County of San Diego
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

El Nopal TM
PDS2017-TM-5619

11320 El Nopal
Lakeside, CA 92040

ASSESSOR'S PARCEL NUMBER(S):
379-023-39

ENGINEER OF WORK:

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DATE OF SWQMP:
April 24, 2018

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SWQMP APPROVED BY:

APPROVAL DATE:


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COUNTY OF SAN DIEGO
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Attachments

Attachment 1: Backup for PDP Pollutant Control BMPs
- Attachment 1a: Storm Water Pollutant Control Worksheet Calculations
- Attachment 1b: DMA Exhibit
- Attachment 1c: Individual Structural BMP DMA Mapbook

Attachment 2: Backup for PDP Hydromodification Control Measures
- Attachment 2a: Flow Control Facility Design
- Attachment 2b: Hydromodification Management Exhibit
- Attachment 2c: Management of Critical Coarse Sediment Yield Areas
- Attachment 2d: Geomorphic Assessment of Receiving Channels (optional)
- Attachment 2e: Vector Control Plan (if applicable)

Attachment 3: Structural BMP Maintenance Plan
- Attachment 3a: Structural BMP Maintenance Thresholds and Actions
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Attachment 4: County of San Diego PDP Structural BMP Verification for DPW Permitted Land Development Projects

Attachment 5: Copy of Plan Sheets Showing Permanent Storm Water BMPs

Attachment 6: Copy of Project's Drainage Report

Attachment 7: Copy of Project's Geotechnical and Groundwater Investigation Report

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: El Nopal TM
Permit Application Number: PDS2017-TM-5619

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.

Engineer of Work's Signature, PE Number & Expiration Date

Larry Walsh
Print Name

Walsh Engineering & Surveying, Inc.
Company

2-6-19
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	2-20-17	Initial Submittal
2	12-19-17	1st Round of Review Comments
3	4-24-18	2nd Round of Review Comments
4		

Final Design

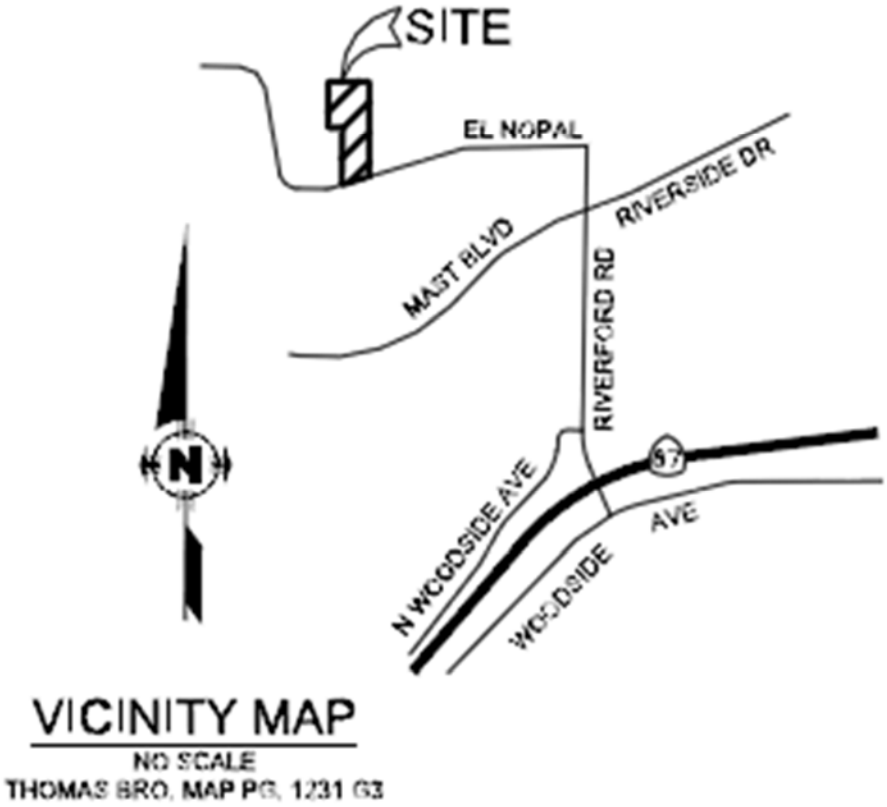
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

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

Project Vicinity Map

Project Name: El Nopal TM
Record ID: PDS2017-TM-5619



VICINITY MAP
NO SCALE
THOMAS BRO. MAP PG. 1231 G3

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

Is the project part of another Priority Development Project (PDP)? If so, a PDP SWQMP is required. Go to Step 2.			(☐ Yes ☒ No
The project is (select one): ☐ New Development ☒ Redevelopment[1]			
The total proposed newly created or replaced impervious area is:			52,272 ft^2
The total existing (pre-project) impervious area is:			13,605 ft^2
The total area disturbed by the project is: ft^2			150,504
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: ___			
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: 13,605 ft^2 (A)
The total proposed newly created or replaced impervious area is 52,272 ft^2 (B)
Percent impervious surface created or replaced (B/A)*100: 384 %
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)	907.12 San Diego Hydrologic Unit, Lower San Diego HA, Santee 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:
There is one existing home on site, as well as two other home structures, all structures on site are run-down and will be removed before construction.

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

☐ Vegetative Cover _____ Acres (_____ Square Feet)
☒ Non-Vegetated Pervious Areas 3.53 Acres (154,100 Square Feet)
☒ Impervious Areas 0.32 Acres (13,605 Square Feet)

Description / Additional Information:
Currently undeveloped land, with private road and one existing house to be removed. Terrain is dry weeds/dirt and the site slopes north to south with a general slope range of 5%-15%

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:

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:

The existing site consists of three existing structures on site that will be removed before construction. There is an existing approximately 20' private road on site that will be widened to the west approximately 20 feet to a 40' private road with 36 feet of drivable width with AC dikes constructed on both sides.

The existing drainage conveyance is natural and runoff is conveyed through the site overland. The site slopes generally 10%-15% from north to south. There is a hillside to the north in which approximately 15 acres flows through the site. Runoff flowing through the site enters an existing 18" CMP that runs under El Nopal, discharging into a natural drainage ditch south of El Nopal. This will remain the POC for the post-developed condition.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:
The proposed project will include 17 lots, with a single family house to be constructed on each lot. The existing 20 foot wide private road will also be widened to a 36' foot private road within a 40 foot right of way.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):
Proposed impervious features of the site will include the widened private road as described above, as well as the 17 proposed single family homes.

List/describe proposed pervious features of the project (e.g., landscape areas):
Proposed impervious features of the site will include the graded slopes as well as the flat area surrounding the homes created from grading the 17 lots.

Does the project include grading and changes to site topography?
☒Yes
☐No

Description / Additional Information:
The lot will be graded to account for 17 single family residential homes.

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)	3.53 Ac	2.01 Ac	44%
Impervious	0.32 Ac	1.52 Ac	31%

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:

The site will include several small storm drain pipes that run along the west side of the property with a catch basin connecting the storm drain pipes to pick up drainage on each individual lot. These storm drain pipes will flow into a proposed bioretention basin with retention in which runoff from the proposed development will be treated. Runoff from the proposed private road widening will also be treated by the bioretention basin as well as the lots fronting the proposed private road. There will also be a proposed concrete brow ditch beginning at the northeast corner of the site that will capture off-site flows that will bypass the bioretention basin. This concrete brow ditch will be connected to a proposed cleanout near the southwest corner of the site, in which treated runoff from the bioretention basin will also converge at this cleanout. From the cleanout there will be a proposed 24” storm drain pipe that connects to another cleanout and takes a 90 degree turn to flow beneath El Nopal and to the POC in which flows from the site meet up with off-site flows. The POC is a natural ditch off-site in which an existing 18” CMP already conveys runoff from the pre-developed condition to the POC.

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 will flow to POC in existing natural channel and make its way to Forester Creek and then eventually the Lower San Diego River.

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
Forester Creek	*Fecal Coliform, Selenium, TDS, pH*	*Fecal coliform*
Lower San Diego River	*Enterococcus, fecal coliform, dissolved oxygen manganese, nitrogen, phosphorus, TDS, aquatic toxicity*	*Fecal coliform*

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	☒	☐	☐
Bacteria & Viruses	☒	☐	☐

[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

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
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:* *N/A* *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.

There is an existing 20' AC paved driveway that is the access for the site that will be treated by the bioretention basin as well due to the 50% rule. This AC driveway will be widened 20' to the west and will be crowned.

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: No storage areas.			
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: No storage areas.			

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: No storage areas.			
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 all "No" answers shown above. Runoff pollutants are listed as N/A because interior floor drains and elevator shaft pumps, interior parking garages, indoor or structural pest control, pools, spas, ponds, fountains, water features, food service, refuse areas, industrial processes, outdoor storage of equipment or materials, vehicle and equipment cleaning, and vehicle repair, fuel dispensing areas, loading docks, fire sprinkler test water, miscellaneous drain or wash water, plazas, sidewalks, and parking lots, are not present on site.			

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: There are no natural drainage pathways.			
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☐Yes	☐No	☒N/A
Discussion / justification if 4.3.2 not implemented: There are no significant natural areas worth conserving. It is dirt and dry weeds.			
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: The majority of the site will be graded and there will be single family homes on each lot. There will not be much opportunity to avoid soil compaction.			
4.3.5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
Discussion / justification if 4.3.5 not implemented:			

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: Harvest and use feasibility analysis is not required for infiltration BMPs.			

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.

There will be a bioretention basin with retention placed at the south end of our project to provide both pollutant control and flow control. This bioretention basin will treat all the newly created impervious surface generated from the project. A bioretention basin was selected due to the Type A soil on site and its ability to allow for infiltration and ability to remove pollutants, as well as ease of maintenance.

