



**CITY OF ENCINITAS  
STORMWATER INTAKE FORM AND PRIORITY DEVELOPMENT PROJECT  
STORMWATER QUALITY MANAGEMENT PLAN (SWQMP)**

**FOR:  
LA COSTA HOTEL  
HOTEL COMMERCIAL DEVELOPMENT**

**18-188 MIN/DR/CDP**

516 LA COSTA AVE  
ENCINITAS, CA 92024  
216-030-48

**PREPARED BY:**  
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858-259-8212

**PREPARED FOR:**  
DM LA COSTA AVENUE, LLC  
1650 N. COAST HIGHWAY 101  
ENCINITAS, CA 92024

**DATE OF SWQMP:**  
OCTOBER 2020

**GRADING PLAN PREPARED BY:**  
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## 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 Priority Development Project (PDP) requirements of the City of Encinitas BMP Design Manual, which is a design manual for compliance with local City of Encinitas and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

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

Engineer's Seal

Brian M. Ardolino, RCE 71651

\_\_\_\_\_  
Print Name

Pasco, Laret, Suiter & Associates

\_\_\_\_\_  
Company

10/1/2020

\_\_\_\_\_  
Date



**PROJECT OWNER'S CERTIFICATION**

This PDP SWQMP has been prepared for DM La Costa Avenue LLC by Pasco Laret Suiter & Associates. The PDP SWQMP is intended to comply with the PDP requirements of the City of Encinitas BMP Design Manual, which is a design manual for compliance with local City of Encinitas and regional MS4 Permit (California Regional Water Quality Control Board San Diego Region Order No. R9-2015-0100) requirements for storm water management.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan. Once the undersigned transfers its interests in the property, its successor-in-interest shall bear the aforementioned responsibility to implement the best management practices (BMPs) described within this plan, including ensuring on-going operation and maintenance of structural BMPs. A signed copy of this document shall be available on the subject property into perpetuity.

\_\_\_\_\_  
Project Owner's Signature

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Company

\_\_\_\_\_  
Date

## **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 the fourth column, 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.

<b>Submittal Number</b>	<b>Date</b>	<b>Project Status</b>	<b>Summary of Changes</b>
1	August 2018	√ Preliminary Design / Planning/ CEQA Final Design	1 <sup>st</sup> Submittal
2	March 2019	√ Preliminary Design / Planning/ CEQA Final Design	2 <sup>nd</sup> Submittal
3	December 2019	√ Preliminary Design / Planning/ CEQA Final Design	3 <sup>rd</sup> Submittal
4	October 2020	√ Preliminary Design / Planning/ CEQA Final Design	4 <sup>th</sup> Submittal

## PROJECT IDENTIFICATION

Project/Applicant Name: DM La Costa Avenue LLC	
Permit/Application Number: 18-188 MIN/DR/CDP	Date: October 2020
Site Address: 516 La Costa Ave, Encinitas, CA 92024	APN: 216-030-48
Scope of work/project description:  The intent of the proposed project is to develop a hotel with restaurant. The proposed development consists of grading to create pads suitable for the construction of structures, new driveway and parking area, stormwater treatment basin, curb and associated hardscape and landscape, and associated underground utilities.	

## DETERMINATION OF PROJECT STATUS AND REQUIREMENTS

This form will identify permanent, post construction BMP requirements. Refer to City of Encinitas Stormwater BMP Design Manual for guidance.			
<b>Step 1:</b> Is the project a "development project"? Development projects are defined as "construction, rehabilitation, redevelopment, or reconstruction of any public or private projects". See Section 1.3 and Table 1-2 of the manual for guidance. For example, interior remodels, roof replacements, and electrical and plumbing work are not development projects.	<input checked="" type="checkbox"/> Yes	<b>Go to Step 2.</b>	
	<input type="checkbox"/> No	<b>Stop.</b> Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.	
If "No", provide discussion / justification explaining why the project is <u>not</u> a "development project":			
<b>Step 2:</b> Complete questions below for Project Type Determination. The project is (select one): <input checked="" type="checkbox"/> New Development <input type="checkbox"/> Redevelopment			
The total proposed, newly created and/or replaced impervious area is: <u>7,266 sf onsite + 1,438 sf off-site</u>			
Is the project in any of the following categories, (a) through (f) below?			
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(a)	New development projects or redevelopment projects that create and/or replaced 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.
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects.

Yes ✓	No <input type="checkbox"/>	(c)	<p>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:</p> <ul style="list-style-type: none"> <li>(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).</li> <li>(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.</li> <li>(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.</li> <li>(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.</li> </ul>
Yes ✓	No <input type="checkbox"/>	(d)	<p>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 discharge directly to an Environmentally Sensitive Area (ESA). "Discharge directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).</p> <p><u>Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and SDRWQCB; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and SDRWQCB; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See manual Section 1.4.2 for additional guidance.</u></p>
Yes <input type="checkbox"/>	No ✓	(e)	<p>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:</p> <ul style="list-style-type: none"> <li>(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.</li> <li>(ii) Retail gasoline outlets. This category includes retail gasoline outlets that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day.</li> </ul>
Yes ✓	No <input type="checkbox"/>	(f)	<p>New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.</p> <p><i>Note: See manual Section 1.4.2 for additional guidance.</i></p>
<p>Does the project meet the definition of one or more of the PDP categories (a) through (f) listed above?</p> <p>✓ Yes – <b>The project is a <u>Priority Development Project</u>, the applicant shall provide PDP Post Construction BMPs and <i>continue to Step 3</i>.</b></p> <p><input type="checkbox"/> No – <b>The project is a <u>Standard or Basic Project</u>. <i>Stop here and complete the "City of Encinitas Stormwater Intake Form for All Developments and Standard Projects SWQMP"</i>.</b></p>			
<p>The following is for <i>redevelopment PDPs</i> only:</p> <p>The area of existing (pre-project) impervious area at the project site is: ft<sup>2</sup> (A)</p> <p>The total proposed newly created or replaced impervious area is: ft<sup>2</sup> (B)</p> <p>Percent impervious surface created or replaced (B/A)*100: %</p> <p>The percent impervious surface created or replaced is (select one based on the above calculation):</p>			

<input type="checkbox"/> Less than or equal to fifty percent (50%) – only new and/or replaced impervious areas are considered PDP subject to treatment and HMP criteria OR <input type="checkbox"/> Greater than fifty percent (50%) – the entire site is a PDP; treatment and HMP criteria apply to entire site regardless of whether it is replaced		
<b>Step 3 (PDPs only):</b> Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual for guidance.	<input checked="" type="checkbox"/> Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). <b>Go to Step 4.</b>
	<input type="checkbox"/> No	PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below. <b>Go to “Site Information Checklist”</b>
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
<b>Step 4 (PDPs subject to treatment and hydromodification controls):</b> Does protection of critical coarse sediment yield areas apply based on review of City of Encinitas Potential Critical Coarse Sediment Yield Area Map? See Section 6.2 of the BMP Design Manual for guidance.	<input type="checkbox"/> Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). <b>Go to “Site Information Checklist”</b>
	<input checked="" type="checkbox"/> No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. <b>Go to “Site Information Checklist”</b>



## SITE INFORMATION CHECKLIST

Project's Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Carlsbad Hydrologic Unit, San Marcos Hydrologic Area, Batiquitos Hydrologic Sub Area, 904.51
Parcel Area (Total area of Assessor's Parcel(s) associated with the project)	1.18 Acres Gross 1.13 Acres Net
Area to be Disturbed by the Project (Project Area)	1.16 Acres
Project Proposed Impervious Area (Subset of Project Area)	0.20 Acres
Project Proposed Pervious Area (Subset of Project Area)	0.94 Acres
Project Proposed Pool/Spa Area (Subset of Project Area)	0.02 Acres
Note: Proposed Impervious Area + Proposed Pervious Area + Proposed Pool/Spa Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	
<b>Description of Existing Site Condition</b>	
Current status of the site (select all that apply):	
<input type="checkbox"/> Existing development <input type="checkbox"/> Previously graded but not built out <input type="checkbox"/> Demolition completed without new construction <input checked="" type="checkbox"/> Agricultural or other non-impervious use <input type="checkbox"/> Vacant, undeveloped/natural	
Description / Additional Information: Undeveloped tree farm	
Existing Land Cover includes (select all that apply):	
<input checked="" type="checkbox"/> Vegetative Cover <input checked="" type="checkbox"/> Non-Vegetated Pervious Areas <input checked="" type="checkbox"/> Impervious Areas	
Description / Additional Information: Small area of impervious driveway and sidewalk on-site.	
Underlying soil belongs to Hydrologic Soil Group (select all that apply):	
<input type="checkbox"/> NRCS Type A <input checked="" type="checkbox"/> NRCS Type B <input type="checkbox"/> NRCS Type C <input type="checkbox"/> NRCS Type D	

Approximate Depth to Groundwater (GW):

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

Existing Natural Hydrologic Features (select all that apply):

- Watercourses
- Seeps
- Springs
- Wetlands
- None

Description / Additional Information:

#### Description of Existing Site Drainage Patterns

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

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

Describe existing site drainage patterns:

In the existing condition the drainage characteristics of the site consist of sheet flow generally from the south to the north. There are three major drainage basins. Basin A consists of the westerly portion of the site. Runoff flows from the south to the north and discharges near the northwestern corner of the site. Basin B consists of the easterly portion of the site. Runoff flows from the south to the north and discharges along the easterly edge of the site. Runoff flows from the south to the north and discharges at the northwestern corner of the site. The table below summarizes the pre-project drainage basins and 100-year 6-hour peak flow rates.

Drainage Basin	Area (ac)	Q100 (cfs)
A	1.2	1.09

**Description of Proposed Site Development**

Project Description / Proposed Land Use and/or Activities:

The project proposes to develop the existing site into a hotel and restaurant. The proposed development consists of grading to create pads suitable for the construction of structures, new driveway and parking area, pool, Hydromodification (HMP) biofiltration basin, drywells, curb and associated hardscape and landscape, and associated underground utilities.

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

Proposed impervious features include 10 structures, concrete trash enclosure pad, and road improvements along La Costa Avenue.

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

Proposed pervious features include pervious paver walkways, drive aisles and parking areas, wood decks, biofiltration basin and landscaped areas.

Does the project include grading and changes to site topography?

Yes

No

Description / Additional Information:

### Description of Proposed Site Drainage Patterns

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

Yes

No

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

Describe proposed site drainage patterns:

A bioretention basin is proposed on the north end of the site. In general, the site will drain south to north either along proposed curb or will sheet flow into proposed stormdrain that will discharge into the Bioretention Basin. The basin will be lined and has an overflow inlet to discharge out via a PVC pipe that outlets to two proposed MaxWell IV infiltration pits by Torrent where the water will infiltrate on site.

The HMP Bioretention Basin will provide hydromodification management flow control and storm water pollutant control to meet the requirements the California Regional Water Quality Control Board San Diego Region municipal storm water permit (Order No. R9-2013-0001, referred to as MS4 Permit). The HMP infiltration Basin will also provide mitigation for the 100-year storm event peak discharge. The table below summarizes the pre- and post-project drainage basins and 100-year 6-hour peak flow rates.

Drainage Basin	Pre-project		Post-Project Unmitigated		Post-Project Mitigated	
	Area (ac)	Q100 (cfs)	Area (ac)	Q100 (cfs)	Area (ac)	Q100 (cfs)
A	1.2	1.09	1.0	1.22	1.0	0.0

<b>Identification and Narrative of Receiving Water and Pollutants of Concern</b>			
Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):			
Storm water runoff discharges easterly and northerly to Batiquitos Lagoon and ultimately the Pacific Ocean.			
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 and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:			
<b>303(d) Impaired Water Body</b>	<b>Pollutant(s)/Stressor(s)</b>	<b>TMDLs / WQIP Highest Priority Pollutant</b>	
San Marcos Creek	DDE	TMDL	
San Marcos Creek	Phosphorus	TMDL	
San Marcos Creek	Sediment Toxicity	TMDL	
San Marcos Creek	Selenium	TMDL	
<b>Identification of Project Site Pollutants*</b>			
<b>*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated)</b>			
Identify pollutants expected from the project site based on all proposed use(s) of the site (see BMP Design Manual Appendix B.6):			
<b>Pollutant</b>	<b>Not Applicable to the Project Site</b>	<b>Expected from the Project Site</b>	<b>Also a Receiving Water Pollutant of Concern</b>
Sediment		X	X
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris		X	
Oxygen Demanding Substances		X	
Oil & Grease		X	
Bacteria & Viruses		X	
Pesticides		X	X

**Hydromodification Management Requirements**

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

- √ Yes, hydromodification management flow control structural BMPs required.
- No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

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

**Critical Coarse Sediment Yield Areas\***

\*This section only required if hydromodification management requirements apply

Based on the maps provided within the City of Encinitas Engineering Design Manual dated January 2016, do potential critical coarse sediment yield areas exist within the project drainage boundaries?

Yes

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

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

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

If optional analyses were performed, what was 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 2.b of the SWQMP.
- Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Pursuant to the City of Encinitas Potential Critical Coarse Sediment Yield Area GIS layer, critical coarse sediment yield areas do not exist on the site within proposed grading areas. Refer to the exhibit in Attachment 2b.

