



## STORM WATER QUALITY MANAGEMENT PLAN

### VALIANO

PDS2013-SP-13-001, PDS2013-GPA-13-011,  
PDS2013-STP-13-003, PDS2013-TM-5575,  
PDS2013-REZ-13-001, PDS2013-ER-12-08-002

MARCH 2017

County of San Diego, CA

#### **prepared for:**

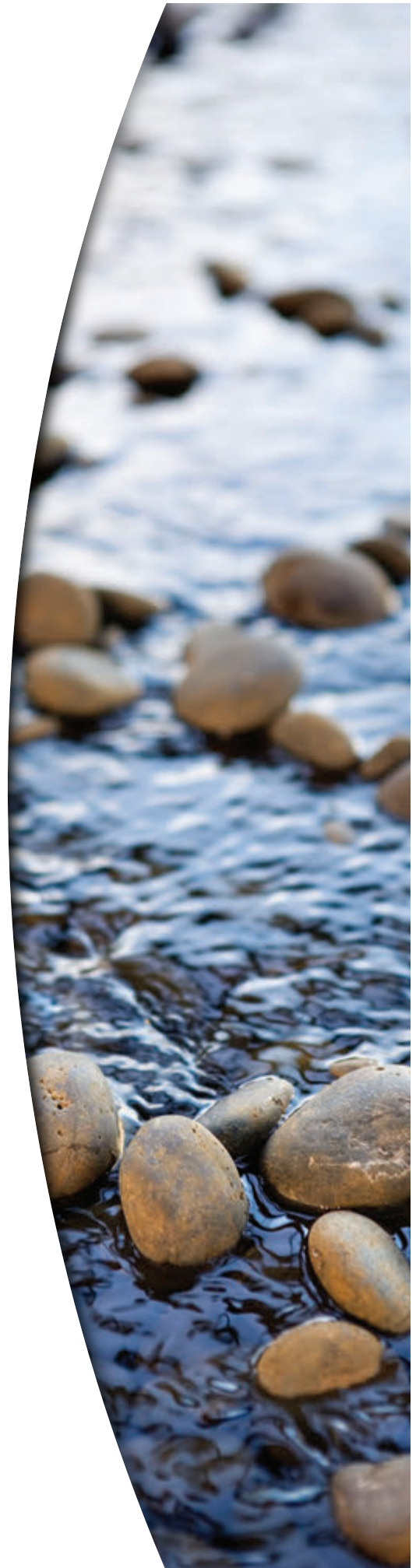
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# **County of San Diego PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

**VALIANO**

**PDS2013-SD-13-001, PDS2013-GPA-13-001, PDS2013-STP-13-003, PDS2013-TM-5575,  
PDS2013-REZ-13-001, PDS2013-ER-12-08-002**

**(SOUTH OF HILL VALLEY DRIVE, NORTH OF MT. WHITNEY ROAD  
(AND WEST OF COUNTRY CLUB DR.)**

**ASSESSOR'S PARCEL NUMBER(S):**

**228-213-13, 232-013-01, 232-013-02, 232-013-03, 232-020-55, 232-492-01, 232-500-18, 232-  
500-19, 232-500-20, 232-500-21, 232-500-22, 232-500-23, 232-500-24**

**ENGINEER OF WORK:**

---

Kenneth T. Kozlik, P.E. 71883

**PREPARED FOR:**

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**DATE OF SWQMP:**

March 31, 2017

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**APPROVAL DATE:**



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## Table of Contents

Table of Contents.....	iv
Attachments.....	v
Acronyms.....	v
PDP SWQMP Preparer's Certification Page.....	vi
Submittal Record .....	viii
Project Vicinity Map .....	ix
Step 1: Project type determination (Standard or Priority Development Project) .....	1
Step 1.1: Storm Water Quality Management Plan requirements.....	4
Step 1.2: Exemption to PDP definitions .....	4
Step 2: Construction Storm Water BMP Checklist .....	5
Step 3: County of San Diego PDP SWQMP Site Information Checklist .....	8
Step 3.1: Description of Existing Site Condition .....	8
Step 3.2: Description of Existing Site Drainage Patterns .....	9
Step 3.3: Description of Proposed Site Development .....	11
Step 3.4: Description of Proposed Site Drainage Patterns.....	13
Step 3.5: Potential Pollutant Source Areas .....	14
Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern .....	15
Step 3.7: Hydromodification Management Requirements .....	16
Step 3.7.1: Critical Coarse Sediment Yield Areas* .....	17
Step 3.7.2: Flow Control for Post-Project Runoff* .....	18
Step 3.8: Other Site Requirements and Constraints .....	19
Step 4: Source Control BMP Checklist .....	20
Step 5: Site Design BMP Checklist.....	22
Step 6: PDP Structural BMPs .....	24
Step 6.1: Description of structural BMP strategy.....	25
Step 6.2: Structural BMP Checklist.....	28
Step 6.3: Offsite Alternative Compliance Participation Form.....	29

## Attachments

- Attachment 1: Backup for PDP Pollutant Control BMPs
  - Attachment 1a: Storm Water Pollutant Control Worksheet Calculations
  - Attachment 1b: DMA Exhibit
  - Attachment 1c: Individual Structural BMP DMA Mapbook
- Attachment 2: Backup for PDP Hydromodification Control Measures
  - Attachment 2a: Flow Control Facility Design
  - Attachment 2b: Hydromodification Management Exhibit
  - Attachment 2c: Management of Critical Coarse Sediment Yield Areas
  - Attachment 2d: Geomorphic Assessment of Receiving Channels (optional)
  - Attachment 2e: Vector Control Plan (if applicable)
- Attachment 3: Structural BMP Maintenance Plan
  - Attachment 3a: Structural BMP Maintenance Thresholds and Actions
  - Attachment 3b: Draft Maintenance Agreements / Notifications(when applicable)
- Attachment 4: County of San Diego PDP Structural BMP Verification for DPW Permitted Land Development Projects
- Attachment 5: Copy of Plan Sheets Showing Permanent Storm Water BMPs
- Attachment 6: Copy of Project's Drainage Report
- Attachment 7: Copy of Project's Geotechnical and Groundwater Investigation Report

## Acronyms

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

## PDP SWQMP Preparer's Certification Page

**Project Name:** Valiano

**Permit Application Number:** PDS2013-SP-13-001, PDS2013-GPA-13-001, PDS2013-STP-13-003, PDS2013-TM-5575, PSD2013-REZ-13-001, PDS2013-ER-12-08-002

### PREPARER'S CERTIFICATION

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

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

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

Kenneth T. Kozlik

Print Name

Fusco Engineering

Company

March 31, 2017

Date

Engineer's Seal:

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## Submittal Record

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

### Preliminary Design / Planning / CEQA

Submittal Number	Date	Summary of Changes
1	May 2016	Initial Submittal
2	October 2016	Response to County Comments
3	January 2017	Response to County Comments
4	March 31, 2017	Response to County Comments

### Final Design

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

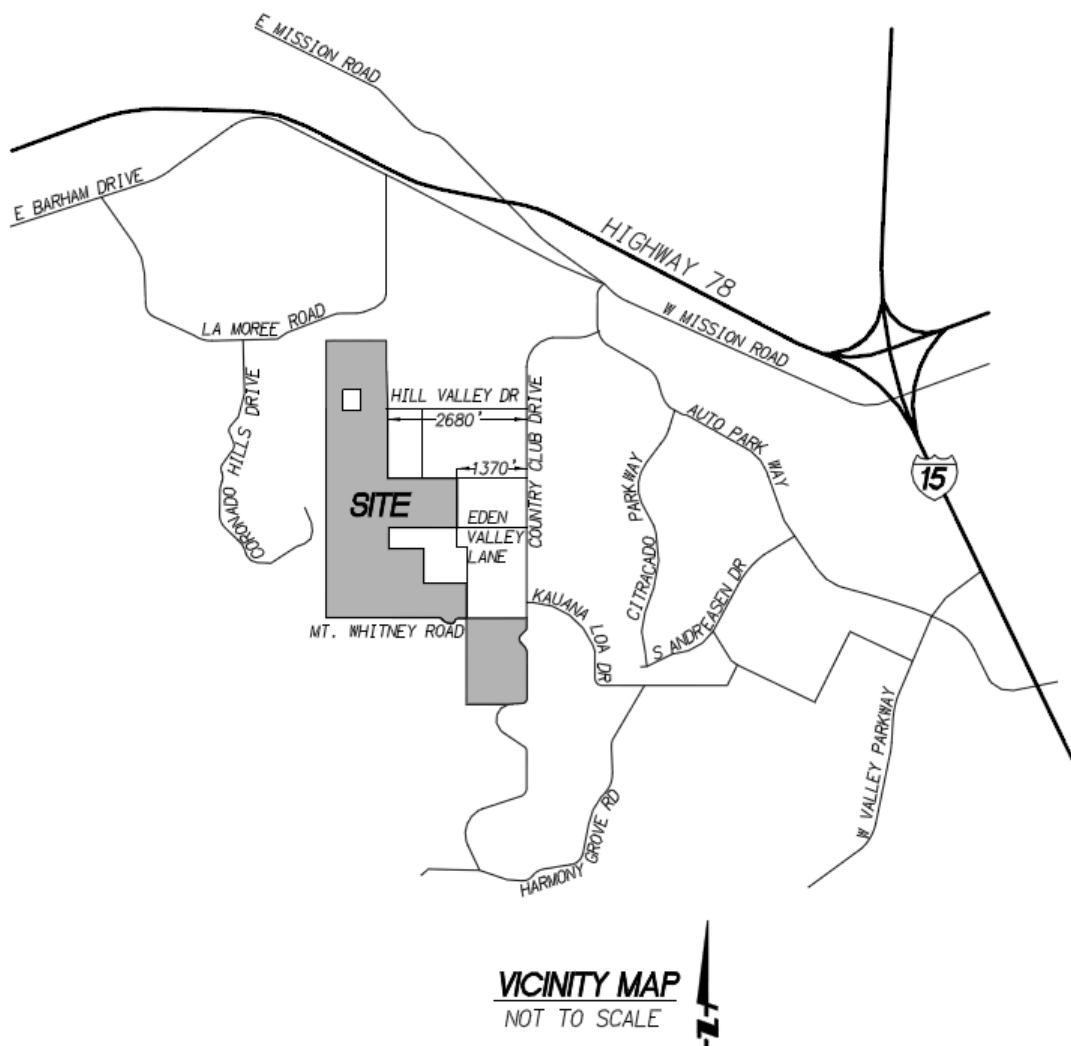
### Plan Changes

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

## Project Vicinity Map

Project Name: Valiano

Record ID: PDS2013-SP-13-001, PDS2013-GPA-13-001, PDS2013-STP-13-003, PDS2013-TM-5575, PSD2013-REZ-13-001, PDS2013-ER-12-08-002



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

Is the project part of another Priority Development Project (PDP)? ( <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No )			
If so, a PDP SWQMP is required. Go to Step 2.			
The project is (select one): <input checked="" type="checkbox"/> New Development <input type="checkbox"/> Redevelopment <sup>1</sup>			
The total proposed newly created or replaced impervious area is:			2,561,328 ft <sup>2</sup>
The total existing (pre-project) impervious area is:			34,848 ft <sup>2</sup>
The total area disturbed by the project is:			5,445,000 ft <sup>2</sup>
If the total area disturbed by the project is 1 acre (43,560 sq. ft.) or more OR the project is part of a larger common plan of development disturbing 1 acre or more, a Waste Discharger Identification (WDID) number must be obtained from the State Water Resources Control Board. WDID: To be determined during grading permit application			
Is the project in any of the following categories, (a) through (f)? <sup>2</sup>			
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	(a)	New development projects that create 10,000 square feet or more of impervious surfaces <sup>3</sup> (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

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

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

<sup>3</sup> For solar energy farm projects, the area of the solar panels does not count toward the total impervious area of the site.





## Project type determination (continued)

Yes <input type="checkbox"/>	No <input checked="" 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 discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).</p> <p><i>Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. See BMP Design Manual Section 1.4.2 for additional guidance.</i></p>
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(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 (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.</li> </ul>
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	(f)	<p>New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.</p> <p><i>Note: See BMP Design Manual Section 1.4.2 for additional guidance.</i></p>

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

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

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

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

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

The area of existing (pre-project) impervious area at the project site is: ft<sup>2</sup> (A)

The total proposed newly created or replaced impervious area is ft<sup>2</sup> (B)

Percent impervious surface created or replaced (B/A)\*100: %

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

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

OR

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

## Step 1.1: Storm Water Quality Management Plan requirements

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

## Step 1.2: Exemption to PDP definitions

<p>Is the project exempt from PDP definitions based on either of the following:</p> <p><input type="checkbox"/> Projects that are only new or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:</p> <ul style="list-style-type: none"> <li>(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR</li> <li>(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads [i.e., runoff from the new improvement does not drain directly onto paved streets or roads]; OR</li> <li>(iii) Designed and constructed with permeable pavements or surfaces in accordance with County of San Diego Guidance on Green Infrastructure;</li> </ul>	<p>If so:</p> <p><u>Standard Project</u> requirements apply, AND <u>any additional requirements specific to the type of project</u>. <u>County concurrence</u> with the exemption is required. <i>Provide discussion and list any additional requirements below in this form.</i>  <b>Complete Standard Project SWQMP</b></p>
<p><input type="checkbox"/> Projects that are only retrofitting or redeveloping existing paved alleys, streets or roads that are designed and constructed in accordance with the County of San Diego Guidance on Green Infrastructure.</p>	<p><b>Complete Green Streets PDP Exempt SWQMP.</b></p>
<p><i>Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:</i></p>	

**Step 2: Construction Storm Water BMP Checklist**

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

Table 1. Construction Storm Water BMP Checklist

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

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

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

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

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

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

Table 1. Construction Storm Water BMP Checklist (continued)

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

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

<sup>9</sup> Regional Standard Drawing D-40 – Rip Rap Energy Dissipater is also acceptable for velocity reduction.

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

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

### Step 3.1: Description of Existing Site Condition

Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Carlsbad (904.62), Escondido HSA
<p>Current Status of the Site (select all that apply):</p> <p><input checked="" type="checkbox"/> Existing development</p> <p><input type="checkbox"/> Previously graded but not built out</p> <p><input type="checkbox"/> Demolition completed without new construction</p> <p><input checked="" type="checkbox"/> Agricultural or other non-impervious use</p> <p><input checked="" type="checkbox"/> Vacant, undeveloped/natural</p> <p><i>Description / Additional Information:</i></p>	
<p>Existing Land Cover Includes (select all that apply and provide each area on site):</p> <p><input checked="" type="checkbox"/> Vegetative Cover <u>239</u> Acres (<u>10,375,992</u> Square Feet)</p> <p><input type="checkbox"/> Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet)</p> <p><input checked="" type="checkbox"/> Impervious Areas <u>0.80</u> Acres (<u>34,848</u> Square Feet)</p> <p><i>Description / Additional Information:</i></p>	
<p>Underlying Soil belongs to Hydrologic Soil Group (select all that apply):</p> <p><input type="checkbox"/> NRCS Type A</p> <p><input checked="" type="checkbox"/> NRCS Type B</p> <p><input checked="" type="checkbox"/> NRCS Type C</p> <p><input checked="" type="checkbox"/> NRCS Type D</p>	
<p>Approximate Depth to Groundwater (GW) (or N/A if no infiltration is used):</p> <p><input type="checkbox"/> GW Depth &lt; 5 feet</p> <p><input checked="" type="checkbox"/> 5 feet &lt; GW Depth &lt; 10 feet</p> <p><input checked="" type="checkbox"/> 10 feet &lt; GW Depth &lt; 20 feet</p> <p><input type="checkbox"/> GW Depth &gt; 20 feet</p>	
<p>Existing Natural Hydrologic Features (select all that apply):</p> <p><input checked="" type="checkbox"/> Watercourses</p> <p><input type="checkbox"/> Seeps</p> <p><input type="checkbox"/> Springs</p> <p><input checked="" type="checkbox"/> Wetlands</p> <p><input type="checkbox"/> None</p> <p><input type="checkbox"/> Other</p> <p><i>Description / Additional Information:</i></p>	

### Step 3.2: Description of Existing Site Drainage Patterns

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

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

***Describe existing site drainage patterns:***

Due to the hillside nature of the site, runoff from the project site splits into several major drainage basins. These basins are delineated in the Hydrology Study and are shown in the Drainage Management Area of Appendix C.

Basin A encompasses the southwesterly corner of the project site, and includes offsite areas to the west of the project. Flows in this basin drain to the south in a natural drainage channel. This channel continues south through agricultural and undeveloped land, including multiple agricultural ponds, before discharging to Escondido Creek south of the project site.

Basin B consists of the south-central and southeasterly portions of the project site. Basin B includes offsite areas to the west of the project boundary and areas adjacent to the southeasterly portion of the project. Runoff from this basin is collected a natural channel which runs roughly southeasterly through the site, and exits the site near the southeasterly corner. From there, the channel runs south to a confluence point with Basin A and eventually to Escondido Creek. Like Basin A, runoff from Basin B flows through agricultural and undeveloped land, including agricultural ponds, on its path the Escondido Creek.

Basin C originates near the high point of the mountains to the west of the project site, and flows easterly through the central portion of the project site. Runoff from Basin C exits the project site at the easterly property line in the central portion of the site. From there, it flows southeasterly to a confluence with Basin B, and then ultimately to Escondido Creek. Basin C consists of undeveloped, agricultural, and residential land. Runoff in Basin C travels primarily through natural and unlined channels, with culverts at road crossings downstream of the project site.

Basin D encompasses the northerly portion of the project site, and drains in an easterly direction. After exiting the project site, runoff flows in a southeasterly direction to an offsite confluence with flows from Basin C, and ultimately to Escondido Creek.

Basin E consists of the extreme northerly portion of the site including the proposed Rincon Del Diablo Municipal Water District water tank and access road. Similar to Basin D, runoff in Basin E drains to the east, and then to the southeast after exiting the site. There it confluence with runoff from Basin D. For hydromodification calculations, the developed portions of Basin E have been identified as DMAs 6A and 6B.





**Step 3.3: Description of Proposed Site Development*****Project Description / Proposed Land Use and/or Activities:***

The Valiano project proposes to construct 326 single family dwelling units on 6 parcels with a cumulative area of 239 acres in the County of San Diego, California. The existing site consists of flat and mountainous terrain and is located on the southwestern corner of Country Club Drive and Hill Valley Drive. The site is located in the unincorporated community of "Eden Valley", primarily comprised of single family residential and equestrian land uses. Reference the Vicinity Map in Attachment A for a detailed map of the project site.

Private streets within the project consist of one main road that traverses the westerly portion of the project from North to South, and numerous private streets that provide access to the lots within each neighborhood. The two primary access points to the project will be from Eden Valley Lane and Mt. Whitney Road. The southeasterly portion of the project is accessed via private roads from Country Club Drive.

In addition to the 326 single family dwelling units within 5 neighborhoods, the project proposes a public neighborhood park, a private recreation facility, equestrian uses, trails, Rincon MWD tank and access road, offsite road improvements such as Hill Valley Drive and Country Club Drive, a wastewater treatment plant and a wet weather storage basin. The wet weather storage basin will store treated water from the wastewater treatment plant per RWQCB requirements. The public neighborhood park proposes open lawn areas, picnic areas, a children play area and shade structure. The private recreation facility proposes a swimming pool, community building, open lawn area, picnic area, and children's play area.

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

The proposed impervious surfaces will include homes and associated driveways in the 5 neighborhoods, community buildings, wastewater treatment plant, roadways, public and private parking lots, sidewalks, and hardscape.

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

Landscaping will be included in unpaved graded areas. A larger percentage of the existing hillside areas will be protected as shown in Attachments 1B. Pervious features such as decomposed granite trails/ pathways and pervious pavers will also be used.

Does the project include grading and changes to site topography?

☒ Yes

☐ No

***Description / Additional Information:***

The proposed topography will include new residential lots, streets, walkways and community recreational areas. In general, the project will maintain the existing west to east slope patterns. The topography will be modified to include cut and fill slopes at a maximum slope ratio of 2 to 1.

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

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft <sup>2</sup> )	Proposed (acres or ft <sup>2</sup> )	Percent Change
Vegetation	239 AC	176.6 AC	-26%
Pervious (non-vegetated)	0 AC	5.2 AC	N/A
Impervious	0.80 AC	58.0 AC	7250%

**Step 3.4: Description of Proposed Site Drainage Patterns**

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

☒ Yes

☐ No

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

***Describe proposed site drainage patterns:***

The drainage management strategy for the project utilizes multifunction BMPs to provide pollutant control, hydromodification mitigation, and peak detention for the developed portions of the site. Points of Compliance (POCs) have been identified where the proposed storm drain system will discharge to the surrounding natural drainage courses. If the project proposes to increase un-mitigated post-development flows to a POC, a storm water management Best Management Practice (BMP) was then designed to mitigate the impacts of the increase. The BMPs then discharge to the natural drainage courses. Where a BMP discharges to a natural drainage course, appropriately sized energy dissipation will be provided. Energy dissipation facilities will be sized at the time of final engineering.

Due to the project's location on the hills bordering a valley, the site accepts runoff from the adjacent hills to the west. There is also a good deal of open space which will be preserved within the project, as well as graded slopes which will have no impervious area. Where possible, the offsite drainages and onsite pervious areas will be provided with separate drainage systems, which will prevent the mingling of runoff from these areas with runoff from the developed areas of the site. Thus, these areas will function as self-mitigating areas which will contain less than 5% impervious areas. The self-mitigating areas of the site are identified on the SWQMP in Attachment 1B. The Hill Valley Road emergency access route has a portion with soil type A under it, which also coincides with where the road slope is less than 5%, the typical upper limit used in permeable paver applications. Permeable pavers are proposed in those areas to allow for infiltration. However, if field conditions or some other unforeseen circumstance precludes the use of permeable pavers, HV-Alt 1 and 2 have been shown in the BMP Map Book and DCV calculations as alternative solutions. HV-Alt 1 would add a biofiltration basin alongside Hill Valley Road. HV-Alt 2 would add a pump at the low point in the road to pump flow from a catch basin to the biofiltration basin for 6B. Thus, DMA 6B and DMA HV would be combined into a single DMA, DMA HV-Alt 2.

**Step 3.5: Potential Pollutant Source Areas**

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

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

*Description / Additional Information:*

A pool and spa will be located at the private recreation facility. Refuse areas will be located at the private recreation facility, public community park, and equestrian staging area. Fire Sprinkler Test Water could be generated at the single family homes and private recreation facility. Miscellaneous drain or wash water could be generated at the private recreation facility.

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

*Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable): Storm water discharges to Escondido Creek located 0.8 miles from site then into San Elijo Lagoon, 12.4 miles from site and ultimately discharges to the Pacific Ocean.*

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

303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs / WQIP Highest Priority Pollutant
<i>San Elijo Lagoon</i>	<i>Eutrophic, Indicator Bacteria, Sedimentation/ Siltation</i>	<i>Indicator Bacteria</i>
<i>Escondido Creek</i>	<i>DDT, Enterococcus, Fecal Coliform, Manganese, Phosphate, Selenium, Sulfates, TDS, Toxicity, Total Nitrogen as N</i>	<i>Indicator Bacteria</i>
<i>Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon</i>	<i>Total Coliform</i>	

#### Identification of Project Site Pollutants\*

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

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

Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Nutrients	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Heavy Metals	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Organic Compounds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Trash & Debris	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxygen Demanding Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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

Oil & Grease	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bacteria & Viruses	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pesticides	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### Step 3.7: Hydromodification Management Requirements

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

- ☒ Yes, hydromodification management requirements for flow control and preservation of critical coarse sediment yield areas are applicable.
- ☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.
- ☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA<sup>12</sup> for the watershed in which the project resides.

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

Please refer to the separate Hydromodification Management Study for Valiano.

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

## Step 3.7.1: Critical Coarse Sediment Yield Areas\*

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

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

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

☒ Identify: Project has identified both onsite and upstream CCSYAs as areas that are coarse,  $\geq 25\%$  slope, and  $\geq 50'$  tall. (*Optional refinement methods may be performed per guidance in Section H.1.2*). AND,

☒ Avoid: Project has avoided onsite CCSYAs per existing RPO steep slope encroachment criteria. AND,

☒ Bypass: Project has demonstrated that both onsite and upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,

☐ No Net Impact: Project does not satisfy all Scenario 1 criteria above and must alternatively demonstrate no net impact to the receiving water.

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

☐ Identify: Project has identified upstream CCSYAs that are coarse,  $\geq 25\%$  slope, and  $\geq 50'$  tall. (*Optional refinement methods may be performed per guidance in Section H.1.2*). AND,

☐ Avoid: Project is not required to avoid onsite CCSYAs as none were identified in the previous step. AND,

☐ Bypass: Project has demonstrated that upstream CCSYAs are bypassed through or around the project site with a 2 year peak storm velocity of 3 feet per second or greater. OR,

☐ No Net Impact: Project does not satisfy all Scenario 2 criteria above and must alternatively demonstrate no net impact to the receiving water. (*Skip to next row*).

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

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

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

## Step 3.7.2: Flow Control for Post-Project Runoff\*

<p><b>*This Section only required if hydromodification management requirements apply</b></p> <p><i>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.</i></p> <p>The project has 21 POCs located in natural runoff concentration points. It has been divided into 5 major basins based on where runoff leaves the property boundary and some of the basins have multiple internal POCs. For more detail, please refer to Preliminary Hydromodification Management Study, November 2015</p>
<p>Has a geomorphic assessment been performed for the receiving channel(s)?</p> <p><input checked="" type="checkbox"/> No, the low flow threshold is 0.1Q2 (default low flow threshold)</p> <p><input type="checkbox"/> Yes, the result is the low flow threshold is 0.1Q2</p> <p><input type="checkbox"/> Yes, the result is the low flow threshold is 0.3Q2</p> <p><input type="checkbox"/> Yes, the result is the low flow threshold is 0.5Q2</p> <p><i>If a geomorphic assessment has been performed, provide title, date, and preparer:</i></p> <p><i>Discussion / Additional Information: (optional)</i></p>



**Step 3.8: Other Site Requirements and Constraints**

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

The use of certain BMPs is limited due to certain site constraints. Due to the presence of Group C and D soils and shallow bedrock under much of the developed portions of the project, infiltration-based Integrated Management Practices (IMPs) are not feasible for the project site. In addition, the steep hillside slopes limit the use of BMPs which require large footprint areas.

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

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

**Step 4: Source Control BMP Checklist**

<b>Source Control BMPs</b>			
<p>All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the County BMP Design Manual for information to implement source control BMPs shown in this checklist.</p> <p>Answer each category below pursuant to the following:</p> <ul style="list-style-type: none"> <li>• "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required.</li> <li>• "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.</li> <li>• "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.</li> </ul>			
<b>Source Control Requirement</b>	<b>Applied?</b>		
<b>4.2.1</b> Prevention of Illicit Discharges into the MS4	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.2.1 not implemented:</i>			
<b>4.2.2</b> Storm Drain Stenciling or Signage	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.2.2 not implemented:</i>			
<b>4.2.3</b> Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.2.3 not implemented:</i>			
<b>4.2.4</b> Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.2.4 not implemented:</i>			

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

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

## Step 5: Site Design BMP Checklist

Site Design BMPs			
<p>All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the County BMP Design Manual for information to implement site design BMPs shown in this checklist.</p> <p>Answer each category below pursuant to the following:</p> <ul style="list-style-type: none"> <li>• "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the County BMP Design Manual. Discussion / justification is not required.</li> <li>• "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.</li> <li>• "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.</li> </ul>			
Site Design Requirement	Applied?		
<b>4.3.1</b> Maintain Natural Drainage Pathways and Hydrologic Features	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.1 not implemented:</i>			
<b>4.3.2</b> Conserve Natural Areas, Soils, and Vegetation	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.2 not implemented:</i>			
<b>4.3.3</b> Minimize Impervious Area	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.3 not implemented:</i>			
<b>4.3.4</b> Minimize Soil Compaction	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.4 not implemented:</i>			
<b>4.3.5</b> Impervious Area Dispersion	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.5 not implemented:</i>			

Site Design Requirement	Applied?		
<b>4.3.6</b> Runoff Collection	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.6 not implemented:</i>			
<b>4.3.7</b> Landscaping with Native or Drought Tolerant Species	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.7 not implemented:</i>			
<b>4.3.8</b> Harvesting and Using Precipitation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A
<i>Discussion / justification if 4.3.8 not implemented:</i> While it will be possible for individual homeowners with the project to install rain barrels, no large scale harvest and use is planned. This is due to the fact that all HOA landscaped areas will be irrigated with reclaimed wastewater generated by the project. Thus, there is no irrigation demand for harvested rainwater.			

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

**Step 6: PDP Structural BMPs**

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

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

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

**Step 6.1: Description of structural BMP strategy**

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

BMPs were selected per the 2013 MS4 Permit requirements. BMP selection process followed the steps outlined in section 5.1 of the BMP Design Manual. For areas requiring treatment that are not 'self-mitigating', Harvest and Use is not feasible (see attachment 1b), infiltration is not feasible due to site constraints such as soil types with poor infiltration rates and steep slopes. The site is considered "No Infiltration Condition". The BMPs designed for the site, Biofiltration Basins, have been sized per Appendix B.5 of the BMP Design Manual.

There are 18 onsite DMAs, each draining to an appropriately sized Biofiltration basin. The DMA Names area as follows: 1, 2A, 2B, 2C, 2D, 2E, 2F, 3A, 3B, 3C, 3D, 4A, 4B, 5A, 5B, 5C, 5D and 6. These proposed developed areas are assumed to be 70% impervious in proposed condition, with the exception of 2F and 5D, the recreation center and community park, respectively, which are assumed to be 50% impervious in proposed condition. Six offsite Basins, MW1, MW2, CC1, CC2, CC3, and HV are offsite road improvements assumed to be 100% impervious in proposed condition.

Where space is available, biofiltration basins have been provided in accordance with the BMP Design Manual. This is the case in the recreation area, water tank and access road, and for the Mt. Whitney Road improvements.

Where space is not available, extended detention basins have been provided, with an integrated biofiltration layer. This biofiltration layer is an LID component. The design capture volume will be captured in the extended detention basin and treated by the biofiltration layer prior to discharge. The extended detention basins will also provide hydromodification flow control through the use of an orifice on the subdrain pipe and an outlet structure with upper orifice and a weir.

Catch basin inserts will also be provided as pre-treatment upstream of the BMPs described above.

Permeable Pavement Retention Areas will be used for the Hill Valley Road emergency access. This roadway is ideal for permeable pavements, such as permeable pavers, since it will have low traffic volumes and will allow for storm water treatment and hydromodification mitigation within the existing 20' access easement. It should be noted that permeable pavers are limited to areas where Hill Valley Road is less than 5%, the typical upper limit for permeable pavement applications. The subgrade will be stepped to create flat retention areas to ensure retention of the 85<sup>th</sup> percentile storm. An underground cistern will be implemented within the 20' access easement to collect and retain runoff before discharging into an existing culvert.

*(Continue on following page as necessary.)*



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

*(Continued from previous page)*

**PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

STEP 6.2: STRUCTURAL BMP CHECKLIST	
<b>Structural BMP Summary Information</b> <b>(Copy this page as needed to provide information for each individual proposed structural BMP)</b>	
Structural BMP ID No. <b>EXTENDED DETENTION WITH BIOFILTRATION</b>	
Construction Plan Sheet No. (To be determined)	
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 checked="" 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 Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input checked="" type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Eden Hills Project Owner, LLC or Current owner
Who will be the final owner of this BMP?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
Who will maintain this BMP into perpetuity?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	2
Discussion (as needed):  (Continue on subsequent pages as necessary)	

**PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

STEP 6.2: STRUCTURAL BMP CHECKLIST	
<b>Structural BMP Summary Information</b> <b>(Copy this page as needed to provide information for each individual proposed structural BMP)</b>	
Structural BMP ID No. <b>BIOFILTRATION</b>	
Construction Plan Sheet No. (To be determined)	
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 checked="" 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 Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input checked="" type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Eden Hills Project Owner, LLC or Current owner
Who will be the final owner of this BMP?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
Who will maintain this BMP into perpetuity?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	2
Discussion (as needed):  (Continue on subsequent pages as necessary)	

**PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

STEP 6.2: STRUCTURAL BMP CHECKLIST	
<b>Structural BMP Summary Information</b> <b>(Copy this page as needed to provide information for each individual proposed structural BMP)</b>	
Structural BMP ID No. <b>BIORETENTION</b>	
Construction Plan Sheet No. (To be determined)	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input checked="" 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 Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input checked="" type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Eden Hills Project Owner, LLC or Current owner
Who will be the final owner of this BMP?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
Who will maintain this BMP into perpetuity?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	2
Discussion (as needed):  (Continue on subsequent pages as necessary)	

**PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

Structural BMP Summary Information (Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. <b>TRASH RACKS</b>	
Construction Plan Sheet No. (To be determined)	
Type of structural BMP: <input type="checkbox"/> Retention by harvest and use (HU-1) <input type="checkbox"/> Retention by infiltration basin (INF-1) <input type="checkbox"/> Retention by bioretention (INF-2) <input type="checkbox"/> Retention by permeable pavement (INF-3) <input type="checkbox"/> Partial retention by biofiltration with partial retention (PR-1) <input type="checkbox"/> Biofiltration (BF-1) <input type="checkbox"/> 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 checked="" type="checkbox"/> Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) <input type="checkbox"/> Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) <input type="checkbox"/> Detention pond or vault for hydromodification management 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 certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Eden Hills Project Owner, LLC or Current owner
Who will be the final owner of this BMP?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
Who will maintain this BMP into perpetuity?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	2
Discussion (as needed):  (Continue on subsequent pages as necessary)	

**PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP**

STEP 6.2: STRUCTURAL BMP CHECKLIST	
<b>Structural BMP Summary Information</b> <b>(Copy this page as needed to provide information for each individual proposed structural BMP)</b>	
Structural BMP ID No. <b>PERMEABLE PAVERS</b>	
Construction Plan Sheet No. (To be determined)	
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 checked="" 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 Other (describe in discussion section below)	
Purpose: <input type="checkbox"/> Pollutant control only <input type="checkbox"/> Hydromodification control only <input checked="" type="checkbox"/> Combined pollutant control and hydromodification control <input type="checkbox"/> Pre-treatment/forebay for another structural BMP <input type="checkbox"/> Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 1.12 of the BMP Design Manual)	Eden Hills Project Owner, LLC or Current owner
Who will be the final owner of this BMP?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
Who will maintain this BMP into perpetuity?	<input checked="" type="checkbox"/> HOA <input type="checkbox"/> Property Owner <input type="checkbox"/> County <input type="checkbox"/> Other (describe)
What Category (1-4) is the Structural BMP? Refer to the Category definitions in Section 7.3 of the BMP DM. Attach the appropriate maintenance agreement in Attachment 3.	2
Discussion (as needed):  (Continue on subsequent pages as necessary)	

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

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

The DMA Exhibit must identify:

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



# **ATTACHMENT 1a**

## **Storm Water Pollutant Control Worksheet Calculations Extended Detention Basin Outlet Structure Details**

## County of San Diego Automated Stormwater Pollutant Control Worksheets (Version 1.3)

### **WELCOME:**

Welcome to the County of San Diego Automated Stormwater Pollutant Control Worksheets. Priority Development Projects that are required to satisfy stormwater pollutant control performance standards set forth in the 2013 MS4 Permit may use these automated worksheets to calculate design capture volumes and determine what portion of pollutant control performance standards are satisfied by their project.

### **INSTRUCTIONS:**

**General:** To use this workbook users must navigate to the appropriate worksheet tabs and populate yellow cells with project specific information. These worksheet tabs are formatted to accommodate calculations for up to 10 drainage areas and associated BMPs. Each drainage area and/or BMP is represented as a discrete column with corresponding user inputs and calculations appearing in the rows below. Please note that projects with more than 10 drainage areas may need to use more than one workbook to accommodate their entire project. Yellow cells represent items that require user input, white cells are locked for editing and are automatically calculated, blue cells are also locked for editing and are automatically populated based on results from previous worksheet tabs, grey cells represent items that typically require user input but may be omitted based on a previous user input, orange cells represent warnings where supplemental information and/or revisions may be required for compliance, and red cells represent errors associated with proposed stormwater pollutant control measures that negatively affect compliance.

**Step 1.** Navigate to the orange tab at the bottom of the workbook and provide required inputs to determine the structural BMP types that are acceptable for implementation at the project site.

**Step 2.** Navigate to the blue tab at the bottom of the workbook and provide the required inputs to determine the design capture volume for each PDP drainage area and identify what type of BMP this area drains to. The calculations in this worksheet determine the initial design capture volume and also apply any applicable reductions associated with site design techniques including dispersion to pervious surfaces, incorporation of tree wells, and incorporation of rain barrels. Upon completion of Step 2, applicants must proceed to Step 3 to ensure that appropriate stormwater pollutant control measures are applied to this volume.

**Step 3.** Examine the green tabs at the bottom of the workbook and identify which of these BMP types are implemented by the PDP. Click the green tab for each of the proposed BMP types and provide the required user inputs to determine the portion of the pollutant control performance standards that are satisfied by the proposed BMP. After providing appropriate inputs users should verify that no red error messages appear at the bottom of their worksheets and, if necessary, refine user inputs until satisfied with the proposed stormwater pollutant control approach. Once satisfied, applicants must proceed to Step 4 to facilitate their project submittal. Note: Users must ensure that all provided inputs are adequately represented in the accompanying stormwater management plans.

**Step 4.** Navigate to the purple "Summary" tab at the bottom of this workbook and examine the sheet for warning messages highlighted in red text at the bottom of the worksheet. Once satisfied with the overall results, print the summary sheet and all applicable supporting worksheets in color, 11x17 landscape format and include in Attachment 1a of the SWQMP submittal.

### **DISCLAIMER:**

The County of San Diego has developed this tool in an effort to streamline traditionally complex efforts associated with planning, design, submittal, and review of PDPs that are subject to stormwater pollutant control requirements set forth in the 2013 MS4 Permit. While the calculations performed herein are deemed to be in compliance with Permit requirements, applicants may elect to provide their own calculations. Use of this tool is optional and the County will not be held liable for any errors or other negative impacts associated with its use. In the event that the County performs updates to these worksheets, applicants that have not established reliance on previous versions of the worksheet via discretionary approval may be required to utilize the latest version of the worksheets. A summary of version releases is included below.

### **QUESTIONS:**

-Questions relating to specific projects, submittal requirements, approval process, and/or policy-related issues should be directed your PDS Land Development Project Manager (link below).

[PDS Land Development Project Manager](#)

-General questions/comments on this worksheet may be directed to Charles Mohrlock in the County of San Diego Watershed Protection Program (link below).

[charles.mohrlock@sdcounty.ca.gov](mailto:charles.mohrlock@sdcounty.ca.gov)

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

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	128,012	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	1,304	#
	3	Total Planted Area within Development	2,883,672	sq-ft
	4	Water Use Category for Proposed Planted Areas	Moderate	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate $\leq$ 0.500 Inches per Hour?	No	yes/no
	6	Is Average Site Design Infiltration Rate $\leq$ 0.010 Inches per Hour?	Yes	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	2,432	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	196.52	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	13,010	cubic-feet
	13	Total Anticipated Use Over 36 Hours	15,442	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.12	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

- A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.
- B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.
- C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.
- D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.
- E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.
- F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at  $\geq$ 3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.
- G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at  $\geq$ 3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.
- H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.

