings, the gently sloping topography of the subject site and sidewalls of the small creek bed along the southern side of the site, and the proposed construction, it is our opinion that the likelihood of slope stability related problems at the site is very low.

EXPANSIVE SOILS: The majority of the near surface soils at the site are expected to possess a very low expansive potential.

FLOODING: As delineated on the referenced Flood Insurance Rate Map (FIRM), panel 06073C1680G prepared by the Federal Emergency Management Agency, the portions of the site to be developed are within an Area of Minimal Flood Hazard.

CONCLUSIONS

In general, it is our opinion that, from a geologic and geotechnical perspective, the subject property is suitable to receive the proposed office/warehouse structure and associated improvements provided the recommendations presented herein are implemented. The main geotechnical considerations for site

development are, potentially compressible fill soils, the liquefaction potential of some of the soils underlying the site below the water table, and site preparation limitations at the southern portion of the property. These conditions are discussed hereinafter.

The portion of the site investigated was found to be underlain by potentially compressible artificial fill extending to a maximum depth of about 5 feet below existing grade (boring B-1). Deeper fill soils may exist in areas of the site not investigated. These materials are considered unsuitable, in their present condition for the support of settlement sensitive improvements and will require removal and replacement as compacted fill.

Potentially liquefiable soils underlie the site. This condition will require special site preparation and foundation consideration as described hereinafter. Good engineering practice requires that where liquefaction is likely, the hazards that might reasonably be caused by liquefaction that could result in the collapse of a structure and/or loss of life be mitigated. The client should realize that the foundation recommendations presented herein are intended to provide this level of life safety. These recommendations, however, will not necessarily prevent the building from sustaining structural damage, even to the extent that it may become uninhabitable in the event of a major, proximal earthquake. To fully mitigate the liquefaction potential at the site would require supporting the structure on pile foundations or altering the existing soils such that they are resistant to liquefaction through the use of extensive deep ground modification techniques.

It is our understanding that no site preparation or grading may be performed south of the 100-year flood boundary shown on the preliminary grading plans (see Plate No. 1). A site retaining wall up to 6 feet high is proposed adjacent to that boundary. In addition, a proposed covered storage area will be located across this boundary. Both of these improvements will be located at the top of a descending slope. The proposed location of these improvements in conjunction with site preparation limitations will require special foundation consideration in the form of drilled, cast-in-place concrete piers.

RECOMMENDATIONS

GRADING AND EARTHWORK

GENERAL: All grading should conform to the guidelines presented in the current edition of the California Building Code, the minimum requirements of the County of San Diego, and the recommended Grading Specifications and Special Provisions attached hereto, except where specifically superseded in the text of this report.

PREGRADE MEETING: It is recommended that a pregrade meeting including the grading contractor and a representative from Christian Wheeler Engineering be held, to discuss the recommendations of this report and address any issues that may affect grading operations.

OBSERVATION OF GRADING: Continuous observation by the Geotechnical Consultant is essential during the grading operation to confirm conditions anticipated by our investigation, to allow adjustments in design criteria to reflect actual field conditions exposed, and to determine that the grading proceeds in general accordance with the recommendations contained herein.

CLEARING AND GRUBBING: Site preparation should begin with the removal of any existing improvements designated for demolition, any vegetation, and other deleterious materials. These removals should include all foundations, floor slabs, utilities, and all significant root material. The resulting materials should be disposed of in an appropriate off-site facility.

SITE PREPARATION: It is recommended that existing artificial fill underlying proposed structure and associated improvements be removed in its entirety. Based on our findings, it is anticipated that maximum fill soil depth will be about 5 feet from existing grade (boring B-2). However, deeper removals may be necessary due to unforeseen conditions. In addition, younger alluvium within 6 feet from existing or proposed grade, whichever is more should also be removed. Younger alluvium removal is not required for areas of the site to receive hardscape or pavements. Lateral removals should extend at least 5 feet beyond the perimeter of the proposed structure and associated improvements. No removals are recommended beyond property lines or the 100-year flood boundary. The bottom of all excavations should be approved by our project geologist, engineer, or technician supervisor prior to

placing fills or constructing improvements. The excavated materials can be replaced as properly compacted fill in accordance with the recommendations presented in the "Compaction and Method of Filling" section of this report. Due to the characteristics of the site such as sandy soils, proximity of existing structures, and shallow groundwater, it is recommended that small, non-vibratory compaction equipment be used.

PROCESSING OF FILL AREAS: Prior to placing any new fill soils or constructing any new improvements in areas that have been cleaned out to receive fill and approved by the geotechnical consultant or his representative, the exposed soils should be scarified to a depth of 12 inches, watered thoroughly, and compacted to at least 90 percent relative compaction.

IMPORTED FILL: Imported soil should consist of silty sands or silty sands with clay with a low expansion potential (EI < 50). Imported soil should be approved by this office prior to delivery to the site. At least 72 hours should be allowed for import soil evaluation.

COMPACTION AND METHOD OF FILLING: All structural fill placed at the site should be compacted to a relative compaction of at least 90 percent of maximum dry density as determined by ASTM Laboratory Test D1557. Fills should be placed at or slightly above optimum moisture content, in lifts six to eight inches thick, with each lift compacted by mechanical means. Fills should consist of approved earth material, free of trash or debris, roots, vegetation, or other materials determined to be unsuitable by our soil technicians or project geologist. Fill material should be free of rocks or lumps of soil in excess of six inches in maximum dimension. Based on our subsurface observations and laboratory testing, we anticipate the removed topsoil will be suitable for use as structural fill. All utility trenches should be compacted to a minimum of 90 percent of its maximum dry density.

SURFACE DRAINAGE: The drainage around the proposed improvements should be designed to collect and direct surface water away from proposed improvements and the top of slopes toward appropriate drainage facilities. Rain gutters with downspouts that discharge runoff away from the structure into controlled drainage devices are recommended.

The ground around the proposed improvements should be graded so that surface water flows rapidly away from the improvements without ponding. In general, we recommend that the ground adjacent to

structure slope away at a gradient of at least 5 percent for a minimum distance of 10 feet. If the minimum distance of 10 feet cannot be achieved, an alternative method of drainage runoff away from the building at the termination of the 5 percent slope will need to be used. Swales and impervious surfaces that are located within 10 feet of the building should have a minimum slope of 2 percent. It is essential that new and existing drainage patterns be coordinated to produce proper drainage. Pervious hardscape surfaces adjacent to structures should be similarly graded.

Drainage patterns provided at the time of construction should be maintained throughout the life of the proposed improvements. Site irrigation should be limited to the minimum necessary to sustain landscape growth. Over watering should be avoided. Should excessive irrigation, impaired drainage, or unusually high rainfall occur, zones of wet or saturated soil may develop.

FOUNDATIONS

GENERAL: Based on our findings and engineering judgment, the proposed structure may be supported by a structural mat foundation. Concrete cast-in-place concrete piers may be used for the support of the proposed covered storage area and retaining wall adjacent to the 100-year flood boundary. Conventional shallow foundations may be used for the support of miscellaneous light exterior improvements. The following recommendations are considered the minimum based on the anticipated soil conditions. All foundations should be designed by a qualified professional.

STRUCTURAL MAT FOUNDATION

A structurally reinforced concrete mat foundation is recommended for support of the proposed structure. Thickness and reinforcement requirements of the mat foundation should be in accordance with the recommendations of the project structural engineer. To reduce potential consolidation settlements, the mat should be designed using an allowable bearing capacity of no more than 1,000 pounds per square foot. The recommended allowable bearing capacity may be increased by up to one-third when considering loads of a short duration such as wind or seismic forces.

Mat foundations typically experience some deflection due to loads placed on the mat and the reaction of the soils underlying the mat. A design coefficient of subgrade reaction, K_{v1}, of 150 pounds per cubic inch (pci) may be used for evaluating such deflections at the site. This value is based on the soil conditions encountered in our exploratory excavations and is considered as applied to a unit square foot area. The value should be adjusted for the design mat size. The coefficient of subgrade reaction K_b for a mat of a specific width may be evaluated using the following equation:

$$K_b = K_{v1} [(b+1)/2b]^2$$

Where **b** is the least width of the foundation

Based on our preliminary evaluation, the anticipated total static settlement for mat foundation should be less than approximately 1 inch. Anticipated maximum differential settlements of approximately 50 percent of the total settlements may occur between the center of the base of the structure and the structure corners. Also, total settlement on the order of 1.9 inches and differential settlements on the order of 1.3 inches are possible as a result of liquefaction during a major, proximal seismic event.

Lateral forces may be resisted by passive pressure resistance. For passive pressure design, an allowable equivalent fluid pressure of 300 pounds per cubic foot (pcf) may be assumed.

CONCRETE CAST-IN-PLACE PIERS

MINIMUM PIER DIMENSIONS: Cast-in-place concrete pier foundations to support the proposed covered storage area or the retaining wall adjacent to the 100-year flood boundary should have a minimum diameter of 24 inches. The piers should extend to a minimum depth of 10 feet below the existing grade. An allowable skin friction of 1,000 pounds per square foot may be assumed for pier design. This value may be increased by one-third when considering wind and/or seismic loads.

PIER REINFORCING: The reinforcing steel for the piers should be specified by the project structural designer. As a minimum, we recommend that the pier reinforcing extend the full depth of the pier excavation.

SKIN FRICTION: An allowable skin friction of 700 pounds per square foot may be assumed for uplift pier design. This value may be increased by one-third when considering wind and/or seismic loads.

