City of Escondido
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

829 S ESCONDIDO BLVD
PROJECT ID: PHG-20-0036

829 S ESCONDIDO BLVD
ESCONDIDO, CA 92025

ASSESSOR'S PARCEL NUMBER(S):
233-371-14 & 233-371-15

ENGINEER OF WORK:

DOLVIN LORENZO BUCHANAN RCE 83241

PREPARED FOR:

JABRO LAW GROUP, LLC
MR. MICHAEL JABRO
1761 HOTEL CIRCLE SOUTH, SUITE 208
SAN DIEGO, CA 92108
(858)430-6700

PDP SWQMP PREPARED BY:

4C ENGINEERING + GEOMATICS
4960 NORTH HARBOR DRIVE, SUITE 200
SAN DIEGO, CA 92101
(619)663-8352

DATE OF SWQMP:
JULY 24, 2023

PLANS PREPARED BY:
4C ENGINEERING + GEOMATICS
4960 NORTH HARBOR DRIVE SUITE 200
SAN DIEGO, CA 92101
(619)663-8352

SWQMP APPROVED BY:
[FOR CITY STAFF ONLY]

APPROVAL DATE:

ESCONDIDO
City of Choice

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TABLE OF CONTENTS

ATTACHMENTS

ACRONYMS

ACP	Alternative Compliance Project
APN	Assessor's Parcel Number
BMP	Best Management Practice
DMA	Drainage Management Area
EOW	Engineer of Work
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
PDP	Priority Development Project
PE	Professional Engineer
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWDM	Storm Water Design Manual
SWQMP	Storm Water Quality Management Plan
USGS	US Geological Survey
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: 829 S ESCONDIDO BLVD
Permit Number: Project ID: PHG20-0036

PREPARER'S CERTIFICATION

I hereby declare that I am the Engineer in Responsible Charge of design of storm water best management practices (BMPs) for this project, and that I have exercised responsible charge over the design of the BMPs as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the PDP requirements of the City of Escondido Storm Water Design Manual, which is a design manual for compliance with the City of Escondido Municipal Code (Chapter 22, Article 2) and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100) requirements for storm water management.

I have read and understand that the City of Escondido has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Design Manual. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by 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.

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

Dolvin Lorenzo Buchanan
Print Name

4C Engineering + Geomatics
Company

_____
Date

Engineer's Seal:

SUBMITTAL RECORD

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

Preliminary Design / Planning / CEQA

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

Final Design

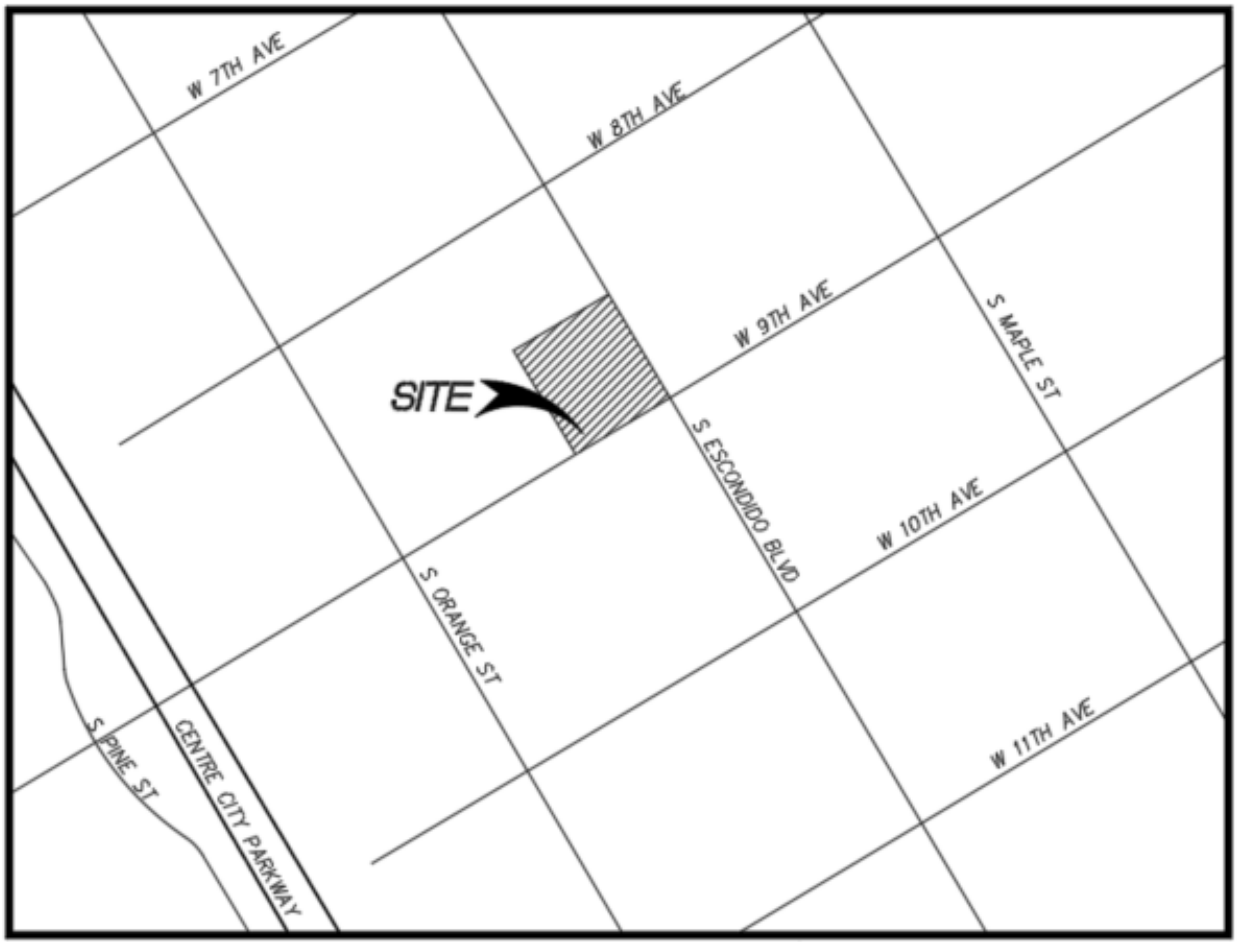
Submittal Number	Date	Summary of Changes
1	10/28/22	Initial Submittal
2	7/24/23	Second Submittal
3		
4		

Plan Changes

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

PROJECT VICINITY MAP

Project Name: [829 S ESCONDIDO BLVD]
Permit Number: Project ID: PHG20-0036



Step 1: Project type determination

Site Information Checklist for PDPs	Form I-2a
Project Summary Information	
Project Name	829 S ESCONDIDO BLVD
Project Address	829 S ESCONDIDO BLVD ESCONDIDO, CA 92025
Assessor's Parcel Number(s)	233-371-14 & 233-371-15
Permit Number	PHG-20-0036
Project Watershed (Hydrologic Unit)	Carlsbad 904
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	0.48 Acres (20,963 Square Feet)
Area to be disturbed by the project (Project Area)	0.48 Acres (20,963 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	0.44 Acres (19,276 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	0.04 Acres (1,687 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Step 1.1: Storm Water Quality Management Plan requirements

Site Information Checklist for PDPs		Form I-2a
Step	**Answer**	**Progression**
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 3 and 4, and see PDP exemption information below. For further guidance, see Section 1.4 of the Storm Water Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply. **Complete Form I-1.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **SWQMP Required.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 5.1** (Offsite Alternative Compliance Participation Form) **and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

Site Information Checklist for PDPs	Form I-2a
Is the project exempt from PDP definitions based on either of the following: ☐ Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria: (i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR (ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR (iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Green Streets Infrastructure;	If so: Standard Project requirements apply, AND any additional requirements specific to the type of project. City concurrence with the exemption is required. *Provide discussion and list any additional requirements below in this form.*
☐ Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Green Streets Infrastructure;	**PDP Exempt.**
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:	

Step 1.3: Confirmation of PDP Determination

Site Information Checklist for PDPs			Form I-2a
The project is (select one): ☐ New Development ☒ Redevelopment[1]			
The total proposed newly created or replaced impervious area is: 19,276 ft²			
The project meets the following categories, (a) through (f): [select all that apply]			
Yes ☐	No ☒	(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 ☒	No ☐	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). *Information and an SIC search function are available at www.osha.gov/pls/imis/sicsearch.html.* (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.
Yes ☐	No ☒	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any*

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

Site Information Checklist for PDPs			Form I-2a
			other equivalent environmentally sensitive areas which have been identified by the Copermittees. *For projects adjacent to an ESA, but not discharging to an ESA, the 2,500 square foot threshold does not apply as long as the project does not physically disturb the ESA and the ESA is upstream of the project.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. *Information and an SIC search function are available at www.osha.gov/pls/imis/sicsearch.html.* (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☐	No ☒	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. Note: See Storm Water Design Manual Section 1.4.2 for additional guidance.

The following is for redevelopment PDPs only:

The area of existing (pre-project) impervious area at the project site is:	A	20,963	ft^2
The total proposed newly created or replaced impervious area is:	B	19,276	ft^2
Percent impervious surface created or replaced:	(B/A)*100	92	%

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

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

OR

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

Step 2: City of Escondido PDP SWQMP Site Information Checklist

Step 2.1: Description of Existing Site Condition and Drainage Patterns

Site Information Checklist for PDPs	Form I-2a
Current Status of the Site (select all that apply): ☒ Existing development ☐ Previously graded but not built out ☐ Demolition completed without new construction ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information:	
Existing Land Cover Includes (select all that apply and provide each area on site): ☐ Vegetative Cover _____ Acres (_____ Square Feet) ☐ Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet) ☒ Impervious Areas 0.48 Acres (20,963 Square Feet) 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 (GW) (or N/A for no infiltration BMPs): ☐ Groundwater Depth < 5 feet ☐ 5 feet < Groundwater Depth < 10 feet ☒ 10 feet < Groundwater Depth < 20 feet ☐ Groundwater Depth > 20 feet	
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☒ None ☐ Other Description / Additional Information:	

Step 2.2: Description of Existing Site Drainage Patterns

Site Information Checklist for PDPs	Form I-2a
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:	

1. The existing drainage is urban.
2. Offsite runoff is not conveyed through the site.
3. There is no existing storm drain infrastructure located adjacent to the property. Existing runoff sheet flows north to south towards 9th Ave, then runs west along 9th Ave.
4. The discharge of the location of the site is the southwest corner of 9th Ave.

Step 2.3: Description of Proposed Site Development

Site Information Checklist for PDPs	Form I-2a
Project Description / Proposed Land Use and/or Activities:	
The project proposes to develop a multi-family development building with tuck under parking and a courtyard area.	
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features):	
The proposed impervious features include a drive aisle, roof, and hardscape.	
List/describe proposed pervious features of the project (e.g., landscape areas):	
The proposed pervious features include landscape areas, permeable pavers and modular wetlands.	
Does the project include grading and changes to site topography? ☒Yes ☐No Description / Additional Information:	
There will be minor grading to the project and new landscape areas.	

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

Change in Land Cover Type Summary

Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	0	0.004 acres	4%
Pervious (non-vegetated)	0	0.003 acres	4%
Impervious	0.48	0.44 acres	92%
total	0.48	0.447 acres	Sum Existing must equal Sum Proposed

Step 2.4: Description of Proposed Site Drainage Patterns

Site Information Checklist for PDPs	Form I-2a

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

☒ Yes

☐ No

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

Describe proposed site drainage patterns:

The project will include a new storm drain conveyance network consisting of 3 modular wetlands that flow to an underground storage vault. Since there is no existing storm drain infrastructure adjacent to the property, the runoff is then directed to a pump that discharges to a curb outlet located on 9th Avenue. Please refer to the Drainage Study for more details.

We will designate the proposed street trees along the street frontages for both S Escondido and W 9th Ave as green street LID trees.

Table No. 2 – Proposed Hydrology Summary

POC	AREA (AC)	RUNOFF 'C'	Q 100-YR (CFS)
A	0.48	0.70	1.44

Step 2.5: Potential Pollutant Source Areas

Site Information Checklist for PDPs	Form I-2a

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

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

Description / Additional Information:

Step 2.6: Identification of Receiving Water and Pollutants of Concern

Site Information Checklist for PDPs	Form I-2a

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

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 / WQIP Highest Priority Pollutant
Escondido Creek	DDT, Manganese, Phosphate	TMDL Required
	Selenium, Sulfates, TDS	TMDL Required

Identification of Project Site Pollutants*

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

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

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

Step 2.7: Hydromodification Management Requirements

Site Information Checklist for PDPs	Form I-2a

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

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

☐ No, the project will discharge runoff directly to the exempt portion of Escondido Creek as detailed in the Carlsbad Watershed WQIP (May 2018 Update). Direct discharge is defined in section 1.6 of the Escondido Storm Water Design Manual.

☐ 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. Refer to HMP Exhibit in Attachment 2.

☐ 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. Refer to HMP Exhibit in Attachment 2.

Note: Direct Discharge refers to an uninterrupted hardened conveyance system. Projects claiming the Direct Discharge exemption must satisfy the applicable criteria (energy dissipation, invert elevation, etc.) included in Section 1.6 of the Escondido Storm Water Design Manual.

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

HMP Exemption Exhibit

Attach an HMP Exemption Exhibit that shows direct storm water runoff discharge from the project site to the HMP exempt area. Include project area, applicable underground storm drain line and/or concrete lined channels, outfall information, and exempt waterbody.

Reference applicable drawing number(s).

Step 2.7.1: Critical Coarse Sediment Yield Areas

Site Information Checklist for PDPs	Form I-2a

☐ **N/A - 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 Appendix H of the manual been performed?

