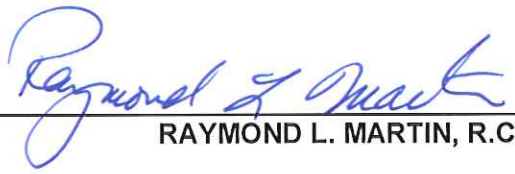
City of Escondido
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

SAFARI HIGHLANDS
RECORD ID NUMBERS: SUB15-0019
w.o. 2374-17

West Zoo Rd.
San Diego, CA

ASSESSOR'S PARCEL NUMBER(S):
240-270-33, 241-060-03, 242-010-02, 36, 37 & 38

ENGINEER OF WORK:



RAYMOND L. MARTIN, R.C.E. #48670

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PDP SWQMP PREPARED BY:

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DATE OF SWQMP:
APRIL 24, 2017

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SWQMP APPROVED BY:

APPROVAL DATE:

ESCONDIDO
City of Choice

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TABLE OF CONTENTS

TABLE OF CONTENTS iii
ATTACHMENTS iv
ACRONYMS iv
PDP SWQMP PREPARER'S CERTIFICATION PAGE v
SUBMITTAL RECORD vii
PROJECT VICINITY MAP viii
Step 1: Project type determination (Standard or Priority Development Project) (Form I-2a) 1
Step 1.1: Storm Water Quality Management Plan requirements 4
Step 1.2: Exception to PDP definitions 4
Step 2: Construction Storm Water BMPs 5
Step 3: City of Escondido PDP SWQMP Site Information Checklist (Form I-2a) 6
Step 3.1: Description of Existing Site Condition 6
Step 3.2: Description of Existing Site Drainage Patterns 7
Step 3.3: Description of Proposed Site Development 9
Step 3.4: Description of Proposed Site Drainage Patterns 10
Step 3.5: Potential Pollutant Source Areas 11
Step 3.6: Identification and Narrative of Receiving Water and Pollutants of Concern 12
Step 3.7: Hydromodification Management Requirements 13
Step 3.7.1: Critical Coarse Sediment Yield Areas* 14
Step 3.7.2: Flow Control for Post-Project Runoff* 15
Step 3.8: Other Site Requirements and Constraints 16
Step 4: Source Control BMP Checklist (Form I-2b) 17
Step 5: Site Design BMP Checklist (Form I-2c) 19
Step 6: PDP Structural BMPs (Form I-3) 21
Step 6.1: Description of structural BMP strategy 21
Step 6.2: Structural BMP Checklist 23
Step 6.3: Offsite Alternative Compliance Participation Form 24

ATTACHMENTS

Attachment 1: Backup for PDP Pollutant Control BMPs
- Attachment 1a: Form I-4, Storm Water Pollutant Control Worksheet Calculations
- Attachment 1b: Form I-5, Categorization of Infiltration Feasibility Condition
- ~~Attachment 1c: Form I-6, Factor of Safety and Design Infiltration Rate Worksheet~~ N/A
- Attachment 1d: Drainage Management Area (DMA) Exhibit
- Attachment 1e: Individual Structural BMP DMA Mapbook
- Attachment 1f: Form I-7, Downstream Systems Requirements for Preservation of Coarse Sediment Supply

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: City of Escondido PDP Structural BMP Verification
Attachment 5: Copy of Plan Sheets Showing Permanent Storm Water BMPs
Attachment 6: Optional Additional Analysis When Potential CCSYA are Present Onsite

ACRONYMS

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

PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

PDP SWQMP PREPARER'S CERTIFICATION PAGE

Project Name: Safari Highlands
Permit Application Number: SUB15-0019

PREPARER'S CERTIFICATION

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

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

Raymond L. Martin

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

Raymond L. Martin
Print Name

Hunsaker & Associates – San Diego, Inc.
Company

4/24/17
Date



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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	9/14/16	Initial Submittal
2	4/24/17	Address Comments
3		
4		

Final Design

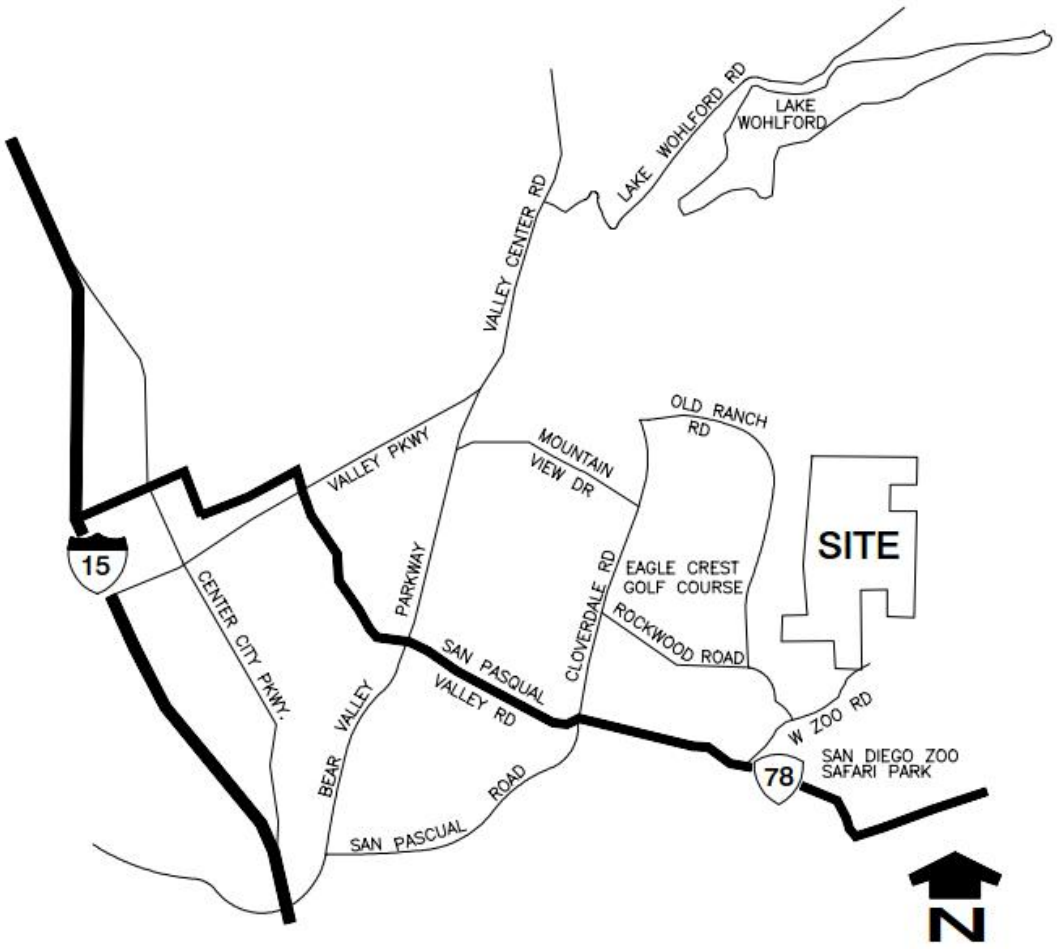
Submittal Number	Date	Summary of Changes
1		Initial Submittal
2		
3		
4		

Plan Changes

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

PROJECT VICINITY MAP

Project Name: Safari Highlands Ranch
Record ID: SUB15-0019



VICINITY MAP
NOT TO SCALE

Step 1: Project type determination (Standard or Priority Development Project) (Form I-2a)

Project Summary Information	
Project Name	Safari Highlands Ranch
Project Address	West of I-15, North of Hwy 78 off of W Zoo Rd.
Assessor's Parcel Number(s)	240-270-33, 241-060-03, 242-010-02, 35, 36, & 38
Permit Application Number	SUB515-0019
Project Watershed (Hydrologic Unit)	Select One: ☐ Carlsbad 904 ☒ San Dieguito 905
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	1099 Acres (47854958 Square Feet)
Area to be disturbed by the project (Project Area)	345 Acres (15027072 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	143 Acres (6228025 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	202 Acres (8799047 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	

Confirmation of Priority Development Project Determination
The project is (select one): ☒ New Development ☐ Redevelopment[1]
The total proposed newly created or replaced impervious area is: 6228025 ft^2

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

Solar energy farms that are not also one of the categories listed in Step 2b of Table 1-1. City staff must also determine that appropriate BMPs are provided to mitigate for downstream impacts due to significant changes to the existing hydrology

Is the project in any of the following categories, (a) through (f)?			
Yes ☒	No ☐	(a)	New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☐	No ☒	(b)	Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.
Yes ☒	No ☐	(c)	New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (Standard Industrial Classification (SIC) code 5812). (ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater. (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ☐	No ☒	(d)	New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). *Note: ESAs are areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.*
Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. (ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Yes ☐	No ☒	(e)	New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses: (iii) 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. (iv) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
Yes ☒	No ☐	(f)	New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction. *Note: See Storm Water Design Manual Section 1.4.2 for additional guidance.*

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 Storm Water Design Manual.

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

The area of existing (pre-project) impervious area at the project site is: _____ ft^2 (A)
The total proposed newly created or replaced impervious area is _____ ft^2 (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
Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, complete Step 1 Project Type Determination Checklist on Pages 1 and 2, and see PDP exemption information below. For further guidance, see Section 1.4 of the Storm Water Design Manual *in its entirety*.	☐ Standard Project	Standard Project requirements apply, including Standard Project SWQMP. **Complete Form I-1.**
	☒ PDP	Standard and PDP requirements apply, including PDP SWQMP. **Complete Form I-1.**
	☐ PDP with ACP	If participating in offsite alternative compliance, **complete Step 6.3 and an ACP SWQMP.**
	☐ PDP Exemption	**Go to Step 1.2 below.**

Step 1.2: Exemption to PDP definitions

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

Step 2: Construction Storm Water BMPs

Construction storm water BMPs shall be shown on the Grading Plan and (if applicable) included in the Storm Water Pollution Prevention Plan (SWPPP).

Step 3: City of Escondido PDP SWQMP Site Information Checklist (Form I-2a)

Step 3.1: Description of Existing Site Condition

Current Status of the Site (select all that apply):
☐Existing development
☐Previously graded but not built out
☐Demolition completed without new construction
☐Agricultural or other non-impervious use
☒Vacant, undeveloped/natural

Description / Additional Information:

Existing Land Cover Includes (select all that apply and provide each area on site):
☒Vegetative Cover 1099 Acres (47854958 Square Feet)
☐Non-Vegetated Pervious Areas _____ Acres (_____ Square Feet)
☐Impervious Areas _____ Acres (_____ Square Feet)

Description / Additional Information:

Underlying Soil belongs to Hydrologic Soil Group (select all that apply):
☐NRCS Type A
☐NRCS Type B
☐NRCS Type C
☒NRCS Type D

Approximate Depth to Groundwater (GW) (or N/A for no infiltration BMPs):
☐GW Depth < 5 feet
☐5 feet < GW Depth < 10 feet
☐10 feet < GW Depth < 20 feet
☒GW Depth > 20 feet
Groundwater not encountered

Existing Natural Hydrologic Features (select all that apply):
☐Watercourses
☐Seeps
☐Springs
☐Wetlands
☒None
☐Other

Description / Additional Information:

Step 3.2: Description of Existing Site Drainage Patterns

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

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

Describe existing site drainage patterns:

The project site currently consists of approximately 1,100 acres of mostly undeveloped natural open space, with an occasional single family residence on hilly terrain. Topographically, the site consists of rugged, steeply sloping, hillside terrain with occasional, somewhat level valleys. Elevations across the overall property vary from approximately 400 feet in the southwest corner to a high of almost 1,800 feet in the northeast portion of the site.

There are no existing storm drain features onsite. A ridgeline that spans from approximately 3,800 feet offsite from the eastern project boundary that runs through the project site separates the site into two drainage areas. Site drainage is conveyed by two primary tributaries that flow across the site in a northeast to southwest direction.

Eventually the 2 tributary channels converge into one unnamed tributary flowing across the southern portion of the site and discharge through three 10-foot x 8-foot box culverts under Rockwood Road between the Eagle Crest Golf Course/ Rancho San Pasqual development and Rancho Vistamonte development. This tributary continues along the south side of Rockwood Road and the San Pasqual Union Elementary School and continues south converging with the tributary conveying drainage area A about 3,400 feet south of Rockwood Road.

Step 3.3: Description of Proposed Site Development

Project Description / Proposed Land Use and/or Activities:

Single family residential area with accompanying roads, sidewalks, water quality basins, and open space

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

Buidlings, roadways, sidewalks, recreational area, parking, and a fire station (to have its own SWQMP)

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

Landscape areas, natural trails, and open space

Does the project include grading and changes to site topography?

☒Yes

☐No

Description / Additional Information:

Grading for public and private streets, 550 residential lots, fire station, recreational area, and water quality basins

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

Change in Land Cover Type Summary			
Land Cover Type	Existing (acres or ft^2)	Proposed (acres or ft^2)	Percent Change
Vegetation	1098.6	956	13%
Pervious (non-vegetated)	0	0	0%
Impervious	0.4	143	-13%

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:

Urban runoff will be collected in storm drain inlets from street surfaces and routed towards multi-purpose basins and treated for storm water quality, flow control for hydromodification, and flood attenuation to maintain existing peak flow rates during the 50-year storm event.

Natural and sloped areas containing no imperious areas are collected in separate storm drains and discharged through rip rap energy dissipates to avoid comingling of drainage and allow passing through any course sediment generated in the areas.

When roads cross major drainage channels, culvert undercrossing are provided to maintain existing drainage patterns.

For offsite improvements; to the south, Rockwood Road is to be widened and will implement green streets to address water quality, and to the north, the fire truck access will have a roadside swale. Both calculations and detail will be provided in final engineering.

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).

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

Description / Additional Information:

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

Describe flow path of storm water from the project site discharge location(s), through urban storm conveyance systems as applicable, to receiving creeks, rivers, and lagoons as applicable, and ultimate discharge to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable):
The flow path is generally in a southwesterly direction, the north and south tributary eventually converging south of Rockwood Rd. flowing through Cloverdale Creek to Lake Hodges and then to the Pacific Ocean within San Dieguito River and San Dieguito Lagoon.

List any 303(d) impaired water bodies[2] 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
San Dieguito Lagoon	Total Coliform	Unknown
Cloverdale Creek	Phosphorus, Total Dissolved Solids	Unknown
San Dieguito River	Enterococcus, Fecal Coliform, Nitrogen, Phosphorus, Total Dissolved Solids	Unknown

Identification of Project Site Pollutants*

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

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

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

[2] 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

Step 3.7: Hydromodification Management Requirements

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

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

☐No, the project will discharge runoff directly to 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[3] for the watershed in which the project resides.

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

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

Step 3.7.1: Critical Coarse Sediment Yield Areas*

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

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

☒ Yes

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

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

☒ 6.2.1 Verification of GLUs (classification that provides an estimate of sediment yield based on geology, hillslope, and land cover) Onsite

☒ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment

☒ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite

- No optional analyses performed, the project will avoid critical coarse sediment yield areas identified based on WMAA maps

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

- No critical coarse sediment yield areas to be protected based on verification of GLUs onsite.

☒ Critical coarse sediment yield areas exist but additional analysis has determined that protection is not required. Documentation attached in Attachment 6 of the SWQMP.

- Critical coarse sediment yield areas exist and require protection. The project will implement management measures described in Sections 6.2.4 and 6.2.5 as applicable, and the areas are identified on the SWQMP Exhibit.

Discussion / Additional Information:

Onsite geology consisted of mostly Coarse Bedrock (CB) material within the grading limits per Geotechnical Analysis and vegetation was mostly "Diegan Coastal Sage Scrub" and "Southern Mixed Chaparral"

GLUs on site were classified as "CB-SCRUB/SHRUB-4" per Appendix H, Table H.1-3 of City of Escondido Storm Water Design Manual.

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. There are 2 points of compliances (POC 1 & 2 on the HMP Map). POC1 is located in the northern area of the project receiving discharge from DMA A, B, C, & D. POC2 receives discharge from DMA E, F, G, H, I,& J
Has a geomorphic assessment been performed for the receiving channel(s)? ☒No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐Yes, the result is the low flow threshold is 0.1Q2 ☐Yes, the result is the low flow threshold is 0.3Q2 ☐Yes, the result is the low flow threshold is 0.5Q2 *If a geomorphic assessment has been performed, provide title, date, and preparer:* *Discussion / Additional Information: (optional)*

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.

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 (Form I-2b)

Source Control BMPs

All development projects must implement source control BMPs 4.2.1 through 4.2.6 where applicable and feasible. See Chapter 4.2 and Appendix E of the City Storm Water Design Manual for information to implement source control BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.