LATERAL LOADS: An active pressure equal to 10 pounds per cubic foot should be assumed for the upper 5 feet of pier embedment for piers located within 10 feet from the top of the existing slope.

LATERAL BEARING CAPACITY: The allowable lateral bearing resistance to lateral loads may be assumed to be 200 pounds per square foot per foot of depth up to a maximum of 3,000 pounds per square foot. These values may be assumed to act on an area equal to twice the pier diameter.

PIER EXCAVATION OBSERVATION AND CLEANING: The pier excavations should be observed by a member from our staff to determine that the minimum embedment recommend in this report is achieved. Prior to placing the steel reinforcing cages, all loose or disturbed soils at the bottom of the pier excavations should be removed. The cleanout of the pier excavations should be approved by the geotechnical engineer.

DRILLING CHARACTERISTICS: It is anticipated that the proposed piers may be drilled utilizing conventional heavy duty drilling equipment in good working condition. Seasonal fluctuations in groundwater levels as well as the depths of proposed pier foundations may result in groundwater being encountered within the pier excavations.

SHALLOW FOUNDATIONS

DIMENSIONS: Spread footings supporting the proposed light exterior improvements should be embedded at least 24 inches below finish grade and should have minimum width of

18 inches. Isolated footings should have a minimum width of 24 inches and should be connected by tie beams as recommend by the project structural engineer.

BEARING CAPACITY: Spread footings with the above minimum dimensions may be designed for an allowable soil bearing pressure of 1,500 pounds per square foot. This value may be increased by one-third for combinations of temporary loads such as those due to wind or seismic loads.

LATERAL LOAD RESISTANCE: Lateral loads against foundations may be resisted by friction between the bottom of the footing and the supporting soil, and by the passive pressure against the footing. The coefficient of friction between concrete and fill material may be considered to be 0.3. The passive resistance for the fill may be considered to be equal to an equivalent fluid weight of 300 pounds per cubic foot. These values are based on the assumption that the footings are poured tight against undisturbed soil. If a combination of the passive pressure and friction is used, the friction value should be reduced by one-third.

REINFORCEMENT: Footing reinforcement should be specified by the project structural engineer. However, based on soil conditions, we recommend that the minimum reinforcing for continuous footings should consist of at least 2 No. 5 bars positioned three inches above the bottom of the footing and 2 No. 5 bars positioned two inches below the top of the footing.

SETTLEMENT CHARACTERISTICS: The anticipated total and differential footing static settlement is expected to be less than about 1 inch and 1 inch in 40 feet, respectively, provided the recommendations presented in this report are followed. It should be recognized that minor cracks normally occur in concrete slabs and foundations due to concrete shrinkage during curing or redistribution of stresses, therefore some cracks should be anticipated. Such cracks are not necessarily an indication of excessive vertical movements. In addition, total settlement on the order of 1.9 inches and differential settlements on the order of 1.3 inches are possible as a result of liquefaction during a major, proximal seismic event.

EXPANSIVE CHARACTERISTICS: The anticipated foundation soils are anticipated to have a low expansion potential (EI < 20). The recommendations presented in this report reflect this condition.

FOUNDATION PLAN REVIEW: The final foundation plan and accompanying details and notes should be submitted to this office for review. The intent of our review will be to verify that the plans used for construction reflect the minimum dimensioning and reinforcing criteria presented in this section and that no additional criteria are required due to changes in the foundation type or layout. It is not our intent to review structural plans, notes, details, or calculations to verify that the design engineer has correctly applied the geotechnical design values. It is the responsibility of the design engineer to properly design/specify the foundations and other structural elements based on the requirements of the structure and considering the information presented in this report.

FOUNDATION EXCAVATION OBSERVATION: All foundation excavations should be observed by the Geotechnical Consultant prior to constructing forms or placing reinforcing steel to determine if the foundation recommendations presented herein are complied with. All footing excavations should be excavated neat, level and square. All loose or unsuitable material should be removed prior to the placement of concrete.

SOLUBLE SULFATES: The water soluble sulfate content of a selected soil sample from the site was determined in accordance with California Test Method 417. The results of this test indicate that the soil sample had a soluble sulfate content of 0.009 percent. Soils with a soluble sulfate content of less than 0.1 percent are considered to be negligible. However, it should be recognized that the sulfate content of surficial soils may increase with time due to soluble sulfate in the irrigation water or fertilized use.

SEISMIC DESIGN FACTORS

The seismic design factors applicable to the subject site are provided below. The seismic design factors were determined in accordance with the 2016 California Building Code. The site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters are presented herein:

TABLE I: SEISMIC DESIGN FACTORS

Site Coordinates: Latitude Longitude	32.855° -116.847°
Site Class	D
Site Coefficient F_a	1.126
Site Coefficient F_v	1.695
Spectral Response Acceleration at Short Periods S_s	0.935g
Spectral Response Acceleration at 1 Second Period S_1	0.353g
$S_{MS} = F_a S_s$	1.053g
$S_{M1} = F_v S_1$	0.598g
$S_{DS} = 2/3 * S_{MS}$	0.702g
$S_{D1} = 2/3 * S_{M1}$	0.398g

Probable ground shaking levels at the site could range from slight to moderate, depending on such factors as the magnitude of the seismic event and the distance to the epicenter. It is likely that the site will experience the effects of at least one moderate to large earthquake during the life of the proposed improvements.

ON-GRADE SLABS

GENERAL: The following recommendations are considered the minimum slab requirements based on the soil conditions and are not intended in lieu of structural considerations.

EXTERIOR CONCRETE FLATWORK: Exterior concrete slabs on grade should have a minimum thickness of 4 inches and be reinforced with at least No. 3 bars placed at 18 inches on center each way (ocew). Driveway slabs should have a minimum thickness of 5 inches and be reinforced with at least No. 4 bars placed at 18 inches ocew. Driveway slabs should be provided with a thickened edge a least 12 inches deep and 6 inches wide. All slabs should be provided with weakened plane joints in accordance with the American Concrete Institute (ACI) guidelines. Special attention should be paid to the method of concrete curing to reduce the potential for excessive shrinkage cracking. It should be recognized that minor cracks occur normally in concrete slabs due to shrinkage. Some shrinkage cracks should be expected and are not necessarily an indication of excessive movement or structural distress.

EARTH RETAINING WALLS

FOUNDATIONS: Foundations for any proposed retaining walls should be constructed in accordance with the foundation recommendations presented previously in this report.

PASSIVE PRESSURE: The passive pressure for the anticipated foundation soils may be considered to be 300 pounds per square foot per foot of depth. The upper foot of embedment should be neglected when calculating passive pressures, unless the foundation abuts a hard surface such as a concrete slab. The passive pressure may be increased by one-third for seismic loading. The coefficient of friction for concrete to soil may be assumed to be 0.30 for the resistance to lateral movement. When combining frictional and passive resistance, the friction should be reduced by one-third.

ACTIVE PRESSURE: The active soil pressure for the design of "unrestrained" earth retaining structures with level backfill may be assumed to be equivalent to the pressure of a fluid weighing 41 pounds per cubic foot. This pressure does not consider any other surcharge. If any are anticipated, this office should be contacted for the necessary increase in soil pressure. These values are based on a drained backfill condition.

Seismic lateral earth pressures may be assumed to equal an inverted triangle starting at the bottom of the wall with the maximum pressure equal to 7H pounds per square foot (where H = wall height in feet) occurring at the top of the wall.

WATERPROOFING AND WALL DRAINAGE SYSTEMS: The need for waterproofing should be evaluated by others. If required, the project architect should provide (or coordinate) waterproofing details for the retaining walls. The design values presented above are based on a drained backfill condition and do not consider hydrostatic pressures. The retaining wall designer should provide a detail for a wall drainage system. Typical retaining wall drain system details are presented as Plate No. 3 of this report for informational purposes. Additionally, outlets points for the retaining wall drain system should be coordinated with the project civil engineer.

BACKFILL: Retaining wall backfill soils should be compacted to at least 90 percent relative compaction. However, retaining wall backfill underlying settlement sensitive improvements should be

compacted to at least 90%. Expansive or clayey soils should not be used for backfill material. The wall should not be backfilled until the masonry has reached an adequate strength.

LIMITATIONS

REVIEW, OBSERVATION AND TESTING

The recommendations presented in this report are contingent upon our review of final plans and specifications. Such plans and specifications should be made available to the Geotechnical Engineer and Engineering Geologist so that they may review and verify their compliance with this report and with the California Building Code.

It is recommended that Christian Wheeler Engineering be retained to provide continuous soil engineering services during the earthwork operations. This is to verify compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

UNIFORMITY OF CONDITIONS

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on an evaluation of the subsurface soil conditions encountered at the subsurface exploration locations and on the assumption that the soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the foundations and/or cut and fill slopes may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the Geotechnical Engineer so that he may make modifications if necessary.

CHANGE IN SCOPE

This office should be advised of any changes in the project scope or proposed site grading so that we may determine if the recommendations contained herein are appropriate. It should be verified in writing if

the recommendations are found to be appropriate for the proposed changes or our recommendations should be modified by a written addendum.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they are due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Government Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations.

PROFESSIONAL STANDARD

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the locations where our borings, surveys, and explorations are made, and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for the interpretations by others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

CLIENT'S RESPONSIBILITY

It is the responsibility of the client, or his representatives, to ensure that the information and recommendations contained herein are brought to the attention of the structural engineer for the project and incorporated into the project's plans and specifications. It is further their responsibility to take the necessary measures to insure that the contractor and his subcontractors carry out such recommendations during construction.