(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. N/A TM Phase	
Construction Plan Sheet No. N/A TM Phase	
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)	SCSS Development, LLC
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 2
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.3: Offsite Alternative Compliance Participation Form

PDP INFORMATION	
Record ID:	N/A
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)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.3-1 (Required) -Worksheet B.1-1 (Required) -Worksheet B.4-1 (if applicable) -Worksheet B.4-2 (if applicable) -Worksheet B.5-1 (if applicable) -Worksheet B.5-2 (if applicable) -Worksheet B.5-3 (if applicable) -Worksheet B.6-1 (if applicable) -Summary Worksheet (optional)	☒ Included
Attachment 1b	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☒ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1c	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☒ Included
Attachment 1d	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☐ Included

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	3,945	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	17	#
	3	Total Planted Area within Development	20,000	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?	No	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?	No	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	32	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	52.14	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	24	cubic-feet
	13	Total Anticipated Use Over 36 Hours	56	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.01	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	Yes	yes/no
	17	Is Partial Retention Feasible for this Project?	Yes	yes/no
Result	18	Feasibility Category	3	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	DMA 1	unitless
	1	Basin Drains to the Following BMP Type	Retention	unitless
	2	85th Percentile 24-hr Storm Depth	0.50	inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	1.000	in/hr
	4	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	71,991	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)	100,146	sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	yes/no
	12	Impervious Surfaces **Directed to Dispersion Area** per SD-B (Ci=0.90)		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)		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)		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	172,137	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.55	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	unitless
	31	Initial Weighted Runoff Factor	0.55	unitless
	32	Initial Design Capture Volume	3,945	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	sq-ft
	34	Total Pervious Dispersion Area	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.55	unitless
	38	Design Capture Volume After Dispersion Techniques	3,945	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	0.55	unitless
	42	Final Effective Tributary Area	94,675	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	3,945	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.4-1: Sizing Retention BMPs (V1.3)

Category	#	Description	*i*	Units
BMP Inputs	0	Drainage Basin ID or Name	DMA 1	unitless
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	1.000	in/hr
	2	Design Capture Volume Tributary to BMP	3,945	cubic-feet
	3	Is Retention BMP Vegetated or Non-Vegetated?	Vegetated	unitless
	4	Provided Surface Area	2,800	sq-ft
	5	Provided Surface Ponding Depth	12	inches
	6	Provided Soil Media Thickness	18	inches
	7	Provided Gravel Storage Thickness	30	inches
Infiltration Calculations	8	Volume Infiltrated Over 6 Hour Storm	1,400	cubic-feet
	9	Soil Media Pore Space	0.25	unitless
	10	Gravel Pore Space	0.40	unitless
	11	Effective Depth of Retention Storage	28.5	inches
	12	Drawdown Time for Surface Ponding (Post-Storm)	12	hours
	13	Drawdown Time for Entire Basin (Including 6 Hour Storm)	35	hours
	14	Volume Retained by BMP	8,050	cubic-feet
	15	Fraction of DCV Retained	2.04	ratio
	16	Percentage of Performance Requirement Satisfied	1.00	ratio
	17	Fraction of DCV Retained (normalized to 36-hr drawdown)	1.00	ratio
	18	This BMP Overflows to the Following Drainage Basin	-	unitless
Result	19	**Deficit of Effectively Treated Stormwater**	**0**	cubic-feet

Worksheet B.4-1 General Notes:

A. Applicants may use this worksheet to size Infiltration, Bioretention, and/or Permeable Pavement BMPs (INF-1, INF-2, INF-3) 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 satisfying the pollutant control performance standards will have a deficit treated volume of zero and be

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?

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.	Yes	

Provide basis:

Double-ring infiltrometer infiltration tests have been preformed at the proposed basin location and yielded an infiltration rate of 1.0 in./hr.

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.	Yes	

Provide basis:

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.	Yes	
Provide basis: 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.	Yes	
Provide basis: 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	Yes	

*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.	Yes	

Provide basis:

Full Infiltration (see Part 1)

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.	Yes	

Provide basis:

Full Infiltration (see Part 1)

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.	Yes	
Provide basis: Full Infiltration (see Part 1) 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.	Yes	
Provide basis: Full Infiltration (see Part 1) 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.**	Full Infiltration (see Part 1)	

*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

CHRISTIAN WHEELER
ENGINEERING

September 21, 2016

SCSS Development, LLC
2608 West Canyon Avenue
San Diego, California 92123
Attention: Salim Miro

CWE 2160426.01

Subject: Report of Geotechnical Infiltration Feasibility
Proposed 17 Lot Subdivision, 11320 El Nopal, Lakeside, California

Reference: Walsh Engineering & Surveying, Inc., Preliminary Grading Plan, 17-Unit Subdivision, 11320 El Nopal, Lakeside, California, print date October 28, 2015.

Ladies and Gentlemen:

In accordance with your request and our proposal dated July 7, 2016, we have prepared this report to present the results of our geotechnical storm water infiltration feasibility study for the subject site. In general, the purpose of our investigation was to provide design infiltration rates based on percolation rates measured in the field. We understand that the subject site will be developed into a 17 lot subdivision. Based on our discussions with the project's civil engineer as well as our review of the referenced preliminary grading plans, we understand that it is proposed to construct an infiltration basin within Lot A.

FINDINGS

SITE DESCRIPTION: The subject site is an irregularly shaped parcel located in the Lakeside area of San Diego County, California. The property, which is identified by Assessor's Parcel Number 379-023-39-00, is bordered to the north and west by developed residential properties, to the east by a private driveway, and to the south by El Nopal. The property presently supports two residences. Topographically, the site slopes gently from the north to the south with elevations ranging from about 446 feet to 338 feet (Walsh Engineering & Surveying, Inc., 2015).

FIELD INVESTIGATION: Our subsurface explorations consisted of two 8-inch-diameter borings that were drilled using a truck-mounted drill rig on August 8, 2016. The approximate locations of these borings are shown on Plate No. 1 of this report and were within 50 feet of the proposed infiltration BMP. These borings were drilled to a depth of 16 feet below grade with continuous core samples retrieved during the drilling operation. Logs of the explorations are presented in Appendix A of this report. Two percolation test borings were also drilled within the areas expected to support the infiltration system. The approximate locations of the percolation borings are also shown on Plate No. 1. The borings were logged in detail with emphasis on describing the soil profile. Low permeability and relatively impermeable materials were identified in the borings. No evidence of soil contamination was detected within the samples obtained.

GEOLOGIC SETTING AND SOIL DESCRIPTION: The site is underlain by Quaternary-age alluvial deposits that are mantled by a relatively thin layer of topsoil. At the proposed infiltration basin location, the topsoil was found to have an approximate thickness of 2 feet. As observed within our borings, the topsoil and alluvial deposits typically consist of silty sand (SM).

INFILTRATION RATE DETERMINATION

Our percolation testing was performed in two borings that were drilled in the planned infiltration areas on August 9, 2016. The approximate locations of the percolation borings are shown on Plate No. 1. The eight-inch-diameter borings, which are labelled as PT-1 and PT-2, were drilled to a depth of 60 inches below existing grade and cleaned of all loose material. A four-inch diameter perforated pipe was set in the hole and surrounded by ¾ inch gravel to prevent caving. After pipe installation, the test holes were presoaked. The water within PT-2 dissipated quickly.

The field percolation rates were determined the following day by using the falling head test method. It can be noted that the water placed within the percolation borings the previous day had completely drained during the overnight presoak. Each pipe was filled with water and the “Sandy Soil Criteria Test” was performed over two-25 minute periods of time. The testing within PT-2 resulted in water dropping more than 6 inches during each 25 minute period however, PT-1 did not. The initial water level was established by refilling the test holes to near the top of the proposed BMP. Percolation rates in PT-1 were monitored and recorded every 30 minutes over a period of 6 hours until the infiltration rates stabilized. Percolation rates in PT-2 were monitored and recorded every 10 minutes over a period of 1 hour until the infiltration rates stabilized. Measurements were taken using a water level meter (Solinst, Model 101) with an accuracy measured to 0.005 foot increments (0.06 inch increments). The measured field infiltration rates are presented in Table I.

TABLE I: FIELD PERCOLATION RATES

Test No.	Location	Depth of Testing	Field Percolation Rate	Field Infiltration Rate
PT-1	Lot A	60 inches	1.92 inches per hour	0.07 inches per hour
PT-2	Lot A	60 inches	25.92 inches per hour	1.93 inches per hour

CONCLUSIONS

STORMWATER INFILTRATION

GENERAL: The measured percolation rates were converted to infiltration rates using the Porchet Method. The spreadsheet used for the conversion is included in Appendix B of this report. The average infiltration rate of the soil underlying the proposed BMP is 1 inch per hour.

LABORATORY TESTING: Grain size distribution testing, cation exchange capacity testing, and organic content testing was performed on soil samples obtained from the borings near the anticipated base of the infiltration basin (4 to 8 feet deep). The test results are presented in Appendix C of this report.

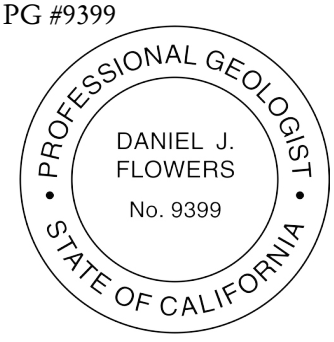
If you should have any questions regarding this report, please do not hesitate to contact this office. This opportunity to be of professional service is sincerely appreciated.

