
Appendix I

Stormwater Quality Management Plan



STORM WATER QUALITY MANAGEMENT PLAN

JEFFERSON OCEANSIDE


PREPARED FOR
JPI DEVELOPMENT COMPANY
12250 EL CAMINO REAL, SUITE 380
SAN DIEGO, CA 92130

PREPARED BY:
FUSCOE ENGINEERING, INC.
6390 GREENWICH DR. STE: 170
SAN DIEGO, CA 92122

PROJECT MANAGER
BRYAN D. SMITH

DATE PREPARED: FEBRUARY 2022

(PERMIT APPLICATION #: D20-00004, CUP20-00005)

CITY OF OCEANSIDE ENGINEERING DIVISION
PRIORITY DEVELOPMENT PROJECT STORM WATER QUALITY MANAGEMENT PLAN FOR Jefferson Oceanside
 2/23/2022 Bryan D. Smith – RCE 75822

PREPARED FOR:

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How to Use This Template

This template, assembled by GHD Inc. on behalf of the City of Oceanside, is for the development of Storm Water Quality Management Plans (SWQMPs) for Priority Development Projects (PDPs) proposed within Oceanside, CA. It is based on requirements set forth in the Regional Water Quality Control Board's National Pollutant Discharge Elimination System MS4 Permit that covers the San Diego Region (Order No. R9-2013-0001).

All references within the template refer to the City of Oceanside BMP Design Manual dated February 2016 (Manual). Use of this template in conjunction with the Manual is intended to help a project applicant develop a SWQMP compliant with City of Oceanside and MS4 Permit requirements.

Template Date: February 16, 2016

Assembled By:



Quick Reference Guide

Item	Project Information
Project Name	Jefferson - Oceanside
Application Number(s)	D20-00004, CUP20-00005
Project Address	SW corner of Oceanside Blvd and Crouch St.
Total Parcel Area	Property: 27 acres, Project/Disturbed Area: 9.91 Acres
Project Description	<p>The Jefferson Oceanside project is a proposed mixed use, Transit-Oriented Development (TOD) project. The site is approximately 27 acres of which, a previously graded 12.89 acre pad is proposed for the mixed use development. 10.63 acres of this site is developable, once accounting for setbacks from Loma Alta Creek and the extension of Oceanside Boulevard from the west through the project site. The site is surrounded by commercial/ office and commercial/retail to the west, commercial/retail to the north, and single family residential to the south. The mixed-use project proposes the construction of 287 Residential Apartments units, 3,000 commercial/retail space, the extension of South Oceanside Boulevard between Union Plaza and Crouch Street and by request of the City of Oceanside, conduct sidewalk resurfacing maintenance of the existing sidewalk on Crouch Street to the south of the project to improve the sidewalk's degraded condition. This sidewalk maintenance is exempt from PDP requirements as it qualifies as "Resurfacing existing roadways, sidewalks, pedestrian ramps or bike lanes on existing roads" per table 1-2 of the City of Oceanside BMP Design Manual. This exempt resurfacing is referred to as 'offsite' work in this plan.</p> <p>In pre-construction conditions, the site is undeveloped and has a pre-graded pad where the proposed apartment buildings will be constructed..</p>
Proposed Disturbed Area	431,680 sq. ft.
Created or Replaced Impervious	302,587 sf. (onsite), 17,266 sf (offsite) <u>Total: 320,414 sf (7.36 ac)</u>
Project Hydrologic Unit Watershed	<input type="checkbox"/> Santa Maria <input type="checkbox"/> San Luis Rey <input checked="" type="checkbox"/> Carlsbad
Required to implement HMP	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



Quick Reference Guide

Item	Project Information
Project Name	Jefferson - Oceanside
Application Number(s)	D20-00004, CUP20-00005
Project Address	SW corner of Oceanside Blvd and Crouch St.
Total Parcel Area	Property: 27 acres, Project/Disturbed Area: 11.34 Acres
Project Description	<p>The Jefferson Oceanside project is a proposed mixed use, Transit-Oriented Development (TOD) project. The site is approximately 27 acres of which, a previously graded 12.89 acre pad is proposed for the mixed use development. 10.63 acres of this site is developable, once accounting for setbacks from Loma Alta Creek and the extension of Oceanside Boulevard from the west through the project site. The site is surrounded by commercial/ office and commercial/retail to the west, commercial/retail to the north, and single family residential to the south. The mixed-use project proposes the construction of 287 Residential Apartments units, 3,000 commercial/retail space, the extension of South Oceanside Boulevard between Union Plaza and Crouch Street and remove and remediate a historic landslide area on the southern slopes of the project site, along existing Crouch Street.</p> <p>In pre-construction conditions, the site is undeveloped and has a pre-graded pad where the proposed apartment buildings will be constructed and an existing slope on the south side of the site, north of Crouch Street that will remain undisturbed with the exception of the remediation of the historic landslide area.</p>
Proposed Disturbed Area	494,215sq. ft.
Created or Replaced Impervious	327,957sq. ft.
Project Hydrologic Unit Watershed	<input type="checkbox"/> Santa Maria <input type="checkbox"/> San Luis Rey <input checked="" type="checkbox"/> Carlsbad
Required to implement HMP	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



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CERTIFICATION PAGE

Project Name: Jefferson Oceanside
Permit Application Number: DS20-00004, CUP20-00005

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the City of Oceanside BMP Design Manual, which is based on the requirements of San Diego Regional Water Quality Control Board Order No. R9-2013-0001 (MS4 Permit).

I have read and understand that the City 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 SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design 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 SWQMP by City 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.

As Engineer of Work, I agree to indemnify, defend, and hold harmless the City of Oceanside, its officers, agents, and employees from any and all liability, claims, damages, or injuries to any person or property which might arise from the negligent acts, errors, or omissions of the Engineer of Work, my employees, agents or consultants.



Engineer of Work's Signature, RCE 75822 Exp 06/30/2022

Bryan D. Smith

Print Name

Fusco Engineering, Inc.

Company

2/24/2022

Date

Engineer's Seal:



Jefferson Oceanside (Permit Application Number: D20-00004, CUP20-00005)
Priority Development Project - Storm Water Mitigation Plan



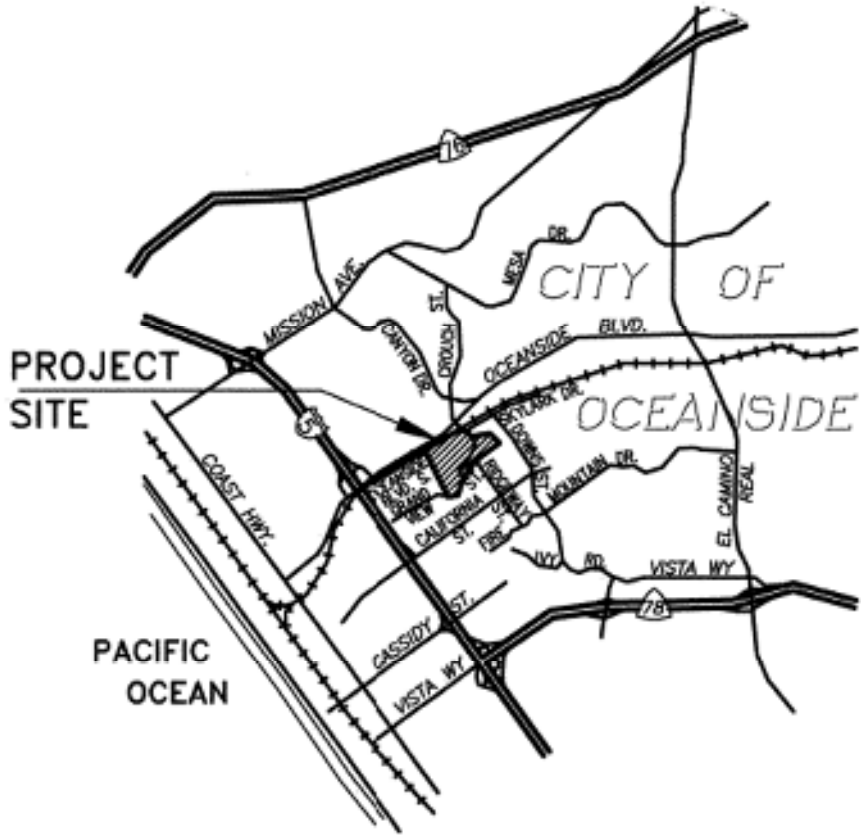
SUBMITTAL RECORD

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

Submittal Number	Date	Project Status	Changes
1	03/06/2020	<input checked="" type="checkbox"/> Preliminary Design/ Planning/ CEQA <input type="checkbox"/> Final Design	Initial Submittal
2	04/09/2021	<input checked="" type="checkbox"/> Preliminary Design/ Planning/ CEQA <input type="checkbox"/> Final Design	2nd Submittal
3	09/01/2021	<input checked="" type="checkbox"/> Preliminary Design/ Planning/ CEQA <input type="checkbox"/> Final Design	3rd Submittal
4	02/23/2022	<input checked="" type="checkbox"/> Preliminary Design/ Planning/ CEQA <input type="checkbox"/> Final Design	4th Submittal



Project Vicinity Map



VICINITY MAP
NTS



Applicability of Permanent, Post-Construction Storm Water BMP Requirements (Storm Water Intake Form for all Development Permit Applications)		Form I-1
Project Identification		
Project Name: Jefferson Oceanside		
Permit Application Number: D20-00004, CUP20-00005		Date: 02/24/2022
Determination of Requirements		
<p>The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short <u>summary</u> of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements.</p> <p>Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to the manual sections and/or separate forms referenced in each step below.</p>		
Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the manual for guidance.	<input checked="" type="checkbox"/> Yes	Go to Step 2.
	<input type="checkbox"/> No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is <u>not</u> a "development project" (e.g., the project includes <i>only</i> interior remodels within an existing building):		
Step 2: Is the project a Standard Project, PDP, or exception to PDP definitions? To answer this item, see Section 1.4 of the manual <i>in its entirety</i> for guidance, AND complete Form I-2, Project Type Determination.	<input type="checkbox"/> Standard Project	Stop. Standard Project requirements apply, including Standard Project SWQMP.
	<input checked="" type="checkbox"/> PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	<input type="checkbox"/> Exception to PDP definitions	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below. Prepare Standard Project SWQMP.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		



Step	Answer	Progression
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the manual for guidance.	<input type="checkbox"/> Yes	Consult the [City Engineer] to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	<input checked="" type="checkbox"/> No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (<i>not required if prior lawful approval does not apply</i>):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the manual for guidance.	<input checked="" type="checkbox"/> Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5.
	<input type="checkbox"/> No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the manual for guidance.	<input type="checkbox"/> Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	<input checked="" type="checkbox"/> No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.



Discussion / justification if protection of critical coarse sediment yield areas does not apply:

There are mapped CCSYAs within the property limits. The file that delineates CCSYAs is not accurate. This is an existing graded pad. The proposed development area is flat and does not have slope grades over 8%. Therefore, this portion of the site (shown below) does not meet any of the criteria that would qualify it as a CCYSA per the County of San Diego BMP Handbook Table H.6-3 shown here:

Table H.6-3: Potential Critical Coarse Sediment Yield Areas

GLU	Geology	Land Cover	Slope (%)
CB-Agricultural/Grass-3	Coarse Bedrock	Agricultural/Grass	20% - 40%
CB-Agricultural/Grass-4	Coarse Bedrock	Agricultural/Grass	>40%
CB-Forest-2	Coarse Bedrock	Forest	10 - 20%
CB-Forest-3	Coarse Bedrock	Forest	20% - 40%
CB-Forest-4	Coarse Bedrock	Forest	>40%
CB-Scrub/Shrub-4	Coarse Bedrock	Scrub/Shrub	>40%
CB-Unknown-4	Coarse Bedrock	Unknown	>40%
CSI-Agricultural/Grass-2	Coarse Sedimentary Impermeable	Agricultural/Grass	10 - 20%
CSI-Agricultural/Grass-3	Coarse Sedimentary Impermeable	Agricultural/Grass	20% - 40%
CSI-Agricultural/Grass-4	Coarse Sedimentary Impermeable	Agricultural/Grass	>40%
CSP-Agricultural/Grass-4	Coarse Sedimentary Permeable	Agricultural/Grass	>40%
CSP-Forest-3	Coarse Sedimentary Permeable	Forest	20% - 40%
CSP-Forest-4	Coarse Sedimentary Permeable	Forest	>40%
CSP-Scrub/Shrub-4	Coarse Sedimentary Permeable	Scrub/Shrub	>40%

The CCSYAs apply to the slope area south of the project. The slope south of the project will not be disturbed and flow from areas in qualified CCSYAs will be directed around the site, bypassing treatment BMPs, to ensure critical coarse sediment flows to downstream waters. See Attachment 5 Hydrology Study "Appendix 9: CCSYA Bypass Velocity Study" for CCSYA Bypass Velocity Calculation.



Project Type Determination Checklist		Form I-2	
Project Information			
Project Name: Jefferson Oceanside			
Permit Application Number: D20-00004, CUP20-00005			
Project Type Determination: Standard Project or PDP			
The project is (select one): <input checked="" type="checkbox"/> New Development <input type="checkbox"/> Redevelopment			
The total proposed newly created or replaced impervious area is: <u> 320,414 </u> ft ² (<u> 7.36 </u>) acres			
Is the project in any of the following categories, (a) through (f)?			
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(c)	<p>New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:</p> <ul style="list-style-type: none"> (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 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.



Form I-2 Page 2 of 2

Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(d)	<p>New or redevelopment projects that create 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).</p> <p><u>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 SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.</u></p>
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(e)	<p>New development projects that support one or more of the following uses:</p> <p>(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.</p> <p>(ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.</p>
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	(f)	<p>New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.</p> <p><i>Note: See manual Section 1.4.2 for additional guidance.</i></p>
<p>Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?</p> <p><input type="checkbox"/> No – the project is not a PDP (Standard Project).</p> <p><input checked="" type="checkbox"/> Yes – the project is a PDP.</p>			
<p>The following is for redevelopment PDPs only:</p> <p>The area of existing (pre-project) impervious area at the project site is: 13,475 ft² (A)</p> <p>The total proposed newly created or replaced impervious area is: 327,976 ft² (B)</p> <p>Percent impervious surface created or replaced (A/B)*100: 243 %</p> <p>The percent impervious surface created or replaced is (select one based on the above calculation):</p> <p><input type="checkbox"/> less than or equal to fifty percent (50%) – only new impervious areas are considered PDP</p> <p>OR</p> <p><input checked="" type="checkbox"/> greater than fifty percent (50%) – the entire project site is a PDP</p>			



Site Information Checklist For PDPs		Form I-3B (PDPs)
Project Summary Information		
Project Name	Jefferson Oceanside	
Project Address	SW corner of Oceanside Blvd and Crouch Street Oceanside, CA	
Assessor's Parcel Number(s)	151-270-50, -52, -53, -56	
Permit Application Number	D20-00004, CUP20-00005	
Project Watershed (Hydrologic Unit)	Select One: <input type="checkbox"/> Santa Margarita 902 <input type="checkbox"/> San Luis Rey 903 <input checked="" type="checkbox"/> Carlsbad 904	
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	27 Acres	
Area to be disturbed by the project (Project Area)	9.91 Acres (431,680 Square Feet)	
Project Proposed Impervious Area (subset of Project Area)	7.36 Acres (320,414 Square Feet)	
Project Proposed Pervious Area (subset of Project Area)	2.55 Acres (111,266 Square Feet)	
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.		

Hydrologic Unit	Hydrologic Area	Hydrologic Sub-Area
Santa Margarita 902.00	<input type="checkbox"/> Ysidora 902.10	<input type="checkbox"/> Lower Ysidora 902.11
San Luis Rey 903.00	<input type="checkbox"/> Lower San Luis 903.10	<input type="checkbox"/> Mission 903.11
		<input type="checkbox"/> Bonsall 903.12
Carlsbad 904.00	<input checked="" type="checkbox"/> Loma Alta 904.10	Not Applicable
	<input type="checkbox"/> Buena Vista Creek 904.20	<input type="checkbox"/> El Salto 904.21
	<input type="checkbox"/> Agua Hedionda 4.30	<input type="checkbox"/> Vista 904.22
		<input type="checkbox"/> Los Monos 904.31



Description of Existing Site Condition and Drainage Patterns

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

- Existing development
- Previously graded but not built out
- Agricultural or other non-impervious use
- Vacant, undeveloped/natural

Description / Additional Information:

Previously graded pads.

Existing Land Cover Includes (select all that apply):

- Vegetative Cover
- Non-Vegetated Pervious Areas
- Impervious Areas

Description / Additional Information:

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:

- Groundwater Depth < 5 feet
- 5 feet < Groundwater Depth < 10 feet
- 10 feet < Groundwater Depth < 20 feet
- Groundwater Depth > 20 feet



Description of Existing Site Topography and Drainage [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) describe existing constructed storm water conveyance systems, if applicable; and (3) is runoff from offsite conveyed through the site? If so, describe]:

The project site in existing conditions is a vacant, previously graded lot south of the Loma Alta Creek and existing NCTD Crouch Street Sprinter Station. The site was previously graded in 1985 and slopes in the northwesterly direction, having an average slope of 2%. The southern portion of the site adjacent to Crouch Street is a historic landslide and consists of steep slopes.

Stormwater runoff from the site consists primarily of sheet flow that drains north where it confluences and discharges to the Loma Alta Creek at two separate locations.

The eastern portion of the site consists primary of sheet flow that drains north to an existing headwall located within the easement at the center of the site. Stormwater is then conveyed north in the existing 36" public storm drain and discharges to the existing triple box culvert (Loma Alta Creek) located north of the project site.

Drainage from the existing unnamed roadway located north of the site flows west to a curb inlet located at the end of the unnamed road. The existing curb inlet drains to the existing 36" public storm identified above.

The western portion of the site sheet flows northwest to an existing concrete lined channel located at the east end of S. Oceanside Blvd. Off-site drainage from the neighborhoods located to the south of the project drains northwest where it confluences with onsite runoff in the existing concrete lined channel that discharges to the Loma Alta Creek. The offsite drainage includes additional runoff from S. Oceanside Blvd. and Union Plaza Ct. This basin includes runoff from the landslide which is conveyed to the bottom of the slope via terrace ditches.

Crouch street is an existing two-lane crowned asphalt road with failing asphalt sidewalks, and 6" AC berms that drain north/northeast. Sheet flow tributary to the Crouch St. right-of-way limits and runoff from the existing unimproved slope that borders Crouch Street to the south, flow north/northeast as concentrated flow along the face of ac berm and ultimately discharges to Loma Alta Creek.



Description of Proposed Site Development and Drainage Patterns

The Jefferson Oceanside project is a proposed mixed use, Transit-Oriented Development (TOD) project. The site is approximately 27 acres of which, a previously graded 12.89 acre pad is proposed for the mixed use development. 10.63 acres of this site is developable, once accounting for setbacks from Loma Alta Creek and the extension of Oceanside Boulevard from the west through the project site. The site is surrounded by commercial/ office and commercial/retail to the west, commercial/retail to the north, and single family residential to the south. The mixed-use project proposes the construction of 287 Residential Apartments units, 3,000 commercial/retail space, the extension of South Oceanside Boulevard between Union Plaza and Crouch Street and per the request of the City of Oceanside, a portion of the sidewalk maintenance on Crouch Street will be included in construction.

In pre-construction conditions, the site is undeveloped and has a pre-graded pad where the proposed apartment buildings will be constructed.

List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):

New residential apartment buildings, associated drive aisles and parking areas, new South Oceanside Boulevard roadway, Crouch Street sidewalk maintenance.

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

Approximately 111,266 sf of landscape area (softscape/planting and irrigation areas)

Does the project include grading and changes to site topography?

Yes

No

Description / Additional Information:

The project is an existing pre-graded pad. Minor adjustments will be made to grade to designed plans.



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

Yes

No

Description / Additional Information:

New storm drain will be installed to convey storm water from the project site to the Loma Alta Creek.



Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

- Onsite 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



Identification of Receiving Water Pollutants of Concern

Describe path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):

Existing site sheet flows northeast and discharges directly to the Loma Alta Creek which flows to the Loma Alta Slough before ultimately discharging to the Pacific Ocean Shoreline at the Loma Alta Creek Mouth.

List any 303(d) impaired water bodies 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 for the impaired water bodies:

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs
Loma Alta Creek	Bethnic Community Effects Bifenthrin Selenium Toxicity	Status: Required Bethnic Community Effects Bifenthrin Selenium Toxicity
Loma Alta Slough	Eutrophic Indicator Bacteria	Status: Required Eutrophic Indicator Bacteria
Pacific Ocean Shoreline @ Loma Alta Creek Mouth	Indicator Bacteria Trash	Status: Required Indicator Bacteria Status: Being addressed with action other than TMDL Trash



Identification of Project Site Pollutants*

***Identification of project site pollutants 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 manual Appendix B.6):

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

Note: Indicator Bacteria shall be addressed as a Pollutant of Concern (POC) for projects located in the Lower San Luis Hydrologic Area and for projects that discharge to the Pacific Ocean Shoreline within the boundaries of the City of Oceanside.

Note: Nutrients shall be addressed as a Pollutant of Concern (POC) for projects located in the Loma Alta Hydrologic Area.



Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the manual)?

- Yes, hydromodification management flow control structural BMPs required.
- 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 for the watershed in which the project resides.

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

Critical Coarse Sediment Yield Areas*

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

Based on the maps provided within the WMAA, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

- Yes
- No, no critical coarse sediment yield areas to be protected based on WMAA maps

If yes, have any of the optional analyses presented in Section 6.2 of the manual been performed?

- 6.2.1 Verification of GLUs Onsite
- 6.2.2 Downstream Systems Sensitivity to Coarse Sediment
- 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
- No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

If optional analyses were performed, what is the final result?

- No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.
- Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 8 of the SWQMP.
- Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

See Memo on CCSYAs, step 5 of Form I-1. Pad is improperly labeled with a portion of CCSYA. Only sloped areas can be designated CCSYAs. No sloped areas labeled CCSYAs will be disturbed.



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.

Site runoff is conveyed via storm drain and sheet flow and flows to POC-1 and POC-2.

Approximately two-thirds of the site is tributary to POC-1, which receives runoff from DMAs 1, 2, 4, 5, 6, 7, and 8.

Approximately one-third of the site is tributary to POC-2, runoff from DMA 3.

Has a geomorphic assessment been performed for the receiving channel(s)?