**Flow Control for Post-Project Runoff\***

\*This section only required if hydromodification management requirements apply

List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit.

There is one POC for the project, POC-A. POC-A is located along the northern boundary of the site at the outlet of BMP-A. For POC location refer to the exhibit located in Attachment 2a.



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 low flow threshold 0.1Q2

Yes, the result is low flow threshold 0.3Q2

Yes, the result is low flow threshold 0.5Q2

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

Discussion / Additional Information: (optional)

**Other Site Requirements and Constraints**

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

The amount of impervious cover has been minimized with the proposed pervious pavers, wood decks and landscaping. Directly connected impervious areas have been minimized with paver areas and large areas of proposed landscaping and open space which are incorporated throughout the site.

**Optional Additional Information or Continuation of Previous Sections As Needed**

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

## SOURCE CONTROL BMP CHECKLIST

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
<b>SC-1</b> Prevention of Illicit Discharges into the MS4	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SC-2</b> Storm Drain Stenciling or Signage	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SC-3</b> Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input type="checkbox"/> Yes	<input type="checkbox"/> No	√ N/A
<b>SC-4</b> Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input type="checkbox"/> Yes	<input type="checkbox"/> No	√ N/A
<b>SC-5</b> Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SC-6</b> Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
√ Onsite storm drain inlets	√ Yes	No	N/A
<input type="checkbox"/> Interior floor drains and elevator shaft sump pumps drain to sewer	Yes	No	√ N/A
<input type="checkbox"/> Interior parking garages drain to sewer	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/Trash areas must be covered	√ Yes	No	N/A
<input type="checkbox"/> Industrial processes	Yes	No	√ N/A
<input type="checkbox"/> Outdoor storage of equipment or materials must be covered	Yes	No	√ N/A
<input type="checkbox"/> Vehicle and equipment cleaning	Yes	No	√ N/A
<input type="checkbox"/> Vehicle/equipment repair and maintenance	Yes	No	√ N/A
<input type="checkbox"/> Fuel dispensing areas	Yes	No	√ N/A
<input type="checkbox"/> 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 <u>SC-1 through SC-6</u> not implemented. Justification must be provided for <u>ALL</u> "No" answers shown above.			

## SITE DESIGN BMP CHECKLIST

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the manual for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

Source Control Requirement	Applied?		
<b>SD-1</b> Maintain Natural Drainage Pathways and Hydrologic Features	<input type="checkbox"/> Yes	<input type="checkbox"/> No	√ N/A
<b>SD-2</b> Conserve Natural Areas, Soils, and Vegetation	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SD-3</b> Minimize Impervious Area	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SD-4</b> Minimize Soil Compaction	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SD-5</b> Impervious Area Dispersion - Directly Connected Impervious Areas (e.g. roof downspouts connected to street) are not allowed	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SD-6</b> Runoff Collection	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SD-7</b> Landscaping with Native or Drought Tolerant Species	√ Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>SD-8</b> Harvesting and Using Precipitation	<input type="checkbox"/> Yes	√ No	<input type="checkbox"/> N/A

Discussion / justification if SD-1 through SD-8 not implemented. Justification must be provided for ALL "No" answers shown above.

Harvesting and Using Precipitation is not feasible to implement as a BMP. Refer to Attachment 1c.

## **PDP STRUCTURAL BMPS**

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

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

Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (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).

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

Step 1A: The DMA is not self-mitigating, de minimus, or self-retaining.

Step 1B: There are no site design BMPs proposed for the project for which the runoff factor was chosen to be adjusted.

Step 2: Harvest and use is not feasible. Refer to Attachment 1c.

Step 3: Full Infiltration is feasible. Refer to Attachment 1d.

Step 3C: Infiltration Biofiltration BMPs have been selected and sized per the design criteria to meet both pollutant control and hydromodification management flow control requirements. Refer to Attachment 1e for pollutant control calculations. Refer to Attachment 2d for hydromodification calculations.

## STRUCTURAL BMP SUMMARY INFORMATION

Copy this page as necessary to provide information on each individual proposed structural BMP

Structural BMP ID No: Bioretention Basin	DMA No: BMP A
Construction Plan Sheet No:	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input checked="" type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Biofiltration with Nutrient Sensitive Media Design (BF-2) <input type="checkbox"/> Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input type="checkbox"/> Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input checked="" type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> Other (describe in discussion section below)	
Who will inspect and certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Brian M. Ardolino, RCE 71651 Pasco Laret Suiter & Associates 535 North Highway 101, Suite A Solana Beach, CA 92075 858-259-8212
Who will be the final owner of this BMP?	DM La Costa Avenue, LLC 1650 N. Coast Highway 101 Encinitas CA 92024
Who will maintain this BMP into perpetuity?	DM La Costa Avenue, LLC 1650 N. Coast Highway 101 Encinitas CA 92024
What is the funding mechanism for maintenance?	DM La Costa Avenue, LLC 1650 N. Coast Highway 101 Encinitas CA 92024

Structural BMP ID No: Drywell System	DMA No: POC-A
Construction Plan Sheet No:	
Type of structural BMP:	
<input type="checkbox"/> Retention by harvest and use (HU-1) <input checked="" type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> Biofiltration with Nutrient Sensitive Media Design (BF-2) <input type="checkbox"/> Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F <input type="checkbox"/> Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) <input type="checkbox"/> Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management <input type="checkbox"/> Other (describe in discussion section below)	
Purpose:	
<input type="checkbox"/> Pollutant control only <input checked="" type="checkbox"/> Hydromodification control only <input type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> Other (describe in discussion section below)	
Who will inspect and certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Brian M. Ardolino, RCE 71651 Pasco Laret Suiter & Associates 535 North Highway 101, Suite A Solana Beach, CA 92075 858-259-8212
Who will be the final owner of this BMP?	DM La Costa Avenue, LLC 1650 N. Coast Highway 101 Encinitas CA 92024
Who will maintain this BMP into perpetuity?	DM La Costa Avenue, LLC 1650 N. Coast Highway 101 Encinitas CA 92024
What is the funding mechanism for maintenance?	DM La Costa Avenue, LLC 1650 N. Coast Highway 101 Encinitas CA 92024

## **ATTACHMENT 1 - BACKUP FOR PDP POLLUTANT CONTROL BMPS**

This is the cover sheet for Attachment 1.

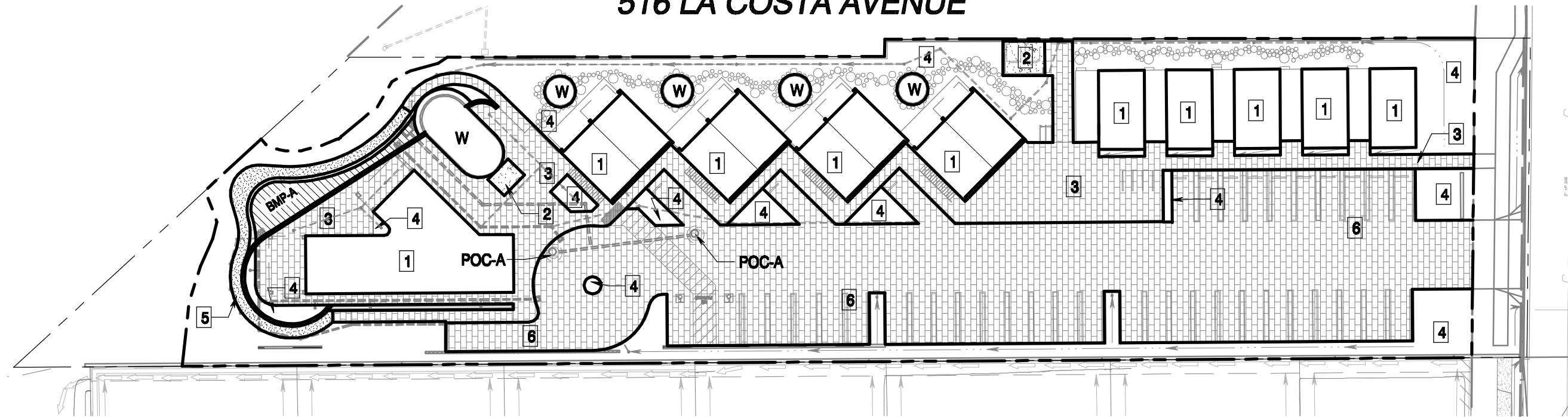
**Indicate which items are included behind this cover sheet:**

<b>Attachment</b>	<b>Contents</b>	<b>Checklist</b>
Attachment 1a	DMA Exhibit (Required)  See DMA Exhibit Checklist on the back of this Attachment cover sheet.	<input checked="" type="checkbox"/> Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)*  *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	<input checked="" type="checkbox"/> Included on DMA Exhibit in Attachment 1a  <input type="checkbox"/> Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs)  Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	<input checked="" type="checkbox"/> Included  <input type="checkbox"/> Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs)  Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	<input checked="" type="checkbox"/> Included  <input type="checkbox"/> Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required)  Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines	<input checked="" type="checkbox"/> Included



**ATTACHMENT 1a/b**

## DMA/HMP EXHBIIT 516 LA COSTA AVENUE



**NOTES:**

1. DEPTH TO GROUNDWATER > 20 FEET.

POTENTIAL POLLUTANT SOURCE	SOURCE CONTROL
ONSITE STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! FLOWS TO OCEAN" OR SIMILAR. MAINTAIN AND PERIODICALLY REPAINT OR REPLACE INLET MARKINGS. PROVIDE STORM WATER POLLUTION PREVENTION INFORMATION TO NEW SITE OWNERS, LESSEES, OR OPERATORS. INCLUDE THE FOLLOWING IN LEASE AGREEMENTS: "TENANT SHALL NOT ALLOW ANYONE TO DISCHARGE ANYTHING TO STORM DDRAINS OR TO STORE OR DEPOSIT MATERIALS SO AS TO CREATE A POTENTIAL DISCHARG TO STORM DRAINS."
LANDSCAPE/OUTDOOR PESTICIDE USE	FINAL LANDSCAPE PLANS SHALL: PRESERVE EXISTING DROUGHT TOLERANT TREES, SHRUBS, AND GROUND COVER TO THE MAXIMUM EXTENT POSSIBLE. BE DESIGNED TO MINIMIZE IRRIGATION AND RUNOFF, PROMOTE SURFACE INFILTRATION WHERE APPROPRIATE, AND MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES. SPECIFY PLANTS THAT ARE TOLERANT OF PERIODIC SATURATED SOIL CONDITIONS FOR AREAS TO RETAIN OR DETAIN STORMWATER. CONSIDER THE USE OF PEST-RESISTANT PLANTS, ESPECIALLY ADJACENT TO HARDSCAPE. SELECT PLANTS APPROPRIATE TO SITE SOILS, SLOPES, CLIMATE, SUN, WIND, RAIN, LAND USE, AIR MOVEMENT, ECOLOGICAL CONSISTENCY, AND PLANT INTERACTIONS. MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES.
PLAZA, SIDEWALKS, AND PARKING LOTS	PLAZAS, SIDEWALKS, AND PARKING LOTS SHALL BE SWEEP REGULARLY TO PREVENT THE ACCUMULATIONS OF LITTER AND DEBRIS. DEBRIS FROM PRESSURE WASHING SHALL BE COLLECTED TO PREVENT ENTRY INTO THE STORM DRAIN SYSTEM. WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER SHALL BE COLLECTED AND DISCHARGED TO THE SANITARY SEWER AND NOT DISCHARGED TO A STORM DRAIN.

### BASIN A WQV SIZING

DMA NAME	DMA AREA	PPST	DMA RF	RF * AREA	SOIL TYPE	IMP NAME
1	7,004	BLDG	1.0	7,004	B	BMP-A
2	262	PCC	1.0	262		
3	7,215	PP	0.1	722		
4	14,498	L	0.1	1450		
5	628	DG	0.1	63		
6	15,449	PP	0.1	1545	IMP SF	MIN PROP AREA AREA
TOTAL					11,045	0.03 332 453 IMP AREA



**SCALE: 1"=40'**

**ATTACHMENT 1c**

<b>Harvest and Use Feasibility Screening</b>	<b>Worksheet B.3-1</b>
--	------------------------

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.