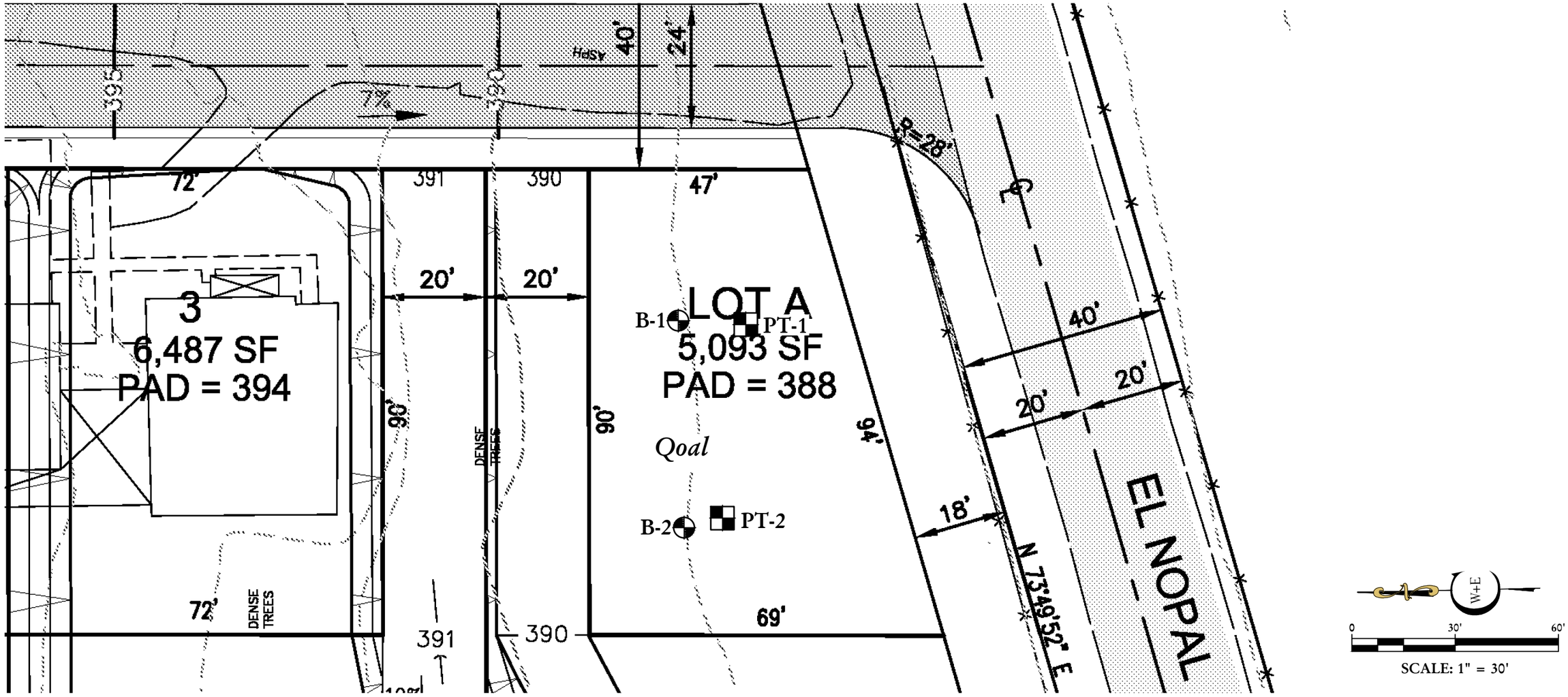
Respectfully submitted,
CHRISTIAN WHEELER ENGINEERING

Daniel B. Adler, RCE #36037

Daniel J. Flowers, PG #9399

DBA:djf
cc: brendan@walsh-engineering.com
larry@walsh-engineering.com





CWE LEGEND

B-2	APPROXIMATE BORING LOCATION
PT-2	APPROXIMATE PERCOLATION TEST LOCATION
Qoal	OLDER ALLUVIUM

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

SITE PLAN AND GEOTECHNICAL MAP

EL NOPAL 17 LOT SUBDIVISION
11320 EL NOPAL
LAKESIDE, CALIFORNIA

DATE:	SEPTEMBER 2016	JOB NO.:	2160426.01
BY:	SD	PLATE NO.:	1

CHRISTIAN WHEELER ENGINEERING

Appendix A

Boring Logs

LOG OF TEST BORING B-1

Date Logged:	8/9/16	Equipment:	Ingersol A300
Logged By:	DJF	Auger Ty;e:	8 inch
Existing Elevation:	388 feet	Drive Type:	140lbs @ 30" drop
Proposed Elevation:	388 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)	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
0	388		SM	**Topsoil:** Light brown, dry, loose, fine- to medium-grained, SILTY SAND, porous with rootlets.							
				Medium dense.	48	SPT					
			SM	**Older Alluvium (Qoal):** Reddish-brown, dry, dense, fine- to medium-grained, SILTY SAND with trace gravels.	90	SPT					
				Damp, very dense.							
5	383				71	SPT					
				Brown, moist.	56	SPT					
				Dense.	45	SPT					
					41	SPT					
10	378				31	SPT					
				Fine- to coarse-grained.	34	SPT					
					45	SPT					
15	373				50	SPT					
				Boring terminated at 16 feet. No groundwater or seepage encountered.							
20	368										
25	363										
30	358										

Notes:

Symbol Legend

- ▽ Groundwater Level During Drilling
- ▼ Groundwater Level After Drilling
- ⁹⁹ Apparent Seepage
- * No Sample Recovery
- ** Non-Representative Blow Count (rocks present)

EL NOPAL 17 LOT SUBDIVISION
11320 EL NOPAL
LAKESIDE, CALIFORNIA

DATE:	SEPTEMBER 2016	JOB NO.:	2160426.01
BY:	SRD	FIGURE NO.:	A-1

CHRISTIAN WHEELER ENGINEERING

LOG OF TEST BORING B-2

Date Logged:	8/9/16	Equipment:	Ingersol A300
Logged By:	DJF	Auger Ty;e:	8 inch
Existing Elevation:	388 feet	Drive Type:	140lbs @ 30" drop
Proposed Elevation:	388 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)	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
0	388		SM	**Topsoil:** Light brown, dry, loose, very fine- to medium-grained, SILTY SAND, porous with rootlets.							
			SM	**Older Alluvium (Qoal):** Light reddish-brown, dry, dense, fine- to medium-grained, SILTY SAND with trace gravels, weathered and porous to 4 feet.	17	SPT					
					45						
				Damp.							
5	383				45						
					46						
				Very dense.							
					62						
				Brown to reddish-brown, moist.	77						
10	378										
					74						
					72						
					50/4"						
15	373				75						
				Boring terminated at 16 feet. No groundwater or seepage encountered.							
20	368										
25	363										
30	358										

Notes:

Symbol Legend

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

EL NOPAL 17 LOT SUBDIVISION
11320 EL NOPAL
LAKESIDE, CALIFORNIA

DATE:	SEPTEMBER 2016	JOB NO.:	2160426.01
BY:	SRD	FIGURE NO.:	A-2

CHRISTIAN WHEELER ENGINEERING

Appendix B

Porchet Method- Percolation to Infiltration Conversion Spreadsheet

Percolation to Infiltration Rate Conversion (Porchet Method)

Perc 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 Height (inches) H_{avg}	Tested Infiltration Rate (inch/hour) I_t
1	0.51	4	60	30	0.00	2.84	2.92	25.92	24.96	0.96	25.44	0.07
2	0.51	4	60	10	0.00	2.82	3.46	26.16	18.48	7.68	22.32	1.93
3												
4												

"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:

1.00 - No Gravel Used (No Caving)

0.51 - 3/4 inch gravel with 8 inch diameter hole

0.64 - 3/4 inch gravel with 6 inch diameter hole

Porchet Method - Tested Percolation Rate Conversion to Tested Infiltration Rate

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

I_t = 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

Appendix C

Laboratory Tests

LABORATORY TEST RESULTS

PROPOSED 17 LOT SUBDIVISION

11320 EL NOPAL

LAKESIDE, CALIFORNIA

GRAIN SIZE DISTRIBUTION (ASTM D422)

Sample Location	**Boring B-1 @ 4'-8'**	**Boring B-2 @ 4'-8'**
Sieve Size		*Percent Passing*
⅜		
#4	100	100
#8	98	98
#16	92	91
#30	80	78
#50	65	61
#100	49	47
#200	36	35

ORGANIC MATTER % (USDA HANDBOOK 60)

Sample Location	**Boring B-1 @ 4'-8'**	**Boring B-2 @ 4'-8'**
Organic Matter (%)	0.16	0.19

CATION EXCHANGE CAPACITY (USDA HANDBOOK 60)

Sample Location	**Boring B-1 @ 4'-8'**	**Boring B-2 @ 4'-8'**
CEC (meq/100g)	9.9	10.9

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 EXHIBIT

11320 EL NOPAL
LAKESIDE, CA 92040

DMA 1
3.95 AC
BIORETENTION BASIN
WITH RETENTION (INF-2)

DMA 3
0.004 AC (168 SF)
DE-MINIMUS

DMA 2
0.16 AC
SELF-MITIGATING

POC 1

EL NOPAL

NOTES:

1. SOIL: TYPE A
2. CRITICAL SEDIMENT YIELD COARSE AREAS: NONE
3. NO GROUNDWATER ENCOUNTERED
4. NO STRUCTURES ON THE PAD ARE SHOWN, HOWEVER, ASSUMED IMPERVIOUS AREA OF 2,750 SF WAS ASSUMED FOR EACH LOT (DRIVEWAY AND HOUSE).