No, the low flow threshold is 0.1Q2 (default low flow threshold)

Yes, the result is the low flow threshold is 0.1Q2

Yes, the result is the low flow threshold is 0.3Q2

Yes, the result is the low flow threshold is 0.5Q2

If a geomorphic assessment has been performed, provide title, date, and preparer:

Discussion / Additional Information: (optional)



Other Site Requirements and Constraints

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

Optional Additional Information or Continuation of Previous Sections As Needed

This space provided for additional information or continuation of information from previous sections as needed.



Source Control BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form I-4
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Project Identification

Project Name Jefferson Oceanside
 Permit Application Number D20-00004, CUP20-00005

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the 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 and/or Appendix E of the 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 may be provided.

Source Control Requirement	Implemented?		
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SC-1 Prevention of Illicit Discharges into the MS4	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
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Discussion / justification if SC-1 not implemented:

SC-2 Storm Drain Stenciling or Signage	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
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Discussion / justification if SC-2 not implemented:

SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
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Discussion / justification if SC-3 not implemented:

No Outdoor Materials Storage Planned for the Jefferson Oceanside project.



Source Control Requirement	Implemented?		
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Discussion / justification if SC-4 not implemented: No Outdoor Work Areas planned for the Jefferson Oceanside project.			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SC-5 not implemented:			



Form I-4 Page 3 of 3

SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)	Implemented?		
	☒ Yes	☐ No	☐ N/A
Onsite storm drain inlets	☒ Yes	☐ No	☐ N/A
Interior floor drains and elevator shaft sump pumps	☒ Yes	☐ No	☐ N/A
Interior parking garages	☒ Yes	☐ No	☐ N/A
Need for future indoor & structural pest control	☒ Yes	☐ No	☐ N/A
Landscape/outdoor pesticide use	☒ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☐ Yes	☐ No	☒ N/A
Food service	☐ Yes	☐ No	☒ N/A
Refuse area	☒ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☒ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☒ N/A
Vehicle and equipment cleaning	☐ Yes	☐ No	☒ N/A
Vehicle/equipment repair and maintenance	☐ Yes	☐ No	☒ N/A
Fuel dispensing areas	☐ Yes	☐ No	☒ N/A
Loading docks	☐ Yes	☐ No	☒ N/A
Fire sprinkler test water	☒ Yes	☐ No	☐ N/A
Miscellaneous drain or wash water	☒ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☒ Yes	☐ No	☐ N/A
<p>Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.</p> <p>SC-6 implemented for all applicable Potential Sources of Runoff Pollutants.</p>			



Site Design BMP Checklist for All Development Projects (Standard Projects and PDPs)	Form I-5
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Project Identification

Project Name Jefferson Oceanside
 Permit Application Number D20-00004, CUP20-00005

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the 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 and/or Appendix E of the 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 may be provided.

Site Design Requirement	Applied?		
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SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
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Discussion / justification if SD-1 not implemented:

Existing conditions show sheet flow drainage of site. Scope includes construction of storm drain to convey site drainage to discharge point.

SD-2 Conserve Natural Areas, Soils, and Vegetation	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
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Discussion / justification if SD-2 not implemented:

Natural Areas, Soils and Vegetation will be conserved in areas that are not proposed to be graded or constructed.

SD-3 Minimize Impervious Area	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
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Discussion / justification if SD-3 not implemented:

Project includes maximizing pervious areas throughout site.

SD-4 Minimize Soil Compaction	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
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Discussion / justification if SD-4 not implemented:



Site Design Requirement	Applied?		
SD-5 Impervious Area Dispersion	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Discussion / justification if SD-5 not implemented:			
SD-6 Runoff Collection	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A
Discussion / justification if SD-6 not implemented:			
SD-7 Landscaping with Native or Drought Tolerant Species	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
Discussion / justification if SD-8 not implemented: Deemed Infeasible see Attachment 1d			



Summary of PDP Structural BMPs	Form I-6 (PDPs)
Project Identification	
Project Name Jefferson Oceanside	
Permit Application Number D20-00004, CUP20-00005	
PDP Structural BMPs	
<p>All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the 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 manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).</p> <p>PDP structural BMPs must be verified by the local jurisdiction at the completion of construction. This may include requiring the project owner or project owner's representative to certify construction of the structural BMPs (see Section 1.12 of the manual). PDP structural BMPs must be maintained into perpetuity, and the local jurisdiction must confirm the maintenance (see Section 7 of the manual).</p> <p>Use this form 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 (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).</p> <p>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 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.</p> <p>The Geotechnical Engineer has classified the site as a No Infiltration Condition due to the depth of fill and compressible alluvium onsite. Geotechnical Engineer is preparing No Infiltration letter which will be submitted to the City and included in Attachment 1e. Therefore, biofiltration basins were deemed infeasible. The Harvest and reuse for toilet demand was considered infeasible per Form I-7 in Attachment 1d. Therefore, one (1) biofiltration basin was designed to satisfy the minimum three percent of the weighted area required to meet the effective area required for evapotranspiration. The other effective BMP that is feasible to implement is the Modular Wetland System (MWS).</p> <p>The proposed Jefferson Oceanside development will be divided into eight (8) DMAs. DMAs 1, 2 and 3 comprise the mixed-use portion of the project and consist of buildings, drive aisles, parking, landscape and associated hardscape. DMAs 4 and 5 will be landscaped and pervious and are therefore deemed self-mitigating. DMA6 is the DMA containing the proposed street dedication of the construction of South Oceanside Boulevard, to be designed per County of San Diego Green Street Manual.</p> <p>(Continue on page 2 as necessary.)</p>	



(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)

(Continued from page 1)

DMA 1 will flow via sheet-flow and proposed storm drain to a lined Biofiltration Basin (BMP 1). This biofiltration basin is designed to meet pollutant control and hydromodification control.

DMA2 consists of 5 sub-DMAs, 2.1, 2.2, 2.3, 2.4, and 2.5. Each of these sub-DMAs will utilize a modular wetland system for pollution control treatment only. Flows will then discharge into an underground storm drain pipe for detention designed to meet hydromodification control.

DMA3 consists of 4 sub-DMAs, 3.1, 3.2, .3., and 3.4. Each of these sub-DMAs will utilize a modular wetland system for pollution control treatment only. Flows will then discharge to an underground storm drain pipe for detention designed to meet hydromodification control.

DMA4 consists of 3 sub-DMAs, 4.1, 4.2, and 4.3, and the entire DMA is proposed 100% landscaped/planted area. DMA4 is deemed self-mitigating.

DMA5 is a proposed vegetated area with trees, shrubs and two meandering DG paths.

DMA6 is a 50,035 SF area the project proposes to dedicate to the construction of a public street, South Oceanside Boulevard. To satisfy pollutant control requirements, proposed street trees, SD-1, or “tree wells” per County of San Diego Green Street Standard Detail GS-1.1a and GS-1.1b will be implemented. Detailed design will be provided in Final Design SWQMP.

Street trees/tree wells have been incorporated throughout DMA 1, 2, and 3 to satisfy volume retention requirements per County of SD Worksheets B. 1 and B.2.



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 1	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input checked="" type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input checked="" type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 2.1	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

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Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 2.2	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 2.3	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 2.4	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 2.5	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 3.1	
Construction Plan Sheet No. C-3.1	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 3.2	
Construction Plan Sheet No. C-3.1	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 3.3	
Construction Plan Sheet No. C-3.1	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. BMP 3.4	
Construction Plan Sheet No. C-3.1	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input checked="" type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fuscoe Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. HMP 2	
Construction Plan Sheet No. C-3.0	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input type="checkbox"/> 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) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input checked="" type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input checked="" type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> 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 if required by the [City Engineer] (See Section 1.12 of the manual)	Bryan D. Smith Fusco Engineering, Inc. 6390 Greenwich Drive, Suite 170 San Diego, CA 92117
Who will be the final owner of this BMP?	JPI 12250 El Camino Real, Suite 380 San Diego, CA 92130 (858) 369-5679
Who will maintain this BMP into perpetuity?	JPI
What is the funding mechanism for maintenance?	JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):



Structural BMP Summary Information
(Copy this page as needed to provide information for each individual proposed structural BMP)

Structural BMP ID No. HMP 3

Construction Plan Sheet No. C-3.1

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)
- 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 if required by the [City Engineer] (See Section 1.12 of the manual)

Bryan D. Smith
Fusco Engineering, Inc.
6390 Greenwich Drive, Suite 170
San Diego, CA 92117

Who will be the final owner of this BMP?

JPI
 12250 El Camino Real, Suite 380
 San Diego, CA 92130
 (858) 369-5679

Who will maintain this BMP into perpetuity?

JPI

What is the funding mechanism for maintenance?

JPI



Structural BMP Summary Information

(Copy this page as needed to provide information for each individual proposed structural BMP)

Discussion (as needed):





City of Oceanside
 300 N Coast Highway
 Oceanside, CA 92054

**Permanent BMP
 Construction
 Self Certification Form**

February
 2016

Date Prepared: Click here to enter text.	Project No.: Click here to enter text.
Project Applicant: Click here to enter text.	Phone: Click here to enter text.
Project Address: Click here to enter text.	
Project Engineer: Click here to enter text.	Phone: Click here to enter text.

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and installing contractor and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and ND PES Permit Order No. R9-2013-0001. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of Oceanside.

ENGINEER'S CERTIFICATION:

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and treatment control BMP's required per the approved SWQMP and Construction Permit No. [Click here to enter text.](#); and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: _____



Date of Signature: _ [Click here to enter text.](#) _

Printed Name: _ [Click here to enter text.](#) _

Title: _ [Click here to enter text.](#) _

Phone No. _ [Click here to enter text.](#) _

Engineer's Stamp

CONTRACTOR'S CERTIFICATION:

As the professional in responsible charge for construction of the above project, I certify that all constructed Low Impact Development (LID) site design, source control and treatment control BMP's required per the approved SWQMP and Construction Permit No. [Click here to enter text.](#); have been constructed in compliance with the approved plans and all applicable specifications, permits, and ordinances.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: _____

Date of Signature: _ [Click here to enter text.](#) _

Printed Name: _ [Click here to enter text.](#) _

Title: _ [Click here to enter text.](#) _

Phone No. _ [Click here to enter text.](#) _



ATTACHMENT 1
BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.



Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	<input checked="" type="checkbox"/> Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	<input checked="" type="checkbox"/> Included on DMA Exhibit in Attachment 1a <input type="checkbox"/> Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Design Capture Volume Worksheet	<input checked="" type="checkbox"/> Included Included as part of Attachment 1f
Attachment 1d	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	<input checked="" type="checkbox"/> Included <input type="checkbox"/> Not included because the entire project will use infiltration BMPs
Attachment 1e	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.	<input checked="" type="checkbox"/> Included <input type="checkbox"/> Not included.
Attachment 1f	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	<input checked="" type="checkbox"/> Included



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 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 Form I-3B)
- Structural BMPs (identify location, type of BMP, and size/detail)



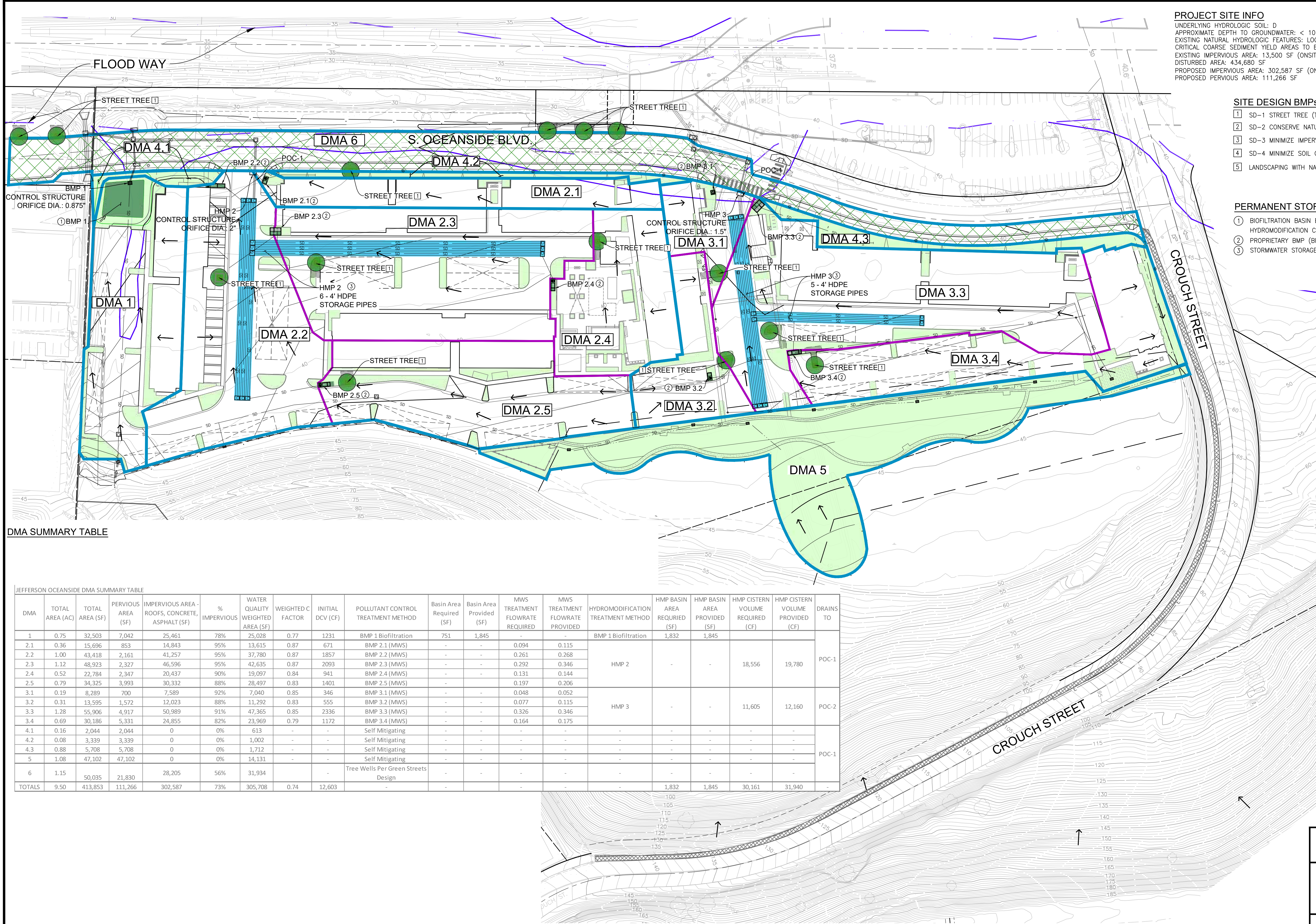
PROJECT SITE INFO
 UNDERLYING HYDROLOGIC SOIL: D
 APPROXIMATE DEPTH TO GROUNDWATER: < 10 FT
 EXISTING NATURAL HYDROLOGIC FEATURES: LOCATED WITHIN FLOODPLAIN AND FLOODWAY, SEEPS LOCATED ON SITE
 CRITICAL COARSE SEDIMENT YIELD AREAS TO BE PROTECTED: NONE LOCATED WITHIN PROJECT BOUNDARY
 EXISTING IMPERVIOUS AREA: 13,500 SF (ONSITE), 17,827 (OFFSITE SIDEWALK TO BE MAINTAINED)
 DISTURBED AREA: 434,680 SF
 PROPOSED IMPERVIOUS AREA: 302,587 SF (ONSITE), 17,827 (OFFSITE SIDEWALK TO BE MAINTAINED)
 PROPOSED PERVIOUS AREA: 111,266 SF

- SITE DESIGN BMPs**
- SD-1 STREET TREE (TREE WELL), 14.5' x 14.5' STRUCTURAL SOIL FOOTPRINT
 - SD-2 CONSERVE NATURAL AREAS, SOILS AND VEGETATION
 - SD-3 MINIMIZE IMPERVIOUS AREA
 - SD-4 MINIMIZE SOIL COMPACTION
 - LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

- PERMANENT STORM WATER BMP NOTES**
- BIOFILTRATION BASIN BMP (BF-1), FOR POLLUTANT AND HYDROMODIFICATION CONTROL
 - PROPRIETARY BMP (BF-3), POLLUTANT CONTROL ONLY
 - STORMWATER STORAGE FOR HYDROMODIFICATION

LEGEND

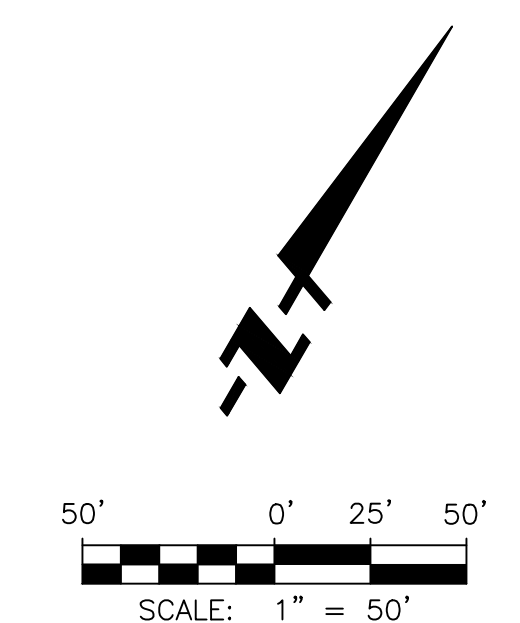
- PROPERTY LINE
- RIGHT-OF-WAY
- STREET CENTERLINE
- EXISTING CONTOUR
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- DMA LIMITS
- SUB-DMA LIMITS
- DIRECTION OF FLOW
- DMA DESIGNATION
- BIOFILTRATION BASIN
- TREE WELL PER SD-A
- PERVIOUS AREA
- TO BE DESIGNED PER COUNTY OF SAN DIEGO GREEN STREETS DESIGN CRITERIA
- MODULAR WETLAND UNITS
- HYDROMODIFICATION CISTERN STORM DRAIN PIPE
- CROUCH STREET SIDEWALK RESURFACING (EXEMPT FROM PDP REQUIREMENTS)



DMA SUMMARY TABLE

JEFFERSON OCEANSIDE DMA SUMMARY TABLE

DMA	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA - ROOFS, CONCRETE, ASPHALT (SF)	% IMPERVIOUS	WATER QUALITY WEIGHTED AREA (SF)	WEIGHTED C FACTOR	INITIAL DCV (CF)	POLLUTANT TREATMENT METHOD	Basin Area Required (SF)	Basin Area Provided (SF)	MWS TREATMENT FLOWRATE REQUIRED	MWS TREATMENT FLOWRATE PROVIDED	HYDROMODIFICATION TREATMENT METHOD	HMP BASIN AREA REQUIRED (SF)	HMP BASIN AREA PROVIDED (SF)	HMP CISTERN VOLUME REQUIRED (CF)	HMP CISTERN VOLUME PROVIDED (CF)	DRAINS TO
1	0.75	32,503	7,042	25,461	78%	25,028	0.77	1231	BMP 1 Biofiltration	751	1,845	-	-	-	-	-	-	-	-
2.1	0.36	15,696	853	14,843	95%	13,615	0.87	671	BMP 2.1 (MWS)	-	-	0.094	0.115	-	-	-	-	-	-
2.2	1.00	43,418	2,161	41,257	95%	37,780	0.87	1857	BMP 2.2 (MWS)	-	-	0.261	0.268	-	-	-	-	-	POC-1
2.3	1.12	48,923	2,327	46,596	95%	42,635	0.87	2093	BMP 2.3 (MWS)	-	-	0.292	0.346	HMP 2	-	-	18,556	19,780	POC-1
2.4	0.52	22,784	2,347	20,437	90%	19,097	0.84	941	BMP 2.4 (MWS)	-	-	0.131	0.144	-	-	-	-	-	-
2.5	0.79	34,325	3,993	30,332	88%	28,497	0.83	1401	BMP 2.5 (MWS)	-	-	0.197	0.206	-	-	-	-	-	-
3.1	0.19	8,289	700	7,589	92%	7,040	0.85	346	BMP 3.1 (MWS)	-	-	0.048	0.052	-	-	-	-	-	-
3.2	0.31	13,595	1,572	12,023	88%	11,292	0.83	555	BMP 3.2 (MWS)	-	-	0.077	0.115	HMP 3	-	-	11,605	12,160	POC-2
3.3	1.28	55,906	4,917	50,989	91%	47,365	0.85	2336	BMP 3.3 (MWS)	-	-	0.326	0.346	-	-	-	-	-	POC-2
3.4	0.69	30,186	5,331	24,855	82%	23,969	0.79	1172	BMP 3.4 (MWS)	-	-	0.164	0.175	-	-	-	-	-	POC-2
4.1	0.16	2,044	2,044	0	0%	613	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	-
4.2	0.08	3,339	3,339	0	0%	1,002	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	-
4.3	0.88	5,708	5,708	0	0%	1,712	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	-
5	1.08	47,102	47,102	0	0%	14,131	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	POC-1
6	1.15	50,035	21,830	28,205	56%	31,934	-	-	Tree Wells Per Green Streets Design	-	-	-	-	-	-	-	-	-	-
TOTALS	9.50	413,853	111,266	302,587	73%	305,708	0.74	12,603	-	-	-	-	-	-	1,832	1,845	30,161	31,940	-