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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	1	2A	2B	2C	2D	2E	2F	3A	3B	3C	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	4	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	84,918	84,634	157,412	290,961	61,390	182,380	41,027	106,291	228,224	121,323	sq-ft
	5	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)	36,394	65,613	81,427	243,671	42,159	107,637	41,027	66,442	233,911	118,021	sq-ft
	7	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	8	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	9	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	10	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces <b>Directed to Dispersion Area</b> per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces <b>Serving as Dispersion Area</b> per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces <b>Serving as Dispersion Area</b> per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in <u>Downstream</u> Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	121,312	150,247	238,839	534,632	103,549	290,017	82,054	172,733	462,135	239,344	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.66	0.55	0.63	0.54	0.57	0.60	0.50	0.59	0.50	0.51	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.66	0.55	0.63	0.54	0.57	0.60	0.50	0.59	0.50	0.51	unitless
	32	Initial Design Capture Volume	4,003	4,132	7,523	14,435	2,951	8,701	2,051	5,096	11,553	6,103	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.66	0.55	0.63	0.54	0.57	0.60	0.50	0.59	0.50	0.51	unitless
	38	Design Capture Volume After Dispersion Techniques	4,003	4,132	7,523	14,435	2,951	8,701	2,051	5,096	11,553	6,103	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.66	0.55	0.63	0.54	0.57	0.60	0.50	0.59	0.50	0.51	unitless
	42	Final Effective Tributary Area	80,066	82,636	150,469	288,701	59,023	174,010	41,027	101,912	231,068	122,065	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	4,003	4,132	7,523	14,435	2,951	8,701	2,051	5,096	11,553	6,103	cubic-feet

Worksheet B.1-1 General Notes:

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

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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
BMP Inputs	0	Drainage Basin ID or Name	1	2A	2B	2C	2D	2E	2F	3A	3B	3C	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	2	Effective Tributary Area	80,066	82,636	150,469	288,701	59,023	174,010	41,027	101,912	231,068	122,065	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	4	Design Capture Volume Tributary to BMP	4,003	4,132	7,523	14,435	2,951	8,701	2,051	5,096	11,553	6,103	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	unitless
	6	Provided Biofiltration BMP Surface Area	3,897	6,037	5,635	10,936	4,135	7,011	2,927	6,594	6,964	7,233	sq-ft
	7	Provided Surface Ponding Depth	24	30	12	21	12	24	6	12	60	36	inches
	8	Provided Soil Media Thickness	21	21	21	21	21	21	21	21	21	21	inches
	9	Provided Depth of Gravel Above Underdrain Invert	12	12	12	15	12	12	12	12	18	18	inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	1.40	1.80	1.70	2.60	1.17	1.77	1.00	1.90	2.80	2.00	inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3	3	3	3	3	3	3	inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	120	120	120	120	120	120	120	120	hours
	17	Volume Retained by BMP	341	528	493	957	362	613	256	577	609	633	cubic-feet
	18	Fraction of DCV Retained	0.09	0.13	0.07	0.07	0.12	0.07	0.12	0.11	0.05	0.10	ratio
	19	Portion of Retention Performance Standard Satisfied	0.11	0.15	0.08	0.08	0.14	0.08	0.14	0.13	0.06	0.12	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.05	0.07	0.04	0.04	0.07	0.04	0.07	0.06	0.03	0.06	ratio
	21	Design Capture Volume Remaining for Biofiltration	3,803	3,843	7,222	13,858	2,744	8,353	1,907	4,790	11,206	5,737	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.1115	0.1936	0.1456	0.3825	0.0692	0.1779	0.0470	0.1816	0.5872	0.2609	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	1.24	1.39	1.12	1.51	0.72	1.10	0.69	1.19	3.64	1.56	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	1.24	1.39	1.12	1.51	0.72	1.10	0.69	1.19	3.64	1.56	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	7.42	8.31	6.70	9.07	4.34	6.58	4.17	7.14	21.85	9.35	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	33.00	39.00	21.00	31.20	21.00	33.00	15.00	21.00	71.40	47.40	inches
	29	Drawdown Time for Surface Ponding	19	22	11	14	17	22	9	10	16	23	hours
	30	Drawdown Time for Effective Biofiltration Depth	27	28	19	21	29	30	22	18	20	30	hours
	31	Total Depth Biofiltered	40.42	47.31	27.70	40.27	25.34	39.58	19.17	28.14	93.25	56.75	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	5,705	5,765	10,833	20,787	4,116	12,530	2,861	7,185	16,809	8,606	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	5,705	5,765	10,833	20,787	4,116	12,530	2,861	7,185	16,809	8,606	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	2,852	2,882	5,417	10,394	2,058	6,265	1,430	3,593	8,405	4,303	cubic-feet
	35	Option 2 - Provided Storage Volume	2,852	2,882	5,417	10,394	2,058	6,265	1,430	3,593	8,405	4,303	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.5-1 General Notes:

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

Summary of Stormwater Pollutant Control Calculations (V1.3)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
General Info	0	Drainage Basin ID or Name	1	2A	2B	2C	2D	2E	2F	3A	3B	3C	unitless
	1	85th Percentile Storm Depth	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	3	Total Tributary Area	121,312	150,247	238,839	534,632	103,549	290,017	82,054	172,733	462,135	239,344	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	6,066	7,512	11,942	26,732	5,177	14,501	4,103	8,637	23,107	11,967	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.66	0.55	0.63	0.54	0.57	0.60	0.50	0.59	0.50	0.51	unitless
	6	Initial Design Capture Volume	4,003	4,132	7,523	14,435	2,951	8,701	2,051	5,096	11,553	6,103	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	80,066	82,636	150,469	288,701	59,023	174,010	41,027	101,912	231,068	122,065	square feet
	10	Final Design Capture Volume Tributary to BMP	4,003	4,132	7,523	14,435	2,951	8,701	2,051	5,096	11,553	6,103	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	200	289	301	577	207	348	144	306	347	366.18	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.05	0.07	0.04	0.04	0.07	0.04	0.07	0.06	0.03	0.06	fraction
	14	Percent of Average Annual Runoff Retention Provided	7.6%	10.7%	6.1%	6.1%	10.7%	6.1%	10.7%	9.1%	4.6%	9.1%	%
	15	Percent of Average Annual Runoff Retention Required	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	0	0	0	0	0	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summarairzed in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

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

False



## County of San Diego Automated Stormwater Pollutant Control Worksheets (Version 1.3)

### **WELCOME:**

Welcome to the County of San Diego Automated Stormwater Pollutant Control Worksheets. Priority Development Projects that are required to satisfy stormwater pollutant control performance standards set forth in the 2013 MS4 Permit may use these automated worksheets to calculate design capture volumes and determine what portion of pollutant control performance standards are satisfied by their project.

### **INSTRUCTIONS:**

**General:** To use this workbook users must navigate to the appropriate worksheet tabs and populate yellow cells with project specific information. These worksheet tabs are formatted to accommodate calculations for up to 10 drainage areas and associated BMPs. Each drainage area and/or BMP is represented as a discrete column with corresponding user inputs and calculations appearing in the rows below. Please note that projects with more than 10 drainage areas may need to use more than one workbook to accommodate their entire project. Yellow cells represent items that require user input, white cells are locked for editing and are automatically calculated, blue cells are also locked for editing and are automatically populated based on results from previous worksheet tabs, grey cells represent items that typically require user input but may be omitted based on a previous user input, orange cells represent warnings where supplemental information and/or revisions may be required for compliance, and red cells represent errors associated with proposed stormwater pollutant control measures that negatively affect compliance.

**Step 1.** Navigate to the orange tab at the bottom of the workbook and provide required inputs to determine the structural BMP types that are acceptable for implementation at the project site.

**Step 2.** Navigate to the blue tab at the bottom of the workbook and provide the required inputs to determine the design capture volume for each PDP drainage area and identify what type of BMP this area drains to. The calculations in this worksheet determine the initial design capture volume and also apply any applicable reductions associated with site design techniques including dispersion to pervious surfaces, incorporation of tree wells, and incorporation of rain barrels. Upon completion of Step 2, applicants must proceed to Step 3 to ensure that appropriate stormwater pollutant control measures are applied to this volume.

**Step 3.** Examine the green tabs at the bottom of the workbook and identify which of these BMP types are implemented by the PDP. Click the green tab for each of the proposed BMP types and provide the required user inputs to determine the portion of the pollutant control performance standards that are satisfied by the proposed BMP. After providing appropriate inputs users should verify that no red error messages appear at the bottom of their worksheets and, if necessary, refine user inputs until satisfied with the proposed stormwater pollutant control approach. Once satisfied, applicants must proceed to Step 4 to facilitate their project submittal. Note: Users must ensure that all provided inputs are adequately represented in the accompanying stormwater management plans.

**Step 4.** Navigate to the purple "Summary" tab at the bottom of this workbook and examine the sheet for warning messages highlighted in red text at the bottom of the worksheet. Once satisfied with the overall results, print the summary sheet and all applicable supporting worksheets in color, 11x17 landscape format and include in Attachment 1a of the SWQMP submittal.

### **DISCLAIMER:**

The County of San Diego has developed this tool in an effort to streamline traditionally complex efforts associated with planning, design, submittal, and review of PDPs that are subject to stormwater pollutant control requirements set forth in the 2013 MS4 Permit. While the calculations performed herein are deemed to be in compliance with Permit requirements, applicants may elect to provide their own calculations. Use of this tool is optional and the County will not be held liable for any errors or other negative impacts associated with its use. In the event that the County performs updates to these worksheets, applicants that have not established reliance on previous versions of the worksheet via discretionary approval may be required to utilize the latest version of the worksheets. A summary of version releases is included below.

### **QUESTIONS:**

-Questions relating to specific projects, submittal requirements, approval process, and/or policy-related issues should be directed your PDS Land Development Project Manager (link below).

[PDS Land Development Project Manager](#)

-General questions/comments on this worksheet may be directed to Charles Mohrlock in the County of San Diego Watershed Protection Program (link below).

[charles.mohrlock@sdcounty.ca.gov](mailto:charles.mohrlock@sdcounty.ca.gov)

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

Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	128,012	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	1,304	#
	3	Total Planted Area within Development	2,883,672	sq-ft
	4	Water Use Category for Proposed Planted Areas	Moderate	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate $\leq$ 0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate $\leq$ 0.010 Inches per Hour?	Yes	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	2,432	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	196.52	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	13,010	cubic-feet
	13	Total Anticipated Use Over 36 Hours	15,442	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.12	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

Worksheet B.3-1 General Notes:

- A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.
- B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.
- C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.
- D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.
- E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.
- F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at  $\geq$ 3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.
- G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at  $\geq$ 3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.
- H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.



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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	3D	4A	4B	5A	5B	5C	5D	6A	6B	MW1	unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	4	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	371,061	163,232	68,263	237,954	147,863	115,521	86,002	22,695	18,971	29,185	sq-ft
	5	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
	6	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)	182,965	94,931	47,553	108,558	63,370	49,509	81,700		260,300		sq-ft
	7	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	8	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	9	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	10	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces <b>Directed to Dispersion Area</b> per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces <b>Serving as Dispersion Area</b> per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces <b>Serving as Dispersion Area</b> per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in <u>Downstream</u> Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	554,026	258,163	115,816	346,512	211,233	165,030	167,702	22,695	279,271	29,185	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.64	0.61	0.57	0.65	0.66	0.66	0.51	0.90	0.15	0.90	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.64	0.61	0.57	0.65	0.66	0.66	0.51	0.90	0.15	0.90	unitless
	32	Initial Design Capture Volume	17,729	7,874	3,301	11,262	6,971	5,446	4,276	1,021	2,095	1,313	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.64	0.61	0.57	0.65	0.66	0.66	0.51	0.90	0.15	0.90	unitless
	38	Design Capture Volume After Dispersion Techniques	17,729	7,874	3,301	11,262	6,971	5,446	4,276	1,021	2,095	1,313	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.64	0.61	0.57	0.65	0.66	0.66	0.51	0.90	0.15	0.90	unitless
	42	Final Effective Tributary Area	354,577	157,479	66,015	225,233	139,414	108,920	85,528	20,426	41,891	26,267	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	17,729	7,874	3,301	11,262	6,971	5,446	4,276	1,021	2,095	1,313	cubic-feet

Worksheet B.1-1 General Notes:

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

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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
BMP Inputs	0	Drainage Basin ID or Name	3D	4A	4B	5A	5B	5C	5D	6A	6B	MW1	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	2	Effective Tributary Area	354,577	157,479	66,015	225,233	139,414	108,920	85,528	20,426	41,891	26,267	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	ratio
	4	Design Capture Volume Tributary to BMP	17,729	7,874	3,301	11,262	6,971	5,446	4,276	1,021	2,095	1,313	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	Lined	unitless
	6	Provided Biofiltration BMP Surface Area	23,810	6,159	8,153	17,846	5,303	9,484	4,888	1,480	1,260	1,868	sq-ft
	7	Provided Surface Ponding Depth	21	21	6	18	24	18	12	10	10	6	inches
	8	Provided Soil Media Thickness	21	21	21	21	21	21	21	21	21	21	inches
	9	Provided Depth of Gravel Above Underdrain Invert	15	12	12	12	12	12	15	12	12	12	inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	2.90	1.80	1.60	2.70	1.80	1.80	1.30	0.60	0.50	0.80	inches
	11	Provided Depth of Gravel Below the Underdrain	3	3	3	3	3	3	3	3	3	3	inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	120	120	120	120	120	120	120	120	120	hours
	17	Volume Retained by BMP	2,083	539	713	1,562	464	830	428	130	110	163	cubic-feet
	18	Fraction of DCV Retained	0.12	0.07	0.22	0.14	0.07	0.15	0.10	0.13	0.05	0.12	ratio
	19	Portion of Retention Performance Standard Satisfied	0.14	0.08	0.24	0.16	0.08	0.17	0.12	0.15	0.06	0.14	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.07	0.04	0.13	0.08	0.04	0.08	0.06	0.07	0.03	0.07	ratio
	21	Design Capture Volume Remaining for Biofiltration	16,488	7,559	2,872	10,361	6,692	5,010	4,019	950	2,032	1,221	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	0.4752	0.1790	0.1200	0.3894	0.1840	0.1739	0.0882	0.0178	0.0124	0.0301	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	0.86	1.26	0.64	0.94	1.50	0.79	0.78	0.52	0.42	0.70	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	0.86	1.26	0.64	0.94	1.50	0.79	0.78	0.52	0.42	0.70	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	5.17	7.53	3.81	5.66	8.99	4.75	4.67	3.12	2.55	4.18	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	31.20	30.00	15.00	27.00	33.00	27.00	22.20	19.00	19.00	15.00	inches
	29	Drawdown Time for Surface Ponding	24	17	9	19	16	23	15	19	24	9	hours
	30	Drawdown Time for Effective Biofiltration Depth	36	24	24	29	22	34	28	36	45	22	hours
	31	Total Depth Biofiltered	36.37	37.53	18.81	32.66	41.99	31.75	26.87	22.12	21.55	19.18	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	24,732	11,339	4,308	15,542	10,038	7,515	6,029	1,425	3,048	1,832	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	24,732	11,339	4,308	15,542	10,038	7,515	6,029	1,425	2,263	1,832	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	12,366	5,669	2,154	7,771	5,019	3,758	3,014	713	1,524	916	cubic-feet
	35	Option 2 - Provided Storage Volume	12,366	5,669	2,154	7,771	5,019	3,758	3,014	713	1,524	916	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Worksheet B.5-1 General Notes:

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

Summary of Stormwater Pollutant Control Calculations (V1.3)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
General Info	0	Drainage Basin ID or Name	3D	4A	4B	5A	5B	5C	5D	6A	6B	MW1	unitless
	1	85th Percentile Storm Depth	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	in/hr
	3	Total Tributary Area	554,026	258,163	115,816	346,512	211,233	165,030	167,702	22,695	279,271	29,185	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	27,701	12,908	5,791	17,326	10,562	8,252	8,385	1,135	13,964	1,459	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.64	0.61	0.57	0.65	0.66	0.66	0.51	0.90	0.15	0.90	unitless
	6	Initial Design Capture Volume	17,729	7,874	3,301	11,262	6,971	5,446	4,276	1,021	2,095	1,313	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	0	0	0	0	0	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	354,577	157,479	66,015	225,233	139,414	108,920	85,528	20,426	41,891	26,267	square feet
	10	Final Design Capture Volume Tributary to BMP	17,729	7,874	3,301	11,262	6,971	5,446	4,276	1,021	2,095	1,313	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	1,241	315	429	901	279	436	257	71	63	91.91	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.07	0.04	0.13	0.08	0.04	0.08	0.06	0.07	0.03	0.07	fraction
	14	Percent of Average Annual Runoff Retention Provided	10.7%	6.1%	18.9%	12.2%	6.1%	12.2%	9.1%	10.7%	4.6%	10.7%	%
	15	Percent of Average Annual Runoff Retention Required	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	0	0	0	0	0	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	0	0	0	0	0	cubic-feet

Summary Notes:

All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summarized in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

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

False

## County of San Diego Automated Stormwater Pollutant Control Worksheets (Version 1.3)

### **WELCOME:**

Welcome to the County of San Diego Automated Stormwater Pollutant Control Worksheets. Priority Development Projects that are required to satisfy stormwater pollutant control performance standards set forth in the 2013 MS4 Permit may use these automated worksheets to calculate design capture volumes and determine what portion of pollutant control performance standards are satisfied by their project.

### **INSTRUCTIONS:**

**General:** To use this workbook users must navigate to the appropriate worksheet tabs and populate yellow cells with project specific information. These worksheet tabs are formatted to accommodate calculations for up to 10 drainage areas and associated BMPs. Each drainage area and/or BMP is represented as a discrete column with corresponding user inputs and calculations appearing in the rows below. Please note that projects with more than 10 drainage areas may need to use more than one workbook to accommodate their entire project. Yellow cells represent items that require user input, white cells are locked for editing and are automatically calculated, blue cells are also locked for editing and are automatically populated based on results from previous worksheet tabs, grey cells represent items that typically require user input but may be omitted based on a previous user input, orange cells represent warnings where supplemental information and/or revisions may be required for compliance, and red cells represent errors associated with proposed stormwater pollutant control measures that negatively affect compliance.

**Step 1.** Navigate to the orange tab at the bottom of the workbook and provide required inputs to determine the structural BMP types that are acceptable for implementation at the project site.

**Step 2.** Navigate to the blue tab at the bottom of the workbook and provide the required inputs to determine the design capture volume for each PDP drainage area and identify what type of BMP this area drains to. The calculations in this worksheet determine the initial design capture volume and also apply any applicable reductions associated with site design techniques including dispersion to pervious surfaces, incorporation of tree wells, and incorporation of rain barrels. Upon completion of Step 2, applicants must proceed to Step 3 to ensure that appropriate stormwater pollutant control measures are applied to this volume.

**Step 3.** Examine the green tabs at the bottom of the workbook and identify which of these BMP types are implemented by the PDP. Click the green tab for each of the proposed BMP types and provide the required user inputs to determine the portion of the pollutant control performance standards that are satisfied by the proposed BMP. After providing appropriate inputs users should verify that no red error messages appear at the bottom of their worksheets and, if necessary, refine user inputs until satisfied with the proposed stormwater pollutant control approach. Once satisfied, applicants must proceed to Step 4 to facilitate their project submittal. Note: Users must ensure that all provided inputs are adequately represented in the accompanying stormwater management plans.

**Step 4.** Navigate to the purple "Summary" tab at the bottom of this workbook and examine the sheet for warning messages highlighted in red text at the bottom of the worksheet. Once satisfied with the overall results, print the summary sheet and all applicable supporting worksheets in color, 11x17 landscape format and include in Attachment 1a of the SWQMP submittal.

### **DISCLAIMER:**

The County of San Diego has developed this tool in an effort to streamline traditionally complex efforts associated with planning, design, submittal, and review of PDPs that are subject to stormwater pollutant control requirements set forth in the 2013 MS4 Permit. While the calculations performed herein are deemed to be in compliance with Permit requirements, applicants may elect to provide their own calculations. Use of this tool is optional and the County will not be held liable for any errors or other negative impacts associated with its use. In the event that the County performs updates to these worksheets, applicants that have not established reliance on previous versions of the worksheet via discretionary approval may be required to utilize the latest version of the worksheets. A summary of version releases is included below.

### **QUESTIONS:**

-Questions relating to specific projects, submittal requirements, approval process, and/or policy-related issues should be directed your PDS Land Development Project Manager (link below).

[PDS Land Development Project Manager](#)

-General questions/comments on this worksheet may be directed to Charles Mohrlock in the County of San Diego Watershed Protection Program (link below).

[charles.mohrlock@sdcounty.ca.gov](mailto:charles.mohrlock@sdcounty.ca.gov)

Automated Worksheet B.3-1: Project-Scale BMP Feasibility Analysis (V1.3)				
Category	#	Description	Value	Units
Capture & Use Inputs	0	Design Capture Volume for Entire Project Site	128,012	cubic-feet
	1	Proposed Development Type	Residential	unitless
	2	Number of Residents or Employees at Proposed Development	1,304	#
	3	Total Planted Area within Development	2,883,672	sq-ft
	4	Water Use Category for Proposed Planted Areas	Moderate	unitless
Infiltration Inputs	5	Is Average Site Design Infiltration Rate $\leq$ 0.500 Inches per Hour?	Yes	yes/no
	6	Is Average Site Design Infiltration Rate $\leq$ 0.010 Inches per Hour?	Yes	yes/no
	7	Is Infiltration of the Full DCV Anticipated to Produce Negative Impacts?	Yes	yes/no
	8	Is Infiltration of Any Volume Anticipated to Produce Negative Impacts?	Yes	yes/no
Calculations	9	36-Hour Toilet Use Per Resident or Employee	1.86	cubic-feet
	10	Subtotal: Anticipated 36 Hour Toilet Use	2,432	cubic-feet
	11	Anticipated 1 Acre Landscape Use Over 36 Hours	196.52	cubic-feet
	12	Subtotal: Anticipated Landscape Use Over 36 Hours	13,010	cubic-feet
	13	Total Anticipated Use Over 36 Hours	15,442	cubic-feet
	14	Total Anticipated Use / Design Capture Volume	0.12	cubic-feet
	15	Are Full Capture and Use Techniques Feasible for this Project?	No	unitless
	16	Is Full Retention Feasible for this Project?	No	yes/no
	17	Is Partial Retention Feasible for this Project?	No	yes/no
Result	18	Feasibility Category	5	1, 2, 3, 4, 5

- Worksheet B.3-1 General Notes:**
- A. Applicants may use this worksheet to determine the types of structural BMPs that are acceptable for implementation at their project site (as required in Section 5 of the BMPDM). User input should be provided for yellow shaded cells, values for all other cells will be automatically generated. Projects demonstrating feasibility or potential feasibility via this worksheet are encouraged to incorporate capture and use features in their project.
- B. Negative impacts associated with retention may include geotechnical, groundwater, water balance, or other issues identified by a geotechnical engineer and substantiated through completion of Form I-8.
- C. Feasibility Category 1: Applicant must implement capture & use, retention, and/or infiltration elements for the entire DCV.
- D. Feasibility Category 2: Applicant must implement capture & use elements for the entire DCV.
- E. Feasibility Category 3: Applicant must implement retention and/or infiltration elements for all DMAs with Design Infiltration Rates greater than 0.50 in/hr.
- F. Feasibility Category 4: Applicant must implement standard unlined biofiltration BMPs sized at  $\geq$ 3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.011 to 0.50 in/hr. Applicants may be permitted to implement lined BMPs, reduced size BMPs, and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.
- G. Feasibility Category 5: Applicant must implement standard lined biofiltration BMPs sized at  $\geq$ 3% of the effective impervious tributary area for all DMAs with Design Infiltration Rates of 0.010 in/hr or less. Applicants may also be permitted to implement reduced size and/or specialized biofiltration BMPs provided additional criteria identified in "Supplemental Retention Criteria for Non-Standard Biofiltration BMPs" are satisfied.
- H. PDPs participating in an offsite alternative compliance program are not held to the feasibility categories presented herein.



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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	MW2	CC1	CC2	CC3	HV						unitless
	1	Basin Drains to the Following BMP Type	Biofiltration	Retention	Biofiltration	Biofiltration	Retention	Biofiltration	Biofiltration	Biofiltration	Biofiltration	Biofiltration	unitless
	2	85th Percentile 24-hr Storm Depth	0.60	0.60	0.60	0.60	0.60						inches
	3	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.200	0.000	0.000	0.200						in/hr
	4	Impervious Surfaces <u>Not Directed to Dispersion Area</u> (C=0.90)	37,026	3,450	3,217	7,435	22,708						sq-ft
	5	Semi-Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.30)					4,000						sq-ft
	6	Engineered Pervious Surfaces <u>Not Serving as Dispersion Area</u> (C=0.10)			6,922	6,735							sq-ft
	7	Natural Type A Soil <u>Not Serving as Dispersion Area</u> (C=0.10)											sq-ft
	8	Natural Type B Soil <u>Not Serving as Dispersion Area</u> (C=0.14)											sq-ft
	9	Natural Type C Soil <u>Not Serving as Dispersion Area</u> (C=0.23)											sq-ft
	10	Natural Type D Soil <u>Not Serving as Dispersion Area</u> (C=0.30)											sq-ft
Dispersion Area, Tree Well & Rain Barrel Inputs (Optional)	11	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	No	No	No	No	No	No	No	No	No	No	yes/no
	12	Impervious Surfaces <b>Directed to Dispersion Area</b> per SD-B (Ci=0.90)											sq-ft
	13	Semi-Pervious Surfaces <b>Serving as Dispersion Area</b> per SD-B (Ci=0.30)											sq-ft
	14	Engineered Pervious Surfaces <b>Serving as Dispersion Area</b> per SD-B (Ci=0.10)											sq-ft
	15	Natural Type A Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.10)											sq-ft
	16	Natural Type B Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.14)											sq-ft
	17	Natural Type C Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.23)											sq-ft
	18	Natural Type D Soil <b>Serving as Dispersion Area</b> per SD-B (Ci=0.30)											sq-ft
	19	Number of Tree Wells Proposed per SD-A											#
	20	Average Mature Tree Canopy Diameter											ft
	21	Number of Rain Barrels Proposed per SD-E											#
	22	Average Rain Barrel Size											gal
Treatment Train Inputs & Calculations	23	Does BMP Overflow to Stormwater Features in <u>Downstream</u> Drainage?	No	No	No	No	No	No	No	No	No	No	unitless
	24	Identify Downstream Drainage Basin Providing Treatment in Series											unitless
	25	Percent of Upstream Flows Directed to Downstream Dispersion Areas											percent
	26	Upstream Impervious Surfaces Directed to Dispersion Area (Ci=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
	27	Upstream Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	0	0	0	0	0	0	0	0	0	0	cubic-feet
Initial Runoff Factor Calculation	28	Total Tributary Area	37,026	3,450	10,139	14,170	26,708	0	0	0	0	0	sq-ft
	29	Initial Runoff Factor for Standard Drainage Areas	0.90	0.90	0.35	0.52	0.81	0.00	0.00	0.00	0.00	0.00	unitless
	30	Initial Runoff Factor for Dispersed & Dispersion Areas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	31	Initial Weighted Runoff Factor	0.90	0.90	0.35	0.52	0.81	0.00	0.00	0.00	0.00	0.00	unitless
	32	Initial Design Capture Volume	1,666	155	177	368	1,082	0	0	0	0	0	cubic-feet
Dispersion Area Adjustments	33	Total Impervious Area Dispersed to Pervious Surface	0	0	0	0	0	0	0	0	0	0	sq-ft
	34	Total Pervious Dispersion Area	0	0	0	0	0	0	0	0	0	0	sq-ft
	35	Ratio of Dispersed Impervious Area to Pervious Dispersion Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ratio
	36	Adjustment Factor for Dispersed & Dispersion Areas	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	ratio
	37	Runoff Factor After Dispersion Techniques	0.90	0.90	0.35	0.52	0.81	n/a	n/a	n/a	n/a	n/a	unitless
	38	Design Capture Volume After Dispersion Techniques	1,666	155	177	368	1,082	0	0	0	0	0	cubic-feet
Tree & Barrel Adjustments	39	Total Tree Well Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
	40	Total Rain Barrel Volume Reduction	0	0	0	0	0	0	0	0	0	0	cubic-feet
Results	41	Final Adjusted Runoff Factor	0.90	0.90	0.35	0.52	0.81	0.00	0.00	0.00	0.00	0.00	unitless
	42	Final Effective Tributary Area	33,323	3,105	3,549	7,368	21,633	0	0	0	0	0	sq-ft
	43	Initial Design Capture Volume Retained by Site Design Elements	0	0	0	0	0	0	0	0	0	0	cubic-feet
	44	Final Design Capture Volume Tributary to BMP	1,666	155	177	368	1,082	0	0	0	0	0	cubic-feet

Worksheet B.1-1 General Notes:

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

Automated Worksheet B.4-1: Sizing Retention BMPs (V1.3)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
BMP Inputs	0	Drainage Basin ID or Name	-	CC1	-	-	HV	-	-	-	-	-	unitless
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	-	0.200	-	-	0.200	-	-	-	-	-	in/hr
	2	Design Capture Volume Tributary to BMP	-	155	-	-	1,082	-	-	-	-	-	cubic-feet
	3	Is Retention BMP Vegetated or Non-Vegetated?		Vegetated			Non-Vegetated						unitless
	4	Provided Surface Area		450			4,000						sq-ft
	5	Provided Surface Ponding Depth		4.8			0						inches
	6	Provided Soil Media Thickness		18			0						inches
	7	Provided Gravel Storage Thickness		18			6						inches
Infiltration Calculations	8	Volume Infiltrated Over 6 Hour Storm	0	45	0	0	400	0	0	0	0	0	cubic-feet
	9	Soil Media Pore Space	0.40	0.25	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	10	Gravel Pore Space	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	unitless
	11	Effective Depth of Retention Storage	0.0	16.5	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	inches
	12	Drawdown Time for Surface Ponding (Post-Storm)	0	24	0	0	0	0	0	0	0	0	hours
	13	Drawdown Time for Entire Basin (Including 6 Hour Storm)	0	89	0	0	18	0	0	0	0	0	hours
	14	Volume Retained by BMP	0	664	0	0	1,200	0	0	0	0	0	cubic-feet
	15	Fraction of DCV Retained	0.00	3.00	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00	ratio
	16	Percentage of Performance Requirement Satisfied	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	ratio
	17	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	ratio
	18	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
Result	19	Deficit of Effectively Treated Stormwater	n/a	0	n/a	n/a	0	n/a	n/a	n/a	n/a	n/a	cubic-feet

**Worksheet B.4-1 General Notes:**

A. Applicants may use this worksheet to size Infiltration, Bioretention, and/or Permeable Pavement BMPs (INF-1, INF-2, INF-3) for up to 10 basins. User input must be provided for yellow shaded cells, values for blue cells are automatically populated based on user inputs from previous worksheets, values for all other cells will be automatically generated, errors/notifications will be highlighted in red/orange and summarized below. BMPs fully satisfying the pollutant control performance standards will have a deficit treated volume of zero and be highlighted in green.

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

Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
BMP Inputs	0	Drainage Basin ID or Name	MW2	-	CC2	CC3	-	-	-	-	-	-	sq-ft
	1	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	-	0.000	0.000	-	-	-	-	-	-	in/hr
	2	Effective Tributary Area	33,323	-	3,549	7,368	-	-	-	-	-	-	sq-ft
	3	Minimum Biofiltration Footprint Sizing Factor	0.030	-	0.030	0.030	-	-	-	-	-	-	ratio
	4	Design Capture Volume Tributary to BMP	1,666	-	177	368	-	-	-	-	-	-	cubic-feet
	5	Is Biofiltration Basin Impermeably Lined or Unlined?	Lined		Lined	Lined							unitless
	6	Provided Biofiltration BMP Surface Area	2,095		514	1,085							sq-ft
	7	Provided Surface Ponding Depth	10		10	10							inches
	8	Provided Soil Media Thickness	21		21	21							inches
	9	Provided Depth of Gravel Above Underdrain Invert	18		18	18							inches
	10	Diameter of Underdrain or Hydromod Orifice (Select Smallest)	5.00		0.40	0.50							inches
	11	Provided Depth of Gravel Below the Underdrain	3		3	3							inches
Retention Calculations	12	Volume Infiltrated Over 6 Hour Storm	0	0	0	0	0	0	0	0	0	0	cubic-feet
	13	Soil Media Pore Space Available for Retention	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	unitless
	14	Gravel Pore Space Available for Retention	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	unitless
	15	Effective Retention Depth	1.05	0.00	1.05	1.05	0.00	0.00	0.00	0.00	0.00	0.00	inches
	16	Calculated Retention Storage Drawdown (Including 6 Hr Storm)	120	0	120	120	0	0	0	0	0	0	hours
	17	Volume Retained by BMP	183	0	45	95	0	0	0	0	0	0	cubic-feet
	18	Fraction of DCV Retained	0.11	0.00	0.25	0.26	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	19	Portion of Retention Performance Standard Satisfied	0.13	0.00	0.26	0.27	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	20	Fraction of DCV Retained (normalized to 36-hr drawdown)	0.06	0.00	0.14	0.15	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	21	Design Capture Volume Remaining for Biofiltration	1,566	0	152	313	0	0	0	0	0	0	cubic-feet
Biofiltration Calculations	22	Max Hydromod Flow Rate through Underdrain	1.2924	n/a	0.0085	0.0132	n/a	n/a	n/a	n/a	n/a	n/a	CFS
	23	Max Soil Filtration Rate Allowed by Underdrain Orifice	26.65	n/a	0.71	0.53	n/a	n/a	n/a	n/a	n/a	n/a	in/hr
	24	Soil Media Filtration Rate per Specifications	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	25	Soil Media Filtration Rate to be used for Sizing	5.00	5.00	0.71	0.53	5.00	5.00	5.00	5.00	5.00	5.00	in/hr
	26	Depth Biofiltered Over 6 Hour Storm	30.00	30.00	4.27	3.16	30.00	30.00	30.00	30.00	30.00	30.00	inches
	27	Soil Media Pore Space Available for Biofiltration	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	unitless
	28	Effective Depth of Biofiltration Storage	21.40	0.00	21.40	21.40	0.00	0.00	0.00	0.00	0.00	0.00	inches
	29	Drawdown Time for Surface Ponding	2	0	14	19	0	0	0	0	0	0	hours
	30	Drawdown Time for Effective Biofiltration Depth	4	0	30	41	0	0	0	0	0	0	hours
	31	Total Depth Biofiltered	51.40	30.00	25.67	24.56	30.00	30.00	30.00	30.00	30.00	30.00	inches
	32	Option 1 - Biofilter 1.50 DCV: Target Volume	2,349	0	228	470	0	0	0	0	0	0	cubic-feet
	33	Option 1 - Provided Biofiltration Volume	2,349	0	228	470	0	0	0	0	0	0	cubic-feet
	34	Option 2 - Store 0.75 DCV: Target Volume	1,175	0	114	235	0	0	0	0	0	0	cubic-feet
	35	Option 2 - Provided Storage Volume	1,175	0	114	235	0	0	0	0	0	0	cubic-feet
	36	Portion of Biofiltration Performance Standard Satisfied	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
Result	37	Do Site Design Elements and BMPs Satisfy Annual Retention Requirements?	Yes	-	Yes	Yes	-	-	-	-	-	-	yes/no
	38	Overall Portion of Performance Standard Satisfied	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	ratio
	39	This BMP Overflows to the Following Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	40	Deficit of Effectively Treated Stormwater	0	n/a	0	0	n/a	n/a	n/a	n/a	n/a	n/a	cubic-feet

Worksheet B.5-1 General Notes:

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



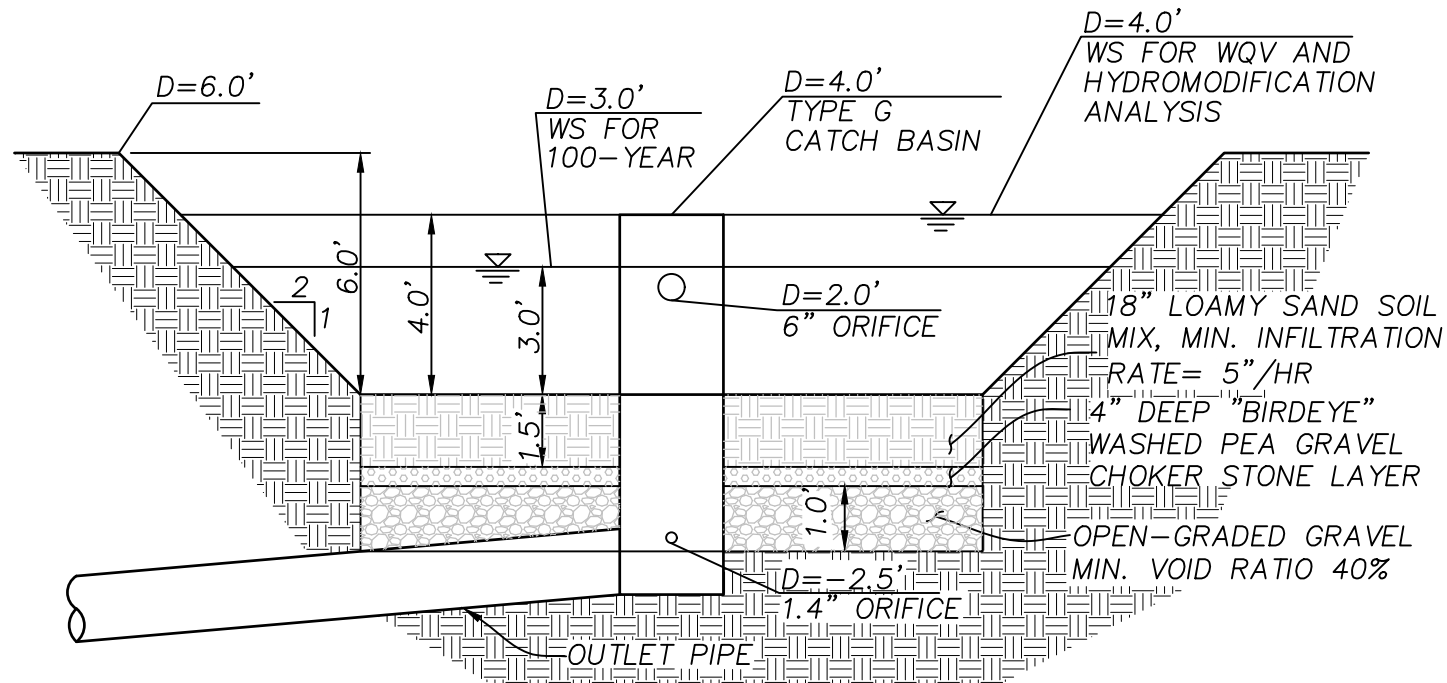
Summary of Stormwater Pollutant Control Calculations (V1.3)													
Category	#	Description	<i>i</i>	<i>ii</i>	<i>iii</i>	<i>iv</i>	<i>v</i>	<i>vi</i>	<i>vii</i>	<i>viii</i>	<i>ix</i>	<i>x</i>	Units
General Info	0	Drainage Basin ID or Name	MW2	CC1	CC2	CC3	HV	-	-	-	-	-	unitless
	1	85th Percentile Storm Depth	0.60	0.60	0.60	0.60	0.60	-	-	-	-	-	inches
	2	Design Infiltration Rate Recommended by Geotechnical Engineer	0.000	0.200	0.000	0.000	0.200	-	-	-	-	-	in/hr
	3	Total Tributary Area	37,026	3,450	10,139	14,170	26,708	-	-	-	-	-	sq-ft
	4	85th Percentile Storm Volume (Rainfall Volume)	1,851	173	507	709	1,335	-	-	-	-	-	cubic-feet
Initial DCV	5	Initial Weighted Runoff Factor	0.90	0.90	0.35	0.52	0.81	-	-	-	-	-	unitless
	6	Initial Design Capture Volume	1,666	155	177	368	1,082	-	-	-	-	-	cubic-feet
Site Design Volume Reductions	7	Dispersion Area Reductions	0	0	0	0	0	-	-	-	-	-	cubic-feet
	8	Tree Well and Rain Barrel Reductions	0	0	0	0	0	-	-	-	-	-	cubic-feet
BMP Volume Reductions	9	Effective Area Tributary to BMP	33,323	3,105	3,549	7,368	21,633	-	-	-	-	-	square feet
	10	Final Design Capture Volume Tributary to BMP	1,666	155	177	368	1,082	-	-	-	-	-	cubic-feet
	11	Basin Drains to the Following BMP Type	Biofiltration	Retention	Biofiltration	Biofiltration	Retention	-	-	-	-	-	unitless
	12	Volume Retained by BMP (normalized to 36 hour drawdown)	100	155	25	55	1,082	-	-	-	-	-	cubic-feet
Total Volume Reductions	13	Total Fraction of Initial DCV Retained within DMA	0.06	1.00	0.14	0.15	1.00	-	-	-	-	-	fraction
	14	Percent of Average Annual Runoff Retention Provided	9.1%	80.4%	20.1%	21.4%	80.4%	-	-	-	-	-	%
	15	Percent of Average Annual Runoff Retention Required	4.5%	37.0%	4.5%	4.5%	37.0%	-	-	-	-	-	%
Performance Standard	16	Percent of Pollution Control Standard Satisfied	100.0%	100.0%	100.0%	100.0%	100.0%	-	-	-	-	-	%
Treatment Train	17	Discharges to Secondary Treatment in Drainage Basin	-	-	-	-	-	-	-	-	-	-	unitless
	18	Impervious Surface Area Still Requiring Treatment	0	0	0	0	0	-	-	-	-	-	square feet
	19	Impervious Surfaces Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
	20	Impervious Surfaces Not Directed to Downstream Dispersion Area	-	-	-	-	-	-	-	-	-	-	square feet
Result	21	Deficit of Effectively Treated Stormwater	0	0	0	0	0	-	-	-	-	-	cubic-feet

Summary Notes:

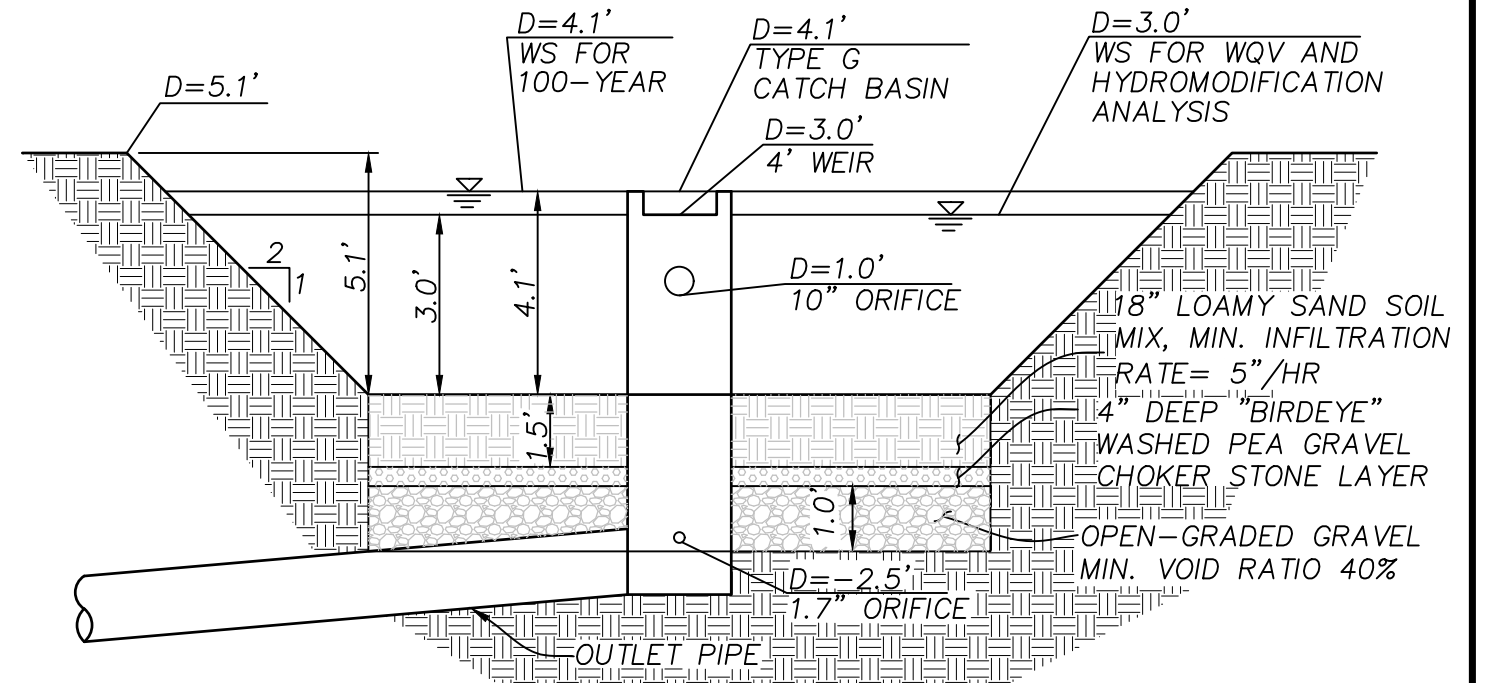
All fields in this summary worksheet are populated based on previous user inputs. If applicable, drainage basin elements that require revisions and/or supplemental information outside the scope of these worksheets are highlighted in orange and summarizred in the red text below. If all drainage basins achieve full compliance without a need for supplemental information, a green message will appear below.