Toilet/Urinal Flushing  
 $(9.3 \text{ gal/person-day}) \times (0.13368 \text{ cuft/gal}) \times (1.5 \text{ days}) = 1.86 \text{ cuft/person-36hr}$   
 Assume (3 people per room x 13 rooms) x (1.86 cuft/person-36 hr) = **73 cf/36hr**

$(7 \text{ gal/person-day}) \times (0.13368 \text{ cuft/gal}) \times (1.5 \text{ days}) = 1.4 \text{ cuft/person-36hr}$   
 Assume (10 employees) x (1.4 cuft/person-36 hr) = **14 cf/36hr**

Landscape Irrigation  
 $(0.34 \text{ ac irrigated}) \times (1470 \text{ gal/ac-36hr}) \times (0.13368 \text{ cuft/gal}) = \mathbf{67 \text{ cf/36hr}}$

**Total = 73 cft + 14 cf + 67 cf = 154 cf**

3. Calculate the DCV using worksheet B-2.1.  
 DCV = 628 cuft

3a. Is the 36-hour demand greater than or equal to the DCV? Yes / <input checked="" type="checkbox"/> No	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV? Yes / <input checked="" type="checkbox"/> No	3c. Is the 36-hour demand less than 0.25DCV? <input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> Harvest and use is considered to be infeasible.
---	---	---

**ATTACHMENT 1d**

Categorization of Infiltration Feasibility Condition		Form I-8	
<p><b>Part 1 - Full Infiltration Feasibility Screening Criteria</b></p> <p><b>Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</b></p>			
Criteria	Screening Question	Yes	No
1	<p><b>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</p>	X	
<p>High infiltration rates are anticipated for the project site.</p>			
2	<p><b>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</p>	X	
<p>Provide basis:</p> <p>High infiltration rates are anticipated for the project site. Drywell infiltration pits are proposed a minimum of 80 LF from existing bluff edge.</p>			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	<p><b>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis:</p> <p>High infiltration rates are anticipated for the project site. Drywell infiltration pits are proposed a minimum of 80 LF from existing bluff edge.</p>			
4	<p><b>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis:</p> <p>High infiltration rates are anticipated for the project site. Drywell infiltration pits are proposed a minimum of 80 LF from existing bluff edge.</p>			
<b>Part 1 Result *</b>	<p>If all answers to rows 1 - 4 are “<b>Yes</b>” a full infiltration design is potentially feasible. The feasibility screening category is <b>Full Infiltration</b></p> <p>If any answer from row 1-4 is “<b>No</b>”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2</p>	Yes	

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

Form I-8 Page 3 of 4

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

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

Criteria	Screening Question	Yes	No
5	<p><b>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</p>		
<p>Provide basis:</p>			
6	<p><b>Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.</p>		
<p>Provide basis:</p>			



Form I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	<p><b>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)?</b>                      The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>		
Provide basis:			
8	<p><b>Can infiltration be allowed without violating downstream water rights?</b> The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>		
Provide basis:			
<b>Part 2 Result*</b>	<p>If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is <b>Partial Infiltration.</b></p> <p>If any answer from row 5-8 is no, then infiltration of any volume is considered to be <b>infeasible</b> within the drainage area. The feasibility screening category is <b>No Infiltration.</b></p>		

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

**ATTACHMENT 1e**

**Appendix B: Stormwater Pollutant Control Hydrologic Calculations and Sizing Methods**

**Worksheet B.2-1. DCV**

**BF-A**

Design Capture Volume		Worksheet B-2.1		
1	85 <sup>th</sup> percentile 24-hr storm depth from Figure B.1-1	d=	0.56	inches
2	Area tributary to BMP (s)	A=	1.03	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1) * See calculation below	C=	0.30	unitless
4	Street trees volume reduction	TCV=	0	cubic-feet
5	Rain barrels volume reduction (1 cubic foot=7.48 gallons)	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	628	cubic-feet

	Area (sq ft)	Runoff Factor	A x RF	Weighted RF
Impervious	7266	0.9	6539	
Pervious Pavers	22664	0.1	2266	
Pervious Landscape	15126	0.3	4538	
Total	45056		13344	

**DRAFT**

Maxwell® IV Drainage System Calculations Prepared on December 17, 2019

Project: **La Costa Hotel-DCV - Encinitas**

Contact: Tara Goldberg at PLSA Engineering - Solana Beach, CA



**Given:**

Measured Infiltration Rate	<u>9.50</u> in/hr
Safety Factor	<u>3.00</u>
Design Infiltration Rate	<u>3.17</u> in/hr
Mitigated Volume	<u>629</u> ft <sup>3</sup>
Required Drawdown Time	<u>36</u> hours
Min. Depth to Infiltration	<u>10</u> ft
Groundwater Depth for Design	<u>62</u> ft

**Proposed:**

Drywell Rock Shaft Diameter	<u>6</u> ft
Drywell Chamber Depth	<u>15</u> ft
Rock Porosity	<u>40</u> %
Depth to Infiltration	<u>11</u> ft
Drywell Bottom Depth	<u>50</u> ft

**Apply Safety Factor to get Design Rate.**

$$9.50 \frac{\text{in}}{\text{hr}} \div 3 = 3.17 \frac{\text{in}}{\text{hr}}$$

**Convert Design Rate from in/hr to ft/sec.**

$$3.17 \frac{\text{in}}{\text{hr}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ hr}}{3600 \text{ sec}} = 0.000073 \frac{\text{ft}}{\text{sec}}$$

**A 6 foot diameter drywell provides 18.85 SF of infiltration area per foot of depth, plus 28.27 SF at the bottom.**

**For a 50 foot deep drywell, infiltration occurs between 11 feet and 50 feet below grade. This provides 39 feet of infiltration depth in addition to the bottom area. Infiltration area per drywell is calculated below.**

$$39 \text{ ft} \times 18.85 \frac{\text{ft}^2}{\text{ft}} + 28.27 \text{ ft}^2 = 763 \text{ ft}^2$$

**Combine design rate with infiltration area to get flow (disposal) rate for each drywell.**

$$0.000073 \frac{\text{ft}}{\text{sec}} \times 763 \text{ ft}^2 = 0.05596 \frac{\text{ft}^3}{\text{sec}}$$

**Volume of disposal for each drywell based on various time frames are included below.**

$$36 \text{ hrs: } 0.056 \text{ CFS} \times 36 \text{ hours} \times \frac{3600 \text{ sec}}{1 \text{ hr}} = 7,252 \text{ cubic feet of retained water disposed of.}$$

**Chamber diameter = 4 feet. Drywell rock shaft diameter = 6 feet.**

**Volume provided in each drywell with chamber depth of 15 feet.**

$$15 \text{ ft} \times 12.57 \text{ ft}^2 + 35 \text{ ft} \times 28.27 \text{ ft}^2 \times 40 \% = 584 \text{ ft}^3$$

**The MaxWell System is composed of 2 drywell(s) .**

$$\text{Total volume provided} = 1,169 \text{ ft}^3$$

$$\text{Total 36 hour infiltration volume} = 14,505 \text{ ft}^3$$

$$\text{Total infiltration flowrate} = 0.11192 \frac{\text{ft}^3}{\text{sec}}$$

**The volume stored in the MaxWell System exceeds the total mitigated volume of 629 CF.**

**For any questions, please contact Jason Dupre at 626-250-4724 or via email at JDupre@TorrentResources.com**

## **ATTACHMENT 2 - BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES**

This is the cover sheet for Attachment 2.

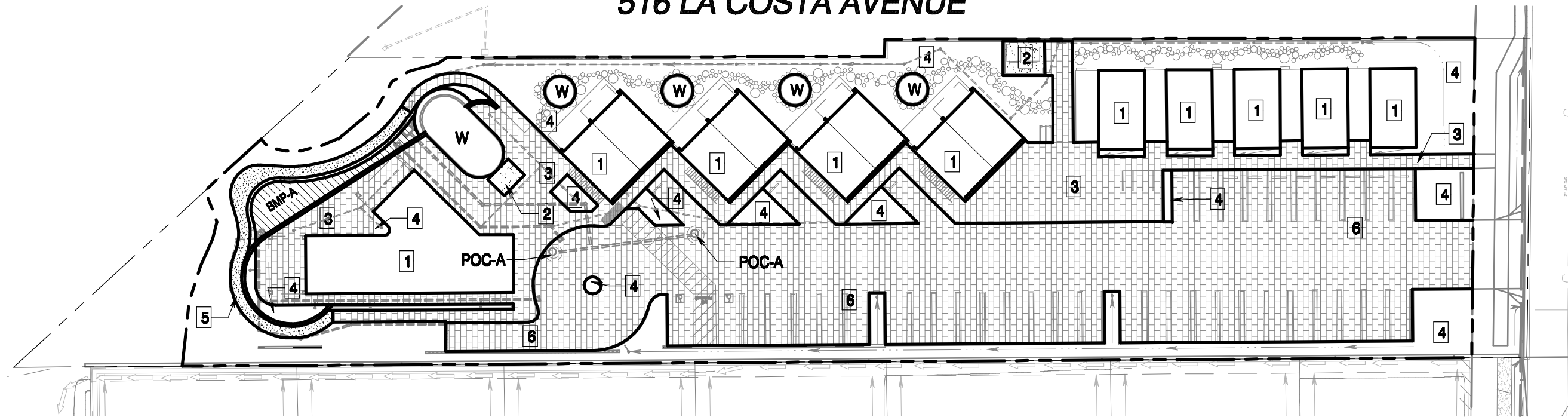
Mark this box if this attachment is not included because the project is exempt from PDP hydromodification management requirements.

**Indicate which items are included behind this cover sheet:**

<b>Attachment</b>	<b>Contents</b>	<b>Checklist</b>
Attachment 2a	Hydromodification Management Exhibit (Required)	<input checked="" type="checkbox"/> Included  See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional)  See Section 6.2 of the BMP Design Manual.	<input checked="" type="checkbox"/> Exhibit showing project drainage boundaries marked on City of Encinitas Potential Critical Coarse Sediment Yield Area Map (Required)  Optional analyses for Critical Coarse Sediment Yield Area Determination <ul style="list-style-type: none"> <li><input type="checkbox"/> 6.2.1 Verification of Geomorphic Landscape Units Onsite</li> <li><input type="checkbox"/> 6.2.2 Downstream Systems Sensitivity to Coarse Sediment</li> <li><input type="checkbox"/> 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite</li> </ul>
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	<input checked="" type="checkbox"/> Not performed <input type="checkbox"/> Included <input type="checkbox"/> Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	<input type="checkbox"/> Submitted as separate stand-alone document  <input checked="" type="checkbox"/> Included for BMP A
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	<input type="checkbox"/> Included  <input checked="" type="checkbox"/> Not required because BMPs will drain in less than 96 hours

**ATTACHMENT 2a**

## DMA/HMP EXHBIIT 516 LA COSTA AVENUE



**NOTES:**

1. DEPTH TO GROUNDWATER > 20 FEET.

POTENTIAL POLLUTANT SOURCE	SOURCE CONTROL
ONSITE STORM DRAIN INLETS	MARK ALL INLETS WITH THE WORDS "NO DUMPING! FLOWS TO OCEAN" OR SIMILAR. MAINTAIN AND PERIODICALLY REPAINT OR REPLACE INLET MARKINGS. PROVIDE STORM WATER POLLUTION PREVENTION INFORMATION TO NEW SITE OWNERS, LESSEES, OR OPERATORS. INCLUDE THE FOLLOWING IN LEASE AGREEMENTS: "TENANT SHALL NOT ALLOW ANYONE TO DISCHARGE ANYTHING TO STORM DRAIN OR TO STORE OR DEPOSIT MATERIALS SO AS TO CREATE A POTENTIAL DISCHARGE TO STORM DRAINS."
LANDSCAPE/OUTDOOR PESTICIDE USE	FINAL LANDSCAPE PLANS SHALL: PRESERVE EXISTING DROUGHT TOLERANT TREES, SHRUBS, AND GROUND COVER TO THE MAXIMUM EXTENT POSSIBLE. BE DESIGNED TO MINIMIZE IRRIGATION AND RUNOFF, PROMOTE SURFACE INFILTRATION WHERE APPROPRIATE, AND MINIMIZE THE USE OF FERTILIZERS AND PESTICIDES. SPECIFY PLANTS THAT ARE TOLERANT OF PERIODIC SATURATED SOIL CONDITIONS FOR AREAS TO RETAIN OR DETAIN STORMWATER. CONSIDER THE USE OF PEST-RESISTANT PLANTS, ESPECIALLY ADJACENT TO HARDSCAPE. SELECT PLANTS APPROPRIATE TO SITE SOILS, SLOPES, CLIMATE, SUN, WIND, RAIN, LAND USE, AIR MOVEMENT, ECOLOGICAL CONSISTENCY, AND PLANT INTERACTIONS. MAINTAIN LANDSCAPING USING MINIMUM OR NO PESTICIDES.
PLAZA, SIDEWALKS, AND PARKING LOTS	PLAZAS, SIDEWALKS, AND PARKING LOTS SHALL BE SWEEPED REGULARLY TO PREVENT THE ACCUMULATIONS OF LITTER AND DEBRIS. DEBRIS FROM PRESSURE WASHING SHALL BE COLLECTED TO PREVENT ENTRY INTO THE STORM DRAIN SYSTEM. WASHWATER CONTAINING ANY CLEANING AGENT OR DEGREASER SHALL BE COLLECTED AND DISCHARGED TO THE SANITARY SEWER AND NOT DISCHARGED TO A STORM DRAIN.