LEGEND:

DMA BOUNDARY

BIORETENTION BASIN WITH RETENTION (INF-2)

BMP TREATMENT AREA:

DMA 1: (INF-2) BIORETENTION BASIN WITH RETENTION	2,800 SF
DMA 2: SELF MITIGATING	
DMA 3: DE MINIMUS	

N

80' 40' 0 80' 160' 240'

SCALE: 1"= 80'

L:\PROJECTS 3D\13776 EL NOPAL\PRODUCTION DRAWINGS\13776-DRAINAGE MAP.DWG January 31, 2018 - 3:41pm

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

SDHM 3.1

PROJECT REPORT

General Model Information

Project Name:	EL NOPAL
Site Name:	El Nopal
Site Address:	11320 El Nopal
City:	Lakeside
Report Date:	4/24/2018
Gage:	FLINN SP
Data Start:	10/01/1963
Data End:	09/30/2004
Timestep:	Hourly
Precip Scale:	1.000
Version Date:	2018/01/19

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

DMA 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Dirt,Flat	0.51
A,Dirt,Moderate	3.06
A,Dirt,Steep	0.54
Pervious Total	4.11

Impervious Land Use	acre
Impervious Total	0
Basin Total	4.11

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

DMA 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A,Dirt,Flat	1.6
A,Dirt,Steep	0.7
Pervious Total	2.3

Impervious Land Use	acre
IMPERVIOUS-FLAT	1.12
IMPERVIOUS-MOD	0.53
Impervious Total	1.65
Basin Total	3.95

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 1	Surface retention 1	

DMA 2 (SELF-MIT)

Bypass:	Yes
GroundWater:	No
Pervious Land Use	acre
A,Dirt,Flat	0.16
Pervious Total	0.16
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.16

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Mitigated Routing

Bioretention 1

Bottom Length: 40.00 ft.
Bottom Width: 70.00 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: 2.5
Material type for third layer: GRAVEL
Infiltration On
Infiltration rate: 1
Infiltration safety factor: 1
Wetted surface area On
Total Volume Infiltrated (ac-ft.): 58.233
Total Volume Through Riser (ac-ft.): 6.139
Total Volume Through Facility (ac-ft.): 64.372
Percent Infiltrated: 90.46
Total Precip Applied to Facility: 1.933
Total Evap From Facility: 1.977
Underdrain not used
Discharge Structure
Riser Height: 1 ft.
Riser Diameter: 24 in.
Element Flows To:
Outlet 1 Outlet 2

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0643	0.0000	0.0000	0.0000
0.0596	0.0643	0.0011	0.0000	0.0000
0.1191	0.0643	0.0023	0.0000	0.0000
0.1787	0.0643	0.0034	0.0000	0.0000
0.2382	0.0643	0.0046	0.0000	0.0000
0.2978	0.0643	0.0057	0.0000	0.0008
0.3574	0.0643	0.0069	0.0000	0.0018
0.4169	0.0643	0.0080	0.0000	0.0036
0.4765	0.0643	0.0092	0.0000	0.0060
0.5360	0.0643	0.0103	0.0000	0.0094
0.5956	0.0643	0.0115	0.0000	0.0113
0.6552	0.0643	0.0126	0.0000	0.0136
0.7147	0.0643	0.0138	0.0000	0.0189
0.7743	0.0643	0.0149	0.0000	0.0236
0.8338	0.0643	0.0161	0.0000	0.0252
0.8934	0.0643	0.0172	0.0000	0.0327
0.9530	0.0643	0.0184	0.0000	0.0414
1.0125	0.0643	0.0195	0.0000	0.0513
1.0721	0.0643	0.0207	0.0000	0.0541
1.1316	0.0643	0.0218	0.0000	0.0573
1.1912	0.0643	0.0230	0.0000	0.0626
1.2508	0.0643	0.0241	0.0000	0.0648
1.3103	0.0643	0.0253	0.0000	0.0648
1.3699	0.0643	0.0264	0.0000	0.0648
1.4295	0.0643	0.0276	0.0000	0.0648

1.4890	0.0643	0.0287	0.0000	0.0648
1.5486	0.0643	0.0299	0.0000	0.0648
1.6081	0.0643	0.0310	0.0000	0.0648
1.6677	0.0643	0.0322	0.0000	0.0648
1.7273	0.0643	0.0333	0.0000	0.0648
1.7868	0.0643	0.0349	0.0000	0.0648
1.8464	0.0643	0.0365	0.0000	0.0648
1.9059	0.0643	0.0381	0.0000	0.0648
1.9655	0.0643	0.0397	0.0000	0.0648
2.0251	0.0643	0.0413	0.0000	0.0648
2.0846	0.0643	0.0428	0.0000	0.0648
2.1442	0.0643	0.0444	0.0000	0.0648
2.2037	0.0643	0.0460	0.0000	0.0648
2.2633	0.0643	0.0476	0.0000	0.0648
2.3229	0.0643	0.0492	0.0000	0.0648
2.3824	0.0643	0.0508	0.0000	0.0648
2.4420	0.0643	0.0524	0.0000	0.0648
2.5015	0.0643	0.0540	0.0000	0.0648
2.5611	0.0643	0.0556	0.0000	0.0648
2.6207	0.0643	0.0571	0.0000	0.0648
2.6802	0.0643	0.0587	0.0000	0.0648
2.7398	0.0643	0.0603	0.0000	0.0648
2.7993	0.0643	0.0619	0.0000	0.0648
2.8589	0.0643	0.0635	0.0000	0.0648
2.9185	0.0643	0.0651	0.0000	0.0648
2.9780	0.0643	0.0667	0.0000	0.0648
3.0376	0.0643	0.0683	0.0000	0.0648
3.0971	0.0643	0.0699	0.0000	0.0648
3.1567	0.0643	0.0714	0.0000	0.0648
3.2163	0.0643	0.0730	0.0000	0.0648
3.2758	0.0643	0.0746	0.0000	0.0648
3.3354	0.0643	0.0762	0.0000	0.0648
3.3949	0.0643	0.0778	0.0000	0.0648
3.4545	0.0643	0.0794	0.0000	0.0648
3.5141	0.0643	0.0810	0.0000	0.0648
3.5736	0.0643	0.0826	0.0000	0.0648
3.6332	0.0643	0.0842	0.0000	0.0648
3.6927	0.0643	0.0857	0.0000	0.0648
3.7523	0.0643	0.0873	0.0000	0.0648
3.8119	0.0643	0.0889	0.0000	0.0648
3.8714	0.0643	0.0905	0.0000	0.0648
3.9310	0.0643	0.0921	0.0000	0.0648
3.9905	0.0643	0.0937	0.0000	0.0648
4.0501	0.0643	0.0953	0.0000	0.0648
4.1097	0.0643	0.0969	0.0000	0.0648
4.1692	0.0643	0.0984	0.0000	0.0648
4.2288	0.0643	0.1000	0.0000	0.0648
4.2500	0.0643	0.1006	0.0000	0.0648

Biofilter Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
4.2500	0.0643	0.1006	0.0000	0.3351	0.0009
4.3096	0.0652	0.1045	0.0000	0.3351	0.0018
4.3691	0.0661	0.1084	0.0000	0.3461	0.0028
4.4287	0.0670	0.1123	0.0000	0.3572	0.0037
4.4882	0.0679	0.1164	0.0000	0.3682	0.0046
4.5478	0.0689	0.1204	0.0000	0.3792	0.0056
4.6074	0.0698	0.1246	0.0000	0.3903	0.0065

4.6669	0.0707	0.1287	0.0000	0.4013	0.0075
4.7265	0.0717	0.1330	0.0000	0.4123	0.0084
4.7860	0.0726	0.1373	0.0000	0.4233	0.0094
4.8456	0.0736	0.1416	0.0000	0.4344	0.0104
4.9052	0.0746	0.1460	0.0000	0.4454	0.0113
4.9647	0.0755	0.1505	0.0000	0.4564	0.0123
5.0243	0.0765	0.1550	0.0000	0.4675	0.0133
5.0838	0.0775	0.1596	0.0000	0.4785	0.0143
5.1434	0.0785	0.1643	0.0000	0.4895	0.0153
5.2030	0.0795	0.1690	0.0000	0.5005	0.0163
5.2625	0.0805	0.1737	0.0298	0.5116	0.0173
5.3221	0.0815	0.1786	0.4105	0.5226	0.0184
5.3816	0.0825	0.1834	1.0115	0.5336	0.0190
5.4200	0.0831	0.1866	1.7649	0.5407	0.0000

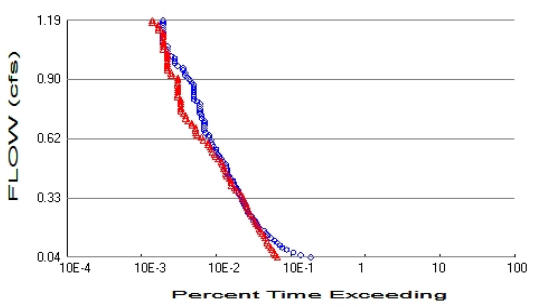
Surface retention 1

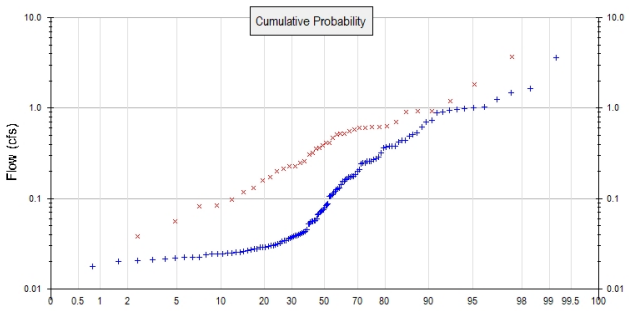
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 1

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 4.11
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.46
Total Impervious Area: 1.65

Flow Frequency Method: Weibull

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.383033
5 year	0.956013
10 year	1.192582
25 year	2.029316

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.387647
5 year	0.629842
10 year	0.933566
25 year	2.174666