Answer each category below pursuant to the following:

- "Yes" means the project will implement the source control BMP as described in Chapter 4.2 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification must be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	☒Yes	☐No	☐N/A
☒ Direct irrigation water away from impervious surfaces □ Direct vehicle wash water away from impervious surfaces □ Other: _____ *Discussion / justification if SC-1 not implemented:*			
SC-2 Storm Drain Stenciling or Signage	☒Yes	☐No	☐N/A
☒ Stencil or stamp storm drains with anti-dumping message □ Post signs prohibiting illegal dumping □ Other *Discussion / justification if SC-2 not implemented:*			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
□ Store materials inside a covered enclosure □ Direct runoff from downspouts and roofs away from storage areas □ Other *Discussion / justification if SC-3 not implemented:* No outdoor materials storage area proposed			

SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐Yes	☐No	☒N/A
□ Locate work area away from storm drains or catch basins □ Work over impermeable surfaces where spills and pollutants can be captured and removed *Discussion / justification if SC-4 not implemented:* No work areas proposed			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒Yes	☐No	☐N/A
☒ Locate trash containers in a roofed, walled enclosure □ Locate trash containers away from storm drains *Discussion / justification if SC-5 not implemented:*			
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below):			
☒ A. On-site storm drain inlets	☒Yes	☐No	☐N/A
☐ B. Interior floor drains and elevator shaft sump pumps	☐Yes	☐No	☒N/A
☐ C. Interior parking garages	☐Yes	☐No	☒N/A
☐ D. Need for future indoor & structural pest control	☐Yes	☐No	☒N/A
☐ E. Landscape/outdoor pesticide use	☐Yes	☐No	☒N/A
☒ F. Pools, spas, ponds, fountains, and other water features	☒Yes	☐No	☐N/A
☐ G. Food service	☐Yes	☐No	☒N/A
☐ H. Refuse areas	☐Yes	☐No	☒N/A
☐ I. Industrial processes	☐Yes	☐No	☒N/A
☐ J. Outdoor storage of equipment or materials	☐Yes	☐No	☒N/A
☐ K. Vehicle and equipment cleaning	☐Yes	☐No	☒N/A
☐ L. Vehicle/equipment repair and maintenance	☐Yes	☐No	☒N/A
☐ M. Fuel dispensing areas	☐Yes	☐No	☒N/A
☐ N. Loading docks	☐Yes	☐No	☒N/A
☐ O. Fire sprinkler test water	☐Yes	☐No	☒N/A
☐ P. Miscellaneous drain or wash water	☐Yes	☐No	☒N/A
☒ Q. Plazas, sidewalks, and parking lots	☒Yes	☐No	☐N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

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

If These Sources Will Be on the Project Site …	… Then Your SWQMP Shall 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**
☒ **A.** Onsite storm drain inlets ☐ Not Applicable	☒ Locations of inlets.	☒ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	☒ Maintain and periodically repaint or replace inlet markings. ☒ Provide storm water pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ☐ 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 shall 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**
❑ **B.** Interior floor drains and elevator shaft sump pumps ☒ Not Applicable		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages ☒ Not Applicable		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D1.** Need for future indoor & structural pest control ☒ Not Applicable		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall 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**
❑ **D2.** Landscape/ Outdoor Pesticide Use ☒ Not Applicable	❑ Show locations of existing trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show storm water treatment facilities.	State that final landscape plans will accomplish all of the following. ❑ Preserve existing drought tolerant trees, shrubs, and ground cover to the maximum extent possible. ❑ 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. ❑ Where landscaped areas are used to retain or detain storm water, specify plants that are tolerant of periodic saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ❑ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. ❑ Provide IPM information to new owners, lessees and operators.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall 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**
☒ **E.** Pools, spas, ponds, decorative fountains, and other water features. ❑ Not Applicable	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ 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.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
❑ **F.** Food service ☒ Not Applicable	❑ 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. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ 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 shall 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**
❑ **G.** Refuse areas ☒ Not Applicable	❑ 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. ❑ 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. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ 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 Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall 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**
❑ **H.** Industrial processes. ☒ Not Applicable	❑ Show process area.	❑ 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."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) ☒ Not Applicable	❑ 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. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ 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.	❑ 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: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release Prevention Program ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall 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**
☐ **J.** Vehicle and Equipment Cleaning ☒ Not Applicable	☐ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall 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 shall 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 shall 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 shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	☐ 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): ☐ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ☐ Car dealerships and similar may rinse cars with water only. ☐ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall 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**
❑ **K.** Vehicle/Equipment Repair and Maintenance ☒ Not Applicable	❑ 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. ❑ 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 shall not be installed within the secondary containment areas. ❑ 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.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ 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. ❑ 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.	In the report, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall 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 shall be contained or drained from the vehicle immediately. ❑ No person shall 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 shall 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**
❑ **L.** Fuel Dispensing Areas ☒ Not Applicable	❑ Fueling areas[1] shall 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. ❑ Fueling areas shall 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 area1.] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

1. The fueling area shall 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 shall 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**
M. Loading Docks ☒ Not Applicable	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall 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. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.

If These Sources Will Be on the Project Site …	… Then Your SWQMP shall 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**
❑ **N.** Fire Sprinkler Test Water ☒ Not Applicable		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim ☒ Not Applicable		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ 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. ❑ Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps onsite shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ 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 shall 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**
☒ **P.** Plazas, sidewalks, and parking lots. ☐ Not Applicable			☒ Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.

Step 5: Site Design BMP Checklist (Form I-2c)

Site Design BMPs

All development projects must implement site design BMPs SD-A through SD-H where applicable and feasible. See Chapter 4.3 and Appendix E of the City Storm Water Design Manual for information to implement site design BMPs shown in this checklist. The following checklists serve as guides only. Mark what elements are included in your project. See Storm Water Design Manual Chapter 4 and Appendix E for more information on determining appropriate BMPs for your project.

Answer each category below pursuant to the following:

- "Yes" means the project will implement the site design BMP as described in Chapter 4.3 and/or Appendix E of the City Storm Water Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification must be provided.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☒Yes	☐No	☐N/A
☒ Maintain existing drainage patterns *Discussion / justification if SD-1 not implemented:*			
SD-2 Conserve Natural Areas, Soils, and Vegetation	☒Yes	☐No	☐N/A
☒ Preserve trees (see Zoning Code Art. 55 Grading & Erosion Control; Art. 62 Landscape Regulations) ☒ Avoid sensitive areas such as wetlands and waterways *Discussion / justification if SD-2 not implemented:*			
SD-3 Minimize Impervious Area	☒Yes	☐No	☐N/A
☒ Install parking and driving aisles to minimum width required to meet standards *Discussion / justification if SD-3 not implemented:*			
SD-4 Minimize Soil Compaction	☒Yes	☐No	☐N/A

☒ Avoid compaction in planned landscaped spaces □ Till and amend soil for improved infiltration capacity *Discussion / justification if SD-4 not implemented:*			
SD-5 Impervious Area Dispersion	☒Yes	☐No	☐N/A
☒ Drain rooftops, roads or sidewalks into adjacent landscape areas □ Drain impervious surfaces through pervious areas *Discussion / justification if SD-5 not implemented:*			
SD-6 Runoff Collection	☒Yes	☐No	☐N/A
☒ use small collection strategies located at, or close to the source □ use permeable material for projects with low traffic areas and appropriate soil conditions *Discussion / justification if SD-5 not implemented:*			
SD-7 Landscaping with native or drought tolerant species	☒Yes	☐No	☐N/A
Discussion / justification if SD-5 not implemented:			
SD-8 Harvest and using precipitation	☐Yes	☒No	☐N/A
Discussion / justification if SD-5 not implemented: Not feasible. See form I-4			

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 (Form I-3)

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the Storm Water 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 Storm Water 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 City 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 8.2.3.2 of the Storm Water Design Manual). PDP structural BMPs must be maintained into perpetuity, and the City must confirm the maintenance (see Section 7 of the Storm Water Design Manual).

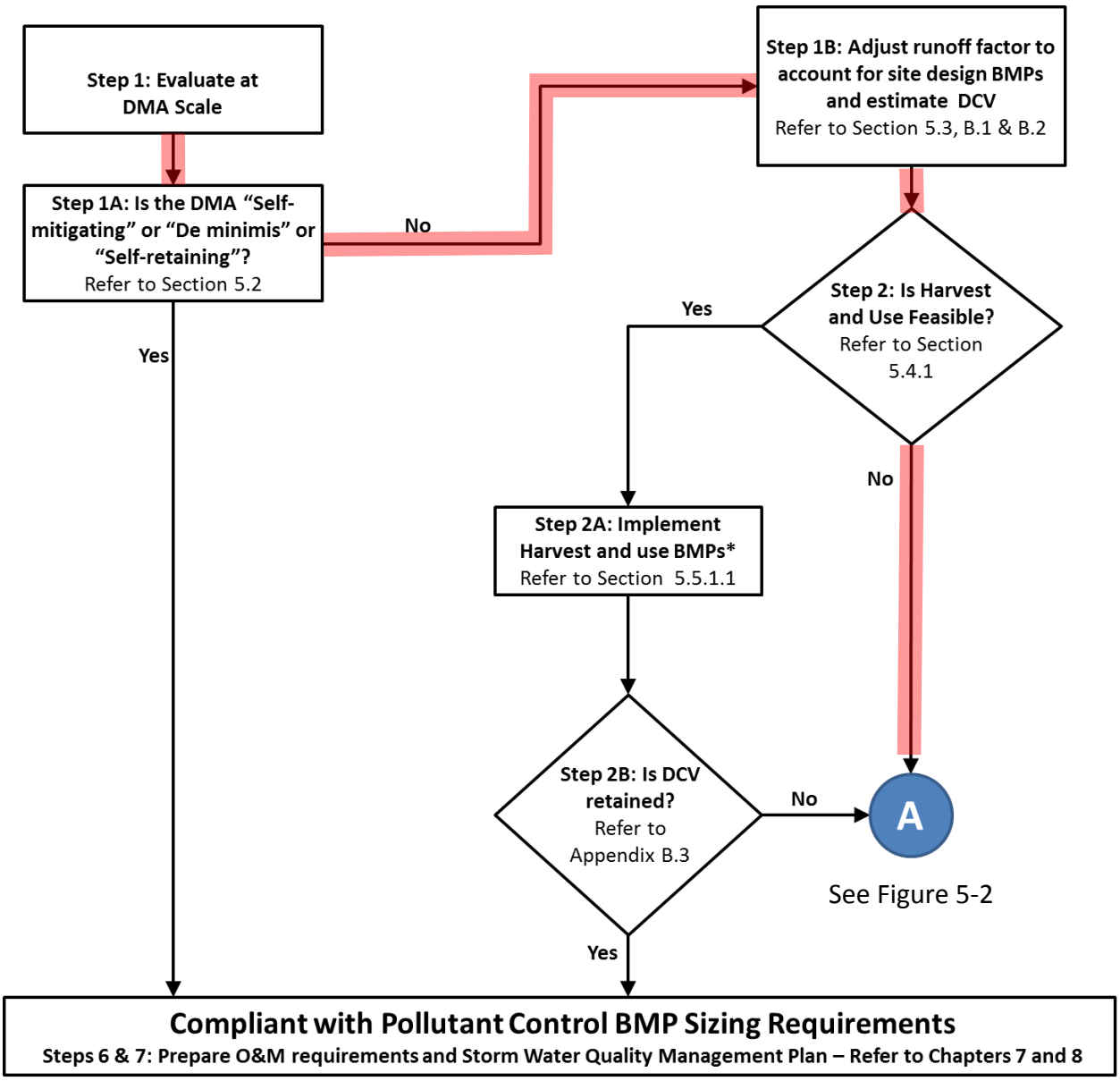
Use this section to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (Step 6.2) for each structural BMP within the project (copy the BMP summary information sheet [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 Storm Water D*esign 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.*

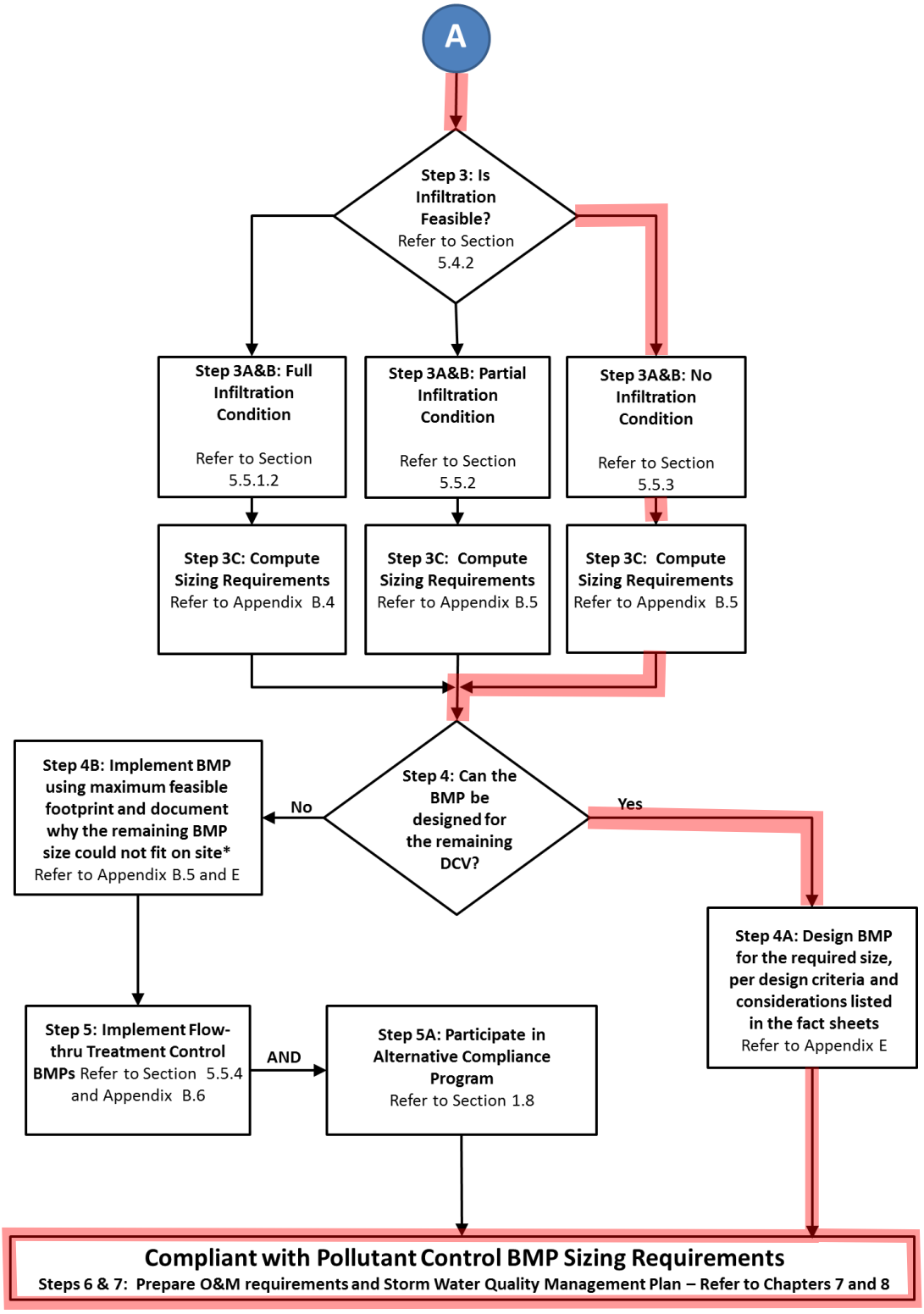
See flow chart from Escondido Storm Water Design Manual (next page)

(Continue on following page as necessary.)



* Step 2C: Project applicant has an option to also conduct feasibility analysis for infiltration and if infiltration is fully or partially feasible has an option to choose between infiltration and harvest and use BMPs. But if infiltration is not feasible and harvest and use is feasible, project applicant must implement harvest and use BMPs

FIGURE 5-1. Storm Water Pollutant Control BMP Selection Flow Chart



* Project approval at the discretion of [City Engineer]

FIGURE 5-2. Storm Water Pollutant Control BMP Selection Flow Chart

Step 6.2: Structural BMP Checklist

(Copy this page as needed to provide information for each individual proposed structural BMP)	
Structural BMP ID No. BF-A – BF-J	
Construction Plan Sheet No. To be provided during final engineering	
Type of structural BMP: ☐Retention by harvest and use (HU-1) ☐Retention by infiltration basin (INF-1) ☐Retention by bioretention (INF-2) ☐Retention by permeable pavement (INF-3) ☐Partial retention by biofiltration with partial retention (PR-1) ☒Biofiltration (BF-1) ☐Biofiltration with Nutrient Sensitive Media Design (BF-2) ☐Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide BMP type/description in discussion section below) ☐Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ☐Flow-thru treatment control with alternative compliance (provide BMP type/description in discussion section below) ☐Detention pond or vault for hydromodification management ☐Other (describe in discussion section below)	
Purpose: ☐Pollutant control only ☐Hydromodification control only ☒Combined pollutant control and hydromodification control ☐Pre-treatment/forebay for another structural BMP ☐Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification forms (See Section 8.2.3.2 of the Storm Water Design Manual)	Third party inspector TBD
Who will be the final owner of this BMP?	☒HOA ☐Property Owner ☐City ☐Other (describe)
Who will maintain this BMP into perpetuity?	☒HOA ☐Property Owner ☐City ☐Other (describe)
Discussion (as needed): *(Continue on subsequent pages as necessary)*	

Step 6.3: Offsite Alternative Compliance Participation Form

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

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Indicate which Items are Included behind this cover sheet:

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

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SAFARI HIGHLANDS BIOFILTRATION
BMP DMA CALCULATIONS

	Imp. RF	Pervious RF	% Imp	DMA A	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA B	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA C	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC		AC		AC	AC		AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	10.96	0.67	5.48	5.48	5.48	15.49	0.58	7.75	7.75	7.75	13.52	0.63	6.76	6.76	6.76
ROAD	0.90	0.10	95	2.64	0.28	2.51	0.13	2.27	5.08	0.33	4.83	0.25	4.37	3.80	0.31	3.61	0.19	3.27
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	3.74	0.05	0.00	3.74	0.37	11.72	0.09	0.00	11.72	1.17	6.61	0.06	0.00	6.61	0.66
				17.3	1.00	7.99	9.35	8.13	32.3	1.00	12.57	19.72	13.29	23.9	1.00	10.37	13.57	10.69
				755383.73			Weighted C =	0.47	1406542.27			Weighted C =	0.41	1042628.00			Weighted C =	0.45