### BASIN A WQV SIZING

DMA NAME	DMA AREA	PPST	DMA RF	RF * AREA	SOIL TYPE	IMP NAME			
1	7,004	BLDG	1.0	7,004	B	BMP-A			
2	262	PCC	1.0	262					
3	7,215	PP	0.1	722					
4	14,498	L	0.1	1450					
5	628	DG	0.1	63					
6	15,449	PP	0.1	1545	IMP SF	MIN PROP AREA AREA			
TOTAL					11,045	0.03	332	453	IMP AREA



**ATTACHMENT 2b**



# CCSY



August 13, 2018

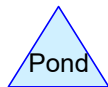
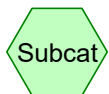
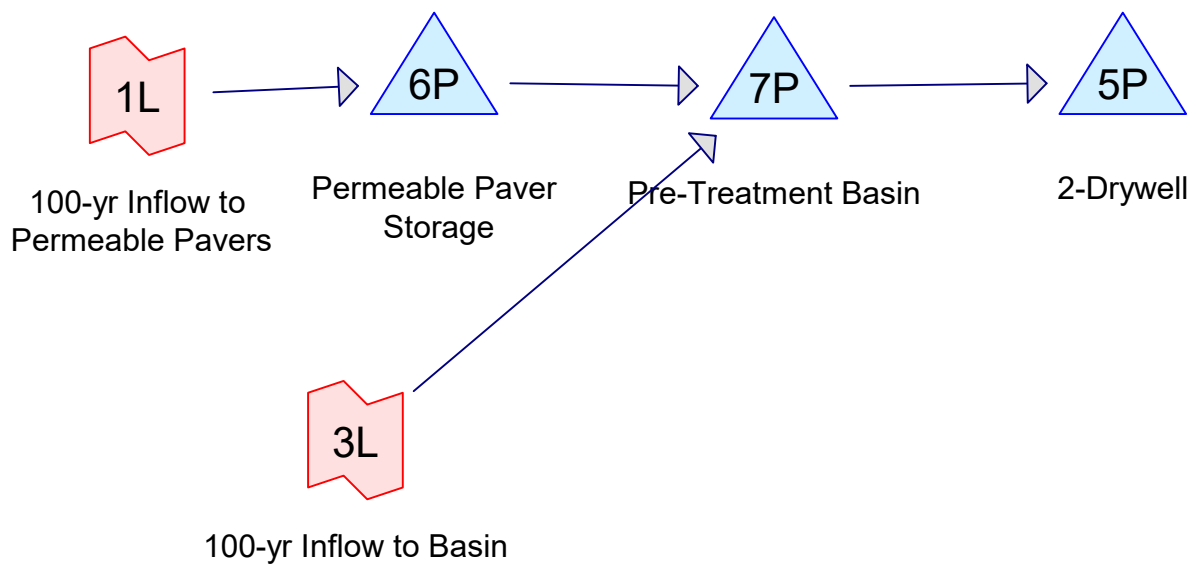


1 inch = 528 feet

0 290 580  
Feet

Every reasonable effort has been made to assure the accuracy of the data provided; nevertheless, some information may not be accurate. The City of Encinitas assumes no liability or responsibility arising from the use of or reliance upon this information.

**ATTACHMENT 2d**



**Routing Diagram for 2882**

Prepared by Pasco Laret Suiter & Associates, Printed 12/17/2019  
 HydroCAD® 10.00-24 s/n 10097 © 2018 HydroCAD Software Solutions LLC

### Summary for Link 1L: 100-yr Inflow to Permeable Pavers

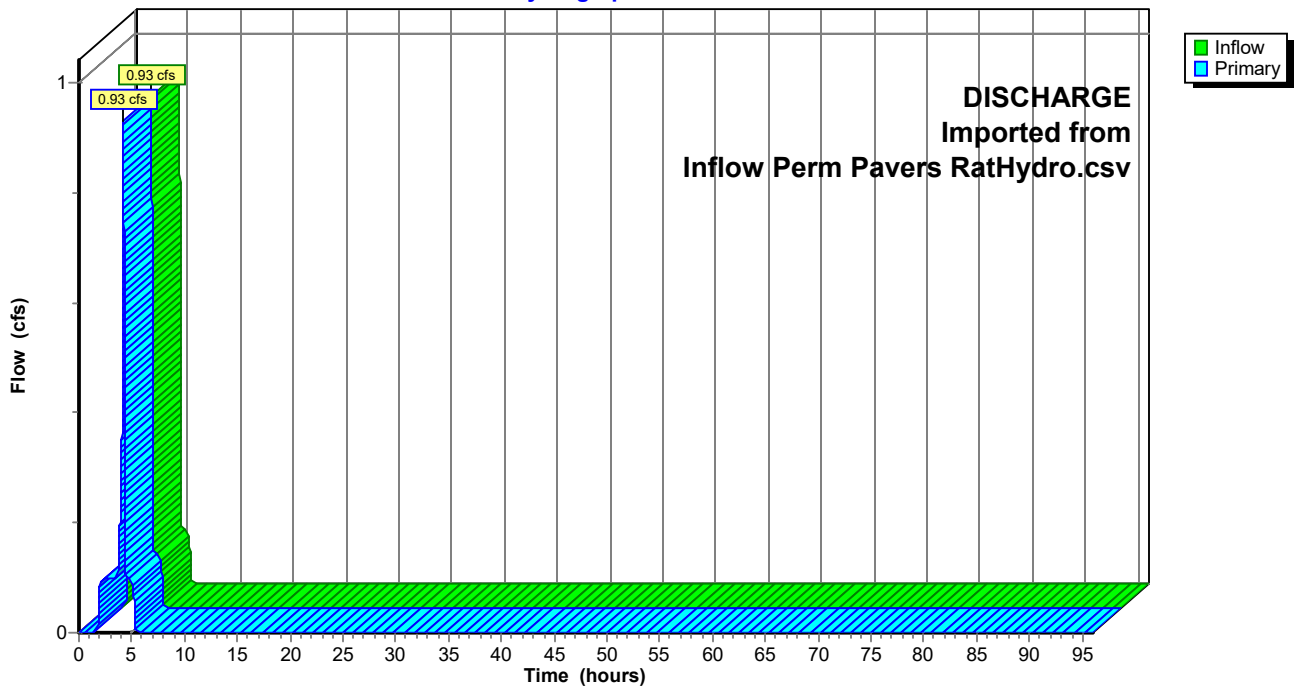
Inflow = 0.93 cfs @ 4.22 hrs, Volume= 0.043 af  
Primary = 0.93 cfs @ 4.22 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.001 hrs

DISCHARGE Imported from Inflow Perm Pavers RatHydro.csv

### Link 1L: 100-yr Inflow to Permeable Pavers

Hydrograph



**Summary for Pond 6P: Permeable Paver Storage**

Inflow = 0.93 cfs @ 4.22 hrs, Volume= 0.043 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

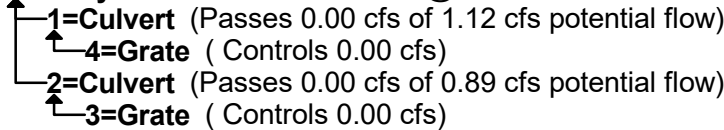
Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.001 hrs  
 Peak Elev= 66.62' @ 5.32 hrs Surf.Area= 0.171 ac Storage= 0.043 af

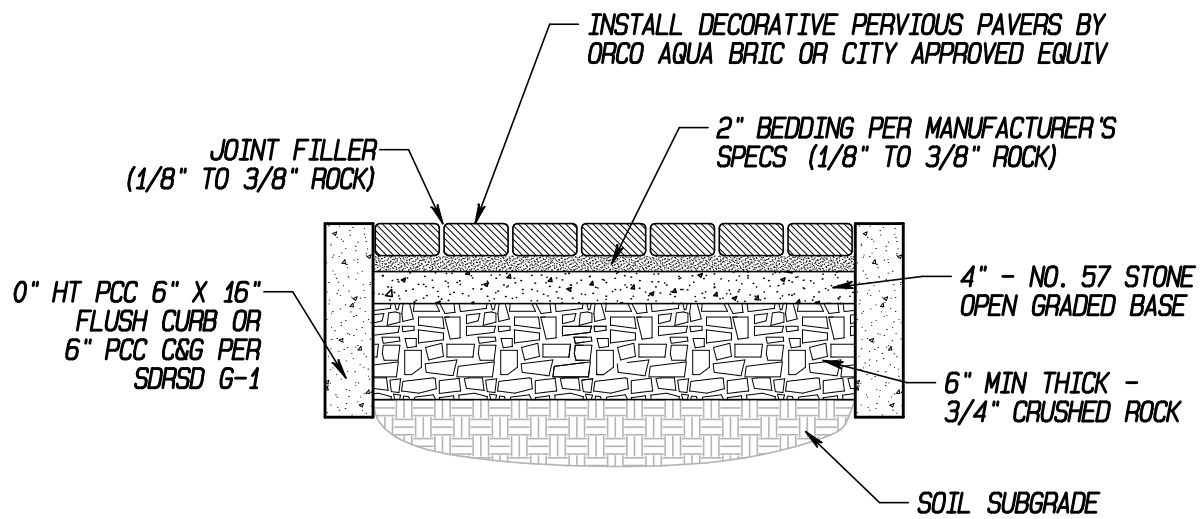
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)  
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	65.84'	0.068 af	<b>288.0" W x 12.0" H Box Permeable Paver Storage</b> L= 310.0' S= 0.0010 '/ 0.171 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	64.40'	<b>6.0" Round Culvert</b> L= 68.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 64.40' / 62.00' S= 0.0353 '/ Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Primary	64.80'	<b>6.0" Round Culvert</b> L= 117.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 64.80' / 62.00' S= 0.0239 '/ Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#3	Device 2	66.84'	<b>12.0" x 12.0" Horiz. Grate X 0.50</b> C= 0.600 in 12.0" x 12.0" Grate (50% open area) Limited to weir flow at low heads
#4	Device 1	66.84'	<b>12.0" x 12.0" Horiz. Grate X 0.50</b> C= 0.600 in 12.0" x 12.0" Grate (50% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=65.84' TW=59.00' (Dynamic Tailwater)