☐ H.6.1 Site-Specific GLU Analysis

☐ H.7 Downstream Systems Sensitivity to Coarse Sediment

- H.7.1 Depositional Analysis,
- H.7.2 Threshold Channel Analysis, or
- H.7.3 Course Sediment Source Area Verification Analysis

☐ 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 H.2, H.3, and H.4 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Step 2.7.2: Flow Control for Post-Project Runoff

Site Information Checklist for PDPs	Form I-2a
☐ **N/A - This Section only required if hydromodification management requirements apply**	
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.	
POC "A" located on W 9th Ave at the proposed curb outlet.	
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)	
Select method used to determine low flow threshold: ☐ Sizing Factor Method ☐ US Geological Survey (USGS) Equation ☐ Continuous Simulation Modeling	

Step 2.8: Other Site Requirements and Constraints

Site Information Checklist for PDPs	Form I-2a
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements.	
Optional Additional Information or Continuation of Previous Sections As Needed	
This space provided for additional information or continuation of information from previous sections as needed.	

Step 3: Source Control BMP Checklist

Source Control BMP Checklist for PDPs			Form I-2b
All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the City Storm Water Design Manual for information to implement source control BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project. Answer each category below pursuant to the following: • "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required. • "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided. • "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.			
Source Control Requirement	**Applied?**		
4.2.1 Prevention of Illicit Discharges into the MS4	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.1 not implemented:			
4.2.2 Storm Drain Stenciling or Signage	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.2 not implemented:			
4.2.3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if 4.2.3 not implemented:			
4.2.4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if 4.2.4 not implemented:			
4.2.5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.2.5 not implemented:			

Form I-2b Page 2 of 2			
Source Control Requirement	**Applied?**		
4.2.6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☐ 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 areas	☐ 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
Discussion / justification if 4.2.6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for all "No" answers shown above.			

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

Step 4: Site Design BMP Checklist

Site Design BMP Checklist for PDPs			Form I-2c
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 must be provided.			
Site Design Requirement	**Applied?**		
4.3.1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	☐ No	☒ N/A
Discussion / justification if 4.3.1 not implemented:			
The proposed project does not include natural drainage pathways or hydraulic features to conserve.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐ Yes	☒ No	☐ N/A
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	☐ No	☒ N/A
1-3 Implemented trees meet the design criteria in 4.3.1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	☐ No	☒ N/A
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A
4.3.2 Conserve Natural Areas, Soils, and Vegetation	☐ Yes	☒ No	☐ N/A
Discussion / justification if 4.3.2 not implemented:			
The project proposes new trees along frontage and landscaping on site.			
4.3.3 Minimize Impervious Area	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.3 not implemented:			
4.3.4 Minimize Soil Compaction	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.4 not implemented:			

Form I-2c Page 2 of 2			
Site Design Requirement	**Applied?**		
4.3.5 Impervious Area Dispersion	☐ Yes	☐ No	☒ N/A
Discussion / justification if 4.3.5 not implemented:			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	☐ Yes	☐ No	☒ N/A
5-2 Does the pervious area satisfy the design criteria in 4.3.5. Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	☐ Yes	☐ No	☒ N/A
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and 4.3.5 Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A
4.3.6 Runoff Collection	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.6 not implemented:			
6a-1 Are green roofs implemented in accordance with design criteria in 4.3.6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☒ N/A
6a-2 Is the green roof credit volume calculated using Appendix B.2.1.2 and 4.3.6A Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A
6b-1 Are permeable pavements implemented in accordance with design criteria in 4.3.6B Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☒ N/A
6b-2 Is the permeable pavement credit volume calculated using Appendix B.2.1.3 and 4.3.6B Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A
4.3.7 Landscaping with Native or Drought Tolerant Species	☒ Yes	☐ No	☐ N/A
Discussion / justification if 4.3.7 not implemented:			
4.3.8 Harvesting and Using Precipitation	☐ Yes	☐ No	☒ N/A
Discussion / justification if 4.3.8 not implemented:			
8-1 Are rain barrels implemented in accordance with design criteria in 4.3.8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	☐ No	☒ N/A
8-2 Is the rain barrel credit volume calculated using Appendix B.2.2.2 and 4.3.8 Fact Sheet in Appendix E?	☐ Yes	☐ No	☒ N/A

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

Step 5: Summary of Structural BMPs

Summary of Structural BMPs	Form I-3

PDP Structural BMPs

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).

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).

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).

Description of Structural BMP Strategy

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the 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.

Step 1: There is a de minimis area proposed on site. Refer to the DMA map.
Step 2: Harvest and use deemed infeasible per form I-8.
Step 3: Infiltrations is considered to be infeasible.
Step 4: 3 Modular Wetlands are proposed to capture roof runoff and drive aisle due to the footprint and layout of the site.
Step 5: For the improvements to the public right of way/street We will designate the proposed street trees along the street frontages for both S Escondido and W 9th Ave as green street LID trees.

(Continue on page 2 as necessary.)

Form I-3 Page 2 of 3
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1)

Form I-3 Page 3 of 3

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.

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)
☐Retention by dry wells (INF-4)
☐Partial retention by biofiltration with partial retention (PR-1)
☒Biofiltration (BF-1)
☐Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐Detention pond or vault for hydromodification management
☐Other (describe in discussion section below)

Purpose:

☒Pollutant control only
☐Hydromodification control only
☐Combined pollutant control and hydromodification control
☐Pre-treatment/forebay for another structural BMP
☐Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	4C Engineering + Geomatics Dolvin L. Buchanan 619-663-8352
Who will be the final owner of this BMP?	☐HOA ☒Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☐HOA ☒Property Owner ☐City ☐Other (describe)

Discussion (as needed):

Form I-3 Page 3 of 3

Structural BMP Summary Information

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

Structural BMP ID No. BMP 2

Construction Plan Sheet No.

Type of structural BMP:

☐Retention by harvest and use (HU-1)
☐Retention by infiltration basin (INF-1)
☐Retention by bioretention (INF-2)
☐Retention by permeable pavement (INF-3)
☐Retention by dry wells (INF-4)
☐Partial retention by biofiltration with partial retention (PR-1)
☒Biofiltration (BF-1)
☐Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐Detention pond or vault for hydromodification management
☐Other (describe in discussion section below)

Purpose:

☒Pollutant control only
☐Hydromodification control only
☐Combined pollutant control and hydromodification control
☐Pre-treatment/forebay for another structural BMP
☐Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	4C Engineering + Geomatics Dolvin L. Buchanan 619-663-8352
Who will be the final owner of this BMP?	☐HOA ☒Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☐HOA ☒Property Owner ☐City ☐Other (describe)

Discussion (as needed):

Form I-3 Page 3 of 3

Structural BMP Summary Information

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

Structural BMP ID No. BMP 3

Construction Plan Sheet No.

Type of structural BMP:

☐Retention by harvest and use (HU-1)
☐Retention by infiltration basin (INF-1)
☐Retention by bioretention (INF-2)
☐Retention by permeable pavement (INF-3)
☐Retention by dry wells (INF-4)
☐Partial retention by biofiltration with partial retention (PR-1)
☒Biofiltration (BF-1)
☐Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☐Detention pond or vault for hydromodification management
☐Other (describe in discussion section below)

Purpose:

☒Pollutant control only
☐Hydromodification control only
☐Combined pollutant control and hydromodification control
☐Pre-treatment/forebay for another structural BMP
☐Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	4C Engineering + Geomatics Dolvin L. Buchanan 619-663-8352
Who will be the final owner of this BMP?	☐HOA ☒Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☐HOA ☒Property Owner ☐City ☐Other (describe)

Discussion (as needed):

Form I-3 Page 3 of 3

Structural BMP Summary Information

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

Structural BMP ID No. BMP 4

Construction Plan Sheet No.

Type of structural BMP:

☐Retention by harvest and use (HU-1)
☐Retention by infiltration basin (INF-1)
☐Retention by bioretention (INF-2)
☐Retention by permeable pavement (INF-3)
☐Retention by dry wells (INF-4)
☐Partial retention by biofiltration with partial retention (PR-1)
☐Biofiltration (BF-1)
☐Biofiltration with Nutrient Sensitive Media Design (BF-2)
☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F
☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below)
☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below)
☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below)
☒Detention pond or vault for hydromodification management
☐Other (describe in discussion section below)

Purpose:

☐Pollutant control only
☒Hydromodification control only
☐Combined pollutant control and hydromodification control
☐Pre-treatment/forebay for another structural BMP
☐Other (describe in discussion section below)

Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	4C Engineering + Geomatics Dolvin L. Buchanan 619-663-8352
Who will be the final owner of this BMP?	☐HOA ☒Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☐HOA ☒Property Owner ☐City ☐Other (describe)

Discussion (as needed):

Step 5.1: Offsite Alternative Compliance Participation Form

THIS FORM IS NOT APPLICABLE AT THIS TIME: An Alternative Compliance Program is under consideration by the City of Escondido.	
PDP INFORMATION	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
What are your PDP Pollutant Control Debits? *See Attachment 1 of the PDP SWQMP	
What are your PDP HMP Debits? (if applicable) *See Attachment 2 of the PDP SWQMP	
ACP Information	
Record ID:	
Assessor's Parcel Number(s) [APN(s)]	
Project Owner/Address	
What are your ACP Pollutant Control Credits? *See Attachment 1 of the ACP SWQMP	
What are your ACP HMP Debits? (if applicable) *See Attachment 2 of the ACP SWQMP	
Is your ACP in the same watershed as your PDP? ☐Yes ☐No	Will your ACP project be completed prior to the completion of the PDP? ☐Yes ☐No
Does your ACP account for all Deficits generated by the PDP? ☐Yes ☐No (PDP and/or ACP must be redesigned to account for all deficits generated by the PDP.)	What is the difference between your PDP debits and ACP Credits? *(ACP Credits -Total PDP Debits = Total Earned Credits) _____

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 1a	Storm Water Pollutant Control Worksheet Calculations -Worksheet B.1-DMA Summary (Optional) -Worksheet B.2-1- DCV (Required) -Worksheet B.3-1- H&U Checklist (Required) -Worksheet B.4-1-Simple Sizing Inf. (if applicable) -Worksheet B.5-1-Biofilt. Sizing (Pollutant)(if applicable) -Worksheet B.5-2-Biofilt. Sizing (Volume) (if applicable) -Worksheet B.5-3-Biofilt. Volume Ret. (if applicable) -Worksheet B.5-4-Biofilt. Alt. Min. Footprint(if applicable) -Worksheet B.5-5-Biofilt. w/Upstream Stor. (if applicable) -Worksheet B.5-6-Biofilt. Ret. No Inf. (if applicable) -Worksheet B.5-7-Vol. Ret. Amended Soils (if applicable) -Worksheet B.6-1-Flow-Thru Design Flow (if applicable) -Form I-10-Compact Biofilt. Checklist (if applicable) -Summary Worksheet (optional)	☐ Worksheet B.1 (Optional) ☐ Worksheet B.2-1 (Required) ☐ Worksheet B.3-1 (Required) ☐ Worksheet B.4-1 (if applicable) ☐ Worksheet B.5-1 (if applicable) ☐ Worksheet B.5-2 (if applicable) ☐ Worksheet B.5-3 (if applicable) ☐ Worksheet B.5-4 (if applicable) ☐ Worksheet B.5-5 (if applicable) ☐ Worksheet B.5-6 (if applicable) ☐ Worksheet B.5-7 (if applicable) ☐ Worksheet B.6-1 (if applicable) ☐ Form I-10 (if applicable) ☐ Summary Worksheet (optional)
Attachment 1b	-Worksheet C.4-1 (Form I-8A), Categorization of Infiltration Feasibility Condition Based on Geotechnical Conditions -Worksheet C.4-2 (Form I-8B), Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions (Required unless the project will use harvest and use BMPs, or an Infiltration Feasibility Condition Letter is submitted) Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-8.	☐Included ☐Not included because the entire project will use harvest and use BMPs ☐Not included because an Infiltration Feasibility Condition Letter is submitted
Attachment 1c	Form I-9, Factor of Safety and Design Infiltration Rate Worksheet (Required unless the project will use harvest and use BMPs, or an Infiltration Feasibility Condition Letter is submitted) Refer to Appendices C and D of the Storm Water Design Manual to complete Form I-9.	☐Included ☐Not included because the entire project will use harvest and use BMPs ☐Not included because an Infiltration Feasibility Condition Letter is submitted
Attachment 1d	DMA Exhibit (Required) See DMA Exhibit Checklist on the back of this Attachment cover sheet.	☐Included
Attachment 1e	Individual Structural BMP DMA Mapbook (Required) -Place each map on 8.5”x11” paper. -Show at a minimum the DMA, Structural BMP, and any existing hydrologic features within the DMA.	☐Included

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

The DMA Exhibit must identify:

☐ Proposed design features and surface treatments used to minimize imperviousness
☐Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
☐Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Step 3.5)
☐Structural BMPs (identify location, structural BMP ID#, type of BMP, and size/detail)
☐Flow direction arrows
☐Site Design BMPs used for volume reduction credits
☐Existing and proposed site drainage network and connections to drainage offsite
☐Trash Enclosure(s), if available
☐Roof downspouts

Additionally, it is generally best practice (and the City may require) that these additional features listed below be included on the DMA Exhibit:

☐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
☐Proposed grading
☐Proposed impervious features

Worksheet B.2-1. BMP Design Capture Volume

BMP 1

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.54	inches
2	Area tributary to BMP (s)	A=	0.05	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.90	unitless
4	Tree well volume reduction	TCV=		cubic-feet
5	Rain barrels volume reduction	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	87	cubic-feet

Worksheet B.2-2. BMP Design Capture Volume

BMP 2

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.54	inches
2	Area tributary to BMP (s)	A=	0.37	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.90	unitless
4	Tree well volume reduction	TCV=		cubic-feet
5	Rain barrels volume reduction	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	659	cubic-feet

Worksheet B.2-3. BMP Design Capture Volume

BMP 3

Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.54	inches
2	Area tributary to BMP (s)	A=	0.04	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.56	unitless
4	Tree well volume reduction	TCV=		cubic-feet
5	Rain barrels volume reduction	RCV=		cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	39	cubic-feet

Worksheet B.3-1. Harvest and Use Feasibility Checklist (Form I-7)

Harvest and Use Feasibility Checklist	Worksksheet B.3-1

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.