	Imp. RF	Pervious RF	% Imp	DMA D	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA K	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA F	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC		AC		AC	AC		AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	10.50	0.56	5.25	5.25	5.25	26.88	0.64	13.44	13.44	13.44	5.90	0.63	2.95	2.95	2.95
ROAD	0.90	0.10	95	3.78	0.35	3.59	0.19	3.25	7.89	0.32	7.50	0.39	6.79	1.25	0.23	1.19	0.06	1.08
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	8.96	0.10	0.00	8.96	0.90	9.20	0.04	0.00	9.20	0.92	6.88	0.15	0.00	6.88	0.69
				23.2	1.00	8.84	14.40	9.40	44.0	1.00	20.94	23.04	21.15	14.0	1.00	4.14	9.89	4.71
				1012392.00			Weighted C =	0.40				Weighted C =	0.48				Weighted C =	0.34

	Imp. RF	Pervious RF	% Imp	DMA G	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA H	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA I	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC		AC		AC	AC		AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.01	0.09	4.26	0.75	3.91
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	21.43	0.40	10.72	10.72	10.72	10.37	0.62	5.19	5.19	5.19	42.79	0.49	21.40	21.40	21.40
ROAD	0.90	0.10	95	15.84	0.50	15.05	0.79	13.62	2.94	0.30	2.79	0.15	2.53	17.20	0.34	16.34	0.86	14.79
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	27.27	0.10	0.00	27.27	2.73	6.23	0.07	0.00	6.23	0.62	32.59	0.08	0.00	32.59	3.26
				64.5	1.00	25.76	38.78	27.07	19.5	1.00	7.98	11.56	8.34	97.6	1.00	41.99	55.60	43.35
							Weighted C =	0.42				Weighted C =	0.43				Weighted C =	0.44

	Imp. RF	Pervious RF	% Imp	DMA J	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA E	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA O-L	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC		AC		AC	AC		AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD	0.90	0.10	95	5.57	0.93	5.29	0.28	4.79	1.32	0.89	1.26	0.07	1.14	1.42	0.96	1.35	0.07	1.22
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	3.41	0.07	0.00	3.41	0.34	1.44	0.11	0.00	1.44	0.14	0.45	0.04	0.00	0.45	0.05
				9.0	1.00	5.29	3.69	5.13	2.8	1.00	1.26	1.51	1.28	1.9	1.00	1.35	0.52	1.27
							Weighted C =	0.57				Weighted C =	0.46				Weighted C =	0.68

SAFARI HIGHLANDS BIOFILTRATION
BMP DMA CALCULATIONS

	Imp. RF	Pervious RF	% Imp	DMA O-M	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA O-N	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA O-O	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC		AC		AC	AC		AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD	0.90	0.10	95	3.72	0.97	3.53	0.19	3.20	2.92	0.68	2.77	0.15	2.51	1.20	1.00	1.14	0.06	1.03
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	0.93	0.03	0.00	0.93	0.09	12.06	0.32	0.00	12.06	1.21	0.00	0.00	0.00	0.00	0.00
				4.6	1.00	3.53	1.11	3.29	15.0	1.00	2.77	12.21	3.72	1.2	1.00	1.14	0.06	1.03
							Weighted C =	0.71				Weighted C =	0.25				Weighted C =	0.86

	Imp. RF	Pervious RF	% Imp	DMA O-P	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA O-Q	Fraction of Total	Imp Area	Pervious Area	Summation RF x A	DMA O-R	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC		AC		AC	AC		AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROAD	0.90	0.10	95	0.53	1.00	0.51	0.03	0.46	0.26	1.00	0.25	0.01	0.23	0.24	1.00	0.23	0.01	0.21
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				0.5	1.00	0.51	0.03	0.46	0.3	1.00	0.25	0.01	0.23	0.2	1.00	0.23	0.01	0.21
							Weighted C =	0.86				Weighted C =	0.86				Weighted C =	0.86

	Imp. RF	Pervious RF	% Imp	DMA O-S	Fraction of Total	Imp Area	Pervious Area	Summation RF x A
				AC		AC	AC	
BASIN	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL	0.90	0.10	87	0.00	0.00	0.00	0.00	0.00
MULTIUSE/COMMERCIAL	0.90	0.10	85	0.00	0.00	0.00	0.00	0.00
PARK	0.90	0.10	10	0.00	0.00	0.00	0.00	0.00
RESIDENTIAL	0.90	0.10	50	0.00	0.00	0.00	0.00	0.00
ROAD	0.90	0.10	95	0.41	1.00	0.39	0.02	0.36
SCHOOL	0.90	0.10	80	0.00	0.00	0.00	0.00	0.00
SLOPES	0.90	0.10	0	0.00	0.00	0.00	0.00	0.00
				0.4	1.00	0.39	0.02	0.36
							Weighted C =	0.86

SAFARI HIGHLANDS
DCV CALCULATION

DMA A: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	17.3	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.47	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	21,531	cubic-feet

DMA B: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	32.3	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.41	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	35,211	cubic-feet

DMA C: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	23.9	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.45	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	28,326	cubic-feet

DMA D: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	23.2	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.40	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	24,904	cubic-feet

SAFARI HIGHLANDS
DCV CALCULATION

DMA E: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	44.0	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.48	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	56,037	cubic-feet

DMA F: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	14.0	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.34	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	12,491	cubic-feet

DMA G: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	64.5	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.42	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	71,721	cubic-feet

DMA H: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	19.5	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.43	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	22,090	cubic-feet

SAFARI HIGHLANDS
DCV CALCULATION

DMA I: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	97.6	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.44	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	114,884	cubic-feet

DMA J: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	9.0	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.57	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	13,587	cubic-feet

DMA E: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	2.8	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.46	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	3,399	cubic-feet

DMA O-L: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	1.9	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.68	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	3,363	cubic-feet

SAFARI HIGHLANDS
DCV CALCULATION

DMA O-M: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	4.6	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.71	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	8,722	cubic-feet

DMA O-N: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	15.0	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.25	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	9,851	cubic-feet

DMA O-O: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	1.2	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.86	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	2,736	cubic-feet

DMA O-P: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	0.5	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.86	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	1,217	cubic-feet

SAFARI HIGHLANDS
DCV CALCULATION

DMA O-Q: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	0.3	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.86	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	601	cubic-feet

DMA O-R: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	0.2	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.86	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	544	cubic-feet

DMA Q-S: Design Capture Volume		Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	0.73	inches
2	Area tributary to BMP (s)	A=	0.4	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	0.86	unitless
4	Street trees volume reduction	TCV=	0.00	cubic-feet
5	Rain barrels volume reduction	RCV=	0.00	cubic-feet
6	Calculate DCV= (3630 x C x d x A) - TCV - RCV	DCV=	942	cubic-feet

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN A: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	21,531	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	11,370	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	1,705.5	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	19,825.8	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	29,738.7	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	8,037	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	14,869.3	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	12,391	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	755,384	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.47	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	10,618	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	10,618	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN B: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	35211	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	17,785	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	2,667.8	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	32,542.9	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	0.5	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	8.9	inches
19	Total Depth Treated (Line 17 + Line 18)	38.9	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	48,814.4	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	15,058	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	24,407.2	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	32,909	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	1,406,542	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.41	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	17,364	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	17,364	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN C: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	28,326	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	15,082	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	2,262.3	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	26,063.7	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	39,095.5	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	10,566	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	19,547.8	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	16,290	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	1,042,628	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.45	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	13,969	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	13,969	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN LOT D: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	24,904	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	14,794	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	2,219.1	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	22,685.3	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	34,027.9	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	9,197	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	17,014.0	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	14,178	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	1,012,392	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.40	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	12,282	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	12,282	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN E: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	3,399	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	1,680	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	252.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	3,147.3	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	4,721.0	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	1,276	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	2,360.5	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	1,967	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	120,467	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.46	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	1,676	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,676	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN K: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	56,037	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	34,505	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	5,175.8	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	50,861.7	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	76,292.6	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	20,620	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	38,146.3	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	31,789	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	1,915,506	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.48	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	27,635	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	27,635	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN F: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	12,491	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	6,920	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	1,038.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	11,453.3	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	17,180.0	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	4,643	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	8,590.0	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	7,158	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	611,067	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.34	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	6,160	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	6,160	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN G: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	71,721	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	36,540	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	5,481.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	66,239.5	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	99,359.3	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	26,854	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	49,679.6	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	41,400	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	2,811,341	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.42	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	35,369	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	35,369	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN H: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	22,090	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	11,886	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	1,782.9	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	20,307.5	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	30,461.2	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	8,233	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	15,230.6	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	12,692	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	851,106	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.43	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	10,894	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	10,894	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN I: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	114,884	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	56,819	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	8,522.9	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	106,361.2	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	159,541.8	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	43,119	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	79,770.9	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	66,476	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	4,251,247	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.44	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	56,655	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	56,655	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN J: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	13,587	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	7,672	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	1,150.8	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	12,436.3	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	18,654.4	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	5,042	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	9,327.2	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	7,773	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	391,033	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.57	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	6,700	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	6,700	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

	BASIN O-L: Simple Sizing Method for Biofiltration BMPs	Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	3,363	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	2,000	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	300.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	3,062.8	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	9.7	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	58.2	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	72.6	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	4,594.2	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	759	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	2,297.1	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	1,914	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	81,704	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.68	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	1,658	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,658	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN O-M: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	8,722	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	5,000	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	750.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	7,971.6	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	11,957.4	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	3,232	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	5,978.7	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	4,982	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	202,420	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.71	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	4,301	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	4,301	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN O-N: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	9,851	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	5,000	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	750.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	9,101.2	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	13,651.8	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	3,690	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	6,825.9	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	5,688	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	652,642	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.25	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	4,858	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	4,858	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN O-O: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	2,736	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	2,000	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	300.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	2,436.0	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	3,654.0	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	988	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	1,827.0	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	1,523	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	52,297	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.86	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	1,349	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	1,349	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN O-P: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	1,217	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	1,200	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	180.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	1,036.9	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	1,555.3	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	420	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	777.7	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	648	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	23,260	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.86	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	600	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	600	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN O-Q: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	601	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	900	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	135.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	466.5	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	699.7	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	189	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	349.9	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	292	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	11,497	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.86	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	297	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	297	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

BASIN O-R: Simple Sizing Method for Biofiltration BMPs		Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	544	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	900	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	135.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	409.1	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	613.6	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	166	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	306.8	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	256	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	10,400	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.86	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	268	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	268	sq-ft

Attachment 1A

BIOFILTRATION BMP SIZING CALCULATION

	BASIN O-S: Simple Sizing Method for Biofiltration BMPs	Worksheet B.5-1	
1	Remaining DCV after implementing retention BMP's	942	cubic-feet
Partial Retention			
2	Infiltration rate from Worksheet D.5-1 if partial infiltration is feasible	0.0	in/hr.
3	Allowable drawdown time for aggregate storage below the underdrain	36.0	hours
4	Depth of runoff that can be infiltrated (Line 2 x Line 3)	0.0	inches
5	Aggregate pore space	0.4	in/in
6	Required depth of gravel below the underdrain (Line 4/ Line 5)	0.0	inches
7	Assumed surface area of the biofiltration BMP	1,200	sq-ft
8	Media retained pore storage	0.1	in/in
9	Volume retained by BMP (Line 4+(Line 12 x Line 8)/12) x Line 7	180.0	cubic-feet
10	DCV that requires biofiltration (Line 1 - Line 9)	761.9	cubic-feet
BMP Parameters			
11	Surface Ponding [6 inch minimum, 12 inch maximum]	6.0	inches
12	Media Thickness [18 inches minimum], also add mulch layer thickness to this line for sizing calculations	18.0	inches
13	Aggregate Storage above underdrain invert (12 inches typical) - use 0 inches for sizing if the agreagate is not over the entire bottom surface area	12.0	inches
14	Freely drained pore storage	0.2	in/in
15	Media filtration rate to be used for sizing (5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate)	5.0	in/hr.
Baseline Calculations			
16	Allowable Routing Time for sizing	6.0	hours
17	Depth filtered during storm (Line 15 x Line 16)	30.0	inches
18	Depth of Detention Storage (Line 11 + (Line 12 x Line 14) + (Line 13 x Line 5))	14.4	inches
19	Total Depth Treated (Line 17 + Line 18)	44.4	inches
Option 1 - Biofilter 1.5 times the DCV			
20	Required biofiltered volume (1.5 x Line 10)	1,142.9	cubic-feet
21	Required Footprint (Line 20/ Line 19) x 12	309	sq-ft
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
22	Required Storage (surface + pores) Volume (0.75 x Line 10)	571.4	cubic-feet
23	Required Footprint (Line 22/ Line 18) x 12	476	sq-ft
Footprint of the BMP			
24	Area draining to the BMP	18,004	sq-ft
25	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.86	unitless
26	Minimum BMP Footprint (Line 24 x Line 25 x 0.03)	465	sq-ft
27	Footprint of the BMP = Maximum(Minimum(Line 21, Line 23), Line 26)	465	sq-ft

Harvest and Use Feasibility Checklist	Form I-4

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

☐ Toilet and urinal flushing

☒ Landscape irrigation

☐ Other: _____

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

General landscape: Moderate Plant water use: 1470GAL/AC*224AC=329280gal->44018 cubic feet

3. Calculate the DCV using worksheet B-2.1.

DCV = 404839 (cubic feet)

0.25DCV= 101210 (cubic feet)

3a. Is the 36 hour demand greater than or equal to the DCV?	3b. Is the 36 hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36 hour demand less than 0.25DCV?
☐ Yes / ☒ No ⇨ ⇩	☐ Yes / ☐ No ⇨ ⇩	☒ Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

Categorization of Infiltration Feasibility Condition	Form I-5

Part 1 - Full Infiltration Feasibility Screening Criteria

Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
1	**Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: Based on review of USDA soil survey maps, the vast majority of the property is classified as Hydrologic Soil Group D, which are not conducive to infiltration BMP's. We have included the soil map from the USDA website and the soil descriptions for the 2 soil types that cover the vast majority of the property. The estimated infiltration rates are expected to be less than 0.5 inches per hour within the underlying formational materials. The loose and porous surficial soils will be removed and replaced as compacted fill placed above formational materials. It has been our experience that compacted fill does not meet the minimum 0.5 inches per hour threshold. In addition, infiltration BMP's founded in compacted fill are not recommended to due to high potential for lateral water migration, potential for hydro-consolidation and settlement, and distress to surrounding structures and improvements.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

2	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis: Due to the steep hillside terrain, slopes over 25% exist on-site, and we expect that fill slopes will be constructed throughout the development. Infiltration BMP's are not recommended within compacted fill or adjacent to fill slopes. Infiltration BMP's could cause slope instability and failures. Infiltration BMP's could result in daylight water seepage that could adversely impact downgradient and adjacent properties.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.

Form I-5			
Criteria	Screening Question	**Yes**	**No**
3	**Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Groundwater is not expected to occur within 10 feet from any proposed infiltration BMP, therefore the risk of storm water infiltration BMP's adversely impacting groundwater is considered negligible. Based on review of the www.water.ca.gov website, groundwater is expected at elevations ranging between 350 and 357 feet above MSL. The lowest elevation onsite is greater than approx. 900 feet above MSL. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	**Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Researching downstream water rights or evaluating water balance issues to stream flows is beyond the scope of the geotechnical consultant. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration The feasibility screening category is **Full Infiltration** If any answer from row 1- 4 is "No", infiltration may be would not generally be feasible or desir Proceed to Part 2		No Full Infiltration

Form I-5

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

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

Criteria	Screening Question	Yes	No
5	**Do soil and geologic conditions allow for infiltration in any appreciable rate or volume?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis: The proposed basins will either be founded in Hydrologic Soil Group D soils or compacted fill compacted to 90% of the maximum dry density. Infiltration BMP's in compacted fill are not recommended due to the shrink/swell characteristics of the fill soils and high potential for lateral water migration to adversely impact proposed structures and improvements, as well as utilities and roadways. Infiltration BMP's could result in daylight water seepage that may adversely impact down gradient and adjacent properties.

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

6	**Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X

Provide basis: Due to the steep hillside terrain, slopes over 25% exist on-site, and we expect that fill slopes will be constructed throughout the development. Infiltration BMP's are not recommended within compacted fill or adjacent to fill slopes. Infiltration BMP's could cause slope instability and failures and result in daylight water seepage that could adversely impact down gradient and adjacent properties.

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-5			
Criteria	Screening Question	**Yes**	**No**
7	**Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?** The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Groundwater is not expected within 10 feet from any proposed infiltration BMP, therefore the risk of storm water infiltration BMP's adversely impacting groundwater is considered negligible. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	**Can infiltration be allowed without violating downstream water rights**? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.		
Provide basis: Researching downstream water rights is beyond the scope of the geotechnical consultant. Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 5-8 are yes then partial infiltration design is potentially feasible. The feasibility screening category is **Partial Infiltration.** If any answer from row 5-8 is no, then infiltration of any volume is considered to be **infeasible** within the drainage area. The feasibility screening category is **No Infiltration.**		No Partial Infiltration

Form I-5 Certification

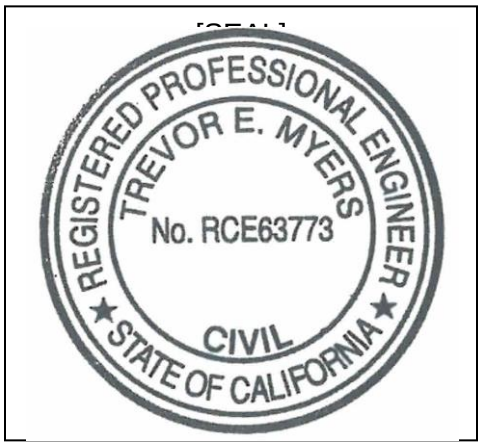
The Geotechnical Engineer certifies they completed Form I-5 except Criteria 4 & 8 (see Appendix C.4.3).