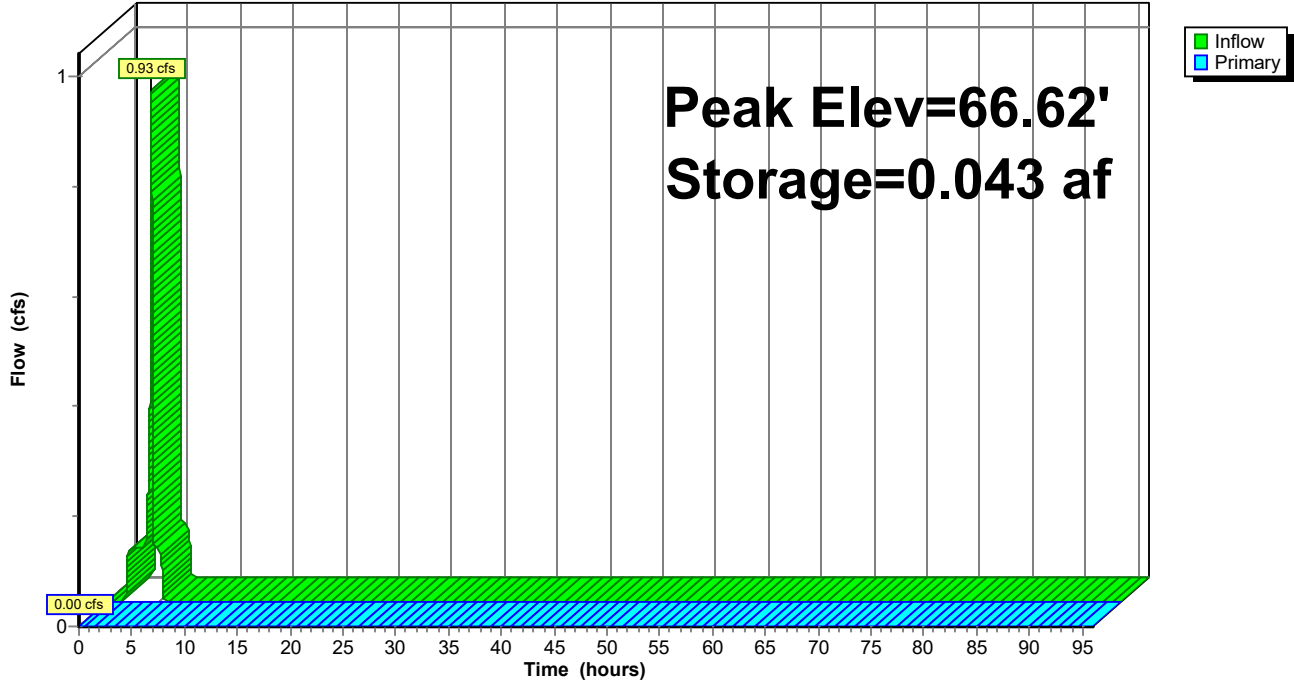


**PERVIOUS PAVER DETAIL**

NTS

### Pond 6P: Permeable Paver Storage

Hydrograph



### Summary for Link 3L: 100-yr Inflow to Basin

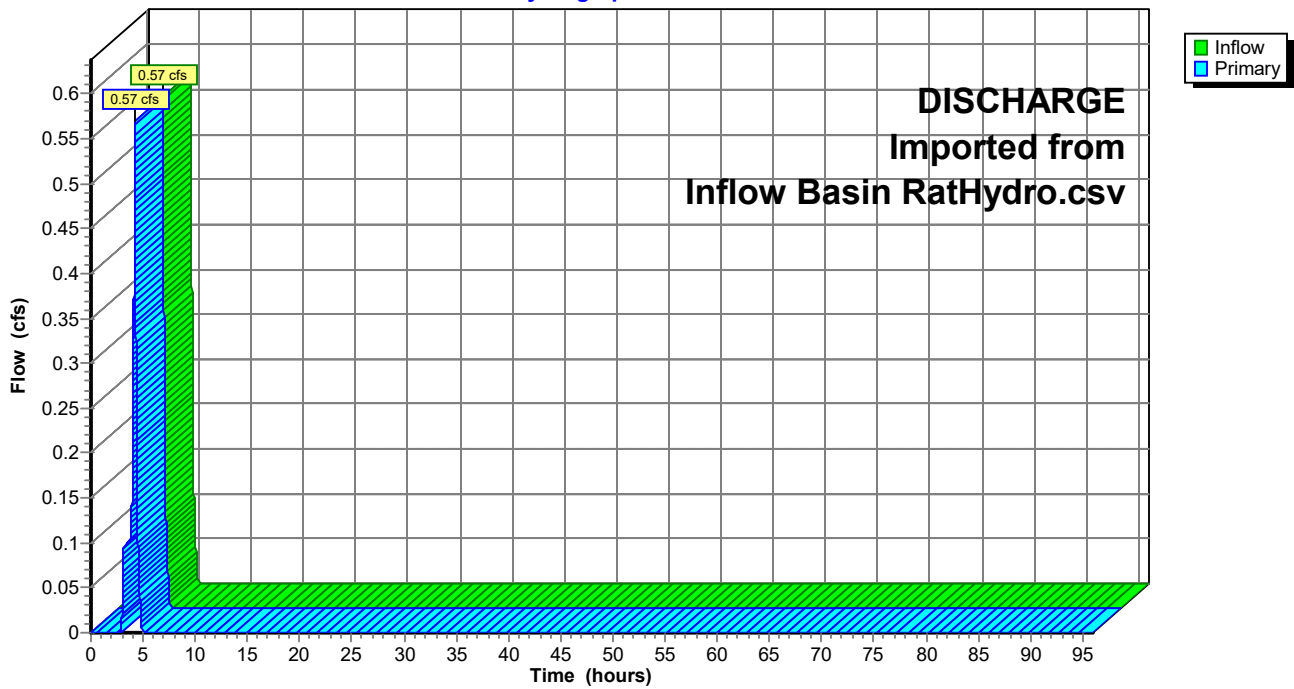
Inflow = 0.57 cfs @ 4.22 hrs, Volume= 0.022 af  
Primary = 0.57 cfs @ 4.22 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.001 hrs

DISCHARGE Imported from Inflow Basin RatHydro.csv

### Link 3L: 100-yr Inflow to Basin

Hydrograph





**Summary for Pond 7P: Pre-Treatment Basin**

Inflow = 0.57 cfs @ 4.22 hrs, Volume= 0.022 af  
 Outflow = 0.11 cfs @ 4.40 hrs, Volume= 0.022 af, Atten= 81%, Lag= 10.8 min  
 Primary = 0.11 cfs @ 4.40 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.001 hrs  
 Peak Elev= 62.40' @ 4.40 hrs Surf.Area= 453 sf Storage= 590 cf

Plug-Flow detention time= 64.3 min calculated for 0.022 af (100% of inflow)  
 Center-of-Mass det. time= 64.3 min ( 303.1 - 238.8 )

Volume	Invert	Avail.Storage	Storage Description			
#1	59.00'	725 cf	<b>Custom Stage Data (Conic) Listed below (Recalc)</b>			
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
59.00	453	0.0	0	0	453	
60.50	453	40.0	272	272	566	
62.00	453	20.0	136	408	679	
62.50	453	100.0	227	634	717	
62.70	453	100.0	91	725	732	

Device	Routing	Invert	Outlet Devices
#1	Primary	59.00'	<b>8.0" Round Culvert</b> L= 95.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 59.00' / 57.30' S= 0.0179 ' / Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Device 1	59.00'	<b>1.5" Vert. Orifice</b> C= 0.600
#3	Device 1	62.50'	<b>36.0" x 36.0" Horiz. Grate X 0.50</b> C= 0.600 in 36.0" x 36.0" Grate (50% open area) Limited to weir flow at low heads

**Primary OutFlow** Max=0.11 cfs @ 4.40 hrs HW=62.40' TW=19.00' (Dynamic Tailwater)

- ↑ 1=Culvert (Passes 0.11 cfs of 2.35 cfs potential flow)
- ↑ 2=Orifice (Orifice Controls 0.11 cfs @ 8.80 fps)
- ↑ 3=Grate ( Controls 0.00 cfs)

# PASCO LARET SUITER

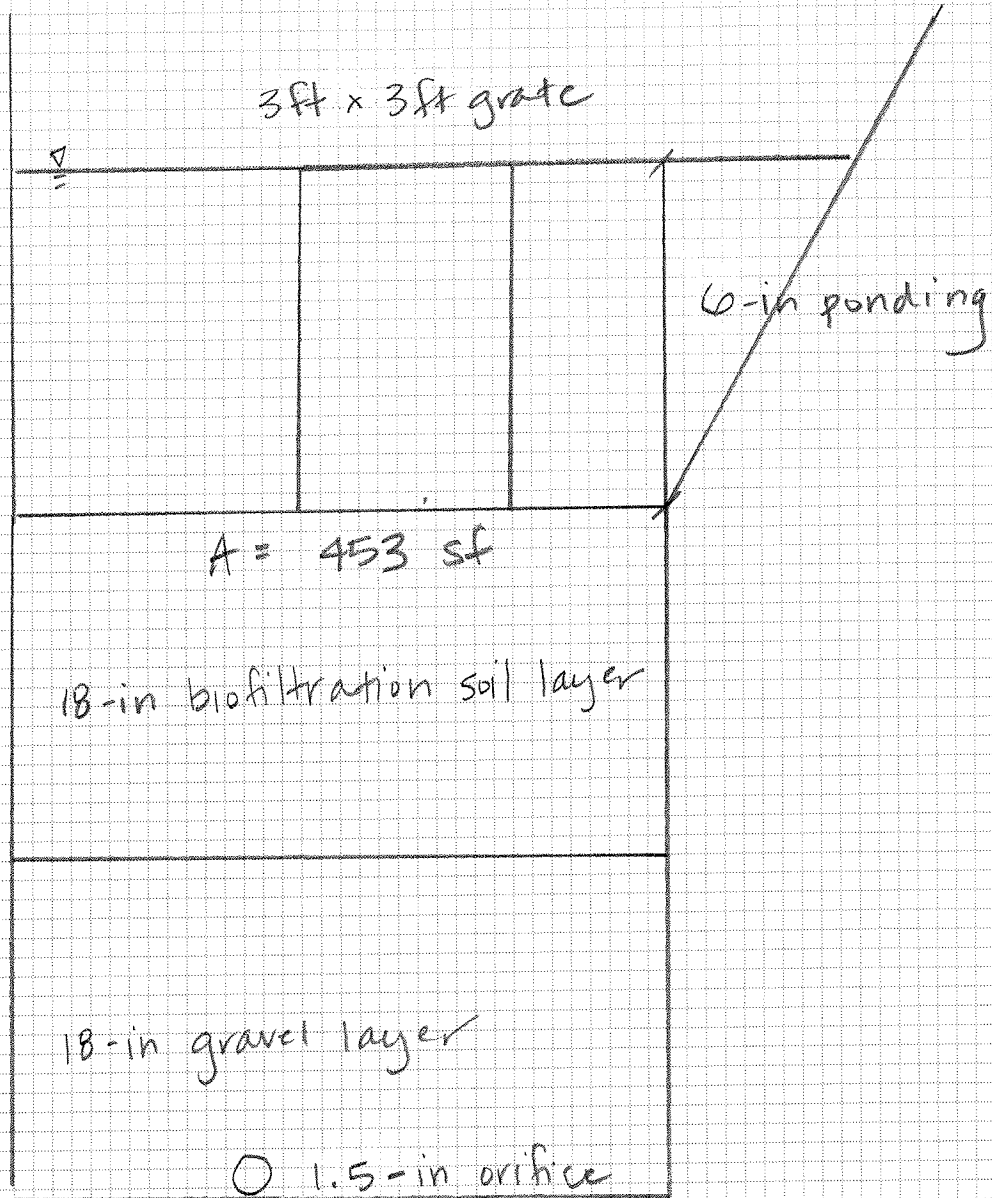
& ASSOCIATES

La Costa

Date 12/16/19

Job# 2882

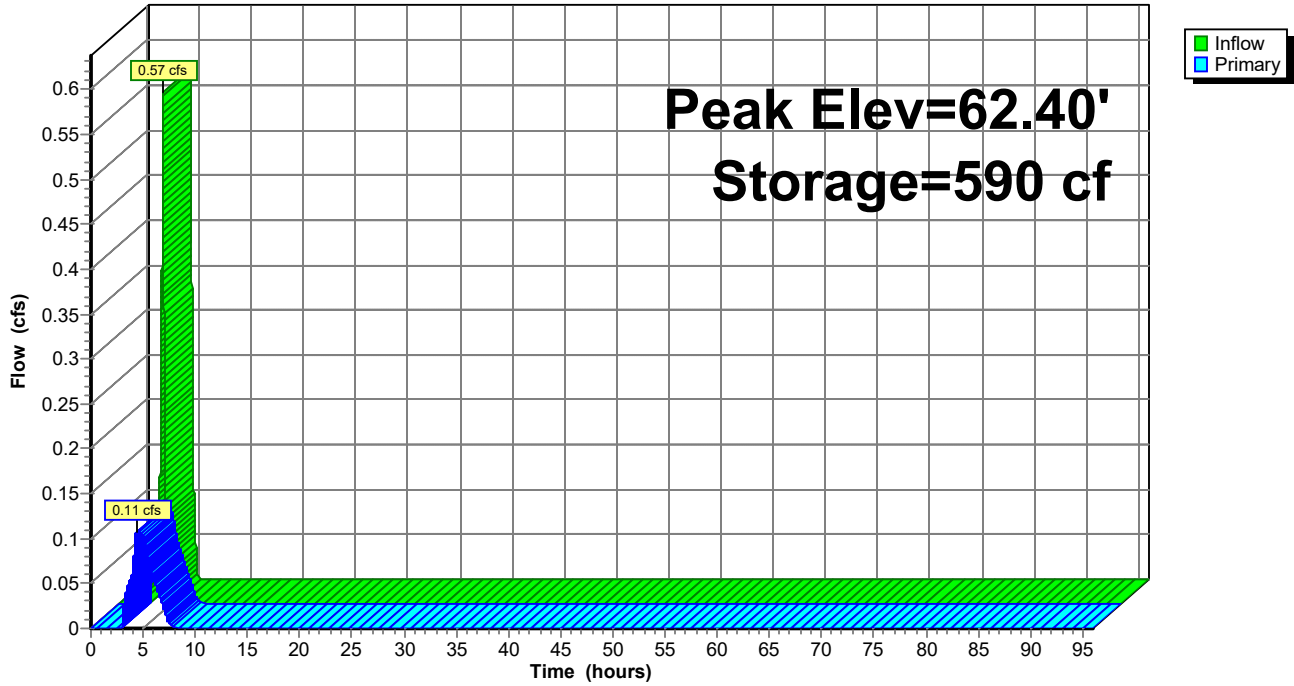
## HMP Biofiltration Basin BMP-A



Not to scale

### Pond 7P: Pre-Treatment Basin

Hydrograph



**Summary for Pond 5P: 2-Drywell**

Inflow = 0.11 cfs @ 4.40 hrs, Volume= 0.022 af  
 Outflow = 0.11 cfs @ 4.40 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min  
 Discarded = 0.11 cfs @ 4.40 hrs, Volume= 0.022 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.001 hrs  
 Peak Elev= 19.00' @ 4.40 hrs Surf.Area= 0.001 ac Storage= 0.000 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= 0.0 min ( 303.1 - 303.1 )