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

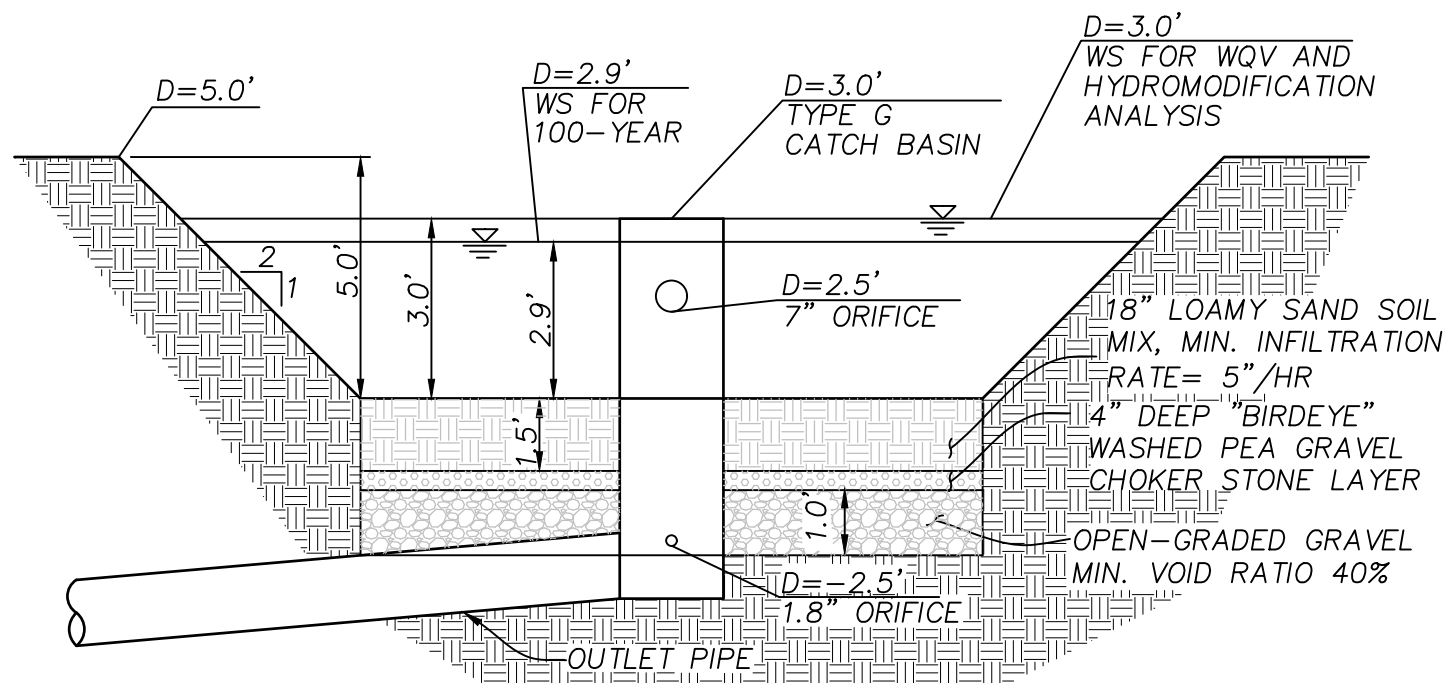
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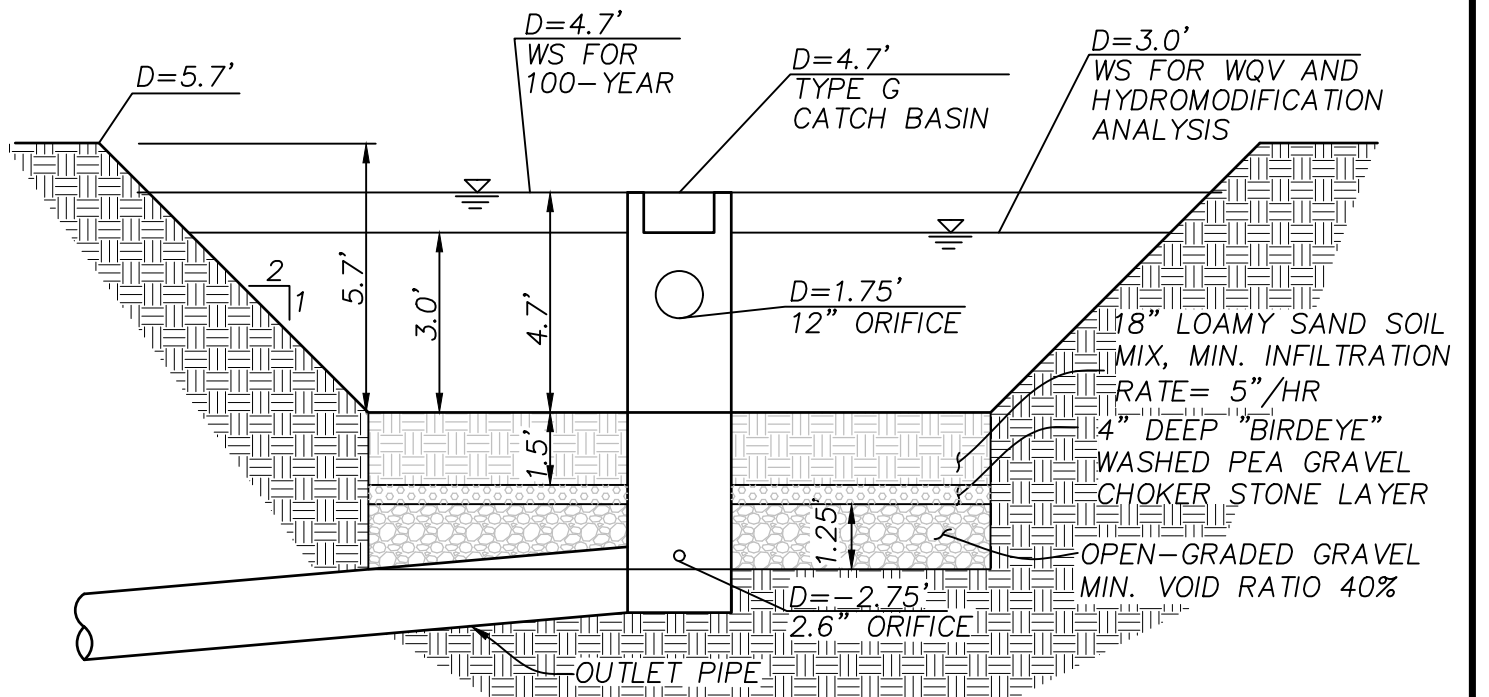
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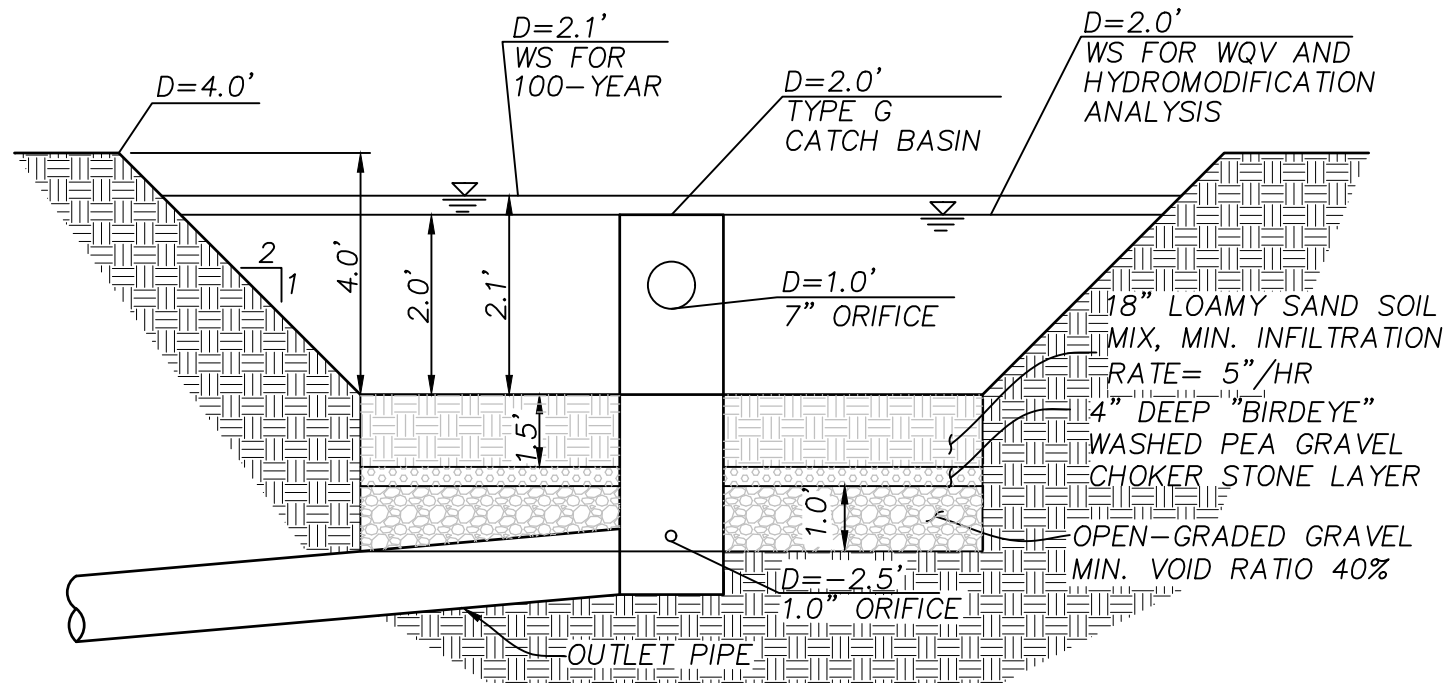
**DMA 2B**



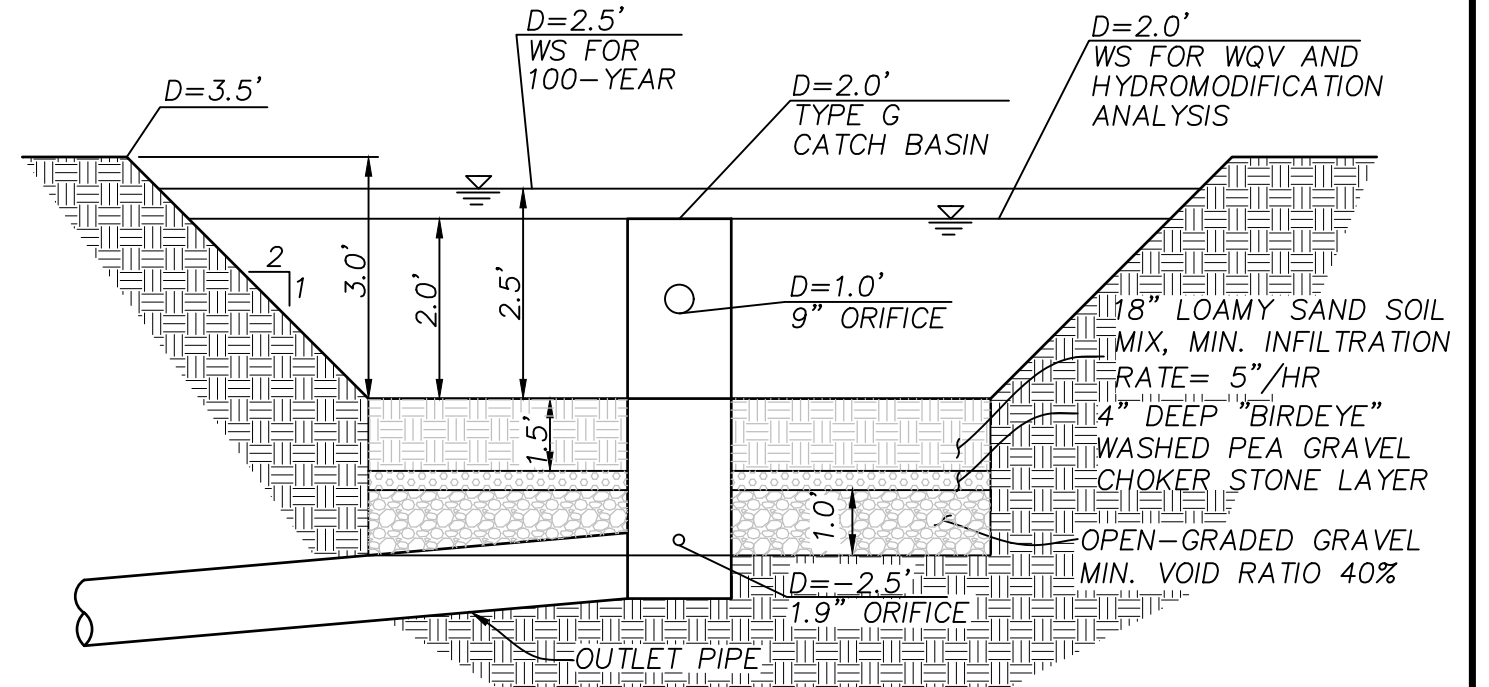
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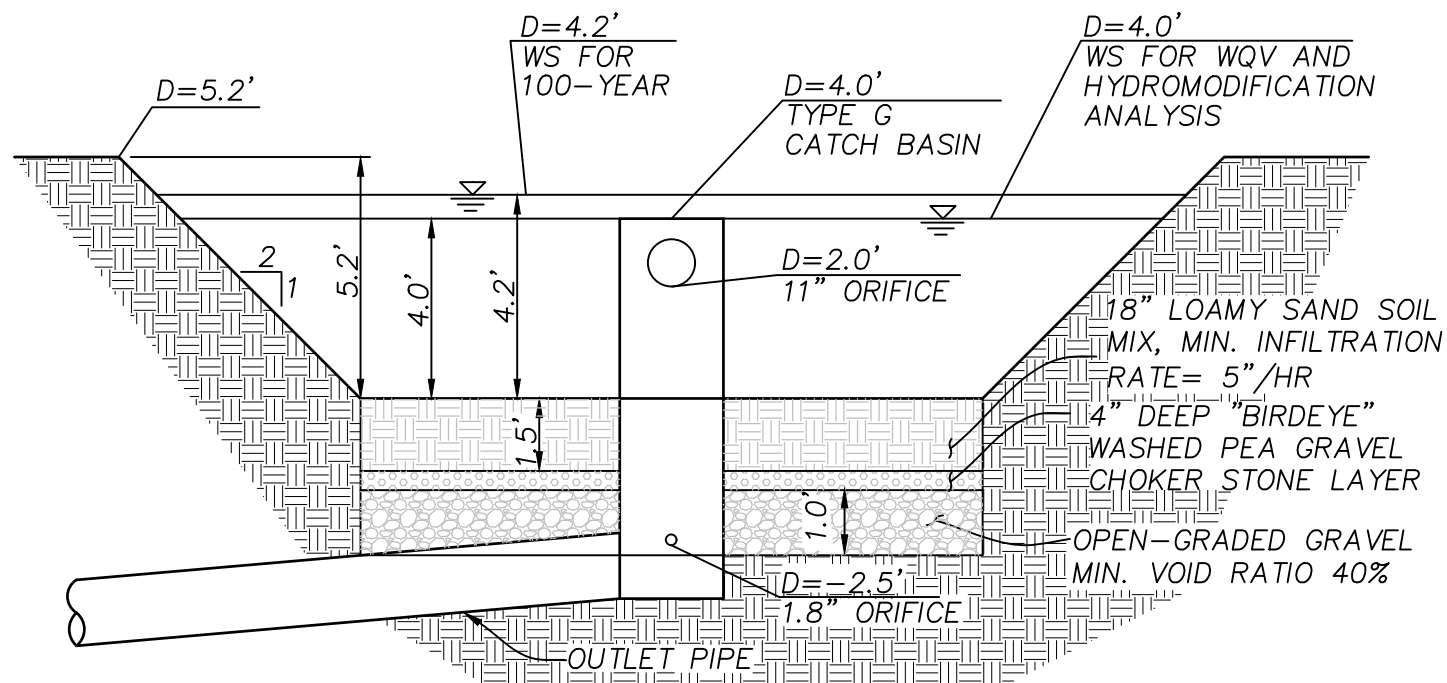
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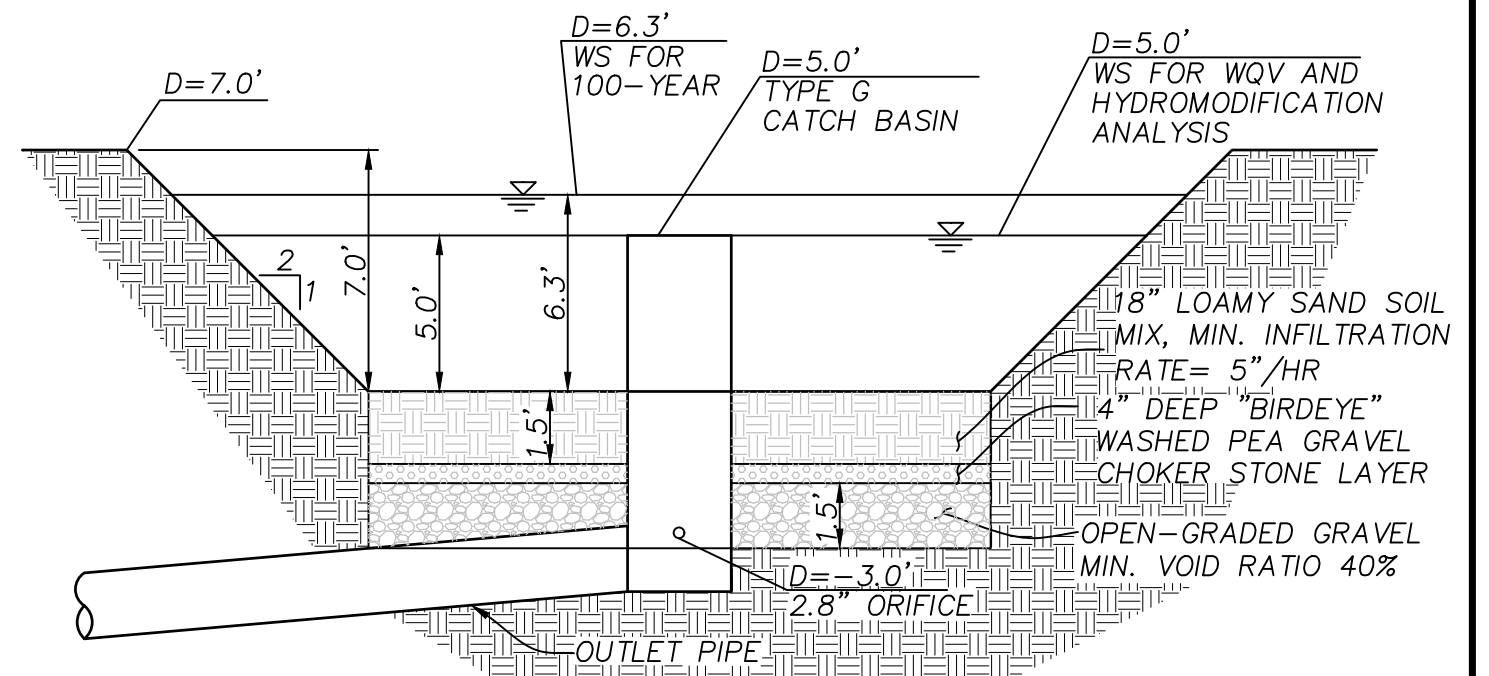
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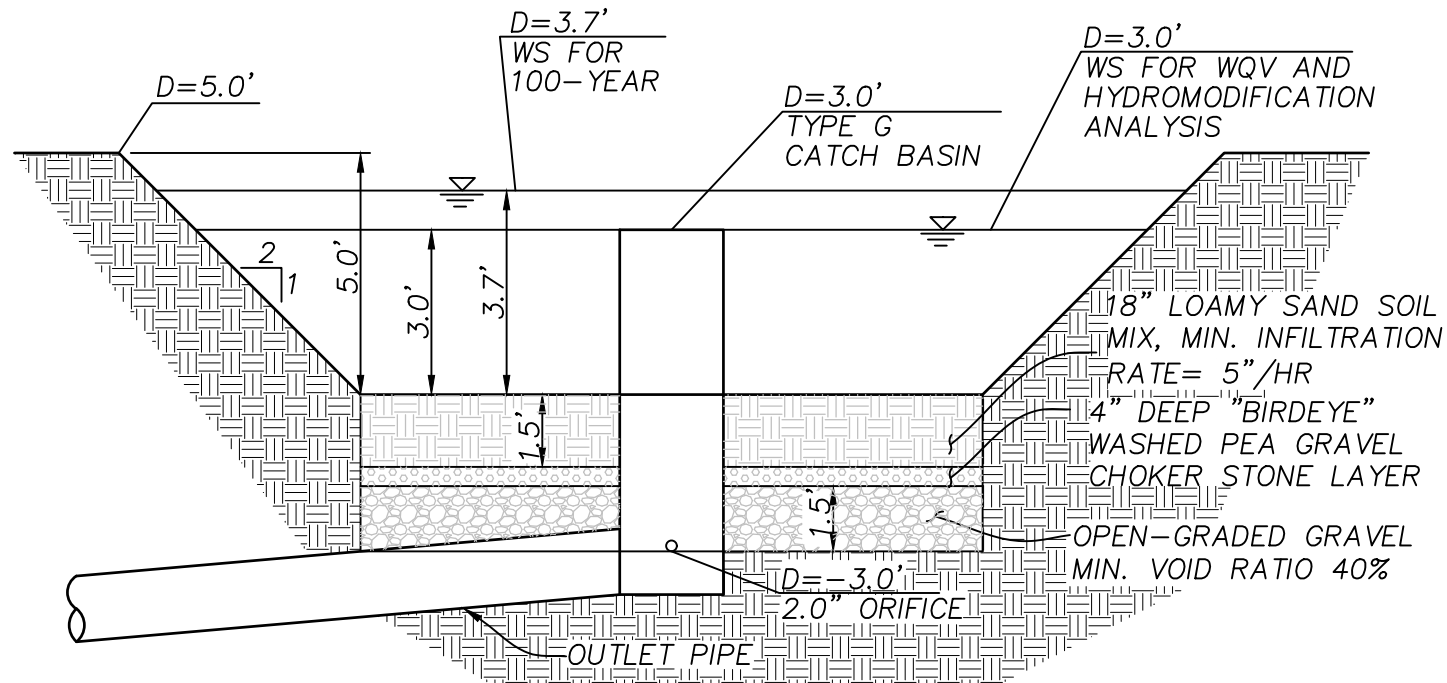
**DMA 3A**