Professional Geotechnical Engineer's Printed Name:

Trevor Myers

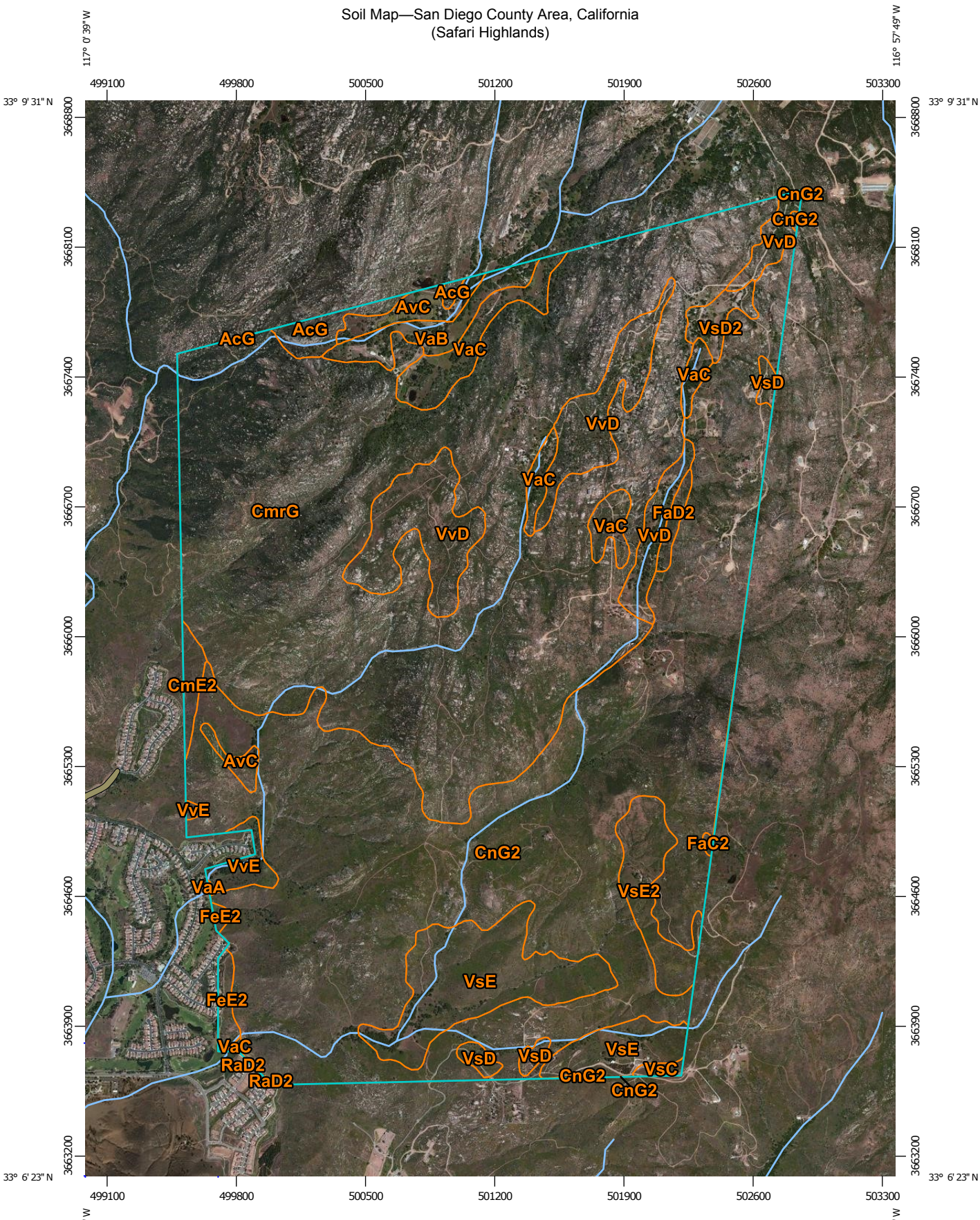
Professional Geotechnical Engineer's Signed Name:

Date: 09-09-16



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Soil Map—San Diego County Area, California
(Safari Highlands)



Map Scale: 1:28,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 400 800 1600 2400

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 9, Sep 17, 2015

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

Date(s) aerial images were photographed: May 2, 2010—Nov 22, 2014

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

Map Unit Legend

San Diego County Area, California (CA638)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AcG	Acid igneous rock land	22.8	0.7%
AvC	Arlington coarse sandy loam, 2 to 9 percent slopes	31.5	1.0%
CmE2	Cieneba rocky coarse sandy loam, 9 to 30 percent slopes , eroded	12.8	0.4%
CmrG	Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes	1,282.2	40.5%
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent s lopes, eroded	1,212.3	38.3%
FaC2	Fallbrook sandy loam, 5 to 9 percent slopes, eroded	1.3	0.0%
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded	8.9	0.3%
FeE2	Fallbrook rocky sandy loam, 9 to 30 percent slopes, ero ded	13.8	0.4%
RaD2	Ramona sandy loam, 9 to 15 percent slopes, eroded	0.3	0.0%
VaA	Visalia sandy loam, 0 to 2 percent slopes	0.2	0.0%
VaB	Visalia sandy loam, 2 to 5 percent slopes	37.6	1.2%
VaC	Visalia sandy loam, 5 to 9 percent slopes	78.1	2.5%
VsC	Vista coarse sandy loam, 5 to 9 percent slopes	4.4	0.1%
VsD	Vista coarse sandy loam, 9 to 15 percent slopes	16.0	0.5%
VsD2	Vista coarse sandy loam, 9 to 15 percent slopes, eroded	18.0	0.6%
VsE	Vista coarse sandy loam, 15 to 30 percent slopes	166.0	5.2%
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, erode d	54.2	1.7%
VvD	Vista rocky coarse sandy loam, 5 to 15 percent slopes	189.5	6.0%
VvE	Vista rocky coarse sandy loam, 15 to 30 percent slopes	18.3	0.6%
Totals for Area of Interest		**3,168.1**	**100.0%**

San Diego County Area, California

CmrG—Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hb9v
Elevation: 500 to 4,000 feet
Mean annual precipitation: 8 to 35 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 110 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 45 percent
Cieneba and similar soils: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and granodiorite

Typical profile

H1 - 0 to 8 inches: coarse sandy loam
H2 - 8 to 12 inches: weathered bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent
Hydric soil rating: No

Las posas

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 9, Sep 17, 2015

San Diego County Area, California

CnG2—Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent s lopes, eroded

Map Unit Setting

National map unit symbol: hb9x
Elevation: 300 to 4,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 40 percent
Fallbrook and similar soils: 35 percent
Rock outcrop: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and granodiorite

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 14 inches: weathered bedrock

Properties and qualities

Slope: 30 to 65 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)

Hydric soil rating: No

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 24 inches: sandy clay loam, loam
H2 - 6 to 24 inches: weathered bedrock
H3 - 24 to 28 inches:

Properties and qualities

Slope: 30 to 65 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 9, Sep 17, 2015

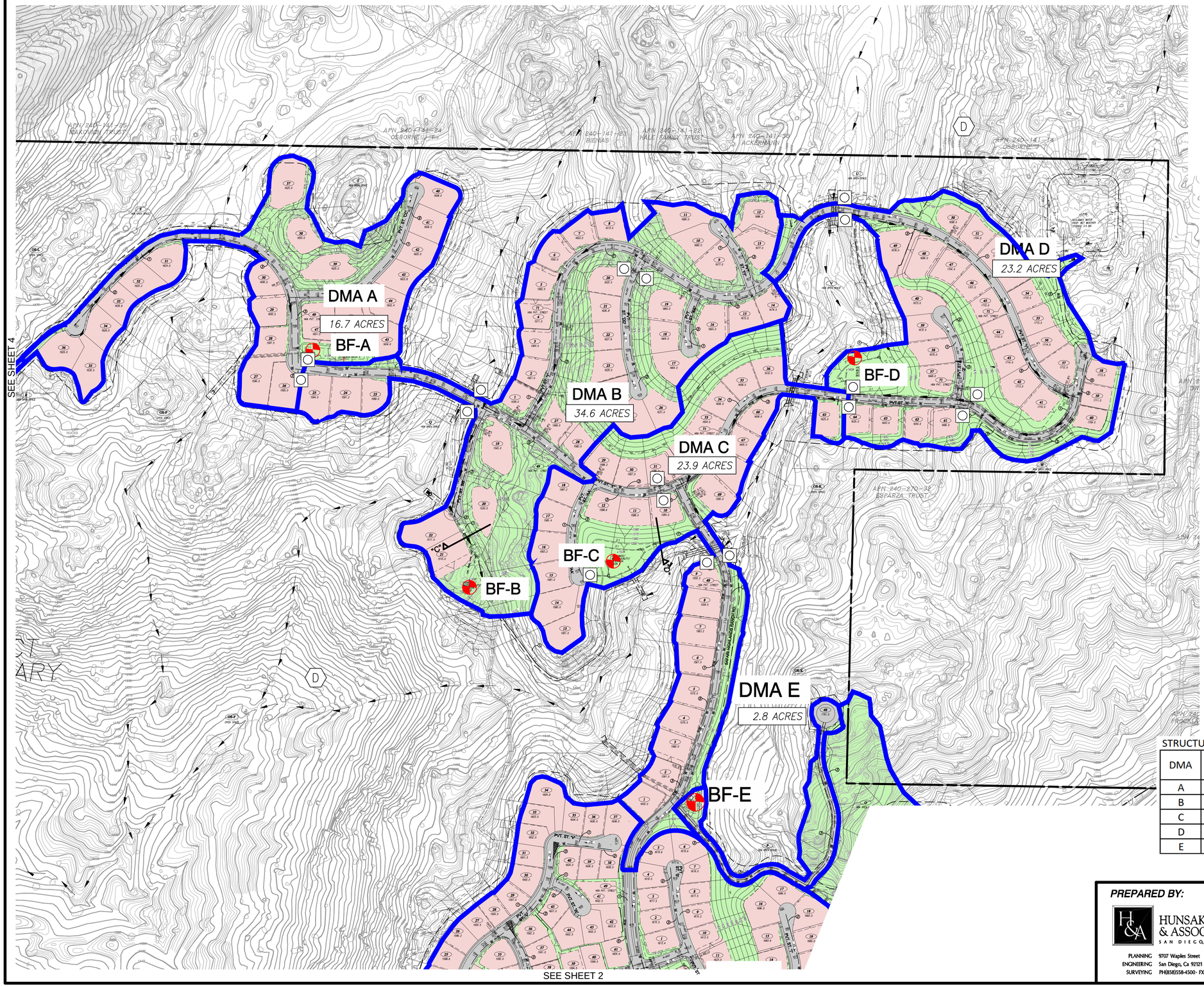
PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

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)

Note: Critical Coarse Sediment Yield Areas (CCSYA) required to be mitigated per Hydromodification Management Plan are show on Attachment 2C



LEGEND

- PROJECT BOUNDARY
- DMA BOUNDARY
- DIRECTION OF FLOW
- PERVIOUS AREAS
- STREETS
- LOT (50% IMPERVIOUS)
- HYDROLOGIC SOIL TYPE (D)

STRUCTURAL BMPS

- BIOFILTRATION BASIN

SOURCE CONTROL BMPs

- MARK INLETS WITH 'NO DUMPING! FLOWS TO BAY' OR SIMILAR.'

NOTES

NO GROUNDWATER FOUND ONSITE

0 200 400 600
SCALE 1"= 200'

SOURCE CONTROLS: SEE STEP 4 OF SWQMP

SC-1 PREVENTION OF ILLICT DISCHARGES INTO THE MS4

SC-2 STORM DRAIN STENCILING

SC-6A ON-SITE SOTMR DRAIN INLETS

SC-6Q PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN: SEE STEP 5 OF SWQMP

SD-1 MAINTAIN ANTURAL DRAINAGE PATHWAYS

SD-3 MINIMIZE IMPERVIOUS AREA

SD-5 IMPERVIOUS AREA DISPERSION

SD-7 LANDSCAPING WITH DROUGHT TOLERANT SPECIES

STRUCTURAL BMPS

DMA	DMA TYPE	BMP	BMP ID	REQUIRED FOOTPRINT	PROVIDED FOOTPRINT
A	DRAINS TO BMP	BIOFILTRATION	BF-A	10618	11370
B	DRAINS TO BMP	BIOFILTRATION	BF-B	17364	17785
C	DRAINS TO BMP	BIOFILTRATION	BF-C	13969	15082
D	DRAINS TO BMP	BIOFILTRATION	BF-D	12282	14794
E	DRAINS TO BMP	BIOFILTRATION	BF-E	1680	1676

PREPARED BY:
HUNSAKER & ASSOCIATES SAN DIEGO, INC.
PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 · FX(858)558-1414

ATTACHMENT 1D
DRAINAGE MANAGEMENT AREA EXHIBIT
SAFARI HIGHLANDS

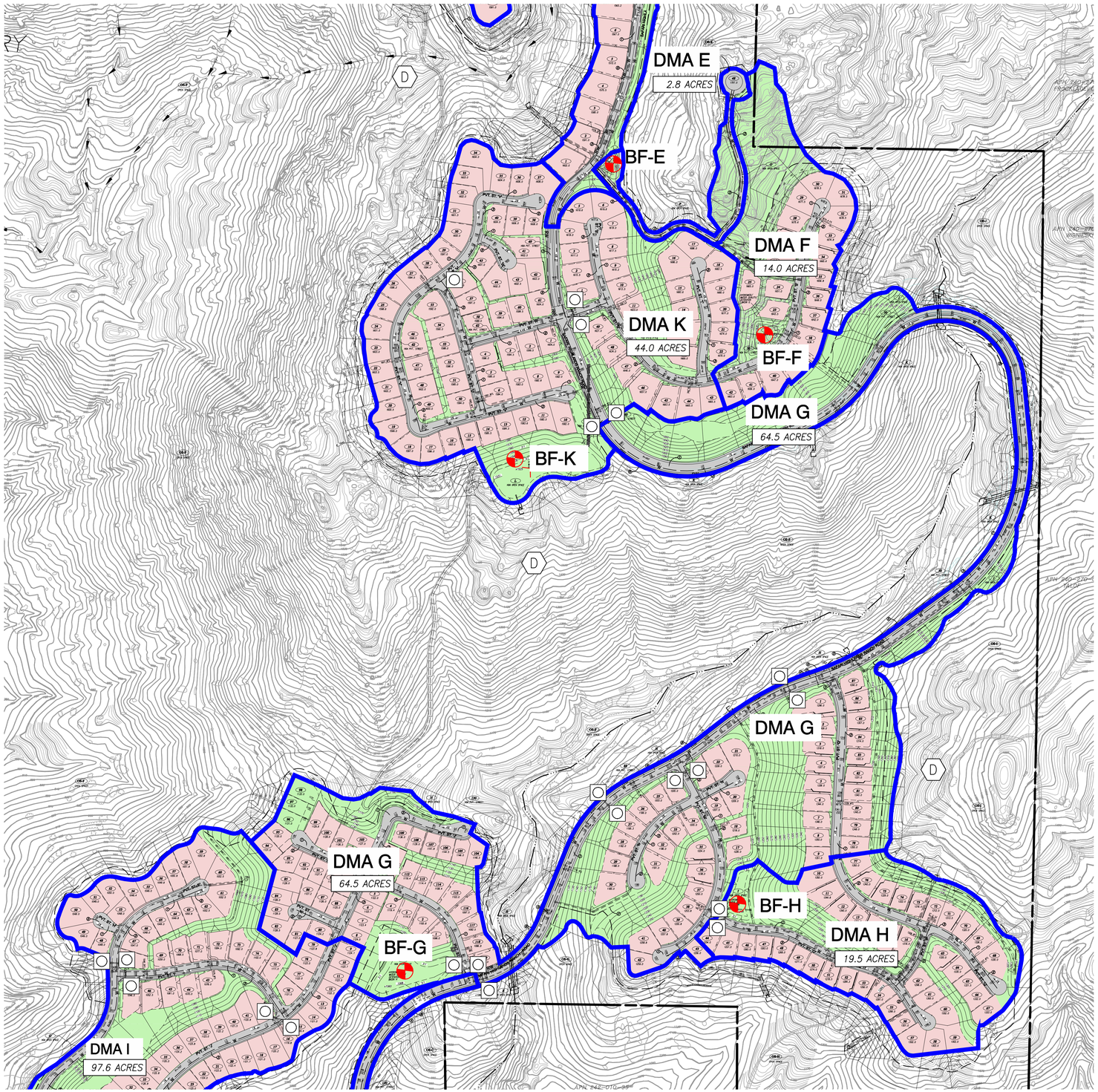
CITY OF ESCONDIDO, CA

SHEET 1 OF 5

W.O. 2374-0017

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SEE SHEET 1



SEE SHEET 3

LEGEND

- PROJECT BOUNDARY
- DMA BOUNDARY
- DIRECTION OF FLOW
- PERVIOUS AREAS
- STREETS
- LOT (50% IMPERVIOUS)
- HYDROLOGIC SOIL TYPE (D)

STRUCTURAL BMPS

- BIOFILTRATION BASIN

SOURCE CONTROL BMPs

- MARK INLETS WITH 'NO DUMPING! FLOWS TO BAY' OR SIMILAR.'