JEFFERSON OCEANSIDE
ATTACHMENT 1a, 1b, & 2a
DMA & HYDROMODIFICATION
MANAGEMENT EXHIBIT

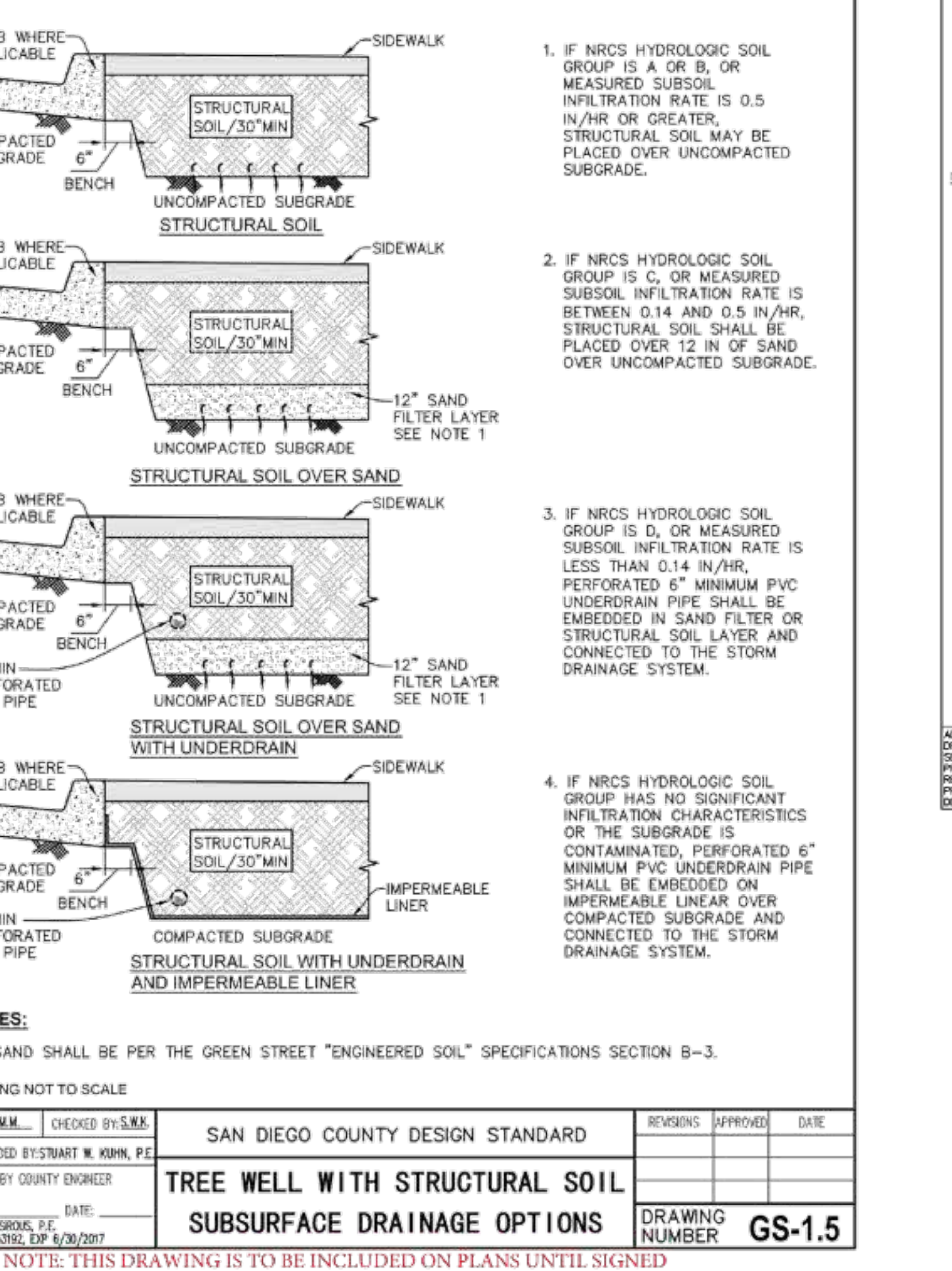
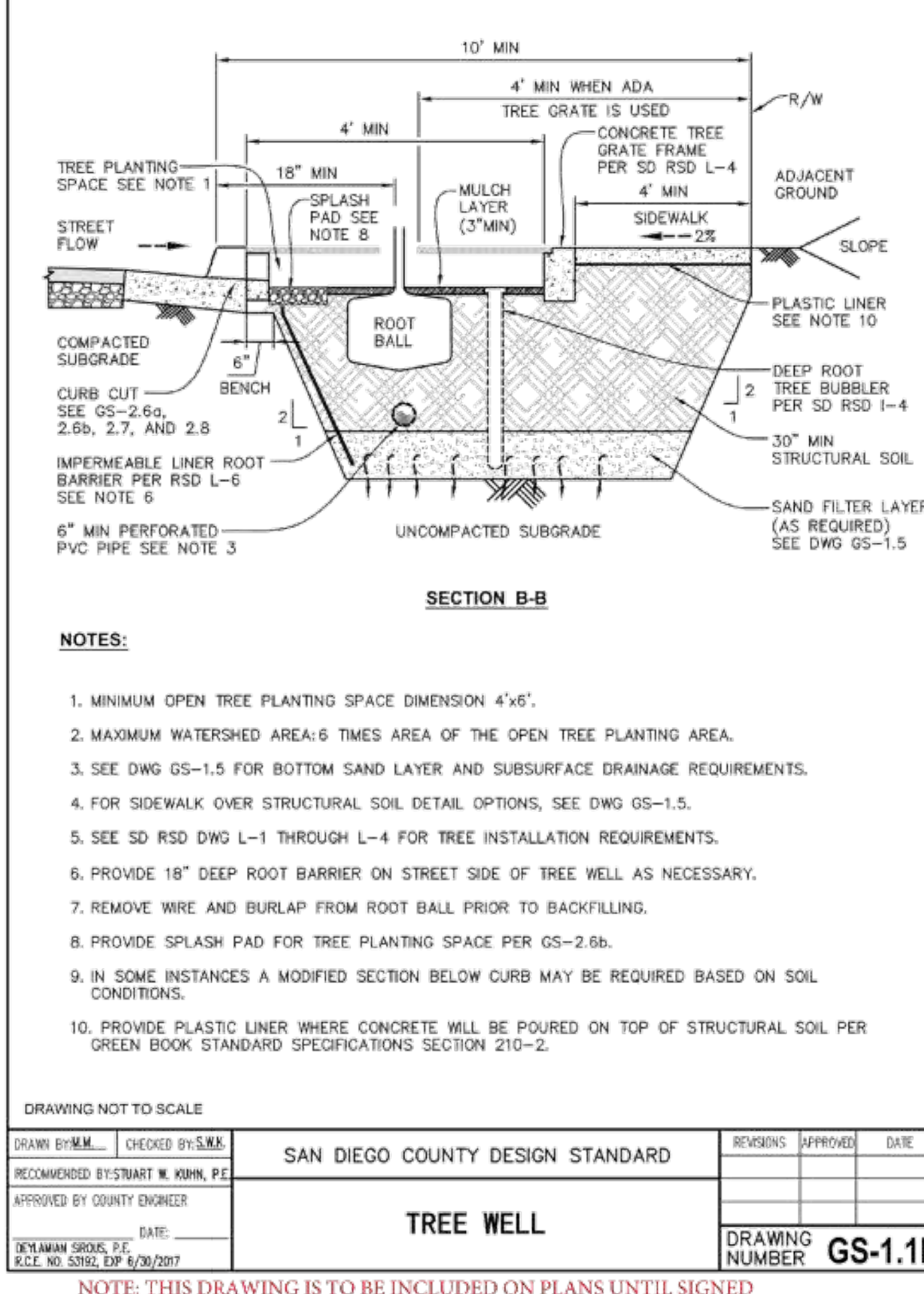
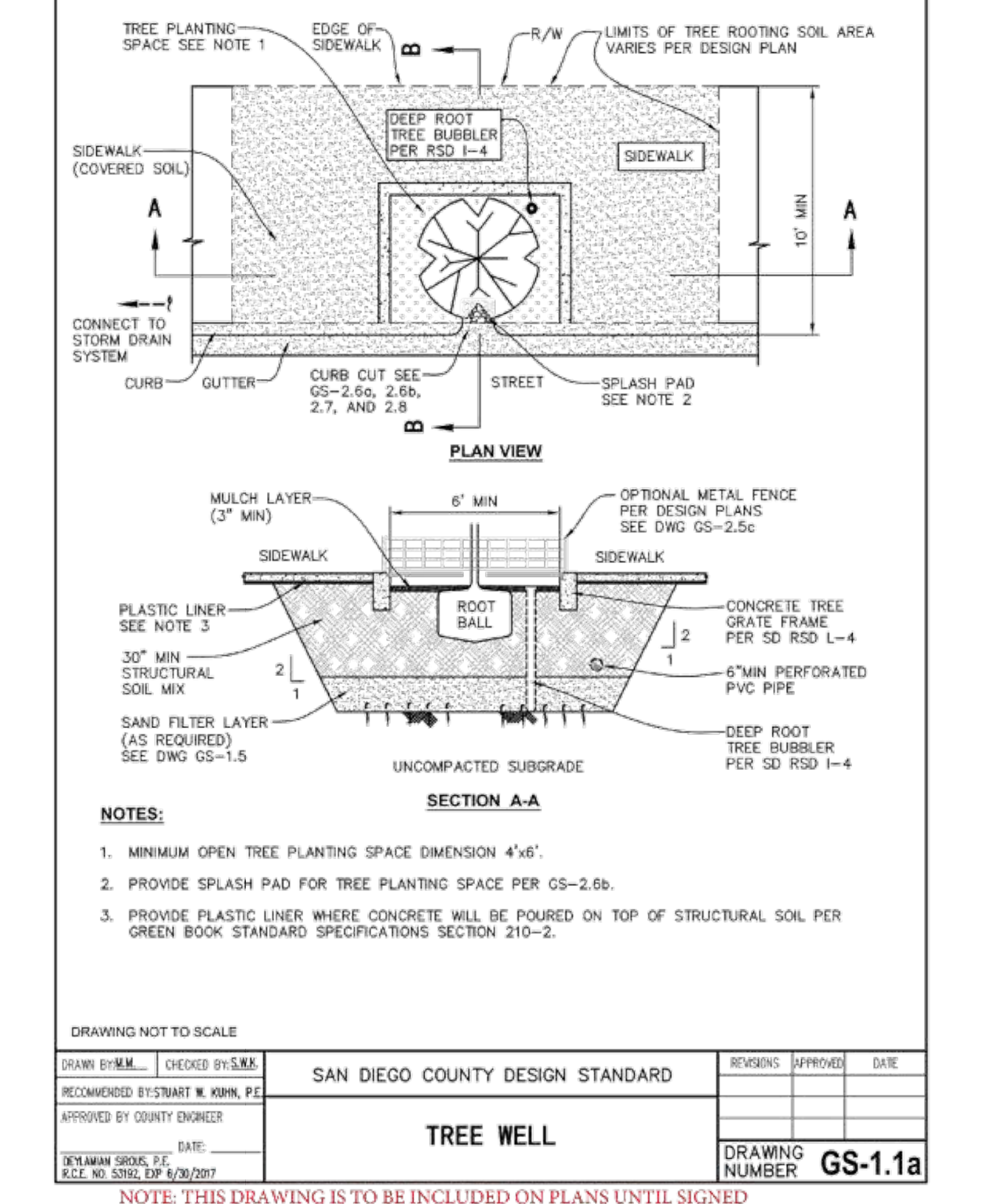
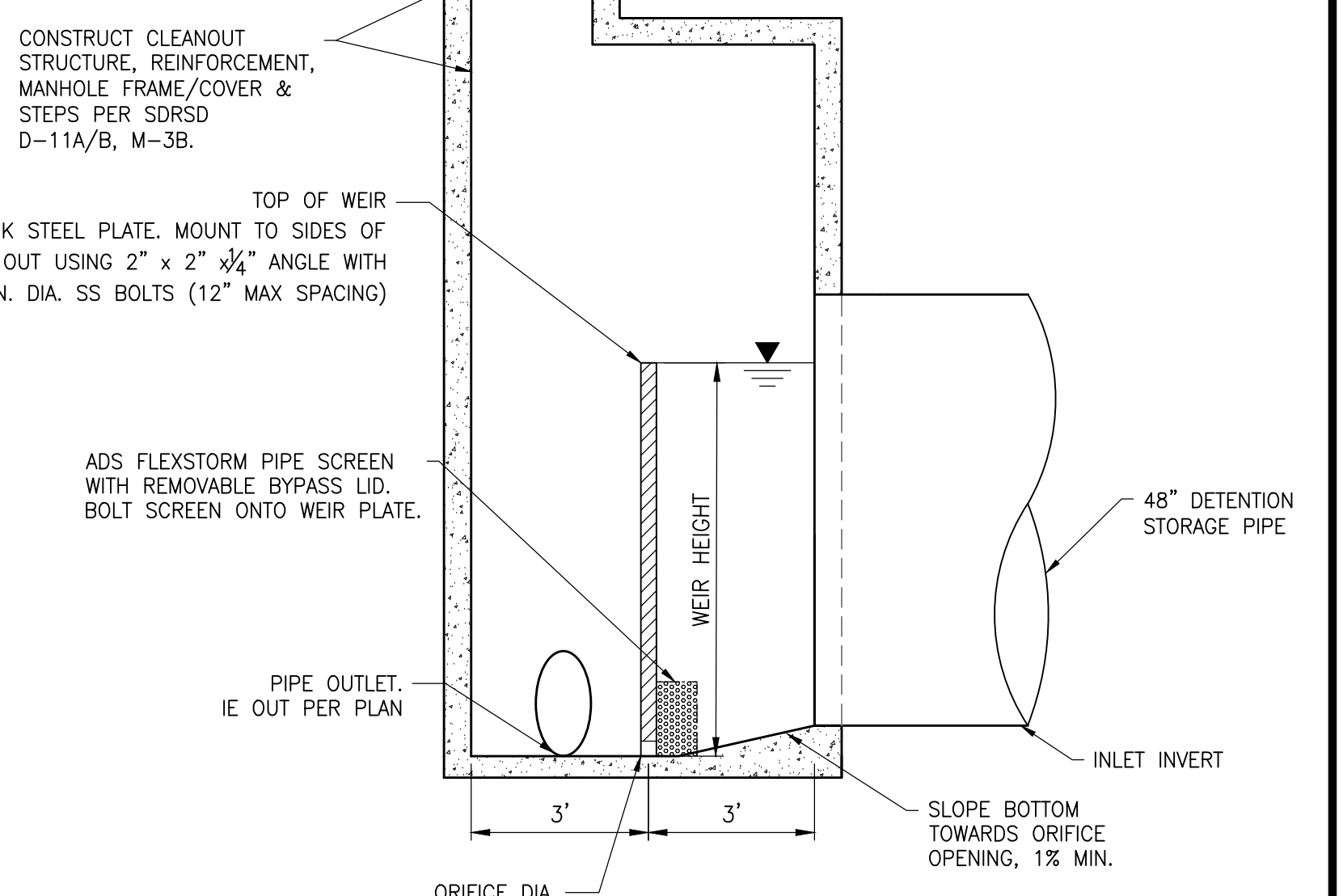
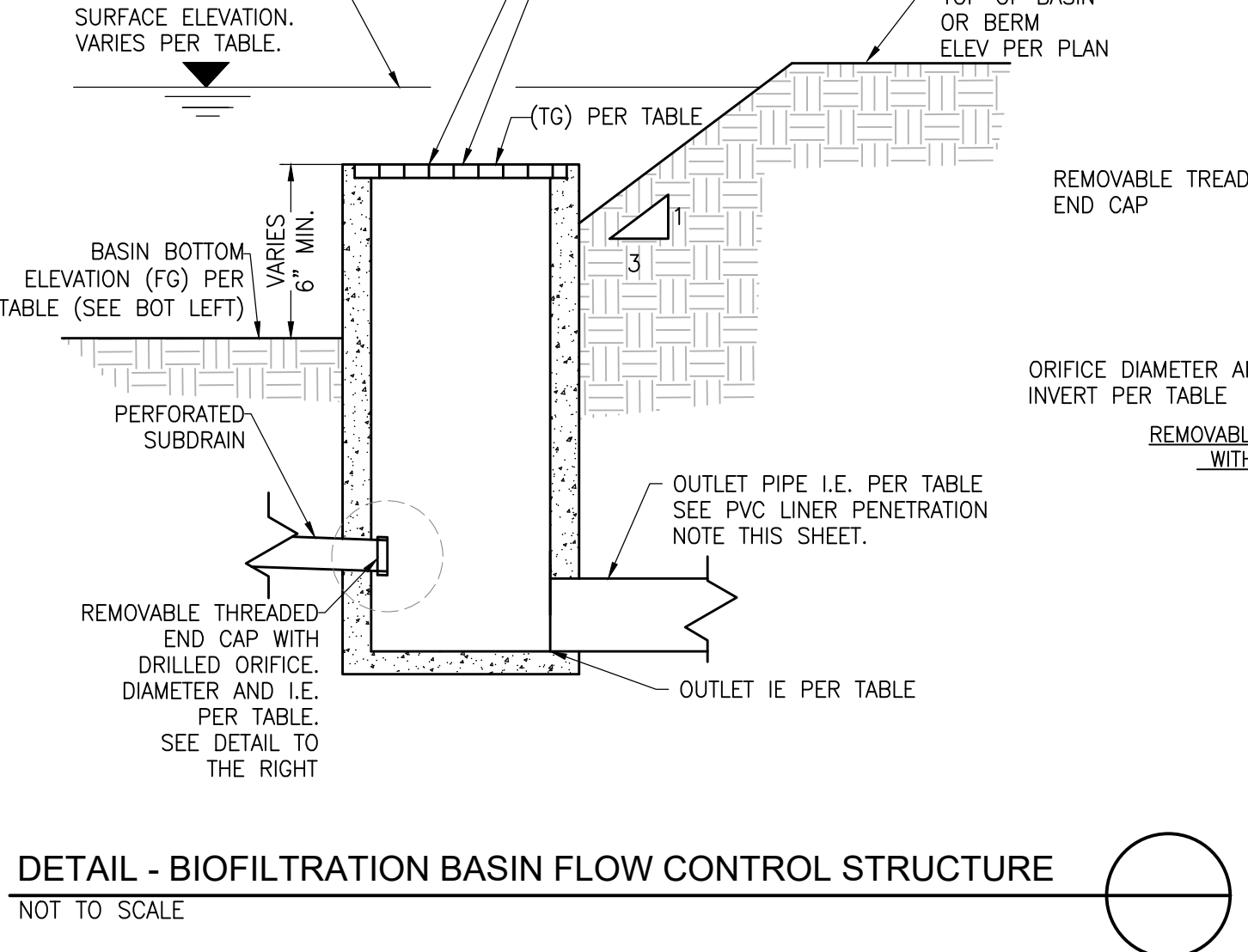
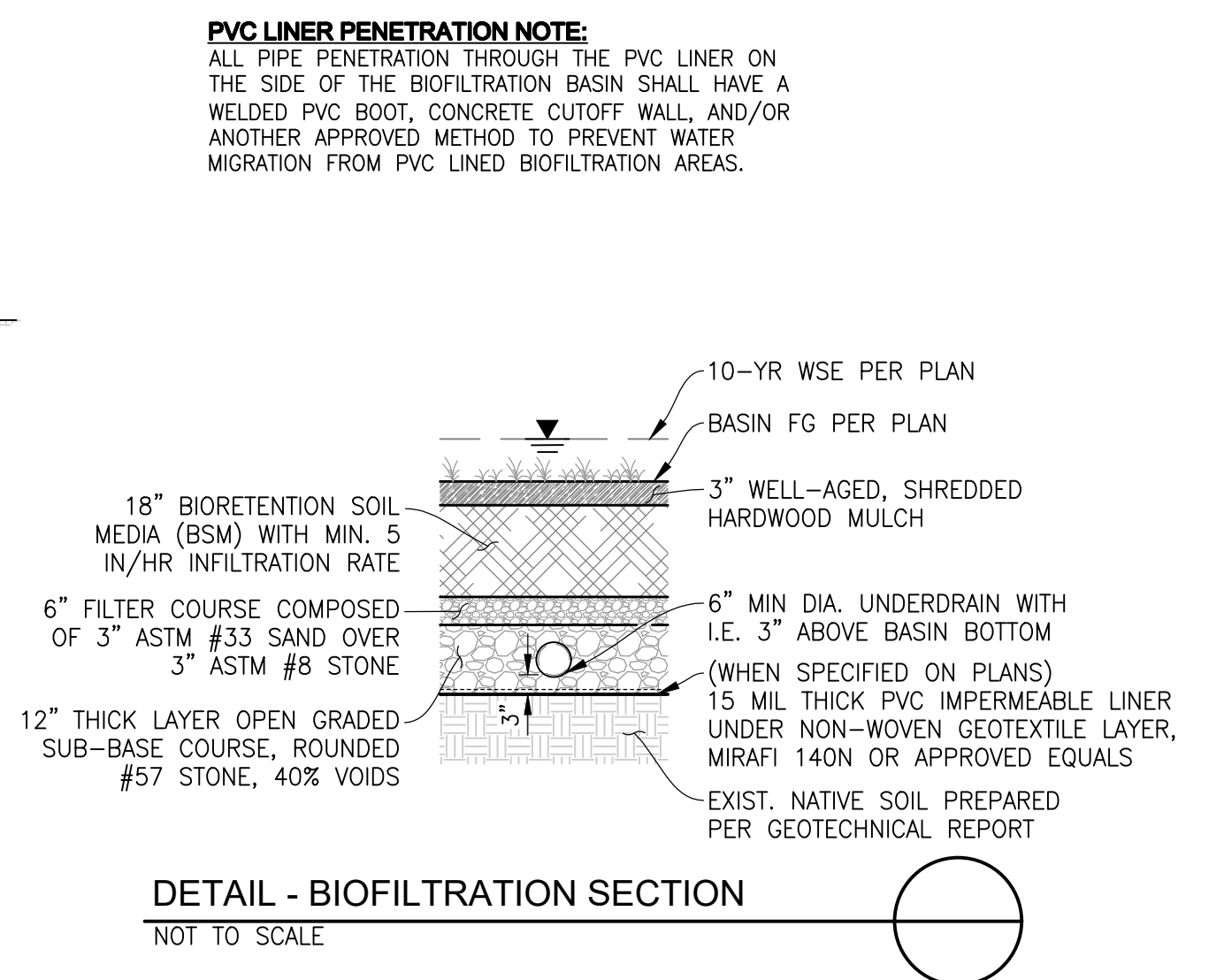
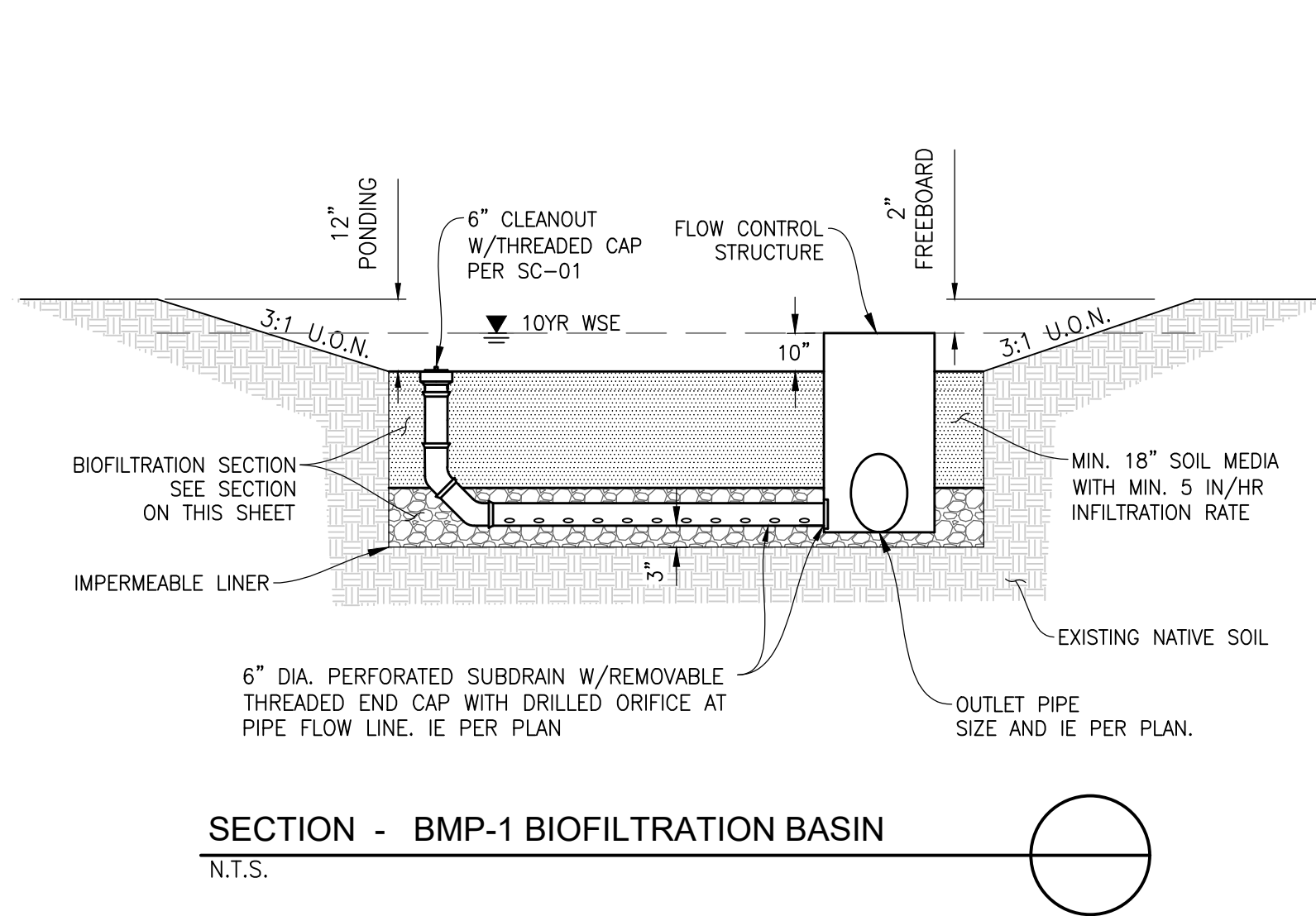
FUSCOE
 ENGINEERING
 6390 Greenwich Dr., Suite 170
 San Diego, California 92122
 tel 858.554.1500 • fax 858.597.0335
 www.fuscoe.com