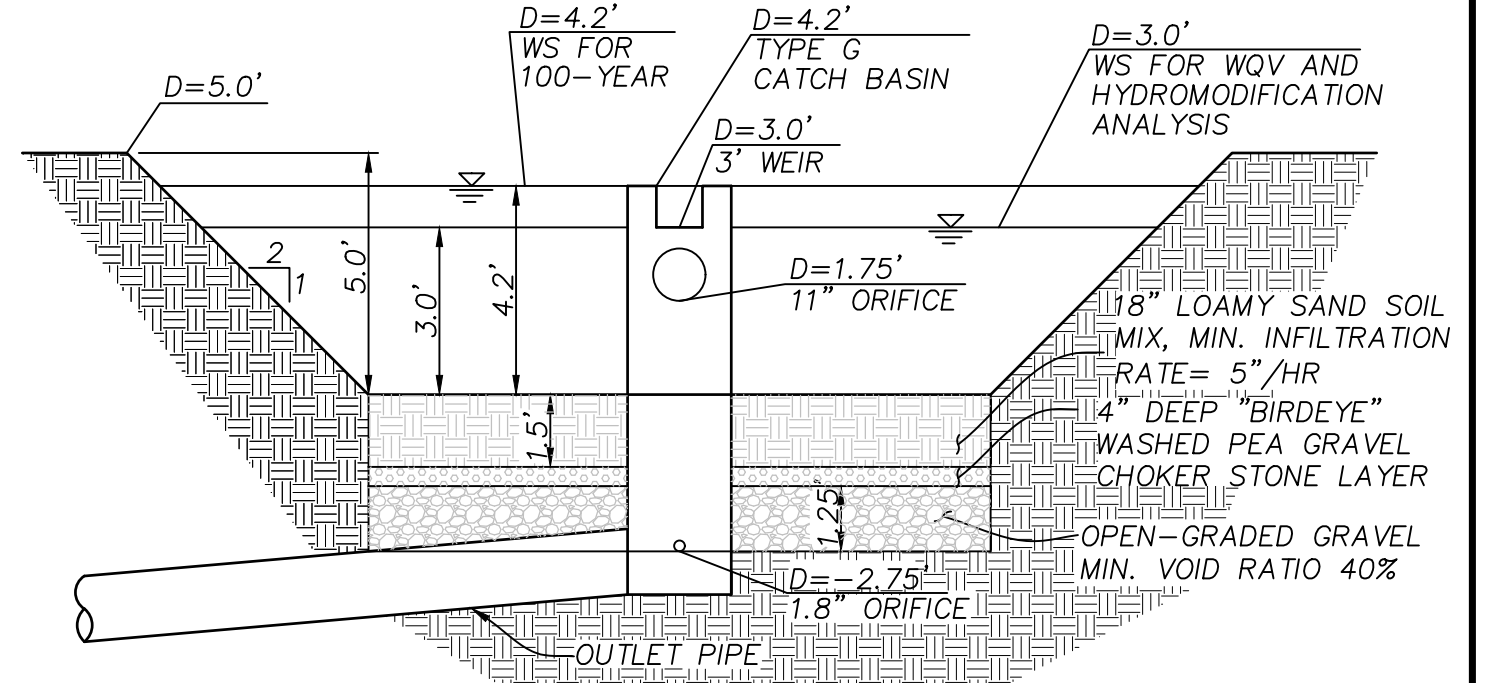
**DMA 2E**



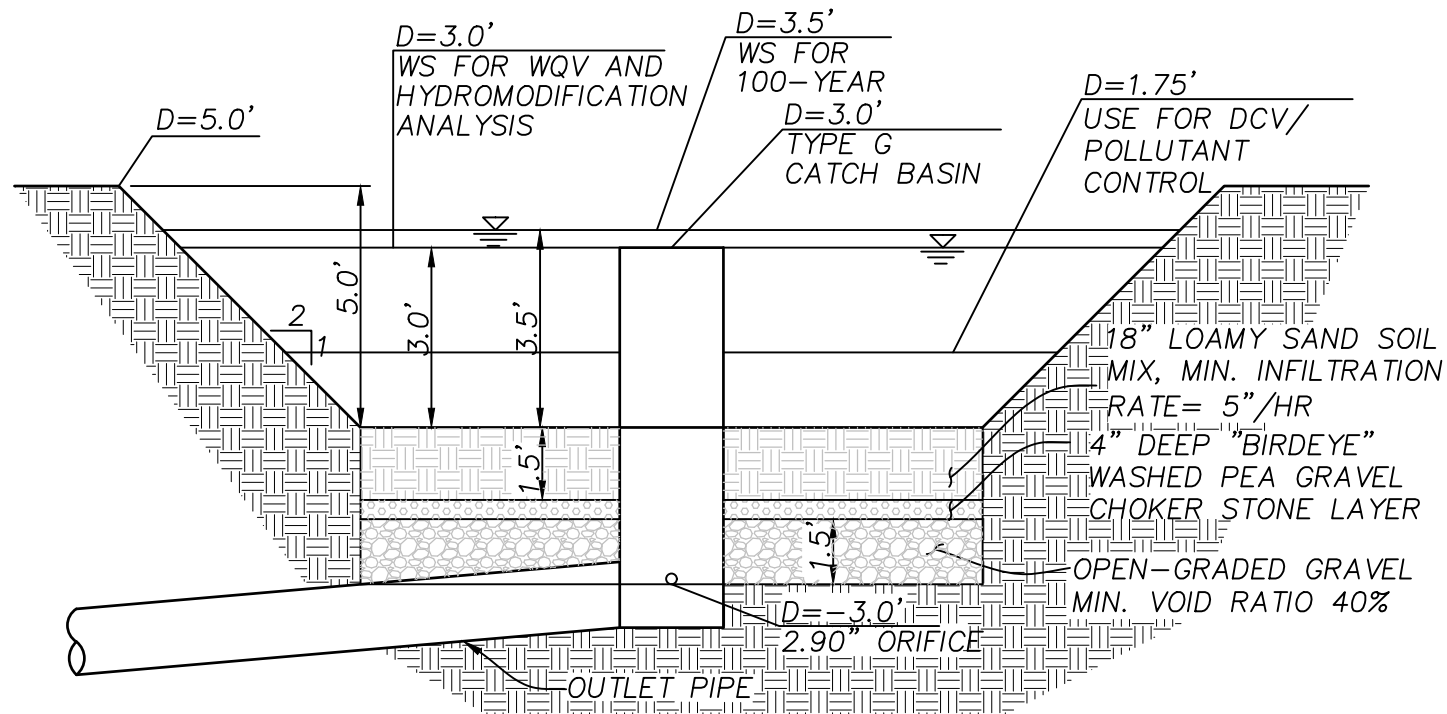
**DMA 3B**



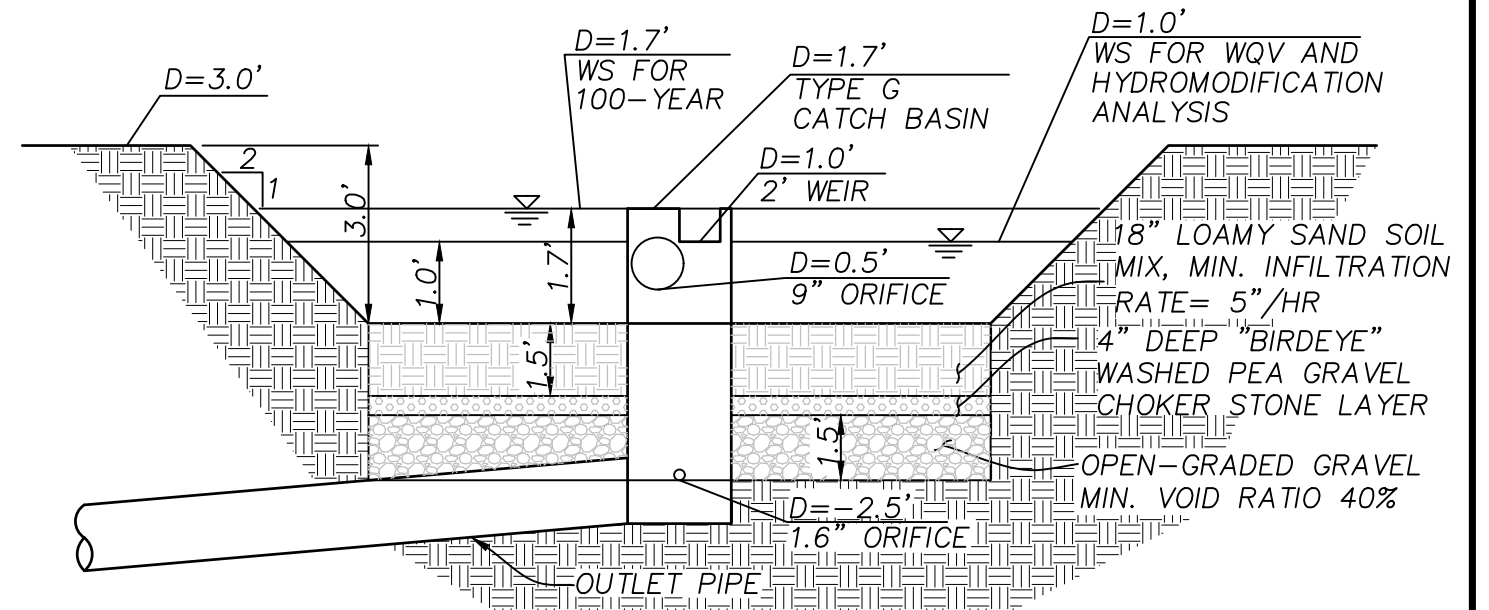
**DMA 3C**



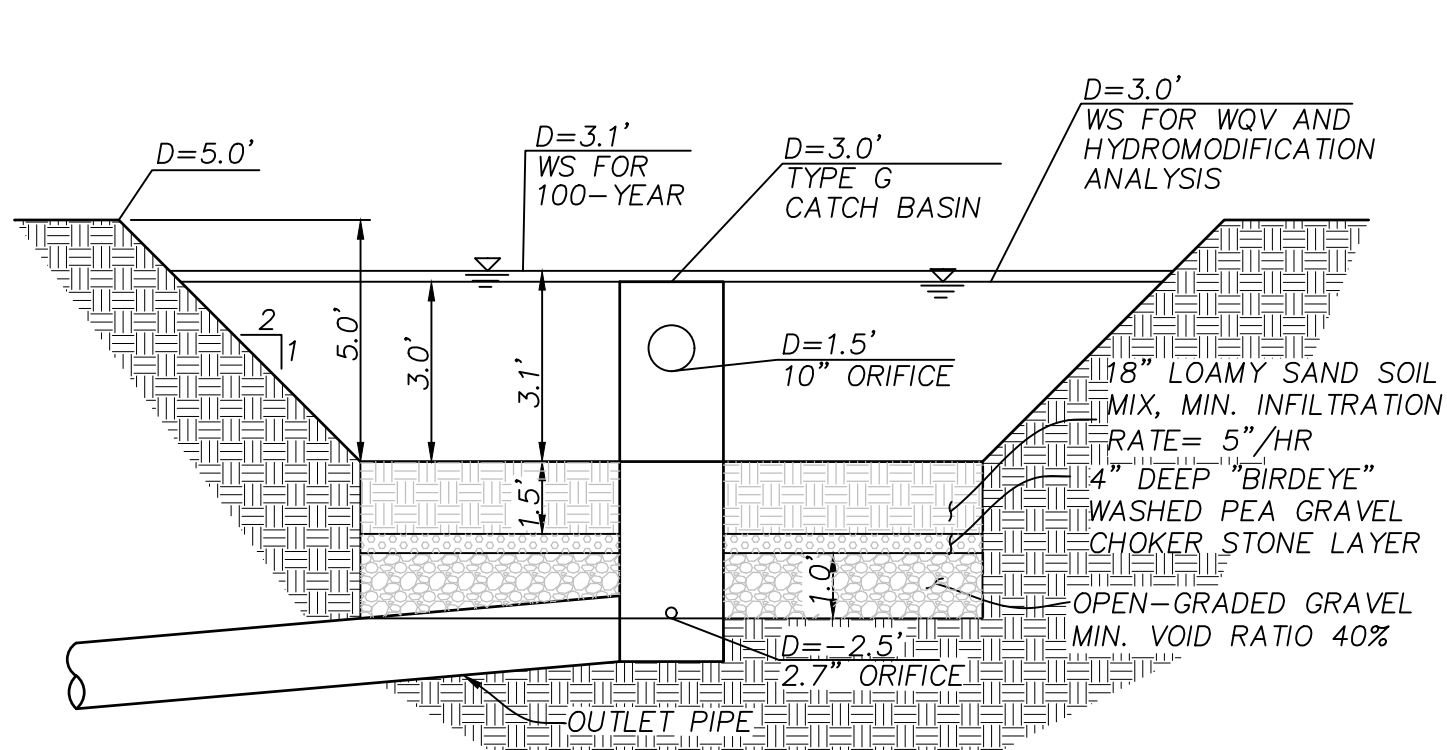
**DMA 4A**



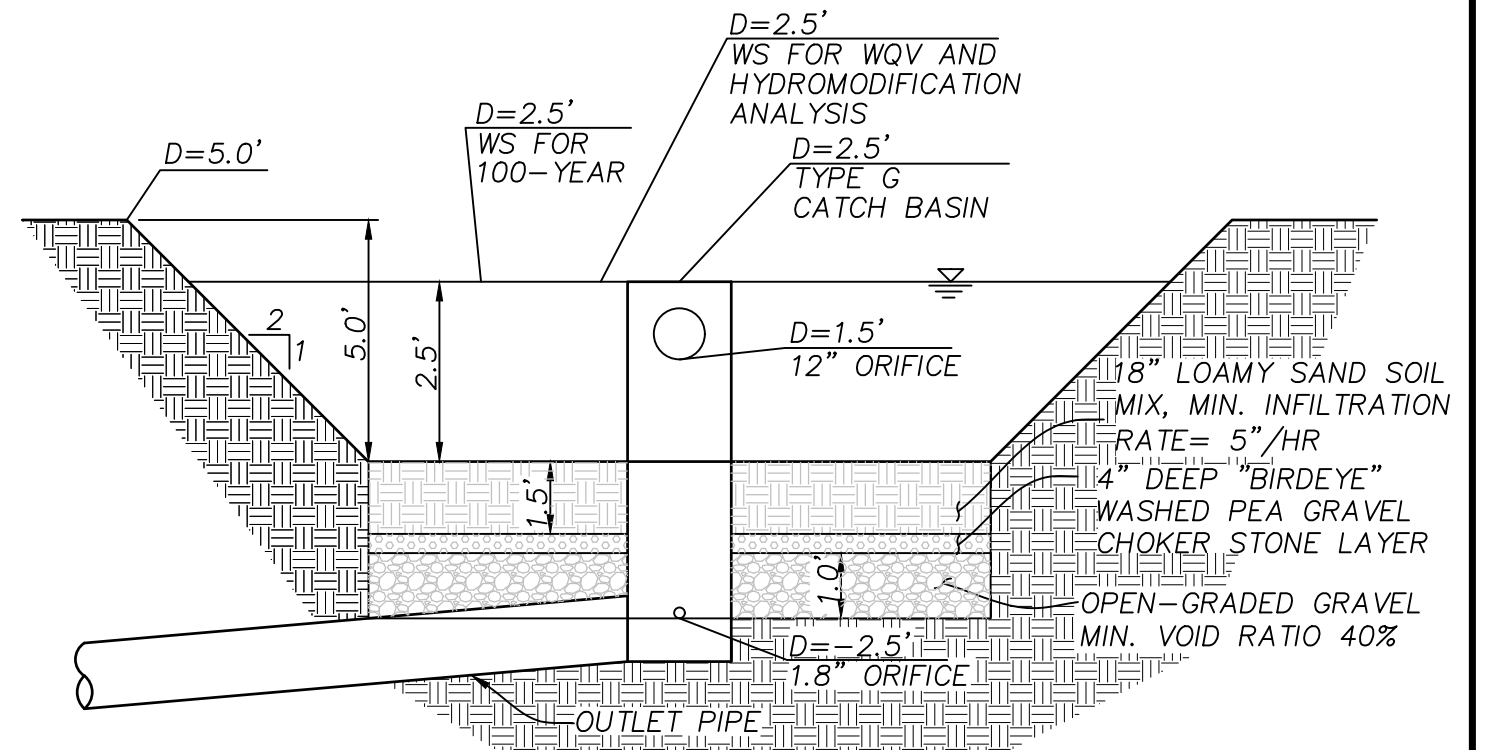
**DMA 3D**



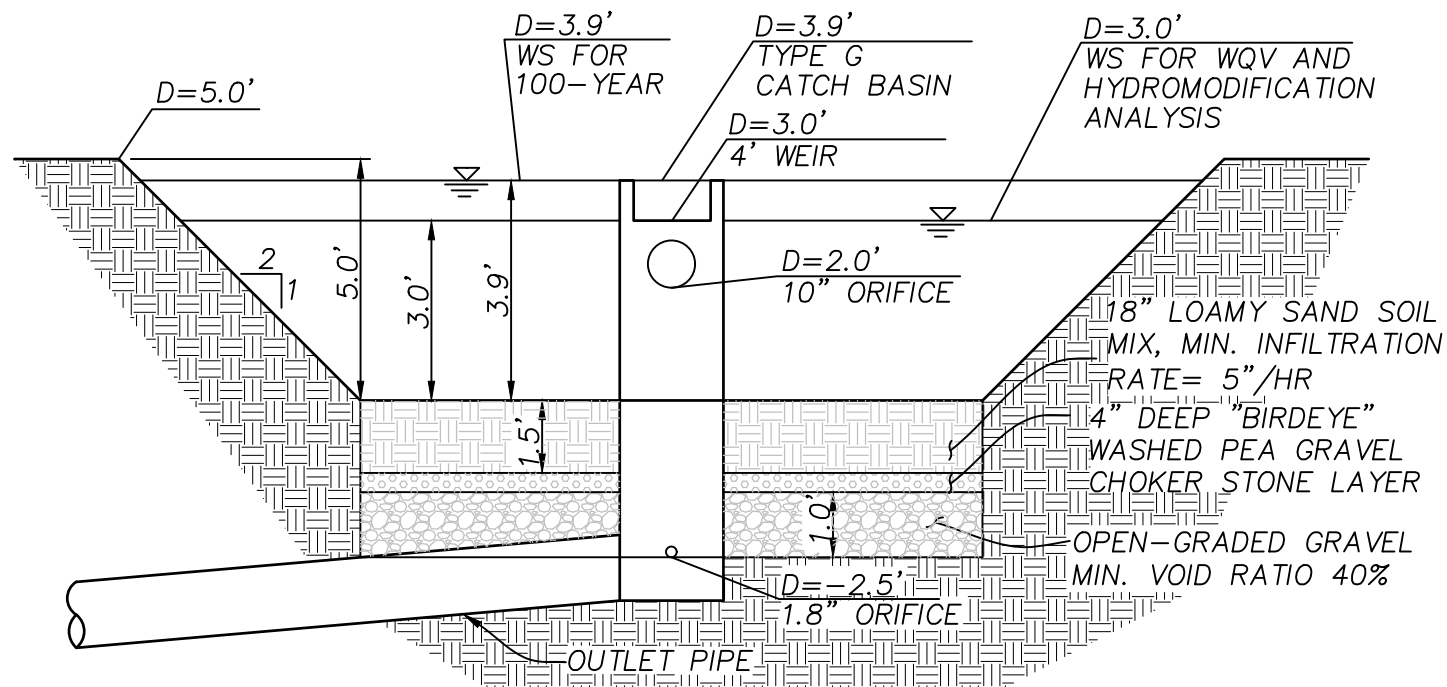
**DMA 4B**



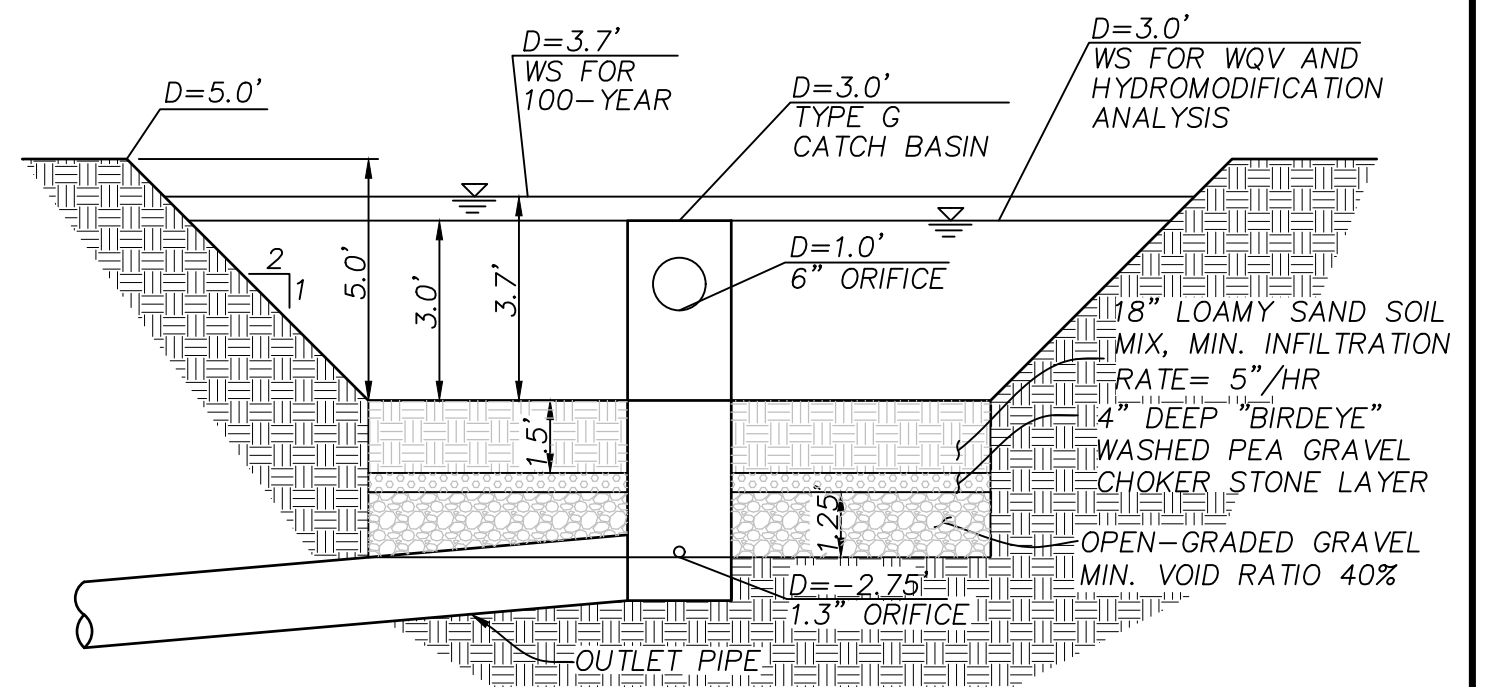
**DMA 5A**



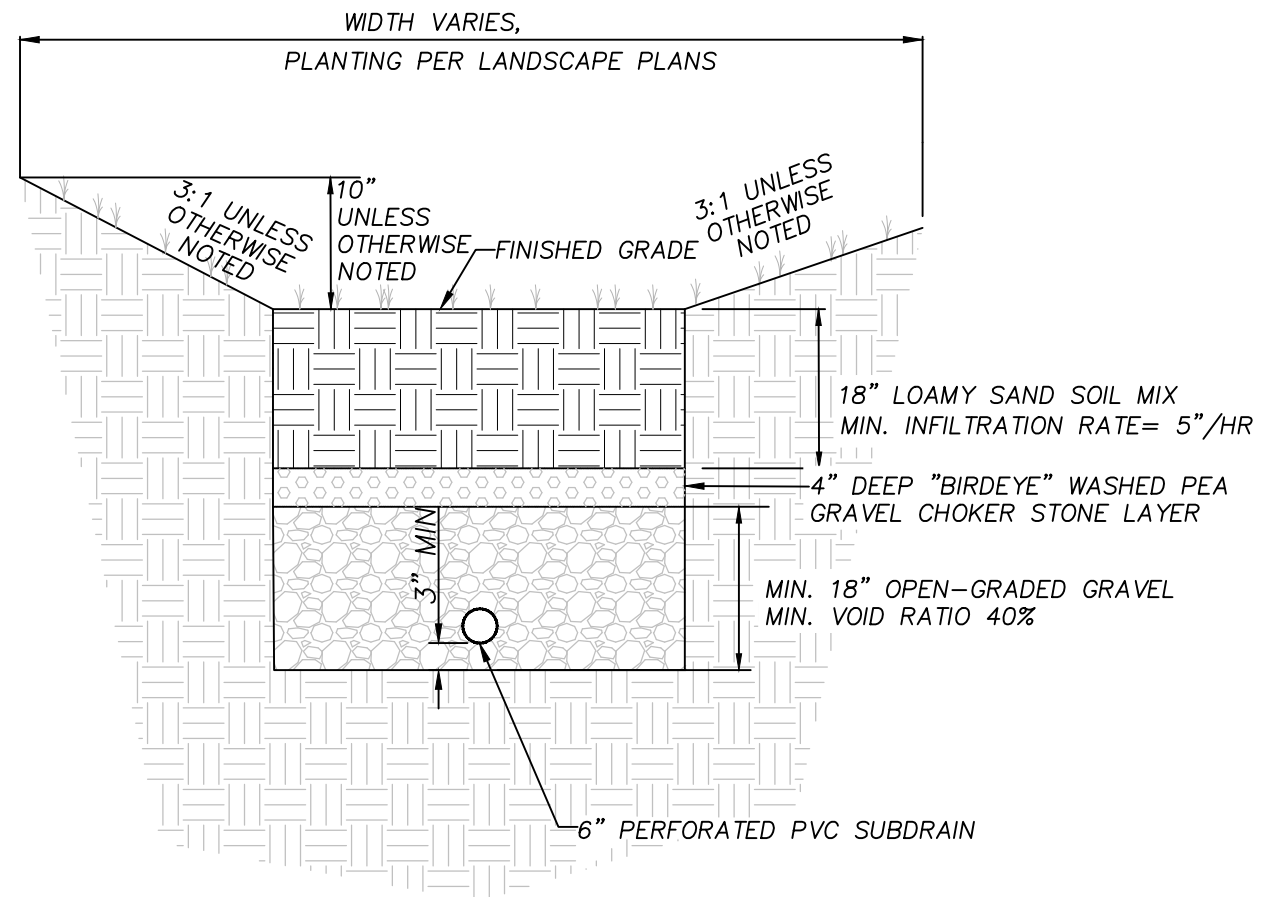
**DMA 5C**



**DMA 5B**



**DMA 5D**



## DMA 6A, 6B, AND FRONTAGE ROADS

If These Sources Will Be on the Project Site ...	... Then Your SWQMP Must Consider These Source Control BMPs		
1 Potential Sources of	2 Permanent Controls—Show on	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input checked="" type="checkbox"/> A. Onsite storm drain inlets  <input type="checkbox"/> Not Applicable	<input checked="" type="checkbox"/> Locations of inlets.	<input checked="" type="checkbox"/> Mark all inlets with the words “No Dumping! Flows to Bay” or similar. See stencil template provided in Appendix I-4	<input checked="" type="checkbox"/> Maintain and periodically repaint or replace inlet markings. <input checked="" type="checkbox"/> Provide storm water pollution prevention information to new site owners, lessees, or operators. <input checked="" type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, “Drainage System Maintenance,” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a> . <input checked="" type="checkbox"/> Include the following in lease agreements: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains.”

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input type="checkbox"/> B. Interior floor drains and elevator shaft sump pumps <input checked="" type="checkbox"/> Not Applicable		<input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	<input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input checked="" type="checkbox"/> C. Interior parking garages <input type="checkbox"/> Not Applicable		<input checked="" type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.	<input checked="" type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input checked="" type="checkbox"/> D1. Need for future indoor & structural pest control <input type="checkbox"/> Not Applicable		<input checked="" type="checkbox"/> Note building design features that discourage entry of pests.	<input checked="" type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.



If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input checked="" type="checkbox"/> <b>D2. Landscape/Outdoor Pesticide Use</b> <input type="checkbox"/> Not Applicable	<input checked="" type="checkbox"/> Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. <input checked="" type="checkbox"/> Show self-retaining landscape areas, if any. <input checked="" type="checkbox"/> Show storm water treatment facilities.	<p>State that final landscape plans will accomplish all of the following.</p> <input checked="" type="checkbox"/> Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. <input checked="" type="checkbox"/> Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution. <input type="checkbox"/> Where landscaped areas are used to retain or detain storm water, specify plants that are tolerant of periodic saturated soil conditions. <input type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape.	<input checked="" type="checkbox"/> Maintain landscaping using minimum or no pesticides. <input checked="" type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a> . <input checked="" type="checkbox"/> Provide IPM information to new owners, lessees and operators.

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input type="checkbox"/> E. Pools, spas, ponds, decorative fountains, and other water features. <input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	<input type="checkbox"/> If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	<input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-72, “Fountain and Pool Maintenance,” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a> .
<input type="checkbox"/> F. Food service <input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.  <input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	<input type="checkbox"/> Describe the location and features of the designated cleaning area.  <input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input checked="" type="checkbox"/> <b>G. Refuse areas</b> <input type="checkbox"/> Not Applicable	<input checked="" type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. <input checked="" type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. Also show how the designated area will be protected from wind dispersal. <input checked="" type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas must be connected to a grease removal device before discharge to sanitary sewer.	<input checked="" type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans. <input checked="" type="checkbox"/> State that signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	<input checked="" type="checkbox"/> State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post “no hazardous materials” signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, “Waste Handling and Disposal” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a> .

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative Table and Narrative
<input checked="" type="checkbox"/> <b>H.</b> Industrial processes. <input type="checkbox"/> Not Applicable	<input checked="" type="checkbox"/> Show process area.	<input checked="" type="checkbox"/> If industrial processes are to be located onsite, state: “All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.”	<input checked="" type="checkbox"/> See Fact Sheet SC-10, “Non-Storm Water Discharges” in the CASQA Storm Water Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> .
<input checked="" type="checkbox"/> <b>I.</b> Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) <input type="checkbox"/> Not Applicable	<input checked="" type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or runoff from area and protected from wind dispersal. <input checked="" type="checkbox"/> Storage of non-hazardous liquids must be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. <input checked="" type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	<input checked="" type="checkbox"/> Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: <ul style="list-style-type: none"> <li>▪ Hazardous Waste Generation</li> <li>▪ Hazardous Materials Release Response and Inventory</li> <li>▪ California Accidental Release Prevention Program</li> <li>▪ Aboveground Storage Tank</li> <li>▪ Uniform Fire Code Article 80 Section 103(b) &amp; (c) 1991</li> <li>▪ Underground Storage Tank</li> </ul>	<input checked="" type="checkbox"/> See the Fact Sheets SC-31, “Outdoor Liquid Container Storage” and SC-33, “Outdoor Storage of Raw Materials” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a> .

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input type="checkbox"/> J. Vehicle and Equipment Cleaning <input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Show on drawings as appropriate:  (1) Commercial/industrial facilities having vehicle /equipment cleaning needs must either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.  (2) Multi-dwelling complexes must have a paved, bermed, and covered car wash area (unless car washing is prohibited onsite and hoses are provided with an automatic shut-off to discourage such use).  (3) Washing areas for cars, vehicles, and equipment must be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.  (4) Commercial car wash facilities must be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility must discharge to the sanitary sewer, or a wastewater reclamation system must be installed.	<input type="checkbox"/> If a car wash area is not provided, describe measures taken to discourage onsite car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable):  <input type="checkbox"/> Washwater from vehicle and equipment washing operations must not be discharged to the storm drain system.  <input type="checkbox"/> Car dealerships and similar may rinse cars with water only.  <input type="checkbox"/> See Fact Sheet SC-21, “Vehicle and Equipment Cleaning,” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a>

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input type="checkbox"/> <b>K.</b> Vehicle/Equipment Repair and Maintenance <input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to protect from rainfall, run-on runoff, and wind dispersal. <input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains must not be installed within the secondary containment areas. <input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	<input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. <input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. <input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	<p>In the report, note that all of the following restrictions apply to use the site:</p> <input type="checkbox"/> No person must dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. <input type="checkbox"/> No vehicle fluid removal must be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids must be contained or drained from the vehicle immediately. <input type="checkbox"/> No person must leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input type="checkbox"/> L. Fuel Dispensing Areas <input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Fueling areas <sup>18</sup> must have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are (1) graded at the minimum slope necessary to prevent ponding; and (2) separated from the rest of the site by a grade break that prevents run-on of storm water to the MEP.  <input type="checkbox"/> Fueling areas must be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area <sup>1</sup> .] The canopy [or cover] must not drain onto the fueling area.		<input type="checkbox"/> The property owner must dry sweep the fueling area routinely.  <input type="checkbox"/> See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Storm Water Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> .

<sup>18</sup> The fueling area must be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in	4 Operational BMPs—Include in Table and Narrative
<b>M.</b> Loading Docks <input checked="" type="checkbox"/> Not Applicable	<input type="checkbox"/> Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks must be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts must be positioned to direct storm water away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited.  <input type="checkbox"/> Loading dock areas draining directly to the sanitary sewer must be equipped with a spill control valve or equivalent device, which must be kept closed during periods of operation.  <input type="checkbox"/> Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		<input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible.  <input type="checkbox"/> See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook">www.casqa.org/resources/bmp-handbooks/municipal-bmp-handbook</a> .



If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input type="checkbox"/> N. Fire Sprinkler Test Water <input checked="" type="checkbox"/> Not Applicable		<input type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.	<input type="checkbox"/> See the note in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Storm Water Quality Handbooks at <a href="http://www.casqa.org/resources/bm">www.casqa.org/resources/bm</a>
<b>O.</b> Miscellaneous Drain or Wash Water <input type="checkbox"/> Boiler drain lines <input type="checkbox"/> Condensate drain lines <input checked="" type="checkbox"/> Rooftop equipment <input type="checkbox"/> Drainage sumps <input checked="" type="checkbox"/> Roofing, gutters, and trim <input type="checkbox"/> Not Applicable		<input type="checkbox"/> Boiler drain lines must be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. <input type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. <input checked="" type="checkbox"/> Rooftop mounted equipment with potential to produce pollutants must be roofed and/or have secondary containment. <input type="checkbox"/> Any drainage sumps onsite must feature a sediment sump to reduce the quantity of sediment in pumped water. <input checked="" type="checkbox"/> Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	

If These Sources Will Be on the Project Site ...	... Then Your SWQMP must consider These Source Control BMPs		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Drawings	3 Permanent Controls—List in Table and Narrative	4 Operational BMPs—Include in Table and Narrative
<input checked="" type="checkbox"/> P. Plazas, sidewalks, and parking lots. <input type="checkbox"/> Not Applicable			<input checked="" type="checkbox"/> Plazas, sidewalks, and parking lots must be swept regularly to prevent the accumulation of litter and debris.  Debris from pressure washing must be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser must be collected and discharged to the sanitary sewer and not discharged to a storm drain.

# **ATTACHMENT 1b**

**Form I-8, Categorization of Infiltration Feasibility Condition**

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> <p>Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.</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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</p>	X	
<p>Provide basis:</p> <p>Percolation tests have not been performed on site. Based on hydrologic soil group mapping, soil types B, C, and D are present. There is also a limited area of type A soil under a portion of the off-site road, Hill Valley Drive. Soils in the areas that are of types A B and C may have infiltration rates of 0.5 inches per hour or greater.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.</p>		X
<p>Provide basis:</p> <p>The "Letter Report Regarding Onsite Wastewater Treatment Systems" prepared by GEOCON, dated October 27, 2015, identified several issues which make infiltration of any sort undesirable, whether it be from septic systems or from storm water basins. These issues include that much of the project site is "underlain by shallow granitic bedrock with extremely low permeability or compacted rock/soil fill derived from onsite sources", leading to a high potential failure rate for infiltration systems due to "the lack of absorption qualities of underlying soil."</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	<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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
<p>Provide basis:</p> <p>During the geotechnical investigation, shallow groundwater and seepage were encountered at several boring locations. Additionally, existing residents in Eden Valley have noted issues with failing septic systems due to the presence of shallow groundwater.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
4	<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 must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
<p>Provide basis:</p> <p>During the geotechnical investigation, shallow groundwater and seepage were encountered at several boring locations. Additionally, existing residents in Eden Valley have noted issues with failing septic systems due to the presence of shallow groundwater.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</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>		No

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

## 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	<b>Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

The "Letter Report Regarding Onsite Wastewater Treatment Systems" prepared by GEOCON, dated October 27, 2015, identified several issues which make infiltration of any sort undesirable, whether it be from septic systems or from storm water basins. These issues include that much of the project site is "underlain by shallow granitic bedrock with extremely low permeability or compacted rock/soil fill derived from onsite sources", leading to a high potential failure rate for infiltration systems due to "the lack of absorption qualities of underlying soil."

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

6	<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 must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
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Provide basis:

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

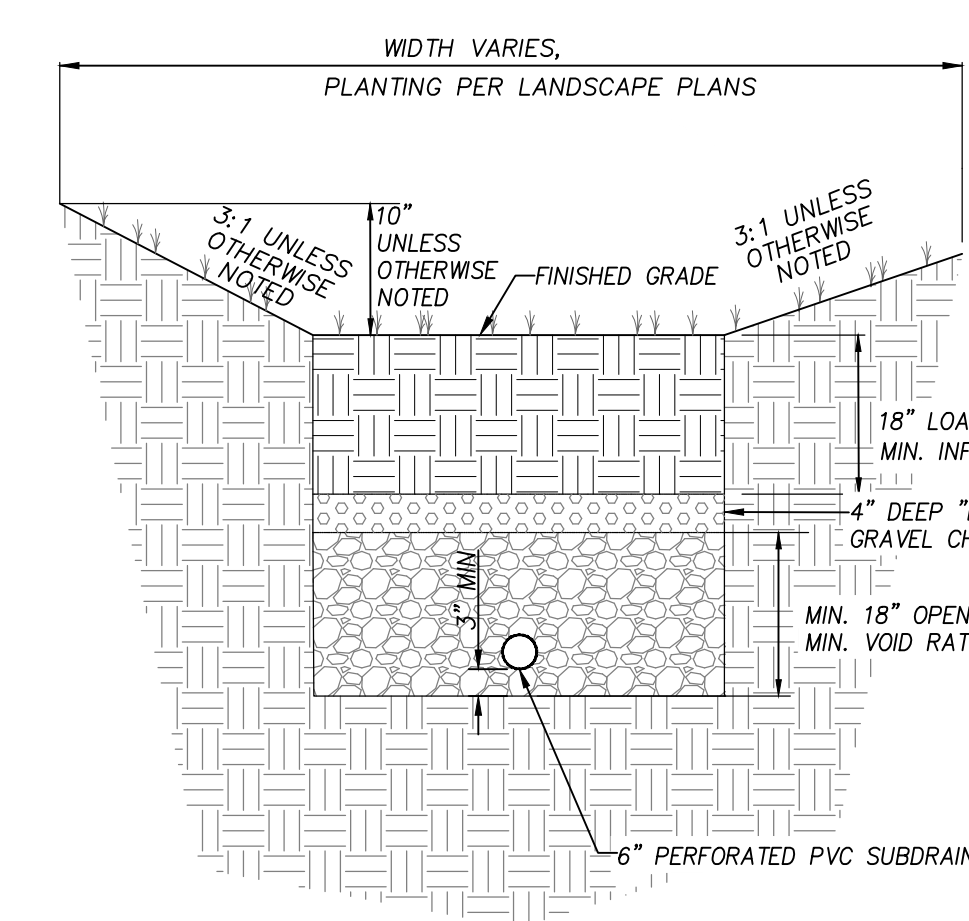
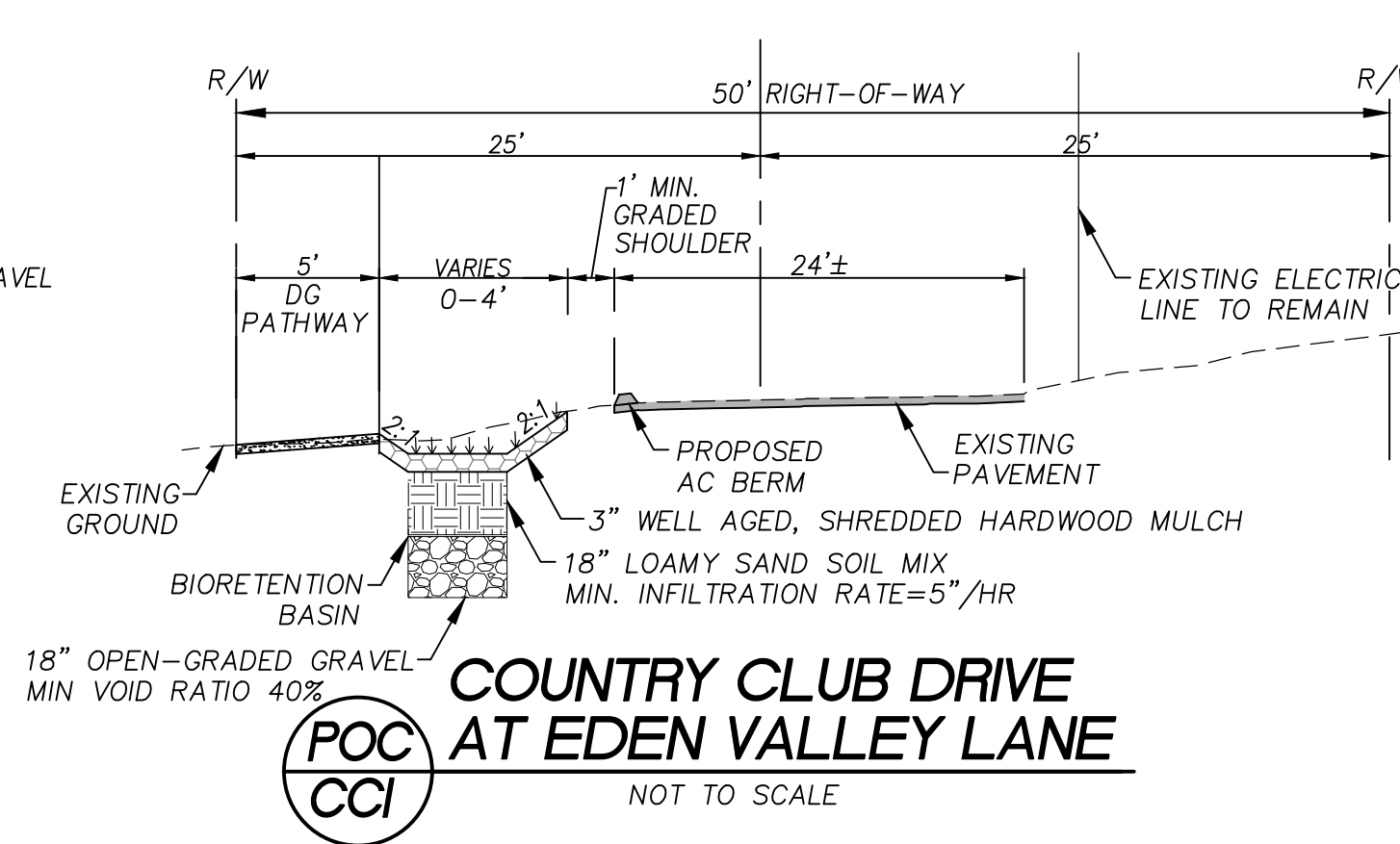
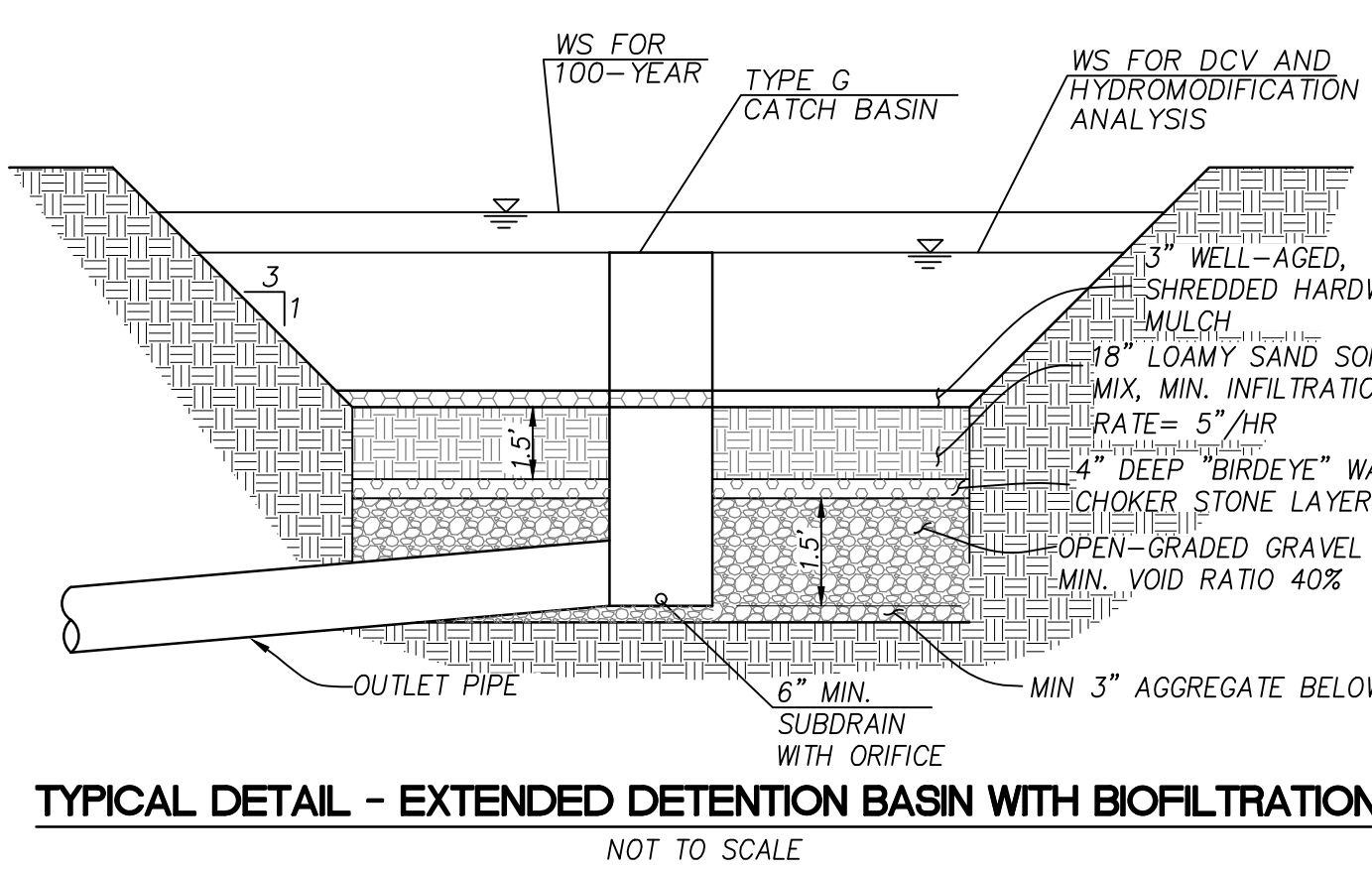
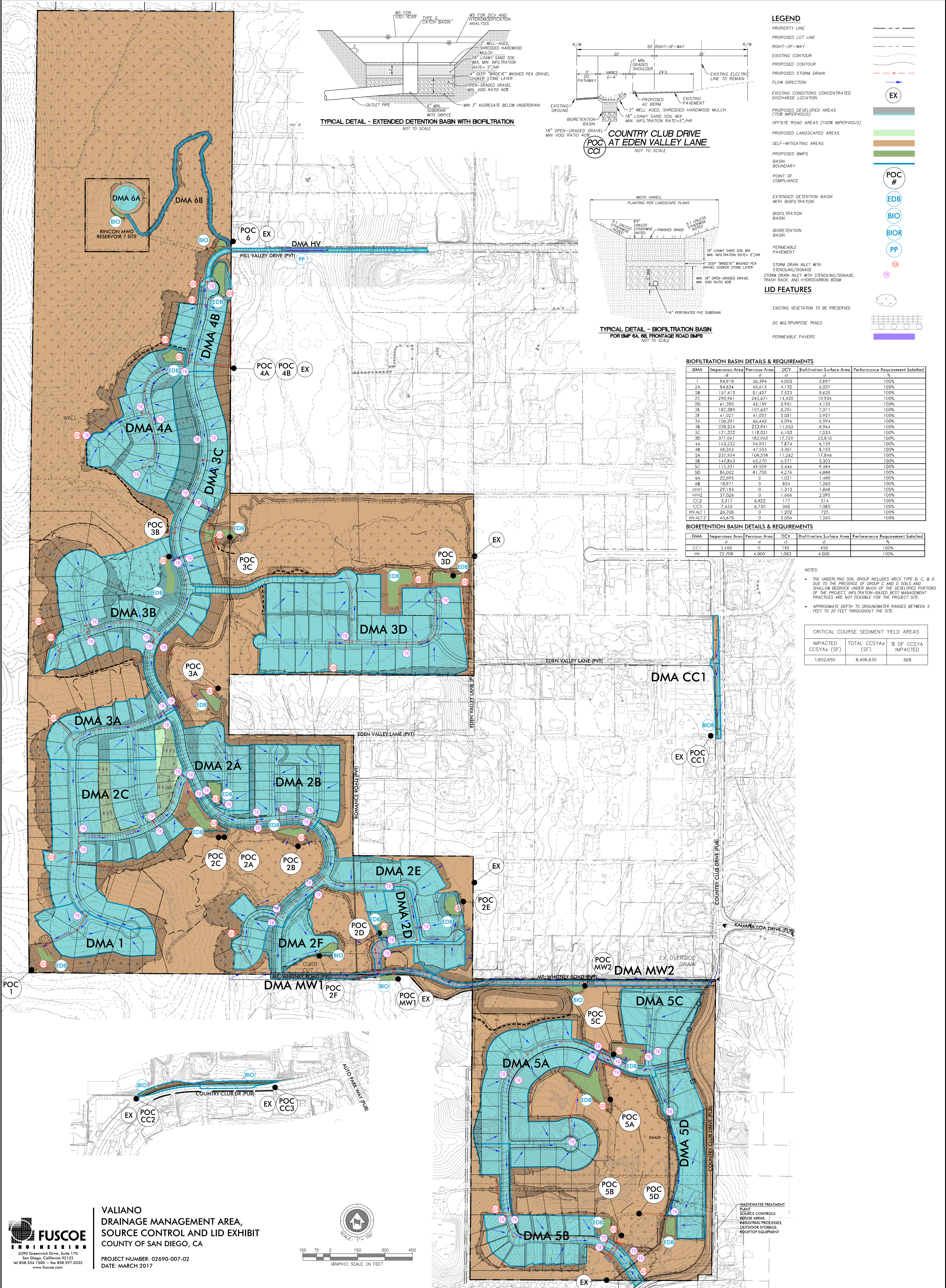
Form I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	<b>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.		X
Provide basis:			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	<b>Can infiltration be allowed without violating downstream water rights?</b> The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis:			
During the geotechnical investigation, shallow groundwater and seepage were encountered at several boring locations. Additionally, existing residents in Eden Valley have noted issues with failing septic systems due to the presence of shallow groundwater.			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
<b>Part 2 Result*</b>	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is <b>Partial Infiltration</b> .  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> .		<b>No Infiltration</b>

\*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 1c**

## **DMA Exhibit**





**LEGEND**

PROPERTY LINE  
PROPOSED LOT LINE  
RIGHT-OF-WAY  
EXISTING CONTOUR  
PROPOSED CONTOUR  
PROPOSED STORM DRAIN  
FLOW DIRECTION  
EXISTING CONDITIONS CONCENTRATED DISCHARGE LOCATION  
PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)  
OFFSITE ROAD AREAS (100% IMPERVIOUS)  
PROPOSED LANDSCAPED AREAS  
SELF-MITIGATING AREAS  
BASIN BOUNDARY  
POINT OF COMPLIANCE  
EXTENDED DETENTION BASIN WITH BIOFILTRATION  
BIOFILTRATION BASIN  
BIORETENTION BASIN  
PERMEABLE PAVEMENT  
STORM DRAIN INLET WITH STENCILING/SIGNAGE  
STORM DRAIN INLET WITH STENCILING/SIGNAGE, TRASH RACK, AND HYDROCARBON BOOM  
**LID FEATURES**  
EXISTING VEGETATION TO BE PRESERVED  
DG MULTIPURPOSE TRAILS  
PERMEABLE PAVERS

EX  
POC #  
EDB  
BIO  
BIOR  
PP  
SD  
TR  
POC 6  
POC 4A  
POC 4B  
POC 3B  
POC 3C  
POC 3A  
POC 2C  
POC 2A  
POC 2B  
POC 2E  
POC 2D  
POC 2F  
POC 1  
POC CC2  
POC CC3  
POC CC1  
POC MW2  
POC MW1  
POC 5C  
POC 5A  
POC 5B  
POC 5D  
POC 5E

BIOFILTRATION BASIN DETAILS & REQUIREMENTS					
DMA	Impervious Area	Pervious Area	DCV	Biofiltration Surface Area	Performance Requirement Satisfied
1	84,918	36,394	4,003	3,897	100%
2A	84,634	65,613	4,132	6,037	100%
2B	157,412	81,427	7,523	5,635	100%
2C	290,961	243,671	14,435	10,936	100%
2D	61,290	42,159	2,951	4,135	100%
2E	182,380	107,637	8,701	7,011	100%
2F	41,027	41,027	2,051	2,927	100%
3A	106,291	66,442	5,096	6,594	100%
3B	228,224	233,911	11,553	6,964	100%
3C	121,323	118,021	6,103	7,233	100%
3D	371,061	182,965	17,729	23,810	100%
4A	163,232	94,931	7,874	6,159	100%
4B	68,263	47,553	3,301	8,153	100%
5A	237,954	108,558	11,242	17,846	100%
5B	147,863	63,370	6,971	5,503	100%
5C	115,521	49,509	5,446	9,484	100%
5D	86,002	81,700	4,276	4,888	100%
6A	22,695	0	1,021	1,480	100%
6B	18,921	0	854	1,260	100%
MW1	29,185	0	1,313	1,868	100%
MW2	37,026	0	1,666	2,095	100%
CC2	3,217	6,922	177	514	100%
CC1	7,433	8,735	348	1,085	100%
HV-ALT 1	26,708	0	1,202	725	100%
HV-ALT 2	45,678	0	2,054	1,260	100%

BIORETENTION BASIN DETAILS & REQUIREMENTS					
DMA	Impervious Area	Pervious Area	DCV	Biofiltration Surface Area	Performance Requirement Satisfied
CC1	3,450	0	155	450	100%
HV	22,708	4,000	1,082	4,000	100%

- NOTES:
- THE UNDERLYING SOIL GROUP INCLUDES NRCS TYPE B, C, & D. DUE TO THE PRESENCE OF GROUP C AND D SOILS AND SHALLOW BEDROCK UNDER MUCH OF THE DEVELOPED PORTIONS OF THE PROJECT, INFILTRATION-BASED BEST MANAGEMENT PRACTICES ARE NOT FEASIBLE FOR THE PROJECT SITE.
  - APPROXIMATE DEPTH TO GROUNDWATER RANGES BETWEEN 5 FEET TO 20 FEET THROUGHOUT THE SITE.