FIELD EXPLORATIONS

Eight subsurface explorations were made at the locations indicated on the attached Plate Number 1 on May 23, 2018. These explorations consisted of borings drilled utilizing a truck mounted drill rig. The fieldwork was conducted under the observation of our engineering geology personnel.

The explorations were carefully logged when made. The logs of the three geotechnical borings are presented on Appendix A. The soils are described in accordance with the Unified Soils Classification. In addition, a verbal textural description, the wet color, the apparent moisture, and the density or consistency is provided. The density of granular soils is given as very loose, loose, medium dense, dense or very dense. The consistency of silts or clays is given as either very soft, soft, medium stiff, stiff, very stiff, or hard.

Relatively undisturbed drive samples were collected using a modified California sampler. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin, brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a 140-pound hammer falling 30 inches in general accordance with ASTM D 3550-84. The driving weight is permitted to fall freely. The number of blows per foot of driving, or as indicated, are presented on the boring logs as an index to the relative resistance of the sampled materials. The samples were removed from the sample barrel in the brass rings, and sealed. Bulk samples of the earth materials encountered were also collected. Samples were transported to our laboratory for testing.

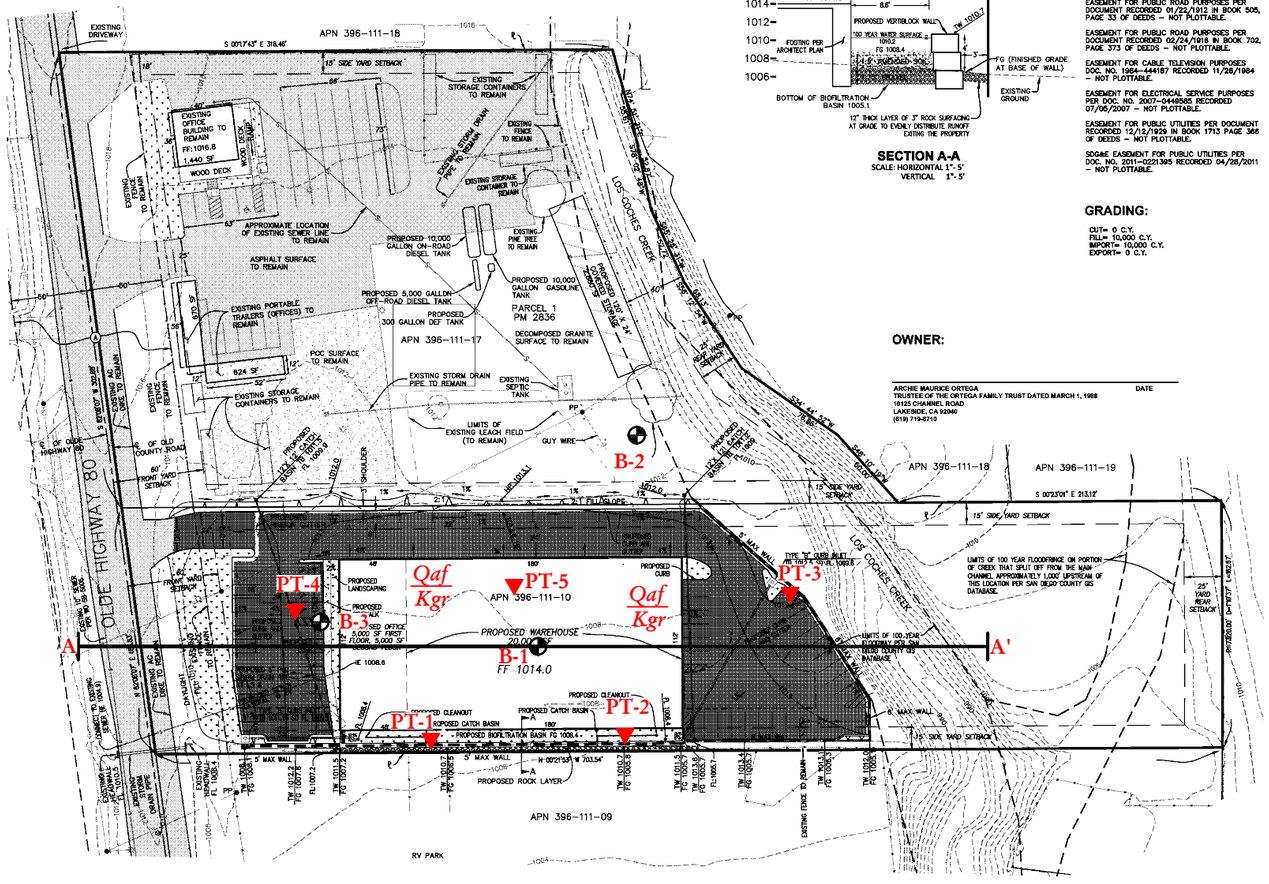
LABORATORY TESTING

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. A brief description of the tests performed and the subsequent results are presented in Appendix B.

LAWRENCE W. WALSH DATE

Walsh Engineering & Surveying, Inc.
507 Aldwych Road, El Cajon, CA 92020
(619) 588-6747 (619) 792-1232 Fax

PRELIMINARY GRADING PLAN



SECTION A-A
SCALE: HORIZONTAL 1"=5'
VERTICAL 1"=5'

EASEMENT NOTES:

EASEMENTS PLOTTED PER PRELIMINARY REPORT PREPARED BY CORINTHIAN TITLE COMPANY AS ORDER NO. 1800480408 DATED 03/20/18.

(A) 100' HIGHWAY EASEMENT PER DOCUMENT RECORDED 01/29/1932 BOOK 85, PAGE 194 OF OFFICIAL RECORDS.

EASEMENT FOR PUBLIC ROAD PURPOSES PER DOCUMENT RECORDED 01/22/1912 IN BOOK 505, PAGE 33 OF DEEDS – NOT PLOTTABLE.

EASEMENT FOR PUBLIC ROAD PURPOSES PER DOCUMENT RECORDED 02/24/1918 IN BOOK 702, PAGE 373 OF DEEDS – NOT PLOTTABLE.

EASEMENT FOR CABLE TELEVISION PURPOSES DOC. NO. 1984-444187 RECORDED 11/28/1984 – NOT PLOTTABLE.

EASEMENT FOR ELECTRICAL SERVICE PURPOSES PER DOC. NO. 2007-0446585 RECORDED 07/05/2007 – NOT PLOTTABLE.

EASEMENT FOR PUBLIC UTILITIES PER DOCUMENT RECORDED 12/12/1929 IN BOOK 1713 PAGE 366 OF DEEDS – NOT PLOTTABLE.

SDG&E EASEMENT FOR PUBLIC UTILITIES PER DOC. NO. 2011-0221395 RECORDED 04/28/2011 – NOT PLOTTABLE.

GRADING:

CUT= 0 C.Y.
FILL= 10,000 C.Y.
IMPORT= 10,000 C.Y.
EXPORT= 0 C.Y.

OWNER:

ARCHIE MAURICE ORTEGA DATE
TRUSTEE OF THE ORTEGA FAMILY TRUST DATED MARCH 1, 1988
19125 CHANNEL ROAD
LAKESIDE, CA 92040
(619) 719-8713

W+E

0 100' 200'

SCALE: 1" = 100'

CWE LEGEND

B-2	APPROXIMATE BORING LOCATION
PT-5	APPROXIMATE PERC TEST LOCATION
Qaf / Kgr	ARTIFICIAL FILL OVER WEATHERED GRANITICS
A — A'	GEOLOGIC CROSS SECTION

SITE PLAN AND GEOLOGIC MAP

A.M. ORTEGA WAREHOUSE
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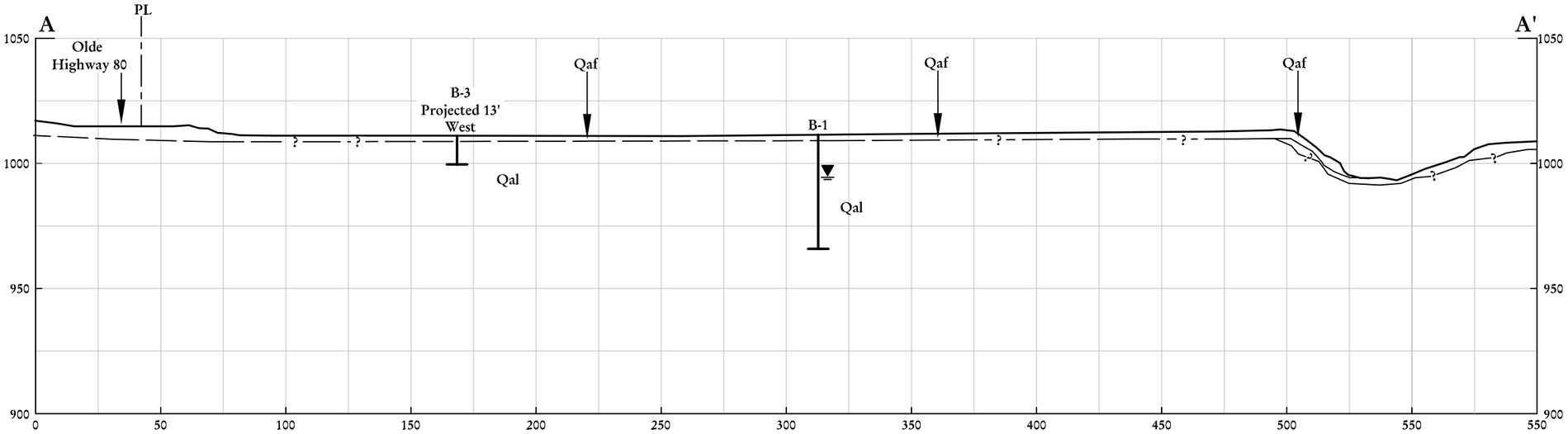
SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SD	PLATE NO.:	1