JOB NO.
557-010

DRAWN BY:
ECS

SHEET
1 of 5

NO.	DATE	REVISION



NOMINAL DIAMETER	NOMINAL C.O.D.	TYPICAL SPACING 12"	NOMINAL WALL THICKNESS	TYPICAL SPACING 18"	H (NON-TRAFFIC)	H (TRAFFIC)
36"	42"	12"	3/8"	12"	12"	12"
42"	48"	12"	3/8"	12"	12"	12"
48"	54"	12"	3/8"	12"	12"	12"
54"	60"	12"	3/8"	12"	12"	12"
60"	66"	12"	3/8"	12"	12"	12"
66"	72"	12"	3/8"	12"	12"	12"
72"	78"	12"	3/8"	12"	12"	12"
78"	84"	12"	3/8"	12"	12"	12"
84"	90"	12"	3/8"	12"	12"	12"
90"	96"	12"	3/8"	12"	12"	12"
96"	102"	12"	3/8"	12"	12"	12"
102"	108"	12"	3/8"	12"	12"	12"
108"	114"	12"	3/8"	12"	12"	12"
114"	120"	12"	3/8"	12"	12"	12"
120"	126"	12"	3/8"	12"	12"	12"
126"	132"	12"	3/8"	12"	12"	12"
132"	138"	12"	3/8"	12"	12"	12"
138"	144"	12"	3/8"	12"	12"	12"
144"	150"	12"	3/8"	12"	12"	12"

JEFFERSON OCEANSIDE

ATTACHMENT 1a, 1b, & 2a
DMA & HYDROMODIFICATION MANAGEMENT
EXHIBIT
DETAILS

FUSCOE
ENGINEERING

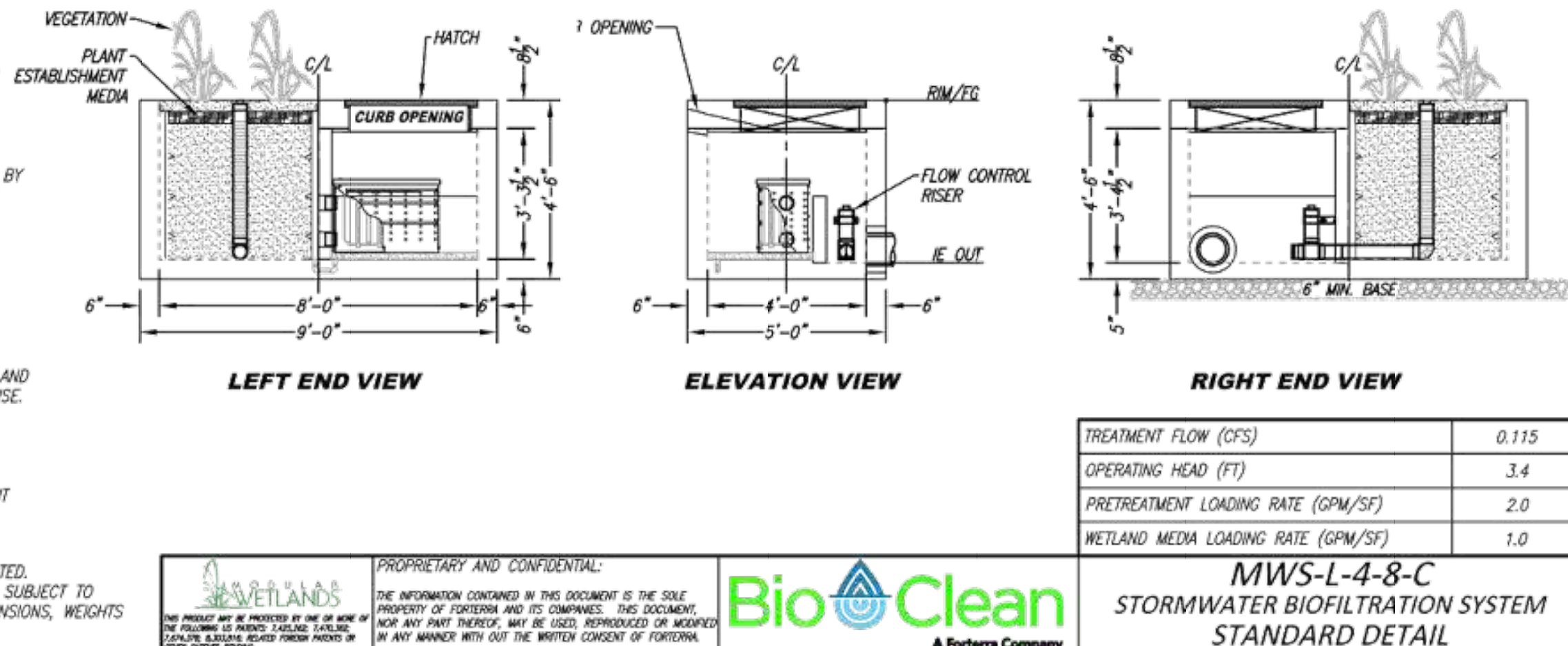
6390 Greenwich Dr., Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoec.com

JOB NO. 557-010
DRAWN BY: ECS
SHEET 2 of 5

SITE SPECIFIC DATA			
PROJECT NUMBER			
ORDER NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	36" x 36"	N/A	N/A
WETLANDMEDIA VOLUME (CY)		TBG	
ORIFICE SIZE (DIA. INCHES)		TBG	
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			

- INSTALLATION NOTES**
- CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
 - UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
 - CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
 - CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
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DETAIL - BMP-2.1 PROPRIETARY BIOFILTRATION UNIT
NOT TO SCALE

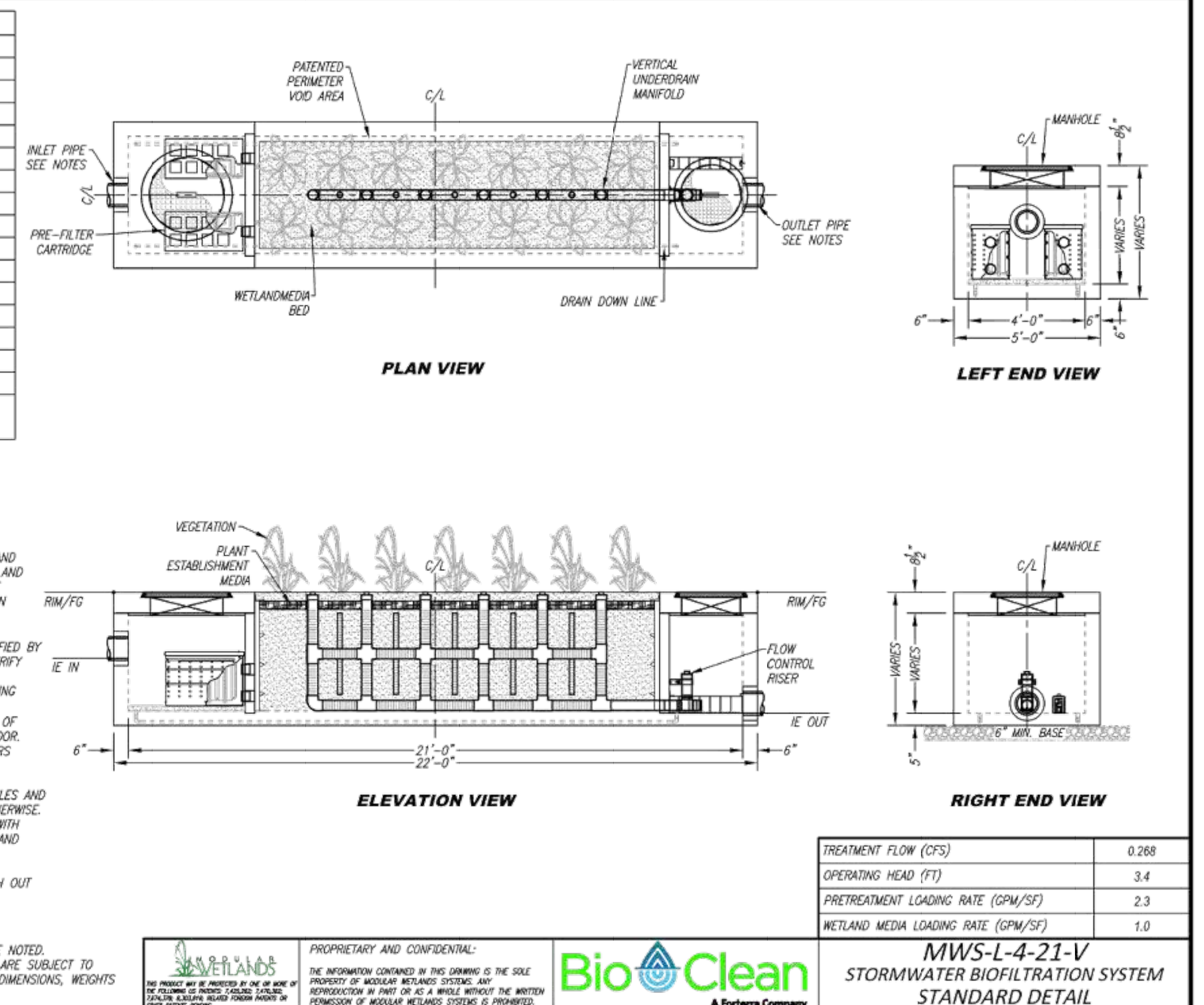
SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.268	
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE OFFLINE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	#30"	OPEN PLANTER	#24"
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION

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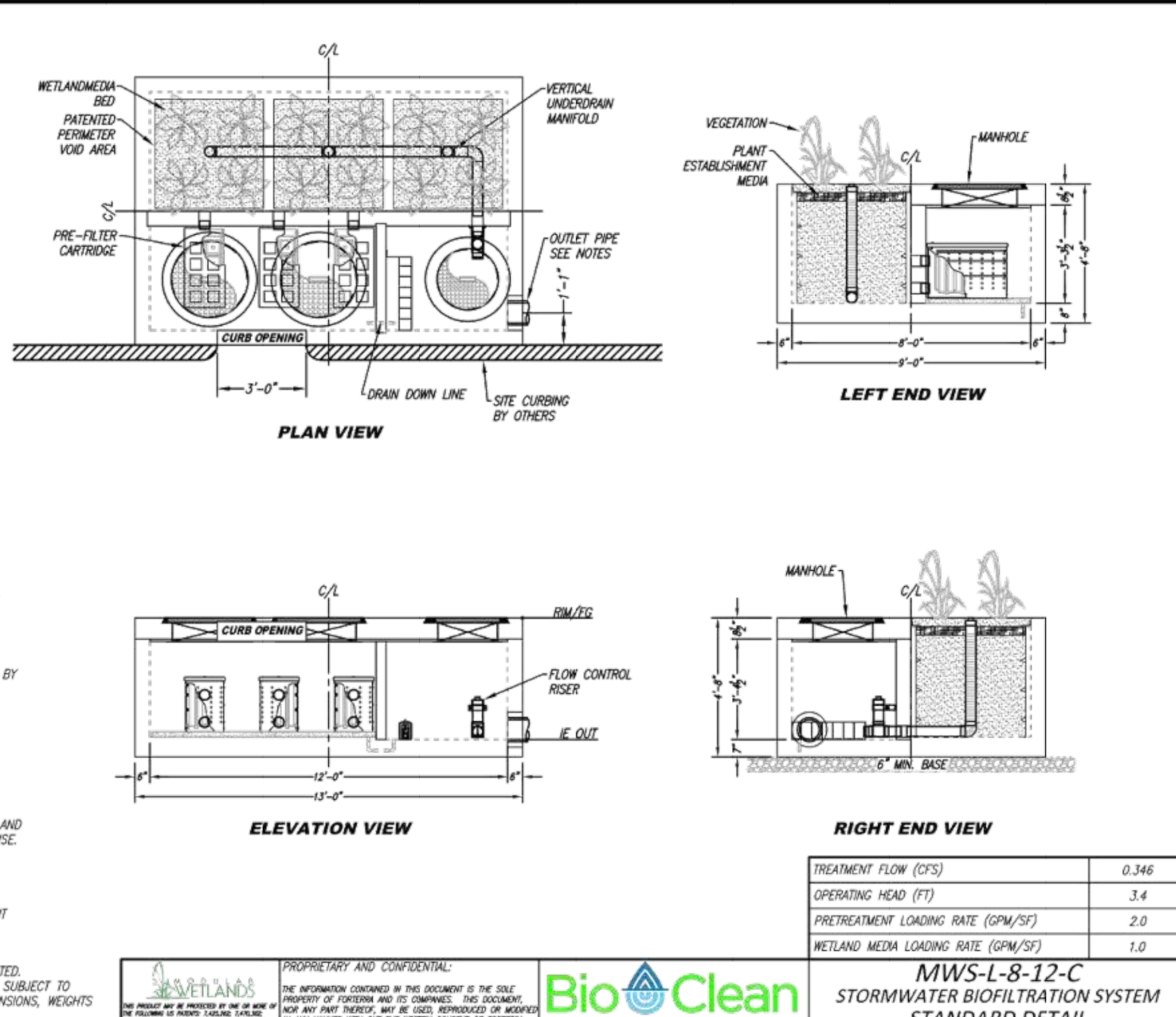
DETAIL - BMP-2.2 PROPRIETARY BIOFILTRATION UNIT
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NUMBER			
ORDER NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	2EA #30"	N/A	#24"
WETLANDMEDIA VOLUME (CY)		TBG	
ORIFICE SIZE (DIA. INCHES)		TBG	
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			

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DETAIL - BMP-2.3 PROPRIETARY BIOFILTRATION UNIT
NOT TO SCALE

JEFFERSON OCEANSIDE

ATTACHMENT 1a, 1b, & 2a
DMA & HYDROMODIFICATION MANAGEMENT
EXHIBIT
DETAILS

FUSCOE
ENGINEERING
6390 Greenwich Dr., Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

JOB NO.
557-010

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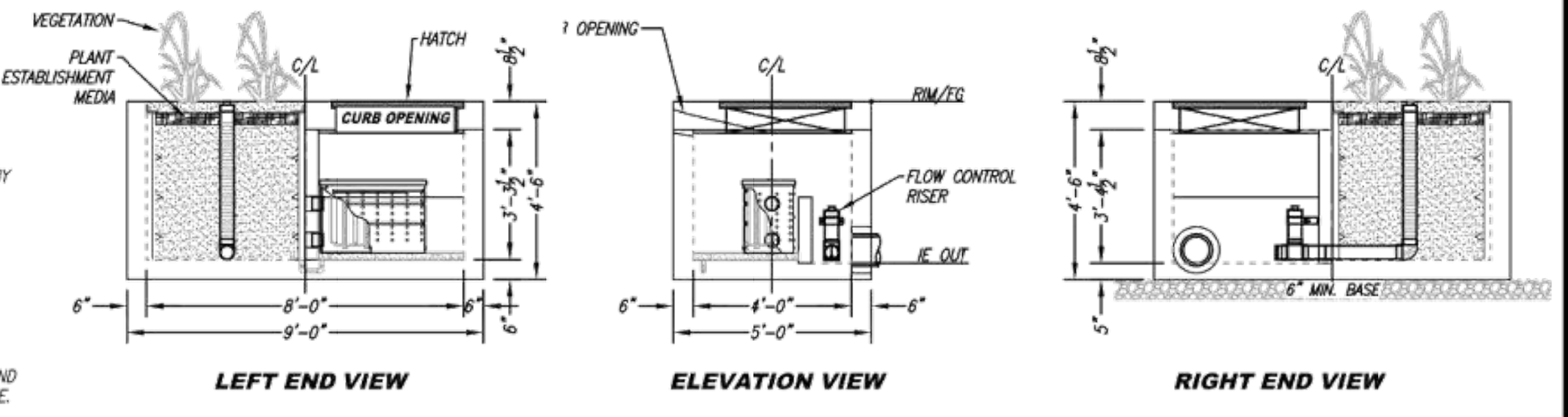
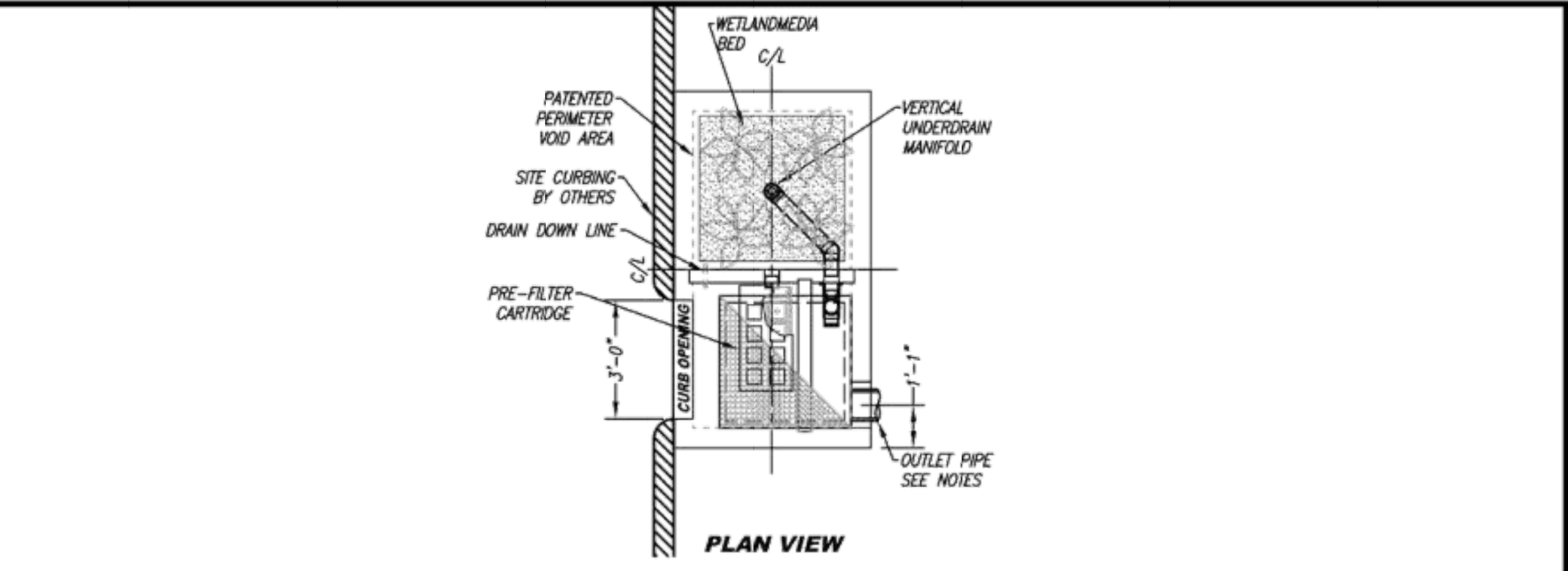
SHEET
3 of 5

C:\Projects\GIS\0701\Support Files\Reports\Cartag\Attachment 1a-1b-2a-DMA & Hydromodification Exhibit (1/19/2021 4:29 PM) Plotted by: Uchete Salazar

SITE SPECIFIC DATA			
PROJECT NUMBER			
ORDER NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	36" X 36"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			TBG
ORIFICE SIZE (DIA. INCHES)			TBG
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			

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TREATMENT FLOW (CFS)	0.115
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