Total/ Urinal: 38 x 9.3 gallons = 353 gallons ⇨ 47 cubic feet
Landscape Irrigation 390 x 0.48 acres = 187 gallons ⇨ 25 cubic feet
Total Demand: 299 cubic feet + 46 cubic feet = 72 cubic feet

3. Calculate the DCV using worksheet B-2.1.

Per summation of all DMA worksheet B-2.1 the DCV is 785 cubic feet.

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
Yes / (No) ⇨ ⇩	Yes / (No) ⇨ ⇩	(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.

Note: 36-hour demand calculations are for feasibility analysis only. Once feasibility analysis is complete the applicant may be allowed to use a different drawdown time provided they meet the 80% annual capture standard (refer to B.4.2) and 96-hour vector control drawdown requirement.

Worksheet B.4-1: Simple Sizing Method for Infiltration BMPs

Simple Sizing Method for Infiltration BMPs		Worksheet B.4-1		
1	DCV (Worksheet B-2.1)	DCV=		cubic-feet
2	Estimated design infiltration rate	K_{design}=		in/hr
3	Available BMP surface area	A_{BMP}=		sq-ft
4	Average effective depth in the BMP footprint (DCV/A_{BMP})	D_{avg}=		feet
5	Drawdown time, T (D_{avg} *12/K_{design})	T=		hours
6	Provide alternative calculation of drawdown time, if needed.			
7	Provide calculations for effective depth provided in the BMP: Effective Depth = Surface ponding (below the overflow elevation) + gravel storage thickness x gravel porosity (0.4)			

Worksheet B.5-1: Sizing Method for Pollutant Removal Criteria

Sizing Method for Pollutant Removal Criteria		Worksheet B.5-1	
1	Area draining to the BMP		sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)		
3	85th percentile 24-hour rainfall depth		inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]		cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]		inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations		inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area		inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area		inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)		in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]		inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]		inches
15	Total Depth Treated [Line 13 + Line 14]		inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]		cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12		sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]		cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12		sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-4)		
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]		sq. ft.
22	Footprint of the BMP = Maximum (Minimum (Line 17, Line 19), Line 21)		sq. ft.
23	Provided BMP Footprint		sq. ft.
24	Is Line 23 ≥ Line 22? If Yes, then footprint criterion is met. If No, increase the footprint of the BMP.	☐ Yes ☐ No	

Worksheet B.5-2: Sizing Method for Volume Retention Criteria

Sizing Method for Volume Retention Criteria		Worksheet B.5-2	
1	Area draining to the BMP		sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)		
3	85th percentile 24-hour rainfall depth		inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]		cu. ft.
Volume Retention Requirement			
5	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05		in/hr.
6	Factor of safety	2	
7	Reliable infiltration rate, for biofiltration BMP sizing [Line 5/ Line 6]		in/hr.
8	Average annual volume reduction target (Figure B.5-2) When Line 7 > 0.01 in/hr. = Minimum (40, 166.9 x Line 7 +6.62) When Line 7 ≤ 0.01 in/hr. = 3.5%		%
9	Fraction of DCV to be retained (Figure B.5-3) When Line 8 > 8% = 0.0000013 x Line 8^3 - 0.000057 x Line 8^2 + 0.0086 x Line 8 - 0.014 When Line 8 ≤ 8% = 0.023		
10	Target volume retention [Line 9 x Line 4]		cu. ft.

Worksheet B.5-3: Volume Retention from Biofiltration with Partial Retention BMPs

Volume Retention from Biofiltration with Partial Retention BMPs		Worksheet B.5-3	
1	Area draining to the BMP		sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)		
3	85th percentile 24-hour rainfall depth		inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]		cu. ft.
BMP Parameters			
5	Footprint of the BMP		sq. ft.
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations		inches
7	Media retained pore space [50% of (Field Capacity-Wilting Point)]	0.05	in/in
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area		inches
9	Porosity of aggregate storage	0.4	in/in
10	Measured infiltration rate in the DMA Note: When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30		in/hr.
11	Factor of safety	2	
12	Reliable infiltration rate, for biofiltration BMP sizing [Line 10/ Line 11]		in/hr.
Evapotranspiration: Average Annual Volume Retention			
13	Effective evapotranspiration depth [Line 6 x Line 7]		inches
14	Retained pore volume [(Line 13 x Line 5)/12]		cu. ft.
15	Fraction of DCV retained in pore spaces [Line 14/Line 4]		
16	Evapotranspiration average annual capture [use ET Nomographs in Figure B.5-5, Refer to Appendix B.5.4]		%
Infiltration: Average Annual Volume Retention			
17	Drawdown for infiltration storage [(Line 8 x Line 9)/Line 12]		hours
18	Equivalent DCV fraction from evapotranspiration (use Line 16 and Line 17 in Figure B.4-1; Refer to Appendix B.4.2.2)		
19	Infiltration volume storage [(Line 5 x Line 8 x Line 9)/12]		cu. ft.
20	Infiltration storage: Fraction of DCV [Line 19 /Line 4]		
21	Total Equivalent Fraction of DCV [Line 18 + Line 20]		
22	Biofiltration BMP average annual capture [use Line 21 and 17 in Figure B.4-1]		%
23	Fraction of DCV retained (Figure B.5-3) 0.0000013 x Line 22^3 - 0.000057 x Line 22^2 + 0.0086 x Line 22- 0.014		
24	Volume retention achieved by biofiltration BMP [Line 23 x Line 4]		cu. ft.

Worksheet B.5-4: Calculation of Alternative Minimum Footprint Sizing Factor for Non-Standard Biofiltration

Alternative Minimum Footprint Sizing Factor for Non-Standard Biofiltration				Worksheet B.5-4
1	Area draining to the BMP			sq. ft.
2	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)			
3	Load to Clog (default value when using Appendix E fact sheets is 2.0)			lb/sq. ft.
4	Allowable Period to Accumulate Clogging Load (T_L) (default value is 10)			years
Volume Weighted EMC Calculation				
Land Use		**Fraction of Total DCV**	**TSS EMC (mg/L)**	**Product**
Single Family Residential			123	
Commercial			128	
Industrial			125	
Education (Municipal)			132	
Transportation			78	
Multi-family Residential			40	
Roof Runoff			14	
Low Traffic Areas			50	
Open Space			216	
Other, specify:				
Other, specify:				
Other, specify:				
5	Volume Weighted EMC (sum of all products)			mg/L
Sizing Factor for Clogging				
6	Adjustment for pretreatment measures Where: Line 6 = 0 if no pretreatment; Line 6 = 0.25 when pretreatment is included; Line 6 = 0.5 if the pretreatment has an active Washington State TAPE approval rating for “pre-treatment.”			
7	Average Annual Precipitation [Provide documentation of the data source in the discussion box; SanGIS has a GIS layer for average annual precipitation]			inches
8	Calculate the Average Annual Runoff (Line 7/12) x Line 1 x Line2			cu-ft/yr
9	Calculate the Average Annual TSS Load (Line 8 x 62.4 x Line 5 x (1 – Line 6))/10^6			lb/yr
10	Calculate the BMP Footprint Needed (Line 9 x Line 4)/Line 3			sq. ft.
11	Calculate the Minimum Footprint Sizing Factor for Clogging [Line 10/ (Line 1 x Line 2)]			
Discussion:				

Worksheet B.5-5: Optimized Biofiltration BMP Footprint when Downstream of a Storage Unit

Optimized Biofiltration BMP Footprint when Downstream of a Storage Unit		Worksheet B.5-5	
1	Area draining to the storage unit and biofiltration BMP		sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)		
3	Effective impervious area draining to the storage unit and biofiltration BMP [Line 1 x Line 2]		sq. ft.
4	Remaining DCV after implementing retention BMPs		cu. ft.
5	Design infiltration rate (measured infiltration rate / 2)		ft./hr.
6	Media Thickness [1.5 feet minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations		ft.
7	Media filtration rate to be used for sizing (0.42 ft/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)		ft./hr.
8	Media retained pore space	0.05	in./in.
Storage Unit Requirement			
9	Drawdown time of the storage unit, minimum (from the elevation that bypasses the biofiltration BMP, overflow elevation)		hours
10	Storage required to achieve greater than 92 percent capture (see Table B.5-5)		fraction
11	Storage required in cubic feet (Line 4 x Line 10)		cu. ft.
12	Storage provided in the design, minimum (from the elevation that bypasses the biofiltration BMP, overflow elevation)		cu. ft.
13	Is Line 12 ≥ Line 11. If no increase storage provided until this criteria is met	☐ Yes	☐ No
Criteria 1: BMP Footprint Biofiltration Capacity			
14	Peak flow from the storage unit to the biofiltration BMP (using the elevation used to evaluate the percent capture)		cfs
15	Required biofiltration footprint [(3,600 x Line 14)/Line 7]		sq. ft.
Criteria 2: Alternative Minimum Sizing Factor (Clogging)			
16	Alternative Minimum Footprint Sizing Factor [Line 11 of Worksheet B.5-4]		Fraction
17	Required biofiltration footprint [Line 3 x Line 16]		sq. ft.
Criteria 3: Retention requirement [Not applicable for No Infiltration Condition]			
18	Retention Target (Line 10 in Worksheet B.5-2)		cu. ft.
19	Average discharge rate from the storage unit to the biofiltration BMP		cfs
20	Depth retained in the optimized biofiltration BMP {Line 6 x Line 8} + {[(Line 4)/(2400 x Line 19)] x Line 5}		ft.
21	Required optimized biofiltration footprint (Line 18/Line 20)		sq. ft.
Optimized Biofiltration Footprint			
22	Optimized biofiltration footprint, maximum (Line 15, Line 17, Line 21)		sq. ft.

Worksheet B.5-6: Volume Retention for No Infiltration Condition

Volume Retention for No Infiltration Condition						Worksheet B.5-6	
1	Area draining to the biofiltration BMP						sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)						
3	Effective impervious area draining to the BMP [Line 1 x Line 2]						sq. ft.
4	Required area for Evapotranspiration [Line 3 x 0.03]						sq. ft.
5	Biofiltration BMP Footprint						sq. ft.
Landscape Area (must be identified on DS-3247)							
	Identification	**A**	**B**	**C**	**D**	**E**	
6	Landscape area that meet the requirements in SD-B and SD-F Fact Sheet (sq. ft.)						
7	Impervious area draining to the landscape area (sq. ft.)						
8	Impervious to Pervious Area ratio [Line 7/Line 6]						
9	Effective Credit Area If Line 8 >1.5, use Line 6; if not use Line 7/1.5						
10	Sum of Landscape area [sum of Lines 9A-9E]						sq. ft.
11	Provided footprint for evapotranspiration [Line 5 + Line 10]						sq. ft.
Volume Retention Performance Standard							
12	Is Line 11 ≥ Line 4? If yes, then volume retention performance standard for no infiltration condition is met. If no, proceed to Line 13					☐ Yes	☐ No
13	Fraction of the performance standard met through the BMP footprint and/or landscaping [Line 11/Line 4]						
14	Target Volume Retention [Line 10 from Worksheet B.5.2]						cu. ft.
15	Volume retention required from other site design BMPs [(1-Line 13) x Line 14]						cu. ft.
Site Design BMP							
	Identification	**Site Design Type**				**Credit**	
16	**A**						cu. ft.
	B						cu. ft.
	C						cu. ft.
	D						cu. ft.
	E						cu. ft.
	Sum of volume retention benefits from other site design BMPs (e.g. trees; rain barrels etc.). [sum of Lines 16A-16E] Provide documentation of how the site design credit is calculated in the PDP SWQMP.						cu. ft.
17	Is Line 16 ≥ Line 15? If yes, then volume retention performance standard for no infiltration condition is met. If no, implement additional site design BMPs.					☐ Yes	☐ No

Worksheet B.5-7: Volume Retention from Amended Soils

Volume Retention From Amended Soils		Worksheet B.5-7	
1	Impervious area draining to the pervious area		sq. ft.
2	Pervious area (must meet the requirements in SD-B and SD-F Fact Sheets)		sq. ft.
3	Dispersion Ratio [Line 1/Line 2] Note: This worksheet is not applicable when Line 3 > 50 or Line 3 < 0.25		
4	Adjusted runoff factor [(Line 1 * 0.9 + Line 2 * 0.1) / (Line 1 + Line 2)]		
5	85th percentile 24-hour rainfall depth		inches
6	Design capture volume [(Line 1 + Line 2) x Line 4 x (Line 5/12)]		cu. ft.
7	Amendment Depth (Choose from 3", 6", 9", 12", 15" and 18")		inches
8	Storage [(porosity – field capacity) + 0.5 * (field capacity – wilting point)]	0.25	in./in.
9	Pervious Storage [Line 2 * (Line 7/12) * Line 8]		cu. ft.
10	Fraction of DCV [Line 9 / Line 6]		
11	Measured Infiltration Rate When mapped hydrologic soil groups are used enter 0.10 for NRCS Type D soils and for NRCS Type C soils enter 0.30 When in no infiltration condition and the actual measured infiltration rate is unknown enter 0.0 if there are geotechnical and/or groundwater hazards identified in Appendix C or enter 0.05		in/hr.
12	Factor of Safety	2	
13	Reliable Infiltration Rate [Line 11/Line 12]		in/hr.
14	Dispersion Credit (Based on Figures B.5.6 to B.5.11; Line 10 and Line 13)		
15	Volume retention due to amendment [Line 1 * (Line 5/12) * Line 14]		cu. ft.