CHRISTIAN WHEELER ENGINEERING



CWE LEGEND	
Qaf	ARTIFICIAL FILL
Qal	ALLUVIUM
▼	GROUNDWATER

0 50' 100'

SCALE: 1" = 50'

GEOLOGIC CROSS SECTION A-A'

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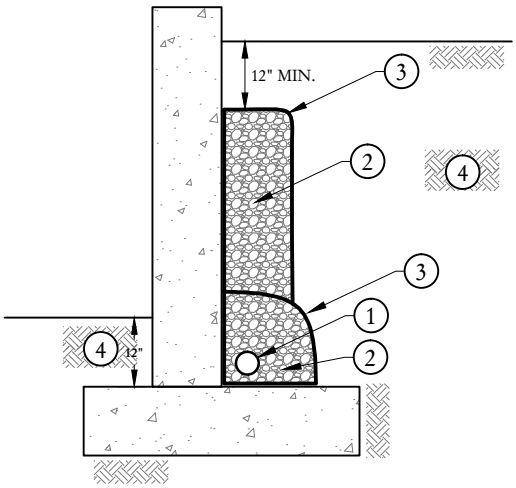
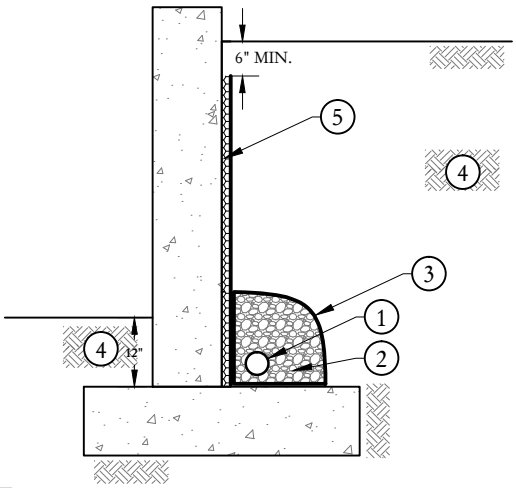
DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SD	PLATE NO.:	2

CHRISTIAN WHEELER
ENGINEERING



1 DETAIL



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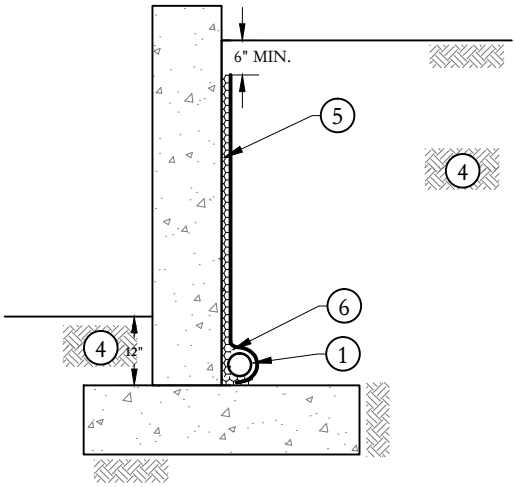
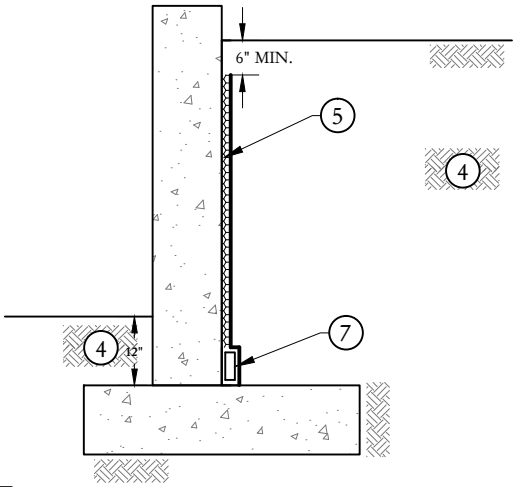


3 DETAIL



4 DETAIL

NOTES AND DETAILS

GENERAL NOTES:

1) THE NEED FOR WATERPROOFING SHOULD BE EVALUATED BY OTHERS.
2) WATERPROOFING TO BE DESIGNED BY OTHERS (CWE CAN PROVIDE A DESIGN IF REQUESTED).
3) EXTEND DRAIN TO SUITABLE DISCHARGE POINT PER CIVIL ENGINEER.
4) DO NOT CONNECT SURFACE DRAINS TO SUBDRAIN SYSTEM.

DETAILS:

1. 4-INCH PERFORATED PVC PIPE ON TOP OF FOOTING, HOLES POSITIONED DOWNWARD (SDR 35, SCHEDULE 40, OR EQUIVALENT).
2. ¾ INCH OPEN-GRADED CRUSHED AGGREGATE.
3. GEOFARBRIC WRAPPED COMPLETELY AROUND ROCK.
4. PROPERLY COMPACTED BACKFILL SOIL.
5. WALL DRAINAGE PANELS (MIRADRAIN OR EQUIVALENT) PLACED PER MANUFACTURER'S REC'S.
6. UNDERLAY SUBDRAIN WITH AND CUT FABRIC BACK FROM DRAINAGE PANELS AND WRAP FABRIC AROUND PIPE.
7. COLLECTION DRAIN (TOTAL DRAIN OR EQUIVALENT) LOCATED AT BASE OF WALL DRAINAGE PANEL PER MANUFACTURER'S RECOMMENDATIONS.

CANTILEVER RETAINING WALL DRAINAGE SYSTEMS

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SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SRD	PLATE NO.:	3

CHRISTIAN WHEELER
ENGINEERING

Appendix A

Subsurface Explorations

LOG OF TEST BORING B-1

Date Logged:	5/23/2018	Equipment:	Wolverine M5
Logged By:	AZ	Bucket Type:	6" Hollow Stem
Existing Elevation:	1008.0 feet	Drive Type:	140lbs/30" drop
Proposed Elevation:	1014.0 feet	Depth to Water:	16.0 feet

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

DEPTH (ft)	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	SM	**Artificial Fill (Qaf):** Brown, dry, loose, fine- to coarse-grained, SILTY SAND.							
	SM	**Younger Alluvium (Qyal):** Brown, damp to moist, medium dense, fine- to coarse-grained, SILTY SAND.							SO4 DS
5			27	Cal		9.8	123.1		SD
10	SM	Brown, moist, loose, fine- to medium-grained, SILTY SAND with clay.	11	Cal		19.7	102.8		SD
15	SC	Brown, moist to wet, medium dense, fine- to medium-grained, CLAYEY SAND with silt.	23	Cal		23	103.4		SD HA
	SM	Brown, saturated, medium dense, fine- to medium-grained, SILTY SAND with clay.							
20			15	Cal					HA
25		Becomes fine- to coarse-grained.	16	SPT					HA
30		Continued on Figure No. A-2							

Notes:

Symbol Legend

- Groundwater Level During Drilling
- Groundwater Level After Drilling
- Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

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SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-1 (Cont.)

Date Logged:	5/23/2018	Equipment:	Wolverine M5
Logged By:	AZ	Bucket Type:	6" Hollow Stem
Existing Elevation:	1008.0 feet	Drive Type:	140lbs/30" drop
Proposed Elevation:	1014.0 feet	Depth to Water:	16.0 feet

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
30			SM-SP	**Older Alluvium (Qoal):** Tan to brown, saturated, dense to very dense, fine- to coarse-grained, SILTY SAND - POORLY GRADED SAND.	54	SPT					
35			SM	Gray, saturated, very dense, fine- to coarse-grained, SILTY SAND.	50/5"	SPT					
40			SW	**Corte Madre Monzogranite (Kcm):** Tan to brown, wet, very dense, fine- to coarse-grained, SILTY SAND.	50/5"	SPT					
45					50/3"	SPT*					
				Boring terminated at 45.5 feet. Groundwater encountered at 16 feet.							
50											
55											
60											

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- ⁘ Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

A.M. ORTEGA WAREHOUSE
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-2

Date Logged:	5/23/2018	Equipment:	Wolverine M5
Logged By:	AZ	Bucket Type:	6" Hollow Stem
Existing Elevation:	1012.0 feet	Drive Type:	140lbs/30" drop
Proposed Elevation:	1012.0 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

DEPTH (ft)	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	SM	**Artificial Fill (Qaf):** Brown, dry, medium dense, fine- to medium-grained, SILTY SAND with gravel.	25	Cal		3.2	110.3		SD
5	SM	**Younger Alluvium (Qyal):** Brown, damp to moist, medium dense, fine- to medium-grained, SILTY SAND.	21	Cal					
10	SM	Brown, moist, medium dense, fine- to coarse-grained, SILTY SAND.	21	Cal					
		Boring terminated at 11.5 feet. No groundwater or seepage encountered.							
15									
20									
25									
30									

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- ⁘ Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

A.M. ORTEGA WAREHOUSE
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SRD	FIGURE NO.:	A-3

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-3

Date Logged:	5/23/2018	Equipment:	Wolverine M5
Logged By:	AZ	Bucket Type:	6" Hollow Stem
Existing Elevation:	1008.0 feet	Drive Type:	140lbs/30" drop
Proposed Elevation:	1014.0 feet	Depth to Water:	N/A