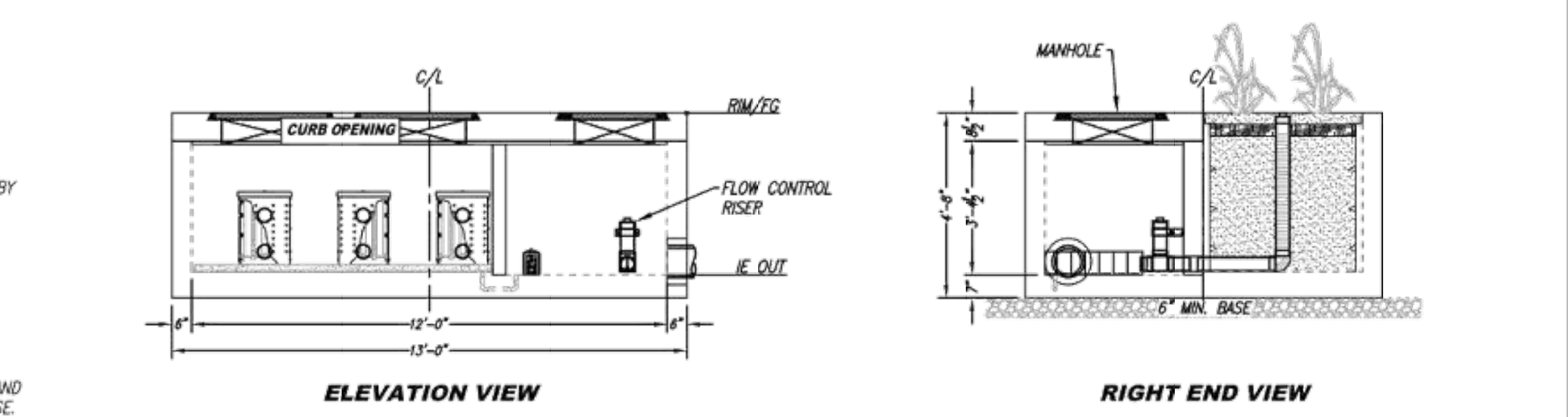
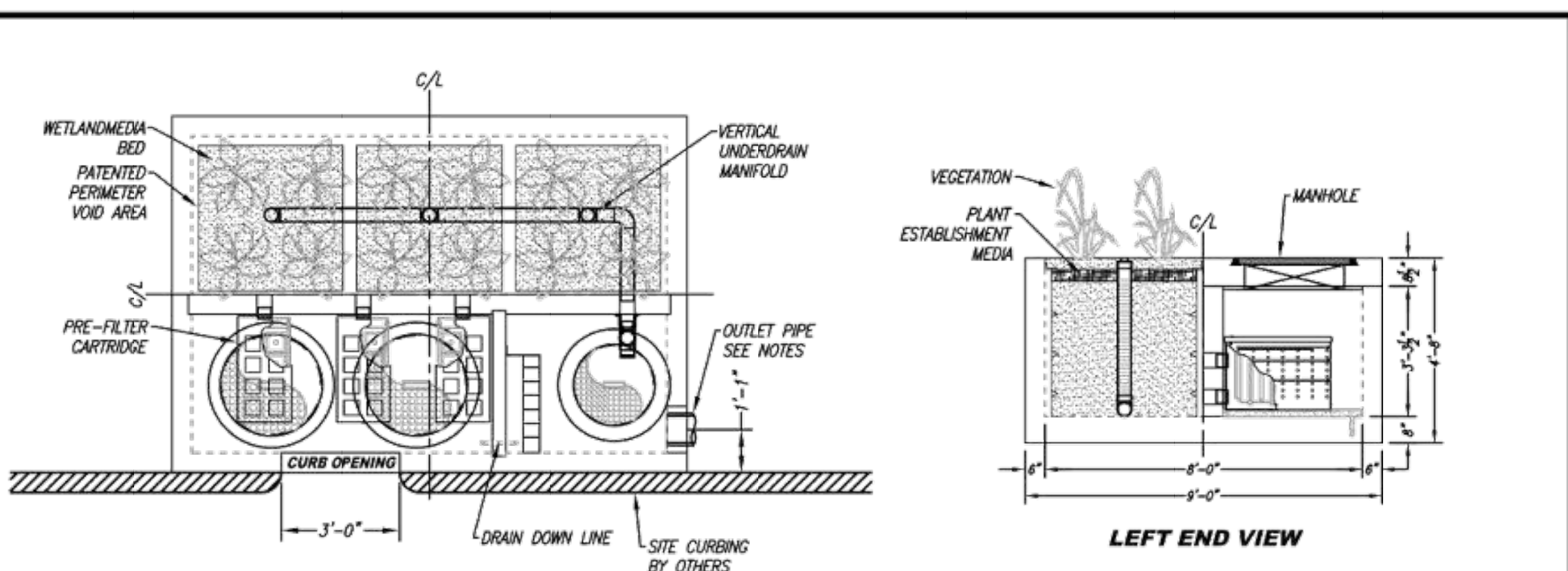
MWS-L-4-8-C
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

DETAIL - BMP-3.2 PROPRIETARY BIOFILTRATION UNIT
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NUMBER			
ORDER NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	24" X 30"	N/A	#24"
WETLANDMEDIA VOLUME (CY)			TBG
ORIFICE SIZE (DIA. INCHES)			TBG
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			

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TREATMENT FLOW (CFS)	0.346
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

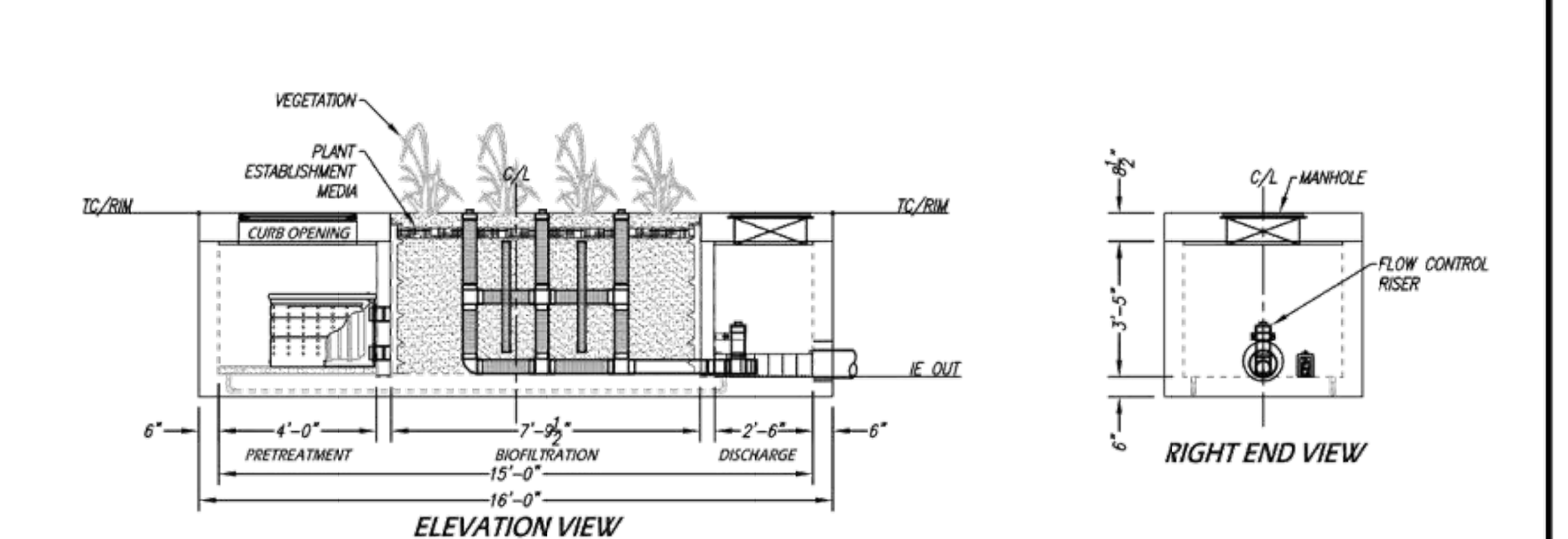
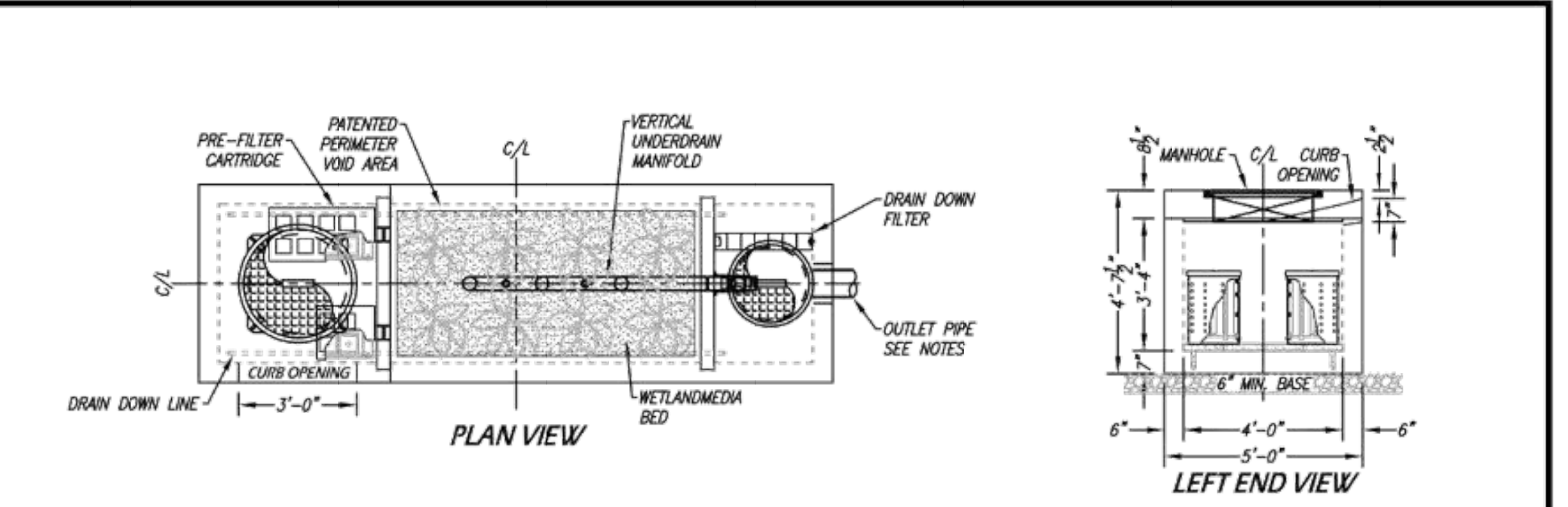
MWS-L-8-12-C
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

DETAIL - BMP-3.3 PROPRIETARY BIOFILTRATION UNIT
NOT TO SCALE

SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	#30"	N/A	#24"
WETLANDMEDIA VOLUME (CY)			4.30
WETLANDMEDIA DELIVERY METHOD			TBG
ORIFICE SIZE (DIA. INCHES)			#1.89"
MAXIMUM PICK WEIGHT (LBS)			31000
NOTES:			

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TREATMENT FLOW (CFS)	0.175
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBG
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-4-15-C
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

DETAIL - BMP-3.4 PROPRIETARY BIOFILTRATION UNIT
NOT TO SCALE

JEFFERSON OCEANSIDE

ATTACHMENT 1a, 1b, & 2a
DMA & HYDROMODIFICATION MANAGEMENT
EXHIBIT
DETAILS

FUSCOE
ENGINEERING
6390 Greenwich Dr., Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoec.com

JOB NO.
557-010

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SHEET
5 of 5

NO.	DATE	REVISION

Placeholder – **Tabular Summary of DMAs (if separate from DMA Exhibit)**

Leave placeholder intact if not applicable.

Not Applicable – Tabular Summary included on DMA Exhibit



Harvest and Use Feasibility Checklist

Form I-7

1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season?

- Toilet and urinal flushing
- Landscape irrigation
- Other: _____

2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2.

SEE ATTACHED HARVEST AND REUSE CALCULATION WORKSHEET

3. Calculate the DCV using worksheet B-2.1.

DCV = 15,270 (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?

- Yes / No ⇒
 ↓

3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?

- Yes / No ⇒
 ↓

3c. Is the 36 hour demand less than 0.25DCV?

- Yes
 ↓

Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.

Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.

Harvest and use is considered to be infeasible.

Is harvest and use feasible based on further evaluation?

- Yes, refer to Appendix E to select and size harvest and use BMPs.
- No, select alternate BMPs.



HARVEST AND REUSE CALCULATION WORKSHEET

Land Use Type	Toilet User Unit of Normalization	Toilet Flushing	Per Capita Use per Day		Water Efficient Factor	Total Use per Resident or Employee
			Urinals	Visitor Factor		
Residential	Resident	18.5	NA	NA	0.5	9.3

Dwelling Units	287	units
Resident per Unit	2.0	Resident
Toilet and Urinal Demand	714	cubic - feet / day
36 hr. Demand	1,070	cubic - feet
DCV	15,270	cubic - feet
36 hr. Demand ≥ DCV	No	
DCV > 36 hr. Demand > 0.25DCV	No	
36 hr. Demand < 0.25DCV	Yes	
Harvest Use:	Not Feasible	

Harvest and use is considered to be infeasible

Planning Level Irrigation Demand by Plant Factor and Landscape Type

General Landscape Type	36-Hour Planning Level Irrigation Demand	Units
Hydrozone - Moderate Plant Water Use	1,470	gal /acre / 36 hrs
36 hr. Demand	747	cubic - feet
DCV	15,270	cubic - feet
36 hr. Demand ≥ DCV	No	
DCV > 36 hr. Demand > 0.25DCV	No	
36 hr. Demand < 0.25DCV	Yes	
Harvest Use:	Not Feasible	

Harvest and use is considered to be infeasible

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Provide basis:

Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed residential development are generally less than 0.5 inches per hour (Leighton, 2020). The calculated infiltration rates via the Porchet Method and applied safety factor of 2 ranges from 0.03 to 0.04 inches per hour.

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	<input type="checkbox"/>
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Provide basis:

The risk of geotechnical hazards would be increased provided mitigation is performed for any underground utilities/structures, slopes (i.e., setbacks) and undocumented fill depths greater than 5 feet within the proposed limits of Hydromodification Basins at the subject site. In addition, compressible alluvium and landslide deposits are present across the site.

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Provide basis:</p> <p>If the infiltration rates were greater than 0.5 inches per hour, it may be possible that the risk of groundwater contamination would not be increased provided there are no known contaminated soil or groundwater sites within 250 feet of the proposed Hydromodification Basins at the subject site.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Provide basis:</p> <p>If the infiltration rates were greater than 0.5 inches per hour, it may be possible that potential water balance issues would not be affected provided there are no unlined site drainages/creeks/streams within 250 feet of the proposed Hydromodification Basins at the subject site.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
Part 1 Result *	<p>If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</p> <p>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</p>	<input type="checkbox"/> Full Infiltration <input checked="" type="checkbox"/> No	

*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



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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Provide basis:
 Based on our field percolation testing, the in-situ infiltration rates of the soils within the limits of proposed the Basin sites are less than 0.5 inches per hour (Leighton, 2020), but greater than 0.01 inches per hour. The calculated infiltration rates via the Porchet Method and applied safety factor of 2 are between 0.03 and 0.04 inches per hour.

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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Provide basis:
 For a partial infiltration condition (greater than 0.01 inches per hour), the risk of geotechnical hazards will be increased by partial infiltration provided mitigation is performed for any underground utilities/structures, slopes (i.e., setbacks) and undocumented fill depths greater than 5 feet within the vicinity of proposed Hydromodification Basins at the subject site. In addition to fill material, Alluvium and Landslide Deposits are considered compressible and may settle if water is introduced to compressible sand layers.

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	<p>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 shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>Provide basis: For a partial infiltration condition (greater than 0.01 inches per hour), the risk of groundwater contamination will not be increased by partial infiltration provided there are no known contaminated soil or groundwater sites within 250 feet of the proposed Hydromodification Basins at the subject site.</p> <p>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.</p>			
8	<p>Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Provide basis: For a partial infiltration condition (greater than 0.01 inches per hour), violation of downstream water rights is not anticipated based on the site location and that there are no unlined site drainages/creeks/streams within 250 feet of the proposed Hydromodification Basins at the subject site.</p> <p>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.</p>			
Part 2 Result*	<p>If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.</p> <p>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.</p>	<input type="checkbox"/>	<input type="checkbox"/> Partial Infiltration <input checked="" type="checkbox"/> No Infiltration

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



Automated Worksheet B.1: Calculation of Design Capture Volume (V2.0)

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	1	Drainage Basin ID or Name	DMA1	DMA2.1	DMA2.2	DMA2.3	DMA2.4	DMA2.5	DMA3.1	DMA3.2	DMA3.3	DMA3.4	unitless
	2	85th Percentile 24-hr Storm Depth	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	inches
	3	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	25,461	14,843	41,257	46,596	20,437	30,332	4,589	12,023	50,989	24,855	sq-ft
	4	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
	5	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	6	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	7	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	8	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	9	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)	7,042	853	2,161	2,327	2,347	3,993	700	1,572	4,917	5,331	sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	11	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)											sq-ft
	12	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	13	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	14	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)											sq-ft
	15	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)											sq-ft
	16	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)											sq-ft
	17	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)											sq-ft
	18	Number of Tree Wells Proposed per SD-A		1	1	1	1	1	1	1	1	1	#
	19	Average Mature Tree Canopy Diameter		20	20	20	20	20	20	20	20	20	ft
	20	Number of Rain Barrels Proposed per SD-E											#
21	Average Rain Barrel Size											gal	
Initial Runoff Factor Calculation	22	Total Tributary Area	32,503	15,696	43,418	48,923	22,784	34,325	5,289	13,595	55,906	30,186	sq-ft
	23	Initial Runoff Factor for Standard Drainage Areas	0.77	0.87	0.87	0.87	0.84	0.83	0.82	0.83	0.85	0.79	unitless
	24	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	25	Initial Weighted Runoff Factor	0.77	0.87	0.87	0.87	0.84	0.83	0.82	0.83	0.85	0.79	unitless
	26	Initial Design Capture Volume	1,231	671	1,857	2,093	941	1,401	213	555	2,336	1,172	cubic-feet
Dispersion Area Adjustments	27	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	28	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	29	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	30	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	31	Runoff Factor After Dispersion Techniques	0.77	0.87	0.87	0.87	0.84	0.83	0.82	0.83	0.85	0.79	unitless
	32	Design Capture Volume After Dispersion Techniques	1,231	671	1,857	2,093	941	1,401	213	555	2,336	1,172	cubic-feet
Tree & Barrel Adjustments	33	Total Tree Well Volume Reduction	0	180	180	180	180	180	180	180	180	180	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	35	Final Adjusted Runoff Factor	0.77	0.64	0.79	0.80	0.68	0.72	0.13	0.56	0.78	0.67	unitless
	36	Final Effective Tributary Area	25,027	10,045	34,300	39,138	15,493	24,714	688	7,613	43,607	20,225	sq-ft
	37	Initial Design Capture Volume Retained by Site Design Elements	0	180	180	180	180	180	180	180	180	180	cubic-feet
	38	Final Design Capture Volume Tributary to BMP	1,231	491	1,677	1,913	761	1,221	33	375	2,156	992	cubic-feet

No Warning Messages

Automated Worksheet B.2: Retention Requirements (V2.0)

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units	
Basic Analysis	1	Drainage Basin ID or Name	DMA1	DMA2.1	DMA2.2	DMA2.3	DMA2.4	DMA2.5	DMA3.1	DMA3.2	DMA3.3	DMA3.4	unitless	
	2	85th Percentile Rainfall Depth	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	inches	
	3	Predominant NRCS Soil Type Within BMP Location	D	D	D	D	D	D	D	D	D	D	unitless	
	4	Is proposed BMP location Restricted or Unrestricted for Infiltration Activities?	Restricted	Restricted	Restricted	Restricted	Restricted	Restricted	Restricted	Restricted	Restricted	Restricted	Restricted	unitless
	5	Nature of Restriction	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	Soil Type	unitless
	6	Do Minimum Retention Requirements Apply to this Project?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	7	Are Habitable Structures Greater than 9 Stories Proposed?	No	No	No	No	No	No	No	No	No	No	No	yes/no
Advanced Analysis	8	Has Geotechnical Engineer Performed an Infiltration Analysis?	No	No	No	No	No	No	No	No	No	No	yes/no	
	9	Design Infiltration Rate Recommended by Geotechnical Engineer											in/hr	
Result	10	Design Infiltration Rate Used To Determine Retention Requirements	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr	
	11	Percent of Average Annual Runoff that Must be Retained within DMA	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	percentage	
	12	Fraction of DCV Requiring Retention	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	ratio	
	13	Required Retention Volume	25	10	34	38	15	24	1	8	43	20	cubic-feet	

No Warning Messages

Automated Worksheet B.3: BMP Performance (V2.0)

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
BMP Inputs	1	Drainage Basin ID or Name	DMA1	DMA2.1	DMA2.2	DMA2.3	DMA2.4	DMA2.5	DMA3.1	DMA3.2	DMA3.3	DMA3.4	sq-ft
	2	Design Infiltration Rate Recommended	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	3	Design Capture Volume Tributary to BMP	1,231	491	1,677	1,913	761	1,221	33	375	2,156	992	cubic-feet
	4	Is BMP Vegetated or Unvegetated?	Vegetated										unitless
	5	Is BMP Impermeably Lined or Unlined?	Lined										unitless
	6	Does BMP Have an Underdrain?	Underdrain										unitless
	7	Does BMP Utilize Standard or Specialized Media?	Standard										unitless
	8	Provided Surface Area	1,850										sq-ft
	9	Provided Surface Ponding Depth	12										inches
	10	Provided Soil Media Thickness	18										inches
	11	Provided Gravel Thickness (Total Thickness)	6										inches
	12	Underdrain Offset	3										inches
	13	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	0.80										inches
	14	Specialized Soil Media Filtration Rate											in/hr
	15	Specialized Soil Media Pore Space for Retention											unitless
	16	Specialized Soil Media Pore Space for Biofiltration											unitless
	17	Specialized Gravel Media Pore Space											unitless
Retention Calculations	18	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	19	Ponding Pore Space Available for Retention	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	unitless
	20	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	21	Gravel Pore Space Available for Retention (Above Underdrain)	0.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	22	Gravel Pore Space Available for Retention (Below Underdrain)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	23	Effective Retention Depth	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	24	Fraction of DCV Retained (Independent of Drawdown Time)	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	25	Calculated Retention Storage Drawdown Time	120	0	0	0	0	0	0	0	0	0	hours
	26	Efficacy of Retention Processes	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	27	Volume Retained by BMP (Considering Drawdown Time)	335	0	0	0	0	0	0	0	0	0	cubic-feet
	28	Design Capture Volume Remaining for Biofiltration	896	491	1,677	1,913	761	1,221	33	375	2,156	992	cubic-feet
Biofiltration Calculations	29	Max Hydromod Flow Rate through Underdrain	0.0277	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	cfs
	30	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	in/hr
	31	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	32	Soil Media Filtration Rate to be used for Sizing	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	in/hr
	33	Depth Biofiltered Over 6 Hour Storm	3.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	34	Ponding Pore Space Available for Biofiltration	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	35	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	36	Gravel Pore Space Available for Biofiltration (Above Underdrain)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	37	Effective Depth of Biofiltration Storage	16.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	38	Drawdown Time for Surface Ponding	19	0	0	0	0	0	0	0	0	0	hours
	39	Drawdown Time for Effective Biofiltration Depth	26	0	0	0	0	0	0	0	0	0	hours
	40	Total Depth Biofiltered	20.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	inches
	41	Option 1 - Biofilter 1.50 DCV: Target Volume	1,344	737	2,516	2,870	1,142	1,832	50	563	3,234	1,488	cubic-feet
	42	Option 1 - Provided Biofiltration Volume	1,344	0	0	0	0	0	0	0	0	0	cubic-feet
	43	Option 2 - Store 0.75 DCV: Target Volume	672	368	1,258	1,435	571	916	25	281	1,617	744	cubic-feet
	44	Option 2 - Provided Storage Volume	672	0	0	0	0	0	0	0	0	0	cubic-feet
	45	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	46	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	47	Overall Portion of Performance Standard Satisfied (BMP Efficacy Factor)	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	48	Deficit of Effectively Treated Stormwater	0	-491	-1,677	-1,913	-761	-1,221	-33	-375	-2,156	-992	cubic-feet

Attention!