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

BMP 1

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV	87	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow-thru}$	87	cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=	1	unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=	0.05	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.90	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.009	cfs
10	***For Proprietary Biofiltration Only:*** *Q_{Bio}=1.5 x Q*	*Q_{Bio}=*	0.014	*cfs*

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

BMP 2

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV	659	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow-thru}$	659	cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=	1	unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=	0.37	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.90	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.067	cfs
10	***For Proprietary Biofiltration Only:*** *Q_{Bio}=1.5 x Q*	*Q_{Bio}=*	0.100	*cfs*

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

BMP 3

Flow-thru Design Flows		Worksheet B.6-1		
1	DCV	DCV	39	cubic-feet
2	DCV retained	$DCV_{retained}$	0	cubic-feet
3	DCV biofiltered	$DCV_{biofiltered}$	0	cubic-feet
4	DCV requiring flow-thru (Line 1 – Line 2 – 0.67*Line 3)	$DCV_{flow\text{-}thru}$	39	cubic-feet
5	Adjustment factor (Line 4 / Line 1)*	AF=	1	unitless
6	Design rainfall intensity	i=	0.20	in/hr
7	Area tributary to BMP (s)	A=	0.04	acres
8	Area-weighted runoff factor (estimate using Appendix B.2)	C=	0.90	unitless
9	Calculate Flow Rate = AF x (C x i x A)	Q=	0.007	cfs
10	***For Proprietary Biofiltration Only:*** *Q_{Bio}=1.5 x Q*	*Q_{Bio}=*	0.011	*cfs*

Form I-10: Compact (high rate) Biofiltration BMP Checklist

BMP 1 THRU BMP 3

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Compact (high rate) biofiltration BMPs have a media filtration rate greater than 5 in/hr. and a media surface area smaller than 3% of contributing area times adjusted runoff factor. Compact biofiltration BMPs are typically proprietary BMPs that may qualify as biofiltration.

A compact biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA and the performance certification/data of the BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite storm water alternative compliance program to meet its pollutant control obligations.

An applicant using a compact biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

Criteria	Answer	Progression
Criteria 1 and 3: What is the infiltration condition of the DMA? Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. Applicant must complete and include the following in the PDP SWQMP submittal to support the feasibility determination:	☐ Full Infiltration Condition	**Stop**. Compact biofiltration BMP is not allowed.
	☐ Partial Infiltration Condition	Compact biofiltration BMP is only allowed, if the target volume retention is met onsite (Refer to Table B.5-1 in Appendix B.5). Use Worksheet B.5- 2 in Appendix B.5 to estimate the target volume retention (Note: retention in this context means reduction). If the required volume reduction is achieved **proceed to Criteria 2**. If the required volume reduction is not achieved, compact biofiltration BMP is not allowed. **Stop**.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
• Infiltration Feasibility Condition Letter; or • Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I- 8B. Applicant must complete and include all applicable sizing worksheets in the SWQMP submittal	✓ No Infiltration Condition	Compact biofiltration BMP is allowed if volume retention criteria in Table B.5-1 in Appendix B.5 for the no infiltration condition is met. Compliance with this criterion must be documented in the PDP SWQMP. If the criteria in Table B.5-1 is met **proceed to Criteria 2**. If the criteria in Table B.5-1 is not met, compact biofiltration BMP is not allowed. **Stop**.

Provide basis for Criteria 1 and 3:

Feasibility Analysis:

Summarize findings and include either infiltration feasibility condition letter or Worksheet C.4-1: Form I-8A and Worksheet C.4-2: Form I-8B in the PDP SWQMP submittal.

If Partial Infiltration Condition:

Provide documentation that target volume retention is met (include Worksheet B.5-2 in the PDP SWQMP submittal). Worksheet B.5-7 in Appendix B.5 can be used to estimate volume retention benefits from landscape areas.

If No Infiltration Condition:

Provide documentation that the volume retention performance standard is met (include Worksheet B.5-2 in the PDP SWQMP submittal) in the PDP SWQMP submittal. Worksheet B.5-6 in Appendix B.5 can be used to document that the performance standard is met.

Per Worksheets B.5-2 and B.5-6, volume retention requirements are met.

Criteria	Answer	Progression
Criteria 2: Is the compact biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP	✓ Meets Flow Based Criteria	Use guidance from **Appendix F.2.2** to size the compact biofiltration BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft. cannot be designed using a loading rate of 1.5 gpm/sq. ft.)

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Design Manual (Part 1 of Storm Water Standards) for guidance.		**Proceed to Criteria 4.**
	☐ Meets Volume Based Criteria	Provide documentation that the compact biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	☐ Does not Meet either	**Stop**. Compact biofiltration BMP is not allowed.
Provide basis for Criteria 2: Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).		
Criteria	**Answer**	**Progression**
Criteria 4: Does the compact biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	✓ Yes, meets the TAPE certification.	Provide documentation that the compact BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	☐ Yes, through other third-party documentation.	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a compact biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	☐ No	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 4:
Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the compact biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

The manufacturer's TAPE certification is attached.

Criteria	Answer	Progression
Criteria 5: Is the compact biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	✓ Yes	Provide documentation that the compact biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	☐ No	**Stop**. Compact biofiltration BMP is not allowed.

Provide basis for Criteria 5:

Provide documentation that appropriate biological activity is supported by the compact biofiltration BMP to maintain treatment process.

Please refer to the attached manufacturer's TAPE certification and documents.

Compact (high rate) Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 6: Is the compact biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	✓ Yes	Provide documentation that the compact biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	☐ No	**Stop**. Compact biofiltration BMP is not allowed.
Provide basis for Criteria 6: Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).		
Please refer to the attached manufacturer's documents.		
Criteria	**Answer**	**Progression**
Criteria 7: Is the compact biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	✓ Yes, and the compact BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop**. The compact biofiltration BMP meets the required criteria.
	☐ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop**. Consult the City Engineer for a determination.
	☐ No	**Stop**. Compact biofiltration BMP is not allowed.

Compact (high rate) Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. PDP SWQMP must include a statement that the compact BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

Please see the attached manufacturer's maintenance guidelines. The owner, who is the responsible party in charge, will maintain the BMPs per these guidelines.

Section 1: Biofiltration Criteria Checklist (Appendix F)	
Is the proposed compact BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	✓ Yes ☐ No, See explanation below

Explanation/reason if the compact BMP is not accepted by the City for onsite pollutant control compliance:

Compact (high rate) Biofiltration BMP Checklist	Form I-10

WASHINGTON STATE DEPARTMENT OF ECOLOGY

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.

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.

Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit **www.ModularWetlands.com/Plants** for more information and various plant lists.

TABLE C-5
SUITABILITY ASSESSMENT RELATED CONSIDERATIONS FOR INFILTRATION FACILITY SAFETY FACTORS

Consideration	High Concern – 3 Points	Medium Concern – 2 Points	Low Concern – 1 Point
Assessment Methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates. Use of well permeameter or borehole methods without accompanying continuous boring log. Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log. Direct measurement of infiltration area with localized infiltration measurement methods (e.g., Infiltrometer). Moderate spatial resolution	Direct measurement with localized (i.e. small-scale) infiltration testing methods at relatively high resolution or use of extensive test pit infiltration measurement methods.
Predominant Soil Texture	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site Soil Variability	Highly variable soils indicated from site assessment or unknown variability	Soil boring/test pits indicate moderately homogenous soils	Soil boring/test pits indicate relatively homogenous soils
Depth to Groundwater/ Impervious Layer	<5 feet below facility bottom	5-15 feet below facility bottom	>15 feet below facility bottom

Based on our geotechnical investigation and the previous table, Table C-6 presents the estimated factor values for the evaluation of the factor of safety. This table only presents the suitability assessment safety factor (Part A) of the worksheet. The project civil engineer should evaluate the safety factor for design (Part B) and use the combined safety factor for the design infiltration rate.

TABLE C-6
FACTOR OF SAFETY WORKSHEET DESIGN VALUES – PART A

Suitability Assessment Factor Category	Assigned Weight (w)	Factor Value (v)	Product (p = w x v)
Assessment Methods	0.25	2	0.50
Predominant Soil Texture	0.25	1	0.25
Site Soil Variability	0.25	2	0.50
Depth to Groundwater/ Impervious Layer	0.25	2	0.50
Suitability Assessment Safety Factor, $S_A = \sum p$			1.75

*The project civil engineer should complete Form I-6 using the data on this table. Additional information is required to evaluate the design factor of safety.

Form I-5 Page 4 of 4			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Groundwater was encountered at a depth of 15 feet during our investigation. Therefore, risk of groundwater contamination does not exist at the site that would preclude infiltration.			
8	**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.	X	
Provide basis: We have not provided a study regarding water rights. However, these rights are not typical in the San Diego County area.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**	No Infiltration	

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

Worksheet C.4-4 (Form I-8A): Categorization of Infiltration Feasibility Condition Based on Geotechnical Conditions[2]

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[3]
Part 1 - Full Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
Criteria 1: Infiltration Rate Screening	
1A	Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper Type A or B and corroborated by available site soil data[4]? ☐ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result or continue to Step 1B if the applicant elects to perform infiltration testing. ☐ No; the mapped soil types are A or B but is not corroborated by available site soil data (continue to Step 1B). ☐ No; the mapped soil types are C, D, or "urban/unclassified" and is corroborated by available site soil data. Answer "No" to Criteria 1 Result. ☐ No; the mapped soil types are C, D, or "urban/unclassified" but is not corroborated by available site soil data (continue to Step 1B).
1B	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1? ☐ Yes; Continue to Step 1C. ☐ No; Skip to Step 1D.
1C	Is the reliable infiltration rate calculated using planning phase methods from Table D.3-1 greater than 0.5 inches per hour? ☐ Yes; the DMA may feasibly support full infiltration. Answer "Yes" to Criteria 1 Result. ☐ No; full infiltration is not required. Answer "No" to Criteria 1 Result.
1D	**Infiltration Testing Method.** Is the selected infiltration testing method suitable during the design phase (see Appendix D.3)? Note: Alternative testing standards may be allowed with appropriate rationales and documentation. ☐ Yes; continue to Step 1E. ☐ No; select an appropriate infiltration testing method.

[2] Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, Part 3, or Part 4 determines a full, partial, or no infiltration condition.
[3] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.
[4] Available data includes site-specific sampling or observation of soil types or texture classes, such as obtained from borings or test pits necessary to support other design elements.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[3]
1E	**Number of Percolation/Infiltration Tests.** Does the infiltration testing method performed satisfy the minimum number of tests specified in Table D.3-2? ☐ Yes; continue to Step 1F. ☐ No; conduct appropriate number of tests.
IF	**Factor of Safety.** Is the suitable Factor of Safety selected for full infiltration design? See guidance in D.5; Tables D.5-1 and D.5-2; and Worksheet D.5-1 (Form I-9). ☐ Yes; continue to Step 1G. ☐ No; select appropriate factor of safety.
1G	**Full Infiltration Feasibility.** Is the average measured infiltration rate divided by the Factor of Safety greater than 0.5 inches per hour? ☐ Yes; answer "Yes" to Criteria 1 Result. ☐ No; answer "No" to Criteria 1 Result.
Criteria 1 Result	Is the estimated reliable infiltration rate greater than 0.5 inches per hour within the DMA where runoff can reasonably be routed to a BMP? ☐ Yes; the DMA may feasibly support full infiltration. Continue to Criteria 2. ☐ No; full infiltration is not required. Skip to Part 1 Result.
Summarize infiltration testing methods, testing locations, replicates, and results and summarize estimates of reliable infiltration rates according to procedures outlined in D.5. Documentation should be included in project geotechnical report.	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[3]	
Criteria 2: Geologic/Geotechnical Screening			
2A	If all questions in Step 2A are answered "Yes," continue to Step 2B. For any "No" answer in Step 2A answer "No" to Criteria 2, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
2A-1	Can the proposed full infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick below the infiltrating surface?	☐ Yes	☐ No
2A-2	Can the proposed full infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
2A-3	Can the proposed full infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
2B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1. If all questions in Step 2B are answered "Yes," then answer "Yes" to Criteria 2 Result. If there are "No" answers continue to Step 2C.		
2B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can full infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
2B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can full infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[3]	
2B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011 or most recent edition). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can full infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No
2B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can full infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
2B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can full infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
2B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can full infiltration BMPs be proposed within the DMA using established setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[3]	
2C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 2B. Provide a discussion of geologic/geotechnical hazards that would prevent full infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for full infiltration BMPs? If the question in Step 2 is answered "Yes," then answer "Yes" to Criteria 2 Result. If the question in Step 2C is answered "No," then answer "No" to Criteria 2 Result.	☐ Yes	☐ No
Criteria 2 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No
Summarize findings and basis; provide references to related reports or exhibits.			