Sample Type and Laboratory Test Legend

Cal	Modified California Sampler	CK	Chunk
SPT	Standard Penetration Test	DR	Drive Ring
ST	Shelby Tube		
MD	Max Density	DS	Direct Shear
SO4	Soluble Sulfates	Con	Consolidation
SA	Sieve Analysis	EI	Expansion Index
HA	Hydrometer	R-Val	Resistance Value
SE	Sand Equivalent	Chl	Soluble Chlorides
PI	Plasticity Index	Res	pH & Resistivity
CP	Collapse Potential	SD	Sample Density

DEPTH (ft)	USCS SYMBOL	SUMMARY OF SUBSURFACE CONDITIONS (based on Unified Soil Classification System)	PENETRATION (blows per foot)	SAMPLE TYPE	BULK	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	RELATIVE COMPACTION (%)	LABORATORY TESTS
0	SM	**Artificial Fill (Qaf):** Brown, dry, medium dense, fine- to medium-grained, SILTY SAND.							
	SM	**Younger Alluvium (Qyal):** Brown, moist, medium dense, fine- to medium-grained, SILTY SAND.	25	Cal		9.2	114.3		SD
5		Brown, moist, medium dense, fine- to coarse-grained, SILTY SAND.	28	Cal					
10			29	Cal					
		Boring terminated at 11.5 feet. No groundwater or seepage encountered.							
15									
20									
25									
30									

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- ⁘ Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

A.M. ORTEGA WAREHOUSE
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

DATE:	MAY 2019	JOB NO.:	2180227.01
BY:	SRD	FIGURE NO.:	A-4

CHRISTIAN WHEELER ENGINEERING

Appendix B

Laboratory Test Results

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. Brief descriptions of the tests performed are presented below:

a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System and are presented on the exploration logs in Appendix A.

b) **MOISTURE-DENSITY: MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for selected soil samples in accordance with ASTM D2937. The results are summarized in the boring logs presented in Appendix A.

c) **MAXIMUM DRY DENSITY AND OPTIUM MOISTURE CONTENT TEST:** The maximum dry density and optimum moisture content of selected soil samples were determined in the laboratory in accordance with ASTM D 1557, Method A.

d) **DIRECT SHEAR:** Direct shear testing was performed on a selected sample of the on-site soils in accordance with ASTM D 3080.

e) **GRAIN SIZE DISTRIBUTION:** The grain size distribution of selected samples was determined in accordance with ASTM C136 and/or ASTM D 422.

f) **SOLUBLE SULFATES:** The soluble sulfate content of selected soil sample was determined in accordance with California Test Method 417.

LABORATORY TEST RESULTS

PROPOSED OFFICE/WAREHOUSE BUILDING

15229 OLDE HIGHWAY 80

SAN DIEGO COUNTY, CALIFORNIA

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT (ASTM D1557)

Sample Location	**Boring B-1 @ 0'-10'**
Sample Description	Brown, Silty Sand (SM)
Maximum Density	130.0 pcf
Optimum Moisture	9.0 %

DIRECT SHEAR (ASTM D3080)

Sample Location	**Boring B-1 @ 0'-10'**
Sample Type	Remolded to 90 %
Friction Angle	33°
Cohesion	150 psf

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ 16½'**	**Boring B-1 @ 21½'**	**Boring B-1 @ 26½'**	**Boring B-1 @ 31½'**
Sieve Size	*Percent Passing*	Percent Passing	Percent Passing	*Percent Passing*
1"	100	100	100	100
¾"	100	100	100	88
½"	100	100	99	83
3/8"	100	100	99	81
#4	100	100	97	76
#8	99	98	91	71
#16	95	94	81	61
#30	89	89	67	49
#50	77	77	49	31
#100	59	55	31	18
#200	41	34	17	11
0.05 mm	37	29	14	10
0.005 mm	19	12	5	4
0.001 mm	11	6	3	3

SOLUBLE SULFATES (CALIFORNIA TEST 417)

Sample Location	**Boring B-1 @ 0'-10'**
Soluble Sulfate	0.009 % (SO_4)

Appendix C

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APPENDIX D

GRADING SPECIFICATIONS

RECOMMENDED GRADING SPECIFICATIONS - GENERAL PROVISIONS

PROPOSED OFFICE/WAREHOUSE BUILDING
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

GENERAL INTENT

The intent of these specifications is to establish procedures for clearing, compacting natural ground, preparing areas to be filled, and placing and compacting fill soils to the lines and grades shown on the accepted plans. The recommendations contained in the preliminary geotechnical investigation report and/or the attached Special Provisions are a part of the Recommended Grading Specifications and shall supersede the provisions contained hereinafter in the case of conflict. These specifications shall only be used in conjunction with the geotechnical report for which they are a part. No deviation from these specifications will be allowed, except where specified in the geotechnical report or in other written communication signed by the Geotechnical Engineer.

OBSERVATION AND TESTING

Christian Wheeler Engineering shall be retained as the Geotechnical Engineer to observe and test the earthwork in accordance with these specifications. It will be necessary that the Geotechnical Engineer or his representative provide adequate observation so that he may provide his opinion as to whether or not the work was accomplished as specified. It shall be the responsibility of the contractor to assist the Geotechnical Engineer and to keep him apprised of work schedules, changes and new information and data so that he may provide these opinions. In the event that any unusual conditions not covered by the special provisions or preliminary geotechnical report are encountered during the grading operations, the Geotechnical Engineer shall be contacted for further recommendations.

If, in the opinion of the Geotechnical Engineer, substandard conditions are encountered, such as questionable or unsuitable soil, unacceptable moisture content, inadequate compaction, adverse weather, etc., construction should be stopped until the conditions are remedied or corrected or he shall recommend rejection of this work.

Tests used to determine the degree of compaction should be performed in accordance with the following American Society for Testing and Materials test methods:

Maximum Density & Optimum Moisture Content - ASTM D1557
Density of Soil In-Place - ASTM D1556 or ASTM D6938

All densities shall be expressed in terms of Relative Compaction as determined by the foregoing ASTM testing procedures.

PREPARATION OF AREAS TO RECEIVE FILL

All vegetation, brush and debris derived from clearing operations shall be removed, and legally disposed of. All areas disturbed by site grading should be left in a neat and finished appearance, free from unsightly debris.

After clearing or benching the natural ground, the areas to be filled shall be scarified to a depth of 6 inches, brought to the proper moisture content, compacted and tested for the specified minimum degree of compaction. All loose soils in excess of 6 inches thick should be removed to firm natural ground which is defined as natural soil which possesses an in-situ density of at least 90 percent of its maximum dry density.

When the slope of the natural ground receiving fill exceeds 20 percent (5 horizontal units to 1 vertical unit), the original ground shall be stepped or benched. Benches shall be cut to a firm competent formational soil. The lower bench shall be at least 10 feet wide or 1-1/2 times the equipment width, whichever is greater, and shall be sloped back into the hillside at a gradient of not less than two (2) percent. All other benches should be at least 6 feet wide. The horizontal portion of each bench shall be compacted prior to receiving fill as specified herein for compacted natural ground. Ground slopes flatter than 20 percent shall be benched when considered necessary by the Geotechnical Engineer.

Any abandoned buried structures encountered during grading operations must be totally removed. All underground utilities to be abandoned beneath any proposed structure should be removed from within 10 feet of the structure and properly capped off. The resulting depressions from the above

described procedure should be backfilled with acceptable soil that is compacted to the requirements of the Geotechnical Engineer. This includes, but is not limited to, septic tanks, fuel tanks, sewer lines or leach lines, storm drains and water lines. Any buried structures or utilities not to be abandoned should be brought to the attention of the Geotechnical Engineer so that he may determine if any special recommendation will be necessary.

All water wells which will be abandoned should be backfilled and capped in accordance to the requirements set forth by the Geotechnical Engineer. The top of the cap should be at least 4 feet below finish grade or 3 feet below the bottom of footing whichever is greater. The type of cap will depend on the diameter of the well and should be determined by the Geotechnical Engineer and/or a qualified Structural Engineer.

FILL MATERIAL

Materials to be placed in the fill shall be approved by the Geotechnical Engineer and shall be free of vegetable matter and other deleterious substances. Granular soil shall contain sufficient fine material to fill the voids. The definition and disposition of oversized rocks and expansive or detrimental soils are covered in the geotechnical report or Special Provisions. Expansive soils, soils of poor gradation, or soils with low strength characteristics may be thoroughly mixed with other soils to provide satisfactory fill material, but only with the explicit consent of the Geotechnical Engineer. Any import material shall be approved by the Geotechnical Engineer before being brought to the site.

PLACING AND COMPACTION OF FILL

Approved fill material shall be placed in areas prepared to receive fill in layers not to exceed 6 inches in compacted thickness. Each layer shall have a uniform moisture content in the range that will allow the compaction effort to be efficiently applied to achieve the specified degree of compaction. Each layer shall be uniformly compacted to the specified minimum degree of compaction with equipment of adequate size to economically compact the layer. Compaction equipment should either be specifically designed for soil compaction or of proven reliability. The minimum degree of compaction to be achieved is specified in either the Special Provisions or the recommendations contained in the preliminary geotechnical investigation report.

When the structural fill material includes rocks, no rocks will be allowed to nest and all voids must be carefully filled with soil such that the minimum degree of compaction recommended in the Special Provisions is achieved. The maximum size and spacing of rock permitted in structural fills and in non-structural fills is discussed in the geotechnical report, when applicable.