-This BMP does not fully satisfy the performance standards for pollutant control for the drainage area.

Appendix B: Storm Water Pollutant Control Hydrologic Calculations and Sizing Methods

Worksheet B.6-1: Flow-Thru Design Flows

Flow-Thru Design Flows		Worksheet B.6-1										
			DMA 2.1	DMA 2.2	DMA 2.3	DMA 2.4	DMA 2.5	DMA 3.1	DMA 3.2	DMA 3.3	DMA 3.4	Units
1	DCV*	DCV	671	1,857	2,093	941	1,401	213	555	2,336	1,172	cubic-feet
2	DCV retained	DCV retained										cubic-feet
3	DCV biofiltered**	DCV biofiltered										cubic-feet
4	DCV requiring flow-thru (Line 1 - Line 2 - 0.67 * Line 3)	DCV flow-thru	671	1,857	2,093	941	1,401	213	555	2,336	1,172	cubic-feet
5	Adjustment Factor (Line 4 / Line 1)*	AF=	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	unitless
6	Design rainfall intensity	i=	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	in/hr
7	Area tributary to BMP (s)	A=	0.36	1.00	1.12	0.52	0.79	0.19	0.31	1.28	0.69	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.87	0.87	0.87	0.84	0.83	0.85	0.83	0.85	0.79	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.063	0.174	0.195	0.087	0.131	0.032	0.051	0.218	0.109	cfs
	TREATMENT FLOW REQUIRED (1.5 X FLOW RATE)	Q=	0.094	0.261	0.292	0.131	0.197	0.048	0.077	0.326	0.164	cfs

*DCV as calculated per County of San Diego Worksheet B.1 in SWQMP Attachment 1e

**Although retention will be provided via trees, each MWS has been sized for its entire DMA



December 2015

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on Modular Wetland Systems, Inc. application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment
 - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment
 - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment
 - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

4. Ecology approves the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:

- Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
- Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
- Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. These use level designations have no expiration date but may be revoked or amended by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. The applicant tested the MWS – Linear Modular Wetland Stormwater Treatment System with an external bypass weir. This weir limited the depth of water flowing through the media, and therefore the active treatment area, to below the root zone of the plants. This GULD applies to MWS – Linear Modular Wetland Stormwater Treatment Systems whether plants are included in the final product or not.
5. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a “one size fits all” maintenance cycle for a particular model/size of manufactured filter treatment device.

- Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
- Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
- Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific

maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
 - Standing water remains in the vault between rain events, or
 - Bypass occurs during storms smaller than the design storm.
 - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
 - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant: Modular Wetland Systems, Inc.
Applicant's Address: PO. Box 869
Oceanside, CA 92054

Application Documents:

- *Original Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- *Quality Assurance Project Plan: Modular Wetland system – Linear Treatment System performance Monitoring Project*, draft, January 2011.
- *Revised Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011
- *Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data*, April 2014
- *Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring*, April 2014.

Applicant's Use Level Request:

General use level designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:Laboratory Testing

The MWS-Linear Modular wetland has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Field Testing

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).
- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Modular Wetland Systems, Inc. should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:

Download at <http://www.modularwetlands.com/>

Contact Information:

Applicant:

Greg Kent
Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92054
gkent@biocleanenvironmental.net

Applicant website: <http://www.modularwetlands.com/>

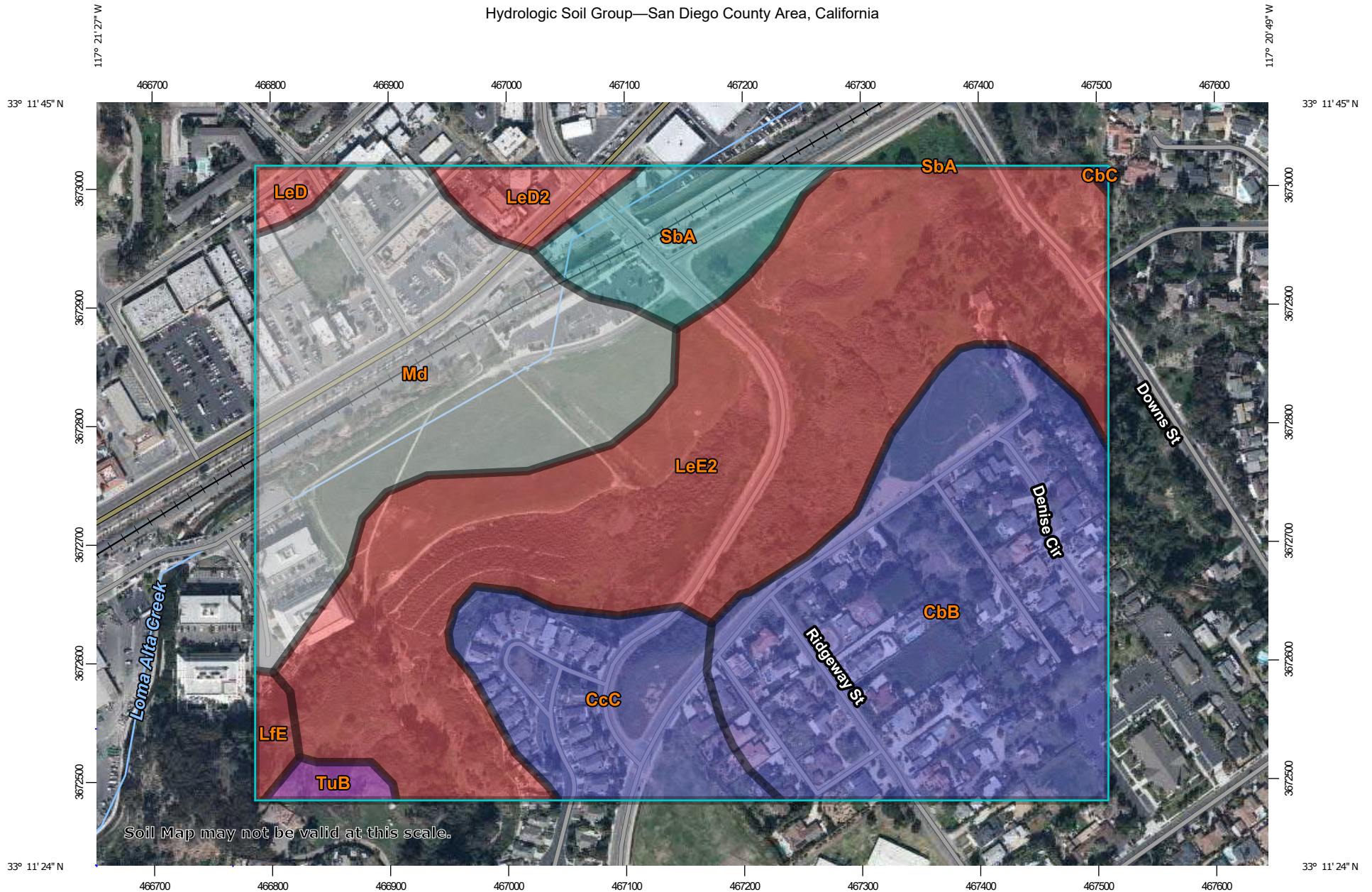
Ecology web link: <http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html>

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

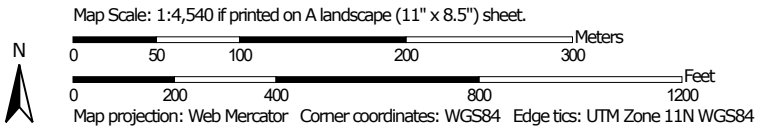
Revision History

Date	Revision
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment
December 2015	Updated GULD to document the acceptance of MWS-Linear Modular Wetland installations with or without the inclusion of plants.

Hydrologic Soil Group—San Diego County Area, California




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: San Diego County Area, California
 Survey Area Data: Version 15, May 27, 2020

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

Date(s) aerial images were photographed: Jan 24, 2020—Feb 12, 2020

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CbB	Carlsbad gravelly loamy sand, 2 to 5 percent slopes	B	23.8	24.8%
CbC	Carlsbad gravelly loamy sand, 5 to 9 percent slopes	B	0.1	0.1%
CcC	Carlsbad-Urban land complex, 2 to 9 percent slopes	B	8.1	8.5%
LeD	Las Flores loamy fine sand, 9 to 15 percent slopes	D	0.7	0.8%
LeD2	Las Flores loamy fine sand, 9 to 15 percent slopes, eroded	D	1.9	2.0%
LeE2	Las Flores loamy fine sand, 15 to 30 percent slopes, eroded	D	34.9	36.3%
LfE	Las Flores-Urban land complex, 9 to 30 percent slopes	D	0.8	0.8%
Md	Made land		20.0	20.8%
SbA	Salinas clay loam, 0 to 2 percent slopes, warm MAAT, MLRA 19	C	5.1	5.3%
TuB	Tujunga sand, 0 to 5 percent slopes	A	0.7	0.8%
Totals for Area of Interest			96.0	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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:

Attachment Sequence	Contents	Checklist
Attachment 2a	1. Hydromodification Management Exhibit (Required)	<input checked="" type="checkbox"/> Included <i>Included as part of Attachment 1a</i> See Hydromodification Management Exhibit Checklist.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	<input checked="" type="checkbox"/> Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination <input type="checkbox"/> 6.2.1 Verification of Geomorphic Landscape Units Onsite <input type="checkbox"/> 6.2.2 Downstream Systems Sensitivity to Coarse Sediment <input type="checkbox"/> 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	<input checked="" type="checkbox"/> Not performed <input type="checkbox"/> Included <input type="checkbox"/> Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design and Structural BMP Drawdown Calculations (Required) Overflow Design Summary for each structural BMP See Chapter 6 and Appendix G of the BMP Design Manual	<input checked="" type="checkbox"/> Included <input type="checkbox"/> Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	<input type="checkbox"/> Included <input checked="" type="checkbox"/> Not required because BMPs will drain in less than 96 hours



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)

Please provide the Exhibit in 24"x36" format with map pocket, wet date, and stamp.



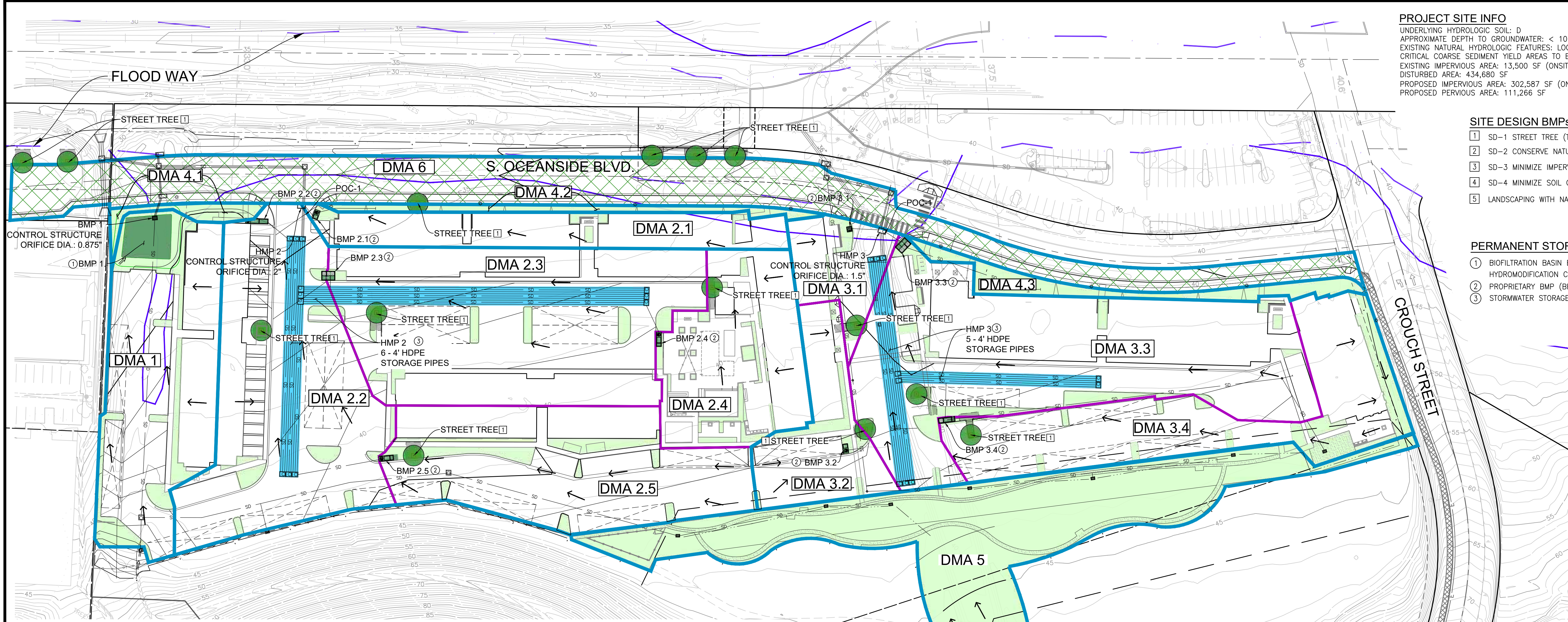
PROJECT SITE INFO
 UNDERLYING HYDROLOGIC SOIL: D
 APPROXIMATE DEPTH TO GROUNDWATER: < 10 FT
 EXISTING NATURAL HYDROLOGIC FEATURES: LOCATED WITHIN FLOODPLAIN AND FLOODWAY, SEEPS LOCATED ON SITE
 CRITICAL COARSE SEDIMENT YIELD AREAS TO BE PROTECTED: NONE LOCATED WITHIN PROJECT BOUNDARY
 EXISTING IMPERVIOUS AREA: 13,500 SF (ONSITE), 17,827 (OFFSITE SIDEWALK TO BE MAINTAINED)
 DISTURBED AREA: 434,680 SF
 PROPOSED IMPERVIOUS AREA: 302,587 SF (ONSITE), 17,827 (OFFSITE SIDEWALK TO BE MAINTAINED)
 PROPOSED PERVIOUS AREA: 111,266 SF

- SITE DESIGN BMPs**
- SD-1 STREET TREE (TREE WELL), 14.5' x 14.5' STRUCTURAL SOIL FOOTPRINT
 - SD-2 CONSERVE NATURAL AREAS, SOILS AND VEGETATION
 - SD-3 MINIMIZE IMPERVIOUS AREA
 - SD-4 MINIMIZE SOIL COMPACTION
 - LANDSCAPING WITH NATIVE OR DROUGHT TOLERANT SPECIES

- PERMANENT STORM WATER BMP NOTES**
- BIOFILTRATION BASIN BMP (BF-1), FOR POLLUTANT AND HYDROMODIFICATION CONTROL
 - PROPRIETARY BMP (BF-3), POLLUTANT CONTROL ONLY
 - STORMWATER STORAGE FOR HYDROMODIFICATION

LEGEND

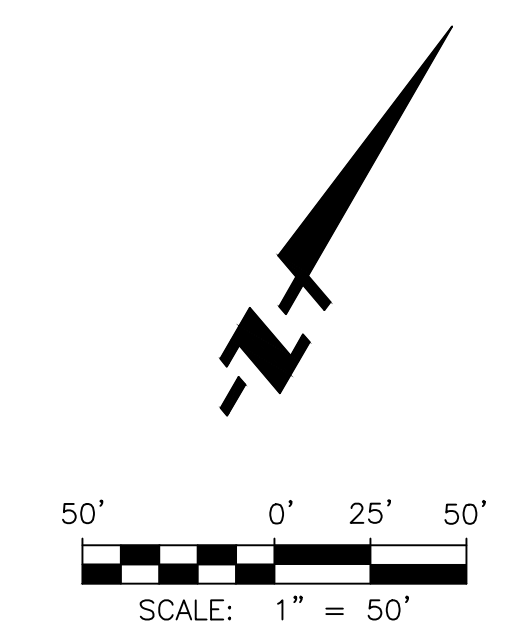
- PROPERTY LINE
- RIGHT-OF-WAY
- STREET CENTERLINE
- EXISTING CONTOUR
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- DMA LIMITS
- SUB-DMA LIMITS
- DIRECTION OF FLOW
- DMA DESIGNATION
- BIOFILTRATION BASIN
- TREE WELL PER SD-A
- PERVIOUS AREA
- TO BE DESIGNED PER COUNTY OF SAN DIEGO GREEN STREETS DESIGN CRITERIA
- MODULAR WETLAND UNITS
- HYDROMODIFICATION CISTERN STORM DRAIN PIPE
- CROUCH STREET SIDEWALK RESURFACING (EXEMPT FROM PDP REQUIREMENTS)



DMA SUMMARY TABLE

JEFFERSON OCEANSIDE DMA SUMMARY TABLE

DMA	TOTAL AREA (AC)	TOTAL AREA (SF)	PERVIOUS AREA (SF)	IMPERVIOUS AREA - ROOFS, CONCRETE, ASPHALT (SF)	% IMPERVIOUS	WATER QUALITY WEIGHTED AREA (SF)	WEIGHTED C FACTOR	INITIAL DCV (CF)	POLLUTANT TREATMENT METHOD	Basin Area Required (SF)	Basin Area Provided (SF)	MWS TREATMENT FLOWRATE REQUIRED	MWS TREATMENT FLOWRATE PROVIDED	HYDROMODIFICATION TREATMENT METHOD	HMP BASIN AREA REQUIRED (SF)	HMP BASIN AREA PROVIDED (SF)	HMP CISTERN VOLUME REQUIRED (CF)	HMP CISTERN VOLUME PROVIDED (CF)	DRAINS TO
1	0.75	32,503	7,042	25,461	78%	25,028	0.77	1231	BMP 1 Biofiltration	751	1,845	-	-	-	-	-	-	-	-
2.1	0.36	15,696	853	14,843	95%	13,615	0.87	671	BMP 2.1 (MWS)	-	-	0.094	0.115	-	-	-	-	-	-
2.2	1.00	43,418	2,161	41,257	95%	37,780	0.87	1857	BMP 2.2 (MWS)	-	-	0.261	0.268	-	-	-	-	-	-
2.3	1.12	48,923	2,327	46,596	95%	42,635	0.87	2093	BMP 2.3 (MWS)	-	-	0.292	0.346	HMP 2	-	-	18,556	19,780	POC-1
2.4	0.52	22,784	2,347	20,437	90%	19,097	0.84	941	BMP 2.4 (MWS)	-	-	0.131	0.144	-	-	-	-	-	-
2.5	0.79	34,325	3,993	30,332	88%	28,497	0.83	1401	BMP 2.5 (MWS)	-	-	0.197	0.206	-	-	-	-	-	-
3.1	0.19	8,289	700	7,589	92%	7,040	0.85	346	BMP 3.1 (MWS)	-	-	0.048	0.052	-	-	-	-	-	-
3.2	0.31	13,595	1,572	12,023	88%	11,292	0.83	555	BMP 3.2 (MWS)	-	-	0.077	0.115	HMP 3	-	-	11,605	12,160	POC-2
3.3	1.28	55,906	4,917	50,989	91%	47,365	0.85	2336	BMP 3.3 (MWS)	-	-	0.326	0.346	-	-	-	-	-	-
3.4	0.69	30,186	5,331	24,855	82%	23,969	0.79	1172	BMP 3.4 (MWS)	-	-	0.164	0.175	-	-	-	-	-	-
4.1	0.16	2,044	2,044	0	0%	613	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	-
4.2	0.08	3,339	3,339	0	0%	1,002	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	-
4.3	0.88	5,708	5,708	0	0%	1,712	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	-
5	1.08	47,102	47,102	0	0%	14,131	-	-	Self Mitigating	-	-	-	-	-	-	-	-	-	POC-1
6	1.15	50,035	21,830	28,205	56%	31,934	-	-	Tree Wells Per Green Streets Design	-	-	-	-	-	-	-	-	-	-
TOTALS	9.50	413,853	111,266	302,587	73%	305,708	0.74	12,603	-	-	-	-	-	-	1,832	1,845	30,161	31,940	-