NOTES

NO GROUNDWATER FOUND ONSITE

0 500 750 250'
SCALE 1"= 250

SOURCE CONTROLS: SEE STEP 4 OF SWQMP

SC-1 PREVENTION OF ILLICT DISCHARGES INTO THE MS4

SC-2 STORM DRAIN STENCILING

SC-6A ON-SITE SOTMR DRAIN INLETS

SC-6Q PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN: SEE STEP 5 OF SWQMP

SD-1 MAINTAIN ANTURAL DRAINAGE PATHWAYS

SD-3 MINIMIZE IMPERVIOUS AREA

SD-5 IMPERVIOUS AREA DISPERSION

SD-7 LANDSCAPING WITH DROUGHT TOLERANT SPECIES

STRUCTURAL BMPS

DMA	DMA TYPE	BMP	BMP ID	REQUIRED DCV FOOTPRINT (SQFT)	PROVIDED DCV FOOTPRINT (SQFT)
K	DRAINS TO BMP	BIOFILTRATION	BF-E	27635	34505
F	DRAINS TO BMP	BIOFILTRATION	BF-F	6160	6920
G	DRAINS TO BMP	BIOFILTRATION	BF-G	35369	36540
H	DRAINS TO BMP	BIOFILTRATION	BF-H	10894	11886

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ATTACHMENT 1D
DRAINAGE MANAGEMENT AREA EXHIBIT
SAFARI HIGHLANDS
CITY OF ESCONDIDO, CA

SHEET 2 OF 5

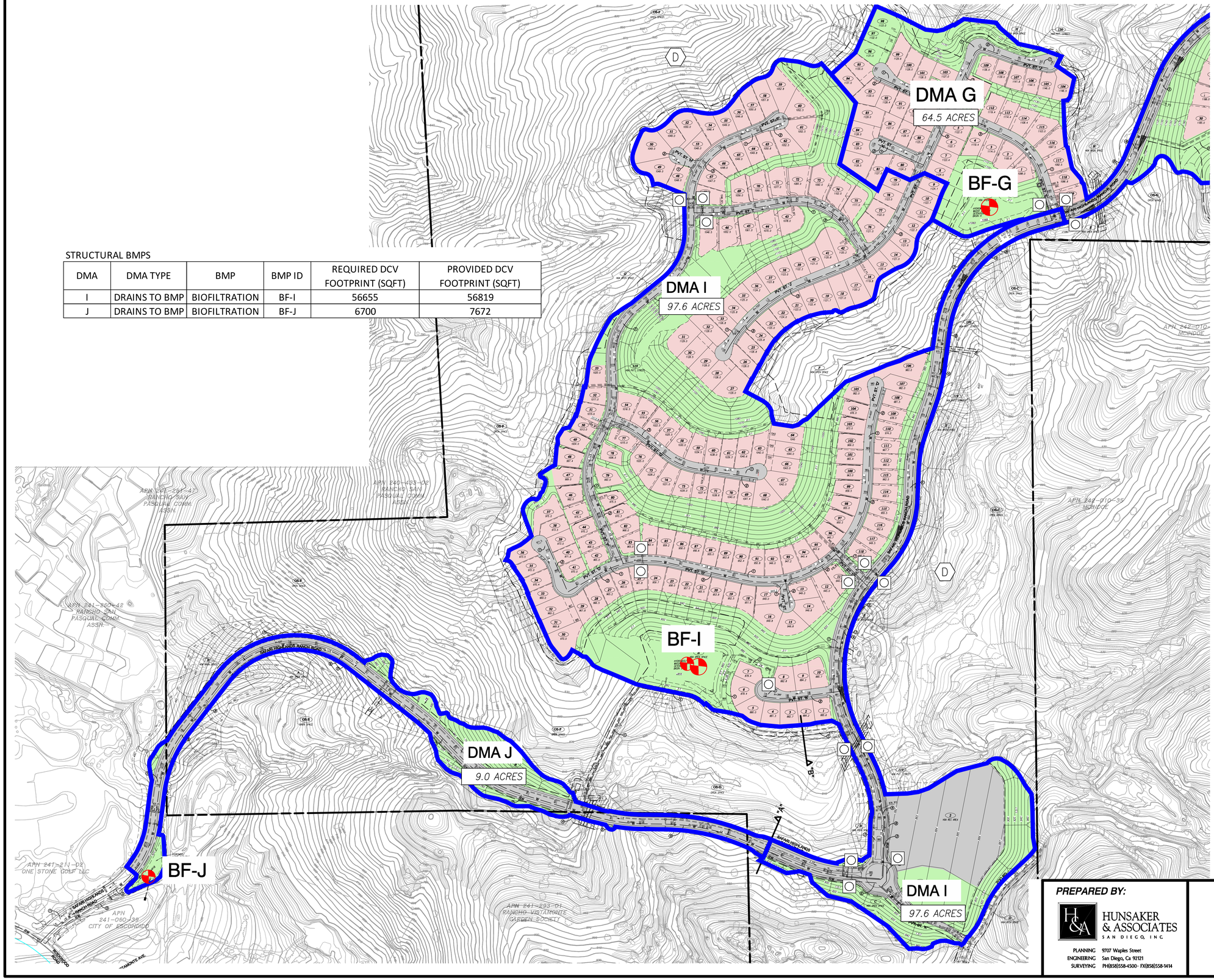
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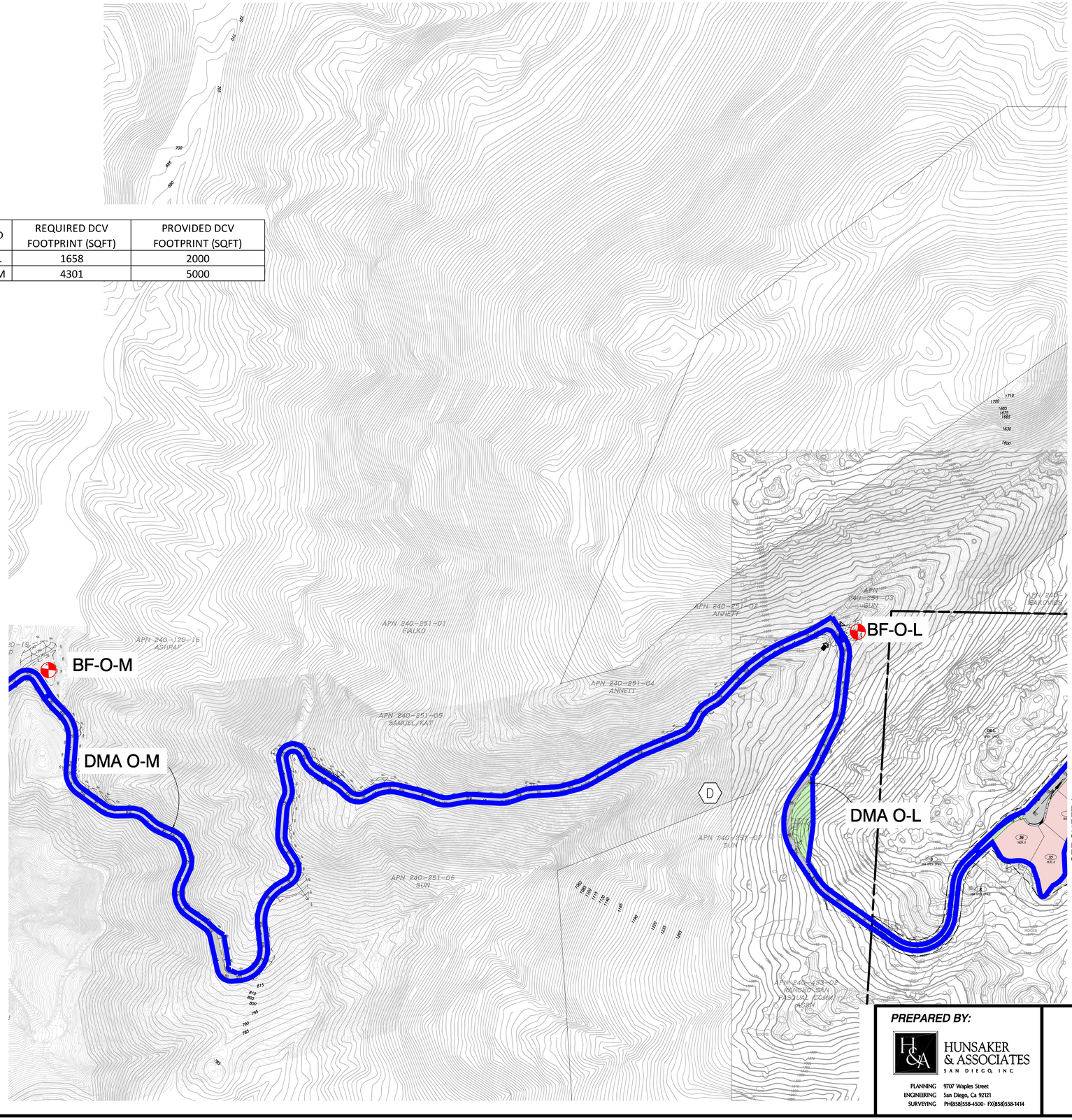
STRUCTURAL BMPS

DMA	DMA TYPE	BMP	BMP ID	REQUIRED DCV FOOTPRINT (SQFT)	PROVIDED DCV FOOTPRINT (SQFT)
I	DRAINS TO BMP	BIOFILTRATION	BF-I	56655	56819
J	DRAINS TO BMP	BIOFILTRATION	BF-J	6700	7672


DMA G
64.5 ACRES
BF-G
DMA I
97.6 ACRES
BF-I
DMA J
9.0 ACRES
BF-J
DMA I
97.6 ACRES
SAFARI HIGHLANDS RANCH ROAD
PVT. ST. W
PVT. ST. V
PVT. ST. U
PVT. ST. T
PVT. ST. S
PVT. ST. R
PVT. ST. Y
PVT. ST. X
PVT. BLVD.
"A"
"B"
APN 241-293-01 RANCHO VISTAMONTE GARDEN SOCIETY
APN 241-060-38 CITY OF ESCONDIDO
APN 241-210-02 ONE STONE GOLF LLC
APN 241-350-42 RANCHO SAN PASQUAL COMM ASSN
APN 241-293-02 RANCHO SAN PASQUAL COMM ASSN
APN 241-210-35 MONDOE
TIERRA ROJA ROAD
TIERRA ROJA WAY
TIERRA ROJA PLACE
TIERRA ROJA COURT
TIERRA ROJA CIRCLE
SAFARI HIGHLANDS RANCH ROAD
TIERRA ROJA ROAD
TIERRA ROJA WAY
TIERRA ROJA PLACE
TIERRA ROJA COURT
TIERRA ROJA CIRCLE
SAFARI HIGHLANDS

STRUCTURAL BMPS

DMA	DMA TYPE	BMP	BMP ID	REQUIRED DCV FOOTPRINT (SQFT)	PROVIDED DCV FOOTPRINT (SQFT)
O-L	DRAINS TO BMP	BIOFILTRATION	BF O-L	1658	2000
O-M	DRAINS TO BMP	BIOFILTRATION	BF O-M	4301	5000



LEGEND

PROJECT BOUNDARY

DMA BOUNDARY

DIRECTION OF FLOW

PERVIOUS AREAS

STREETS

LOT (50% IMPERVIOUS)

HYDROLOGIC SOIL TYPE

STRUCTURAL BMPS

BIOFILTRATION BASIN

SOURCE CONTROL BMPs

MARK INLETS WITH 'NO DUMPING! FLOWS TO BAY' OR SIMILAR.'

NOTES

NO GROUNDWATER FOUND ONSITE

0 200 400 600

SCALE 1" = 200'

SOURCE CONTROLS: SEE STEP 4 OF SWQMP

SC-1 PREVENTION OF ILLICT DISCHARGES INTO THE MS4

SC-2 STORM DRAIN STENCILING

SC-6A ON-SITE SOTMR DRAIN INLETS

SC-6Q PLAZAS, SIDEWALKS, AND PARKING LOTS

SITE DESIGN: SEE STEP 5 OF SWQMP

SD-1 MAINTAIN ANTURAL DRAINAGE PATHWAYS

SD-3 MINIMIZE IMPERVIOUS AREA

SD-5 IMPERVIOUS AREA DISPERSION

SD-7 LANDSCAPING WITH DROUGHT TOLERANT SPECIES

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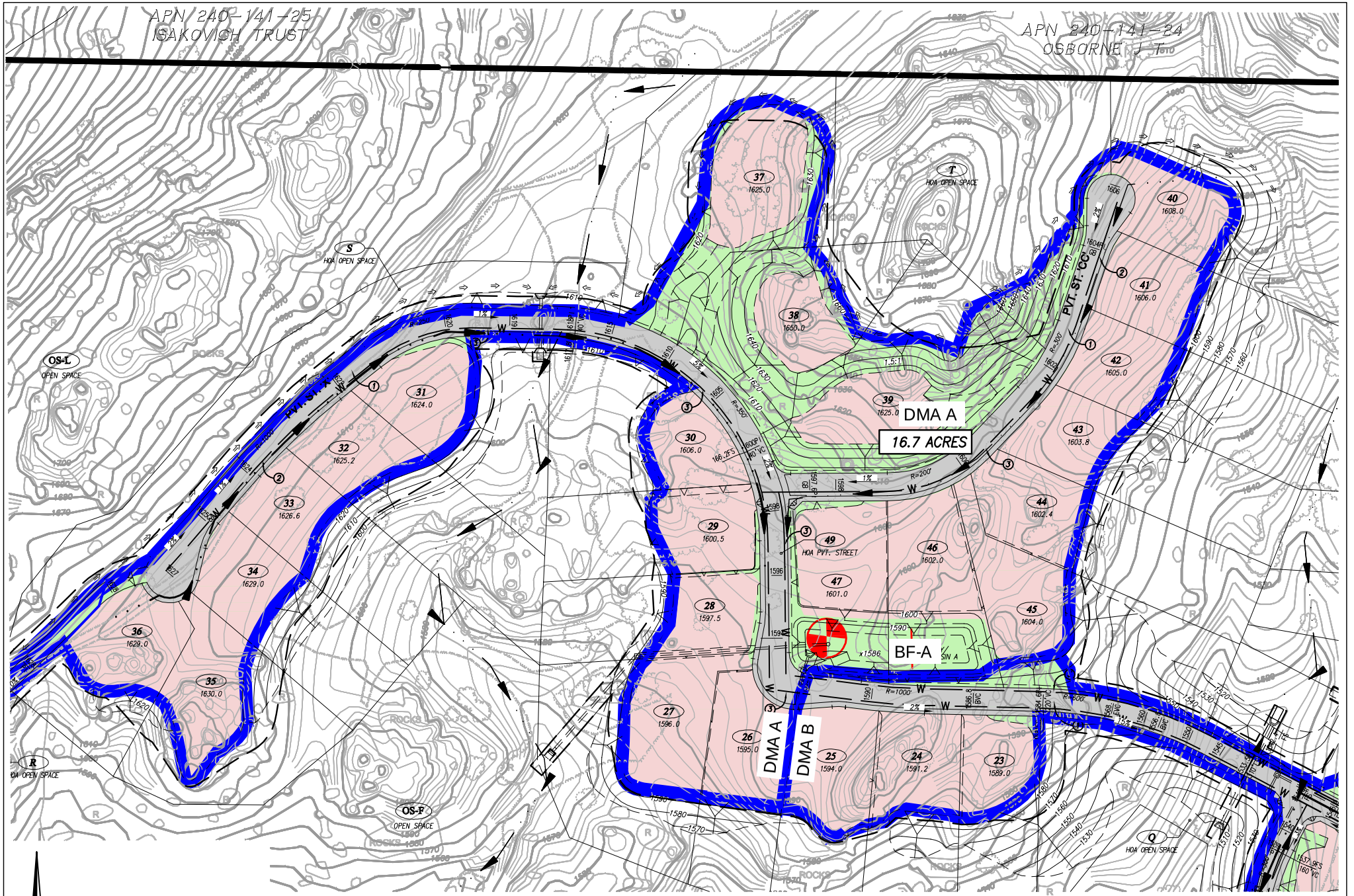
ATTACHMENT 1D
DRAINAGE MANAGEMENT AREA EXHIBIT
SAFARI HIGHLANDS

CITY OF ESCONDIDO, CA

SHEET 4 OF 5

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LEGEND: SEE DMA MAP

SCALE: 1" = 200'

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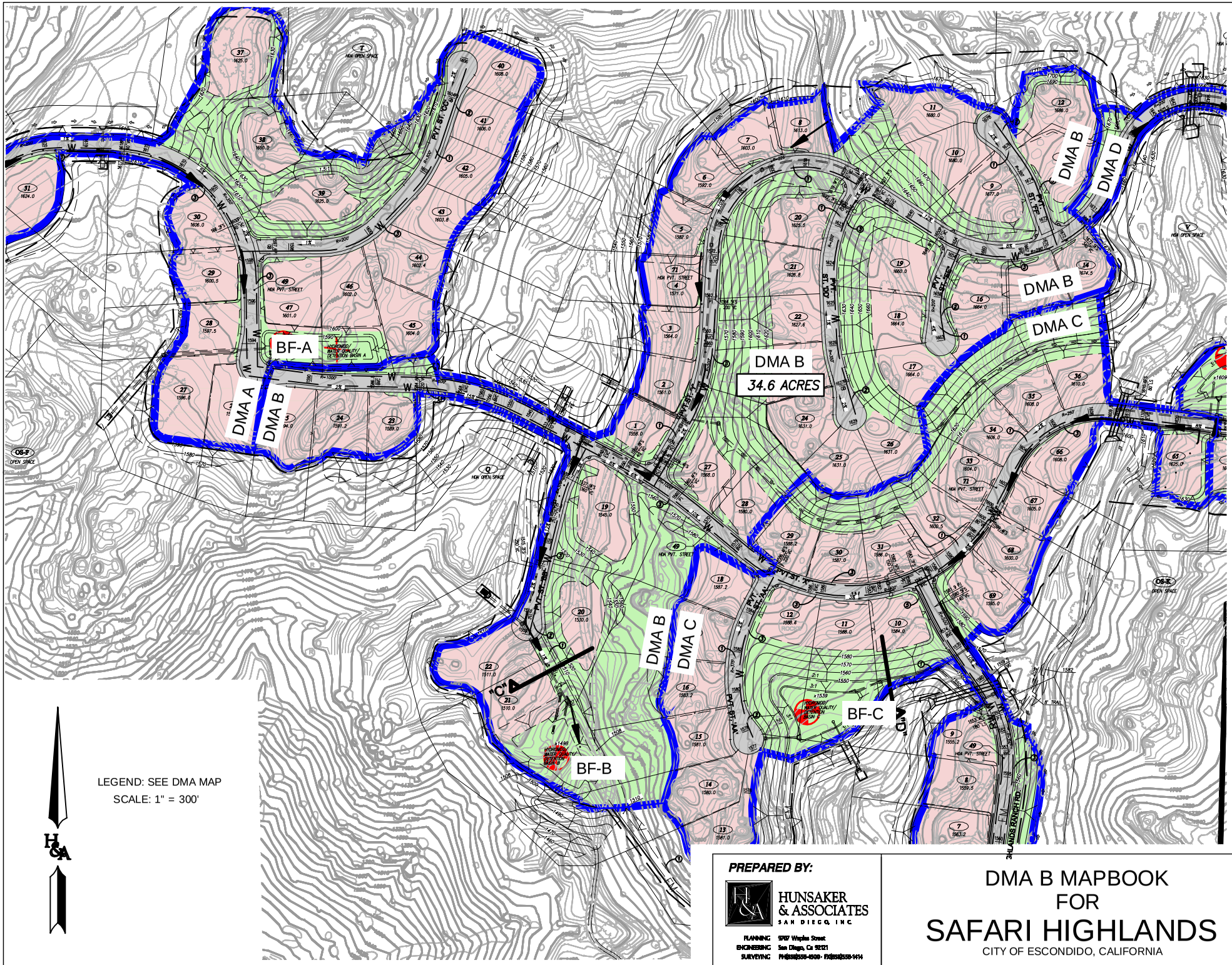
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LEGEND: SEE DMA MAP