Field observation and compaction tests to estimate the degree of compaction of the fill will be taken by the Geotechnical Engineer or his representative. The location and frequency of the tests shall be at the Geotechnical Engineer's discretion. When the compaction test indicates that a particular layer is at less than the required degree of compaction, the layer shall be reworked to the satisfaction of the Geotechnical Engineer and until the desired relative compaction has been obtained.

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compaction by sheepsfoot roller shall be at vertical intervals of not greater than four feet. In addition, fill slopes at a ratio of two horizontal to one vertical or flatter, should be trackrolled. Steeper fill slopes shall be over-built and cut-back to finish contours after the slope has been constructed. Slope compaction operations shall result in all fill material six or more inches inward from the finished face of the slope having a relative compaction of at least 90 percent of maximum dry density or the degree of compaction specified in the Special Provisions section of this specification. The compaction operation on the slopes shall be continued until the Geotechnical Engineer is of the opinion that the slopes will be surficially stable.

Density tests in the slopes will be made by the Geotechnical Engineer during construction of the slopes to determine if the required compaction is being achieved. Where failing tests occur or other field problems arise, the Contractor will be notified that day of such conditions by written communication from the Geotechnical Engineer or his representative in the form of a daily field report.

If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor shall rework or rebuild such slopes until the required degree of compaction is obtained, at no cost to the Owner or Geotechnical Engineer.

CUT SLOPES

The Engineering Geologist shall inspect cut slopes excavated in rock or lithified formational material during the grading operations at intervals determined at his discretion. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer to determine if mitigating measures are necessary.

Unless otherwise specified in the geotechnical report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of the controlling governmental agency.

ENGINEERING OBSERVATION

Field observation by the Geotechnical Engineer or his representative shall be made during the filling and compaction operations so that he can express his opinion regarding the conformance of the grading with acceptable standards of practice. Neither the presence of the Geotechnical Engineer or his representative or the observation and testing shall release the Grading Contractor from his duty to compact all fill material to the specified degree of compaction.

SEASON LIMITS

Fill shall not be placed during unfavorable weather conditions. When work is interrupted by heavy rain, filling operations shall not be resumed until the proper moisture content and density of the fill materials can be achieved. Damaged site conditions resulting from weather or acts of God shall be repaired before acceptance of work.

RECOMMENDED GRADING SPECIFICATIONS - SPECIAL PROVISIONS

RELATIVE COMPACTION: The minimum degree of compaction to be obtained in compacted natural ground, compacted fill, and compacted backfill shall be at least 90 percent. For street and

parking lot subgrade, the upper six inches should be compacted to at least 95 percent relative compaction.

EXPANSIVE SOILS: Detrimentally expansive soil is defined as clayey soil which has an expansion index of 50 or greater when tested in accordance with the Uniform Building Code Standard 29-2.

OVERSIZED MATERIAL: Oversized fill material is generally defined herein as rocks or lumps of soil over 6 inches in diameter. Oversized materials should not be placed in fill unless recommendations of placement of such material should be provided by the Geotechnical Engineer. At least 40 percent of the fill soils shall pass through a No. 4 U.S. Standard Sieve.

TRANSITION LOTS: Where transitions between cut and fill occur within the proposed building pad, the cut portion should be undercut a minimum of one foot below the base of the proposed footings and recompacted as structural backfill. In certain cases that would be addressed in the geotechnical report, special footing reinforcement or a combination of special footing reinforcement and undercutting may be required.

Appendix E

Preliminary Storm Water Infiltration Feasibility Study

Percolation to Infiltration Rate Conversion (Porchet Method)

NRCS Web Soil Survey Map

PRELIMINARY STORM WATER INFILTRATION FEASIBILITY STUDY

PROPOSED OFFICE/WAREHOUSE BUILDING
15229 OLDE HIGHWAY 80
SAN DIEGO COUNTY, CALIFORNIA

We have prepared this feasibility study to address the potential for storm water infiltration at the subject site. In general, the purpose of our feasibility analysis is to provide design phase infiltration rates based on the Natural Resources Conservation Service (NCRS) Web Soil Survey, subsurface explorations, and the percolation testing performed at the subject site.

SITE AND PROJECT DESCRIPTION

The subject site consists of two adjacent lots identified as Assessor's Parcel Numbers 396-111-10 and 396-111-07 that are located along the south side of Olde Highway 80 in the Flinn Springs area of San Diego County, California. The site currently supports a construction yard that includes several single-story buildings and sheds, asphalt and Portland cement concrete drive and parking areas, and equipment and materials storage areas. The site is bounded to the east and southeast by additional construction yard areas and a batch plant, a recreational vehicle (RV) camping site to the west, Olde Highway 80 to the north, and Interstate 8 to the south.

We understand that it is proposed to construct an approximately 25,000 square foot office/warehouse building and new parking and drive areas, as well as a bio-filtration basin within the western portion of the site (APN 396-111-10). Additionally, an approximately 2,880 square foot carport is proposed within the southeast portion of the site (APN 396-111-17). We anticipate that the proposed office/warehouse structure will be supported by a structural mat foundation and that he associated improvements will be supported by conventional shallow foundations. Grading to accommodate the proposed improvements is expected to consist of fills of up to approximately 6 feet from existing grades.

FIELD INVESTIGATION

The subsurface explorations consisted of 3 exploratory borings advanced using a truck-mounted drill rig. The subsurface exploration logs are presented in the attached Appendix A. The explorations were logged in detail with emphasis on describing the soil profile. No visible or olfactory evidence of soil contamination was identified within the samples obtained.

GEOLOGIC SETTING AND SOIL DESCRIPTION: Based upon the findings of our subsurface explorations and review of readily available, pertinent geologic and geotechnical literature, it was determined that the project area is underlain by a surficial veneer of artificial fill, Quaternary-age younger alluvium and older alluvium, and Cretaceous-age monzogranite. A site plan and geotechnical map, which depicts the location of our subsurface explorations, is included as Plate No.1 of this report.

MAPPED HYDROLOGIC SOIL GROUP: According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, the site is located in the map unit designated Visalia sandy loam (VaB). This unit has a Hydrologic Soil Group rating of A. Group A soils typically have a high infiltration rate when thoroughly wetted and a high rate of water transmission. Our findings at the site do not correlate to the Hydrologic Soil Group rating of A. Our field percolation tests were very low and would correlate to a Hydrologic Soil Group rating of D. The NRCS Web Soil Survey map for the subject site and corresponding map unit descriptions are presented hereafter.

INFILTRATION RATE DETERMINATION

FIELD MEASUREMENTS

Percolation testing was performed within six borings that were drilled throughout the site. The approximate locations of the percolation borings are shown on Plate No. 1.

The seven-inch-diameter borings, which are labelled as PT-1 through PT-6, were drilled to a depth of approximately 5 feet below existing site grades, which corresponds to the anticipated bottom elevation of the proposed BMPs. Once cleaned of slough, a 3-inch diameter perforated pipe was set in the

excavation and surrounded by ¾-inch gravel to prevent caving. After pipe installation, the percolation borings were presoaked.

The field percolation rates were determined the following day by using the falling head test method. It should be noted that water remained within the borings from presoaking on the previous day. The percolation borings were filled with water and the "Sandy Soil Criteria Test" was performed. The testing resulted in water dropping less than 6 inches during each 25 minute period. The initial water level was established by refilling the test holes and percolation rates were monitored and recorded every 30 minutes over a period of at least 6 hours until the infiltration rates stabilized. Measurements were taken using a water level meter (Solinst, Model 101) with an accuracy of measurement of 0.005 foot (0.06 inch). To account for the use of gravel placed around the perforated pipe, an adjustment factor of 0.47 was used in the calculations. The gravel adjusted percolation rates and calculated infiltration rates are presented in Table I.

TABLE I: FIELD PERCOLATION AND INFILTRATION RATES

Test No.	Location	Soil Underlying BMP	Depth of Testing	Gravel Adjusted Percolation Rate	Field Infiltration Rate	Average Field Infiltration Rate
PT-1	Easterly Portion	Qal	54 inches	0.46 inches per hour	0.06 inches per hour	0.07 inches per hour
PT-2	Easterly Portion	Qal	60 inches	0.46 inches per hour	0.08 inches per hour	
PT-3	Central Portion	Qal	60 inches	0.31 inches per hour	0.04 inches per hour	
PT-4	Central Portion	Qal	60 inches	0.61 inches per hour	0.10 inches per hour	
PT-5	Central Portion	Qal	53 inches	0.61 inches per hour	0.08 inches per hour	

Infiltration and percolation are two related but different processes describing the movement of moisture through soil. Lateral and downward movement of water into soil and porous or fractured rock is called percolation, and the downward entry of water into the soil is called infiltration. The direct measurement yielded by a percolation test tends to overestimate the infiltration rate, except perhaps in cases where an infiltration basin is similarly dimensioned to the borehole. As such, adjustments of the measured

percolation rates were converted into infiltration rates using the Porchet Method. The spreadsheet used for the conversion is included hereafter.

FACTOR OF SAFETY

The County of San Diego BMP Design Manual states that "if the proposed BMP utilizes an underdrain, a default safety factor of 2.0 may be applied." The proposed BMP design has not been determined at this time but we are recommending that an underdrain will be incorporated into the design. If this is not the case then a safety factor will need to be determined in accordance with Table D.2-3.

Using a factor of safety of 2.0 will reduce the average field infiltration rate to 0.035 inches per hour.