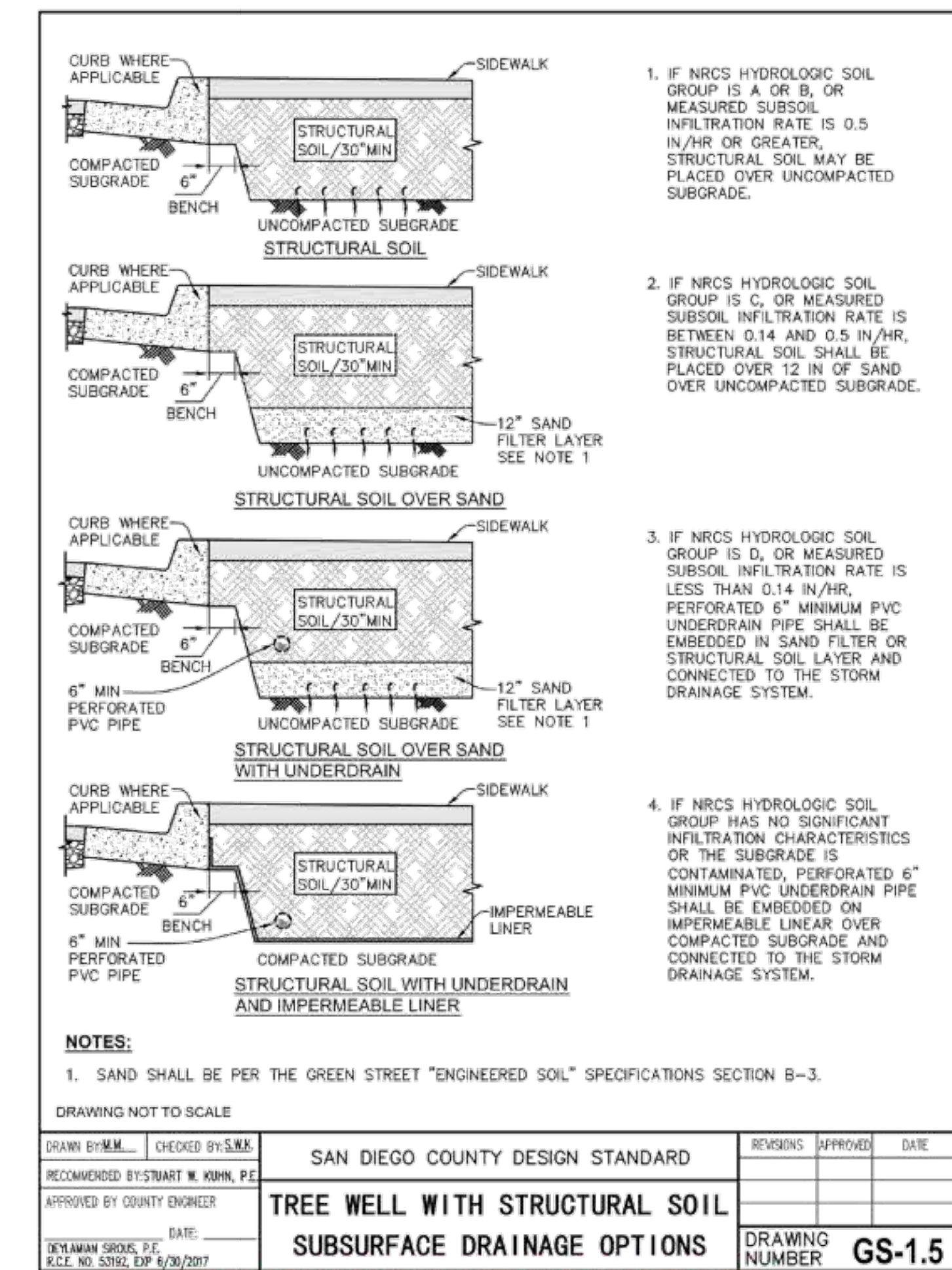
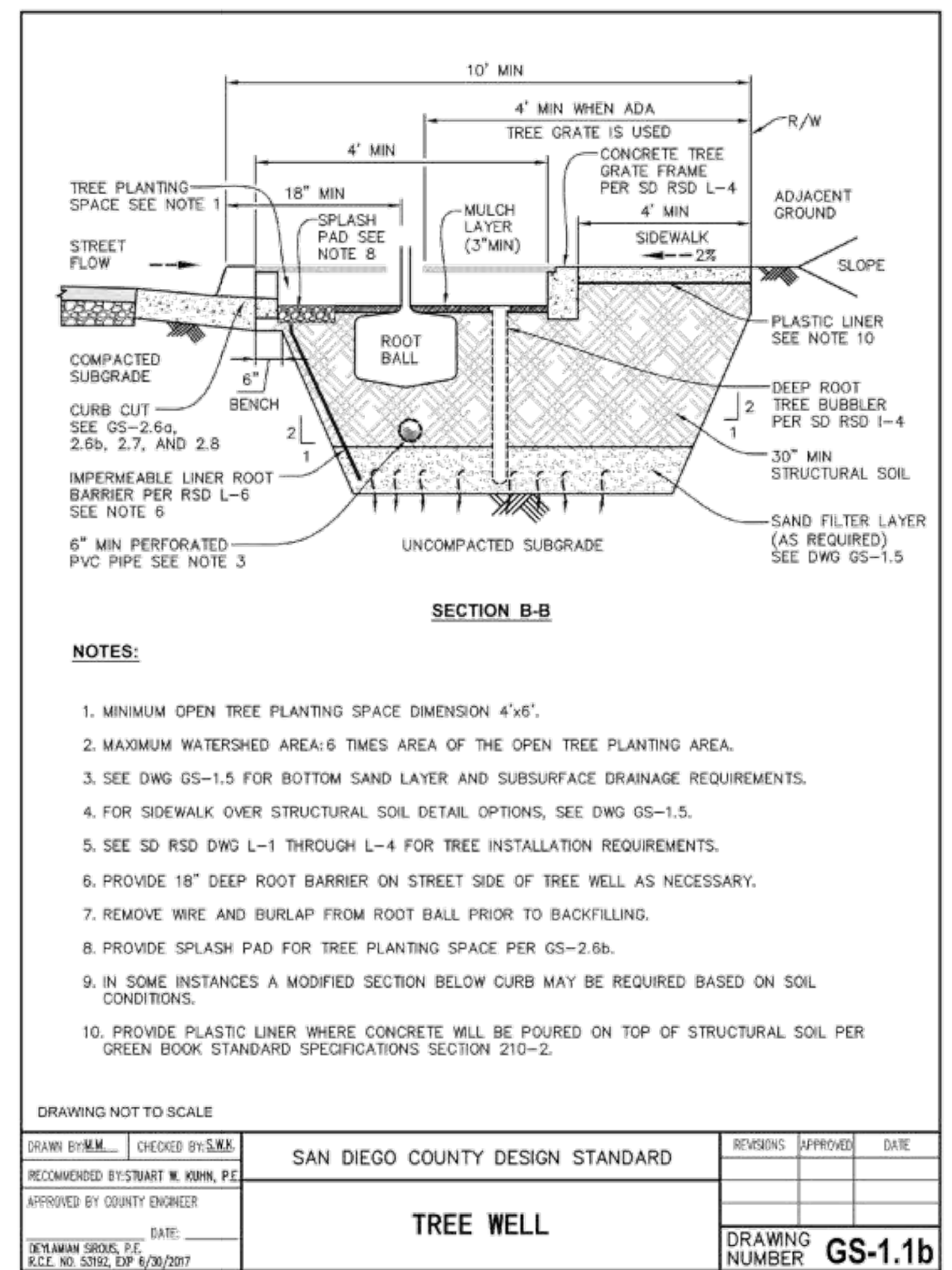
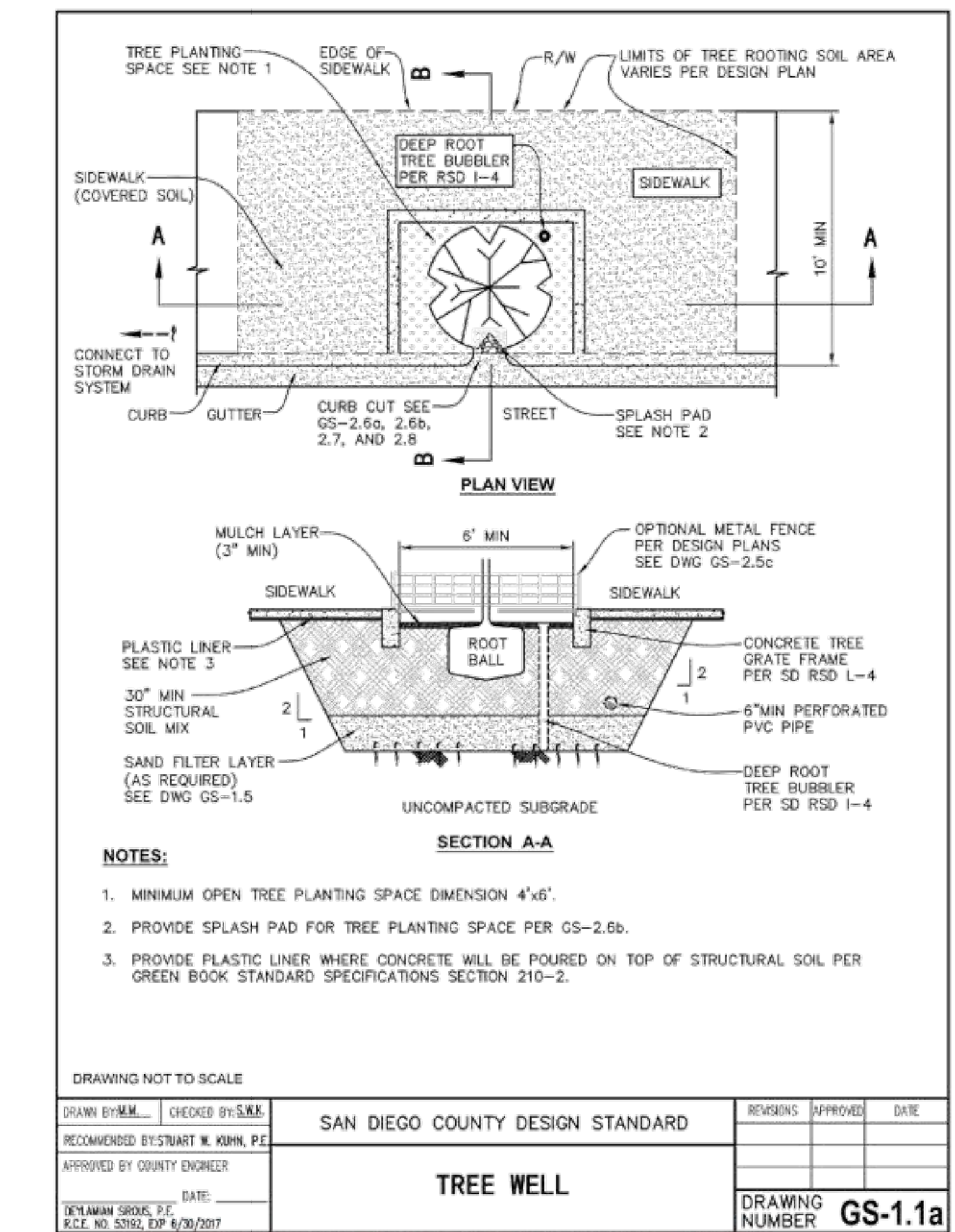
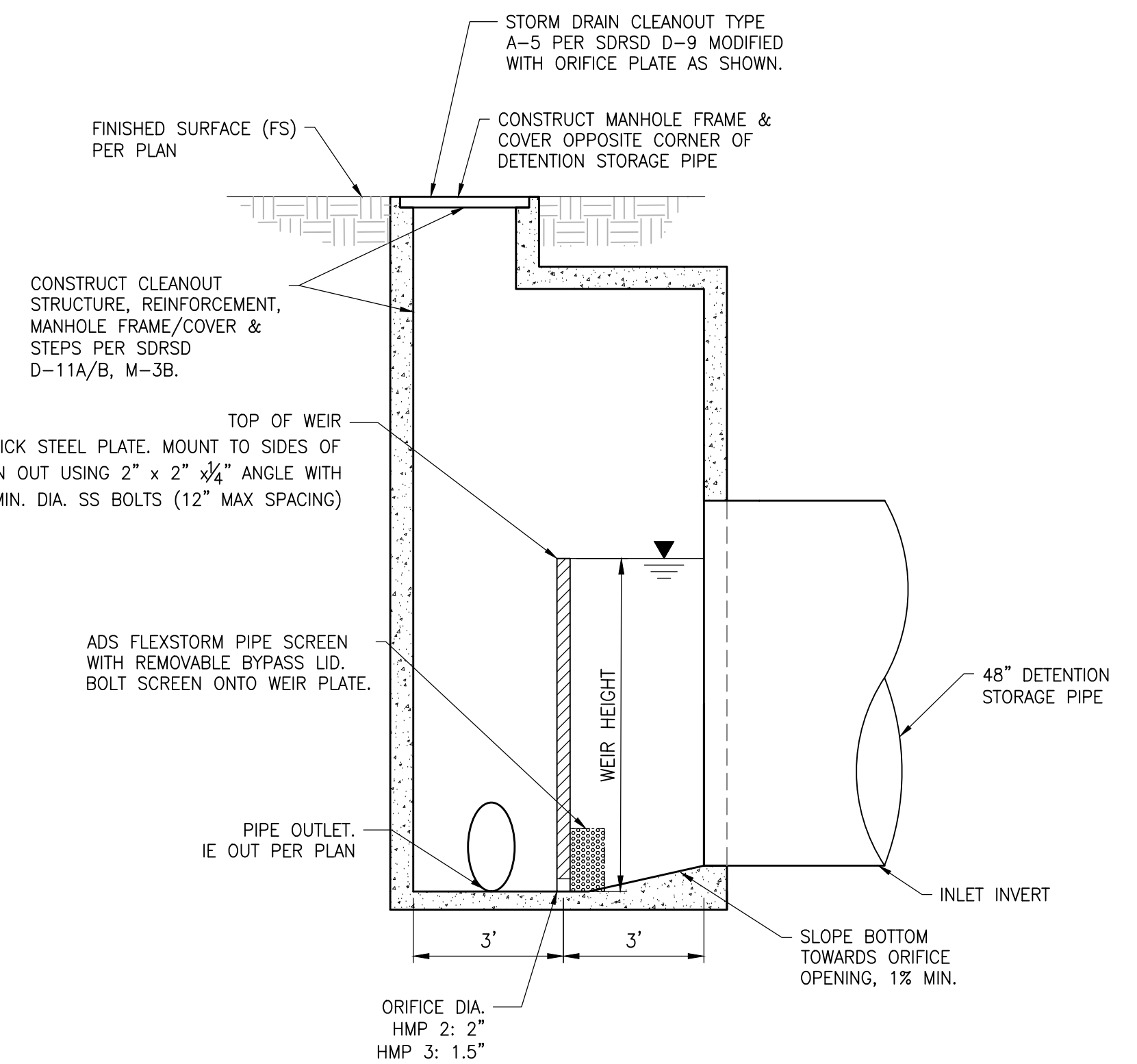
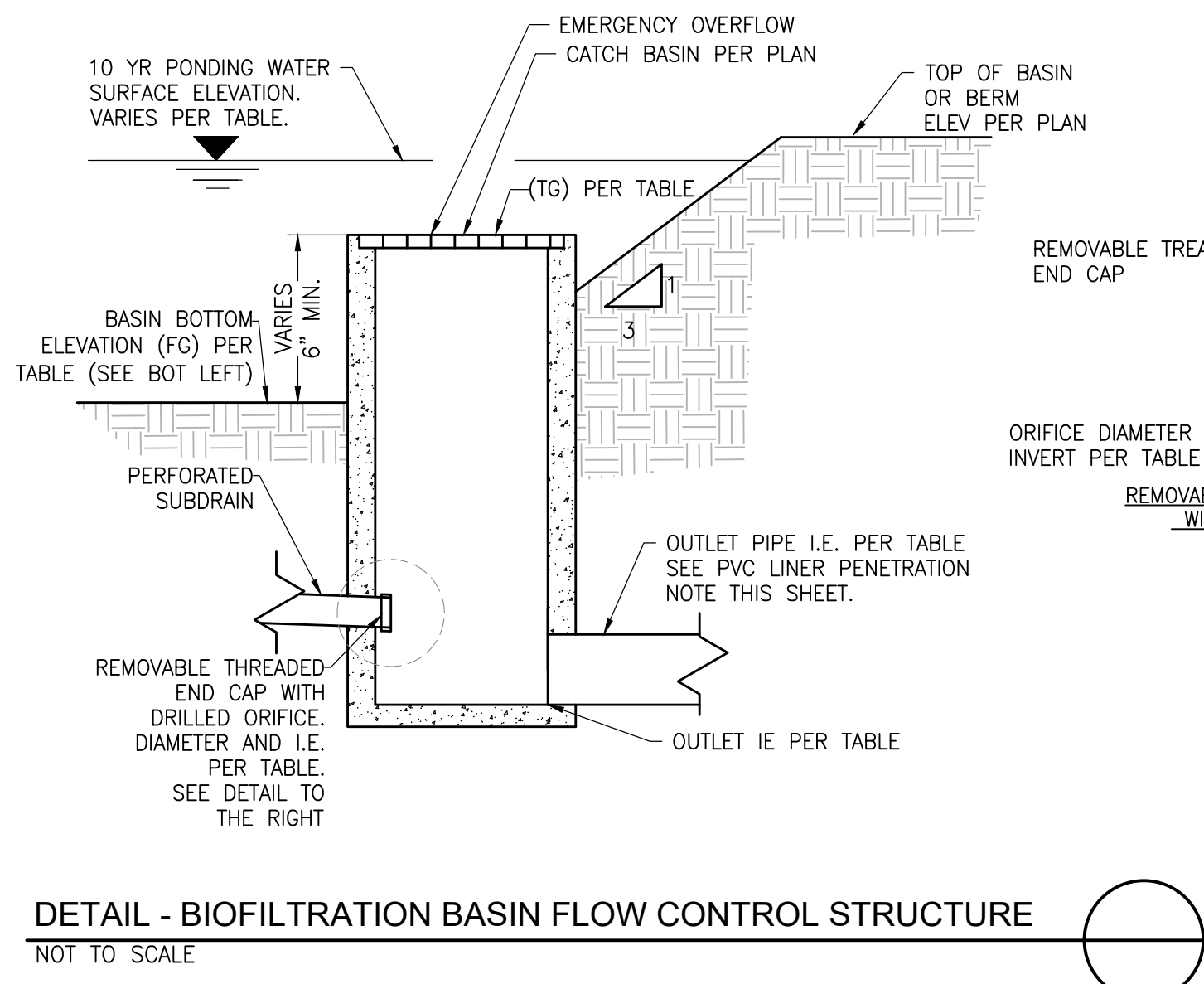
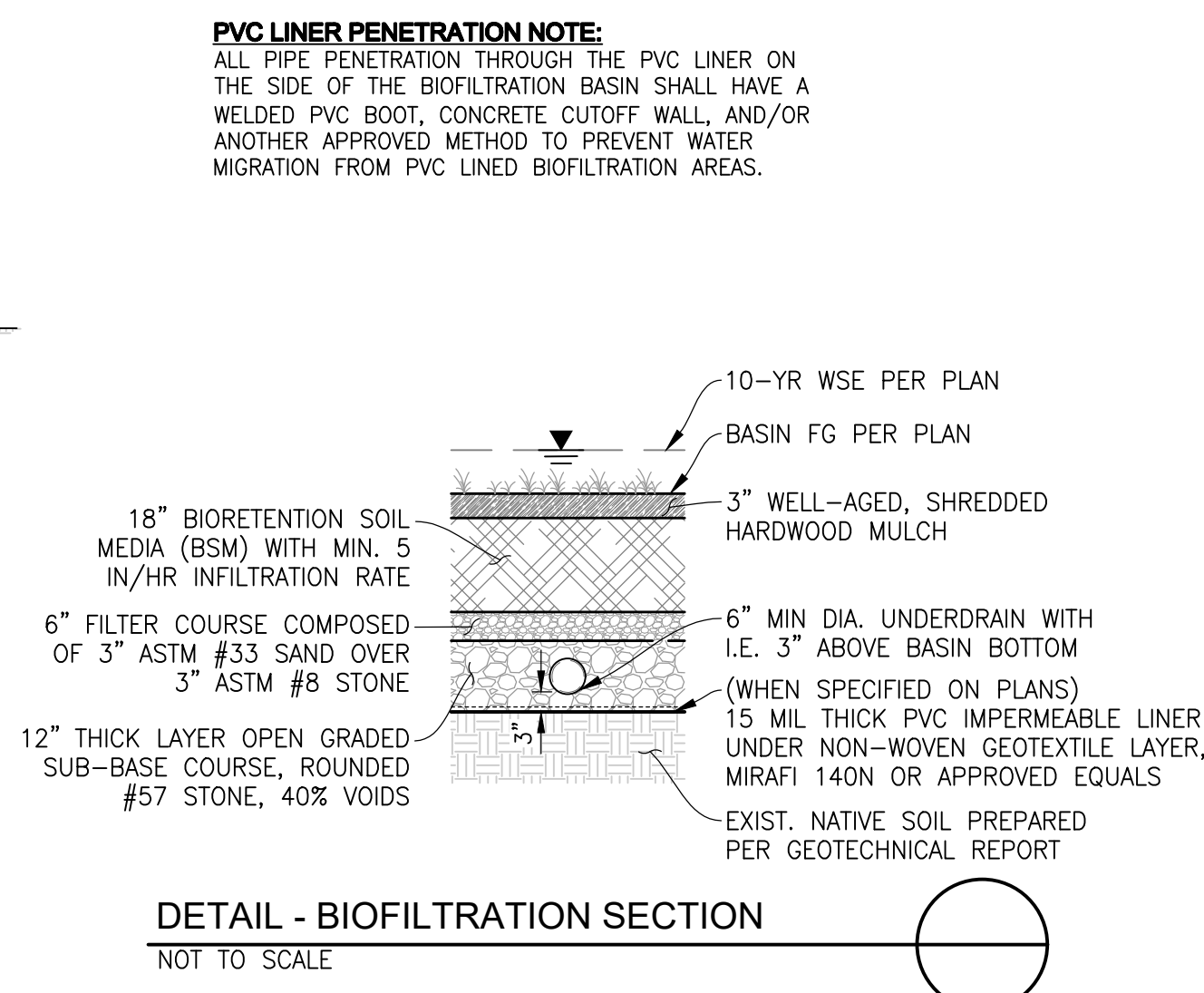
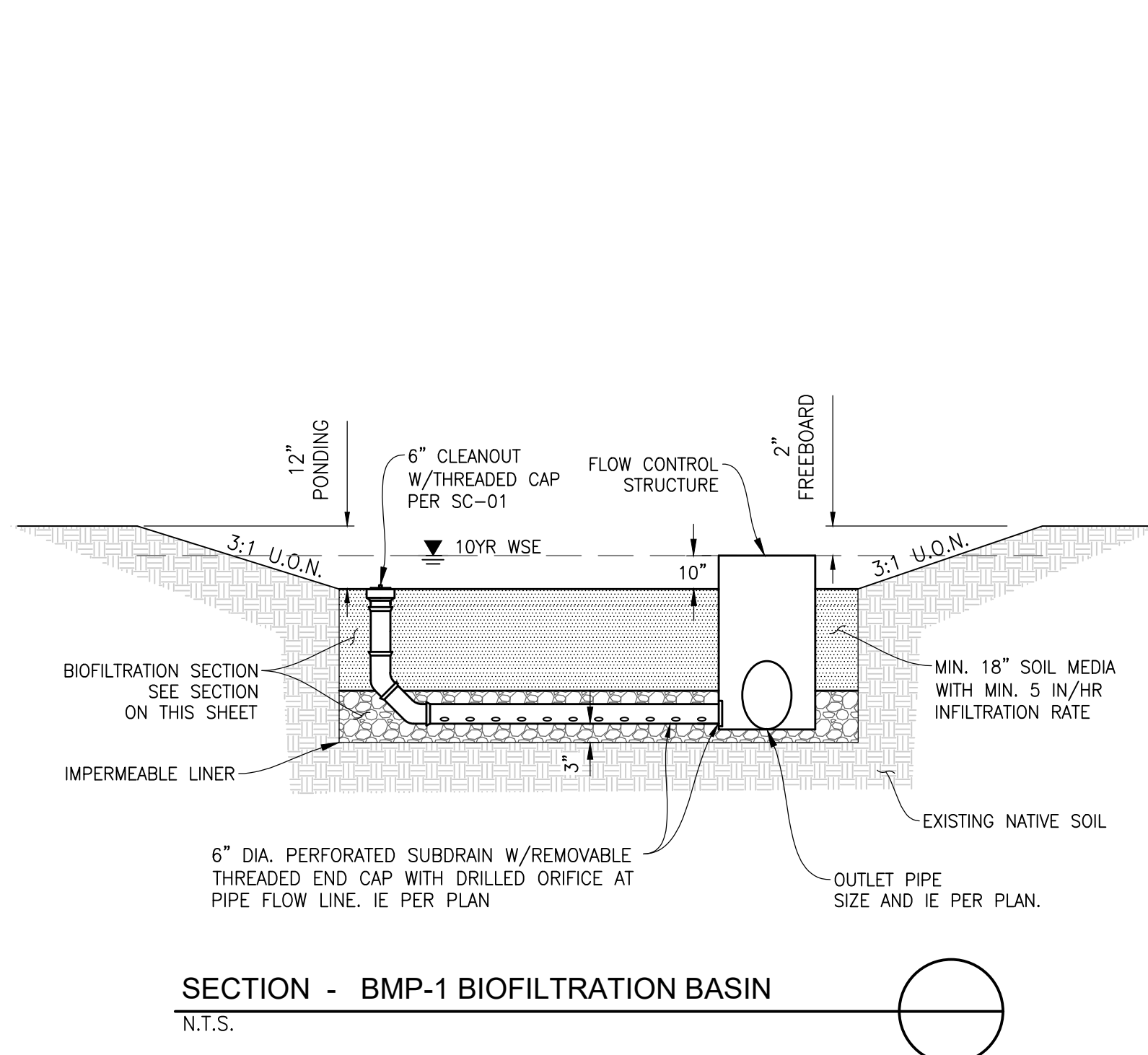