Part 1 Result – Full Infiltration Geotechnical Screening [5]	Result
If answers to both Criteria 1 and Criteria 2 are "Yes", a full infiltration design is potentially feasible based on Geotechnical conditions only. If either answer to Criteria 1 or Criteria 2 is "No", a full infiltration design is not required.	☐ Full infiltration Condition ☐ Complete Part 2

[5] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[3]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
Criteria 3: Infiltration Rate Screening	
3A	**NRCS Type C, D, or "urban/unclassified":** Is the mapped hydrologic soil group according to the NRCS Web Soil Survey or UC Davis Soil Web Mapper is Type C, D, or "urban/unclassified" and corroborated by available site soil data? ☐ Yes; the site is mapped as C soils and a reliable infiltration rate of 0.15 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ Yes; the site is mapped as D soils or "urban/unclassified" and a reliable infiltration rate of 0.05 in/hr. is used to size partial infiltration BMPS. Answer "Yes" to Criteria 3 Result. ☐ No; infiltration testing is conducted (refer to Table D.3-1), continue to Step 3B.
3B	**Infiltration Testing Result:** Is the reliable infiltration rate (i.e. average measured infiltration rate/2) greater than 0.05 in/hr. and less than or equal to 0.5 in/hr? ☐ Yes; the site may support partial infiltration. Answer "Yes" to Criteria 3 Result. ☐ No; the reliable infiltration rate (i.e. average measured rate/2) is less than 0.05 in/hr., partial infiltration is not required. Answer "No" to Criteria 3 Result.
Criteria 3 Result	Is the estimated reliable infiltration rate (i.e., average measured infiltration rate/2) greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour at any location within each DMA where runoff can reasonably be routed to a BMP? ☐ Yes; Continue to Criteria 4. ☐ No: Skip to Part 2 Result.
Summarize infiltration testing and/or mapping results (i.e. soil maps and series description used for infiltration rate).	

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[3]	
Criteria 4: Geologic/Geotechnical Screening			
4A	If all questions in Step 4A are answered "Yes," continue to Step 2B. For any "No" answer in Step 4A answer "No" to Criteria 4 Result, and submit an "Infiltration Feasibility Condition Letter" that meets the requirements in Appendix C.1.1. The geologic/geotechnical analyses listed in Appendix C.2.1 do not apply to the DMA because one of the following setbacks cannot be avoided and therefore result in the DMA being in a no infiltration condition. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP.		
4A-1	Can the proposed partial infiltration BMP(s) avoid areas with existing fill materials greater than 5 feet thick?	☐ Yes	☐ No
4A-2	Can the proposed partial infiltration BMP(s) avoid placement within 10 feet of existing underground utilities, structures, or retaining walls?	☐ Yes	☐ No
4A-3	Can the proposed partial infiltration BMP(s) avoid placement within 50 feet of a natural slope (>25%) or within a distance of 1.5H from fill slopes where H is the height of the fill slope?	☐ Yes	☐ No
4B	When full infiltration is determined to be feasible, a geotechnical investigation report must be prepared that considers the relevant factors identified in Appendix C.2.1 If all questions in Step 4B are answered "Yes," then answer "Yes" to Criteria 4 Result. If there are any "No" answers continue to Step 4C.		
4B-1	**Hydroconsolidation.** Analyze hydroconsolidation potential per approved ASTM standard due to a proposed full infiltration BMP. Can partial infiltration BMPs be proposed within the DMA without increasing hydroconsolidation risks?	☐ Yes	☐ No
4B-2	**Expansive Soils.** Identify expansive soils (soils with an expansion index greater than 20) and the extent of such soils due to proposed full infiltration BMPs. Can partial infiltration BMPs be proposed within the DMA without increasing expansive soil risks?	☐ Yes	☐ No
4B-3	**Liquefaction**. If applicable, identify mapped liquefaction areas. Evaluate liquefaction hazards in accordance with Section 6.4.2 of the City of San Diego's Guidelines for Geotechnical Reports (2011). Liquefaction hazard assessment shall take into account any increase in groundwater elevation or groundwater mounding that could occur as a result of proposed infiltration or percolation facilities. Can partial infiltration BMPs be proposed within the DMA without increasing liquefaction risks?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions		Worksheet C.4-1: Form I-8A[3]	
4B-4	**Slope Stability**. If applicable, perform a slope stability analysis in accordance with the ASCE and Southern California Earthquake Center (2002) Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Landslide Hazards in California to determine minimum slope setbacks for full infiltration BMPs. See the City of San Diego's Guidelines for Geotechnical Reports (2011) to determine which type of slope stability analysis is required. Can partial infiltration BMPs be proposed within the DMA without increasing slope stability risks?	☐ Yes	☐ No
4B-5	**Other Geotechnical Hazards.** Identify site-specific geotechnical hazards not already mentioned (refer to Appendix C.2.1). Can partial infiltration BMPs be proposed within the DMA without increasing risk of geologic or geotechnical hazards not already mentioned?	☐ Yes	☐ No
4B-6	**Setbacks.** Establish setbacks from underground utilities, structures, and/or retaining walls. Reference applicable ASTM or other recognized standard in the geotechnical report. Can partial infiltration BMPs be proposed within the DMA using recommended setbacks from underground utilities, structures, and/or retaining walls?	☐ Yes	☐ No
4C	**Mitigation Measures.** Propose mitigation measures for each geologic/geotechnical hazard identified in Step 4B. Provide a discussion on geologic/geotechnical hazards that would prevent partial infiltration BMPs that cannot be reasonably mitigated in the geotechnical report. See Appendix C.2.1.8 for a list of typically reasonable and typically unreasonable mitigation measures. Can mitigation measures be proposed to allow for partial infiltration BMPs? If the question in Step 4C is answered "Yes," then answer "Yes" to Criteria 4 Result. If the question in Step 4C is answered "No," then answer "No" to Criteria 4 Result.	☐ Yes	☐ No
Criteria 4 Result	Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing the risk of geologic or geotechnical hazards that cannot be reasonably mitigated to an acceptable level?	☐ Yes	☐ No

Categorization of Infiltration Feasibility Condition based on Geotechnical Conditions	Worksheet C.4-1: Form I-8A[3]
Summarize findings and basis; provide references to related reports or exhibits	

Part 2 – Partial Infiltration Geotechnical Screening Result[6]	Result
If answers to both Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible based on geotechnical conditions only. If answers to either Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site.	☐ Partial Infiltration Condition ☐ No Infiltration Condition

[6] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet C.4-2: Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions[7]

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions		Worksheet C.4-2: Form I-8B[8]
Part 1 - Full Infiltration Feasibility Screening Criteria		
DMA(s) Being Analyzed:		**Project Phase:**
Criteria 1: Groundwater Screening		
1A	**Groundwater Depth.** Is the depth to seasonally high groundwater tables (normal high depth during the wet season) beneath the base of any full infiltration BMP greater than 10 feet? ☐ Yes; continue to Step 1B. ☐ No; The depth to groundwater is less than or equal to 10 feet, but site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to step 1B. ☐ No; The depth to groundwater is less than or equal to 10 feet and site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer "No" for Criteria 1 Result.	
1B	**Contaminated Soil/Groundwater.** Are proposed full infiltration BMPs at least 250 feet away from contaminated soil or groundwater sites? This can be confirmed using GeoTracker (geotracker.waterboards.ca.gov) to identify open contaminated sites. The setbacks must be the closest horizontal radial distance from the surface edge (at the overflow elevation) of the BMP. ☐ Yes; continue to Step 1C. ☐ No; However, site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to Step 1C. ☐ No; Site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer "No" to Criteria 1 Result.	

[7] Note that it is not required to investigate each and every criterion in the worksheet, a single "no" answer in Part 1, Part 2, part 3, or Part 4 determines a full, partial, or no infiltration condition.
[8] This form must be completed each time there is a change to the site layout that would affect the infiltration feasibility condition. Previously completed forms shall be retained to document the evolution of the site storm water design.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[8]
1C	**Inadequate Soil Treatment Capacity.** Are full infiltration BMPs proposed in DMA soils that have adequate soil treatment capacity? The DMA has adequate soil treatment capacity if **ALL** of the following criteria (detailed in C.2.2.1) for all soil layers beneath the infiltrating surface are met: • USDA texture class is sandy loam or loam or silt loam or silt or sandy clay loam or clay loam or silty clay loam or sandy clay or silty clay or clay; and • Cation Exchange Capacity (CEC) greater than 5 milliequivalents/100g; and • Soil organic matter is greater than 1%; and • Groundwater table is equal to or greater than 10 feet beneath the base of the full infiltration BMP. ☐ Yes; continue to Step 1D. ☐ No; However, site layout changes or reasonable mitigation measures can be proposed to support full infiltration BMPs. Continue to Step 1D. ☐ No; Site layout changes or reasonable mitigation measures cannot be proposed to support full infiltration BMPs. Answer "No" to Criteria 1 Result.
1D	**Other Groundwater Contamination Hazards.** Are there site-specific groundwater contamination hazards not already mentioned (refer to Appendix C.2.2) that can be reasonably mitigated to support full infiltration BMPs? ☐ Yes; there are other contamination hazards identified that can be mitigated. Answer "Yes" to Criteria 1 Result. ☐ No; there are other contamination hazards identified that cannot be mitigated. Answer "No" to Criteria 1 Result. ☐ N/A; no contamination hazards are identified. Answer "Yes" to Criteria 1 Result.
Criteria 1 Result	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination that cannot be reasonably mitigated to an acceptable level? See Appendix C.2.2.8 for a list of typically reasonable and typically unreasonable mitigation measures. ☐ Yes; Continue to Part 1, Criteria 2. ☐ No; Continue to Part 1 Result.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[8]
Summarize groundwater quality and any mitigation measures proposed. Documentation should focus on groundwater table, mapped soil types and contaminated site locations.	

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[8]
Criteria 2: Water Balance Screening	
2A	**Ephemeral Stream Setback.** Does the proposed full infiltration BMP meet both the following? • The full infiltration BMP is located at least 250 feet away from an ephemeral stream; **AND** • The bottom surface of the full infiltration BMP is at a depth 20 feet or greater from seasonally high groundwater tables. ☐ Yes; Answer "Yes" to Criteria 2 Result. ☐ No; Continue to Step 2B.
2B	**Mitigation Measures.** Can site layout changes be proposed to support full infiltration BMPs? ☐ Yes; the site can be reconfigured to mitigate potential water balance issues. Answer "Yes" to Criteria 2 Result. ☐ No; the site cannot be reconfigured to mitigate potential water balance issues. Continue to Step 2C and provide discussion.
2C	**Additional studies.** Do additional studies support full infiltration BMPs? In the event that water balance effects are used to reject full infiltration (anticipated to be rare), additional analysis shall be completed and documented by a qualified professional indicating the site-specific information evaluated and the technical basis for this finding. ☐ Yes; Answer "Yes" to Criteria 2 Result. ☐ No; Answer "No" to Criteria 2 Result.
Criteria 2 Result	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? ☐ Yes; Continue to Part 1 Result. ☐ No; Continue to Part 1 Result.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[8]
Summarize potential water balance effects. Documentation should focus on mapping and soil data regarding proximity to ephemeral streams and groundwater depth.	

Part 1 – Full Infiltration Groundwater and Water Balance Screening Result[9]	Result
If answers to Criteria 1 and 2 are "Yes", a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration based on groundwater conditions. If answer to Criteria 1 or Criteria 2 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design based on groundwater conditions. Proceed to Part 2.	☐ Full Infiltration ☐ Complete Part 2

[9] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[8]
Part 2 – Partial vs. No Infiltration Feasibility Screening Criteria	
DMA(s) Being Analyzed:	**Project Phase:**
Criteria 3: Groundwater Screening	
Contaminated Soil/Groundwater. Are partial infiltration BMPs proposed at least 100 feet away from contaminated soil or groundwater sites? This can be confirmed using GeoTracker (geotracker.waterboards.ca.gov) to identify open contaminated sites. This criterion is intentionally a smaller radius than full infiltration, as the potential quantity of infiltration from partial infiltration BMPs is smaller. ☐ Yes; Answer "Yes" to Criteria 3 Result. ☐ No; However, site layout changes can be proposed to avoid contaminated soils or soils that lack adequate treatment capacity. Select "Yes" to Criteria 3 Result. It is a requirement for the SWQMP preparer to identify potential mitigation measures. ☐ No; Contaminated soils or soils that lack adequate treatment capacity cannot be avoided and partial infiltration BMPs are not feasible. Select "No" to Criteria 3 Result.	
Criteria 3 Result: Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without increasing risk of groundwater contamination that cannot be reasonably mitigated to an acceptable level? Yes; Continue to Part 2, Criteria 4. ☐ No; Skip to Part 2 Result.	
Summarize findings and basis. Documentation should focus on mapped soil types and contaminated site locations.	