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0383	664	238	35	Pass
0.0500	492	225	45	Pass
0.0616	388	215	55	Pass
0.0733	317	201	63	Pass
0.0849	277	193	69	Pass
0.0966	256	183	71	Pass
0.1083	236	177	75	Pass
0.1199	218	172	78	Pass
0.1316	193	164	84	Pass
0.1432	177	156	88	Pass
0.1549	167	148	88	Pass
0.1666	159	141	88	Pass
0.1782	140	135	96	Pass
0.1899	129	131	101	Pass
0.2015	125	125	100	Pass
0.2132	121	119	98	Pass
0.2249	114	114	100	Pass
0.2365	107	107	100	Pass
0.2482	100	104	104	Pass
0.2598	94	100	106	Pass
0.2715	91	97	106	Pass
0.2832	89	93	104	Pass
0.2948	85	90	105	Pass
0.3065	82	89	108	Pass
0.3181	80	85	106	Pass
0.3298	78	81	103	Pass
0.3414	74	78	105	Pass
0.3531	72	74	102	Pass
0.3648	71	67	94	Pass
0.3764	67	63	94	Pass
0.3881	63	57	90	Pass
0.3997	61	57	93	Pass
0.4114	60	57	95	Pass
0.4231	55	54	98	Pass
0.4347	54	50	92	Pass
0.4464	51	49	96	Pass
0.4580	50	48	96	Pass
0.4697	50	46	92	Pass
0.4814	49	45	91	Pass
0.4930	48	43	89	Pass
0.5047	44	42	95	Pass
0.5163	42	38	90	Pass
0.5280	40	35	87	Pass
0.5397	38	34	89	Pass
0.5513	36	32	88	Pass
0.5630	36	31	86	Pass
0.5746	33	30	90	Pass
0.5863	32	28	87	Pass
0.5980	31	28	90	Pass
0.6096	31	24	77	Pass
0.6213	29	23	79	Pass
0.6329	29	20	68	Pass
0.6446	26	19	73	Pass

0.6563	25	19	76	Pass
0.6679	25	19	76	Pass
0.6796	25	17	68	Pass
0.6912	25	17	68	Pass
0.7029	25	15	60	Pass
0.7145	23	14	60	Pass
0.7262	23	14	60	Pass
0.7379	22	13	59	Pass
0.7495	22	12	54	Pass
0.7612	22	12	54	Pass
0.7728	22	12	54	Pass
0.7845	22	12	54	Pass
0.7962	20	12	60	Pass
0.8078	18	12	66	Pass
0.8195	18	11	61	Pass
0.8311	18	11	61	Pass
0.8428	18	11	61	Pass
0.8545	18	11	61	Pass
0.8661	18	11	61	Pass
0.8778	18	11	61	Pass
0.8894	17	11	64	Pass
0.9011	16	11	68	Pass
0.9128	15	11	73	Pass
0.9244	14	9	64	Pass
0.9361	14	9	64	Pass
0.9477	13	8	61	Pass
0.9594	13	8	61	Pass
0.9711	11	8	72	Pass
0.9827	10	8	80	Pass
0.9944	10	8	80	Pass
1.0060	10	8	80	Pass
1.0177	9	8	88	Pass
1.0294	8	8	100	Pass
1.0410	8	8	100	Pass
1.0527	8	7	87	Pass
1.0643	8	7	87	Pass
1.0760	7	7	100	Pass
1.0876	7	7	100	Pass
1.0993	7	7	100	Pass
1.1110	7	7	100	Pass
1.1226	7	7	100	Pass
1.1343	7	7	100	Pass
1.1459	7	6	85	Pass
1.1576	7	6	85	Pass
1.1693	7	6	85	Pass
1.1809	7	5	71	Pass
1.1926	7	5	71	Pass

Water Quality

Drawdown Time Results

Pond: Bioretention 1

Days	Stage(feet)	Percent of Total Run Time
1	0.010	38.578
2	0.020	37.975
3	0.030	37.317
4	0.041	36.536
5	0.051	35.821

Maximum Stage: 4.250 Drawdown Time: 05 00:00:10

Pond: Surface retention 1

Days	Stage(feet)	Percent of Total Run Time
1	N/A	0.0158
2	N/A	0.0158
3	N/A	0.0158
4	N/A	0.0158
5	N/A	0.0158

Maximum Stage: 1.000 Drawdown Time: Less than 1 day

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

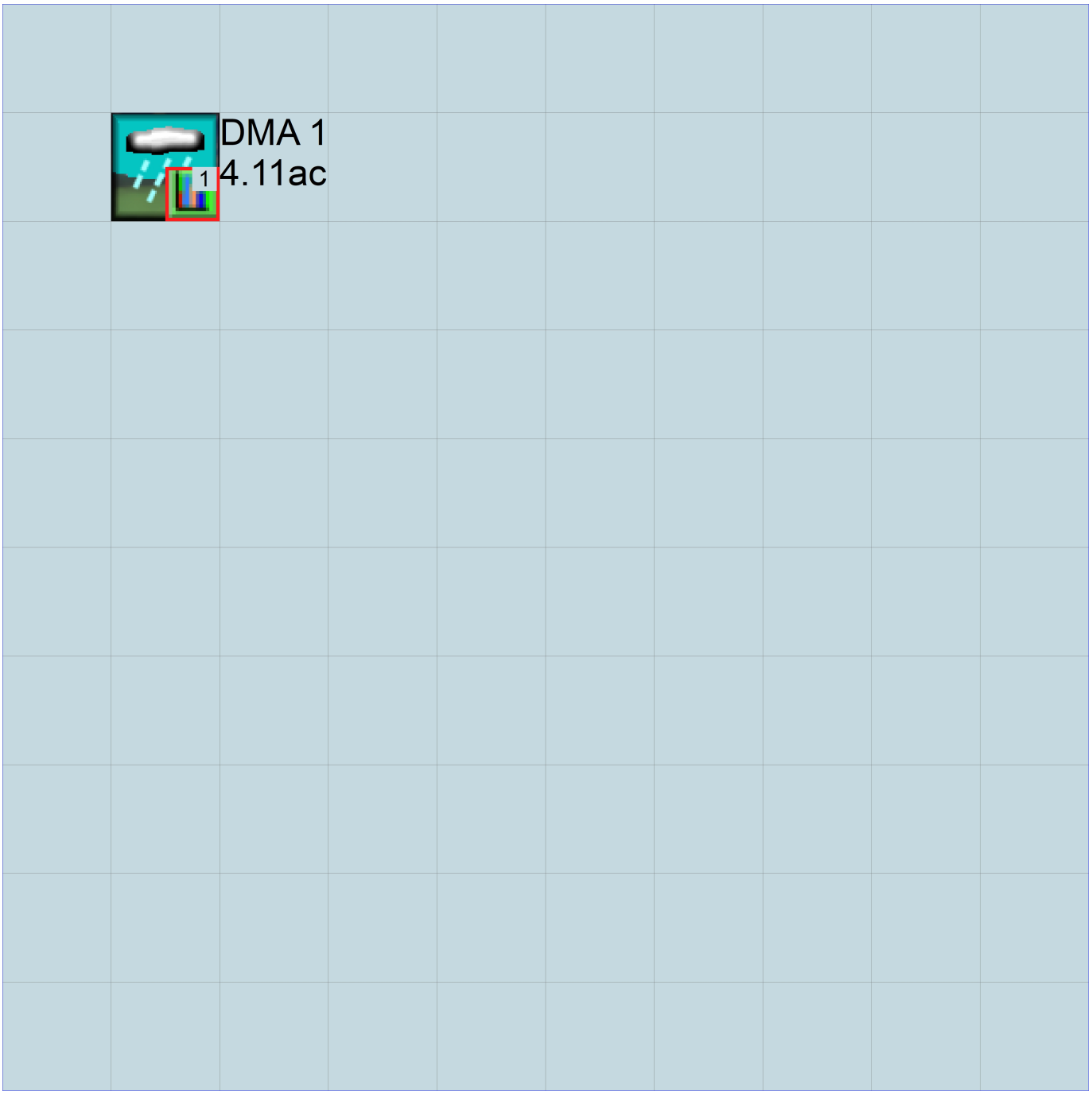
No PERLND changes have been made.

IMPLND Changes

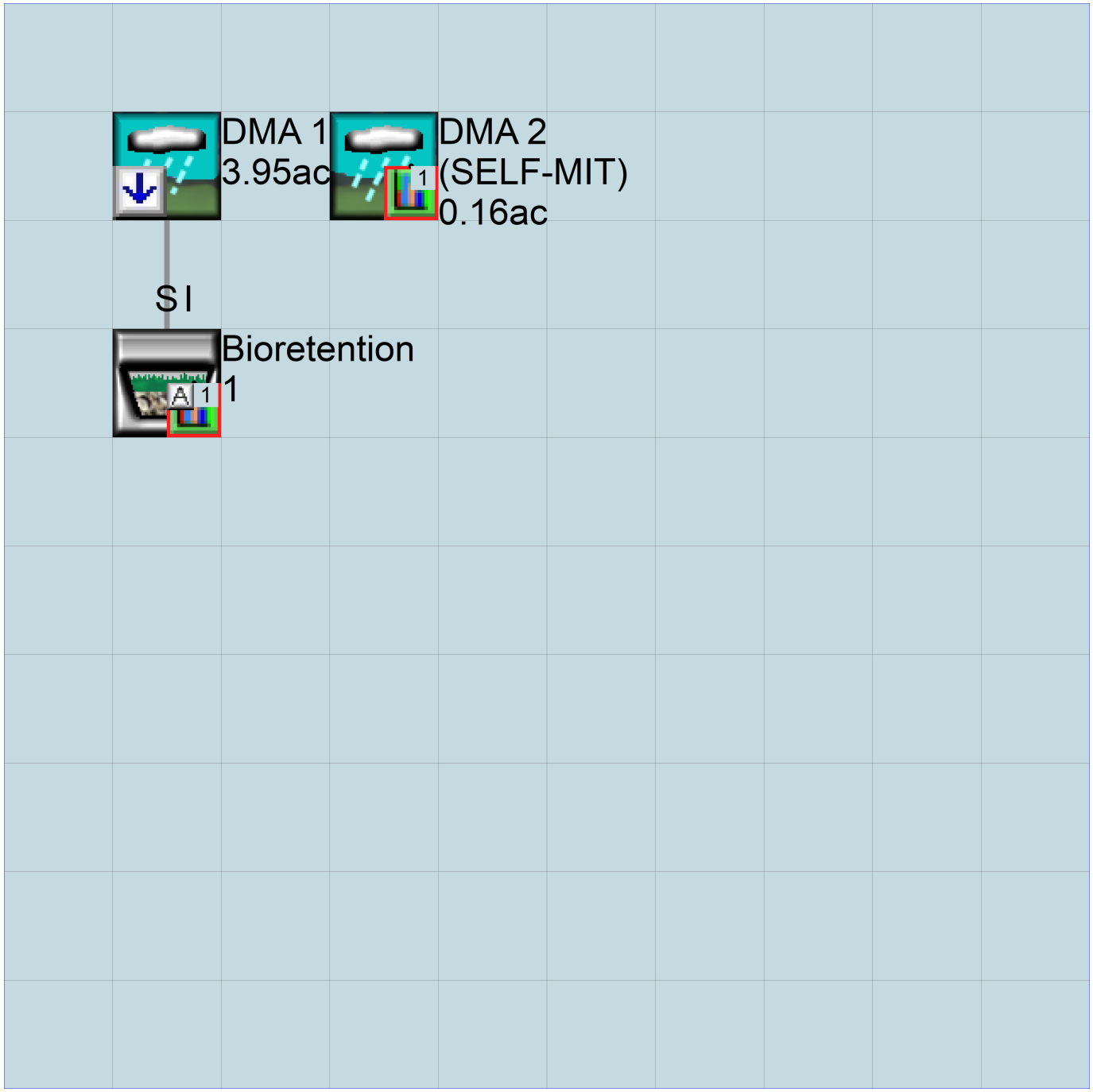
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