SCALE: 1" = 300'

H&A

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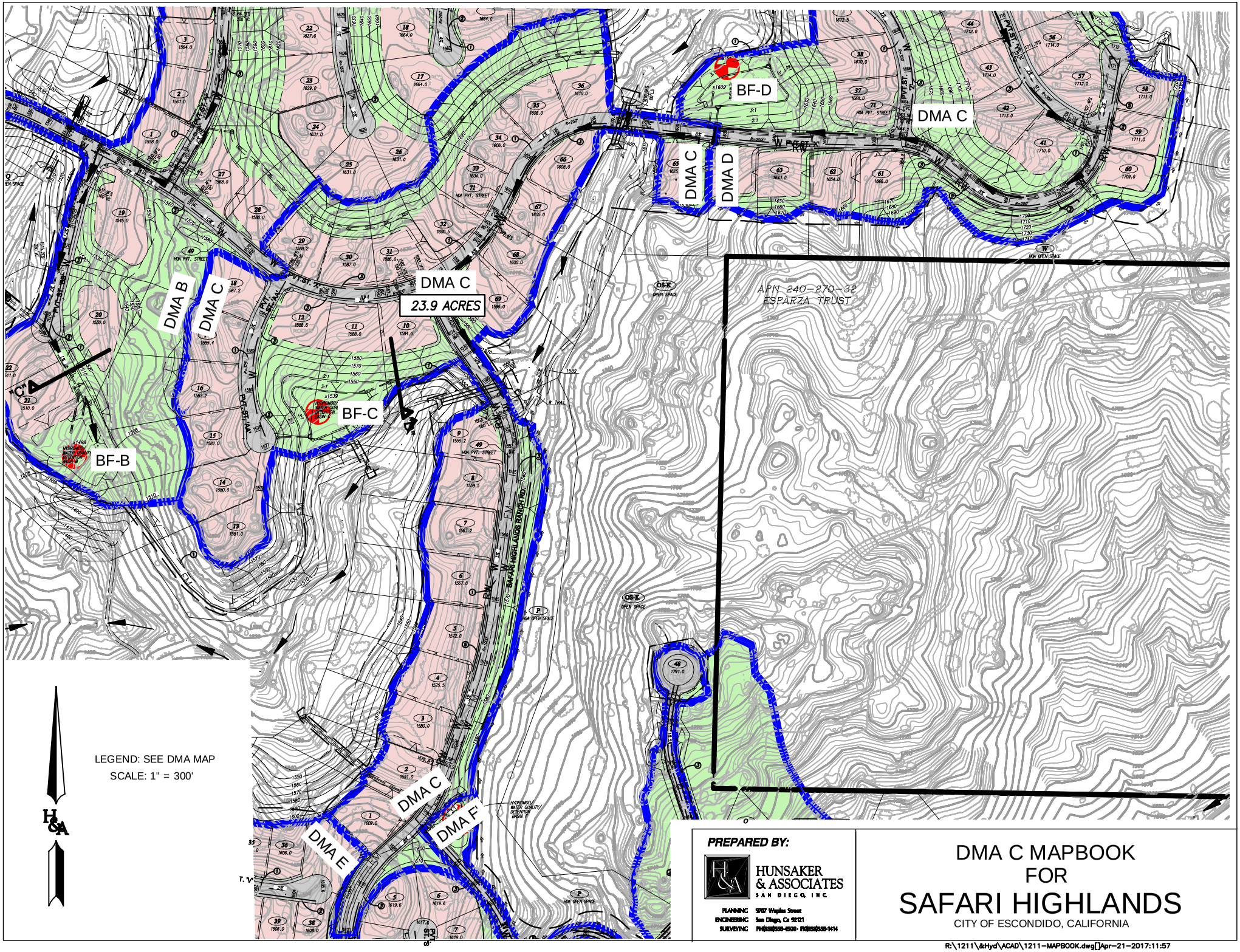
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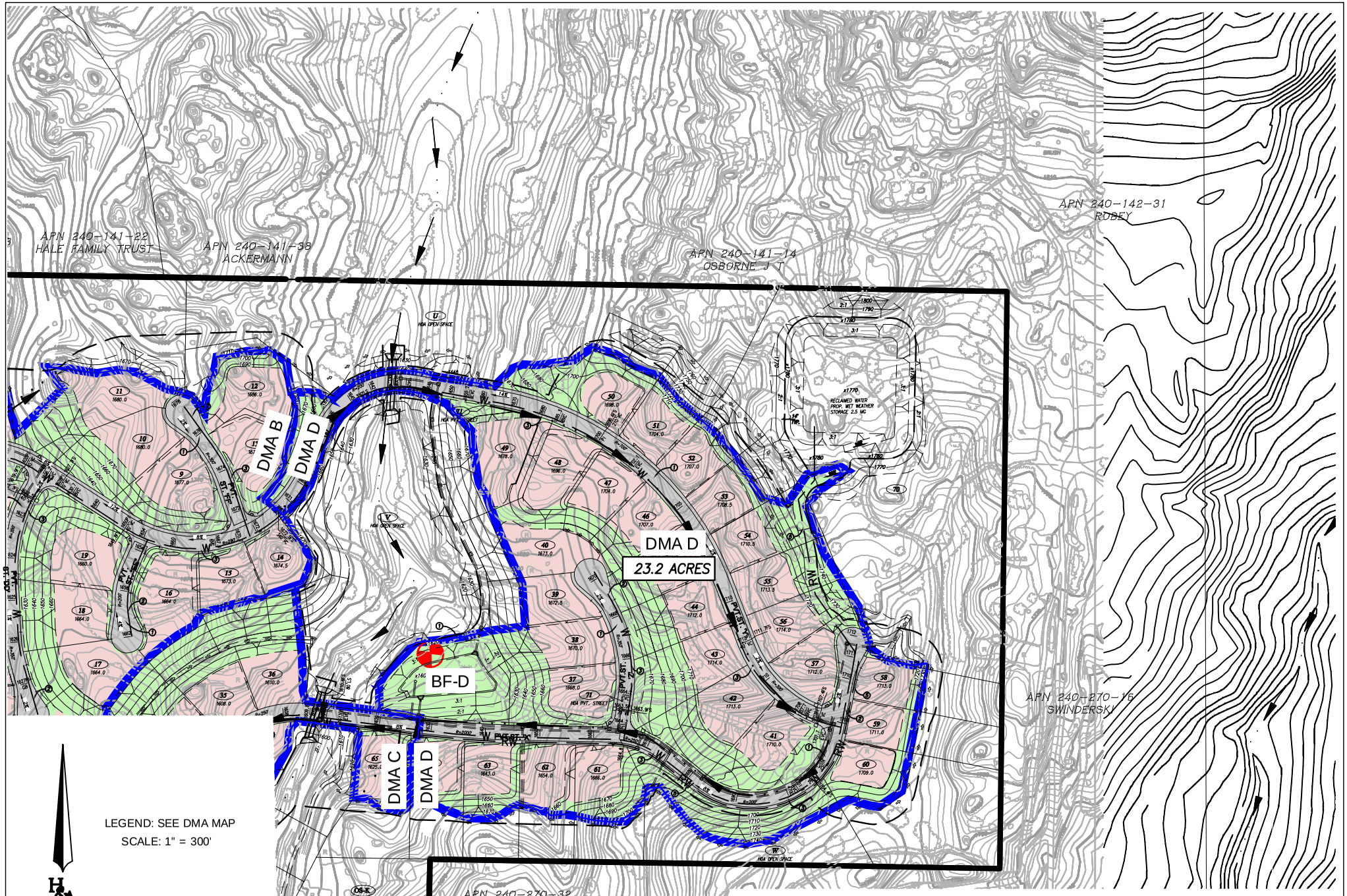
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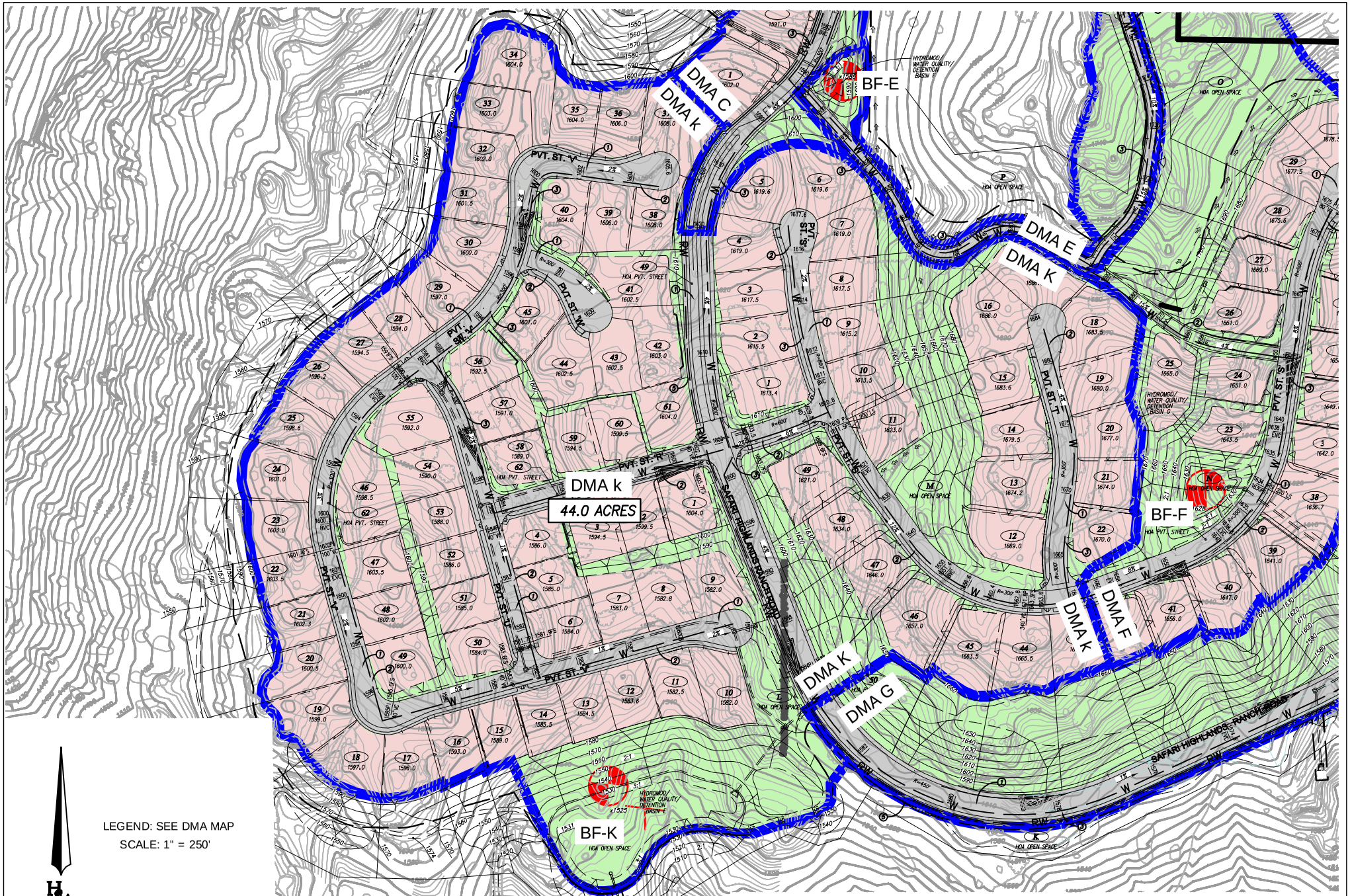
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LEGEND: SEE DMA MAP

SCALE: 1" = 250'

H&A

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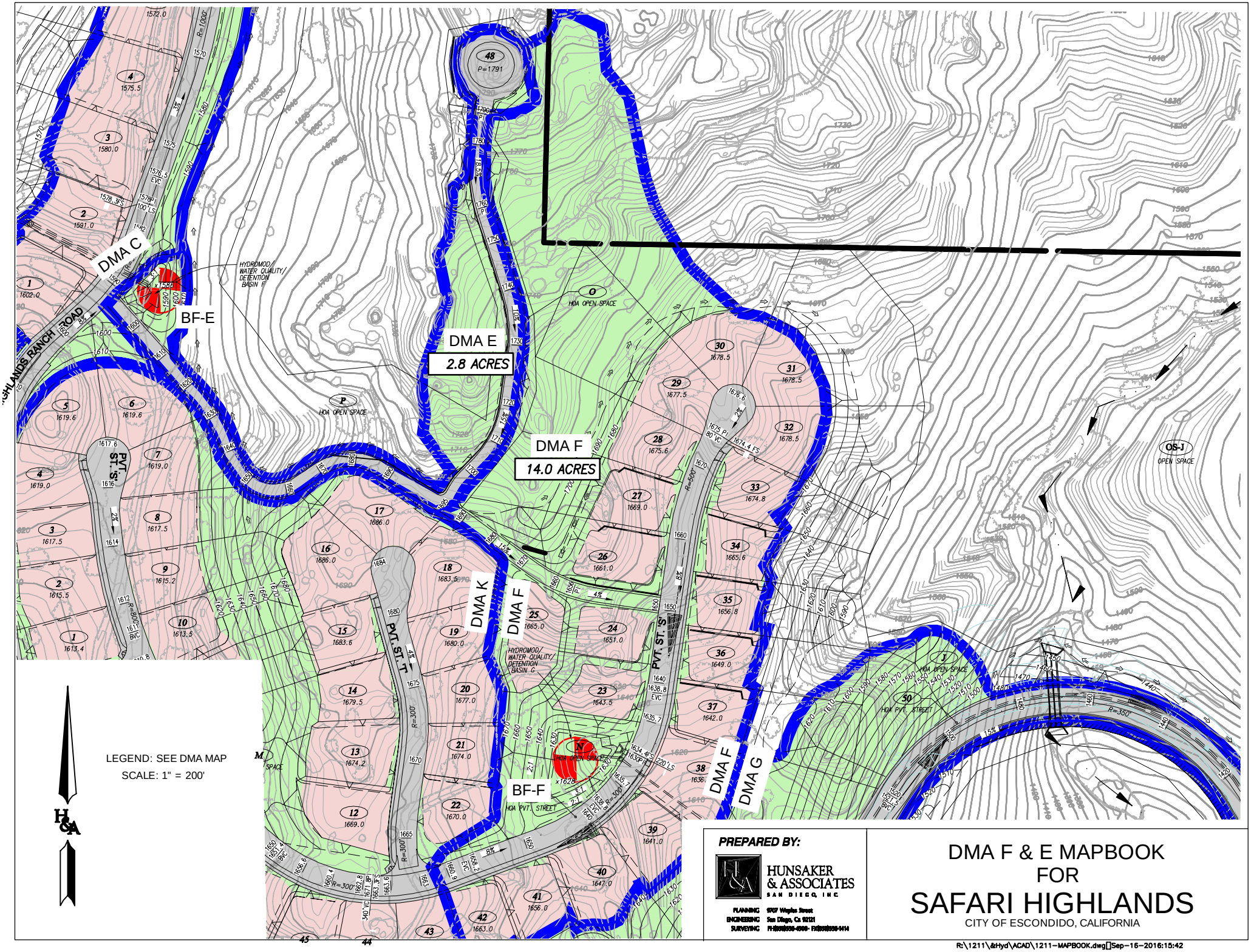
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DMA k MAPBOOK FOR SAFARI HIGHLANDS