CRITICAL COURSE SEDIMENT YIELD AREAS		
IMPACTED CCSYAs (SF)	TOTAL CCSYAs (SF)	% OF CCSYA IMPACTED
1,602,650	8,406,630	36%

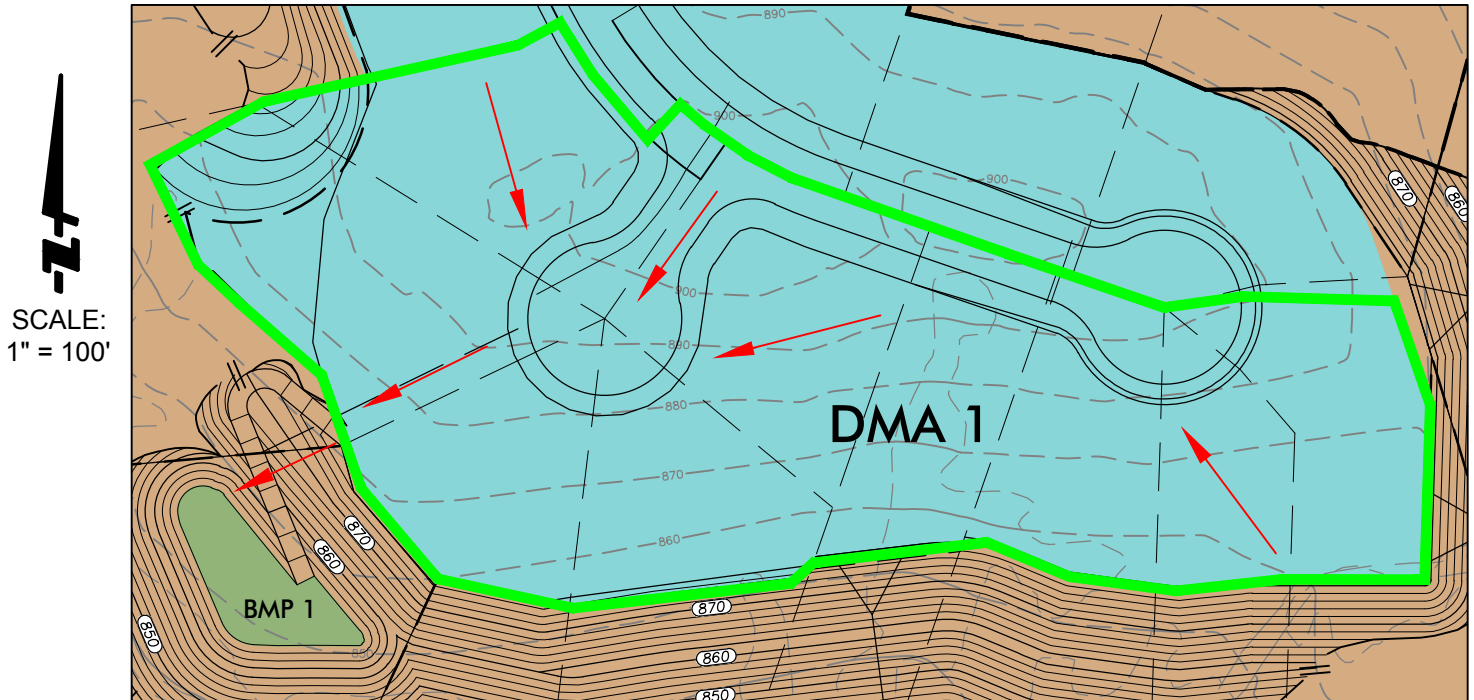


# **ATTACHMENT 1d**

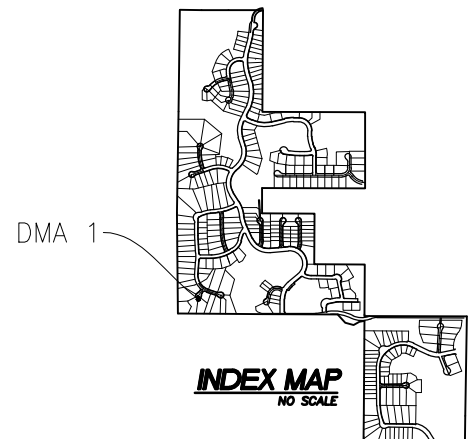
## **Individual Structural BMP DMA Mapbook**

# STRUCTURAL BMP DMA MAPBOOK

DMA 1 / BMP 1






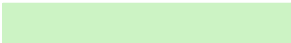
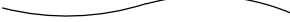



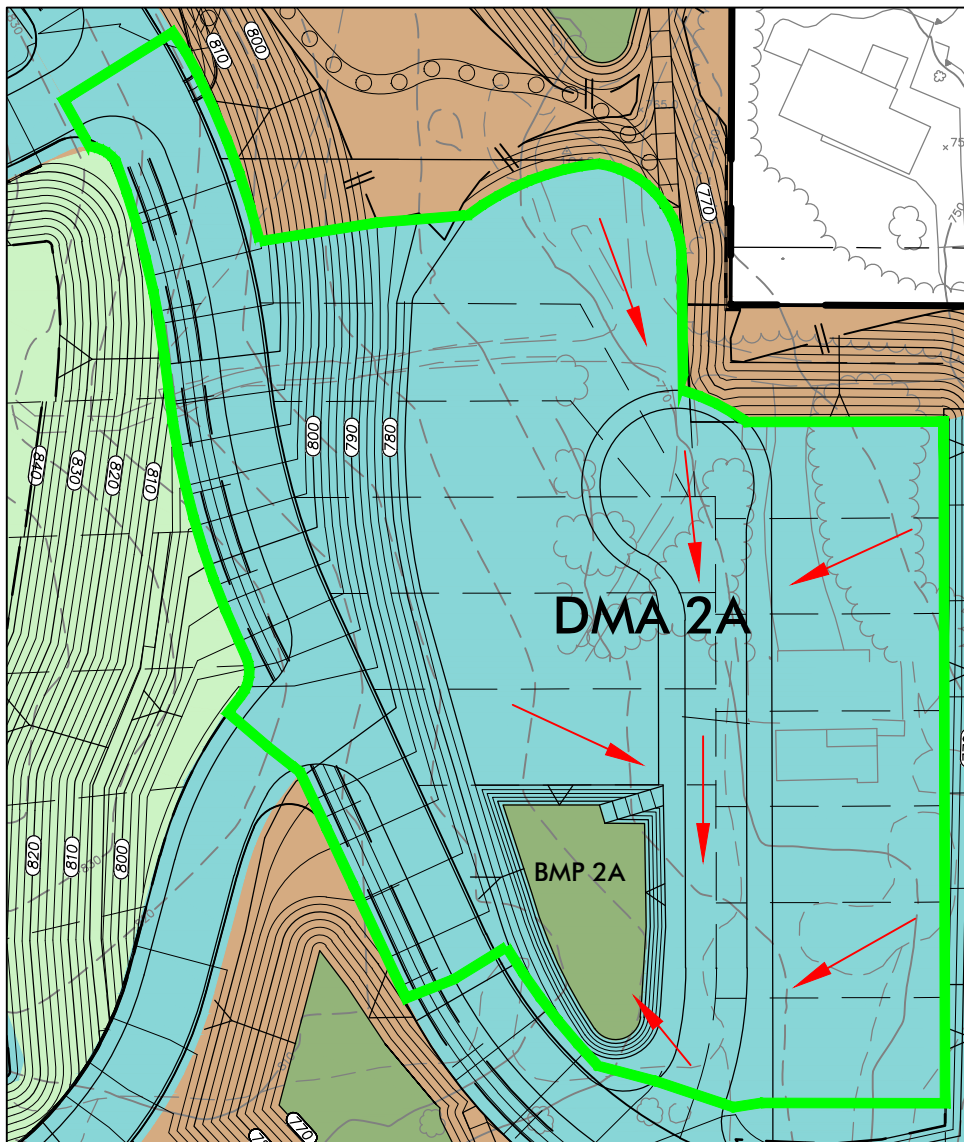
PROPERTY LINE	— — — — —
PROPOSED LOT LINE	- - - - -
DMA OUTLINE	— (thick green line) —
EXISTING CONTOUR	— (solid line) —
PROPOSED CONTOUR	— (dashed line) —
FLOW DIRECTION	→ (red arrow)
PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	— (light blue fill) —
OFFSITE ROAD AREAS (100% IMPERVIOUS)	— (gray fill) —
PROPOSED LANDSCAPED AREAS	— (light green fill) —
SELF-TREATING AREAS	— (brown fill) —



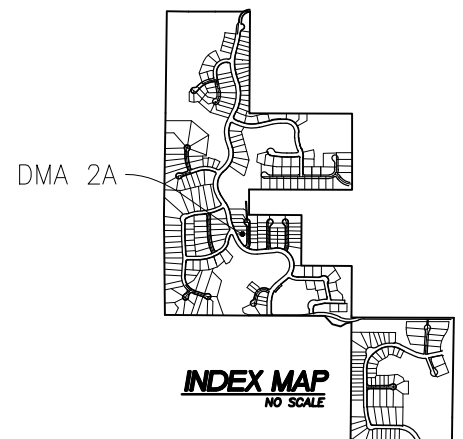
# STRUCTURAL BMP DMA MAPBOOK

## DMA 2A / BMP 2A

PROPERTY LINE	— — — — —	FLOW DIRECTION	
PROPOSED LOT LINE	- - - - -	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
DMA OUTLINE		OFFSITE ROAD AREAS (100% IMPERVIOUS)	
EXISTING CONTOUR		PROPOSED LANDSCAPED AREAS	
PROPOSED CONTOUR		SELF-TREATING AREAS	

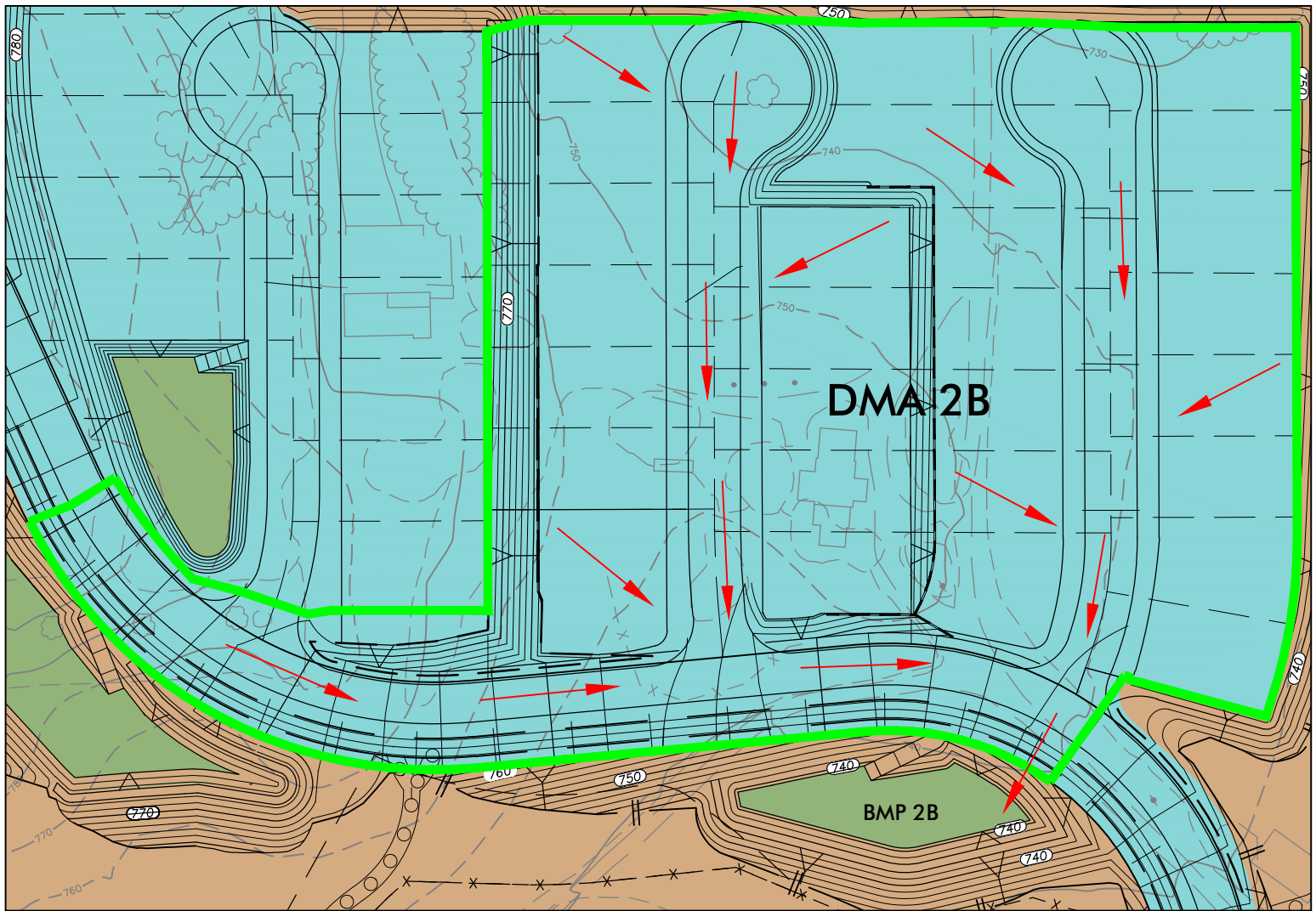


SCALE:  
1" = 100'



# STRUCTURAL BMP DMA MAPBOOK

## DMA 2B / BMP 2B



PROPERTY LINE — — — — —

PROPOSED LOT LINE — — — — —

DMA OUTLINE —————

EXISTING CONTOUR ~~~~~

PROPOSED CONTOUR ~~~~~

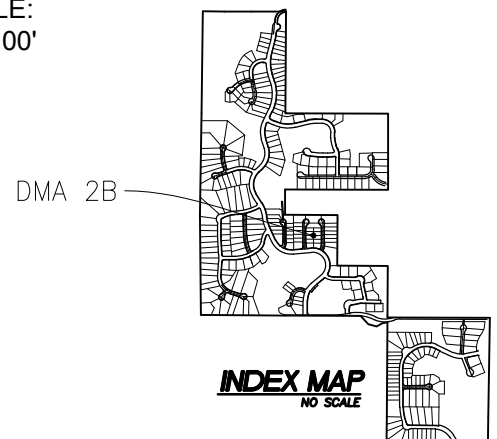
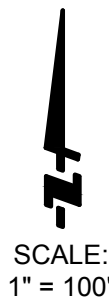
FLOW DIRECTION →

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) —————

OFFSITE ROAD AREAS  
(100% IMPERVIOUS) —————






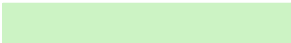


PROPOSED LANDSCAPED AREAS —————

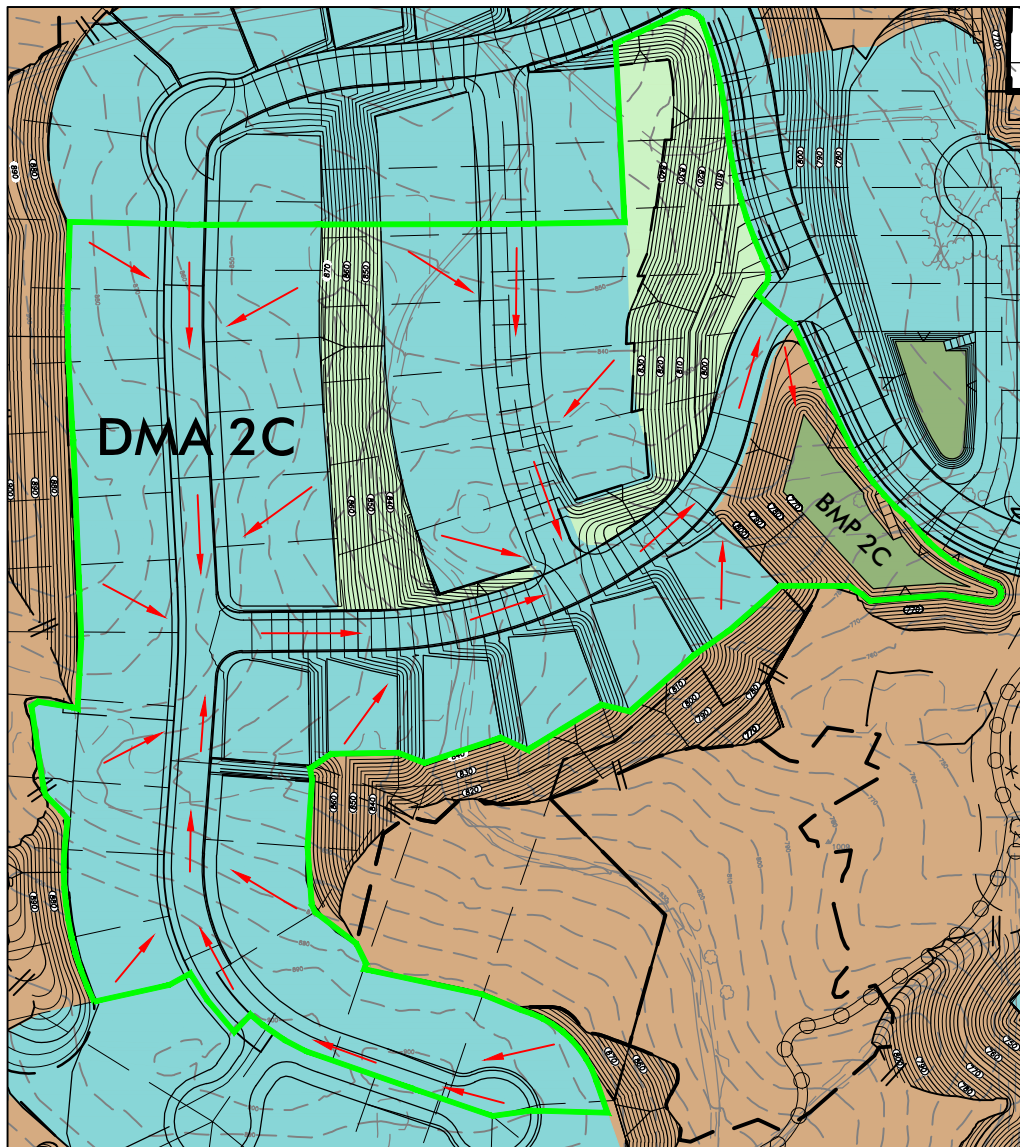
SELF-TREATING AREAS —————



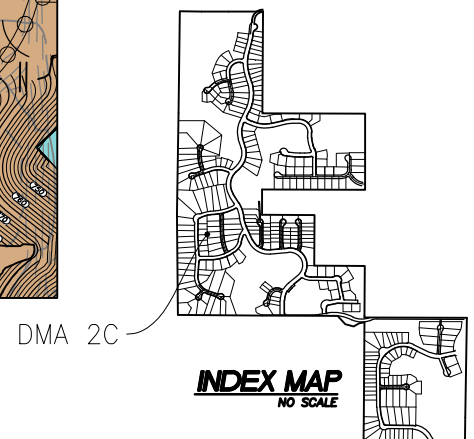
# STRUCTURAL BMP DMA MAPBOOK

## DMA 2C / BMP 2C

PROPERTY LINE	— — — — —	FLOW DIRECTION	
PROPOSED LOT LINE	- - - - -	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
DMA OUTLINE		OFFSITE ROAD AREAS (100% IMPERVIOUS)	
EXISTING CONTOUR		PROPOSED LANDSCAPED AREAS	
PROPOSED CONTOUR		SELF-TREATING AREAS	



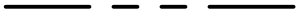




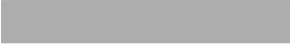

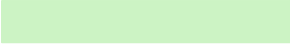


SCALE:  
1" = 200'

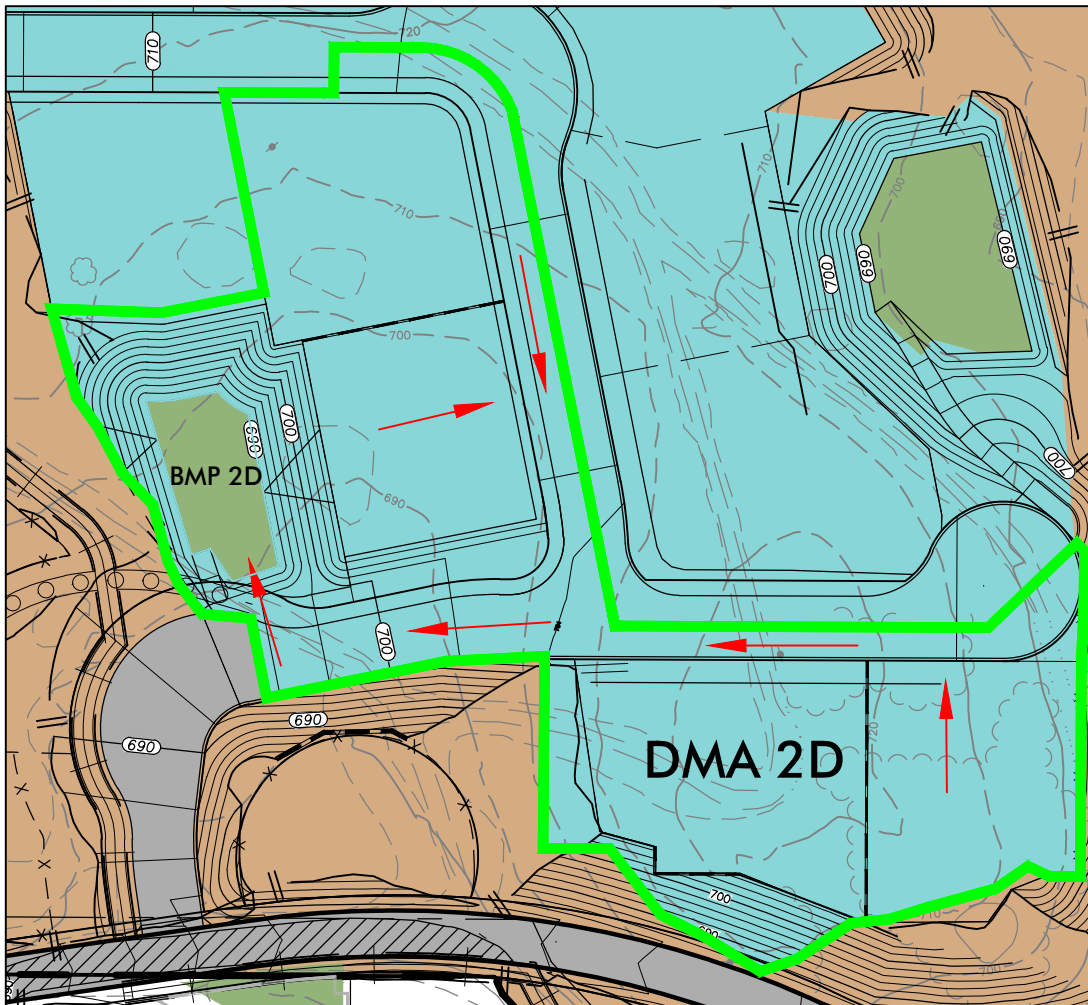





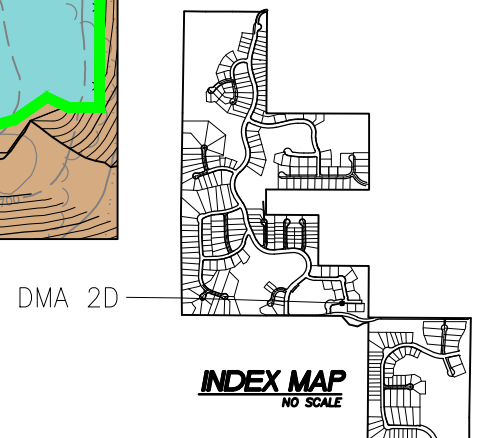
# STRUCTURAL BMP DMA MAPBOOK

DMA 2D / BMP 2D

PROPERTY LINE		FLOW DIRECTION	
PROPOSED LOT LINE		PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
DMA OUTLINE		OFFSITE ROAD AREAS (100% IMPERVIOUS)	
EXISTING CONTOUR		PROPOSED LANDSCAPED AREAS	
PROPOSED CONTOUR		SELF-TREATING AREAS	



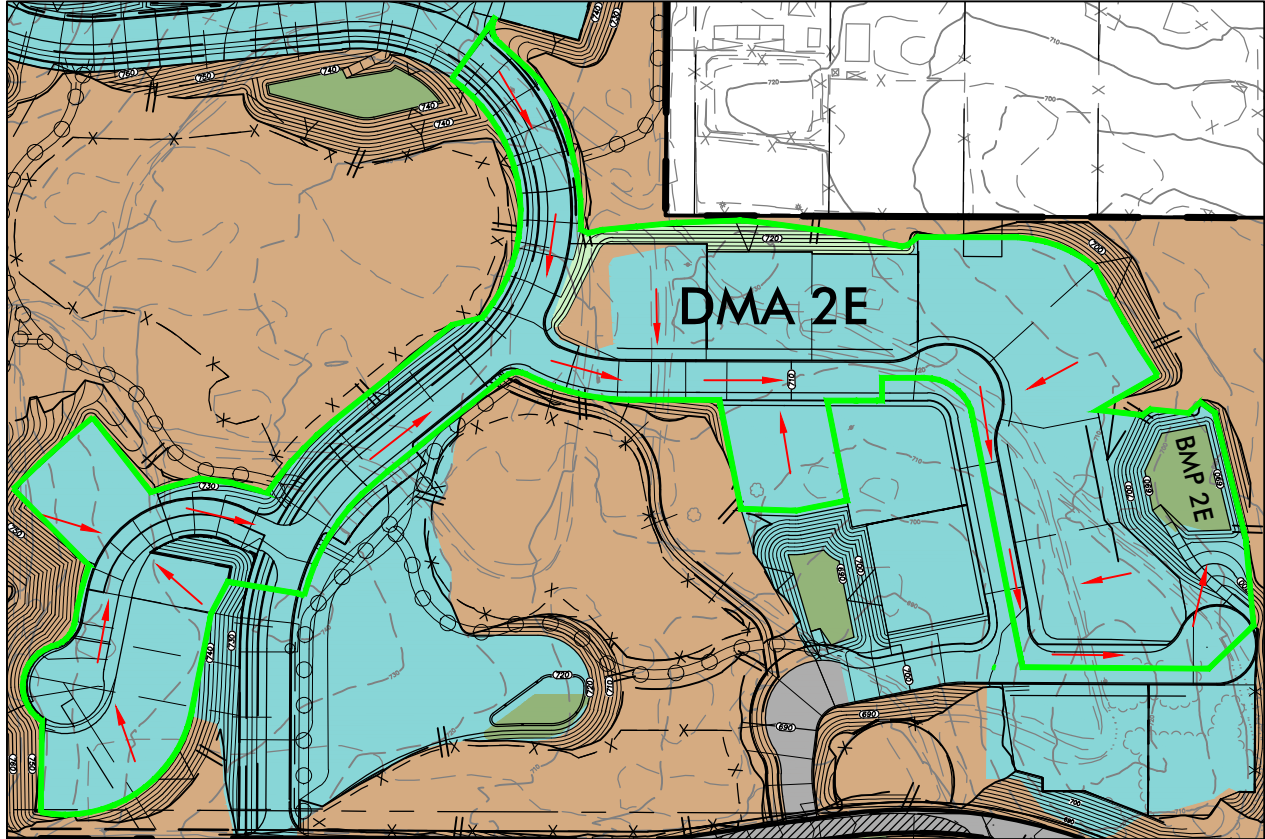
  
SCALE:  
1" = 100'



# STRUCTURAL BMP DMA MAPBOOK

DMA 2E / BMP 2E

SCALE:  
1" = 200'



PROPERTY LINE — — — — —

PROPOSED LOT LINE - - - - -

DMA OUTLINE —————

EXISTING CONTOUR ~~~~~

PROPOSED CONTOUR ~~~~~

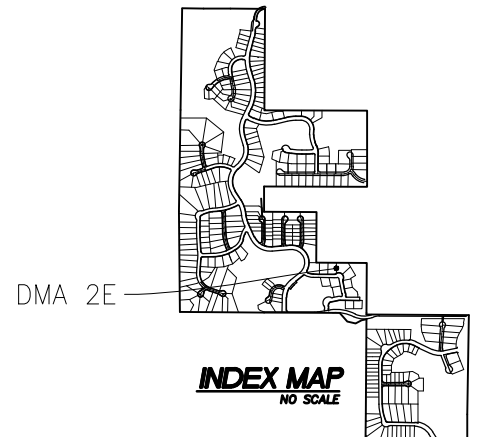
FLOW DIRECTION →

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS)

OFFSITE ROAD AREAS  
(100% IMPERVIOUS)

PROPOSED LANDSCAPED AREAS

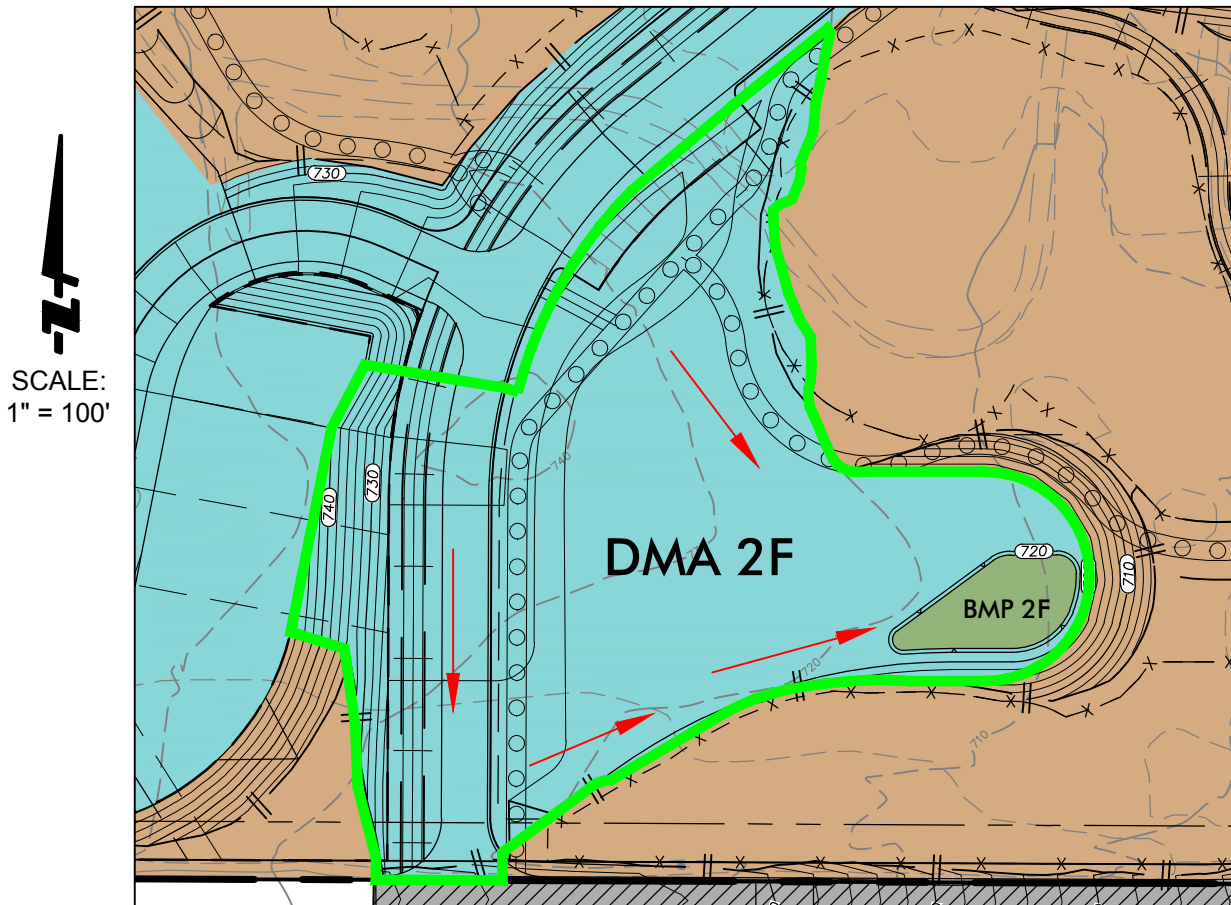
SELF-TREATING AREAS



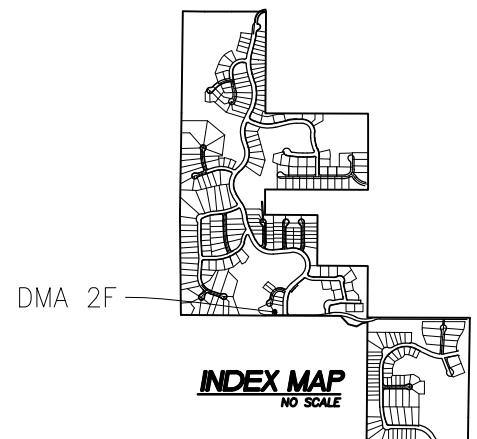


# STRUCTURAL BMP DMA MAPBOOK

DMA 2F / BMP 2F



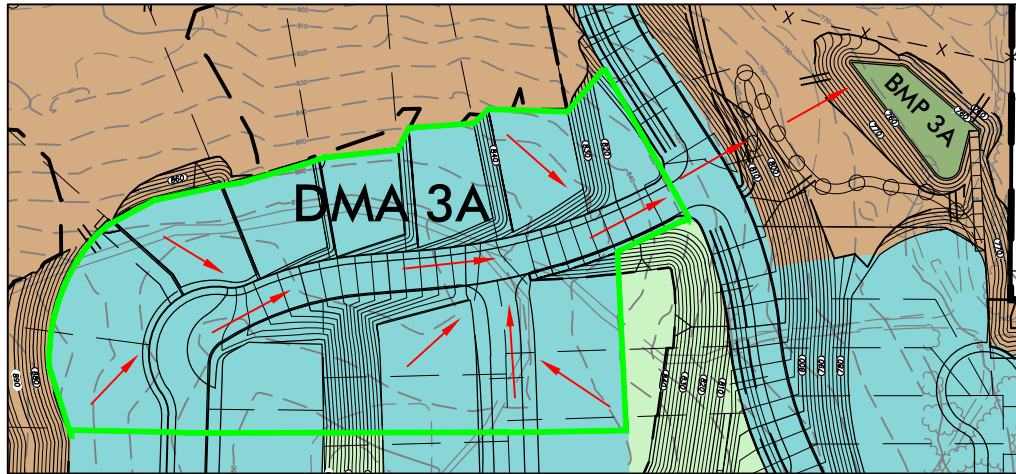
PROPERTY LINE	---
PROPOSED LOT LINE	- - -
DMA OUTLINE	—
EXISTING CONTOUR	~~~~~
PROPOSED CONTOUR	~~~~~
FLOW DIRECTION	→
PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	Light Blue
OFFSITE ROAD AREAS (100% IMPERVIOUS)	Grey
PROPOSED LANDSCAPED AREAS	Light Green
SELF-TREATING AREAS	Brown




# STRUCTURAL BMP DMA MAPBOOK

DMA 3A / BMP 3A

SCALE:  
1" = 200'



PROPERTY LINE 

PROPOSED LOT LINE 

DMA OUTLINE 

EXISTING CONTOUR 

PROPOSED CONTOUR 

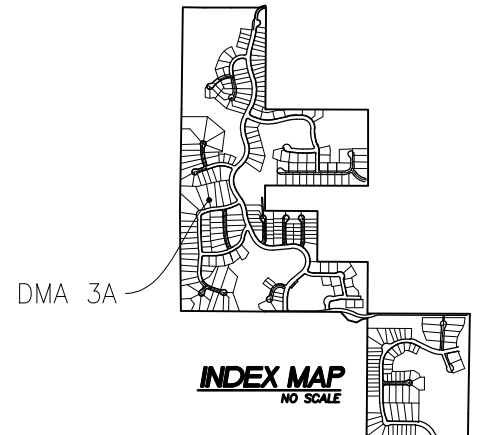
FLOW DIRECTION 

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) 

OFFSITE ROAD AREAS  
(100% IMPERVIOUS) 

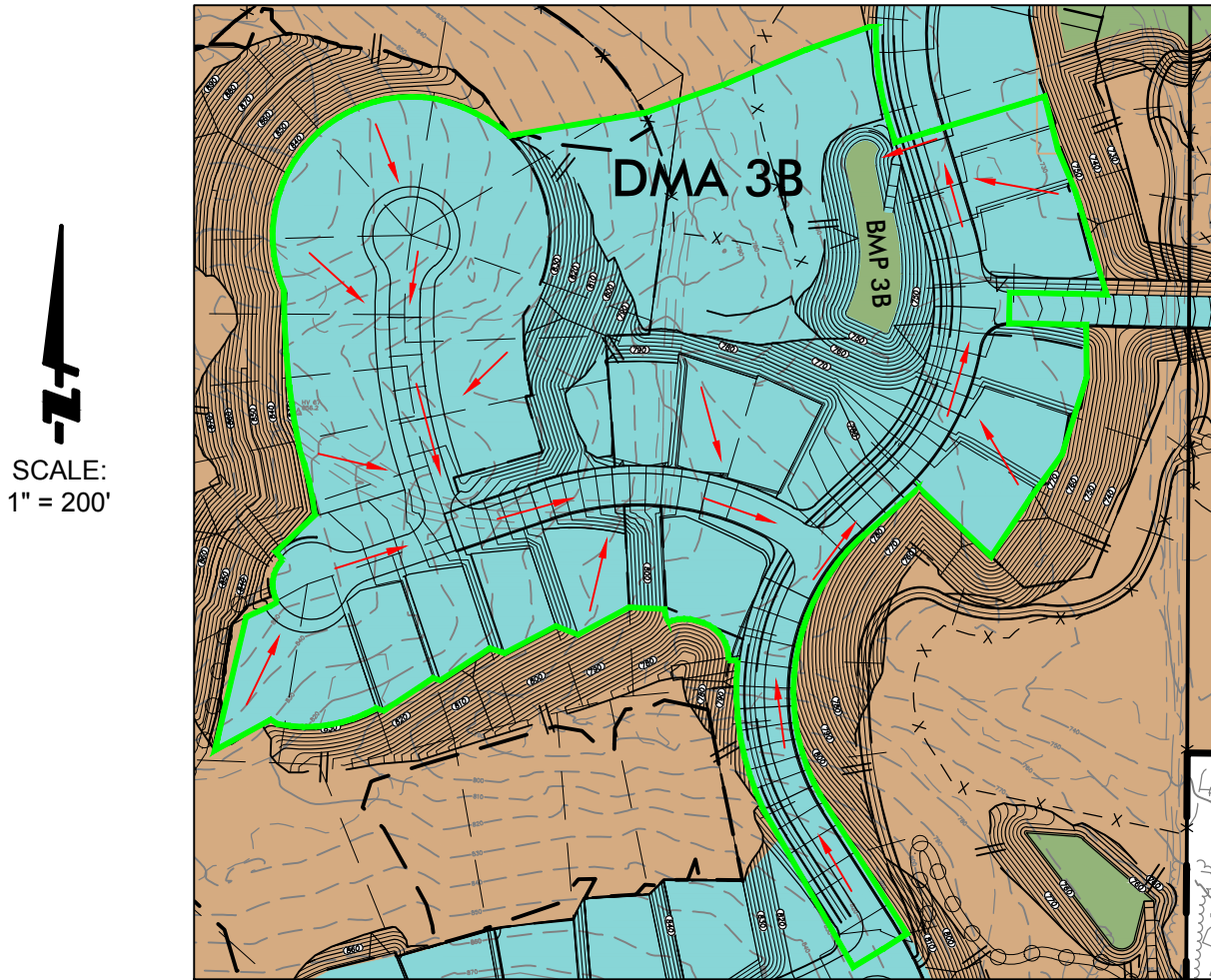
PROPOSED LANDSCAPED AREAS 

SELF-TREATING AREAS 



# STRUCTURAL BMP DMA MAPBOOK

DMA 3B / BMP 3B



PROPERTY LINE — — — — —

PROPOSED LOT LINE - - - - -

DMA OUTLINE —————

EXISTING CONTOUR ~~~~~

PROPOSED CONTOUR ~~~~~

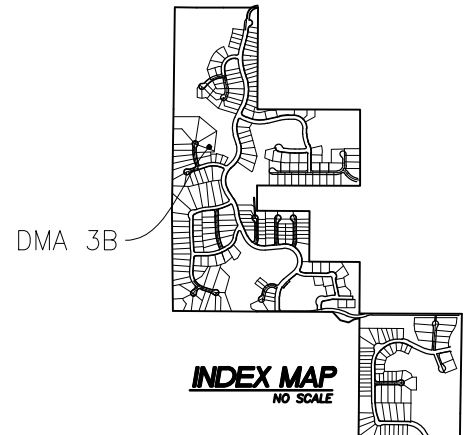
FLOW DIRECTION →

PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)

OFFSITE ROAD AREAS (100% IMPERVIOUS)