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Local (360)943-0304

www.clearcreeksolutions.com

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

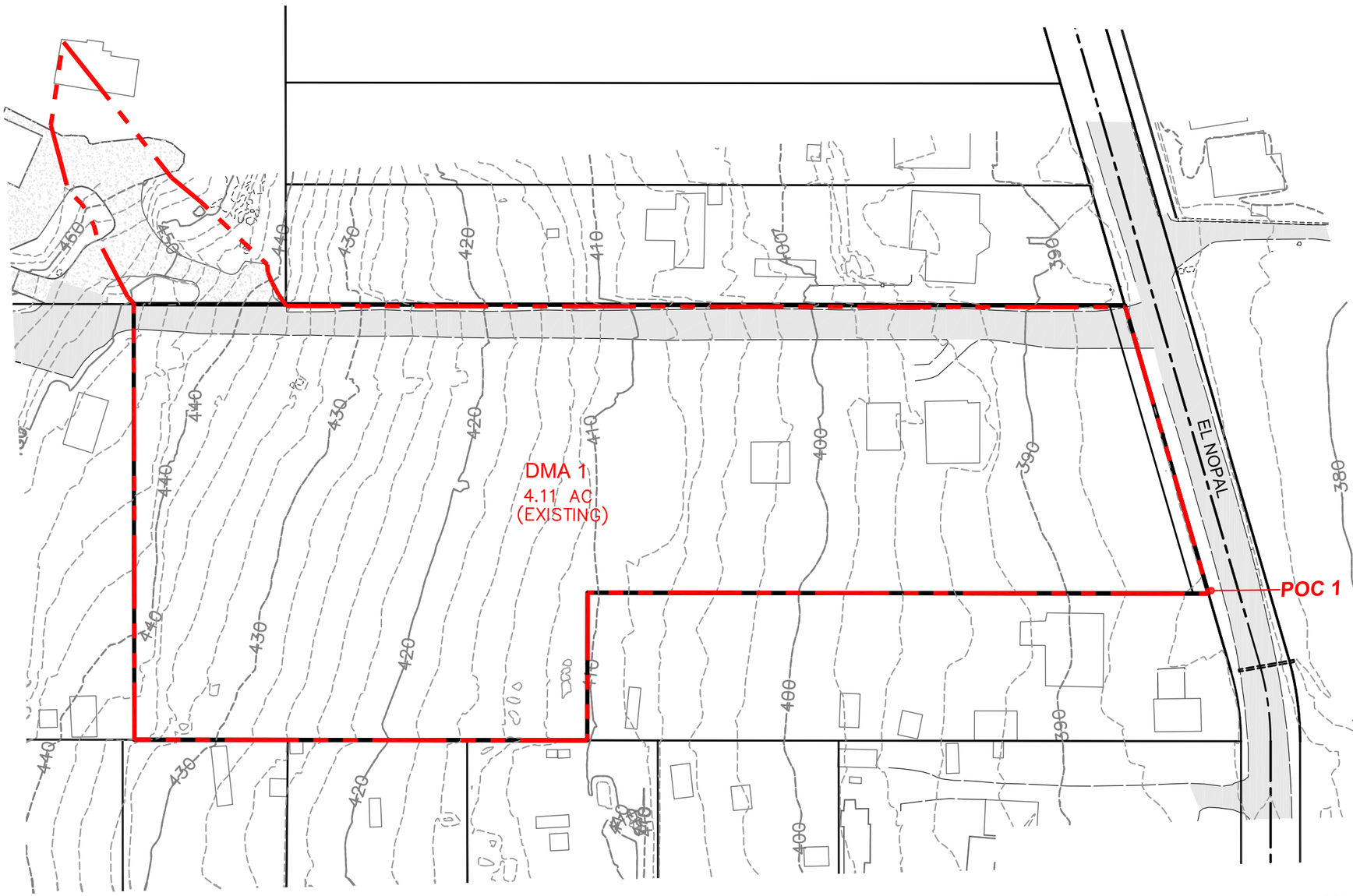
The Hydromodification Management Exhibit must identify:

☒ 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

EXISTING CONDITION

11320 EL NOPAL
LAKESIDE, CA 92040



LEGEND:

DMA BOUNDARY

NOTES:

1. SOIL: TYPE A
2. CRITICAL SEDIMENT YIELD COARSE AREAS: NONE
3. NO GROUNDWATER ENCOUNTERED

N

80' 40' 0 80' 160' 240'

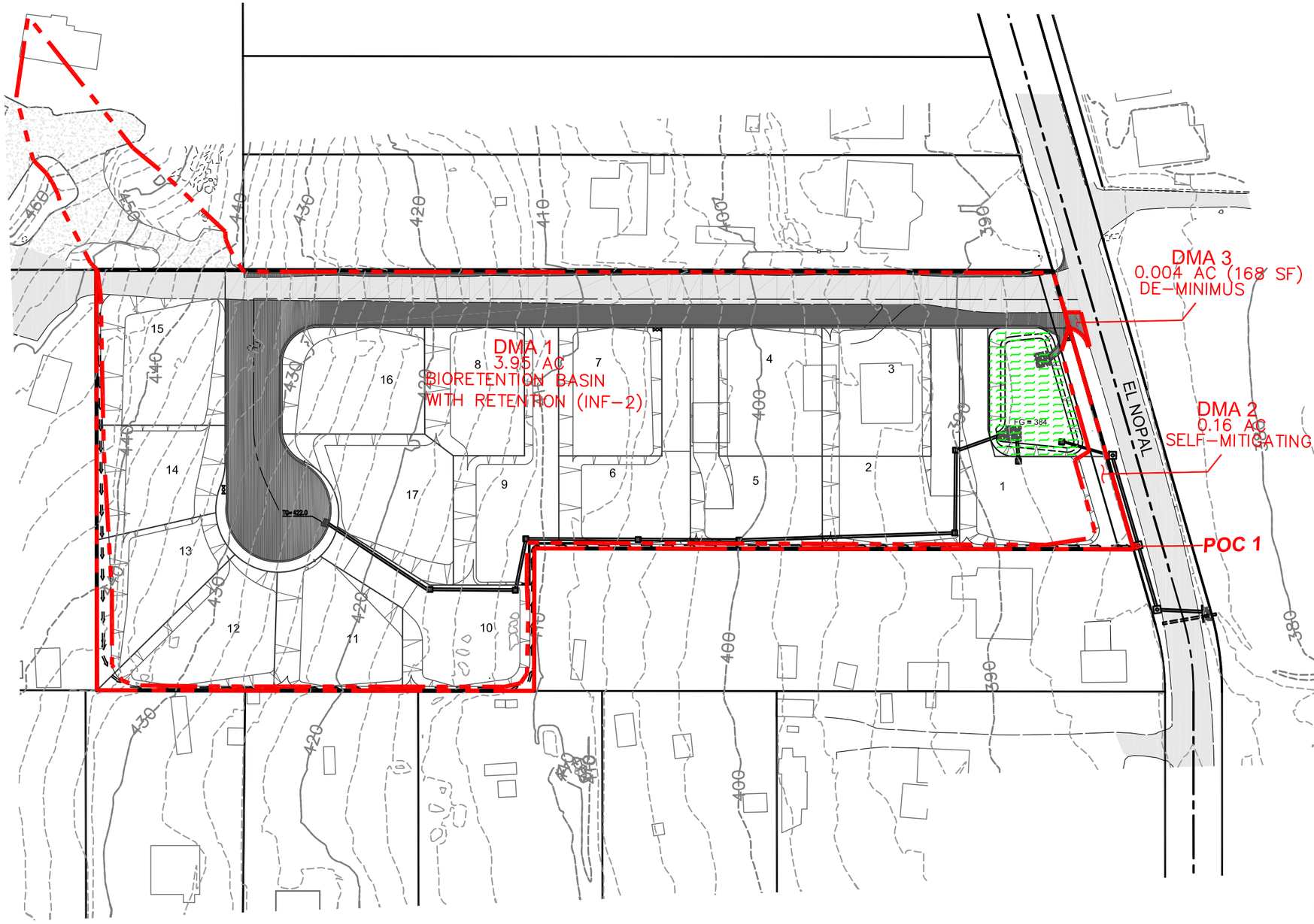
SCALE: 1"= 80'

L:\PROJECTS 3D\13776 EL NOPAL\PRODUCTION DRAWINGS\13776-DRAINAGE MAP.DWG January 31, 2018 - 3:37pm

HYDROMODIFICATION EXHIBIT

PROPOSED CONDITION

11320 EL NOPAL
LAKESIDE, CA 92040



NOTES:

1. SOIL: TYPE A

2. CRITICAL SEDIMENT YIELD COARSE AREAS: NONE

3. NO GROUNDWATER ENCOUNTERED

4. NO STRUCTURES ON THE PAD ARE SHOWN, HOWEVER, ASSUMED IMPERVIOUS AREA OF 2,750 SF WAS ASSUMED FOR EACH LOT (DRIVEWAY AND HOUSE).