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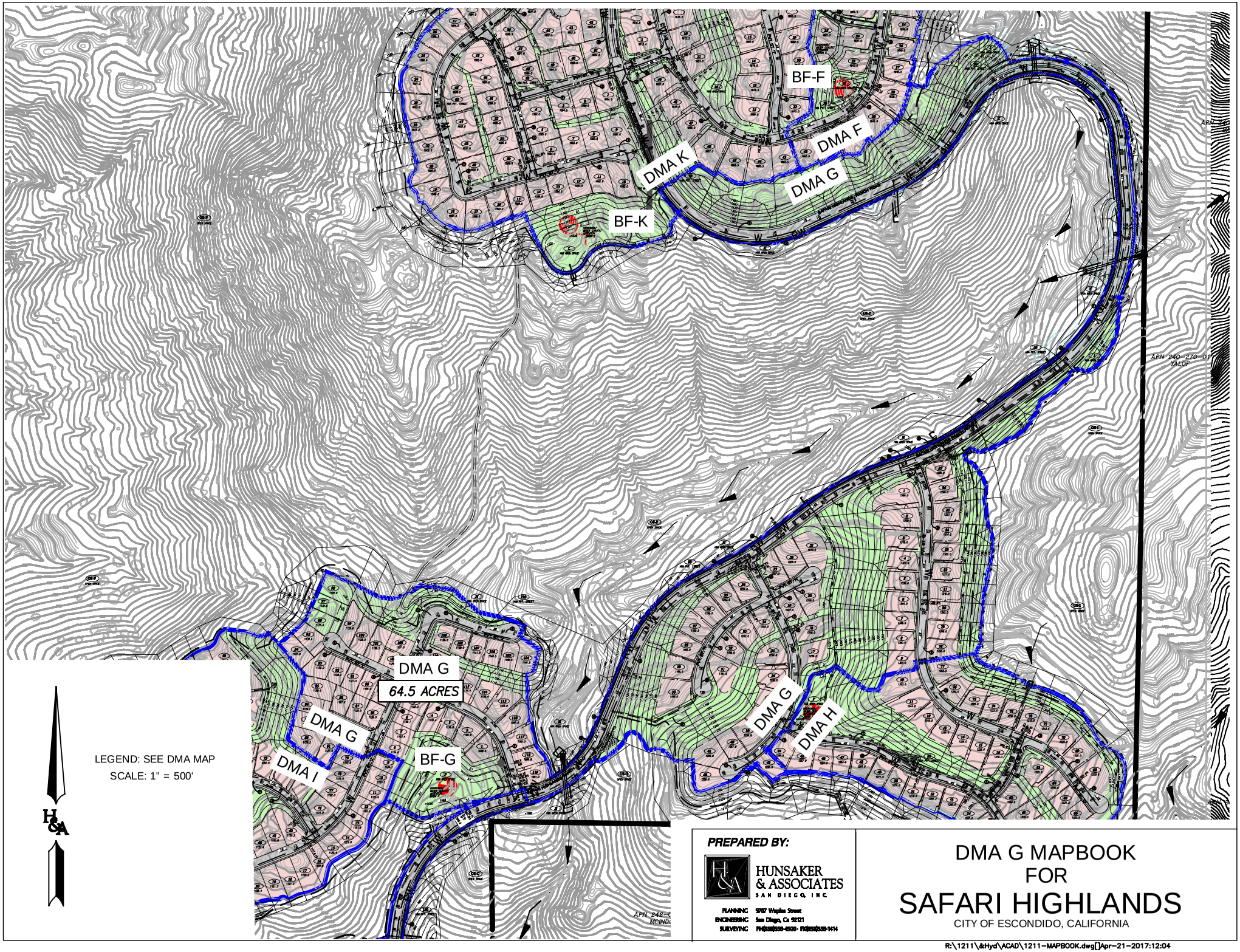
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LEGEND: SEE DMA MAP

SCALE: 1" = 500'

H&A

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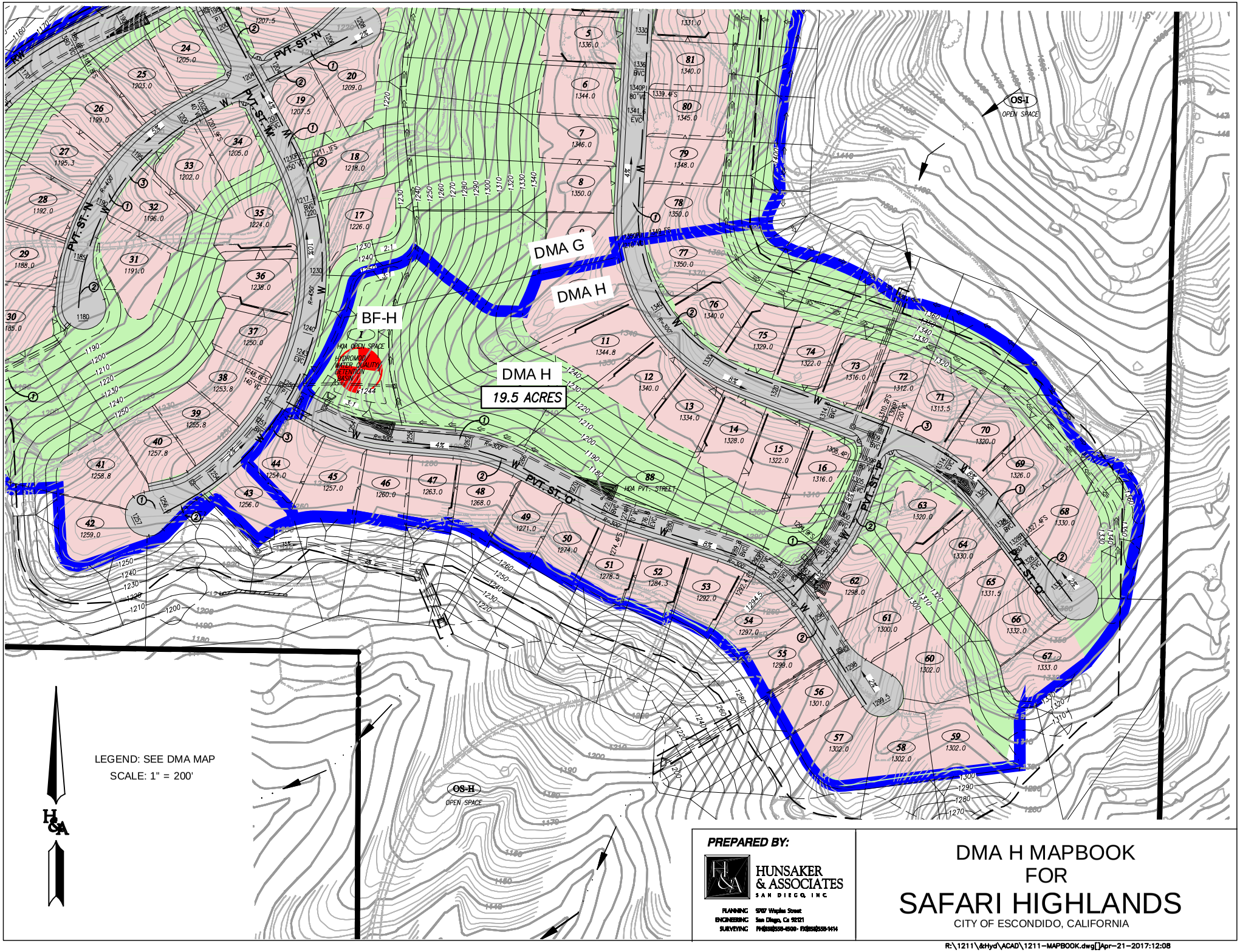
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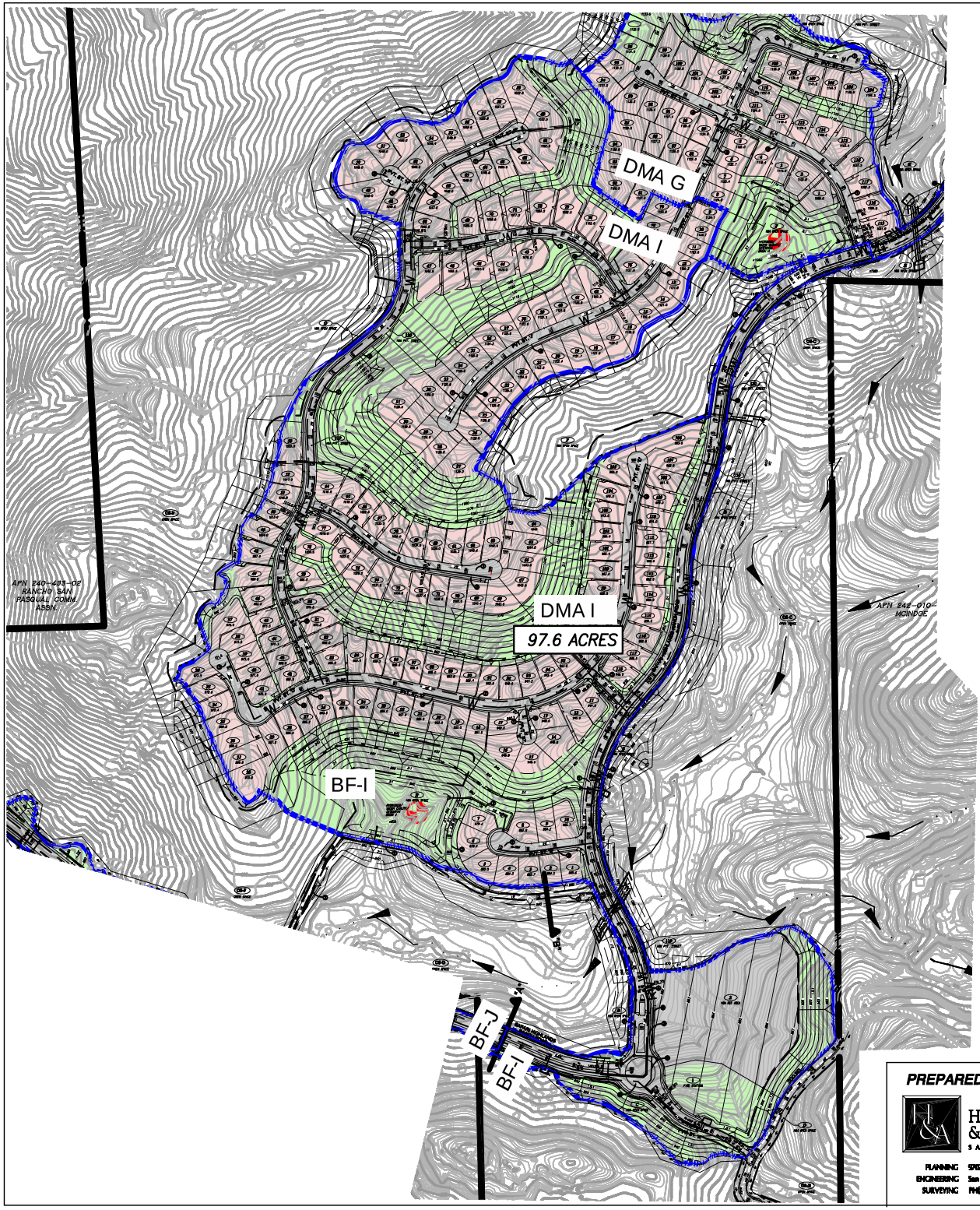
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LEGEND: SEE DMA MAP

SCALE: 1" = 550'

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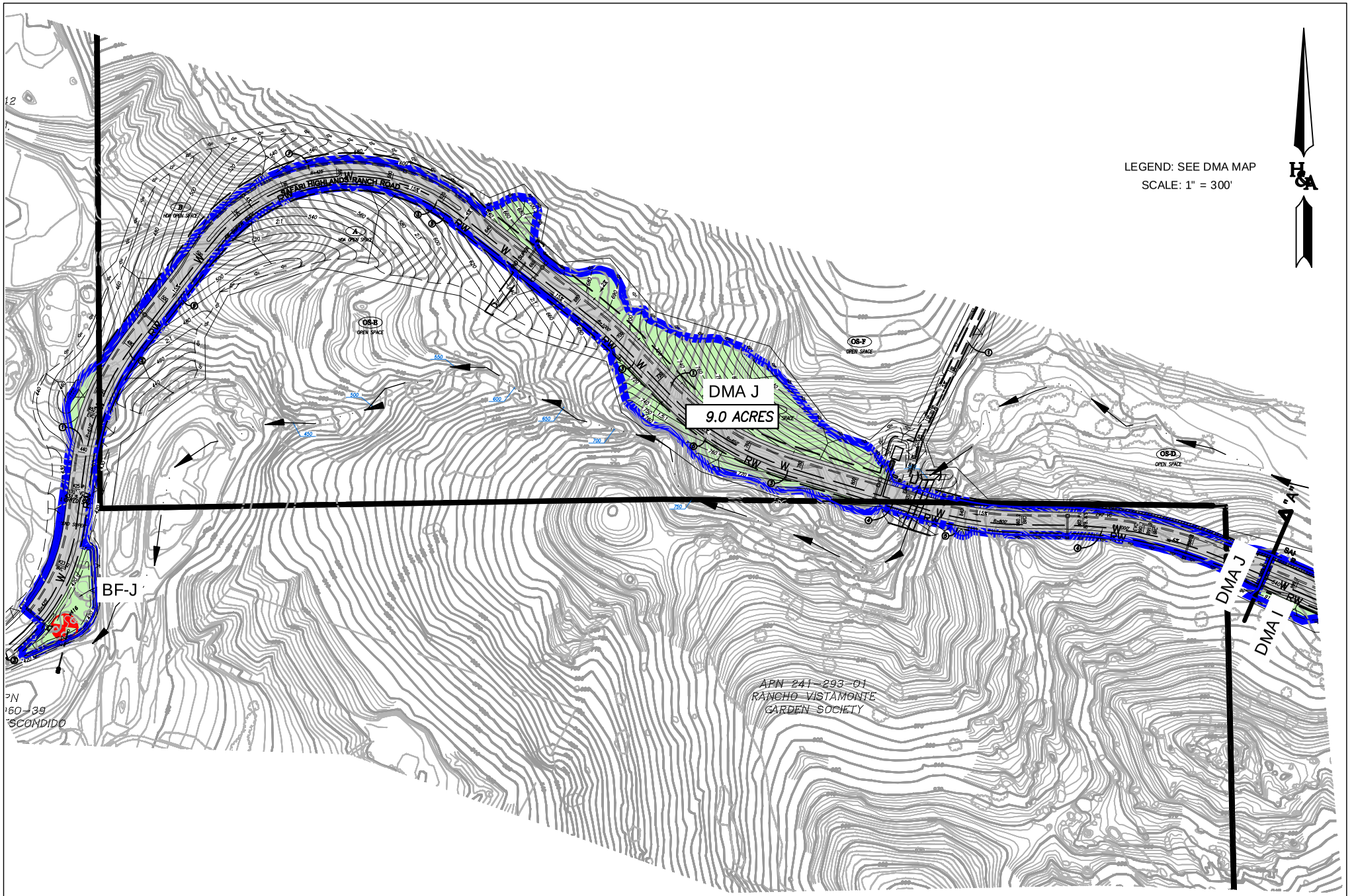
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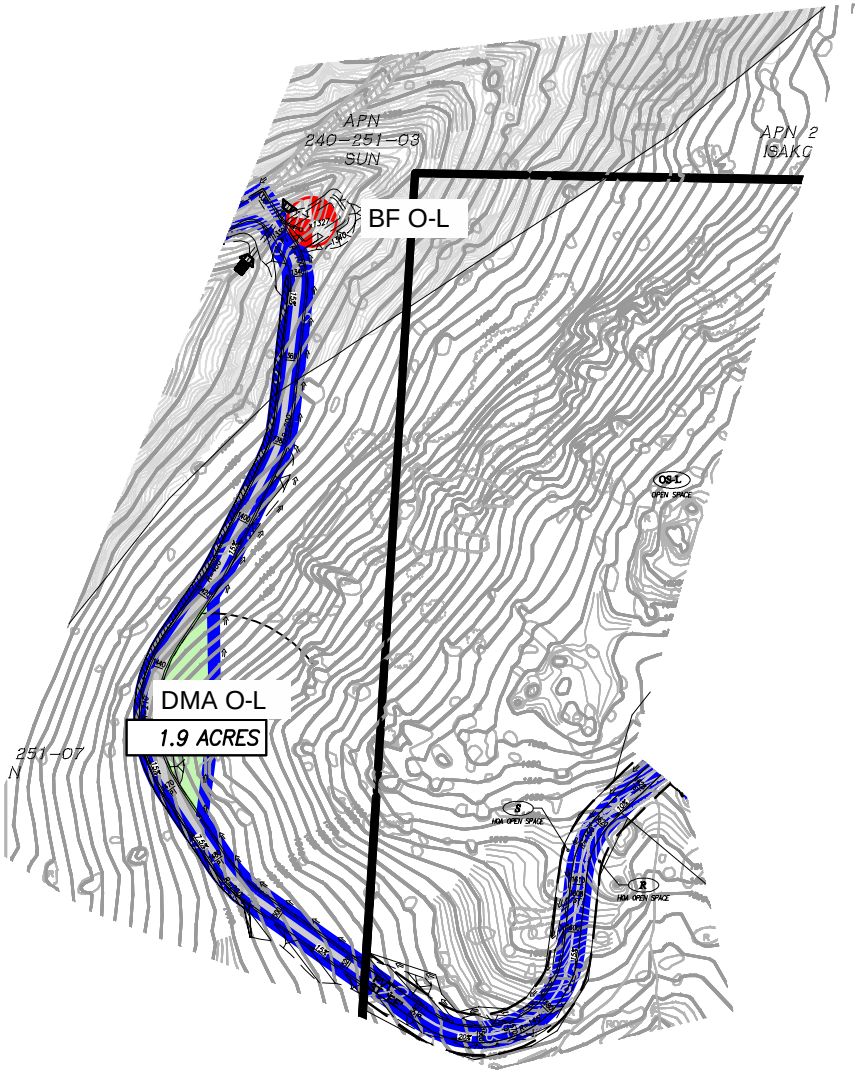
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LEGEND: SEE DMA MAP

SCALE: 1" = 300'



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DMA O-L MAPBOOK FOR SAFARI HIGHLANDS