PROPOSED LANDSCAPED AREAS

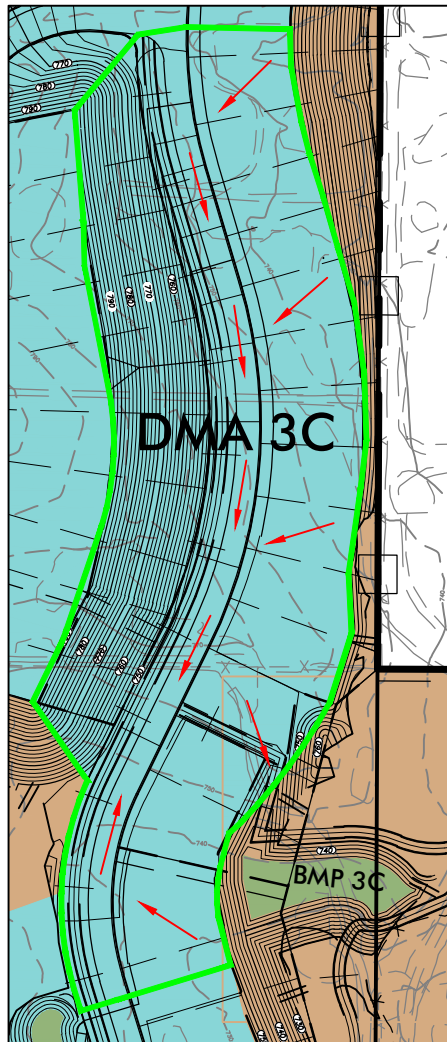
SELF-TREATING AREAS




# STRUCTURAL BMP DMA MAPBOOK

## DMA 3C / BMP 3C

  
SCALE:  
1" = 200'



PROPERTY LINE 

PROPOSED LOT LINE 

DMA OUTLINE 

EXISTING CONTOUR 

PROPOSED CONTOUR 

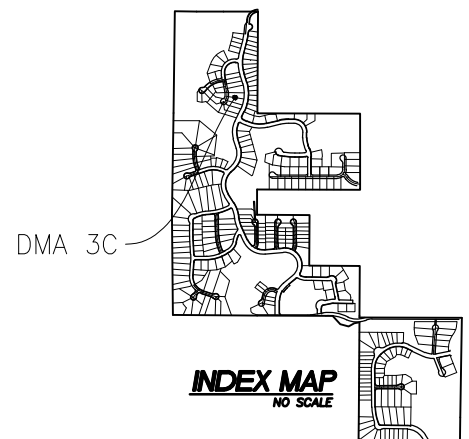
FLOW DIRECTION 

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) 

OFFSITE ROAD AREAS  
(100% IMPERVIOUS) 

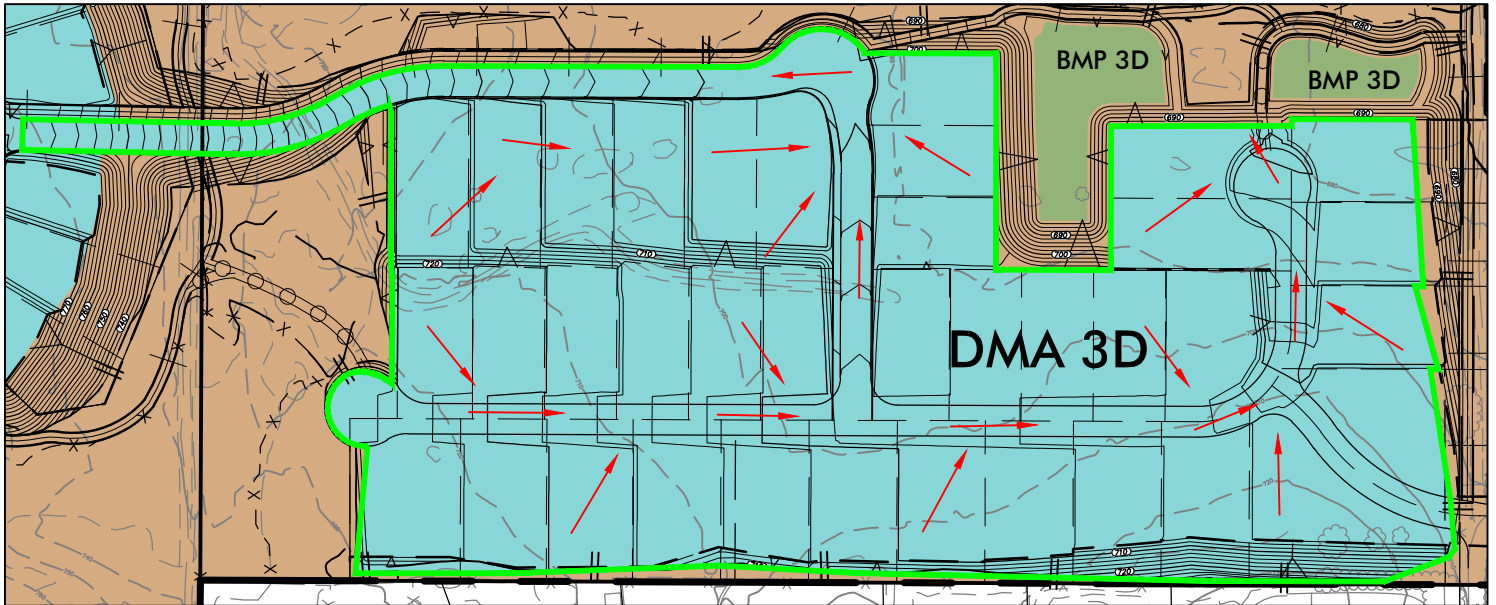
PROPOSED LANDSCAPED AREAS 

SELF-TREATING AREAS 



# STRUCTURAL BMP DMA MAPBOOK

DMA 3D / BMP 3D




PROPERTY LINE — — — — —

PROPOSED LOT LINE - - - - -

DMA OUTLINE —————

EXISTING CONTOUR 

PROPOSED CONTOUR 


FLOW DIRECTION 

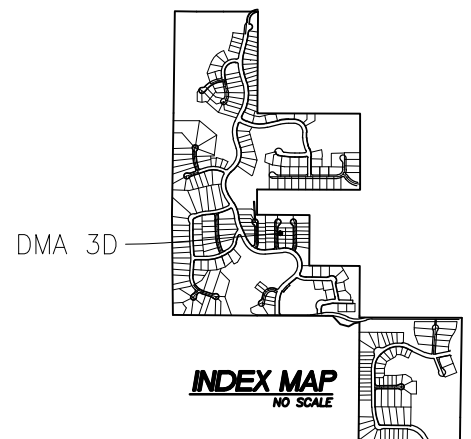
PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) 

OFFSITE ROAD AREAS  
(100% IMPERVIOUS) 

PROPOSED LANDSCAPED AREAS 

SELF-TREATING AREAS 

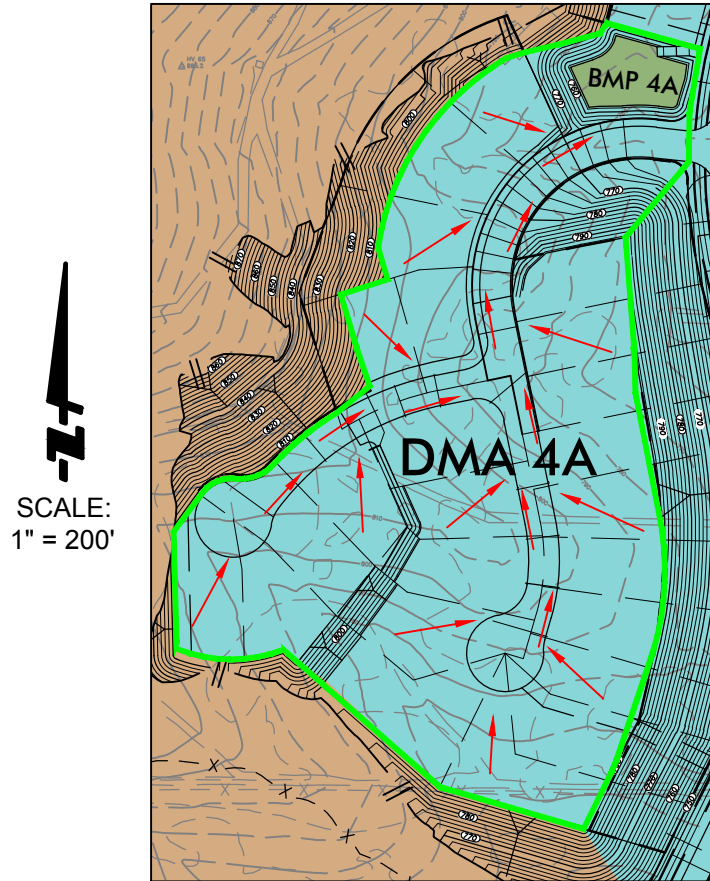
  
SCALE:  
1" = 200'





# STRUCTURAL BMP DMA MAPBOOK

DMA 4A / BMP 4A



PROPERTY LINE — — — — —

PROPOSED LOT LINE - - - - -

DMA OUTLINE —————

EXISTING CONTOUR 

PROPOSED CONTOUR 

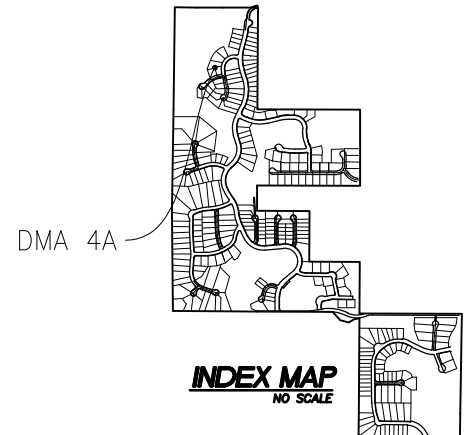
FLOW DIRECTION 

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) 

OFFSITE ROAD AREAS  
(100% IMPERVIOUS) 






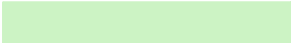


PROPOSED LANDSCAPED AREAS 

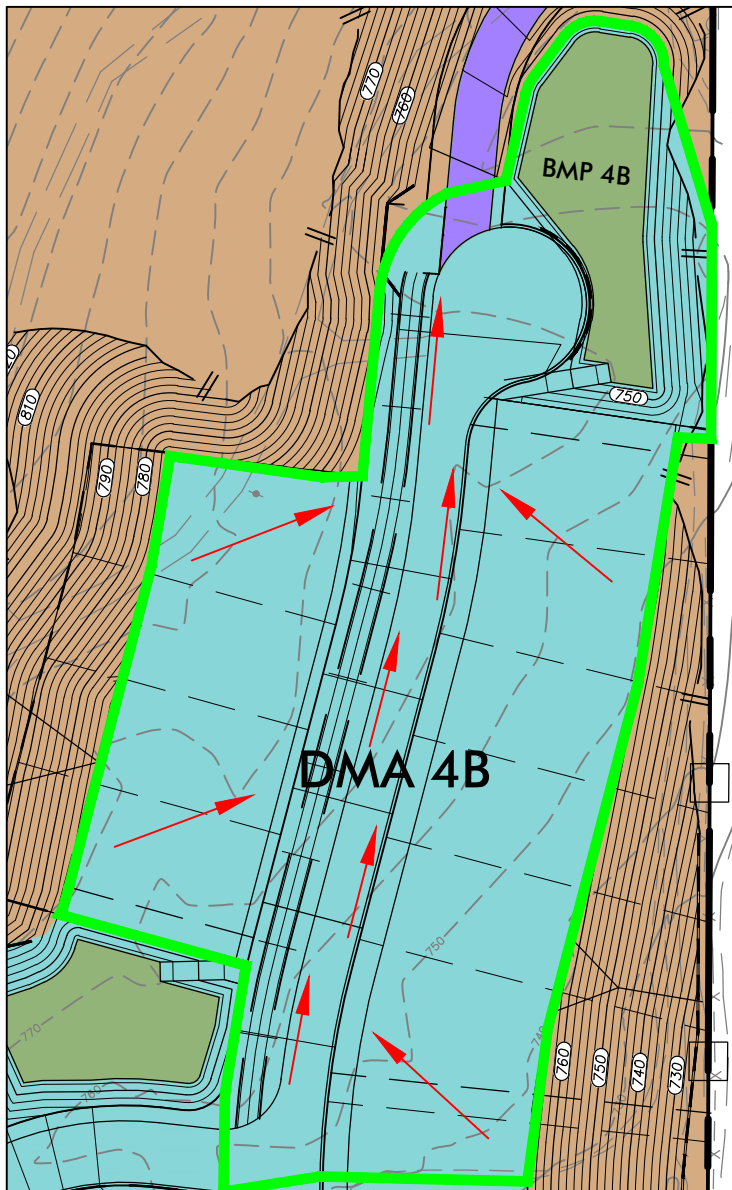
SELF-TREATING AREAS 




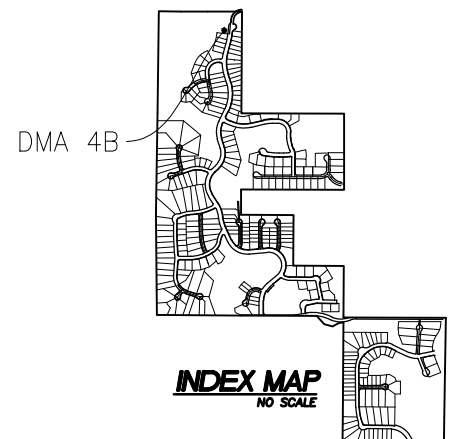
# STRUCTURAL BMP DMA MAPBOOK

DMA 4B / BMP 4B

PROPERTY LINE	— — — — —	FLOW DIRECTION	
PROPOSED LOT LINE	- - - - -	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
DMA OUTLINE		OFFSITE ROAD AREAS (100% IMPERVIOUS)	
EXISTING CONTOUR		PROPOSED LANDSCAPED AREAS	
PROPOSED CONTOUR		SELF-TREATING AREAS	








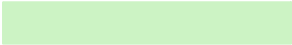
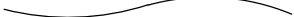



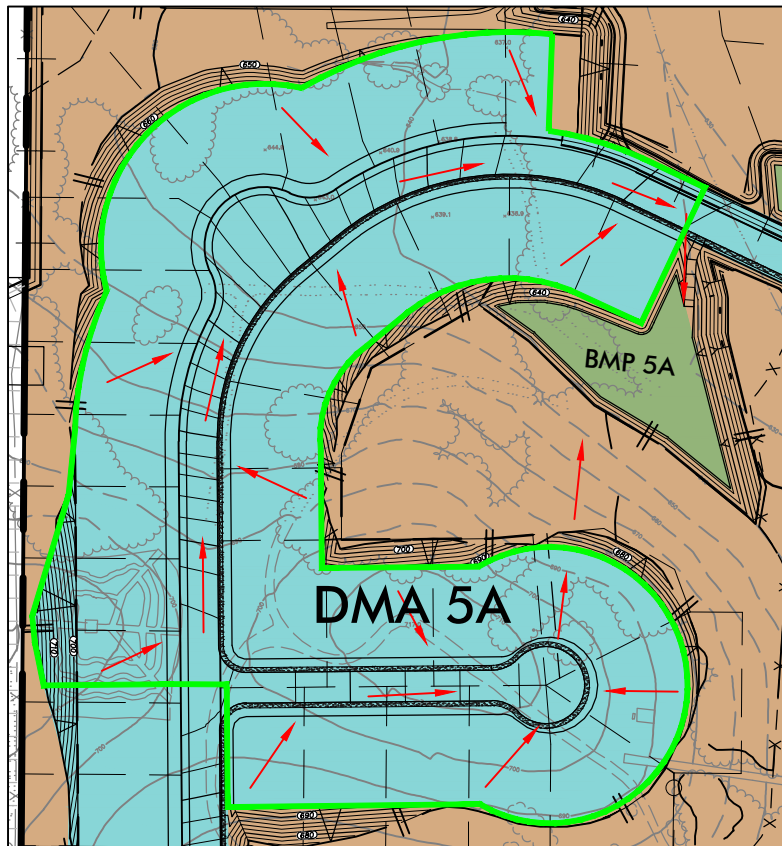
  
SCALE:  
1" = 100'




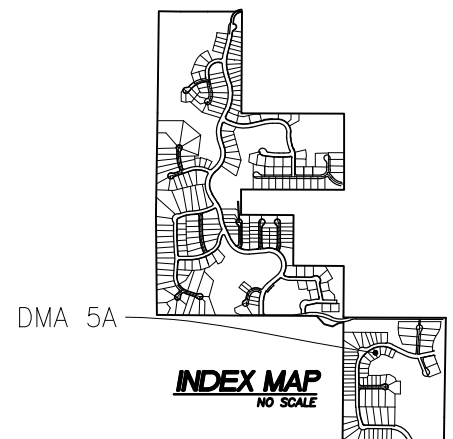
# STRUCTURAL BMP DMA MAPBOOK

## DMA 5A / BMP 5A

PROPERTY LINE		FLOW DIRECTION	
PROPOSED LOT LINE		PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
DMA OUTLINE		OFFSITE ROAD AREAS (100% IMPERVIOUS)	
EXISTING CONTOUR		PROPOSED LANDSCAPED AREAS	
PROPOSED CONTOUR		SELF-TREATING AREAS	








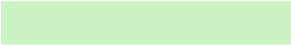


  
SCALE:  
1" = 200'

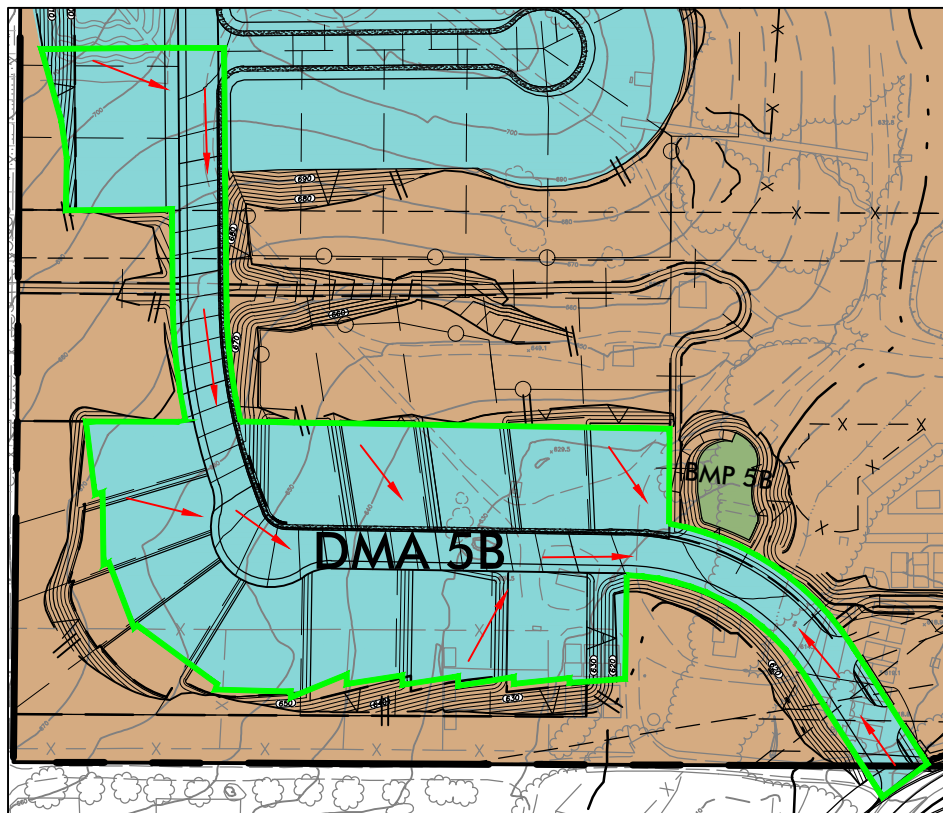





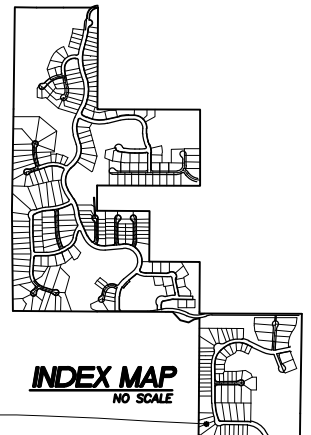
# STRUCTURAL BMP DMA MAPBOOK

## DMA 5B / BMP 5B

PROPERTY LINE	— — — — —	FLOW DIRECTION	
PROPOSED LOT LINE	- - - - -	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
DMA OUTLINE		OFFSITE ROAD AREAS (100% IMPERVIOUS)	
EXISTING CONTOUR		PROPOSED LANDSCAPED AREAS	
PROPOSED CONTOUR		SELF-TREATING AREAS	



  
SCALE:  
1" = 200'



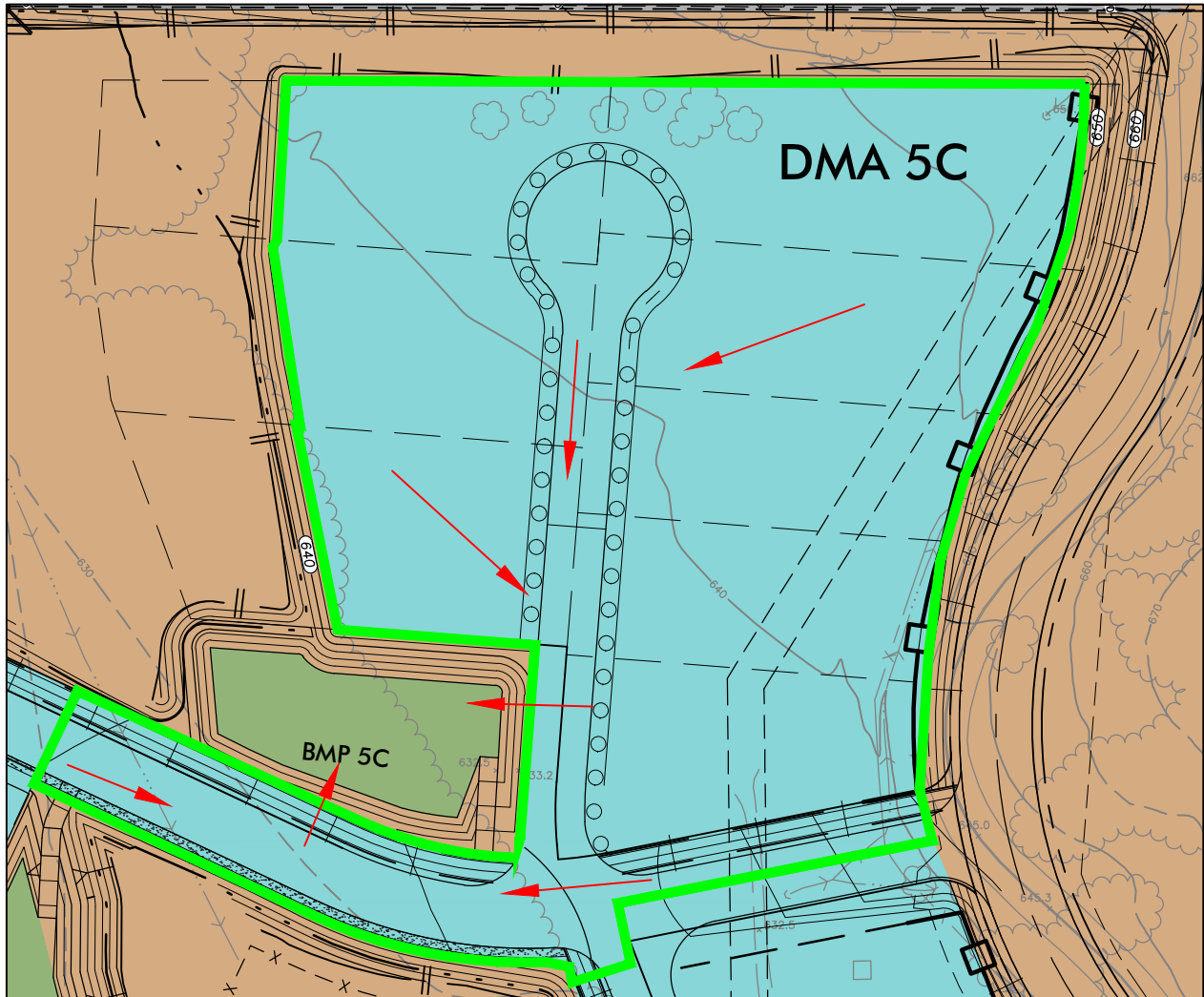
DMA 5B

**INDEX MAP**  
NO SCALE

# STRUCTURAL BMP DMA MAPBOOK

## DMA 5C / BMP 5C

SCALE:  
1" = 100'



PROPERTY LINE — — — — —

PROPOSED LOT LINE - - - - -

DMA OUTLINE —————

EXISTING CONTOUR ~~~~~

PROPOSED CONTOUR ~~~~~

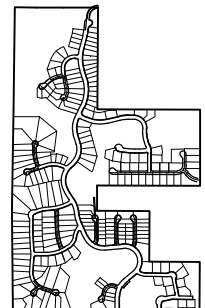
FLOW DIRECTION →

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) ██████████

OFFSITE ROAD AREAS  
(100% IMPERVIOUS) ██████████

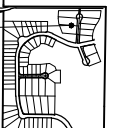
PROPOSED LANDSCAPED AREAS ██████████

SELF-TREATING AREAS ██████████



DMA 5C

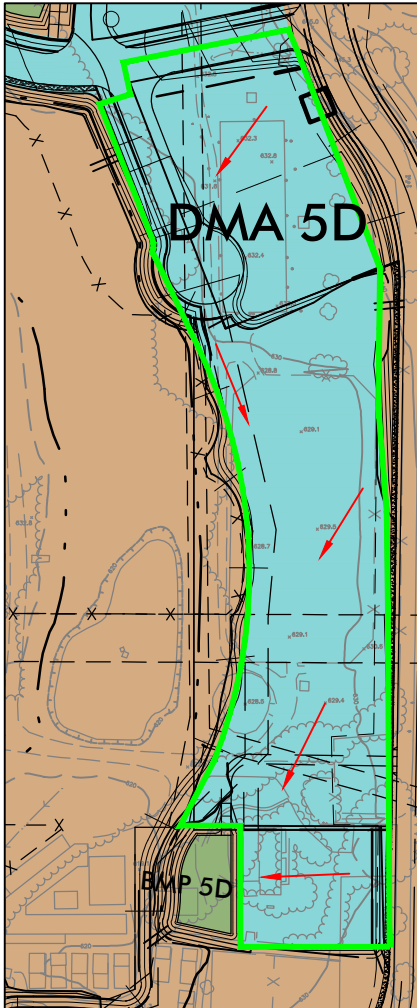
**INDEX MAP**  
NO SCALE



# STRUCTURAL BMP DMA MAPBOOK

## DMA 5D / BMP 5D

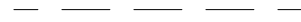
SCALE:  
1" = 200'



PROPERTY LINE



PROPOSED LOT LINE



DMA OUTLINE



EXISTING CONTOUR



PROPOSED CONTOUR



FLOW DIRECTION



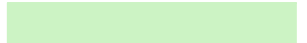
PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS)



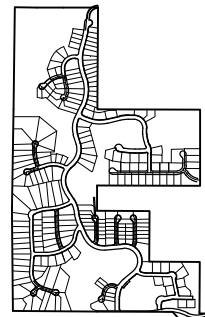
OFFSITE ROAD AREAS  
(100% IMPERVIOUS)



PROPOSED LANDSCAPED AREAS

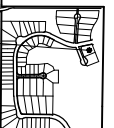


SELF-TREATING AREAS



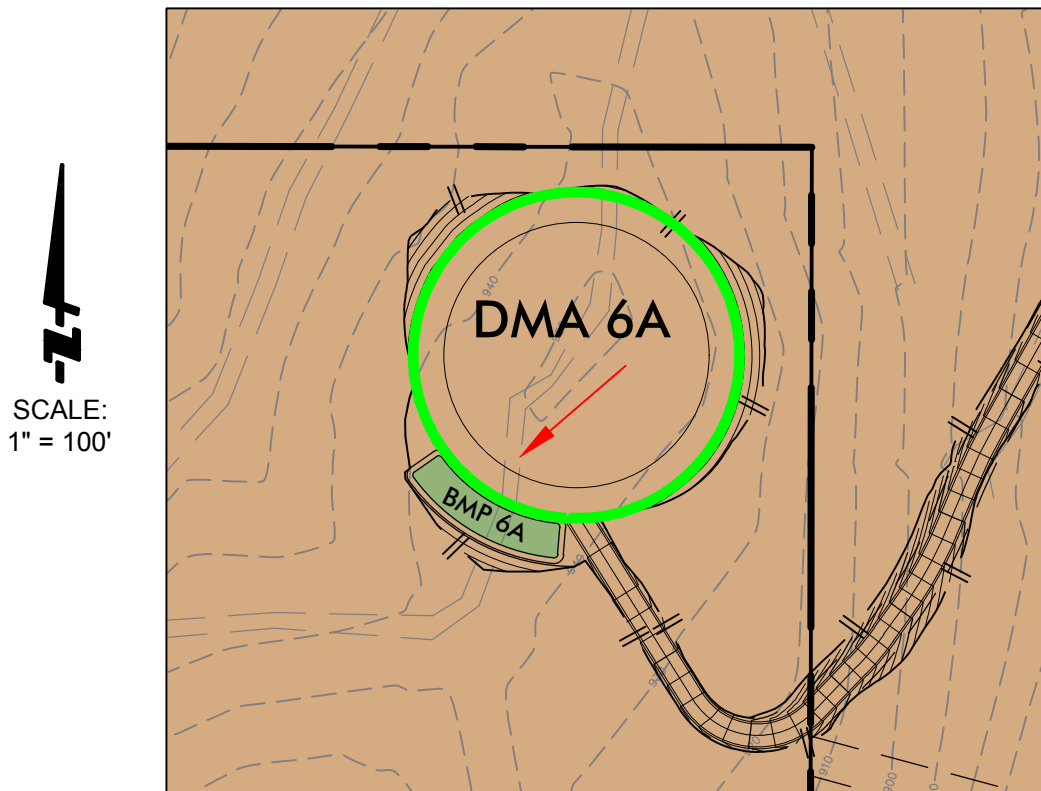
DMA 5D

**INDEX MAP**  
NO SCALE



# STRUCTURAL BMP DMA MAPBOOK

DMA 6A / BMP 6A



PROPERTY LINE



PROPOSED LOT LINE



DMA OUTLINE



EXISTING CONTOUR



PROPOSED CONTOUR



FLOW DIRECTION



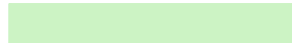
PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS)



OFFSITE ROAD AREAS  
(100% IMPERVIOUS)



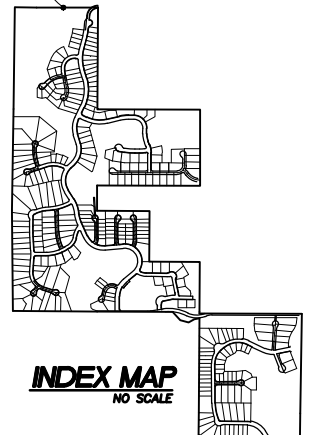
PROPOSED LANDSCAPED AREAS



SELF-TREATING AREAS




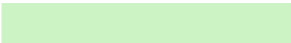


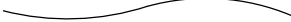



DMA 6A



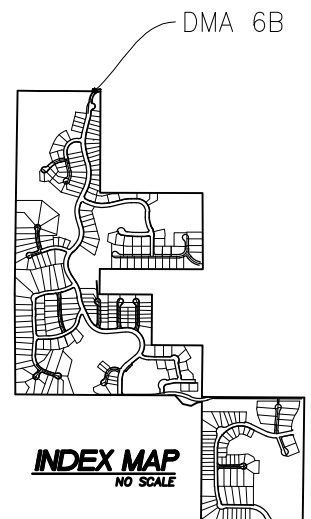
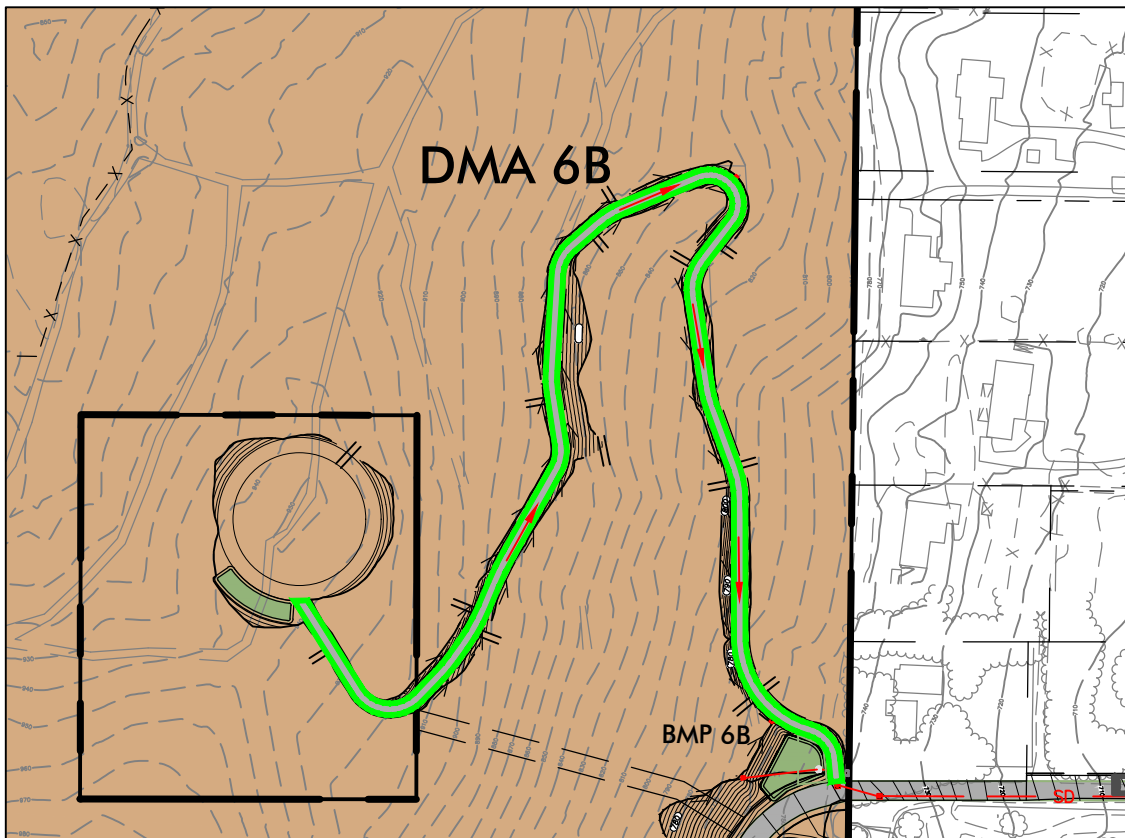
# STRUCTURAL BMP DMA MAPBOOK

## DMA 6B / BMP 6B

PROPERTY LINE	— — — — —	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
PROPOSED LOT LINE	- - - - -	OFFSITE ROAD AREAS (100% IMPERVIOUS)	
DMA OUTLINE		PROPOSED LANDSCAPED AREAS	
EXISTING CONTOUR		SELF-TREATING AREAS	
PROPOSED CONTOUR			
FLOW DIRECTION			



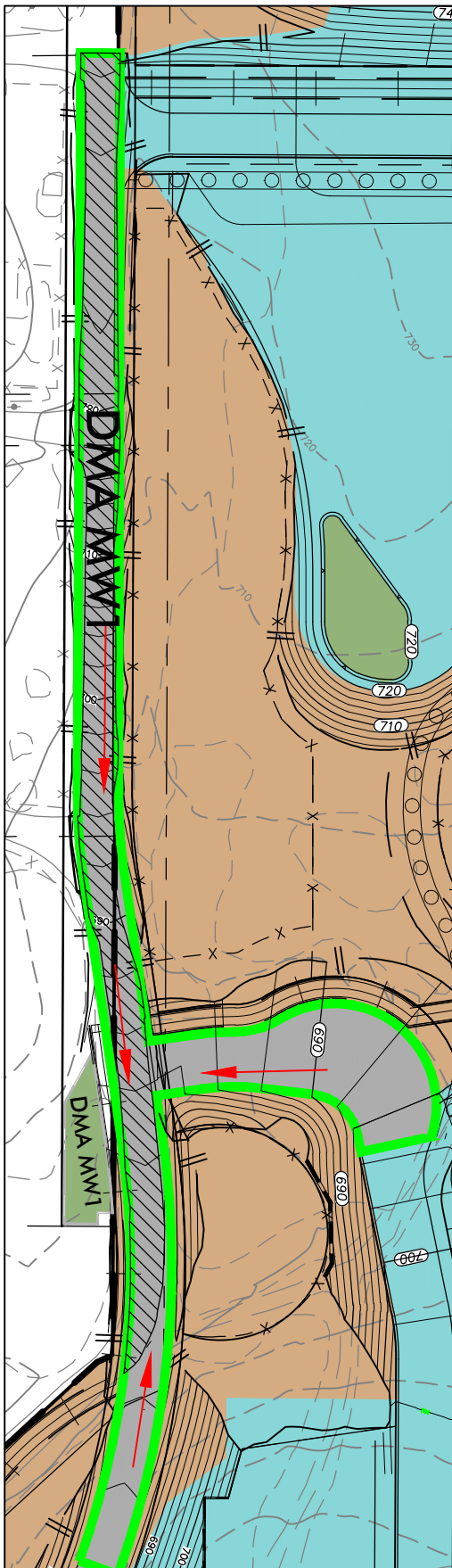
SCALE:  
1" = 200'



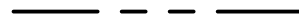
**INDEX MAP**  
NO SCALE

# STRUCTURAL BMP DMA MAPBOOK

DMA MW1 / BMP MW1



PROPERTY LINE



PROPOSED LOT LINE



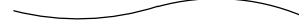
DMA OUTLINE



EXISTING CONTOUR



PROPOSED CONTOUR



FLOW DIRECTION



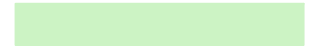
PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS)



OFFSITE ROAD AREAS  
(100% IMPERVIOUS)



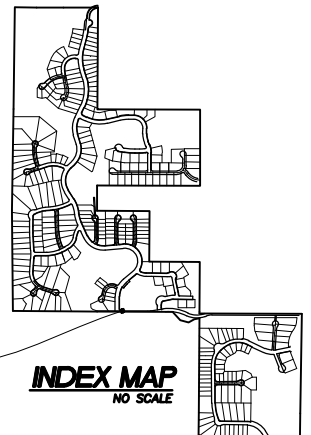
PROPOSED LANDSCAPED AREAS



SELF-TREATING AREAS



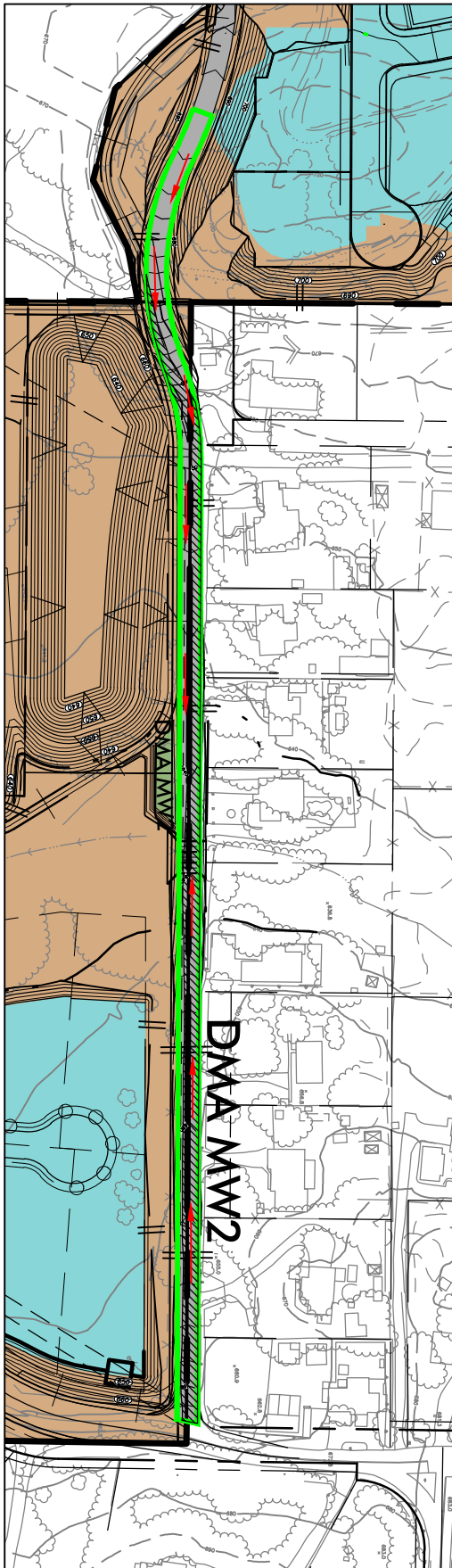
SCALE:  
1" = 100'