POTENTIAL INFILTRATION RESTRICTIONS

GROUNDWATER: Data from our borings indicate that the local groundwater table at the time of our investigation was approximately 16 feet below the existing grade within boring B-1. It is our opinion that the seasonal high, free groundwater level is approximately 10 feet below grade existing site grades.

HYDROCONSOLIDATION

The entire site is underlain by approximately 30 feet of younger alluvium which is overlain by 1 foot to 5 feet of artificial fill. The younger alluvium and existing fill are susceptible to hydroconsolidation and considered unsuitable to support full or partial infiltration from a geotechnical standpoint.

CONCLUSIONS

Field infiltration rates within the alluvium were very low. Using a safety factor of 2.0, an infiltration rate of 0.035 inches per hour was determined for the subject site. However; two potential infiltration restrictions have been identified at the subject site. These restrictions have been assessed in accordance with Appendix D of the January 2019 Edition of the County of San Diego BMP Design Manual.

Based on our investigation, we expect that the project site is underlain by approximately 30 feet of younger alluvium. With proper foundation design, the younger alluvium is generally suitable to support the proposed project in its current condition; however, we anticipate that wetting the soil

through infiltration could result in hydro-consolidation and subsequent distress to the proposed improvements. Additionally, the depth to seasonal high groundwater beneath the site is expected to fluctuate seasonally and is estimated to be as high as 10 feet below the existing site grades. Based on this information we anticipate that seasonal high groundwater will encroach within 10 feet of the base of the proposed BMPs.

The infiltration restrictions have been assessed and consist of hydro-consolidation within the underlying younger alluvium and a shallow seasonal high groundwater depth. Based on these conditions, it is our opinion that the site should be considered restricted for infiltration.

It should be recognized that routine inspection and maintenance of bio-filtration basins are necessary to prevent clogging and failure. A maintenance plan should be specified for each BMP by the designer and followed by the owner during the entire lifetime of the BMP.

LIMITATIONS

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on our evaluation of the subsurface soil conditions encountered at our subsurface exploration locations and the assumption that the infiltration rates and soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the BMPs may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the soils engineer so that he may make modifications if necessary. In addition, this office should be advised of any changes in the project scope, proposed site grading or BMP design so that it may be determined if the recommendations contained herein are appropriate. This should be verified in writing or modified by a written addendum.

It should be noted that it is not our intent to review the civil engineering plans, notes, details, or calculations, when prepared, to verify that the engineer has complied with any particular storm water design standards. It is the responsibility of the designer to properly prepare the storm water plan based on the municipal requirements considering the planned site development and infiltration rates.

Percolation to Infiltration Rate Conversion (Porchet Method)

AM Ortega Warehouse

CWE 2180227

Test #	Gravel Adjustment Factor	Effective Radius (inches) r	Depth of Hole Below Existing Grade (inches)	Time Interval (min.) Δt	Height of pipe above surface (feet)	Initial Water Depth without correction (feet)	Final Water Depth without correction (feet)	Initial Water Height with correction (inches) H_o	Final Water Height with correction (inches) H_f	Change in head (inches) ΔH	Average Head Height (inches) H_{avg}	Gravel Adjusted Percolation Rate (inch/hour)	Tested Infiltration Rate (inch/hour) I_t
PT-1	0.64	4	54	30	0.50	3.93	3.96	12.84	12.48	0.36	12.66	0.46	0.06
PT-2	0.64	4	60	30	0.00	4.13	4.16	10.44	10.08	0.36	10.26	0.46	0.08
PT-3	0.64	4	60	30	0.00	3.87	3.89	13.56	13.32	0.24	13.44	0.31	0.04
PT-4	0.64	4	60	30	0.00	4.12	4.16	10.56	10.08	0.48	10.32	0.61	0.10
PT-5	0.64	4	53	30	0.58	3.90	3.94	13.20	12.72	0.48	12.96	0.61	0.08
									Average Tested Infiltration Rate				0.07

"Initial and final water depth without correction" are measurements taken from top of pipe if pipe is sticking out of ground (most cases)

"Initial and final water height with correction" factors in the height of pipe above surface, and provides measurement of water above bottom of pipe

If measurements are taken from grade "Height of pipe above surface" = 0

Gravel Adjustment Factor:

4-inch Diameter Pipe: 1.00 - No Gravel Used (No Caving)
0.51 - 3/4 inch gravel with 8 inch diameter hole
0.56 - 3/4 inch gravel with 7 inch diameter hole
0.64 - 3/4 inch gravel with 6 inch diameter hole

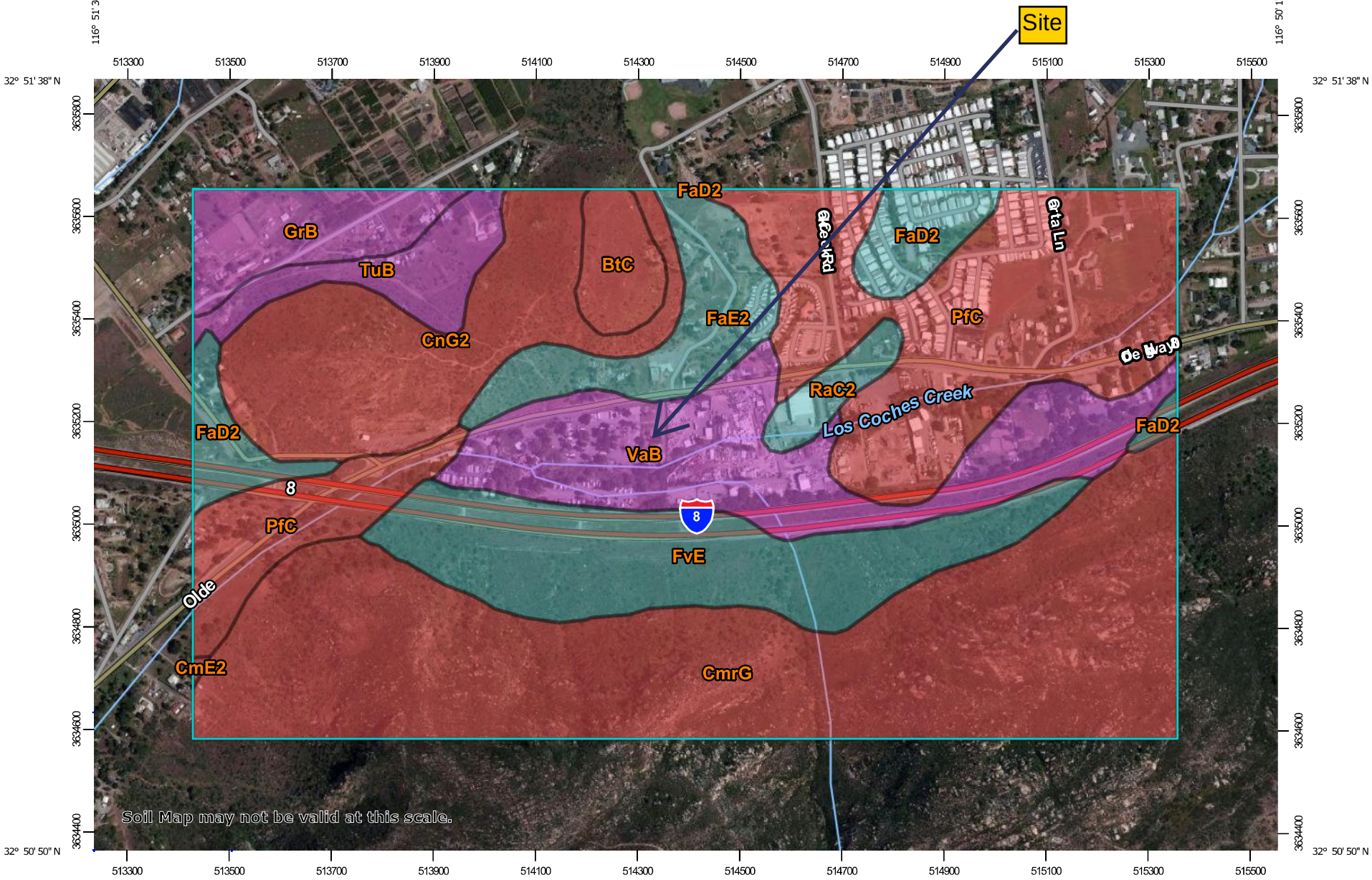
3-inch Diameter Pipe: 1.00 - No Gravel Used (No Caving)
0.44 - 3/4 inch gravel with 8 inch diameter hole
0.47 - 3/4 inch gravel with 7 inch diameter hole
0.51 - 3/4 inch gravel with 6 inch diameter hole

Porchet Method - Tested Percolation Rate Conversion to Tested Infiltration Rate

$$I_t = \frac{\Delta H \, 60 \, r}{\Delta t \, (r + 2H_{avg})}$$

8.5 tested infiltration rate, inches per hour
ΔH = change in head over the time interval, inches
Δt = time interval, minutes
r = effective radius of test hole
H_{avg} = average head over the time interval, inches

Hydrologic Soil Group—San Diego County Area, California



Map Scale: 1:10,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 12, Sep 13, 2017

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

Date(s) aerial images were photographed: Data not available.