LEGEND:

DMA BOUNDARY

BIORETENTION BASIN WITH RETENTION (INF-2)

BMP TREATMENT AREA:

DMA 1:
(INF-2) BIORETENTION BASIN WITH RETENTION — 2,800 SF

DMA 2:
SELF MITIGATING

DMA 3:
DE MINIMUS

N

80' 40' 0 80' 160' 240'

SCALE: 1"= 80'

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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

BMP: Bioretention Area
MAINTENANCE ACTIVITIES

ROUTINE ACTION	MAINTENANCE INDICATOR	FIELD MEASUREMENT	MEASUREMENT FREQUENCY	MAINTENANCE ACTIVITY	Frequency (# of times per year)	Hours per Event	Average Labor Crew Size	Avg. (Pro-Rated) Labor Rate/Hr. ($)	Equipment	Equipment Cost/Hour ($)	Materials & Incidentals Cost or Disposal Cost/Event ($)	Total cost per visit ($)	Total cost per year ($)
Vegetation Management for Aesthetics (optional)	Average vegetation height greater than 12-inches, emergence of trees or woody vegetation,	Visual observation and random measurements through out the side slope area	Annually, prior to start of wet season	Cut vegetation to an average height of 6-inches and remove trimmings. Remove any trees, or woody vegetation.	1.0	2.0	2	$ 74.97	Utility Truck	$ 14.39	$ 50.00	$ 379	$ 379
Soil Repair	Evidence of erosion	Visual observation	Annually, prior to start of wet season	Reseed/revegetate barren spots prior to wet season.	1.0	4.0	2	$ 74.97	Utility Truck	$ 14.39	$ 150.00	$ 807	$ 807
Standing Water	Standing water for more than 96 hrs	Visual observation	Annually, 96 hours after a target storm (0.60 in) event	Drain facility. Corrective action prior to wet season. Consult engineers if immediate solution is not evident.	1.0	1.0	2	$ 74.97	Utility Truck	$ 14.39		$ 164	$ 164
Trash and Debris	Trash and Debris present	Visual observation	Annually, prior to start of wet season	Remove and dispose of trash and debris	1.0	2.0	2	$ 74.97	Utility Truck	$ 14.39		$ 329	$ 329
Sediment Management	Sediment depth exceeds 10% of the facility design	Measure depth at apparent maximum and minimum accumulation of sediment. Calculate average depth	Annually, prior to start of wet season	Remove and properly dispose of sediment. Regrade if necessary. (expected every 2 years)	0.5	8.0	2	$ 74.97	Utility Truck, 10-15 yd Truck, Backhoe	$ 56.02	$ 400.00	$ 2,048	$ 1,024
Underdrains	Evidence of Clogging	Visual Observation	Annually, prior to start of wet season	Corrective action prior to wet season. Consult engineers if immediate solution is not evident.	1.0	0.5	2	$ 74.97	Utility Truck	$ 14.39		$ 82	$ 82
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, burrows, emergence of trees or woody vegetation, graffiti or vandalism, fence damage, etc.	Visual observation	Annually, prior to start of wet season	Corrective action prior to wet season. Consult engineers if immediate solution is not evident.	1.0	1.0	2	$ 74.97	Utility Truck	$ 14.39		$ 164	$ 164
Reporting					1.0	3.0	1	$ 74.97				$ 225	$ 225
				Average Annual Total		32.0							$ 3,174

				Small Bioretention (500 sf)		32.0							$ 3,174
				Medium Bioretention (2000 sf)		44.0							$ 4,078
				Large Bioretention (4000 sf)		68.0							$ 5,877

Labor Rate	$74.97/hr

Equipment	Equipment Cost
Utility Truck	$14.39/hr
10-15 yd truck	$28.27/hr
Backhoe	$13.36/hr
Vactor	$62.70/hr
Sweeper	$123.26/hr

INF-2
Bioretention

BMP MAINTENANCE FACT SHEET
FOR
STRUCTURAL BMP INF-2 BIORETENTION

Bioretention (bioretention without underdrain) facilities are vegetated surface water systems that filter water through vegetation and soil, or engineered media prior to infiltrating into native soils. Bioretention facilities are designed to infiltrate the full design capture volume (DCV) into native soils. They have no underdrain, and no impermeable liner. Typical bioretention 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 optional aggregate storage layer
- Optional aggregate storage layer for additional infiltration storage
- Uncompacted native soils at the bottom of the facility
- Overflow structure

Normal Expected Maintenance

Bioretention 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, underlying native soils, or outlet structure. The specific cause of the drainage issue must be determined and corrected. If it is determined that the underlying native soils have been compacted or do not have the infiltration capacity expected, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.
- 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

Bioretention 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**.

INF-2
Bioretention

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR INF-2 BIORETENTION		
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 INF-2 BIORETENTION (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, or repairing/replacing clogged or compacted soils. If it is determined that the underlying native soils have been compacted or do not have the infiltration capacity expected, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.	• 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 because the underlying native soils have been compacted or do not have the infiltration capacity expected, 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.

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 INF-2.
http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=250&Itemid=220

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INF-2
Bioretention

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 INF-2 BIORETENTION 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 INF-2 BIORETENTION 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 INF-2 BIORETENTION 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:		

INF-2
Bioretention

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

INSPECTION AND MAINTENANCE CHECKLIST FOR INF-2 BIORETENTION 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:		
Damage to structural components such as weirs, inlet or outlet structures Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Repair or replace as applicable ☐ Other / Comments:		

INF-2
Bioretention

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

INSPECTION AND MAINTENANCE CHECKLIST FOR INF-2 BIORETENTION PAGE 5 of 5			
Threshold/Indicator	**Maintenance Recommendation**	**Date**	**Description of Maintenance Conducted**
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 Maintenance Needed? ☐ YES ☐ NO ☐ N/A	☐ Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, 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 it is determined that the underlying native soils have been compacted or do not have the infiltration capacity expected, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

**If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria because the underlying native soils have been compacted or do not have the infiltration capacity expected, 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.

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.

ATTACHMENT 4

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

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County of San Diego BMP Design Manual Verification Form	
Project Summary Information	
Project Name	N/A TM Phase
Record ID (e.g., grading/improvement plan number)	
Project Address	
Assessor's Parcel Number(s) (APN(s))	
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	
Responsible Party for Construction Phase	
Developer's Name	
Address	
Email Address	
Phone Number	
Engineer of Work	
Engineer's Phone Number	
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

County of San Diego BMP Design Manual Verification Form Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)					
Description/Type of Structural BMP	**Plan Sheet #**	**STRUCT-URAL BMP ID#**	**Maint-enance Category**	**Maintenance Agreement Recorded Doc #**	**Revisions**
*All Priority Development Projects (PDPs) require a Structural BMP					

Note: If this is a partial verification of Structural BMPs, provide a list and map denoting Structural BMPs that have already been submitted, those for this submission, and those anticipated in future submissions.

County of San Diego BMP Design Manual Verification Form Page 3 of 4

Checklist for Applicant to submit to PDCI:

- ☐ Copy of the final accepted SWQMP and any accepted addendum.
- ☐ Copy of the most current plan showing the Stormwater Structural BMP Table, plans/cross-section sheets of the Structural BMPs and the location of each verified as-built Structural BMP.
- ☐ Photograph of each Structural BMP.
- ☐ Photograph(s) of each Structural BMP during the construction process to illustrate proper construction.
- ☐ Copy of the approved Structural BMP maintenance agreement and associated security

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs 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 your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

[SEAL]

Date:_____

County of San Diego BMP Design Manual Verification Form Page 4 of 4

COUNTY - OFFICIAL USE ONLY:

For PDCI: Verification Package #: _____

PDCI Inspector: _____

Date Project has/expects to close: _____

Date verification received from EOW: _____

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

PDCI Inspector's Signature: _____ Date: _____

FOR WPP:

Date Received from PDCI: _____

WPP Submittal Reviewer: _____

WPP Reviewer concurs that the information provided for the following Structural BMPs is acceptable to enter into the Structural BMP Maintenance verification inventory:

List **acceptable** Structural BMPs:

WPP Reviewer's Signature: _____ Date: _____

ATTACHMENT 5

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

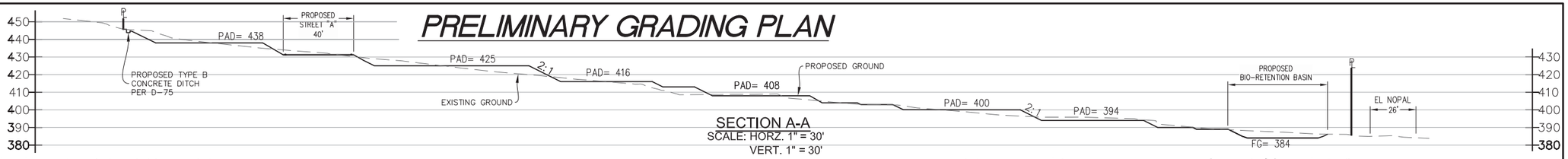
This is the cover sheet for Attachment 5.