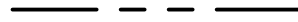


# STRUCTURAL BMP DMA MAPBOOK

DMA MW2 / BMP MW2



PROPERTY LINE



PROPOSED LOT LINE



DMA OUTLINE



EXISTING CONTOUR



PROPOSED CONTOUR



FLOW DIRECTION



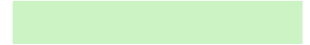
PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS)



OFFSITE ROAD AREAS  
(100% IMPERVIOUS)



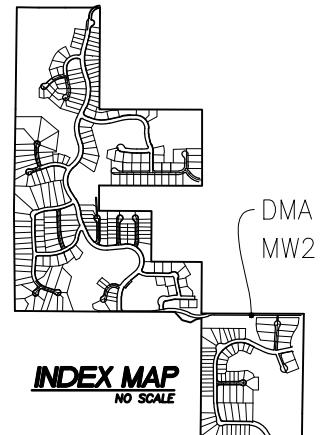
PROPOSED LANDSCAPED AREAS



SELF-TREATING AREAS



SCALE:  
1" = 200'










# STRUCTURAL BMP DMA MAPBOOK

DMA CC2 / BMP CC2

PROPERTY LINE 

PROPOSED LOT LINE 


DMA OUTLINE 

EXISTING CONTOUR 

PROPOSED CONTOUR 

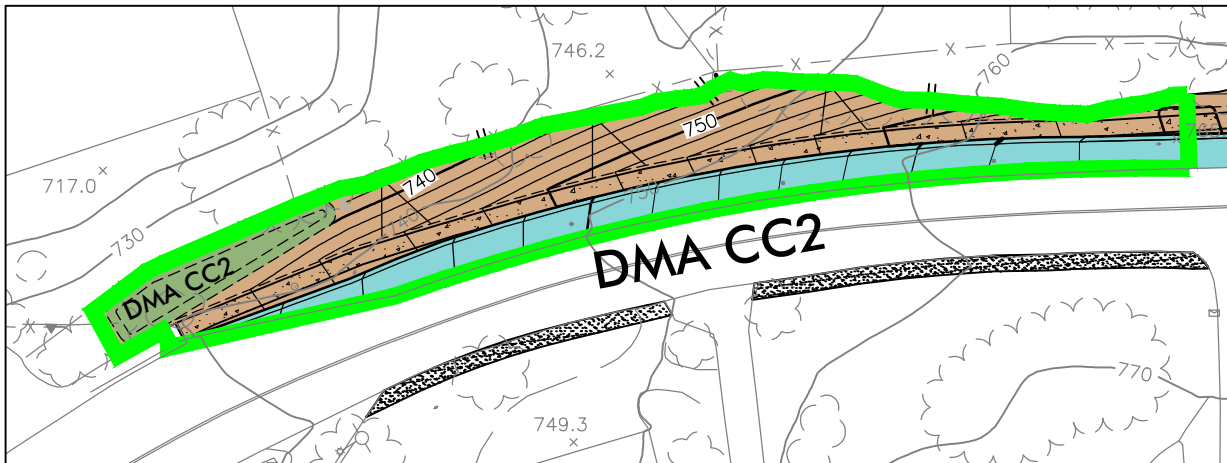
FLOW DIRECTION 

PROPOSED DEVELOPED AREAS  
(70% IMPERVIOUS) 

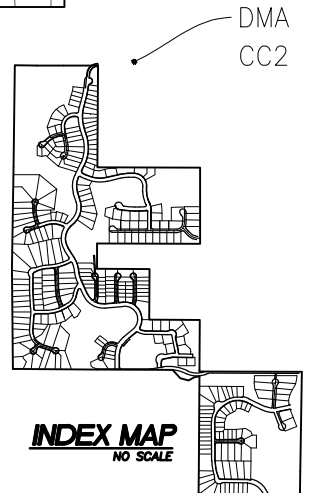
OFFSITE ROAD AREAS  
(100% IMPERVIOUS) 

PROPOSED LANDSCAPED AREAS 

SELF-TREATING AREAS 









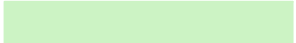



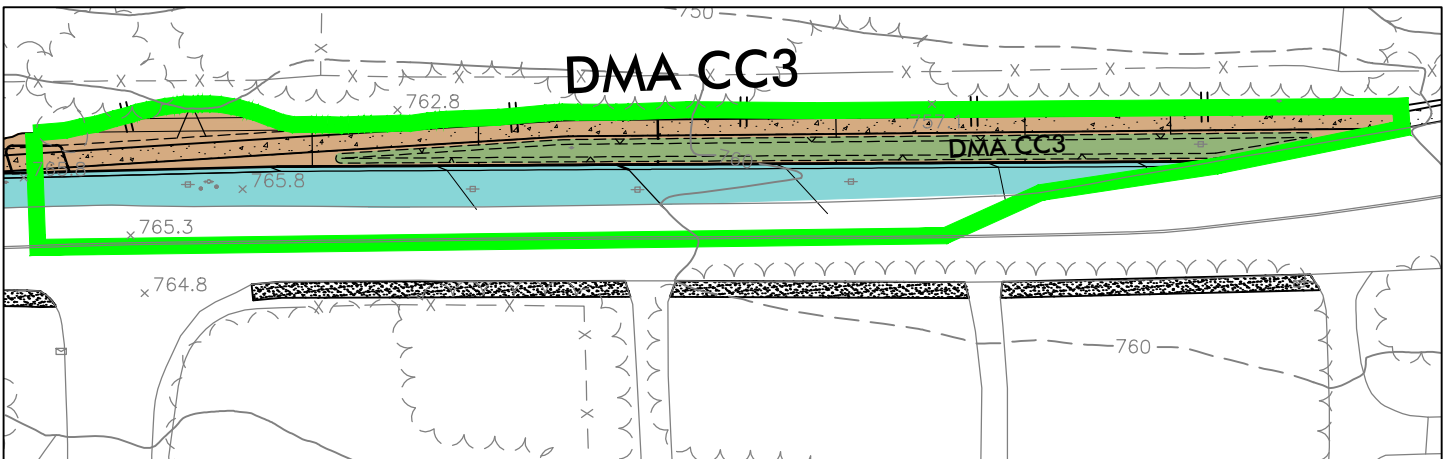
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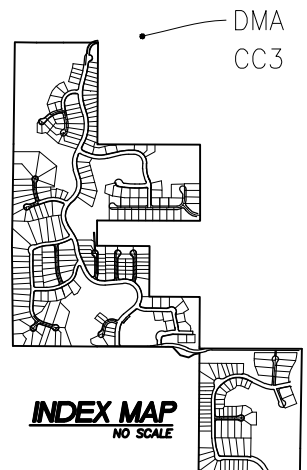
# STRUCTURAL BMP DMA MAPBOOK

DMA CC3 / BMP CC3

PROPERTY LINE	
PROPOSED LOT LINE	
DMA OUTLINE	
EXISTING CONTOUR	
PROPOSED CONTOUR	
FLOW DIRECTION	
PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
OFFSITE ROAD AREAS (100% IMPERVIOUS)	
PROPOSED LANDSCAPED AREAS	
SELF-TREATING AREAS	

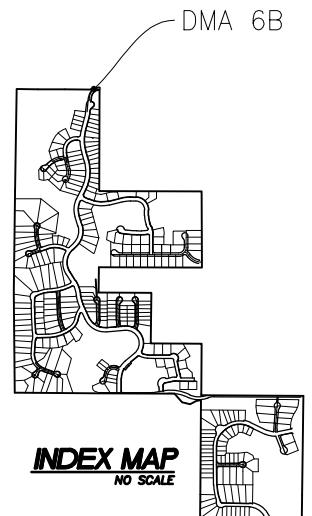


SCALE:  
1" = 60'






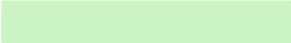





## DMA HV / BMP HV

The topographic map shows the DMA HV (Distributed Stormwater Management Area) and BMP HV (Best Management Practice Hydrologic Volume) locations. The DMA HV is a long, straight, green-shaded area, and the BMP HV is a smaller, purple-shaded area. The map includes contour lines, trees, and buildings.

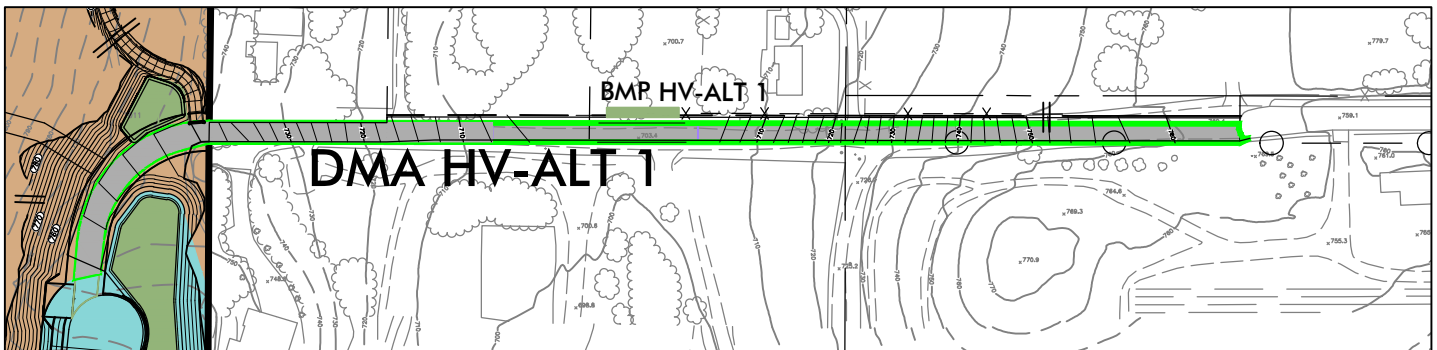


# STRUCTURAL BMP DMA MAPBOOK

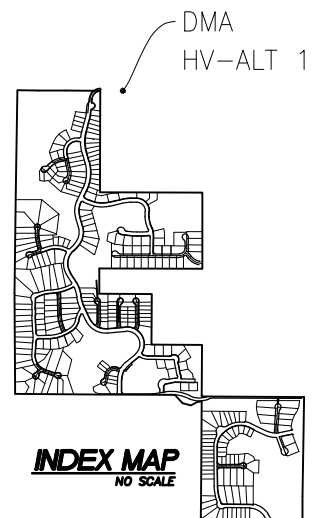
## DMA HV / BMP HV - ALT 1

PROPERTY LINE	— — — — —	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
PROPOSED LOT LINE	- - - - -	OFFSITE ROAD AREAS (100% IMPERVIOUS)	
DMA OUTLINE		PROPOSED LANDSCAPED AREAS	
EXISTING CONTOUR		SELF-TREATING AREAS	
PROPOSED CONTOUR		PERMEABLE PAVERS	
FLOW DIRECTION			

DMA/BMP HV ALT-1, AS SHOWN HERE, IS A BIOFILTRATION OPTION TO PERMEABLE PAVERS. IT IS SHOWN FOR INFORMATION ONLY AND WOULD BE USED IN THE EVENT THAT INFILTRATION RATES FOUND IN THE FIELD ARE LESS THAN 0.2 INCHES/HR OR THERE ARE OTHER FIELD CONDITIONS THAT WOULD ELIMINATE PERMEABLE PAVERS AS A SOLUTION.




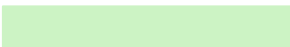







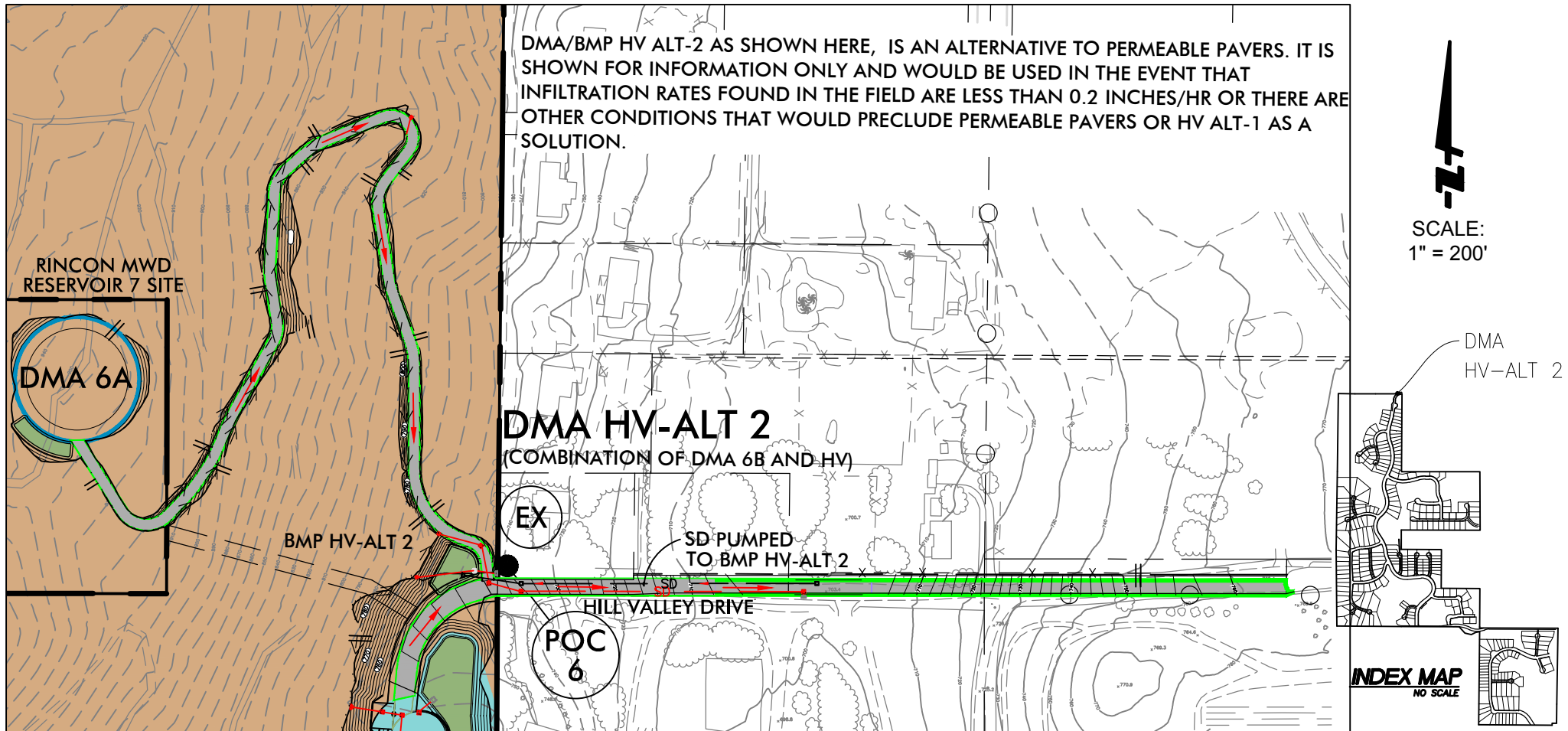
SCALE:  
1" = 200'



# STRUCTURAL BMP DMA MAPBOOK

## DMA HV / BMP HV - ALT 2

PROPERTY LINE	— — — — —	PROPOSED DEVELOPED AREAS (70% IMPERVIOUS)	
PROPOSED LOT LINE	- - - - -	OFFSITE ROAD AREAS (100% IMPERVIOUS)	
DMA OUTLINE		PROPOSED LANDSCAPED AREAS	
EXISTING CONTOUR		SELF-TREATING AREAS	
PROPOSED CONTOUR			
FLOW DIRECTION		PERMEABLE PAVERS	



## ATTACHMENT 2

## BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

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

**Indicate which Items are Included behind this cover sheet:**

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

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

The Hydromodification Management Exhibit must identify:

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

# **ATTACHMENT 2a**

## **Flow Control Facility Design**

**(Submitted as separate stand-alone document)**





Irvine  
San Diego  
Ontario  
Los Angeles  
El Centro  
San Ramon  
Mission Hills

January 23, 2017

PDS Land Development  
County of San Diego  
5510 Overland Avenue  
San Diego, CA 92123

**Subject:** Item 1-26: Hydromodification Calculations for SWQMP per Comments on Eden Hills Project (SP 13-001, GPA 13-001, REZ 13-001, TM 5575, STP 13, 003)

Nick Ortiz:

The current CEQA level PDP SWQMP is in conformance with the MS4 permit. Prior to approval of Final Improvement/Grading Plans, an updated PDP SWQMP will be provided that has final engineering calculations which meet the MS4 permit requirements to the satisfaction of the County of San Diego.

If you have any questions, please feel free to contact me. I may be reached at (858) 554-1500 or by email at [kkozlik@fuscoe.com](mailto:kkozlik@fuscoe.com)

Sincerely,

  
Kenneth T. Kozlik, PE  
Project Manager



*full circle thinking®*

Gravel Cistern Option

BMP Sizing Spreadsheet V2.0

Project Name:	Valiano
Project Applicant:	
Jurisdiction:	County of San diego
Parcel (APN):	
Hydrologic Unit:	
Rain Gauge:	Oceanside
Total Project Area (sf):	6.66
Channel Susceptibility:	High

BMP Sizing Spreadsheet V2.0			
Project Name:	Valiano	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Oceanside
Jurisdiction:	County of San diego	Total Project Area:	7
Parcel (APN):		Low Flow Threshold:	0.1Q2
BMP Name	BMP HV	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition			Q <sub>2</sub> Sizing Factor (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q <sub>2</sub> (cfs)	Orifice Area (in <sup>2</sup> )
		Soil Type	Cover	Slope				
Flat-Perv->Pervious A	Oceanside	A	Scrub	Flat	0.035	0.092	0.000	0.01
Mod-Perv->Imp B	Oceanside	B	Scrub	Moderate	0.134	0.075	0.001	0.02
Steep-Perv->Imp C	Oceanside	C	Scrub	Steep	0.217	0.409	0.009	0.16
Flat-Perv->Imp A	Oceanside	A	Scrub	Flat	0.035	0.037	0.000	0.00
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					

0.010	0.19	0.49
Tot. Allowable Orifice Flow (cfs)	Tot. Allowable Orifice Area (in <sup>2</sup> )	Max Orifice Diameter (in)

0.011	0.19	0.49
Actual Orifice Flow  (cfs)	Actual Orifice Area  (in <sup>2</sup> )	Selected Orifice Diameter  (in)

Drawdown (Hrs)	provide hand calculation
----------------	-----------------------------



Stormtech Chamber Cistern Option

BMP Sizing Spreadsheet V2.0	
Project Name:	Valiano
Project Applicant:	
Jurisdiction:	County of San diego
Parcel (APN):	
Hydrologic Unit:	
Rain Gauge:	Oceanside
Total Project Area (sf):	6.66
Channel Susceptibility:	High



BMP Sizing Spreadsheet V2.0			
Project Name:	Valiano	Hydrologic Unit:	
Project Applicant:		Rain Gauge:	Oceanside
Jurisdiction:	County of San diego	Total Project Area:	7
Parcel (APN):		Low Flow Threshold:	0.1Q2
BMP Name	BMP HV	BMP Type:	Cistern

DMA Name	Rain Gauge	Pre-developed Condition			Q <sub>2</sub> Sizing Factor (cfs/ac)	DMA Area (ac)	Orifice Flow - %Q <sub>2</sub> (cfs)	Orifice Area (in <sup>2</sup> )
		Soil Type	Cover	Slope				
Flat-Perv->Pervious A	Oceanside	A	Scrub	Flat	0.035	0.092	0.000	0.01
Mod-Perv->Imp B	Oceanside	B	Scrub	Moderate	0.134	0.075	0.001	0.02
Steep-Perv->Imp C	Oceanside	C	Scrub	Steep	0.217	0.409	0.009	0.20
Flat-Perv->Imp A	Oceanside	A	Scrub	Flat	0.035	0.037	0.000	0.00
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					
			Scrub					

0.010	0.23	0.55
Tot. Allowable Orifice Flow (cfs)	Tot. Allowable Orifice Area (in <sup>2</sup> )	Max Orifice Diameter (in)

0.011	0.24	0.55
Actual Orifice Flow  (cfs)	Actual Orifice Area  (in <sup>2</sup> )	Selected Orifice Diameter  (in)

Drawdown (Hrs)	provide hand calculation
----------------	-----------------------------



### User Inputs

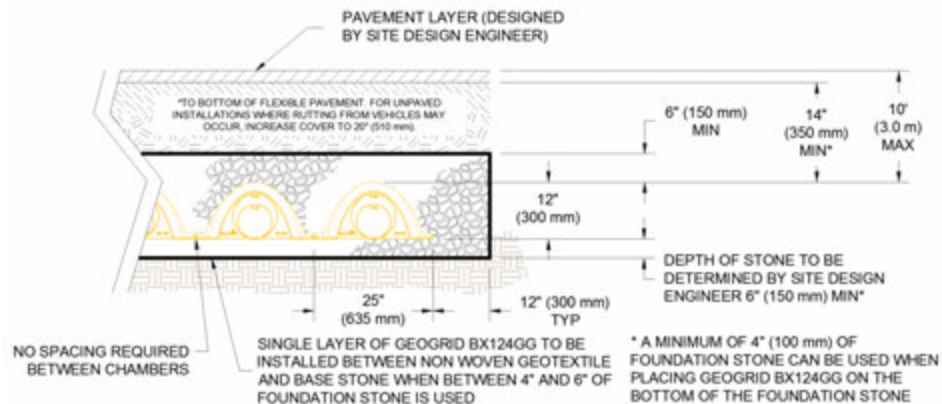
Chamber Model	SC-160
Outlet Control Structure	Yes (Outlet)
Project Name	Valiano
Project Location	San Diego County
Project Date	04/03/2017
Engineer	Ken Kozlik
Measurement Type	Imperial
Required Storage Volume	5,062 cubic ft.
Stone Porosity	40%
Stone Above Chambers	6 in.
Stone Foundation Depth	6 in.
Average Cover Over Chambers	14 in.
Design Constraint	Width
Design Constraint Dimension	20 ft.

### Results

<u>System Volume and Bed Size</u>	
Installed Storage Volume	5064 cubic ft.
Storage Volume Per Chamber	15.97 cubic ft.
Number Of Chambers Required	278 each
Number Of End Caps Required	16 each
Rows/Chambers	6 row(s) of 35 chamber(s)
Leftover Rows/Chambers	2 row(s) of 34 chamber(s)
Maximum Length	255.41 ft.
Maximum Width	19.27 ft.
Approx. Bed Size Required	4901 square ft.

### System Components

Amount Of Stone Required	292.52 cubic yards
Volume Of Excavation (Not Including Fill)	363 cubic yards
Non-woven Filter Fabric Required	1225 square yards
Length Of Isolator Row	249.80 ft.
Woven Isolator Row Fabric	255 square yards



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# Valiano

## San Diego County

### STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-160LP OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE MATERIAL REQUIREMENTS IN ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". (NOTE: THE SC160LP CHAMBER CLASSIFICATION HAS NOT YET BEEN ADDED TO THE ASTM F2418 STANDARD)
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
  - a. A STRUCTURAL EVALUATION THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
  - b. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

### IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-160LP SYSTEM

1. STORMTECH SC-160LP CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-106LP CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-160LP CONSTRUCTION GUIDE".
3. FOUNDATION STONE AND EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE; AASHTO M43 #3,357, 4, 467, 5, 56, OR 57.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. THE DEPTH OF FOUNDATION STONE SHALL BE DETERMINED BASED ON THE SUBGRADE BEARING CAPACITY PROVIDED BY THE SITE DESIGN ENGINEER.
6. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES CONCERNING CHAMBER FOUNDATION DESIGN AND SUBGRADE BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
7. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
8. CHAMBERS SHALL BE INSTALLED "TOE TO TOE". NO ADDITIONAL SPACING BETWEEN ROWS IS REQUIRED.
9. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
10. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

### NOTES FOR CONSTRUCTION EQUIPMENT

1. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-160LP CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-160LP CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-106LP CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

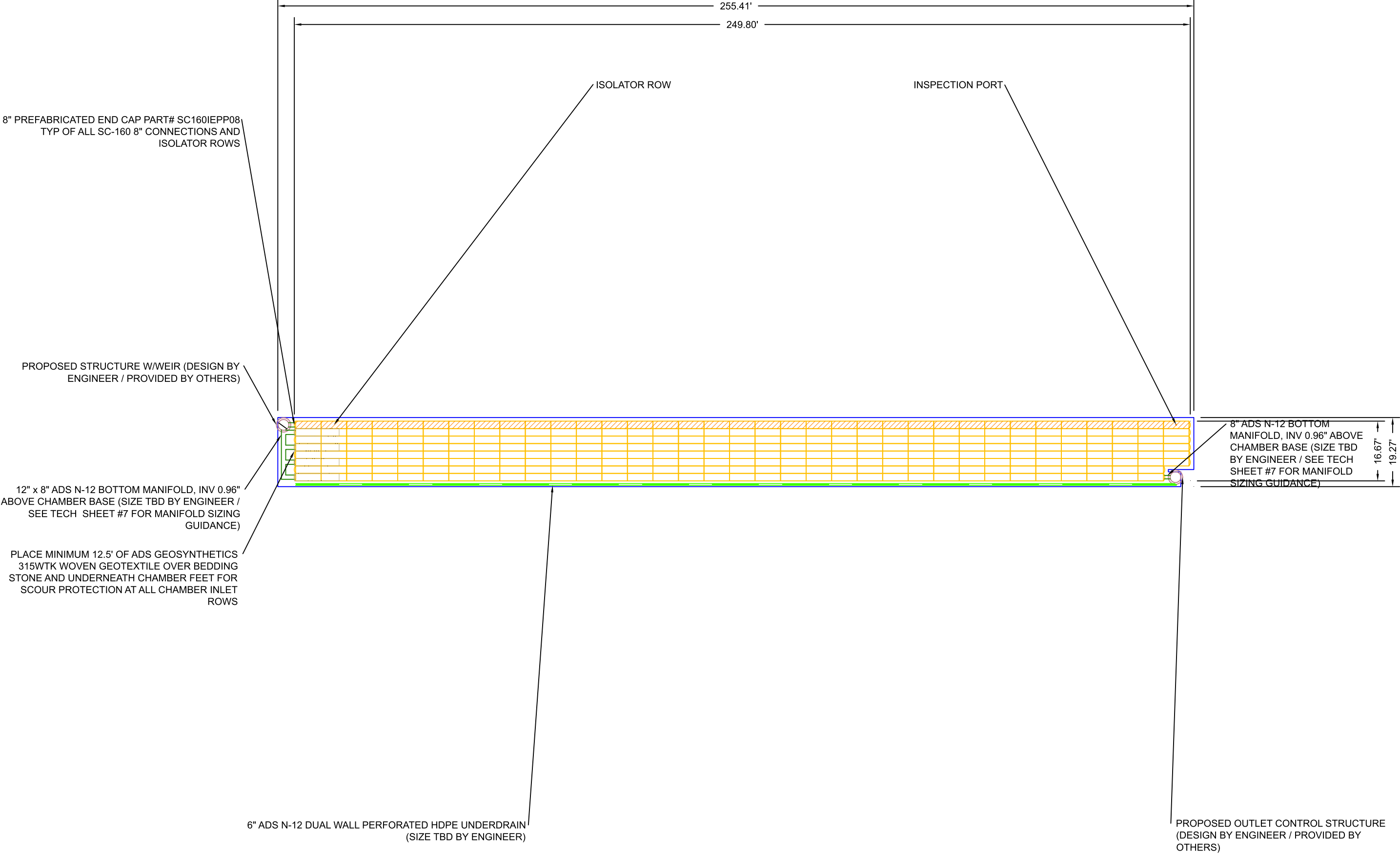
**USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.**

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

(278) STORMTECH SC-160 CHAMBERS  
(16) STORMTECH SC-160 END CAPS  
INSTALLED WITH 6 " COVER STONE, 6 " BASE STONE, 40% STONE VOID  
**INSTALLED SYSTEM VOLUME: 5064 CF**  
AREA OF SYSTEM: 4901 FT²  
PERIMETER OF SYSTEM: 556 FT

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION





Valiano  
San Diego County

REV	DRW	CHK	DESCRIPTION

DATE:	DRAWN:	CHECKED:
04/03/2017	RR	---

PROJECT #:	Tool

**Stormtech**  
Detention - Retention - Water Quality  
70 NWWOOD ROAD, SUITE 3 | ROCKY HILL, CT | 06067  
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

**ADS.**  
ADVANCED DRAINAGE SYSTEMS, INC.  
4640 TRUEMAN BLVD  
HILLIARD, OH 43026  
1-800-733-7473

NOT TO SCALE

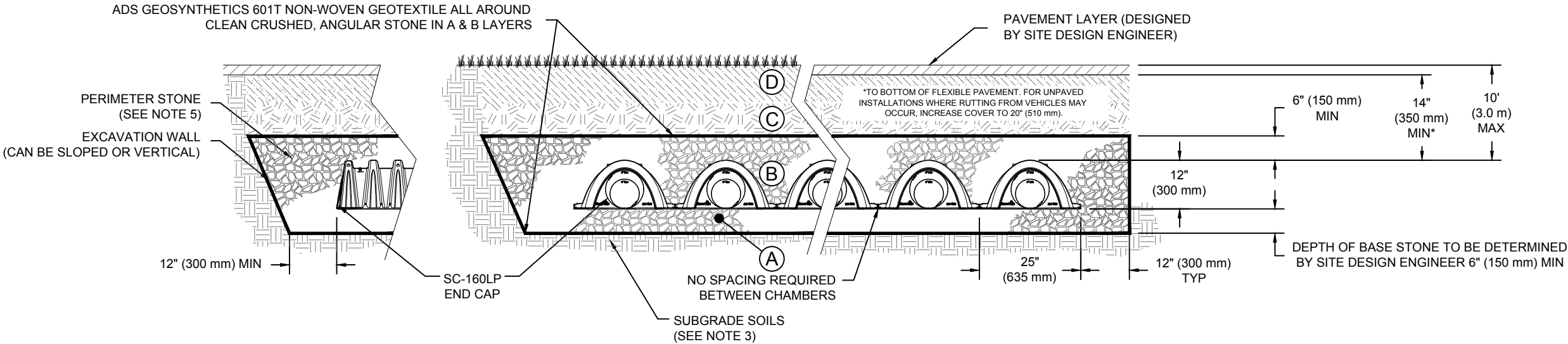
SHEET  
2 OF 5

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 14" (355 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE.  MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2-4, A-3  OR  AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2 3</sup>

- PLEASE NOTE:
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
  - STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
  - WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

- SC-160LP CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

Valiano  
San Diego County

DESCRIPTION

CHK

DRW


REV

DATE: 04/03/2017

DRAWN: RR


CHECKED: ---

PROJECT #: Tool



StormTech  
Detention/Retention Water Quality

70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067  
860-529-8188 | 888-892-2684 | WWW.STORMTECH.COM



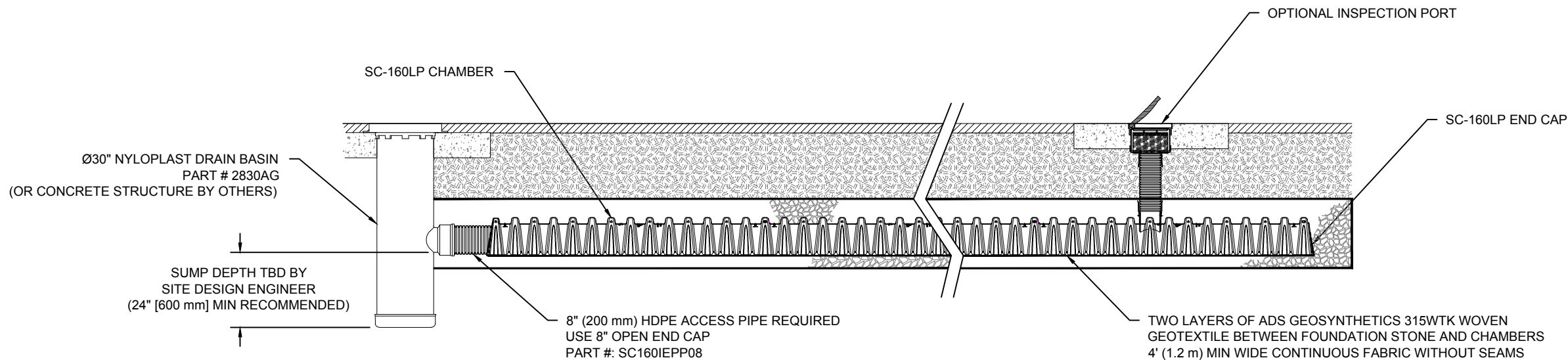
ADS  
ADVANCED DRAINAGE SYSTEMS, INC.

4640 TRUEJMAN BLVD  
HILLIARD, OH 43026  
1-800-733-7473

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

SHEET

3 OF 5



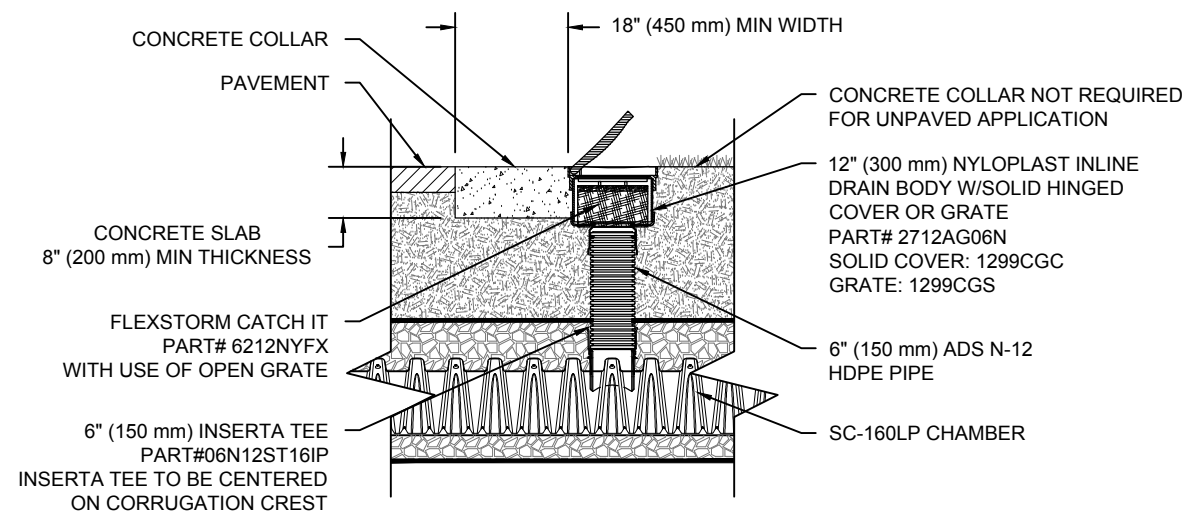
**SC-160LP ISOLATOR ROW DETAIL**  
NTS

## INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
- A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
- A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
- A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
- A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
- A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
- B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
- B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
- i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
- ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
- B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

## NOTES

- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



**SC-160LP 6" INSPECTION PORT DETAIL**  
NTS



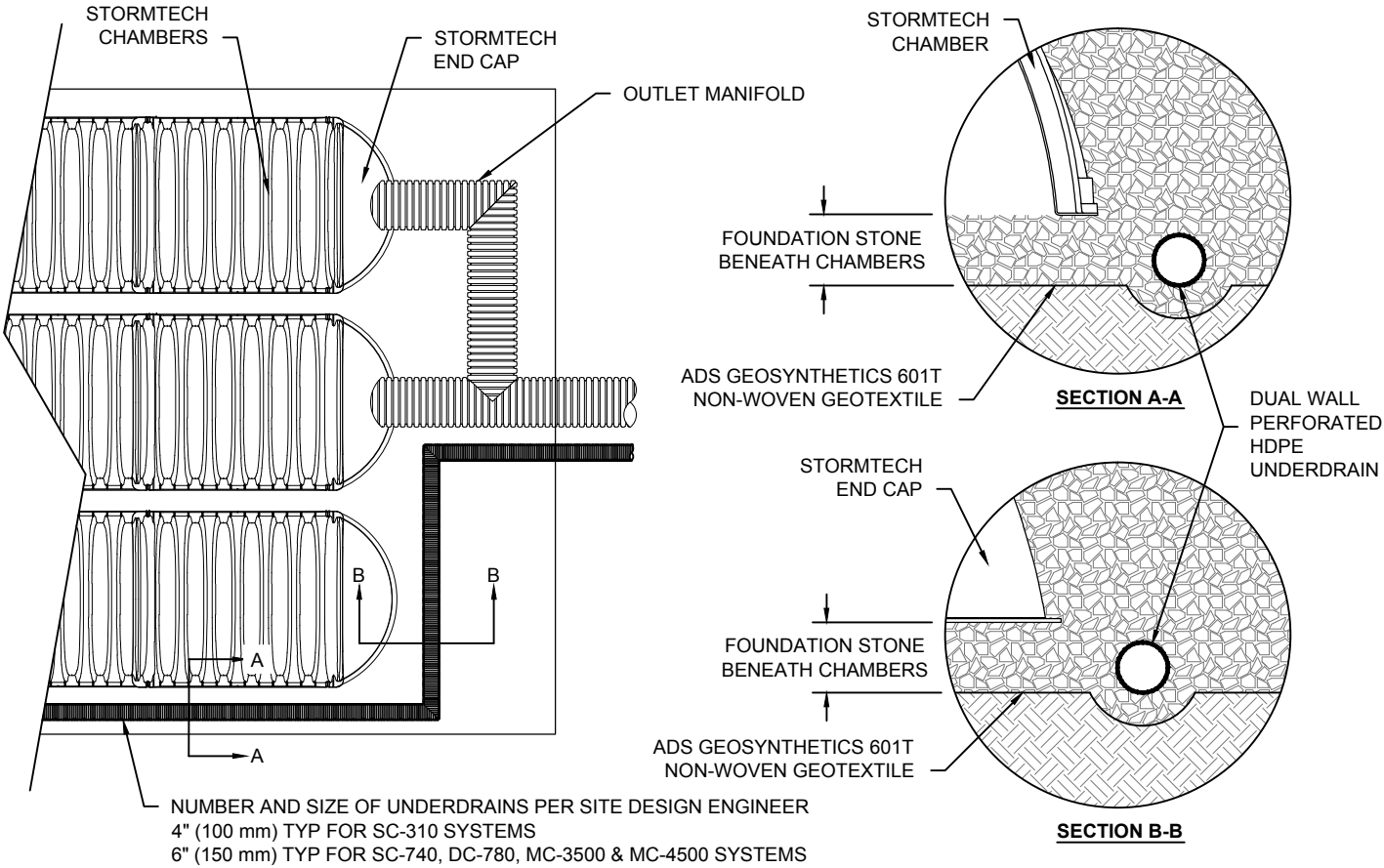
Valiano San Diego County		DATE: 04/03/2017	DRAWN: RR
		PROJECT #: Tool	CHECKED: ---

REV	DRW	CHK	DESCRIPTION



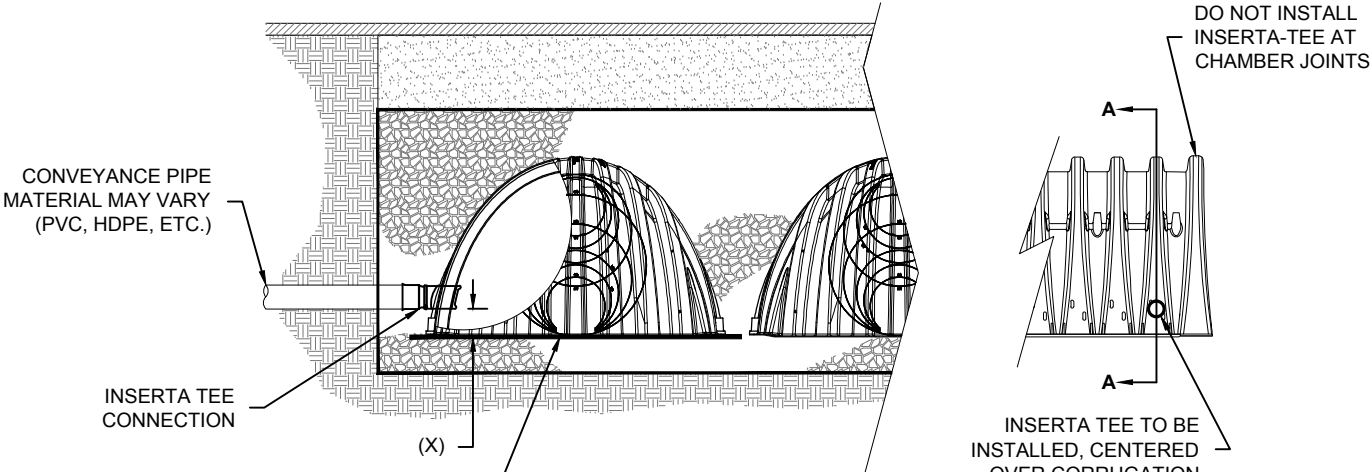
UNDERDRAIN DETAIL

NTS



INSERTA TEE DETAIL

NTS



SECTION A-A

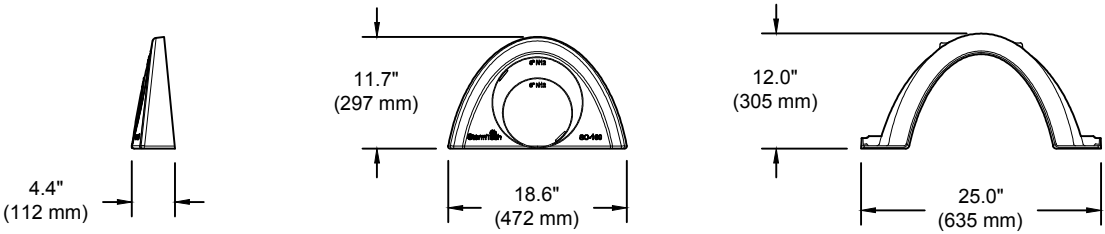
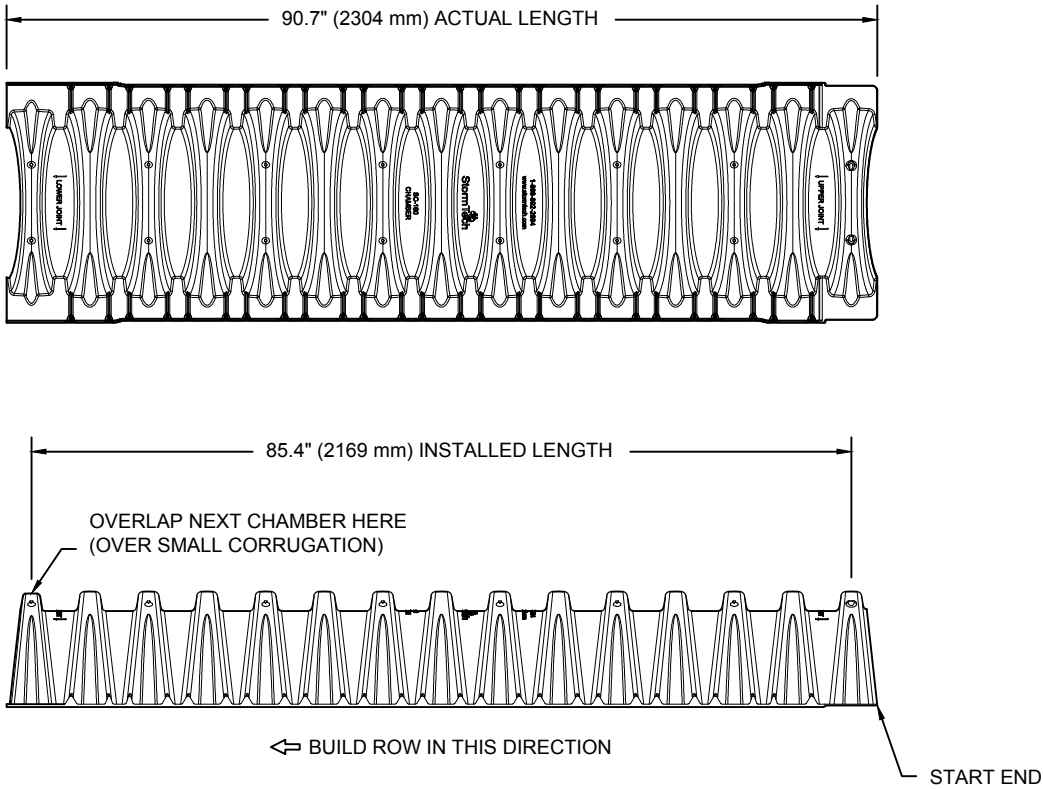
SIDE VIEW

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

**NOTE:**  
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.

SC-160LP TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

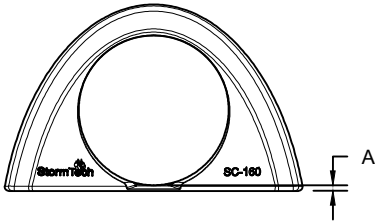
SIZE (W X H X INSTALLED LENGTH)	35.0" X 12.0" X 85.4"	(635 mm X 305 mm X 2169 mm)
CHAMBER STORAGE	6.85 CUBIC FEET	(0.19 m³)
MINIMUM INSTALLED STORAGE*	15.0 CUBIC FEET	(0.42 m³)
WEIGHT	24.0 lbs.	(10.9 kg)

\*ASSUMES 6" (152 mm) ABOVE, 4" (100 mm) BELOW, AND STONE BETWEEN CHAMBERS WITH 40% STONE POROSITY.