Categorization of Infiltration Feasibility Condition based on Groundwater and Water Balance Conditions	Worksheet C.4-2: Form I-8B[8]
Criteria 4: Water Balance Screening	
Additional studies. In the event that water balance effects are used to reject partial infiltration (anticipated to be rare), a qualified professional must provide an analysis of the incremental effects of partial infiltration BMPs on the water balance compared to incidental infiltration under a no infiltration scenario (e.g. precipitation, irrigation, etc.).	
Criteria 4 Result: Can infiltration of greater than or equal to 0.05 inches/hour and less than or equal to 0.5 inches/hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams? ☐ Yes: Continue to Part 2 Result. ☐ No: Continue to Part 2 Result.	
Summarize potential water balance effects. Documentation should focus on mapping and soil data regarding proximity to ephemeral streams and groundwater depth	

Part 2 – Partial Infiltration Groundwater and Water Balance Screening Result[10]	Result
If answers to Criteria 3 and Criteria 4 are "Yes", a partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration based on groundwater and water balance conditions. If answer to Criteria 3 or Criteria 4 is "No", then infiltration of any volume is considered to be infeasible within the site. The feasibility screening category is No Infiltration based on groundwater or water balance condition.	☐ Partial Infiltration Condition ☐ No Infiltration Condition

[10] To be completed using gathered site information and best professional judgement considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		**Factor Description**	**Assigned Weight (w)**	**Factor Value (v)**	**Product (p) p = w x v**
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater or impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/resiliency	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms:					

Factor of Safety and Design Infiltration Rate Worksheet	Form I-9

The Geotechnical Engineer certifies they completed Form I-9 (see Appendix C.4.3).

Professional Geotechnical Engineer's Printed Name:

_____

Professional Geotechnical Engineer's Signed Name:

_____

Date: _____

[SEAL]

EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: D

GROUNDWATER: GROUNDWATER WAS ENCOUNTERED IN BORING B-2 AT A DEPTH OF 15 FEET

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: NO CRITICAL COARSE SEDIMENT YIELD AREAS (CCSYAS) EXIST ONSITE. NO PROTECTION OF CCSYAS REQUIRED.

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON. SEE AREA SUMMARY TABLE FOR EXISTING IMPERVIOUS AREA.

EXISTING DRAINAGE: THE PROJECT SITE DRAINS NORTH TO SOUTH TO 9TH AVE, THEN FLOWS WEST ALONG 9TH AVE VIA CURB AND GUTTER.

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: ROOF RUNOFF WILL DRAIN TO THE COURTYARD INTO A 4'X8 MODULAR WETLAND (BMP-1) VIA DOWNSPOUT, THE COURTYARD AREA RUNOFF DRAINS TO A 4'X4' MODULAR WETLAND (BMP-2), AND THE DRIVE AISLE DRAINS NORTH TO SOUTH INTO THE 4'X4' MODULAR WETLAND (BMP-4). ALL BMPS CONNECT TO A HYDROMODIFICATION STORAGE VAULT, AND THEN TO A PUMP AND OUTLETS TO 9TH AVE VIA CURB OUTLET.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLE.

STRUCTURAL BMPS: 3 MODULAR WETLAND SYSTEMS (BMP-1 THRU BMP-3) AND 1 HYDROMODIFICATION VAULT (BMP-4)

SOURCE CONTROL ELEMENTS: REFER TO FORM 1-2B

LEGEND

PROPOSED FLOW PATH

WATERSHED BOUNDARY

DMA AREA Q — BASIN

IMPERVIOUS ROOF AREA

IMPERVIOUS HARDSCAPE

PERVIOUS LANDSCAPING

DE MINIMIS AREA

SELF-MITIGATING AREA

BMP

S ESCONDIDO BLVD

W 9TH AVE

4 — 0.003 AC — CFS

2 — 0.374 AC — CFS

1 — 0.049 AC — CFS

5 — 0.008 AC — CFS

3 — 0.036 AC — CFS

6 — 0.006 AC — CFS

7 — 0.006 AC — CFS

BF-1

BF-2

BF-3

BF-4

DE MINIMIS (13SF)

DE MINIMIS (20SF)

DE MINIMIS (250SF)

DE MINIMIS (108SF)

DE MINIMIS (28SF)

652.90FF

653.62FF

653.85FF

POC "A"

15 7.5 0 15 30 45

SCALE: 1"=15'

829 S ESCONDIDO BLVD

SCALE: 1"=20' JOB NO.: 141.00

DATE: 2022-10-25 SHEET: 1 OF 1

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

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

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 2a	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the Storm Water Design Manual	☐Included ☐Submitted as separate stand-alone document
Attachment 2b	Hydromodification Management Exhibit (Required)	☐Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2c	Management of Critical Coarse Sediment Yield Areas See Section 6.2 and Appendix H of the Storm Water Design Manual.	☐Exhibit depicting onsite and/or upstream sources of critical coarse sediment as mapped in the WMAA AND, ☐Demonstration that the project effectively avoids and bypasses sources of mapped critical coarse sediment OR, ☐Demonstration that the downstream system is not sensitive to preservation of Coarse Sediment Supply (Form I-11). ☐Demonstration that project does not generate a net impact on the receiving water.
Attachment 2d	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the Storm Water Design Manual.	☐Not performed ☐Included ☐Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐Included ☐Not required because BMPs will drain in less than 96 hours

BMP Sizing Spreadsheet V3.1			
Project Name:	829 S Escondido Blvd	Hydrologic Unit:	Carlsbad 904
Project Applicant:	Jabro Law Group, LLC	Rain Gauge:	Oceanside
Jurisdiction:	City of Escondido	Total Project Area:	20,963
Parcel (APN):	233-371-14 & 233-371-15	Low Flow Threshold:	0.1Q2
BMP Name:	BMP 4	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)
1	2,143	D	Flat	Concrete	1.0	0.12	257
2	16,283	D	Flat	Roofs	0.1	0.12	195
3	900	D	Flat	Concrete	1.0	0.12	108
3	668	D	Flat	Landscape	0.1	0.12	8
4	116	D	Flat	Pervious Concrete	0.1	0.12	1
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
						0	0
BMP Tributary Area	20,110					Minimum BMP Size	570
						Proposed BMP Size*	570

* Assumes standard configuration

	12.00	
Standard Cistern Depth (Overflow Elevation)	3.5	ft
Provided Cistern Depth (Overflow Elevation)	4.0	ft
Minimum Required Cistern Footprint)	142	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 Manu

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, May 2018. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V3.1			
Project Name:	829 S Escondido Blvd	Hydrologic Unit:	Carlsbad 904
Project Applicant:	Jabro Law Group, LLC	Rain Gauge:	Oceanside
Jurisdiction:	City of Escondido	Total Project Area:	20,963
Parcel (APN):	233-371-14 & 233-371-15	Low Flow Threshold:	0.1Q2
BMP Name	BMP 4	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				
1	Oceanside	D	Flat	0.571	0.049	0.003	**0.04**
2	Oceanside	D	Flat	0.571	0.374	0.021	**0.29**
3	Oceanside	D	Flat	0.571	0.021	0.001	**0.02**
3	Oceanside	D	Flat	0.571	0.015	0.001	**0.01**
4	Oceanside	D	Flat	0.571	0.003	0.000	**0.00**

4.00	**0.026**	**0.36**	**0.68**
Max Orifice Head (feet)	**Max Tot. Allowable Orifice Flow (cfs)**	**Max Tot. Allowable Orifice Area (in^2)**	**Max Orifice Diameter (in)**

Provide Hand Calc.	**0.014**	**0.20**	**0.500**
Average outflow during surface drawdown (cfs)	Max Orifice Outflow (cfs)	Actual Orifice Area (in^2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	Provide Hand Calculation

Vault Drawdown Calculation

Project Name 829 S Escondido Blvd

Project No 311 Date 8/3/2023

Vault Drawdown	**18.58**	**hrs**

Note: Drawdown time is calculated assuming an initial water surface depth equal to the invert of the lowest surface discharge opening in the vault outlet structure.

Underdrain Orifice Diameter:	**0.5**	in
C:	**0.6**	

Surface Depth (ft)	**Volume (cf)**	**$Q_{orifice}$ (cfs)**	**ΔT (hr)**	**Total Time (hr)**
5	386.25	0.015	0.000	0.0
4	309.00	0.013	1.558	1.56
3	231.75	0.011	1.774	3.33
2	154.50	0.009	2.115	5.45
1	77.25	0.006	2.793	8.24
0	0.00			

Qorifice = Line 2*(3.14*(Line 1/2)^2*(1/144))*(SQRT(2*32.2*(Line 3-((Line 1/2)/12))))

ΔT (hr) = ((Line C3-Line C4)/((Line D3+Line D4)/2))/3600

Total Time (hr) = Line F3+Line E4

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)

EXISTING SITE INFORMATION

HYDROLOGIC SOIL GROUP: D

GROUNDWATER: GROUNDWATER WAS ENCOUNTERED IN BORING B-2 AT A DEPTH OF 15 FEET

EXISTING NATURAL HYDROLOGIC FEATURES: NO NATURAL HYDROLOGIC FEATURES EXIST ONSITE.

CRITICAL COARSE SEDIMENT YIELD AREAS: NO CRITICAL COARSE SEDIMENT YIELD AREAS (CCSYAS) EXIST ONSITE. NO PROTECTION OF CCSYAS REQUIRED.

EXISTING TOPOGRAPHY AND IMPERVIOUS AREA: EXISTING TOPOGRAPHY SHOWN HEREON. SEE AREA SUMMARY TABLE FOR EXISTING IMPERVIOUS AREA.

EXISTING DRAINAGE: THE PROJECT SITE DRAINS NORTH TO SOUTH TO 9TH AVE, THEN FLOWS WEST ALONG 9TH AVE VIA CURB AND GUTTER.

PROPOSED SITE INFORMATION

PROPOSED DRAINAGE: ROOF RUNOFF WILL DRAIN TO THE COURTYARD INTO A 4'X8 MODULAR WETLAND (BMP-1) VIA DOWNSPOUT, THE COURTYARD AREA RUNOFF DRAINS TO A 4'X4' MODULAR WETLAND (BMP-2), AND THE DRIVE AISLE DRAINS NORTH TO SOUTH INTO THE 4'X4' MODULAR WETLAND (BMP-4). ALL BMPS CONNECT TO A HYDROMODIFICATION STORAGE VAULT, AND THEN TO A PUMP AND OUTLETS TO 9TH AVE VIA CURB OUTLET.

PROPOSED GRADING: SHOWN HEREON.

PROPOSED IMPERVIOUS FEATURES: SHOWN HEREON.

PROPOSED DRAINAGE: SHOWN HEREON.

PROPOSED DESIGN FEATURES: SITE DESIGN REQUIREMENTS SHOWN HEREON.

DRAINAGE MANAGEMENT AREAS: SHOWN HEREON. SEE DMA SUMMARY TABLE.

STRUCTURAL BMPS: 3 MODULAR WETLAND SYSTEMS (BMP-1 THRU BMP-3) AND 1 HYDROMODIFICATION VAULT (BMP-4)

SOURCE CONTROL ELEMENTS: REFER TO FORM 1-2B

LEGEND

PROPOSED FLOW PATH

WATERSHED BOUNDARY

DMA AREA Q — BASIN

IMPERVIOUS ROOF AREA

IMPERVIOUS HARDSCAPE

PERVIOUS LANDSCAPING

DE MINIMIS AREA

SELF-MITIGATING AREA

BMP

S ESCONDIDO BLVD

W 9TH AVE

4 — 0.003 AC — CFS

2 — 0.374 AC — CFS

1 — 0.049 AC — CFS

5 — 0.008 AC — CFS

3 — 0.036 AC — CFS

6 — 0.006 AC — CFS

7 — 0.006 AC — CFS

BF-1

BF-2

BF-3

BF-4

DE MINIMIS (13SF)

DE MINIMIS (20SF)

DE MINIMIS (250SF)

DE MINIMIS (108SF)

DE MINIMIS (28SF)

652.90FF

653.62FF

653.85FF

POC "A"

15 7.5 0 15 30 45

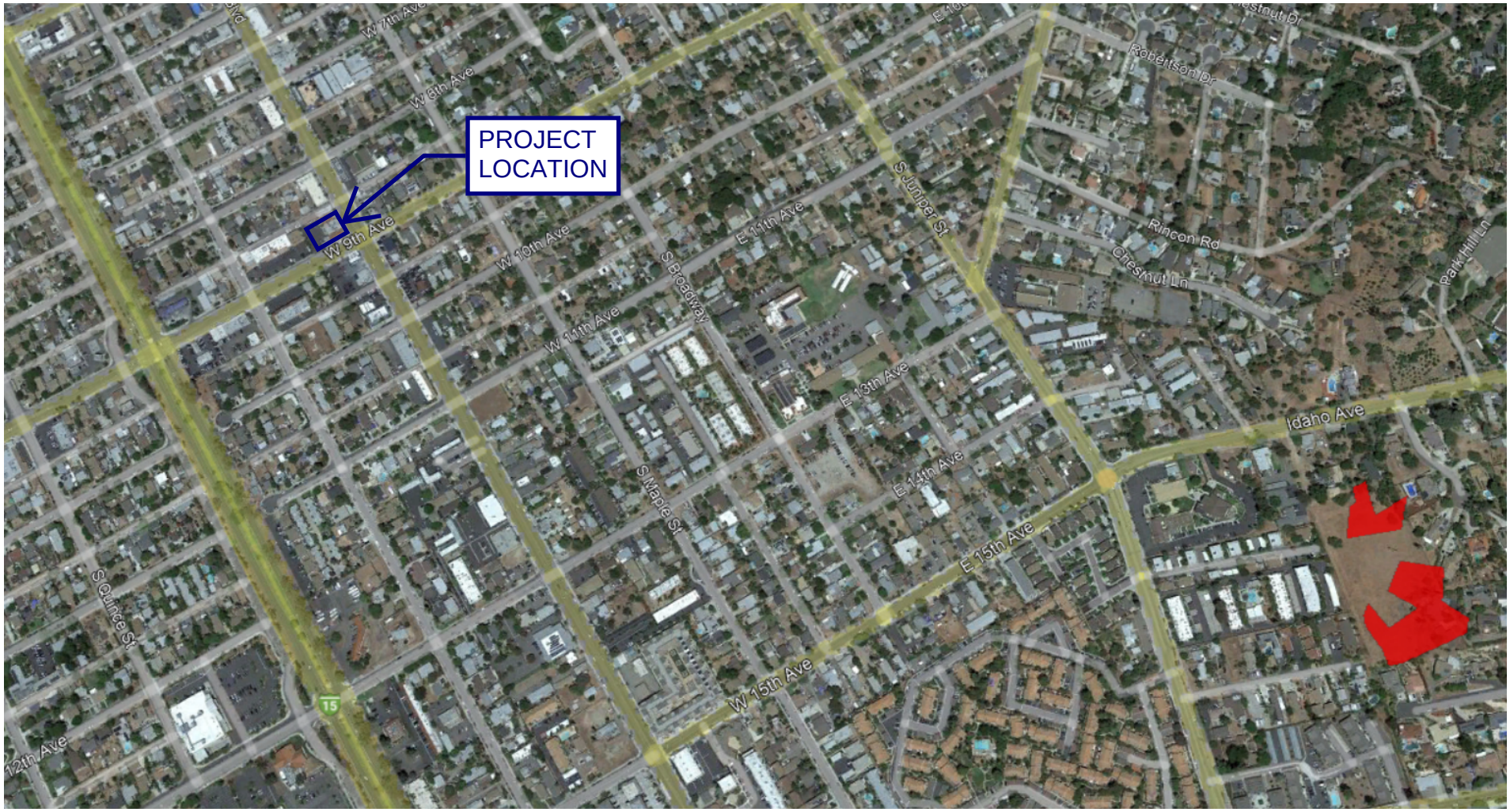
SCALE: 1"=15'