JEFFERSON OCEANSIDE
ATTACHMENT 1a, 1b, & 2a
DMA & HYDROMODIFICATION
MANAGEMENT EXHIBIT

FUSCOE
 ENGINEERING
 6390 Greenwich Dr., Suite 170
 San Diego, California 92122
 tel 858.554.1500 • fax 858.597.0335
 www.fuscoe.com

JOB NO. 557-010
 DRAWN BY: ECS
 SHEET 1 of 5

NO.	DATE	REVISION



NOMINAL DIAMETER	NOMINAL C.O.D.	TYPICAL SPACING 12"	NOMINAL SPACING 12"	TYPICAL SPACING 12"	H (NON-TRAFFIC)	H (TRAFFIC)
36"	42.5"	11"	35.5"	8"	52"	12"
(300mm)	(368mm)	(279mm)	(660mm)	(203mm)	(330mm)	(305mm)
42"	48.5"	13"	41.5"	10"	52"	12"
(343mm)	(457mm)	(330mm)	(737mm)	(254mm)	(330mm)	(305mm)
48"	54.5"	15"	47.5"	12"	52"	12"
(406mm)	(533mm)	(381mm)	(813mm)	(305mm)	(330mm)	(305mm)
54"	60.5"	17"	53.5"	14"	52"	12"
(457mm)	(593mm)	(432mm)	(893mm)	(355mm)	(330mm)	(305mm)
60"	66.5"	19"	59.5"	16"	52"	12"
(508mm)	(653mm)	(483mm)	(1053mm)	(406mm)	(330mm)	(305mm)
66"	72.5"	21"	65.5"	18"	52"	12"
(541mm)	(713mm)	(533mm)	(1113mm)	(457mm)	(330mm)	(305mm)
72"	78.5"	23"	71.5"	20"	52"	12"
(597mm)	(773mm)	(584mm)	(1173mm)	(508mm)	(330mm)	(305mm)
78"	84.5"	25"	77.5"	22"	52"	12"
(641mm)	(833mm)	(635mm)	(1233mm)	(559mm)	(330mm)	(305mm)
84"	90.5"	27"	83.5"	24"	52"	12"
(697mm)	(893mm)	(686mm)	(1293mm)	(610mm)	(330mm)	(305mm)
90"	96.5"	29"	89.5"	26"	52"	12"
(753mm)	(953mm)	(737mm)	(1353mm)	(661mm)	(330mm)	(305mm)
96"	102.5"	31"	95.5"	28"	52"	12"
(809mm)	(1013mm)	(788mm)	(1413mm)	(712mm)	(330mm)	(305mm)
102"	108.5"	33"	101.5"	30"	52"	12"
(865mm)	(1073mm)	(839mm)	(1473mm)	(763mm)	(330mm)	(305mm)
108"	114.5"	35"	107.5"	32"	52"	12"
(921mm)	(1133mm)	(890mm)	(1533mm)	(814mm)	(330mm)	(305mm)
114"	120.5"	37"	113.5"	34"	52"	12"
(977mm)	(1193mm)	(941mm)	(1593mm)	(865mm)	(330mm)	(305mm)
120"	126.5"	39"	119.5"	36"	52"	12"
(1033mm)	(1253mm)	(992mm)	(1653mm)	(916mm)	(330mm)	(305mm)

NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER

DATE: 8/26/2017

DRAWING NUMBER: GS-1.1a

NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER

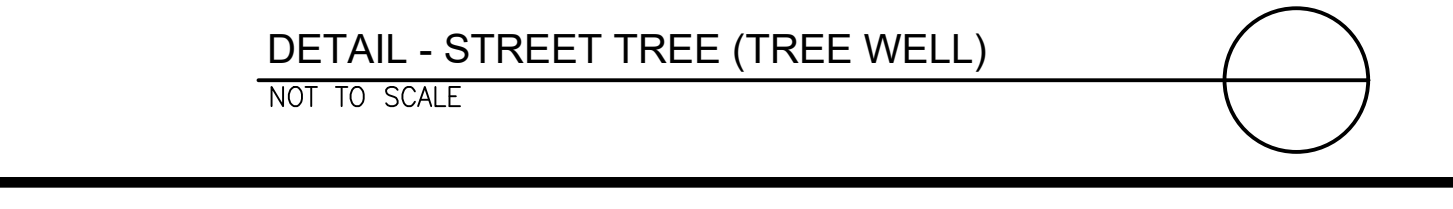
DATE: 8/26/2017

DRAWING NUMBER: GS-1.1b

NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER

DATE: 8/26/2017

DRAWING NUMBER: GS-1.5



JEFFERSON OCEANSIDE

ATTACHMENT 1a, 1b, & 2a
DMA & HYDROMODIFICATION MANAGEMENT
EXHIBIT
DETAILS

FUSCOE ENGINEERING
6390 Greenwich Dr., Suite 170
San Diego, California 92122
tel 858.554.1500 • fax 858.597.0335
www.fuscoe.com

JOB NO. 557-010
DRAWN BY: ECS
SHEET 2 of 5

Placeholder – **WMAA Exhibit**

Replace placeholder with required exhibit.



LEGEND

 CRITICAL COARSE
SEDIMENT YIELD AREAS



JEFFERSON OCEANSIDE

ATTACHMENT 2b - CRITICAL COARSE SEDIMENT YIELD AREAS EXHIBIT

Placeholder – **6.2.1 Verification of GLUs Onsite** (if applicable)

Replace placeholder with required calculations/documentation.

Leave placeholder intact if not applicable.

Not Applicable



Placeholder – **6.2.3 Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite** (Optional)

Replace placeholder with required calculations/documentation.

Leave placeholder intact if not applicable.

Not Applicable



Placeholder – **6.3.4 Geomorphic Assessment of Receiving Channels** (Optional)

Replace placeholder with required calculations/documentation.

Leave placeholder intact if not applicable.

Not Applicable



BMP Sizing Spreadsheet V3.0

Project Name:	Jefferson Oceanside
Project Applicant:	JPI
Jurisdiction:	City of Oceanside
Parcel (APN):	
Hydrologic Unit:	Carlsbad
Rain Gauge:	Oceanside
Total Project Area (sf):	494,215
Channel Susceptibility:	HIGH

BMP Sizing Spreadsheet V3.0			
Project Name:	Jefferson Oceanside	Hydrologic Unit:	Carlsbad
Project Applicant:	JPI	Rain Gauge:	Oceanside
Jurisdiction:	City of Oceanside	Total Project Area:	494,215
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name	HMP 2	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q ₂ (cfs)	Orifice Area (in ²)
		Soil Type	Slope				
DMA 2.1-Pervious	Oceanside	D	Flat	0.571	0.020	0.001	0.02
DMA 2.1- Impervious	Oceanside	D	Flat	0.571	0.341	0.019	0.29
DMA 2.2-Pervious	Oceanside	D	Flat	0.571	0.050	0.003	0.04
DMA 2.2- Impervious	Oceanside	D	Flat	0.571	0.947	0.054	0.80
DMA 2.3-Pervious	Oceanside	D	Flat	0.571	0.053	0.003	0.05
DMA 2.3- Impervious	Oceanside	D	Flat	0.571	1.070	0.061	0.90
DMA 2.3-Pervious	Oceanside	D	Flat	0.571	0.054	0.003	0.05
DMA 2.3- Impervious	Oceanside	D	Flat	0.571	0.469	0.027	0.40
DMA 2.3-Pervious	Oceanside	D	Flat	0.571	0.092	0.005	0.08
DMA 2.3- Impervious	Oceanside	D	Flat	0.571	0.696	0.040	0.59

3.50	0.216	3.19	2.02
Max Orifice Head (feet)	Max Tot. Allowable Orifice Flow (cfs)	Max Tot. Allowable Orifice Area (in ²)	Max Orifice Diameter (in)

Provide Hand Calc.	0.213	3.14	2.000
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in ²)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation
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BMP Sizing Spreadsheet V3.0			
Project Name:	Jefferson Oceanside	Hydrologic Unit:	Carlsbad
Project Applicant:	JPI	Rain Gauge:	Oceanside
Jurisdiction:	City of Oceanside	Total Project Area:	494,215
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name:	HMP 3	BMP Type:	Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	NA

Areas Draining to BMP						HMP Sizing Factors	Minimum BMP Size
DMA Name	Area (sf)	Pre Project Soil Type	Pre-Project Slope	Post Project Surface Type	Area Weighted Runoff Factor (Table G.2-1) ¹	Volume	Volume (CF)
DMA 3.1-Pervious	700	D	Flat	Landscape	0.1	0.12	8
DMA 3.1- Impervious	7,589	D	Flat	Mixed	1.0	0.12	911
						0	0
DMA 3.1-Pervious	1,572	D	Flat	Landscape	0.1	0.12	19
DMA 3.1- Impervious	12,023	D	Flat	Mixed	1.0	0.12	1443
						0	0
DMA 3.1-Pervious	4,917	D	Flat	Landscape	0.1	0.12	59
DMA 3.1- Impervious	50,989	D	Flat	Mixed	1.0	0.12	6119
						0	0
DMA 3.1-Pervious	5,331	D	Flat	Landscape	0.1	0.12	64
DMA 3.1- Impervious	24,855	D	Flat	Mixed	1.0	0.12	2983
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	107,976					Minimum BMP Size	11605
						Proposed BMP Size*	12160

* Assumes standard configuration

Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	3.5	ft
Minimum Required Cistern Footprint	3316	CF

Notes:
 1. Runoff factors which are used for hydromodification management flow control (Table G.2-1) are different from the runoff factors used for pollutant control BMP sizing (Table B.1-1). Table references are taken from the San Diego Region Model BMP Design Manual.

Describe the BMP's in sufficient detail in your PDP SWQMP to demonstrate the area, volume, and other criteria can be met within the constraints of the site.

BMP's must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head. Designated Staff have final review and approval authority over the project design.

This BMP Sizing Spreadsheet has been updated in conformance with the San Diego Region Model BMP Design Manual, April 2018. For questions or concerns please contact the jurisdiction in which your project is located.

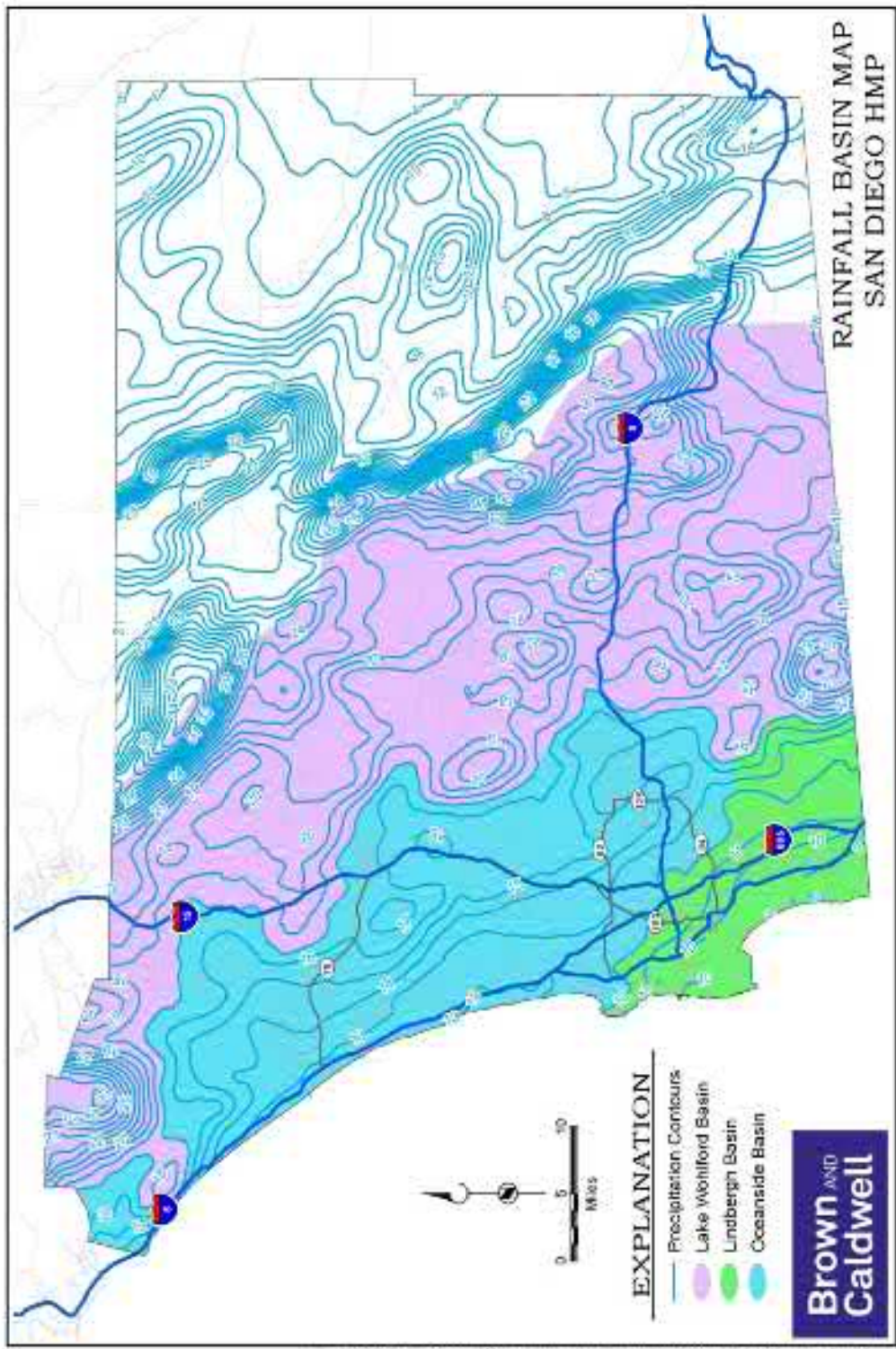
BMP Sizing Spreadsheet V3.0			
Project Name:	Jefferson Oceanside	Hydrologic Unit:	Carlsbad
Project Applicant:	JPI	Rain Gauge:	Oceanside
Jurisdiction:	City of Oceanside	Total Project Area:	494,215
Parcel (APN):	0	Low Flow Threshold:	0.1Q2
BMP Name	HMP 3	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition		Unit Runoff Ratio (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q ₂ (cfs)	Orifice Area (in ²)
		Soil Type	Slope				
DMA 3.1-Pervious	Oceanside	D	Flat	0.571	0.016	0.001	0.01
DMA 3.1- Impervious	Oceanside	D	Flat	0.571	0.174	0.010	0.15
DMA 3.1-Pervious	Oceanside	D	Flat	0.571	0.036	0.002	0.03
DMA 3.1- Impervious	Oceanside	D	Flat	0.571	0.276	0.016	0.23
DMA 3.1-Pervious	Oceanside	D	Flat	0.571	0.113	0.006	0.10
DMA 3.1- Impervious	Oceanside	D	Flat	0.571	1.171	0.067	0.99
DMA 3.1-Pervious	Oceanside	D	Flat	0.571	0.122	0.007	0.10
DMA 3.1- Impervious	Oceanside	D	Flat	0.571	0.571	0.033	0.48

3.50	0.142	2.09	1.63
Max Orifice Head (feet)	Max Tot. Allowable Orifice Flow (cfs)	Max Tot. Allowable Orifice Area (in²)	Max Orifice Diameter (in)

Provide Hand Calc.	0.120	1.77	1.500
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in ²)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation
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Brown AND Caldwell

Table G.2-3: Sizing Factors for Hydromodification Flow Control Infiltration BMPs Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A
0.1Q2	A	Flat	Lindbergh	0.055
0.1Q2	A	Moderate	Lindbergh	0.055
0.1Q2	A	Steep	Lindbergh	0.055
0.1Q2	B	Flat	Lindbergh	0.045
0.1Q2	B	Moderate	Lindbergh	0.045
0.1Q2	B	Steep	Lindbergh	0.045
0.1Q2	C	Flat	Lindbergh	0.035
0.1Q2	C	Moderate	Lindbergh	0.035
0.1Q2	C	Steep	Lindbergh	0.035
0.1Q2	D	Flat	Lindbergh	0.03
0.1Q2	D	Moderate	Lindbergh	0.03
0.1Q2	D	Steep	Lindbergh	0.03
0.1Q2	A	Flat	Oceanside	0.06
0.1Q2	A	Moderate	Oceanside	0.06
0.1Q2	A	Steep	Oceanside	0.06
0.1Q2	B	Flat	Oceanside	0.05
0.1Q2	B	Moderate	Oceanside	0.05
0.1Q2	B	Steep	Oceanside	0.05
0.1Q2	C	Flat	Oceanside	0.05
0.1Q2	C	Moderate	Oceanside	0.05
0.1Q2	C	Steep	Oceanside	0.045
0.1Q2	D	Flat	Oceanside	0.035
0.1Q2	D	Moderate	Oceanside	0.035
0.1Q2	D	Steep	Oceanside	0.035
0.1Q2	A	Flat	Lake Wohlford	0.085
0.1Q2	A	Moderate	Lake Wohlford	0.085
0.1Q2	A	Steep	Lake Wohlford	0.085
0.1Q2	B	Flat	Lake Wohlford	0.07

0.1Q2	B	Moderate	Lake Wohlford	0.07
0.1Q2	B	Steep	Lake Wohlford	0.07
0.1Q2	C	Flat	Lake Wohlford	0.055
0.1Q2	C	Moderate	Lake Wohlford	0.055
0.1Q2	C	Steep	Lake Wohlford	0.055
0.1Q2	D	Flat	Lake Wohlford	0.04
0.1Q2	D	Moderate	Lake Wohlford	0.04
0.1Q2	D	Steep	Lake Wohlford	0.04

Table G.2-4: Sizing Factors for Hydromodification Flow Control Biofiltration with Partial Retention Designed Using Sizing Factor Method

Lower Flow Threshold	Soil Group	Slope	below low orifice inv	Rain Gauge	A
0.1Q2	A	Flat	18	Lindbergh	0.08
0.1Q2	A	Moderate	18	Lindbergh	0.08
0.1Q2	A	Steep	18	Lindbergh	0.08
0.1Q2	B	Flat	18	Lindbergh	0.065
0.1Q2	B	Moderate	18	Lindbergh	0.065
0.1Q2	B	Steep	18	Lindbergh	0.06
0.1Q2	C	Flat	6	Lindbergh	0.05
0.1Q2	C	Moderate	6	Lindbergh	0.05
0.1Q2	C	Steep	6	Lindbergh	0.05
0.1Q2	D	Flat	3	Lindbergh	0.05
0.1Q2	D	Moderate	3	Lindbergh	0.05
0.1Q2	D	Steep	3	Lindbergh	0.05
0.1Q2	A	Flat	18	Oceanside	0.08
0.1Q2	A	Moderate	18	Oceanside	0.075
0.1Q2	A	Steep	18	Oceanside	0.075
0.1Q2	B	Flat	18	Oceanside	0.07
0.1Q2	B	Moderate	18	Oceanside	0.07
0.1Q2	B	Steep	18	Oceanside	0.07
0.1Q2	C	Flat	6	Oceanside	0.07
0.1Q2	C	Moderate	6	Oceanside	0.07