PART #	STUB	A
SC160IEPP	6" (150 mm)	0.66" (16 mm)
	8" (200 mm)	0.80" (20 mm)
SC160IEPP08	8" (200 mm)	0.96" (24 mm)

ALL STUBS ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

NOTE: ALL DIMENSIONS ARE NOMINAL



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HILLIARD, OH 43026  
1-800-733-7473  
ADVANCED DRAINAGE SYSTEMS, INC.

REV	DRW	CHK	DESCRIPTION

Valiano San Diego County	DATE: 04/03/2017	DRAWN: RR	CHECKED: ---
PROJECT #:	Tool		

# **ATTACHMENT 2b**

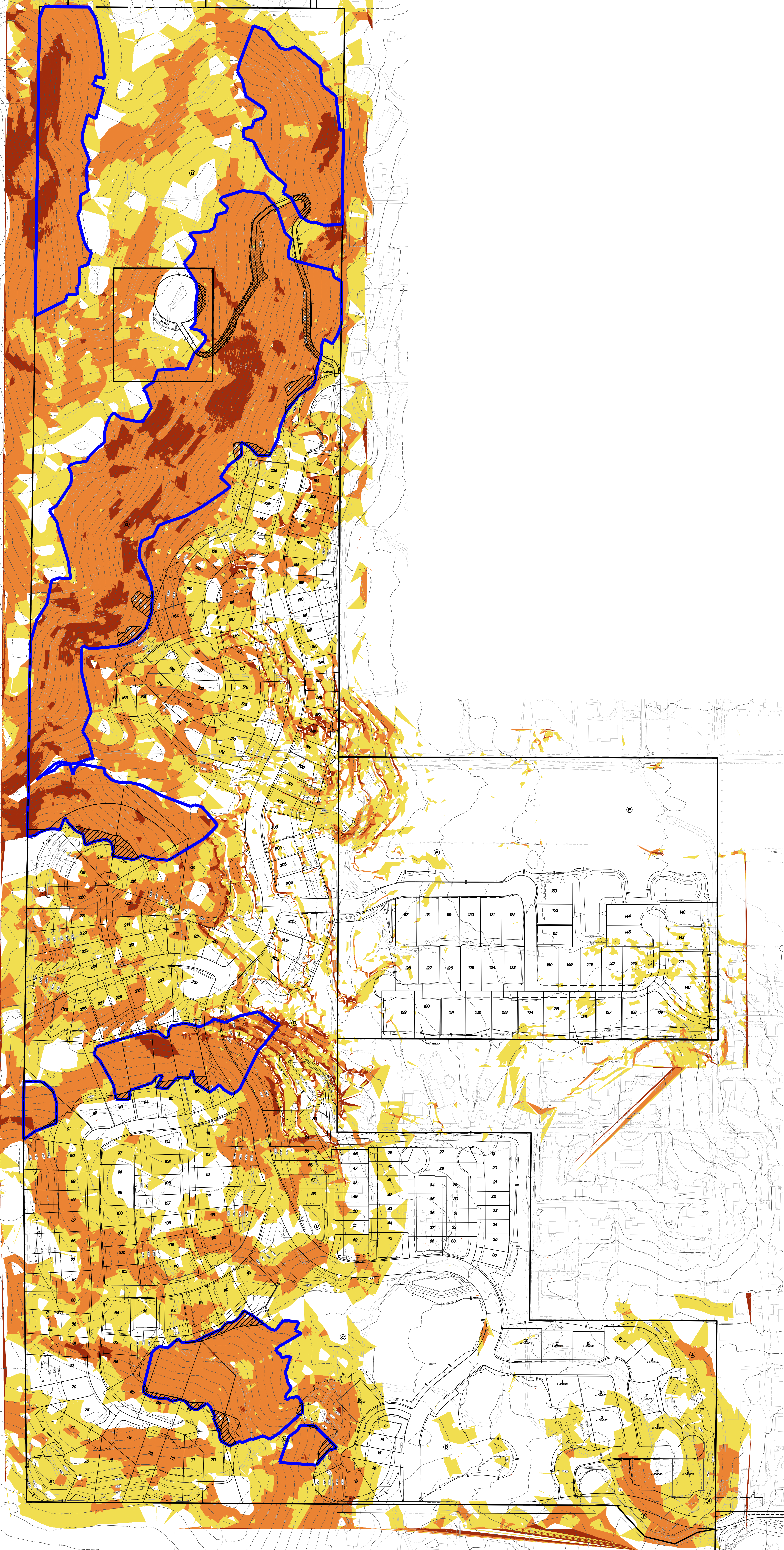
## **Hydromodification Management Exhibit**

**(See Attachment 1c – DMA Exhibit)**

# **ATTACHMENT 2c**

## **Management of Critical Coarse Sediment Yield Areas**





LEGEND

RPO STEEP SLOPE LANDS  
ALL LANDS HAVING A SLOPE WITH NATURAL GRADIENT OF  
25% OR GREATER AND A MINIMUM RISE OF 50 FEET,  
UNLESS SAID LAND HAS BEEN SUBSTANTIALLY DISTURBED  
BY PREVIOUS LEGAL GRADING. THE MINIMUM RISE SHALL BE  
MEASURED VERTICALLY FROM THE TOE OF SLOPE TO THE  
TOP OF SLOPE WITHIN THE PROJECT BOUNDARY.

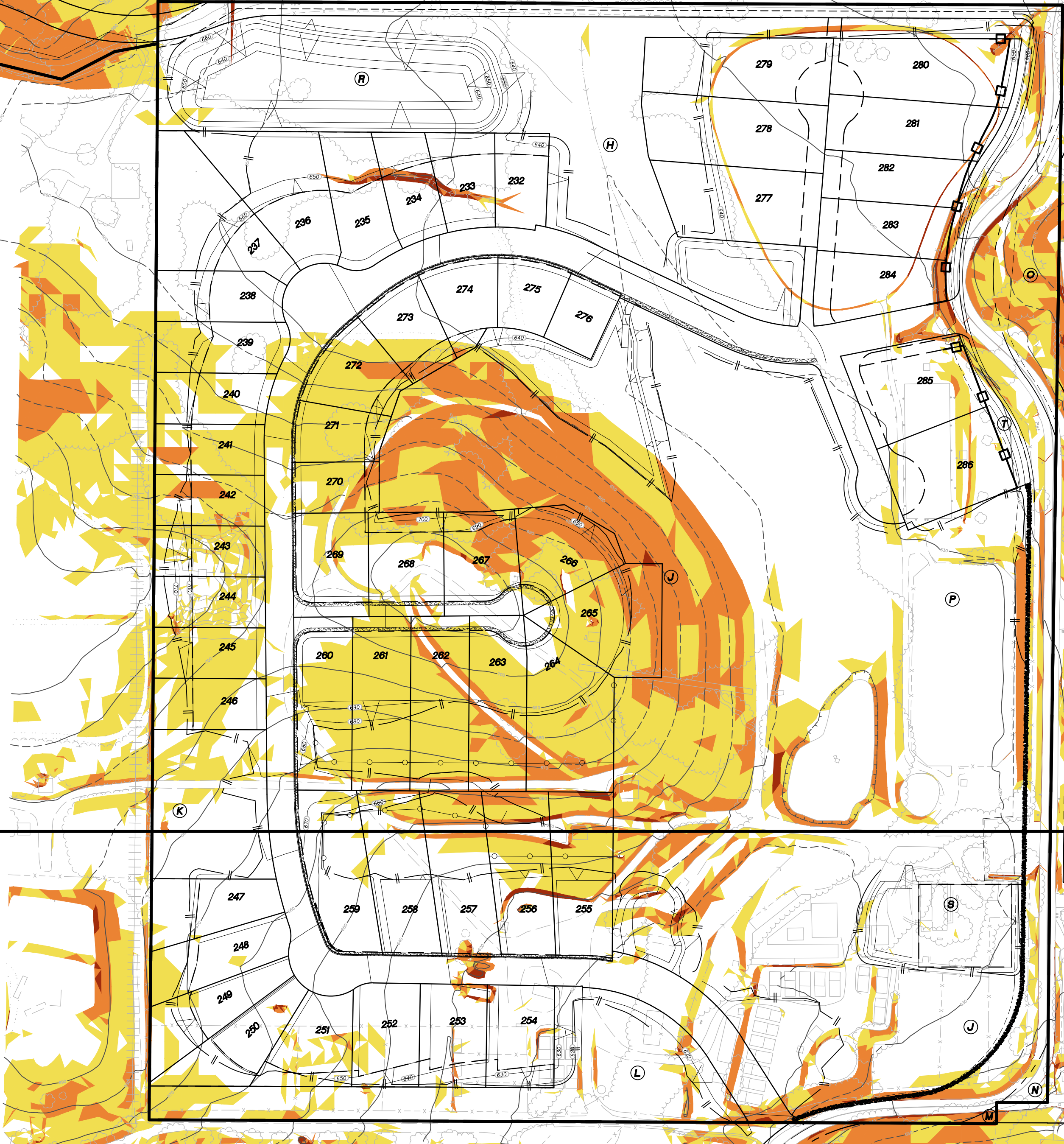
GRADING FOOTPRINT

GRADING ENCROACHMENT INTO RPO STEEP SLOPE LANDS  
RPO STEEP SLOPE EXEMPT DUE TO CONSTRUCTION OF A  
PUBLIC UTILITY SYSTEM USING THE LEAST  
ENVIRONMENTALLY DAMAGING ALTERNATIVE

Slope Analysis Data		
Minimum Slope	Maximum Slope	Color
15%	25%	
25%	50%	
50%	VERTICAL	

STEEP SLOPE CALCULATIONS

Lot #	Gross Area		RPO Steep Slope Area		Encroachment Allowed per RPO		Encroachment Proposed	
	(SF)	(acres)	(SF)	% of Gross Area	Area (SF)	% of Steep Slope	Area (SF)	% of Steep Slope
67	21,820	0.50	3,351	15.4%	335	10.0%	290	8.7%
68	41,990	0.96	26,205	62.4%	10.0%	2,621	1,893	7.2%
69	44,330	1.02	30,402	68.6%	10.0%	3,040	3,032	10.0%
90	21,950	0.50	27	0.1%	10.0%	3	0	0.0%
91	32,190	0.74	18,178	56.5%	10.0%	1,818	467	2.6%
92	54,240	1.25	316	0.6%	10.0%	32	0	0.0%
93	33,880	0.78	15,188	44.8%	10.0%	1,519	1,067	7.0%
94	29,920	0.69	18,080	60.4%	10.0%	1,808	0	0.0%
95	24,960	0.57	12,535	50.3%	10.0%	1,254	1,150	9.2%
96	31,800	0.73	19,941	62.7%	10.0%	1,994	1,927	9.7%
216	33,700	0.77	3,484	10.3%	10.0%	349	0	0.0%
217	45,440	1.04	38,139	83.9%	12.0%	4,577	4,488	11.8%
218	71,670	1.65	55,973	78.1%	10.0%	5,597	4,964	8.9%
219	40,380	0.93	975	2.4%	10.0%	98	0	0.0%
C	532,203	12.22	117,782	22.1%	10.0%	11,778	11,412	9.7%
G	2,340,081	53.72	1,140,748	48.7%	10.0%	114,075	17,584	1.5%





# **ATTACHMENT 2d**

## **Geomorphic Assessment of Receiving Channels** **(Not performed)**

# **ATTACHMENT 2e**

## **Vector Control Plan**

**(Not required because BMPs will drain less than 96 hours)**

**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 Sequence</b>	<b>Contents</b>	<b>Checklist</b>
Attachment 3a	Structural BMP Maintenance Plan (Required)	<input checked="" type="checkbox"/> Included  See Structural BMP Maintenance Information Checklist on the back of this Attachment cover sheet.
Attachment 3b	Draft Stormwater Maintenance Notification / Agreement (when applicable)	<input type="checkbox"/> Included <input checked="" type="checkbox"/> Not Applicable

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

**Attachment 3a must identify:**

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

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

# **ATTACHMENT 3a**

## **Structural BMP Maintenance Plan**

## **MAINTENANCE PLAN FOR EXTENDED DETENTION BASIN**

### **1. INSPECTION FREQUENCY**

Inspections of the extended detention basins (EDBs) will occur at a minimum of once a month. Inspections will also occur before and after large storm events or on a weekly basis during periods of wet weather. The rainy season within the jurisdiction of the San Diego Regional Water Quality Control Board is October 1 – April 30. Refer to Attachment D for extended detention basin locations.

### **2. PREVENTATIVE ACTIONS**

The following is a list of actions that will help prevent problems from occurring. They should be done on a routine basis throughout the duration of the project.

#### VEGETATION CONTROL

Vegetation in the basin should be trimmed and mowed to keep a maximum height of 18 inches. All vegetation clippings should be removed from the basin when trimming and mowing is conducted. Trimming and mowing prevents marsh vegetation from overtaking the basin and creating faunal habitats. It also prevents areas of water stagnation which can create a vector and health problem.

#### BASIN CLEANING

Trash and debris should be removed from the basin. Special attention should be given to the inlet and outlet structures. A build up of trash and debris in these areas can decrease the efficiency of the basin or make it inoperable during storms.

#### VECTOR CONTROL

Sediments deposited at the inlet structures should be managed to prevent areas of ponding and possible vector problems. Sediment grading can be accomplished by manually raking the deposits.

#### REMOVAL OF SEDIMENT ACCUMULATION

Sediments that settle in the basin should be removed when the accumulation grows to a depth of 18 inches or 10% of the basin volume, whichever is less.

#### EQUIPMENT INSPECTION

All physical components of the basin should be regularly inspected for operability. This includes all valves, fence gates, locks, and access hatches.

#### GENERAL CLEANUP

Graffiti will be removed in a timely manner to improve the appearance of the basin. Weeds will be removed around fences and grass trimmed. All landscape clippings and cleaning solvents used to remove graffiti should be properly removed from the basin after cleanup.

### **3. MAINTENANCE INDICATORS AND CORRECTIVE ACTIONS**

The following is a list of indicators that would trigger immediate corrective actions to be taken. Corrective action should be taken within 10 days to ensure that damage does not occur from the extended detention basin not operating efficiently.

#### BLOCKAGE OF INLETS/OUTLETS

Any blockages from sediment, debris, or vegetation that keep the basin from operating effectively will be removed immediately and properly disposed of. The basin should be able to completely drain within 72 hours after a storm.

#### STRUCTURAL DAMAGE

If any damage to the structural components of the basin is found, repairs will be made promptly. Designers and contractors will conduct repairs where structural damage has occurred.

#### EMBANKMENT DAMAGE

Any damage to the embankments and slopes will be repaired quickly so that no erosion will occur.

#### EROSION DAMAGE

If there is damage due to erosion such as siltation, steps will be taken to prevent further loss of soil and repair any conditions that may cause the basin to not operate effectively. Possible corrective steps include erosion control blankets, riprap, sodding, or reduced flow through the area. Design engineers will be consulted to address erosion problems if the solution is not evident.

#### FENCE DAMAGE

Timely repair of fences will be done to maintain the security of the site and the safety of residents.

#### INVASIVE VEGETATION

If necessary, elimination of trees and woody vegetation will be required. Woody vegetation will be removed from embankments.

#### ANIMAL BURROWS

Animal burrows will be filled and compacted. Further steps may be needed to physically remove the animals if the problem persists. Vector control specialists will be consulted regarding possible solutions. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated.

### EQUIPMENT DAMAGE

General corrective maintenance will be done to fix any damage done to the basin or related components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

## **4. PROPOSED METHOD OF DISPOSING OF SEDIMENT AND POLLUTANTS**

Removed sediment materials are not considered hazardous waste and can be disposed of as landscaping material. If it is determined that hazardous waste has been deposited into the basin, the suspected waste will be analyzed to determine proper disposal options.

## **5. COST ESTIMATE**

Based on Appendix H of the County of San Diego's SUSMP, each extended detention basin costs approximately \$4330 a year to maintain. A private maintenance company will be hired to maintain them.

## **6. PROPOSED MECHANISM TO ASSURE MAINTENANCE FUNDING**

The extended detention basins are to fall under the 2<sup>nd</sup> category BMP Maintenance Plans per the County of San Diego SUSMP. A recorded maintenance agreement and access easement will be required.



Inspected By: \_\_\_\_\_ Inspection Date: \_\_\_\_\_

Extended Detention Basin Location: \_\_\_\_\_

### **MAINTENANCE ACTIVITY CHECKLIST**

- ☐ Has trash and debris been removed from the detention basin?
- ☐ Has the outlet riser been inspected and debris and sediment removed from it?
- ☐ Is the sediment 18" deep or volume decreased by 10%? If so, has the accumulated materials been removed?
- ☐ Is Vegetation in the basin taller than 18 inches? If so, was it trimmed and mowed?
- ☐ Were the banks of the basin inspected for vegetative stabilization?
- ☐ Do the banks need replanting?
- ☐ Are there signs of severe erosion in the form of ruts or sediment deposits?
- ☐ Have the banks been inspected for structural integrity?
- ☐ Have the fences been inspected?
- ☐ Is there graffiti? Has it been removed?
- ☐ Has the grass been trimmed around fences, the basin, outlet structures, and sampling structures?
- ☐ Have weeds been removed?
- ☐ Have alluvial deposits created zones of ponded water? If so, were the sediments manually raked to eliminate the ponding zones?
- ☐ Have all the valves, fence gates, locks, and access hatches been inspected?
- ☐ Are there any trees or woody vegetation on the embankments? Have they been removed?
- ☐ Are there any animal burrows? Were they filled and compacted?

### **Items Repaired or Replaced:**

## **MAINTENANCE PLAN FOR BIO-FILTRATION BASIN**

### **1. INSPECTION FREQUENCY**

Inspections of the Bio-Filtration Basins will occur at a minimum of once a month. Inspections will also occur before and after large storm events or on a weekly basis during periods of wet weather. The rainy season within the jurisdiction of the San Diego Regional Water Quality Control Board is October 1 – April 30. Refer to Attachment D for extended detention basin locations.

### **2. PREVENTATIVE ACTIONS**

The following is a list of actions that will help prevent problems from occurring. They should be done on a routine basis throughout the duration of the project.

#### **VEGETATION CONTROL**

Vegetation in the basin should be trimmed and mowed to keep a maximum height of 18 inches. All vegetation clippings should be removed from the basin when trimming and mowing is conducted. Trimming and mowing prevents marsh vegetation from overtaking the basin and creating faunal habitats. It also prevents areas of water stagnation which can create a vector and health problem.

#### **BASIN CLEANING**

Trash and debris should be removed from the basin. Special attention should be given to the inlet and outlet structures. A build up of trash and debris in these areas can decrease the efficiency of the basin or make it inoperable during storms.

#### **VECTOR CONTROL**

Sediments deposited at the inlet structures should be managed to prevent areas of ponding and possible vector problems. Sediment grading can be accomplished by manually raking the deposits.

#### **FILTER MEDIA AND SEDIMENT REMOVAL**

The planter shall be excavated and cleaned, and gravel or soil shall be replaced to correct low infiltration rates. Holes that are not consistent with the design and allow water to flow directly through the planter to the ground shall be plugged. Sediment accumulation shall be hand removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 2 inches thick or so thick as to damage or kill vegetation.

#### **EQUIPMENT INSPECTION**

All physical components of the basin should be regularly inspected for operability. This includes all valves, fence gates, locks, and access hatches.

### GENERAL CLEANUP

Graffiti will be removed in a timely manner to improve the appearance of the basin. Weeds will be removed around fences and grass trimmed. All landscape clippings and cleaning solvents used to remove graffiti should be properly removed from the basin after cleanup.

### **3. MAINTENANCE INDICATORS AND CORRECTIVE ACTIONS**

The following is a list of indicators that would trigger immediate corrective actions to be taken. Corrective action should be taken within 10 days to ensure that damage does not occur from the bio-filtration basin not operating efficiently.

#### BLOCKAGE OF INLETS/OUTLETS

Any blockages from sediment, debris, or vegetation that keep the basin from operating effectively will be removed immediately and properly disposed of. The basin should be able to completely drain within 3-4 hours of a storm event.

#### STRUCTURAL DAMAGE

If any damage to the structural components of the basin is found, repairs will be made promptly. Designers and contractors will conduct repairs where structural damage has occurred.

#### EMBANKMENT DAMAGE

Any damage to the embankments and slopes will be repaired quickly so that no erosion will occur.

#### EROSION DAMAGE

If there is damage due to erosion such as siltation, steps will be taken to prevent further loss of soil and repair any conditions that may cause the basin to not operate effectively. Possible corrective steps include erosion control blankets, riprap, sodding, or reduced flow through the area. Design engineers will be consulted to address erosion problems if the solution is not evident.

#### FENCE DAMAGE

Timely repair of fences will be done to maintain the security of the site and the safety of residents.

#### INVASIVE VEGETATION

If necessary, elimination of trees and woody vegetation will be required. Woody vegetation will be removed from embankments.

#### ANIMAL BURROWS

Animal burrows will be filled and compacted. Further steps may be needed to physically remove the animals if the problem persists. Vector control

specialists will be consulted regarding possible solutions. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated.

#### EQUIPMENT DAMAGE

General corrective maintenance will be done to fix any damage done to the basin or related components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

### **4. PROPOSED METHOD OF DISPOSING OF SEDIMENT AND POLLUTANTS**

Removed sediment materials are not considered hazardous waste and can be disposed of as landscaping material. If it is determined that hazardous waste has been deposited into the basin, the suspected waste will be analyzed to determine proper disposal options.

### **5. COST ESTIMATE**

Based on Appendix H of the County of San Diego's SUSMP, the bio-filtration basin will cost approximately \$5,000 a year to maintain. A private maintenance company will be hired to maintain them.

### **6. PROPOSED MECHANISM TO ASSURE MAINTENANCE FUNDING**

The bio-filtration basins are to fall under the 2nd category BMP Maintenance Plans per the County of San Diego SUSMP. A recorded maintenance agreement and access easement will be required.

Inspected By: \_\_\_\_\_ Inspection Date: \_\_\_\_\_

Bio-Retention Basin Location: \_\_\_\_\_

**MAINTENANCE ACTIVITY CHECKLIST**

- ☐ Has trash and debris been removed from the detention basin?
- ☐ Has the outlet been inspected and debris and sediment removed from it?
- ☐ Is the sediment 2" deep? If so, have the accumulated materials been removed?
- ☐ Is Vegetation in the basin taller than 18 inches? If so, was it trimmed and mowed?
- ☐ Were the banks of the basin inspected for vegetative stabilization?
- ☐ Do the banks need replanting?
- ☐ Are there signs of severe erosion in the form of ruts or sediment deposits?
- ☐ Have the banks been inspected for structural integrity?
- ☐ Have the fences been inspected?
- ☐ Is there graffiti? Has it been removed?
- ☐ Has the grass been trimmed around fences, the basin, outlet structures, and sampling structures?
- ☐ Have weeds been removed?
- ☐ Have alluvial deposits created zones of ponded water? If so, were the sediments manually raked to eliminate the ponding zones?
- ☐ Have all the valves, fence gates, locks, and access hatches been inspected?
- ☐ Are there any trees or woody vegetation on the embankments? Have they been removed?
- ☐ Are there any animal burrows? Were they filled and compacted?
- ☐ Does the bio-retention basin drain completely within 3-4 hours of the storm event? If not was the soil/filter medium replaced or amended to allow the basin to drain within 3-4 hours?

**Items Repaired or Replaced:**

## **MAINTENANCE PLAN FOR BIO-RETENTION BASIN**

### **1. INSPECTION FREQUENCY**

Inspections of the Bio-Retention Basins will occur at a minimum of once a month. Inspections will also occur before and after large storm events or on a weekly basis during periods of wet weather. The rainy season within the jurisdiction of the San Diego Regional Water Quality Control Board is October 1 – April 30. Refer to Attachment D for extended detention basin locations.

### **2. PREVENTATIVE ACTIONS**

The following is a list of actions that will help prevent problems from occurring. They should be done on a routine basis throughout the duration of the project.

#### VEGETATION CONTROL

Vegetation in the basin should be trimmed and mowed to keep a maximum height of 18 inches. All vegetation clippings should be removed from the basin when trimming and mowing is conducted. Trimming and mowing prevents marsh vegetation from overtaking the basin and creating faunal habitats. It also prevents areas of water stagnation which can create a vector and health problem.

#### BASIN CLEANING

Trash and debris should be removed from the basin. Special attention should be given to the inlet and outlet structures. A build up of trash and debris in these areas can decrease the efficiency of the basin or make it inoperable during storms.

#### VECTOR CONTROL

Sediments deposited at the inlet structures should be managed to prevent areas of ponding and possible vector problems. Sediment grading can be accomplished by manually raking the deposits.

#### FILTER MEDIA AND SEDIMENT REMOVAL

The planter shall be excavated and cleaned, and gravel or soil shall be replaced to correct low infiltration rates. Holes that are not consistent with the design and allow water to flow directly through the planter to the ground shall be plugged. Sediment accumulation shall be hand removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 2 inches thick or so thick as to damage or kill vegetation.

#### EQUIPMENT INSPECTION

All physical components of the basin should be regularly inspected for operability. This includes all valves, fence gates, locks, and access hatches.

### GENERAL CLEANUP

Graffiti will be removed in a timely manner to improve the appearance of the basin. Weeds will be removed around fences and grass trimmed. All landscape clippings and cleaning solvents used to remove graffiti should be properly removed from the basin after cleanup.

### **3. MAINTENANCE INDICATORS AND CORRECTIVE ACTIONS**

The following is a list of indicators that would trigger immediate corrective actions to be taken. Corrective action should be taken within 10 days to ensure that damage does not occur from the extended detention basin not operating efficiently.

#### BLOCKAGE OF INLETS/OUTLETS

Any blockages from sediment, debris, or vegetation that keep the basin from operating effectively will be removed immediately and properly disposed of. The basin should be able to completely drain within 3-4 hours of a storm event.

#### STRUCTURAL DAMAGE

If any damage to the structural components of the basin is found, repairs will be made promptly. Designers and contractors will conduct repairs where structural damage has occurred.

#### EMBANKMENT DAMAGE

Any damage to the embankments and slopes will be repaired quickly so that no erosion will occur.

#### EROSION DAMAGE

If there is damage due to erosion such as siltation, steps will be taken to prevent further loss of soil and repair any conditions that may cause the basin to not operate effectively. Possible corrective steps include erosion control blankets, riprap, sodding, or reduced flow through the area. Design engineers will be consulted to address erosion problems if the solution is not evident.

#### FENCE DAMAGE

Timely repair of fences will be done to maintain the security of the site and the safety of residents.

#### INVASIVE VEGETATION

If necessary, elimination of trees and woody vegetation will be required. Woody vegetation will be removed from embankments.

#### ANIMAL BURROWS

Animal burrows will be filled and compacted. Further steps may be needed to physically remove the animals if the problem persists. Vector control

specialists will be consulted regarding possible solutions. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated.

#### EQUIPMENT DAMAGE

General corrective maintenance will be done to fix any damage done to the basin or related components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

#### **4. PROPOSED METHOD OF DISPOSING OF SEDIMENT AND POLLUTANTS**

Removed sediment materials are not considered hazardous waste and can be disposed of as landscaping material. If it is determined that hazardous waste has been deposited into the basin, the suspected waste will be analyzed to determine proper disposal options.

#### **5. COST ESTIMATE**

Based on Appendix H of the County of San Diego's SUSMP, the bio-retention basin will cost approximately \$5,000 a year to maintain. A private maintenance company will be hired to maintain them.

#### **6. PROPOSED MECHANISM TO ASSURE MAINTENANCE FUNDING**

The bioretention basins are to fall under the 2<sup>nd</sup> category BMP Maintenance Plans per the County of San Diego SUSMP. A recorded maintenance agreement and access easement will be required.



Inspected By: \_\_\_\_\_ Inspection Date: \_\_\_\_\_

Bio-Retention Basin Location: \_\_\_\_\_

**MAINTENANCE ACTIVITY CHECKLIST**

- ☐ Has trash and debris been removed from the detention basin?
- ☐ Has the outlet been inspected and debris and sediment removed from it?
- ☐ Is the sediment 2" deep? If so, have the accumulated materials been removed?
- ☐ Is Vegetation in the basin taller than 18 inches? If so, was it trimmed and mowed?
- ☐ Were the banks of the basin inspected for vegetative stabilization?
- ☐ Do the banks need replanting?
- ☐ Are there signs of severe erosion in the form of ruts or sediment deposits?
- ☐ Have the banks been inspected for structural integrity?
- ☐ Have the fences been inspected?
- ☐ Is there graffiti? Has it been removed?
- ☐ Has the grass been trimmed around fences, the basin, outlet structures, and sampling structures?
- ☐ Have weeds been removed?
- ☐ Have alluvial deposits created zones of ponded water? If so, were the sediments manually raked to eliminate the ponding zones?
- ☐ Have all the valves, fence gates, locks, and access hatches been inspected?
- ☐ Are there any trees or woody vegetation on the embankments? Have they been removed?
- ☐ Are there any animal burrows? Were they filled and compacted?
- ☐ Does the bio-retention basin drain completely within 3-4 hours of the storm event? If not was the soil/filter medium replaced or amended to allow the basin to drain within 3-4 hours?

**Items Repaired or Replaced:**

## **MAINTENANCE PLAN FOR TRASH RACKS**

### **1. INSPECTION FREQUENCY**

Inspections and cleanings of the Trash Racks will occur at a minimum of three times per year. Inspections will also occur before and after the rainy season. The rainy season within the jurisdiction of the San Diego Regional Water Quality Control Board is October 1 – April 30. Refer to Attachment D for extended detention basin locations.

### **2. PREVENTATIVE ACTIONS**

The following is a list of actions that will help prevent problems from occurring.

#### EQUIPMENT INSPECTION

All physical components of the trash rack should be regularly inspected for operability.

#### GENERAL CLEANUP

All trash and sediment shall be removed during routine cleanings.

### **3. MAINTENANCE INDICATORS AND CORRECTIVE ACTIONS**

The following is a list of indicators that would trigger immediate corrective actions to be taken. Corrective action should be taken within 10 days.

#### BLOCKAGE OF INLETS/OUTLETS

Any blockages from sediment, debris, or vegetation that keep the basin from operating effectively will be removed immediately and properly disposed of.

#### TIMING OF MAINTENANCE

Maintenance activities shall follow the manufacturer recommended 3:3:1 plan. Tri-yearly inspections and cleanings are designed to monitor the filters to ensure proper function of the units. Once per year, prior to the rainy season, the filter medium (boom) should be replaced. If the inspections find that the filter medium is becoming clogged or is not functioning properly, the frequency of cleaning and replacement of the filters should increase.

#### MAINTENANCE PROCEDURE

The inlet manhole cover(s) and or grate(s) shall be removed and placed to one side. The insert will be cleaned in accordance with the general specifications for maintenance of those devices. Any floatable materials will be removed and disposed of in accordance with local regulations. The standing water shall be checked for clarity, oils and hydrocarbons, and the depth of the collected silt and sediment will be measured. The filter media will be replaced once per year. If sediment level exceeds manufacturer's recommended level for effective operation, an industrial vacuum shall be used to carefully remove all sediment and debris.

**4. PROPOSED METHOD OF DISPOSING OF SEDIMENT AND POLLUTANTS**

Removed sediment materials are not considered hazardous waste and can be disposed of as landscaping material. If it is determined that hazardous waste has been deposited into the basin, the suspected waste will be analyzed to determine proper disposal options.

Because the filter media (boom) may likely contain petroleum hydrocarbons, heavy metals and other harmful pollutants, the materials may be treated as an EPA class 2 Waste and properly disposed of.

**5. COST ESTIMATE**

The BMPs will cost approximately \$300 a year each to maintain. A private maintenance company will be hired to maintain them.

**6. PROPOSED MECHANISM TO ASSURE MAINTENANCE FUNDING**

The trash racks are to fall under the 2<sup>nd</sup> category BMP Maintenance Plans per the County of San Diego SUSMP. A recorded maintenance agreement and access easement will be required.

Inspected By: \_\_\_\_\_ Inspection Date: \_\_\_\_\_

Bio-Retention Basin Location: \_\_\_\_\_

### **MAINTENANCE ACTIVITY CHECKLIST**

- ☐ Has trash and debris been removed from the rack?
- ☐ Has the boom been replaced?
- ☐ Has the outlet been inspected and debris and sediment removed from it?
- ☐ Are the physical components of the trash rack functioning properly?

### **Items Repaired or Replaced:**

# **ATTACHMENT 3b**

## **Draft Storm Water Maintenance Notification / Agreement**

**(Not applicable)**

**ATTACHMENT 4**

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

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County of San Diego BMP Design Manual Verification Form	
<b>Project Summary Information</b>	
Project Name	Valiano
Record ID (e.g., grading/improvement plan number)	PDS2013-SD-13-001, PDS2013-GPA-13-001, PDS2013-STP-13-003, PDS2013-TM-5575, PDS2013-REZ-13-001, PDS2013-ER-12-08-002
Project Address	South of Hill Valley Drive, North of Mt. Whitney Road, and West of Country Club Dr.
Assessor's Parcel Number(s) (APN(s))	228-213-13, 232-013-01, 232-013-02, 232-013-03, 232-020-55, 232-492-01, 232-500-18, 232-500-19, 232-500-20, 232-500-21, 232-500-22, 232-500-23, 232-500-24
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	Carlsbad (904.62), Escondido HSA
<b>Responsible Party for Construction Phase</b>	
Developer's Name	
Address	
Email Address	
Phone Number	
Engineer of Work	
Engineer's Phone Number	
<b>Responsible Party for Ongoing Maintenance</b>	
Owner's Name(s)*	
Address	
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	



County of San Diego BMP Design Manual Verification Form Page 2 of 4					
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)					
Description/Type of Structural BMP	Plan Sheet #	STRUCT-URAL BMP ID#	Maint-enance Category	Maintenance Agreement Recorded Doc #	Revisions
Biofiltration		1	2		
Biofiltration		2A	2		
Biofiltration		2B	2		
Biofiltration		2C	2		
Biofiltration		2D	2		
Biofiltration		2E	2		
Biofiltration		2F	2		
Biofiltration		3A	2		
Biofiltration		3B	2		
Biofiltration		3C	2		
Biofiltration		3D	2		
Biofiltration		4A	2		
Biofiltration		4B	2		
Biofiltration		5A	2		
Biofiltration		5B	2		
Biofiltration		5C	2		
Biofiltration		5D	2		
Biofiltration		6A	2		
Biofiltration		6B	2		
Biofiltration		MW1	2		
Biofiltration		MW2	2		
Bioretention		CC1	2		
Biofiltration		CC2	2		
Biofiltration		CC3	2		
Bioretention		HV	2		
*All Priority Development Projects (PDPs) require a Structural BMP					

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

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

### Checklist for Applicant to submit to PDCI:

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

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

Please sign your name and seal.

Professional Engineer's Printed Name:

Kenneth T. Kozlik

Professional Engineer's Signed Name:

\_\_\_\_\_

Date: 03/29/17

[SEAL]



**ATTACHMENT 5****Copy of Plan Sheets Showing Permanent Storm Water BMPs,  
Source Control, and Site Design**

This is the cover sheet for Attachment 5.

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

**The plans must identify:**

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

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**ATTACHMENT 6**

**Copy of Project's Drainage Report**

This is the cover sheet for Attachment 6.

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

Title: CEQA Drainage Study - Valiano  
Prepared By: Fuscoe Engineering, Inc.  
Date: November 2015

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**ATTACHMENT 7**

**Copy of Project's Geotechnical and Groundwater Investigation Report**

This is the cover sheet for Attachment 7.

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

Title: Update Geotechnical Investigation – Valiano (Eden Hills) San Diego County, California

Prepared By: Geocon Incorporated

Date: May 13, 2014

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