829 S ESCONDIDO BLVD

SCALE: 1"=20' JOB NO.: 141.00

DATE: 2022-10-25 SHEET: 1 OF 1

828 S. Escondido Blvd - WMMA CRITICAL COURSE SEDIMENT YIELD AREA MAP



CRITICAL COARSE SEDIMENT YEILD AREAS

PROJECT BOUNDARY

Downstream Systems Requirements for Preservation of Coarse Sediment Supply			Form I-11
When it has been determined that potential critical coarse sediment yield areas exist within the project site, the next step is to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. Use this form to document the evaluation of downstream systems requirements for preservation of coarse sediment supply.			
Project Name:			
Project Tracking Number / Permit Application Number:			
1	Will the project discharge runoff to a hardened MS4 system (pipe or lined channel) or an un-lined channel?	☐ Hardened MS4 system	Go to 2
		☐ Un-lined channel	Go to 4
2	Will the hardened MS4 system convey sediment (e.g., a concrete-lined channel with steep slope and cleansing velocity) or sink sediment (e.g., flat slopes, constrictions, treatment BMPs, or ponds with restricted outlets within the system will trap sediment and not allow conveyance of coarse sediment from the project site to an un-lined system).	☐ Convey	Go to 3
		☐ Sink	Go to 7
3	What kind of receiving water will the hardened MS4 system convey the sediment to?	☐ Un-lined channel	Go to 4
		☐ Lake ☐ Reservoir ☐ Bay	Go to 7
		☐ Lagoon ☐ Ocean	Go to 6
4	Is the un-lined channel impacted by deposition of sediment? This condition must be documented by the local agency.	☐ Yes	Go to 7
		☐ No	Go to 5
5	End – Preserve coarse sediment supply to protect un-lined channels from accelerated erosion due to reduction of coarse sediment yield from the project site unless further investigation determines the sediment is not critical to the receiving stream. Sediment that is critical to receiving streams is the sediment that is a significant source of bed material to the receiving stream (bed sediment supply) (see Section 6.2.3 and Appendix H.2 of the manual).		
6	End – Provide management measures for preservation of coarse sediment supply (protect beach sand supply).		
7	End – Downstream system does not warrant preservation of coarse sediment supply, no measures for protection of critical coarse sediment yield areas onsite are necessary. Use the space below to describe the basis for this finding for the project.		

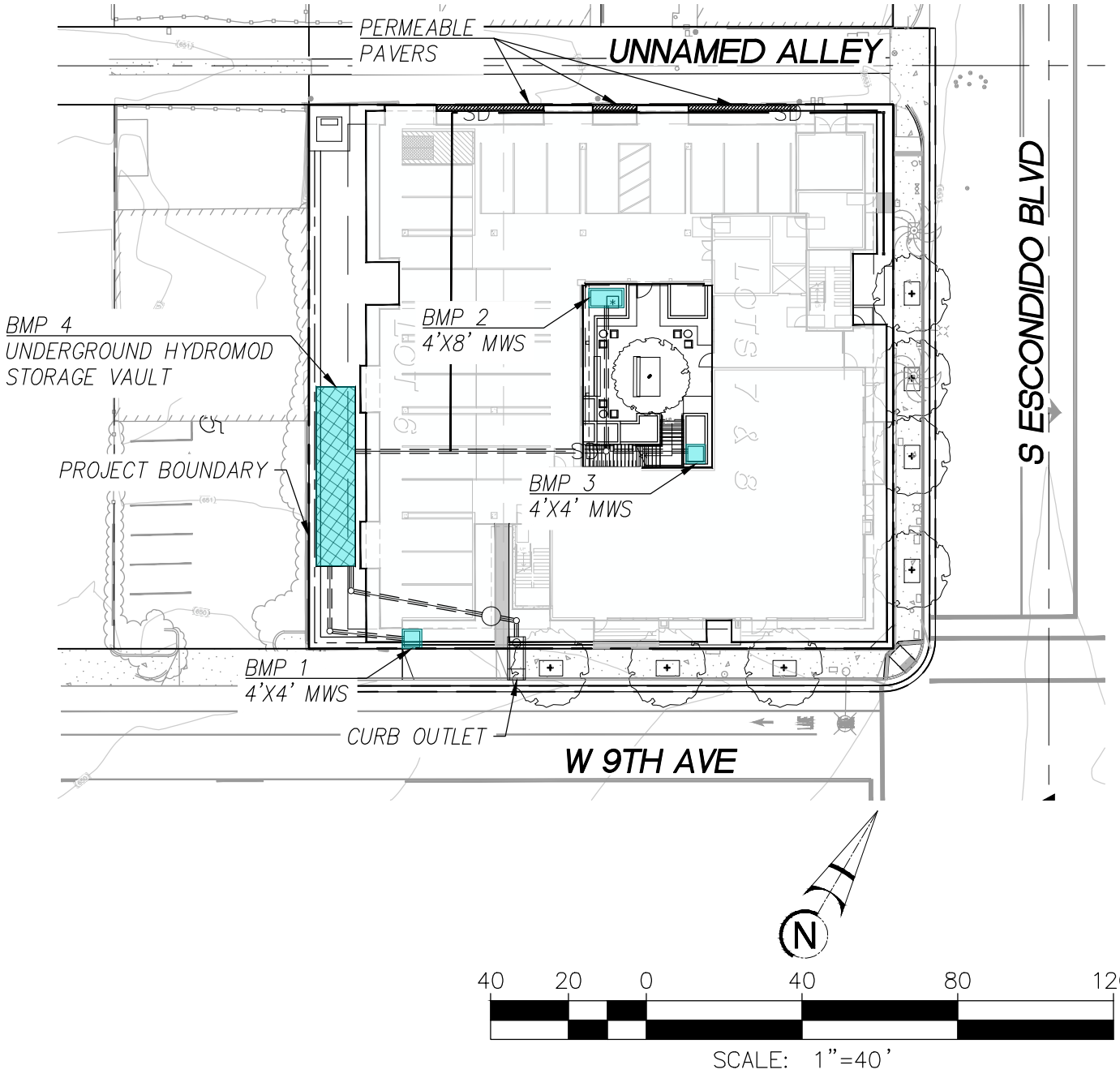
ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Plan (Required)	☐Included See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Storm Water Control Facilities Maintenance Agreement (SWCFMA) (when applicable)	☐Included ☐Not Applicable


PERMEABLE
PAVERS
UNNAMED ALLEY
S ESCONDIDO BLVD
BMP 4
UNDERGROUND HYDROMOD
STORAGE VAULT
PROJECT BOUNDARY
BMP 2
4'X8' MWS
BMP 3
4'X4' MWS
BMP 1
4'X4' MWS
CURB OUTLET
W 9TH AVE
SLOT 7 & 8
N
40 20 0 40 80 120
SCALE: 1"=40'

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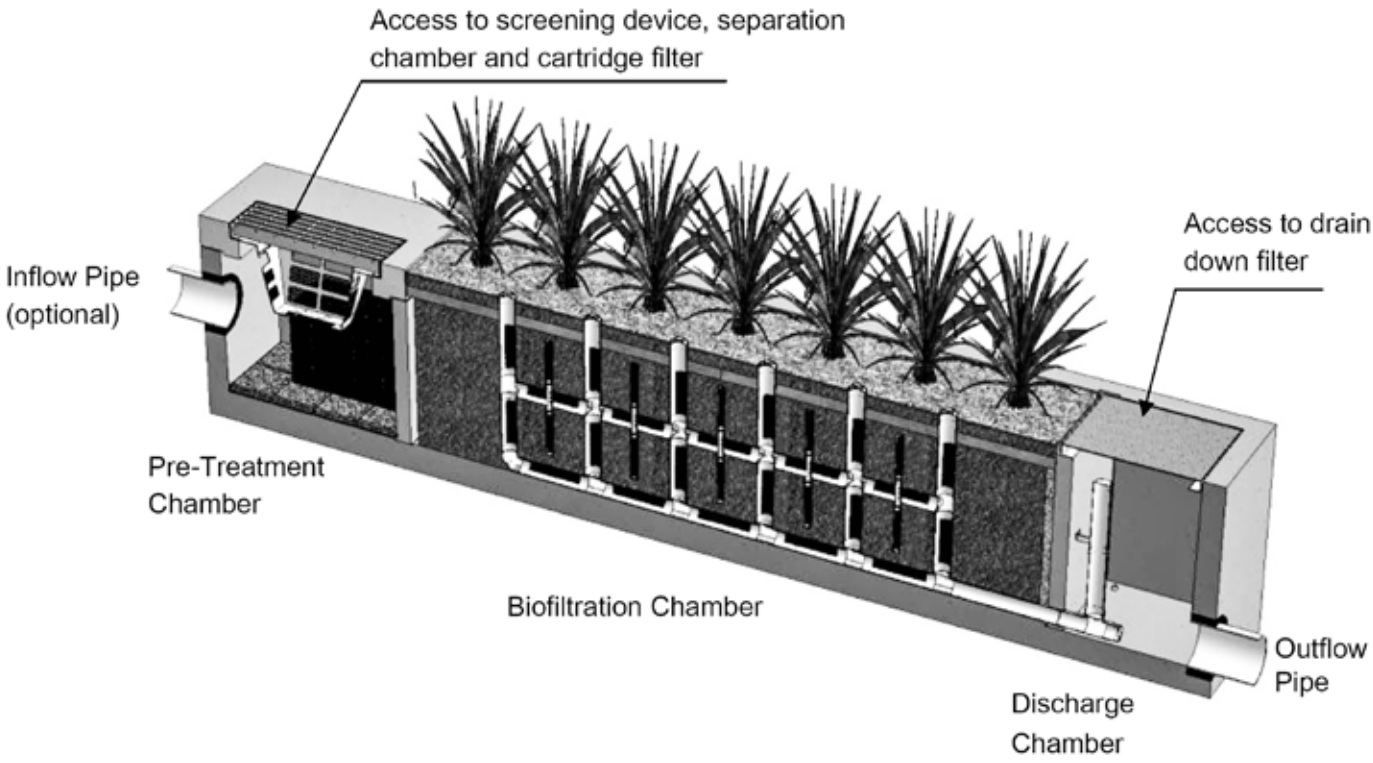
ENGINEERED SOLUTIONS

Modular Wetlands® Linear
Operation & Maintenance Manual

MODULAR WETLANDS®

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - *(5 minute average service time).*
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - *(10 minute average service time).*
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - *(10-15 minute per cartridge average service time).*
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - *(5 minute average service time).*
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - *(Service time varies).*



System Diagram

Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre- Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer, spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber. Entry into chambers may require confined space training based on state and local regulations.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/ inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
4. Entry into chambers may require confined space training based on state and local regulations.
5. No fertilizer shall be used in the Biofiltration Chamber.
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

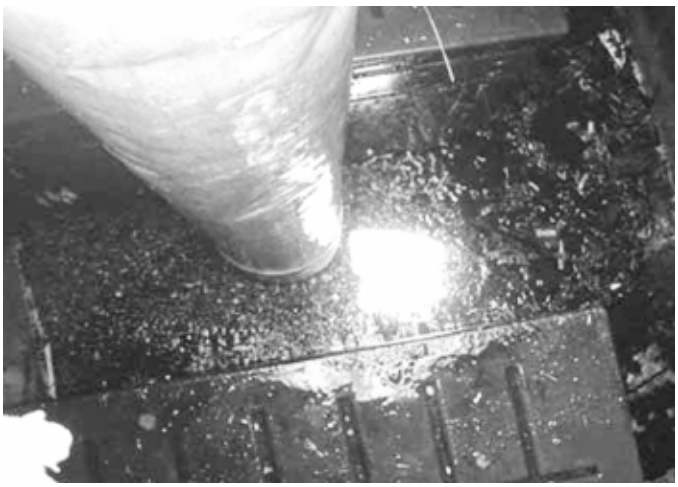
Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

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Inspection Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