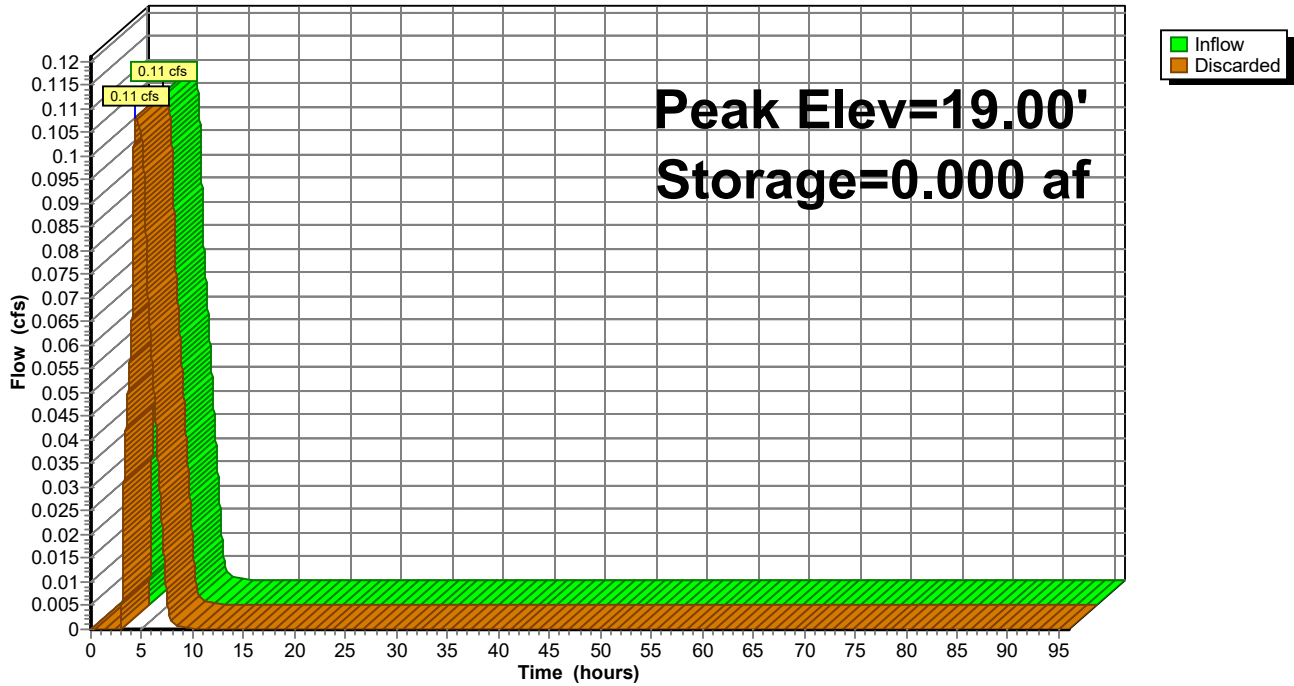
Volume	Invert	Avail.Storage	Storage Description
#1	19.00'	0.027 af	<b>6.00'D x 39.00'H Drywell</b> x 2 0.051 af Overall x 53.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Discarded	19.00'	<b>0.06 cfs Exfiltration X 2.00</b> when above 19.00'

**Discarded OutFlow** Max=0.11 cfs @ 4.40 hrs HW=19.00' (Free Discharge)  
 ↳1=Exfiltration (Exfiltration Controls 0.11 cfs)

**Pond 5P: 2-Drywell**

Hydrograph



**DRAFT**

Maxwell® IV Drainage System Calculations Prepared on December 10, 2019

Project: **La Costa Hotel-100YR - Encinitas**

Contact: Tara Goldberg at PLSA Engineering - Solana Beach, CA



**Given:**

Measured Infiltration Rate	9.50 in/hr
Safety Factor	3.00
Design Infiltration Rate	3.17 in/hr
Mitigated Volume	3,570 ft <sup>3</sup>
Required Drawdown Time	96 hours
Min. Depth to Infiltration	10 ft
Groundwater Depth for Design	62 ft

**Proposed:**

Drywell Rock Shaft Diameter	6 ft
Drywell Chamber Depth	15 ft
Rock Porosity	40 %
Depth to Infiltration	11 ft
Drywell Bottom Depth	50 ft

**Apply Safety Factor to get Design Rate.**

$$9.50 \frac{\text{in}}{\text{hr}} \div 3 = 3.17 \frac{\text{in}}{\text{hr}}$$

**Convert Design Rate from in/hr to ft/sec.**

$$3.17 \frac{\text{in}}{\text{hr}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ hr}}{3600 \text{ sec}} = 0.000073 \frac{\text{ft}}{\text{sec}}$$

**A 6 foot diameter drywell provides 18.85 SF of infiltration area per foot of depth, plus 28.27 SF at the bottom.**

**For a 50 foot deep drywell, infiltration occurs between 11 feet and 50 feet below grade. This provides 39 feet of infiltration depth in addition to the bottom area. Infiltration area per drywell is calculated below.**

$$39 \text{ ft} \times 18.85 \frac{\text{ft}^2}{\text{ft}} + 28.27 \text{ ft}^2 = 763 \text{ ft}^2$$

**Combine design rate with infiltration area to get flow (disposal) rate for each drywell.**

$$0.000073 \frac{\text{ft}}{\text{sec}} \times 763 \text{ ft}^2 = 0.05596 \frac{\text{ft}^3}{\text{sec}}$$

**Volume of disposal for each drywell based on various time frames are included below.**

$$96 \text{ hrs: } 0.056 \text{ CFS} \times 96 \text{ hours} \times \frac{3600 \text{ sec}}{1 \text{ hr}} = 19,340 \text{ cubic feet of retained water disposed of.}$$

**Chamber diameter = 4 feet. Drywell rock shaft diameter = 6 feet.**

**Volume provided in each drywell with chamber depth of 15 feet.**

$$15 \text{ ft} \times 12.57 \text{ ft}^2 + 35 \text{ ft} \times 28.27 \text{ ft}^2 \times 40 \% = 584 \text{ ft}^3$$

**The MaxWell System is composed of 2 drywell(s) .**

$$\text{Total volume provided} = 1,169 \text{ ft}^3$$

$$\text{Total 96 hour infiltration volume} = 38,679 \text{ ft}^3$$

$$\text{Total infiltration flowrate} = 0.11192 \frac{\text{ft}^3}{\text{sec}}$$

**Based on the total mitigated volume of 3570 CF, after subtracting the volume stored in the MaxWell System, the residual volume of 2401 CF could be stored in a separate detention system and connected to the drywell system.**

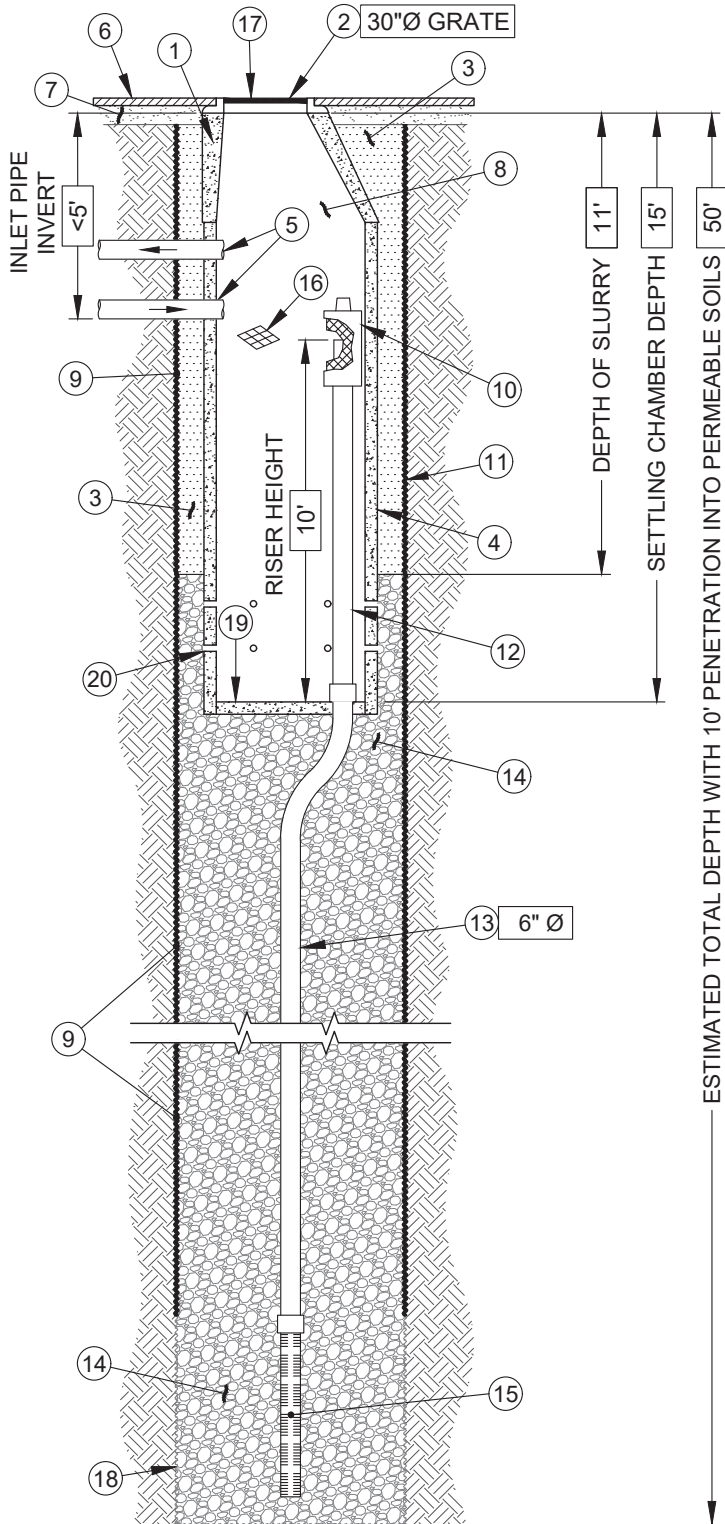
**For any questions, please contact Jason Dupre at 626-250-4724 or via email at JDupre@TorrentResources.com**

# The MaxWell® IV

DRAINAGE SYSTEM DETAILS AND SPECIFICATIONS

La Costa Hotel

Encinitas, CA



## ITEM NUMBERS

1. **MANHOLE CONE** - MODIFIED FLAT BOTTOM.
2. **BOLTED RING & GRATE/COVER** - DIAMETER & TYPE AS SHOWN. CLEAN CAST IRON WITH WORDING "STORM WATER ONLY" IN RAISED LETTERS. **BOLTED IN 2 LOCATIONS** AND SECURED TO CONE WITH MORTAR. RIM ELEVATION  $\pm 0.02'$  OF PLANS.
3. **STABILIZED BACKFILL** - TWO-SACK SLURRY MIX.
4. **PRE-CAST LINER** - 4000 PSI CONCRETE 48" ID. X 54" OD. **CENTER IN HOLE** AND ALIGN SECTIONS TO **MAXIMIZE BEARING SURFACE**.
5. **INLET PIPE/OUTLET PIPE (BY OTHERS)**. SEE SEPARATE PLAN FOR INVERT ELEVATIONS.
6. **GRADED BASIN OR PAVING (BY OTHERS)**.
7. **COMPACTED BASE MATERIAL**, IF REQUIRED (BY OTHERS).
8. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE SETTLING CHAMBER DEPTH AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE RISER PIPE.
9. **NON-WOVEN GEOTEXTILE SLEEVE** - MIRAFI 140 NL. MIN. 6 FT  $\phi$ . HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
10. **PUREFLO® DEBRIS SHIELD** - ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL 0.265" MAX. SWO FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. **FUSION BONDED EPOXY COATED**.
11. **MIN. 6'  $\phi$  DRILLED SHAFT**.
12. **RISER PIPE** - SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
13. **DRAINAGE PIPE** - ADS HIGHWAY GRADE OR SCH. 40 PVC WITH TRI-A COUPLER. SUSPEND PIPE DURING BACKFILL OPERATIONS. DIAMETER AS NOTED.
14. **ROCK** - WASHED, SIZED BETWEEN 3/8" AND 1-1/2".
15. **FLOFAST® DRAINAGE SCREEN** - SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH 32 SLOTS PER ROW/FT. OVERALL LENGTH VARIES, UP TO 120" WITH TRI-B COUPLER.
16. **ABSORBENT** - HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL, 2 PER CHAMBER.
17. **FABRIC SEAL** - U.V. RESISTANT GEOTEXTILE - **TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION. GRATED ONLY.
18. **MIN. 6'  $\phi$  DRILLED SHAFT**.
19. **BASE SEAL** - CONCRETE SLURRY.
20. **6 PERFORATIONS MINIMUM PER FOOT, 2 ROWS MINIMUM**.

AZ Lic. ROC070465 A, ROC047067 B-4, ADWR 363  
 CA Lic. 886759, C-42, C-57, HAZ.  
 Also licensed in the following states: MT, NM, NV, OR, TX, UT, and WA.  
 U.S. Patent No. 4,923,330 - TM Trademark 1974, 1990, 2004

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DETAIL: IV-6-SS-CA	REVISED BY: JMD	
DRAWN ON: 05-14-19	REVISED DATE: 12-17-19	SCALE: N.T.S

## **ATTACHMENT 3 - STRUCTURAL BMP MAINTENANCE INFORMATION**

This is the cover sheet for Attachment 3.

**Indicate which items are included behind this cover sheet:**

<b>Attachment</b>	<b>Contents</b>	<b>Checklist</b>
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	<input checked="" type="checkbox"/> Included  See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Maintenance Agreement (when applicable)	<input type="checkbox"/> Included <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> To be provided at final design

**ATTACHMENT 3a**



# BF-1

## Biofiltration

### BMP MAINTENANCE FACT SHEET FOR STRUCTURAL BMP BF-1 BIOFILTRATION

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

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

#### Normal Expected Maintenance

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

#### Non-Standard Maintenance or BMP Failure

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

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

# BF-1

## Biofiltration

### Other Special Considerations

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

# BF-1 Biofiltration

## SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR BF-1 BIOFILTRATION

The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.

Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.

Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Accumulation of sediment, litter, or debris	Remove and properly dispose of accumulated materials, without damage to the vegetation or compaction of the media layer.	<ul style="list-style-type: none"> <li>• Inspect monthly. If the BMP is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event.</li> <li>• Remove any accumulated materials found at each inspection.</li> </ul>
Obstructed inlet or outlet structure	Clear blockage.	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event.</li> <li>• Remove any accumulated materials found at each inspection.</li> </ul>
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable	<ul style="list-style-type: none"> <li>• Inspect annually.</li> <li>• Maintenance when needed.</li> </ul>
Poor vegetation establishment	Re-seed, re-plant, or re-establish vegetation per original plans.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
Dead or diseased vegetation	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
Overgrown vegetation	Mow or trim as appropriate.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
2/3 of mulch has decomposed, or mulch has been removed	Remove decomposed fraction and top off with fresh mulch to a total depth of 3 inches.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Replenish mulch annually, or more frequently when needed based on inspection.</li> </ul>

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

# BF-1

## Biofiltration

<b>SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR BF-1 BIOFILTRATION (Continued from previous page)</b>		
<b>Threshold/Indicator</b>	<b>Maintenance Action</b>	<b>Typical Maintenance Frequency</b>
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.	<ul style="list-style-type: none"> <li>• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.</li> </ul>
<p>Standing water in BMP for longer than 24 hours following a storm event</p> <p>Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health</p>	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains, or repairing/replacing clogged or compacted soils.	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed.</li> </ul>
<p>Presence of mosquitos/larvae</p> <p>For images of egg rafts, larva, pupa, and adult mosquitos, see <a href="http://www.mosquito.org/biology">http://www.mosquito.org/biology</a></p>	<p>If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water.</p> <p>If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria due to release rates controlled by an orifice installed on the underdrain, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.</p>	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed.</li> </ul>
Underdrain clogged	Clear blockage.	<ul style="list-style-type: none"> <li>• Inspect if standing water is observed for longer than 24-96 hours following a storm event.</li> <li>• Maintenance when needed.</li> </ul>

# BF-1

## Biofiltration

### References

American Mosquito Control Association.

<http://www.mosquito.org/>

California Storm Water Quality Association (CASQA). 2003. Municipal BMP Handbook.

<https://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook>

County of San Diego. 2014. Low Impact Development Handbook.

<http://www.sandiegocounty.gov/content/sdc/dpw/watersheds/susmp/lid.html>

San Diego County Copermittees. 2016. Model BMP Design Manual, Appendix E, Fact Sheet BF-1.

[http://www.projectcleanwater.org/index.php?option=com\\_content&view=article&id=250&Itemid=220](http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=250&Itemid=220)

# **BF-1**

## **Biofiltration**

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# BF-1 Biofiltration

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

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

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

# BF-1 Biofiltration

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

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



# BF-1 Biofiltration

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

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

# BF-1 Biofiltration

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

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

# BF-1 Biofiltration

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

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

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

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

## Permeable Pavement as Site Design BMP

### BMP MAINTENANCE FACT SHEET

#### FOR

#### SITE DESIGN BMP SD-6B PERMEABLE PAVEMENT AS SITE DESIGN BMP

**Permeable pavement** is pavement that allows for percolation through void spaces in the pavement surface into subsurface layers. When used as a site design BMP, the subsurface layers are designed to provide storage of storm water runoff so that outflow rates can be controlled via infiltration into subgrade soils. As a site design BMP, permeable pavement areas are designed to be self-retaining and are designed primarily for direct rainfall. Self-retaining permeable pavement areas have a ratio of total drainage area (including permeable pavement) to area of permeable pavement of 1.5:1 or less. Permeable pavement as structural BMP usually receives runoff from a larger tributary area than permeable pavement as site design BMP (see INF-3 for permeable pavement as structural BMP). Permeable pavement surfaces can be constructed from modular paver units or paver blocks, pervious concrete, porous asphalt, and turf pavers. Typical components include:

- Permeable surface layer
- Bedding layer for permeable surface
- Aggregate storage layer with optional underdrain(s)
- Optional final filter course layer over uncompacted existing subgrade
- Optional subsurface check dams at regular intervals when pavement is sloped (more closely spaced on steeper slopes)

#### Normal Expected Maintenance

Routine maintenance of permeable pavement includes: removal of materials such as trash and debris accumulated on the paving surface; vacuuming of the paving surface to prevent clogging; and flushing paving and subsurface gravel to remove fine sediment. If the BMP includes underdrains, check and clear underdrains. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

#### Non-Standard Maintenance or BMP Failure

If the permeable pavement area is not drained between storm events, or if runoff sheet flows across the permeable pavement area and flows off the permeable pavement area during storm events, the BMP is not performing as intended to protect downstream waterways from pollution and/or erosion. During storm events up to the 85<sup>th</sup> percentile storm event (approximately 0.5 to 1 inch of rainfall in San Diego County), runoff should not flow off the permeable pavement area. The permeable pavement area is expected to have adequate hydraulic conductivity and storage such that rainfall landing on the permeable pavement and runoff from the surrounding drainage area will go directly into the pavement without ponding or overflow (in properly designed systems, the surrounding drainage area is not more than half as large as the permeable pavement area). Following the storm event, there should be no standing water (puddles) on the permeable pavement area.

If storm water is flowing off the permeable pavement during a storm event, or if there is standing water on the permeable pavement surface following a storm event, this is an indicator of clogging somewhere within the system. Poor drainage can result from clogging of the permeable surface layer, any of the subsurface components, or the subgrade soils. The specific cause of the drainage issue must be determined and corrected. Surface or subsurface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Corrective maintenance, increased inspection and maintenance, BMP replacement, or a different BMP type will be required. If poor drainage persists after flushing of the paving, subsurface gravel, and/or underdrain(s) when applicable, or if it is determined that the underlying soils do not have the infiltration capacity expected, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

## Permeable Pavement as Site Design BMP

### Other Special Considerations

Site design BMPs, such as permeable pavement, installed within a new development or redevelopment project are components of an overall storm water management strategy for the project. The presence of site design BMPs within a project is usually a factor in the determination of the amount of runoff to be managed with structural BMPs (i.e., the amount of runoff expected to reach downstream retention or biofiltration basins that process storm water runoff from the project as a whole). When site design BMPs are not maintained or are removed, this can lead to clogging or failure of downstream structural BMPs due to greater delivery of runoff and pollutants than intended for the structural BMP. Therefore, the [City Engineer] may require confirmation of maintenance of site design BMPs as part of their structural BMP maintenance documentation requirements. Site design BMPs that have been installed as part of the project should not be removed, nor should they be bypassed by re-routing roof drains or re-grading surfaces within the project. If changes are necessary, consult the [City Engineer] to determine requirements.

The runoff storage and infiltration surface area in this BMP are not readily accessible because they are subsurface. This means that clogging and poor drainage are not easily corrected. If the tributary area draining to the BMP includes unpaved areas, the sediment load from the tributary drainage area can be too high, reducing BMP function or clogging the BMP. All unpaved areas within the tributary drainage area should be stabilized with vegetation. Other pretreatment components to prevent transport of sediment to the paving surface, such as grass buffer strips, will extend the life of the subsurface components and infiltration surface. Along with proper stabilization measures and pretreatment within the tributary area, **routine maintenance, including preventive vacuum/regenerative air street sweeping, is key to preventing clogging.**

## Permeable Pavement as Site Design BMP

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR SD-6B PERMEABLE PAVEMENT AS SITE DESIGN BMP		
<p>The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.</p> <p>Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.</p>		
Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Preventive vacuum/regenerative air street sweeping	Pavement should be swept with a vacuum power or regenerative air street sweeper to maintain infiltration through paving surface	<ul style="list-style-type: none"> <li>Schedule/perform this preventive action at least twice per year.</li> </ul>
Accumulation of sediment, litter, or debris on permeable pavement surface	Remove and properly dispose of accumulated materials. Inspect tributary area for exposed soil or other sources of sediment and apply stabilization measures to sediment source areas. Apply source control measures as applicable to sources of litter or debris.	<ul style="list-style-type: none"> <li>Inspect monthly and after every 0.5-inch or larger storm event.</li> <li>Remove any accumulated materials found at each inspection.</li> </ul>
Weeds growing on/through the permeable pavement surface	Remove weeds and add features as necessary to prevent weed intrusion. Use non-chemical methods (e.g., instead of pesticides, control weeds using mechanical removal, physical barriers, and/or physical changes in the surrounding area adjacent to pavement that will preclude weed intrusion into the pavement).	<ul style="list-style-type: none"> <li>Inspect monthly.</li> <li>Remove any weeds found at each inspection.</li> </ul>
Standing water in permeable paving area following a storm event, or runoff is observed overflowing off the permeable paving surface during a storm event	This condition requires investigation of why infiltration is not occurring. If feasible, corrective action shall be taken to restore infiltration (e.g., pavement should be swept with a vacuum power or regenerative air street sweeper to restore infiltration rates, clear underdrains if underdrains are present). BMP may require retrofit if infiltration cannot be restored. The [City Engineer] shall be contacted prior to any repairs or reconstruction.	<ul style="list-style-type: none"> <li>Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>Maintenance when needed.</li> </ul>

## Permeable Pavement as Site Design BMP

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR SD-6B PERMEABLE PAVEMENT AS SITE DESIGN BMP (Continued from previous page)		
Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
<p>Presence of mosquitos/larvae</p> <p>For images of egg rafts, larva, pupa, and adult mosquitos, see <a href="http://www.mosquito.org/biology">http://www.mosquito.org/biology</a></p>	<p>If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water.</p> <p>If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria because the underlying soils do not have the infiltration capacity expected, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.</p>	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed.</li> </ul>
<p>Damage to permeable paving surface (e.g., cracks, settlement, misaligned paver blocks, void spaces between paver blocks need fill materials replenished)</p>	<p>Repair or replace damaged surface as appropriate.</p>	<ul style="list-style-type: none"> <li>• Inspect annually.</li> <li>• Maintenance when needed.</li> </ul>

### References

American Mosquito Control Association.

<http://www.mosquito.org/>

California Storm Water Quality Association (CASQA). 2003. Municipal BMP Handbook.

<https://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook>

County of San Diego. 2014. Low Impact Development Handbook.

<http://www.sandiegocounty.gov/content/sdc/dpw/watersheds/susmp/lid.html>

San Diego County Copermittees. 2016. Model BMP Design Manual, Appendix E, Fact Sheet SD-6.

[http://www.projectcleanwater.org/index.php?option=com\\_content&view=article&id=250&Itemid=220](http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=250&Itemid=220)

## Permeable Pavement as Site Design BMP

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

INSPECTION AND MAINTENANCE CHECKLIST FOR SD-6B PERMEABLE PAVEMENT AS SITE DESIGN BMP PAGE 1 of 3			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
Accumulation of sediment, litter, or debris on permeable pavement surface  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Remove and properly dispose of accumulated materials  <input type="checkbox"/> Inspect tributary area for exposed soil or other sources of sediment and apply stabilization measures to sediment source areas. Apply source control measures as applicable to sources of litter or debris  <input type="checkbox"/> Other / Comments:		
Weeds growing on/through the permeable pavement surface  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Remove weeds and add features as necessary to prevent weed intrusion  <input type="checkbox"/> Use non-chemical methods (e.g., instead of pesticides, control weeds using mechanical removal, physical barriers, and/or physical changes in the surrounding area adjacent to pavement that will preclude weed intrusion into the pavement).  <input type="checkbox"/> Other / Comments:		



## Permeable Pavement as Site Design BMP

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

INSPECTION AND MAINTENANCE CHECKLIST FOR SD-6B PERMEABLE PAVEMENT AS SITE DESIGN BMP PAGE 2 of 3			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
<p>Standing water in permeable paving area following a storm event, or runoff is observed overflowing off the permeable paving surface during a storm event*</p> <p>Maintenance Needed?</p> <p><input type="checkbox"/> YES</p> <p><input type="checkbox"/> NO</p> <p><input type="checkbox"/> N/A</p>	<p><input type="checkbox"/> If feasible, take corrective action to restore infiltration (e.g., sweep pavement with a vacuum power or regenerative air street sweeper to restore infiltration rates, clear underdrains if underdrains are present). BMP may require retrofit if infiltration cannot be restored. The [City Engineer] shall be contacted prior to any repairs or reconstruction.</p> <p><input type="checkbox"/> Other / Comments:</p>		
<p>Presence of mosquitos/larvae</p> <p>For images of egg rafts, larva, pupa, and adult mosquitos, see <a href="http://www.mosquito.org/biology">http://www.mosquito.org/biology</a></p> <p>Maintenance Needed?</p> <p><input type="checkbox"/> YES</p> <p><input type="checkbox"/> NO</p> <p><input type="checkbox"/> N/A</p>	<p><input type="checkbox"/> Apply corrective measures to remove standing water in BMP when standing water occurs for longer than 96 hours following a storm event.**</p> <p><input type="checkbox"/> Other / Comments:</p>		

\*If storm water is flowing off the permeable pavement during a storm event, or if there is standing water on the permeable pavement surface following a storm event, this is an indicator of clogging somewhere within the system. Poor drainage can result from clogging of the permeable surface layer, any of the subsurface components, or the subgrade soils. The specific cause of the drainage issue must be determined and corrected. Surface or subsurface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. If poor drainage persists after flushing of the paving, subsurface gravel, and/or underdrain(s) when applicable, or if it is determined that the underlying soils do not have the infiltration capacity expected, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

\*\*If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria because the underlying soils do not have the infiltration capacity expected, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.