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BtC	Bosanko stony clay, 5 to 9 percent slopes	D	9.7	1.9%
CmE2	Cieneba rocky coarse sandy loam, 9 to 30 percent slopes , eroded	D	0.3	0.1%
CmrG	Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes	D	151.9	29.6%
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded	D	53.8	10.5%
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded	C	19.4	3.8%
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes, eroded	C	23.7	4.6%
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent slopes	C	55.5	10.8%
GrB	Greenfield sandy loam, 2 to 5 percent slopes	A	18.8	3.7%
PfC	Placentia sandy loam, thick surface, 2 to 9 percent slo pes	D	99.7	19.5%
RaC2	Ramona sandy loam, 5 to 9 percent slopes, eroded	C	6.5	1.3%
TuB	Tujunga sand, 0 to 5 percent slopes	A	15.0	2.9%
VaB	Visalia sandy loam, 2 to 5 percent slopes	A	58.5	11.4%
Totals for Area of Interest			**512.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix F

Liquefaction Analysis

Christian Wheeler Engineering
3980 Home Avenue
San Diego, California 92105

SPT BASED LIQUEFACTION ANALYSIS REPORT

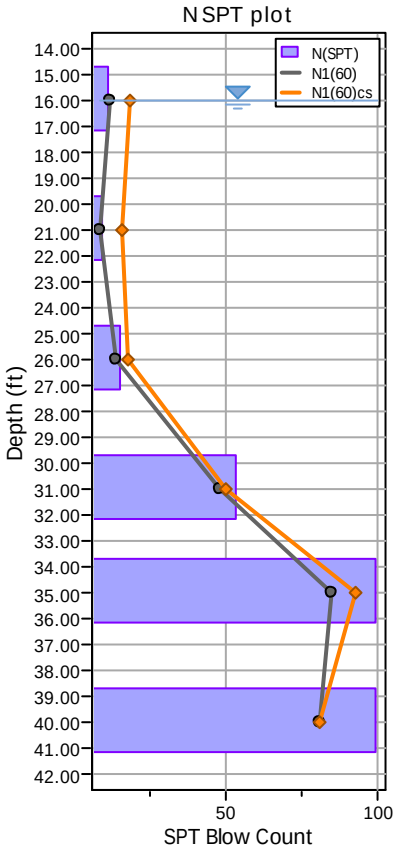
Project title : A.M. Ortega Warehouse

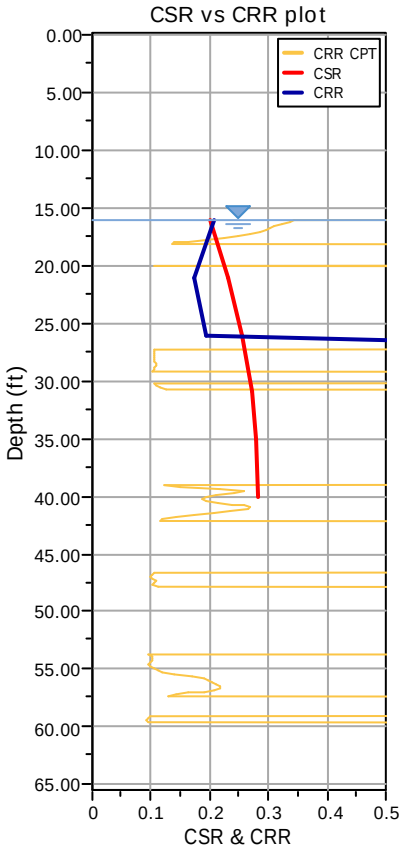
Location : 15229 Olde Highway 80, San Diego County, CA

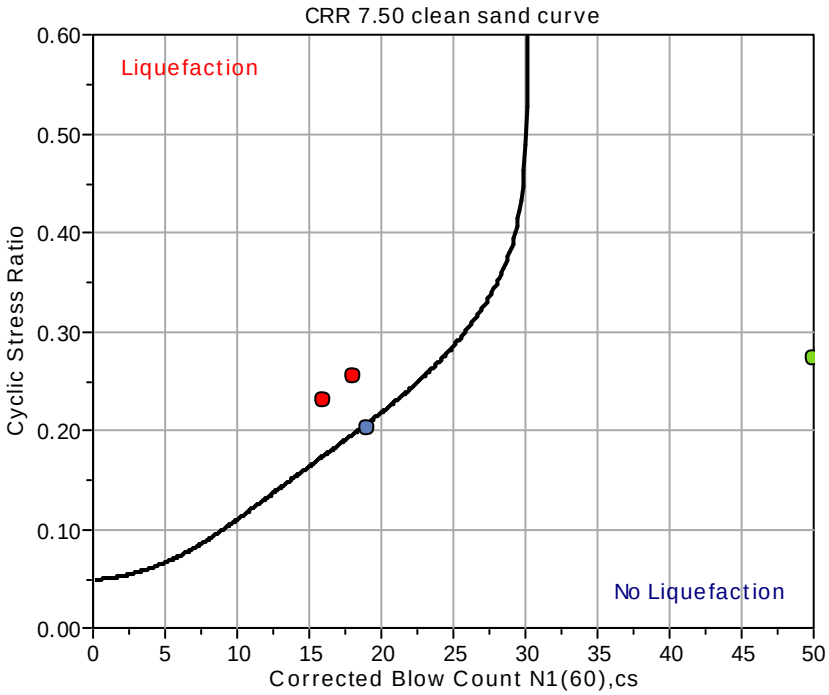
CPT file : Boring B-1

:: Input parameters and analysis properties ::

Analysis method:	NCEER 1998	G.W.T. (in-situ):	16.00
Fines correction method:	Idriss & Seed	G.W.T. (earthq.):	16.00
Sampling method:	Standard Sample	Earthquake magnitude M_w:	6.90
Borehole diameter:	150 mm	Peak ground acceleration:	0.40
Rod length:	5.00	SPT results rounding mode:	Nearest
Hammer energy ratio:	1.00		







:: Cyclic Stress Ratio fully adjusted (CSR*) numeric results ::

No	Depth (ft)	Weight (pcf)	u_o (tsf)	σ_v (tsf)	σ'_v (tsf)	r_d	CSR	K_σ	MSF	CSR^*
1	16.00	127.00	0.00	1.02	1.02	0.96	0.250	1.00	1.24	0.202
2	21.00	127.00	0.16	1.33	1.18	0.95	0.280	0.98	1.24	0.231
3	26.00	127.00	0.31	1.65	1.34	0.94	0.301	0.95	1.24	0.255
4	31.00	127.00	0.47	1.97	1.50	0.92	0.315	0.93	1.24	2.000
5	35.00	127.00	0.59	2.22	1.63	0.89	0.316	0.92	1.24	2.000
6	40.00	127.00	0.75	2.54	1.79	0.85	0.313	0.90	1.24	2.000

Abbreviations

Depth: Depth from free surface where SPT was performed (ft)
u_0: Water pressure at test point (tsf)
σ_v: Total overburden pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio ()
MSF: Effective overburden stress factor
K_σ: Magnitude Scaling Factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) numeric results ::

No	Depth (ft)	Fines %	u_o (tsf)	σ_v (tsf)	σ'_v (tsf)	N_{SPT}	C_N	C_R	C_B	C_S	C_E	$N_{1(60)}$	α	β	$N_{1(60),cs}$	$CRR_{7.5}$	F.S.
1	16.00	34.00	0.00	1.02	1.02	12	1.02	0.95	1.05	1.00	1.00	12	4.93	1.19	19	0.206	1.02
2	21.00	34.00	0.16	1.33	1.18	10	0.95	0.95	1.05	1.00	1.00	9	4.93	1.19	16	0.174	0.75
3	26.00	17.00	0.31	1.65	1.34	16	0.89	0.95	1.05	1.00	1.00	14	3.01	1.06	18	0.196	0.77
4	31.00	11.00	0.47	1.97	1.50	54	0.84	1.00	1.05	1.00	1.00	48	1.21	1.03	50	4.000	2.00
5	35.00	17.00	0.59	2.22	1.63	100	0.81	1.00	1.05	1.00	1.00	85	3.01	1.06	93	4.000	2.00
6	40.00	5.00	0.75	2.54	1.79	100	0.77	1.00	1.05	1.00	1.00	81	0.00	1.00	81	4.000	2.00

Abbreviations

Depth: Depth from free surface where SPT was performed (ft)
Weight: Soil unit weight from previous test point to current (pcf)
u_0: Water pressure at test point (tsf)
σ_v: Total overburden pressure at test point (tsf)
σ_v': Effective overburden pressure based on in situ GWT (tsf)
N_{SPT}: Number of blows count in the field (blows/feet)
C_N: Overburden pressure factor
C_E: Energy ratio factor
C_B: Borehole diameter factor
C_R: Rod length factor
C_S: Sampling method factor
$N_{1(60)}$: Number of blows corrected for 60% energy
α: Fines correction coefficient
β: Fines correction coefficient
$N_{1(60),cs}$: Number of blows corrected for 60% energy and fines
$CRR_{7.5}$: Cyclic Resistance Ratio for M_w 7.50
F.S.: Factor of safety against liquefaction

- Post Liquefaction Reconsolidation (Seed et al, 1985)-

No	Bottom Depth (ft)	ΔH (ft)	$N_{1,60,CS}$	CSR	Factor of Safety	Vertical Strain (%)	ΔSi (in)
1	19.0	3	19.0	0.202	1.02	0.000	0.000
2	24.0	5	16.0	0.231	0.75	1.700	1.020
3	29.0	5	18.0	0.255	0.77	1.500	0.900
4	35.0	6	50.0	2.000	2.00	0.000	0.000
5	40.0	5	93.0	2.000	2.00	0.000	0.000
6	46.0	6	81.0	2.000	2.00	0.000	0.000
						Total	**1.92**