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ENGINEERED SOLUTIONS

Cleaning and Maintenance Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

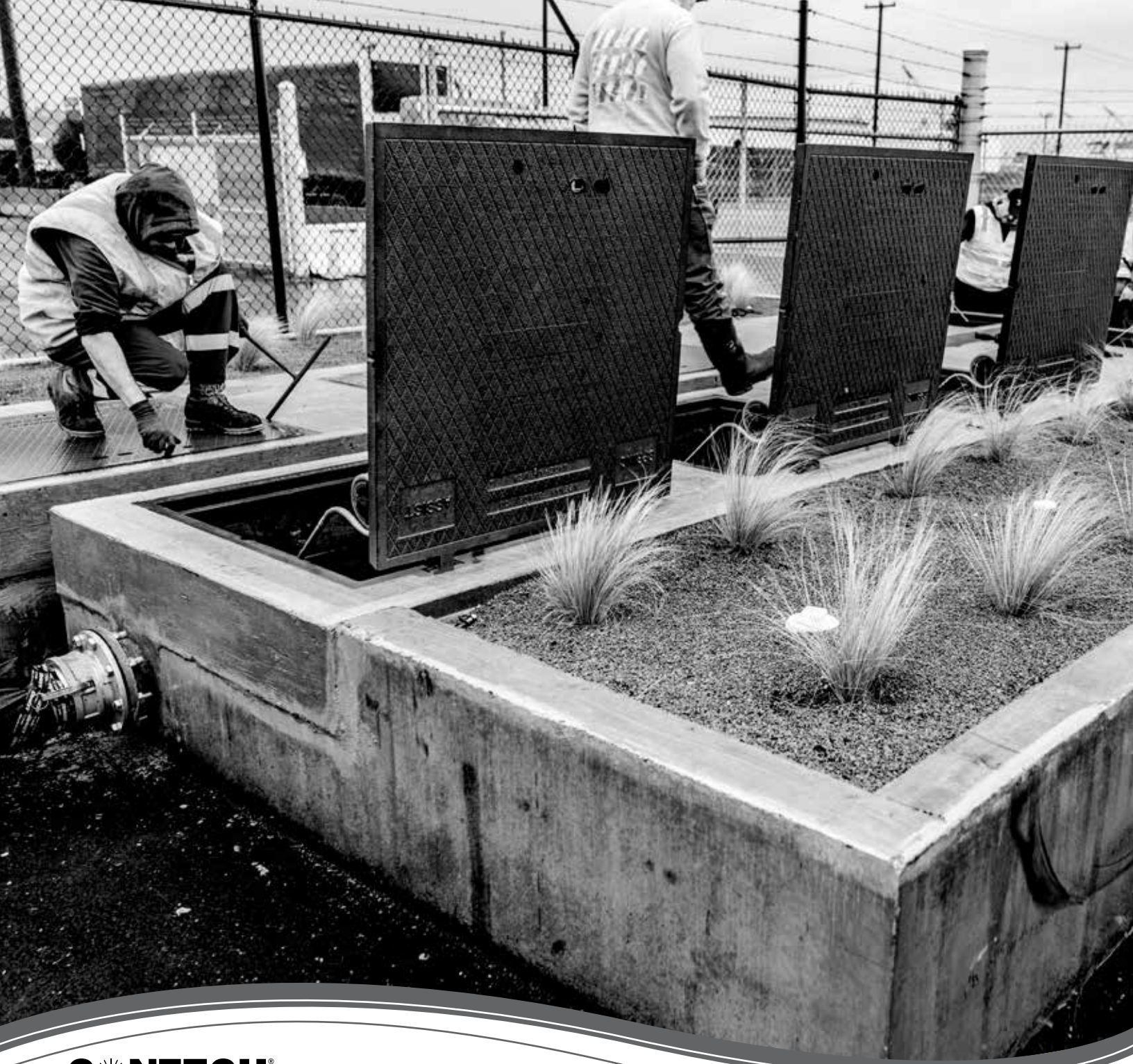
For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:



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800-338-1122

WWW.CONTECHES.COM

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SUPPORT

DRAWINGS AND SPECIFICATIONS ARE AVAILABLE AT WWW.CONTECHES.COM

Modular Wetlands Maintenance Guide 08/22

PEMEABLE PAVER MAINTENANCE	
ACTIVITY	**SCHEDULE**
Visually inspect pervious pavement area to ensure that it is clean of debris, de-waters between storms, and is clean of sediments	Monthly
Keep the pervious pavement surface free of sediment by blowing, sweeping or vacuuming.	As Needed
Inspect the pervious pavement surface for deterioration or spalling.	Every 6 months

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

Attachment 3a must identify:

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

Attachment 3b: For all Structural BMPs, Attachment 3b must include a draft maintenance agreement in the City's standard format (PDP applicant to contact City staff to obtain the current maintenance agreement forms or download from City's website).

ATTACHMENT 4

City of Escondido PDP Structural BMP Verification for Permitted Land Development Projects

This is the cover sheet for Attachment 4.

City of Escondido Storm Water Structural BMP Verification Form Page 1 of 3	
Project Summary Information	
Project Name	
Permit Number (e.g., grading/improvement plan number)	
Project Address	
Assessor's Parcel Number(s) (APN(s))	
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	
Maintenance Notification / Agreement No.	
Responsible Party for Construction Phase	
Developer's Name	
Address	
Email Address	
Phone Number	
Engineer of Work	
Engineer's Phone Number	
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

City of Escondido Storm Water Structural BMP Verification Form Page 2 of 3				
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)				
Description/Type of Structural BMP	**Plan Sheet #**	**Structural BMP ID#**	**Maintenance Agreement Recorded Doc #**	**Revisions**
*All Priority Development Projects (PDPs) require a Structural BMP				

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

City of Escondido Storm Structural BMP Verification Form Page 3 of 3

Checklist for Engineer of Work (EOW) to submit to Field Engineering:

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

By signing below, I certify that the Structural BMP(s) for this project have been constructed and all BMPs are in substantial conformance with the approved plans and applicable regulations. I understand the City reserves the right to inspect the above BMPs to verify compliance with the approved plans and Storm Water Ordinance. Should it be determined that the BMPs were not constructed to plan or code, corrective actions may be necessary before permits can be closed.

Please sign your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

Date: _____

[SEAL]

ATTACHMENT 5

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

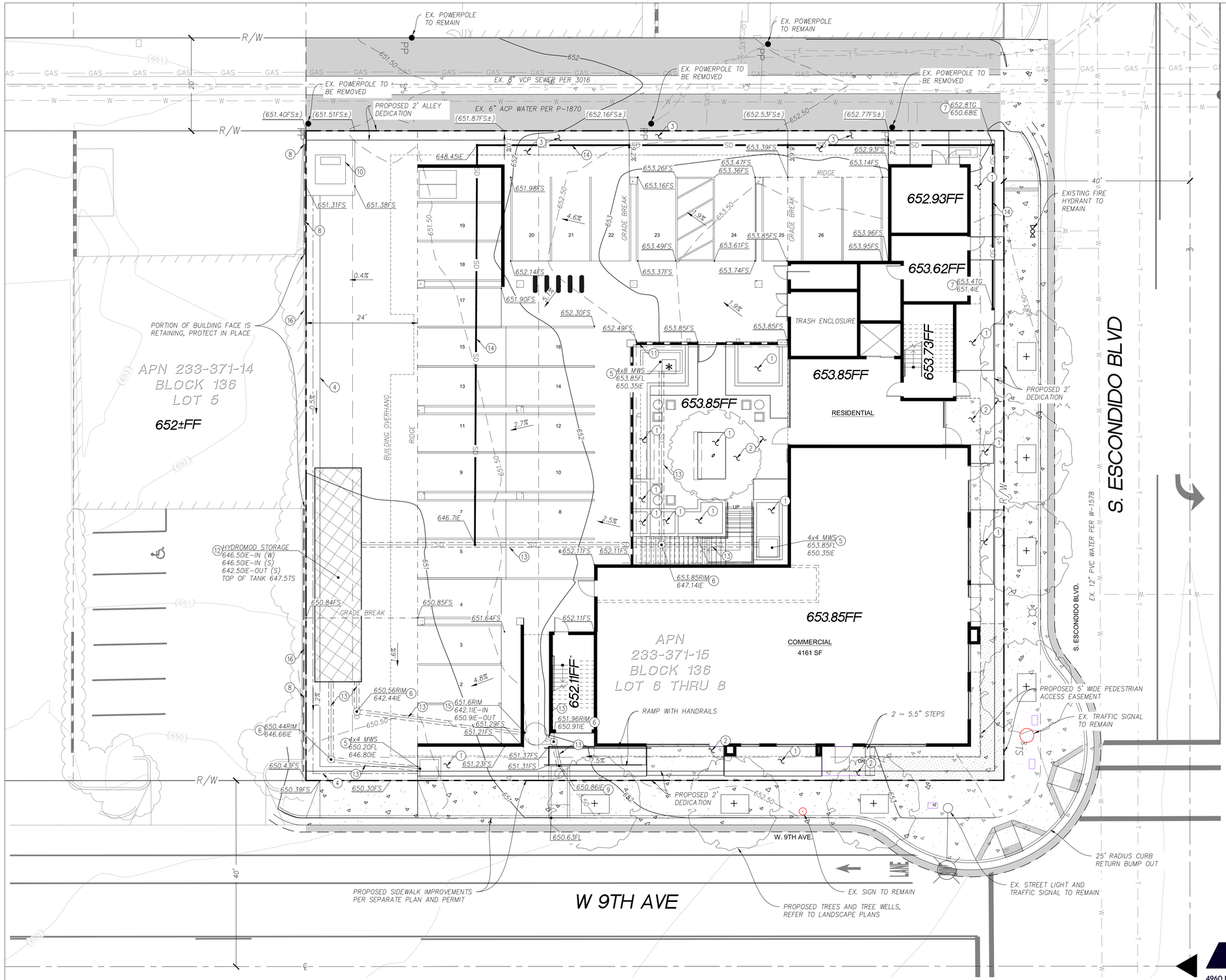
This is the cover sheet for Attachment 5.

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

The plans must identify:

☐Structural BMP(s) with ID numbers matching Step 5 Summary of PDP Structural BMPs
☐The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
☐Details and specifications for construction of structural BMP(s)
☐Signage indicating the location and boundary of structural BMP(s) as required by City staff
☐How to access the structural BMP(s) to inspect and perform maintenance
☐Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
☐Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
☐Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
☐Recommended equipment to perform maintenance
☐When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
☐Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
☐All BMPs must be fully dimensioned on the plans
☐When proprietary BMPs are used, site-specific cross section with outflow, inflow, and model number must be provided. Photocopies of general brochures are not acceptable.
☐Include all source control and site design measures described in Steps 3 and 4 of the SWQMP. Can be included as a separate exhibit as necessary.

***Note: Plan sheets included in this attachment can be full size or half size.**

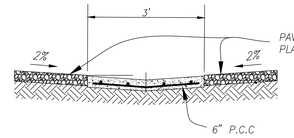


CONSTRUCTION NOTES:

1. PLANTING PER LANDSCAPE ARCHITECT PLANS.
2. P.C.C. HARDSCAPE PER LANDSCAPE ARCHITECT PLANS.
3. PERMEABLE PAVERS, SEE DETAIL PER LANDSCAPE ARCHITECT PLANS.
4. 3' WIDE RIBBON GUTTER, SEE DETAIL ON THIS SHEET.
5. MWS BIOFILTRATION TREATMENT, SIZE PER PLAN.
6. PROPOSED 24" NYLOPLAST ADS BASIN WITH SOLID COVER.
7. 6" ATRIUM GRATED DRAIN.
8. EXISTING RETAINING WALL TO REMAIN, PROTECT IN PLACE.
9. CONNECT TO PROPOSED CURB OUTLET. SEE PUBLIC IMPROVEMENT PLANS, XXXXXX.
10. TRANSFORMER PAD PER ELECTRIC PLANS.
11. DOWNSPOUT LOCATION PER ARCHITECT PLANS.
12. HYDROMOD STORAGE FACILITY. X,XXXCF REQ'D, X,XXXCF PROVIDED
13. 12" HDPE STORM DRAIN.
14. 4" PVC AREA DRAIN.
15. PUMP VAULT AND CISTERN.
16. CONTRACTOR TO PROVIDE WATER PROOFING/VAPOR BARRIER BETWEEN EXISTING WALL AND BUILDING, MARAFI MTK OR APPROVED EQUAL.

GENERAL NOTES

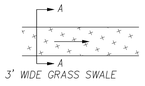
1. IMPROVEMENTS PER SEPARATE PLAN AND PERMIT, SEE DRAWING XXXXXX.
2. ALL OVERHEAD UTILITIES WILL BE UNDERGROUNDED AND POLES REMOVED.
3. EXISTING PALM TREES TO BE REMOVED; NEW TREE WELLS AND TREES.



1. CONCRETE SHALL BE 520-C-2500
2. SEE SDRSD G-9 &G-10 FOR JOINT DETAILS
3. BROOM FINISH SMOOTH, TROWEL AT CENTER
4. (4) #4 LONGITUDINAL @ 8" O.C.
5. #3 CROSS BARS @ 32" O.C.
6. UPPER 18" OF SUBGRADE SHALL BE COMPACTED TO 90% RELATIVE COMPACTION

P.C.C RIBBON GUTTER DETAIL

NO SCALE



GRASS SWALE

NTS

10 5 0 10 20 30

SCALE: 1"=10'

4C ENGINEERING + GEOMATICS
4960 N HARBOR DR STE 200 (619) 663 8352
SAN DIEGO, CA 92106 www.4c.engineering

PRECISE GRADING PLAN

C01