## Permeable Pavement as Site Design BMP

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

INSPECTION AND MAINTENANCE CHECKLIST FOR SD-6B PERMEABLE PAVEMENT AS SITE DESIGN BMP PAGE 3 of 3			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
<p>Damage to permeable paving surface (e.g., cracks, settlement, misaligned paver blocks, void spaces between paver blocks need fill materials replenished)</p> <p>Maintenance Needed?</p> <p><input type="checkbox"/> YES  <input type="checkbox"/> NO  <input type="checkbox"/> N/A</p>	<p><input type="checkbox"/> Repair or replace damaged surface as appropriate</p> <p><input type="checkbox"/> Other / Comments:</p>		
<p>Preventive vacuum/regenerative air street sweeping</p> <p>Maintenance Needed?</p> <p><input type="checkbox"/> YES  <input type="checkbox"/> NO  <input type="checkbox"/> N/A</p>	<p><input type="checkbox"/> Pavement should be swept with a vacuum power or regenerative air street sweeper to maintain infiltration through paving surface.</p> <p><input type="checkbox"/> Schedule/perform this preventive action at least twice per year.</p> <p><input type="checkbox"/> Other / Comments:</p>		

# INF-1

## Infiltration Basin

### BMP MAINTENANCE FACT SHEET FOR STRUCTURAL BMP INF-1 INFILTRATION BASIN

An **infiltration basin** typically consists of an earthen basin with a flat bottom constructed in uncompacted native soils. An infiltration basin retains storm water and allows it to evaporate and/or percolate into the underlying soils. Infiltration basins can also be constructed as linear trenches or as underground infiltration galleries. Typical infiltration basin components include:

- Inflow distribution mechanisms (e.g., perimeter flow spreader or filter strips)
- Energy dissipation mechanism for concentrated inflows (e.g., splash blocks or riprap)
- Forebay to provide pretreatment, or other pretreatment device (e.g., drainage inlet inserts, hydrodynamic separator installed within storm drain system)
- Surface ponding for captured flows
- Vegetation or other surface cover such as mulch or rocks selected based on basin use, climate, and ponding depth
- Uncompacted native soils at the bottom of the facility
- Overflow structure

#### Normal Expected Maintenance

Infiltration basins require routine maintenance to: remove accumulated materials such as sediment, trash or debris from the forebay and the basin; maintain vegetation health if the BMP includes vegetation; and maintain integrity of side slopes, inlets, energy dissipators, and outlets. A summary table of standard inspection and maintenance indicators is provided within this Fact Sheet.

#### Non-Standard Maintenance or BMP Failure

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

- The BMP is not drained between storm events. Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface or subsurface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the underlying native soils, or clogging of covers applied at the basin surface such as topsoil, mulch, or rock layer. The specific cause of the drainage issue must be determined and corrected. For surface-level basins (i.e., not underground infiltration galleries), surface cover materials can be removed and replaced, and/or native soils can be scarified or tilled to help reestablish infiltration. If it is determined that the underlying native soils have been compacted or do not have the infiltration capacity expected, or if the infiltration surface area is not accessible (e.g., an underground infiltration gallery) the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.
- Sediment, trash, or debris accumulation has filled the forebay or other pretreatment device within one month, or if no forebay or other pretreatment device is present, has filled greater than 25% of the surface ponding volume within one maintenance cycle. This means the load from the tributary drainage area is too high, reducing BMP function or clogging the BMP. This would require adding a forebay or other pretreatment measures within the tributary area draining to the BMP to intercept the materials if no pretreatment component is present, or increased maintenance frequency for an existing forebay or other pretreatment device. Pretreatment components, especially for sediment, will extend the life of the infiltration basin.

# INF-1

## Infiltration Basin

- Erosion due to concentrated storm water runoff flow that is not readily corrected by adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

### Other Special Considerations

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

# INF-1

## Infiltration Basin

<b>SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR INF-1 INFILTRATION BASIN</b>		
<p>The property owner is responsible to ensure inspection, operation and maintenance of permanent BMPs on their property unless responsibility has been formally transferred to an agency, community facilities district, homeowners association, property owners association, or other special district.</p> <p>Maintenance frequencies listed in this table are average/typical frequencies. Actual maintenance needs are site-specific, and maintenance may be required more frequently. Maintenance must be performed whenever needed, based on maintenance indicators presented in this table. The BMP owner is responsible for conducting regular inspections to see when maintenance is needed based on the maintenance indicators. During the first year of operation of a structural BMP, inspection is recommended at least once prior to August 31 and then monthly from September through May. Inspection during a storm event is also recommended. After the initial period of frequent inspections, the minimum inspection and maintenance frequency can be determined based on the results of the first year inspections.</p>		
Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Accumulation of sediment, litter, or debris in forebay and/or basin	Remove and properly dispose of accumulated materials, (without damage to vegetation when applicable).	<ul style="list-style-type: none"> <li>• Inspect monthly. If the forebay is 25% full* or more in one month, increase inspection frequency to monthly plus after every 0.1-inch or larger storm event.</li> <li>• Remove any accumulated materials found within the infiltration area at each inspection.</li> <li>• When the BMP includes a forebay, materials must be removed from the forebay when the forebay is 25% full*, or if accumulation within the forebay blocks flow to the infiltration area.</li> </ul>
Obstructed inlet or outlet structure	Clear blockage.	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event.</li> <li>• Remove any accumulated materials found at each inspection.</li> </ul>
Poor vegetation establishment (when the BMP includes vegetated surface by design)	Re-seed, re-plant, or re-establish vegetation per original plans.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
Dead or diseased vegetation (when the BMP includes vegetated surface by design)	Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
Overgrown vegetation (when the BMP includes vegetated surface by design)	Mow or trim as appropriate.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>

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

# INF-1

## Infiltration Basin

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR INF-1 INFILTRATION BASIN (Continued from previous page)		
Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Erosion due to concentrated irrigation flow	Repair/re-seed/re-plant eroded areas and adjust the irrigation system.	<ul style="list-style-type: none"> <li>• Inspect monthly.</li> <li>• Maintenance when needed.</li> </ul>
Erosion due to concentrated storm water runoff flow	Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.	<ul style="list-style-type: none"> <li>• Inspect after every 0.5-inch or larger storm event. If erosion due to storm water flow has been observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.</li> </ul>
Standing water in infiltration basin without subsurface infiltration gallery for longer than 24-96 hours following a storm event	Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, or removing/replacing clogged or compacted surface treatments and/or scarifying or tilling native soils. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller. If it is determined that the underlying native soils have been compacted or do not have the infiltration capacity expected, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed.</li> </ul>
Standing water in subsurface infiltration gallery for longer than 24-96 hours following a storm event	This condition requires investigation of why infiltration is not occurring. If feasible, corrective action shall be taken to restore infiltration (e.g., flush fine sediment or remove and replace clogged soils). BMP may require retrofit if infiltration cannot be restored. The [City Engineer] shall be contacted prior to any repairs or reconstruction.	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event. If standing water is observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed.</li> </ul>

# INF-1

## Infiltration Basin

SUMMARY OF STANDARD INSPECTION AND MAINTENANCE FOR INF-1 INFILTRATION BASIN (Continued from previous page)		
Threshold/Indicator	Maintenance Action	Typical Maintenance Frequency
Presence of mosquitos/larvae  For images of egg rafts, larva, pupa, and adult mosquitos, see <a href="http://www.mosquito.org/biology">http://www.mosquito.org/biology</a>	<p>If mosquitos/larvae are observed: first, immediately remove any standing water by dispersing to nearby landscaping; second, make corrective measures as applicable to restore BMP drainage to prevent standing water. For subsurface infiltration galleries, ensure access covers are tight fitting, with gaps or holes no greater than 1/16 inch, and/or install barriers such as inserts or screens that prevent mosquito access to the subsurface storage.</p> <p>If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria because the underlying native soils have been compacted or do not have the infiltration capacity expected, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.</p>	<ul style="list-style-type: none"> <li>• Inspect monthly and after every 0.5-inch or larger storm event. If mosquitos are observed, increase inspection frequency to after every 0.1-inch or larger storm event.</li> <li>• Maintenance when needed</li> </ul>
Damage to structural components such as weirs, inlet or outlet structures	Repair or replace as applicable.	<ul style="list-style-type: none"> <li>• Inspect annually.</li> <li>• Maintenance when needed.</li> </ul>

### References

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

# INF-1 Infiltration Basin

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# INF-1 Infiltration Basin

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

INSPECTION AND MAINTENANCE CHECKLIST FOR INF-1 INFILTRATION BASIN PAGE 1 of 5			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
<p>Accumulation of sediment, litter, or debris</p> <p>Materials must be removed from the forebay when the forebay is 25% full*. In any case, materials must be removed if accumulation blocks flow to the infiltration area.</p> <p>Materials must be removed from the infiltration area any time accumulation is observed in the infiltration area.</p> <p>Maintenance Needed?</p> <p><input type="checkbox"/> YES  <input type="checkbox"/> NO  <input type="checkbox"/> N/A</p>	<p><input type="checkbox"/> Remove and properly dispose of accumulated materials, (without damage to the vegetation when applicable)</p> <p><input type="checkbox"/> If accumulation within the forebay is greater than 25% in one month, increase the inspection and maintenance frequency**</p> <p><input type="checkbox"/> Other / Comments:</p>		

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

\*\*If no forebay is present, if sediment, litter, or debris accumulation exceeds 25% of the surface ponding volume within one month, add a forebay or other pre-treatment measures within the tributary area draining to the BMP to intercept the materials.

# INF-1 Infiltration Basin

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

INSPECTION AND MAINTENANCE CHECKLIST FOR INF-1 INFILTRATION BASIN PAGE 2 of 5			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
Poor vegetation establishment (when the BMP includes vegetated surface by design)  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Re-seed, re-plant, or re-establish vegetation per original plans  <input type="checkbox"/> Other / Comments:		
Dead or diseased vegetation (when the BMP includes vegetated surface by design)  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Remove dead or diseased vegetation, re-seed, re-plant, or re-establish vegetation per original plans  <input type="checkbox"/> Other / Comments:		
Overgrown vegetation (when the BMP includes vegetated surface by design)  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Mow or trim as appropriate  <input type="checkbox"/> Other / Comments:		

# INF-1 Infiltration Basin

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

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

# INF-1 Infiltration Basin

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

INSPECTION AND MAINTENANCE CHECKLIST FOR INF-1 INFILTRATION BASIN PAGE 4 of 5			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
Obstructed inlet or outlet structure  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Clear blockage  <input type="checkbox"/> Other / Comments:		
Damage to structural components such as weirs, inlet or outlet structures  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Repair or replace as applicable  <input type="checkbox"/> Other / Comments:		

# INF-1 Infiltration Basin

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

INSPECTION AND MAINTENANCE CHECKLIST FOR INF-1 INFILTRATION BASIN PAGE 5 of 5			
Threshold/Indicator	Maintenance Recommendation	Date	Description of Maintenance Conducted
Standing water in infiltration basin without subsurface infiltration gallery for longer than 24-96 hours following a storm event*  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, or removing/replacing clogged or compacted surface treatments and/or scarifying or tilling native soils.  <input type="checkbox"/> Other / Comments:		
Standing water in subsurface infiltration gallery for longer than 24-96 hours following a storm event*  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> If feasible, take corrective action to restore infiltration (e.g., flush fine sediment or remove and replace clogged soils). BMP may require retrofit if infiltration cannot be restored. The [City Engineer] shall be contacted prior to any repairs or reconstruction.  <input type="checkbox"/> Other / Comments:		
Presence of mosquitos/larvae  For images of egg rafts, larva, pupa, and adult mosquitos, see <a href="http://www.mosquito.org/biology">http://www.mosquito.org/biology</a>  Maintenance Needed?  <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	<input type="checkbox"/> Apply corrective measures to remove standing water in BMP when standing water occurs for longer than 24-96 hours following a storm event.**  <input type="checkbox"/> Other / Comments:		

# INF-1

## Infiltration Basin

\*Surface ponding longer than approximately 24 hours following a storm event may be detrimental to vegetation health, and surface or subsurface ponding longer than approximately 96 hours following a storm event poses a risk of vector (mosquito) breeding. Poor drainage can result from clogging of the underlying native soils, or clogging of covers applied at the basin surface such as topsoil, mulch, or rock layer. The specific cause of the drainage issue must be determined and corrected. If it is determined that the underlying native soils have been compacted or do not have the infiltration capacity expected, or if the infiltration surface is not accessible (e.g., an underground infiltration gallery) the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.

\*\*If mosquitos persist following corrective measures to remove standing water, or if the BMP design does not meet the 96-hour drawdown criteria because the underlying native soils have been compacted or do not have the infiltration capacity expected, the [City Engineer] shall be contacted to determine a solution. A different BMP type, or a Vector Management Plan prepared with concurrence from the County of San Diego Department of Environmental Health, may be required.

## **ATTACHMENT 4 - COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS**

This is the cover sheet for Attachment 4.

**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 Form I-6 Summary of PDP Structural BMPs
- The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- Details and specifications for construction of structural BMP(s)
- Signage indicating the location and boundary of structural BMP(s) as required by the [City Engineer]
- 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 shall be provided. Photocopies of general brochures are not acceptable.