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



SECTION A-A
SCALE: HORZ. 1" = 30'
VERT. 1" = 30'

SITE ADDRESS:

11320 EL NOPAL
LAKESIDE, CA 92040

OWNER:

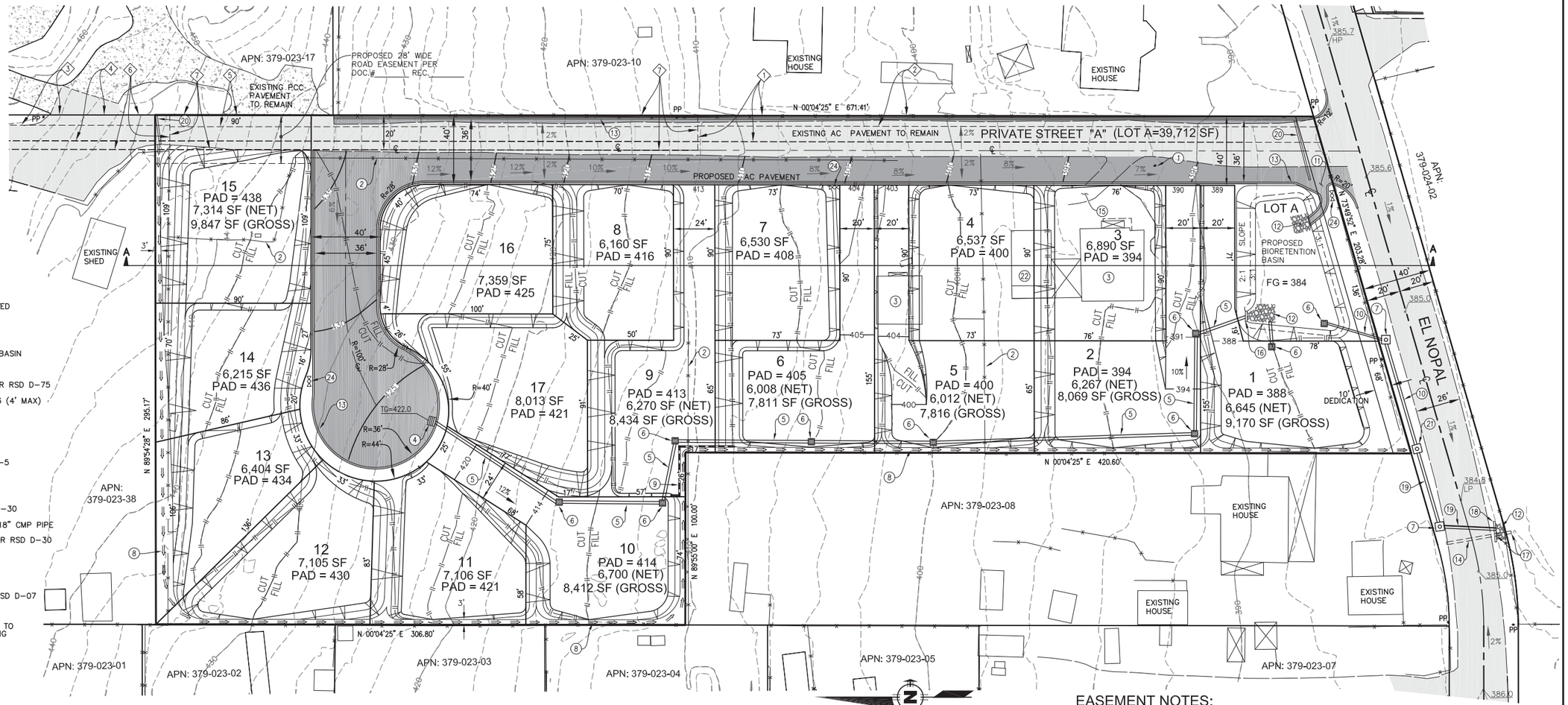
SALIM MIRO, MANAGING MEMBER
SCSS DEVELOPMENT, LLC
12905 SEDGE CT.
SAN DIEGO, CA 92129
(858)922-6424

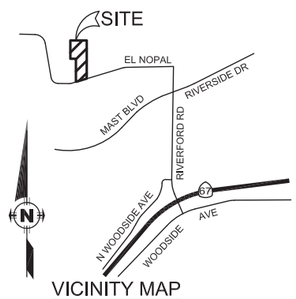
EARTHWORK:

CUT = FILL = 9,000 CY
IMPORT/EXPORT = 0 CY

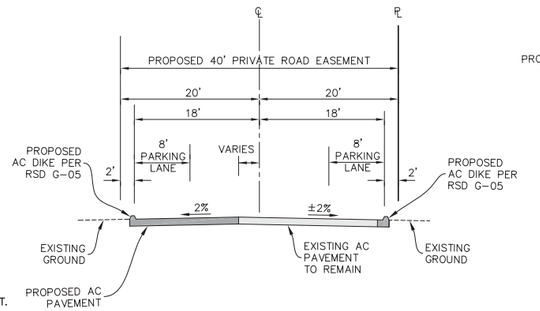
LEGEND:

1. EXISTING POWER POLE TO BE REMOVED
2. EXISTING FENCE TO BE REMOVED
3. EXISTING STRUCTURE/HOME TO BE REMOVED
4. PROPOSED GRATE INLET
5. PROPOSED 12" RCP STORM DRAIN PIPE
6. PROPOSED 36"x36" BROOKS BOX CATCH BASIN
7. PROPOSED CLEAN-OUT PER RSD D-09
8. PROPOSED TYPE "B" CONCRETE DITCH PER RSD D-75
9. PROPOSED RETAINING WALL PER RSD C-3 (4' MAX)
10. PROPOSED 18" RCP STORM DRAIN PIPE
11. PROPOSED AC SPILLWAY PER RSD D-22
12. PROPOSED RIP RAP PER RSD D-40
13. PROPOSED MODIFIED AC DIKE PER RSD G-5
14. EXISTING 18" CMP TO REMAIN
15. EXISTING AC DRIVEWAY TO BE REMOVED
16. PROPOSED TYPE A HEADWALL PER RSD D-30
17. REMOVE APPROXIMATELY 9' OF EXISTING 18" CMP PIPE
18. PROPOSED TYPE A DOUBLE HEADWALL PER RSD D-30
19. PROPOSED 24" RCP STORM DRAIN PIPE
20. PROPOSED 3" HIGH AC SPEED BUMP FOR DRAINAGE PURPOSES
21. PROPOSED TYPE "F" CATCH BASIN PER RSD D-07
22. EXISTING GARAGE TO BE REMOVED
23. PROPOSED PCC BROW DITCH CONNECTION TO TRANSPORT OFF-SITE FLOW FROM EXISTING AC ROAD TO PROPOSED BROW DITCH
24. PROPOSED FIRE HYDRANT

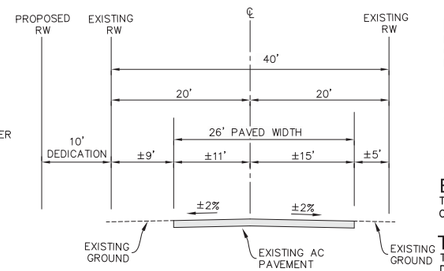




VICINITY MAP
NO SCALE
THOMAS BRO. MAP PG. 1231 G3



PROPOSED STREET "A" (TYPICIAL SECTION)
LOOKING NORTH
NO SCALE



EL NOPAL (TYPICIAL SECTION)
LOOKING EAST
NO SCALE

30' 15' 0 30' 60' 90'
SCALE: 1"= 30'

LEGAL DESCRIPTION:

PARCEL "B" IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE CERTIFICATE OF COMPLIANCE RECORDED 3-26-15 AS DOC # 2015-0142449.

BENCHMARK:

DESCRIPTION: PT. 2170 - 3/4" PIPE WITH DISC STAMPED "RCE 20516"
LOCATION: SOUTHEAST CORNER OF PARCEL 3, PM 11542.
ELEVATION: 385.35
SOURCE: ROS 12252

BASIS OF BEARINGS:

THE WESTERLY LINE OF THAT 10.95 AC TRACT OF LAND SHOWN ON ROS 1503, BEING N 00°04'25" E.

TOPOGRAPHY:

TOPOGRAPHY PROVIDED BY PHOTOGEODETIC, INC.
DATE FLOWN: JULY 13, 2013.

ASSESSOR'S PARCEL NUMBER:

379-023-39

EASEMENT NOTES:

EASEMENTS PLOTTED PER PRELIMINARY REPORT PREPARED BY CORINTHIAN TITLE COMPANY AS ORDER NO. 67621-PD DATED MAY 6, 2013.

1. 15' WIDE EASEMENTS FOR ROAD AND PUBLIC UTILITIES RECORDED 3-11-1949 IN BOOK 3138, PAGE 17, AND RECORDED 4-16-1951 IN BOOK 4056, PAGE 165, O.R.
2. 6' WIDE EASEMENT FOR SDG&E RECORDED 10-25-1956 IN BOOK 6315, PAGE 398, O.R.

   EASEMENT FOR SDG&E RECORDED 5-11-1949 IN BOOK 2637, PAGE 49, O.R. NOT SHOWN HEREON. THE EXACT LOCATION OF SAID EASEMENT IS NOT DISCLOSED OF RECORD.
3. 6' WIDE EASEMENT FOR SDG&E RECORDED 10-25-1956 IN BOOK 6315, PAGE 350, O.R.
4. 15' WIDE EASEMENT FOR ROAD AND PUBLIC UTILITIES RECORDED 6-22-1953 IN BOOK 4897, O.R.
5. EASEMENT FOR SDG&E RECORDED 10-25-1956 IN BOOK 6315, PAGE 362, O.R. EASEMENT IS NOT PARALLEL TO PROPERTY LINE AND IS THEREFORE NOT OF CONSTANT WIDTH.
6. 20' WIDE EASEMENT FOR ROAD AND PUBLIC UTILITIES RECORDED 4-1-1974 AS INSTRUMENT NO. 74-80223, O.R.
7. 20' WIDE EASEMENT FOR ROAD AND PUBLIC UTILITIES RECORDED 4-1-1974 AS INSTRUMENT NO. 74-80224, O.R.

NOTE:
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 PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.

PREPARED BY:

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

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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: El Nopal Drainage Study
Prepared By: Walsh Engineering & Surveying, Inc.
Date: 2-7-17

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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: N/A
Prepared By:
Date:
n

Infiltration Testing report performed by Christian Wheeler is provided within this report after Infiltration Form I-8 in Attachment 1.

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