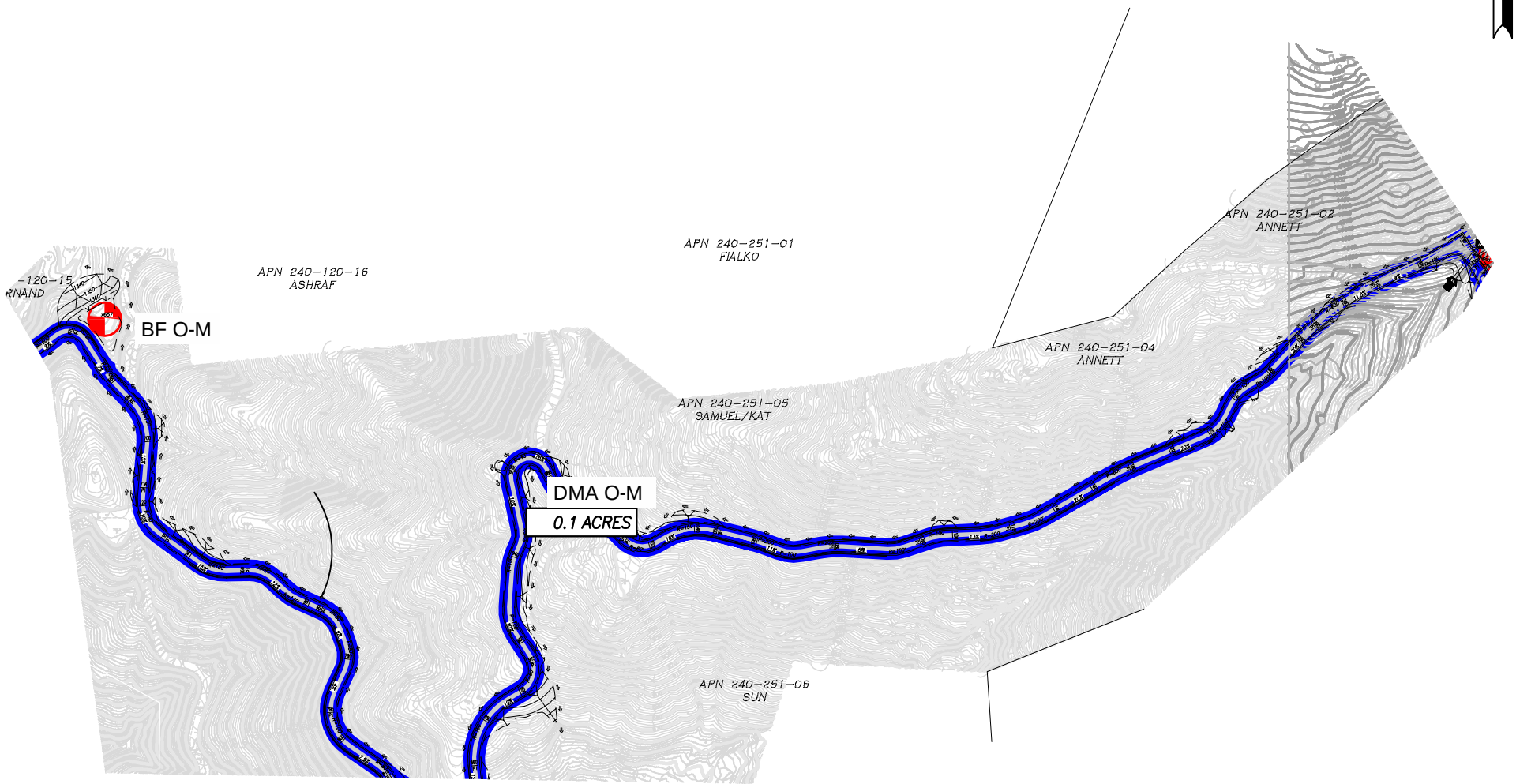
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LEGEND: SEE DMA MAP

SCALE: 1" = 400'



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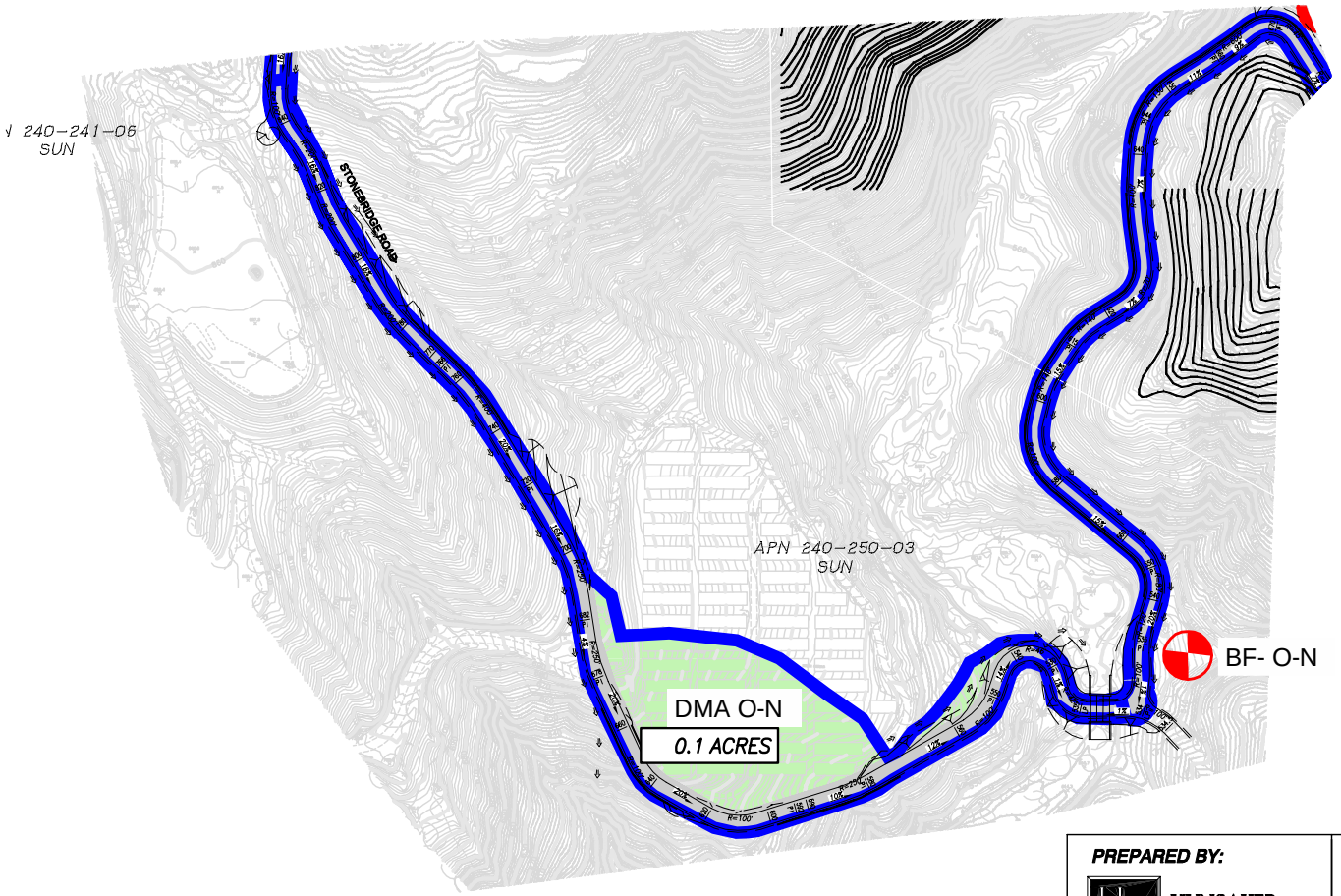
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LEGEND: SEE DMA MAP

SCALE: 1" = 300'



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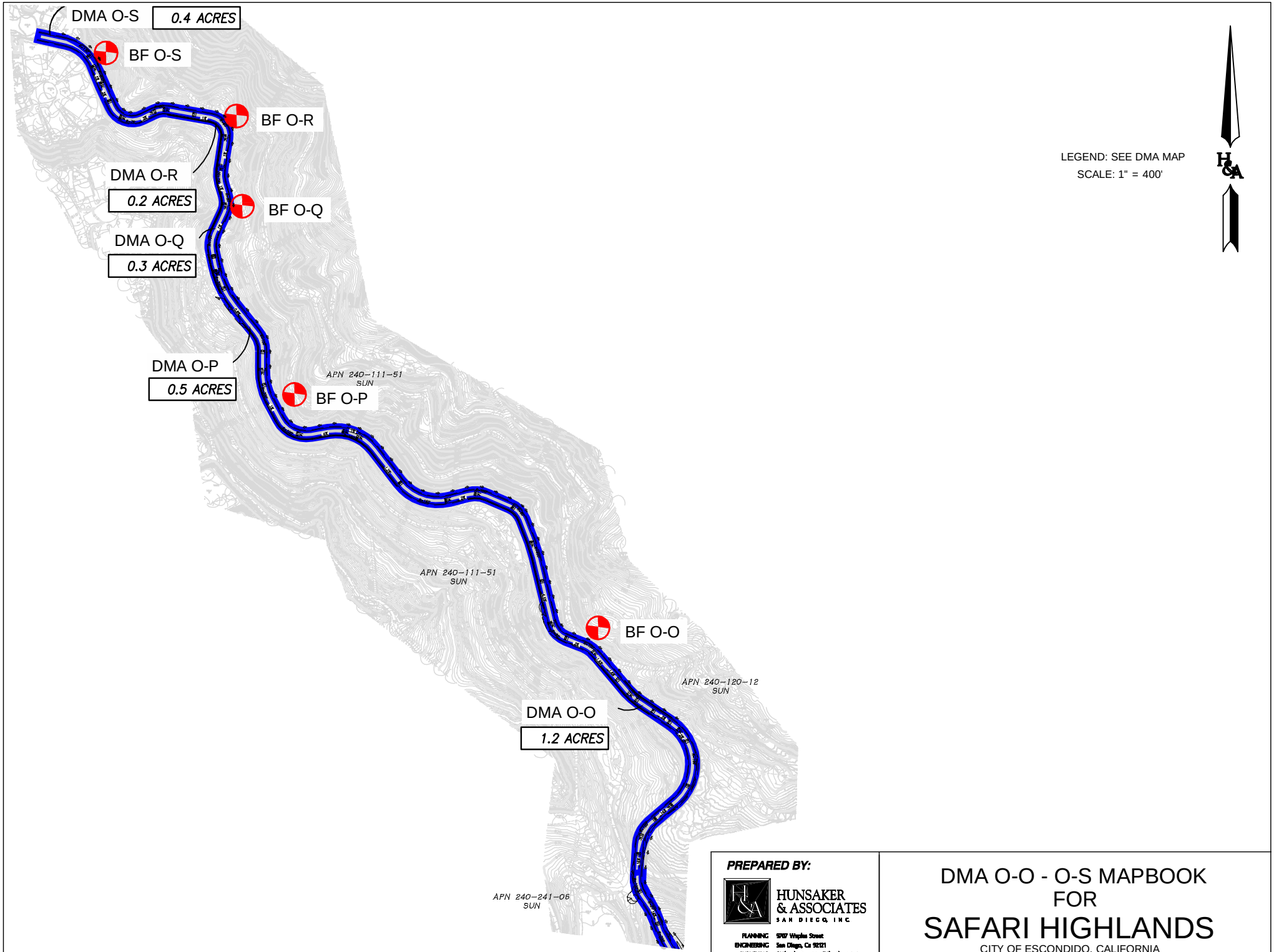
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DMA O-N MAPBOOK FOR SAFARI HIGHLANDS

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Downstream Systems Requirements for Preservation of Coarse Sediment Supply		Form I-7	
When it has been determined that potential critical coarse sediment yield areas exist within the project site, the next step is to determine whether downstream systems would be sensitive to reduction of coarse sediment yield from the project site. Use this form to document the evaluation of downstream systems requirements for preservation of coarse sediment supply.			
Project Name: Safari Highlands Ranch			
Project Tracking Number / Permit Application Number:			
1	Will the project discharge runoff to a hardened MS4 system (pipe or lined channel) or an un-lined channel?	☐ Hardened MS4 system	Go to 2
		☒ Un-lined channel	Go to 4
2	Will the hardened MS4 system convey sediment (e.g., a concrete-lined channel with steep slope and cleansing velocity) or sink sediment (e.g., flat slopes, constrictions, treatment BMPs, or ponds with restricted outlets within the system will trap sediment and not allow conveyance of coarse sediment from the project site to an un-lined system).	☐ Convey	Go to 3
		☐ Sink	Go to 7
3	What kind of receiving water will the hardened MS4 system convey the sediment to?	☐ Un-lined channel	Go to 4
		☐ Lake ☐ Reservoir ☐ Bay	Go to 7
		☐ Lagoon ☐ Ocean	Go to 6
4	Is the un-lined channel impacted by deposition of sediment? This condition must be documented by the local agency.	☐ Yes	Go to 7
		☒ No	Go to 5

Form I-7 Page 2 of 2	
5	End – Preserve coarse sediment supply to protect un-lined channels from accelerated erosion due to reduction of coarse sediment yield from the project site unless further investigation determines the sediment is not critical to the receiving stream. Sediment that is critical to receiving streams is the sediment that is a significant source of bed material to the receiving stream (bed sediment supply) (see Section 6.2.3 and Appendix H.2 of the manual).
6	End – Provide management measures for preservation of coarse sediment supply (protect beach sand supply).
7	End – Downstream system does not warrant preservation of coarse sediment supply, no measures for protection of critical coarse sediment yield areas onsite are necessary. Use the space below to describe the basis for this finding for the project.

ATTACHMENT 2

BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

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

Indicate which Items are Included behind this cover sheet:

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

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Hydromodification Management Plan

INTRODUCTION

This report summarizes the approach used to model the proposed Safari Highlands project site in Escondido, CA using the Environmental Protection Agency (EPA) Storm Water Management Model 5.1 (SWMM). SWMM models were prepared for the pre and post developed conditions at the site in order to determine if the proposed biofiltration facilities have sufficient footprint to meet the current Hydromodification Management Plan (HMP) requirements from the Regional Water Quality Control Board (RWQCB).

SWMM MODEL DEVELOPMENT

Ten (10) SWMM models were prepared for this study, five for point of compliance 1 - 5 (POC) in existing conditions and five for POC 1 - 5 in the proposed condition. For all SWMM models, flow duration curves were prepared to demonstrate that the proposed biofiltration basin footprint will be sufficient to meet the current HMP requirements.

The inputs required to develop SWMM models include rainfall, watershed characteristics, and BMP configurations. The Escondido Rain Gage from the Project Clean Water website was used for this study, since it is the most representative of the project site precipitation.

Evaporation for the site was modeled using average monthly values from the San Diego County hourly dataset. The site was modeled with hydrologic soil group D soils as determined from both the San Diego County Hydrology Manual soil map and the USGS Survey web-based Soil Survey Map. Other SWMM inputs for the subareas are discussed in the attachment to this document where the selection of the parameters is explained in detail.

BIOFILTRATION MODELING

Developed storm water runoff is routed through nineteen (19) biofiltration basins. The basins were modeled using the bioretention LID module within SWMM. The bioretention module can model the underground gravel storage layer, underdrain with an orifice plate, amended soil layer, and a surface storage pond up to the elevation of the invert of the bottom orifice. A separate diversion and detention basin were used to model the portion of the storage pond between the base orifice invert elevations and the spillway elevation from the biofiltration basin, according to the assumptions explained in the appendix. Once runoff has been routed through the respective basin outlet structures, it is conveyed via a storm drain pipe to each POC.

Basin Discussion:

Flow control in the basin is achieved using multiple orifices on a concrete riser box. The size, number and location of the orifices are presented in the Basin Table below. Each basin also contains an emergency overflow riser that is only utilized in storm events equal to or larger than the 100 year storm. Sizing and further peak flow discussion is in the "Drainage Report for Safari Highlands".

Basin Table POC1

	Basin A	Basin B	Basin C	Basin D	Basin E
Weir Height (ft)*	2	6.5	6	9.5	3.5
Weir Length (ft)	10	10	10	10	10
Amended Soil Depth (in)	18	18	18	18	18
Class 2 Perm. Depth (in)	12	12	12	12	12
Approx. Dimensions (L x W)	256'x40'	173'x110'	208'x140'	222'x104'	285'x102'
Top Orifice					
No. of Orifices	0	12	12	12	0
Diameter (in)	0	4	4	4	0
Invert Height (ft)*	2	5	5	5	2
Bottom Orifice					
No. of Orifices	2	2	2	2	2
Diameter (in)	2	2	2	2	2
Invert Height (ft)*	0.5	0.5	0.5	0.5	0.5
Sub-Drain Orifice					
No. of Orifices	1	1	1	1	1
Diameter (in)	2	2.5	2	3	2

*From finish grade

Basin Table Continued

	Basin K	Basin F	Basin G	Basin H	Basin I	Basin J
Spillway Height (ft)*	5	2.5	2.75	5	5	3.25
Spillway Size (sqft)	13	7	7	13	13	13
Amended Soil Depth (in)	18	18	18	18	18	18
Class 2 Perm. Depth (in)	12	12	12	12	12	12
Approx. Dimensions (L x W)	87'x80'	70'x30'	205'x190'	208'x49'	297'x166'	161'x59'
Top Orifice						
No. of Orifices	4	0	6	10	12	12
Diameter (in)	4	0	5	4	4	4
Invert Height (ft)*	3	0	2	3	2	2
Middle Orifice						
No. of Orifices	0	0	12	12	6	12
Diameter (in)	0	0	5	3	3	3
Invert Height (ft)*	0	0	1	1	1	1
Bottom Orifice						
No. of Orifices	1	1	2	2	1	1
Diameter (in)	2	2	2	12	2	2
Invert Height (ft)*	0.5	0.5	0.5	0.5	0.5	0.5
Sub-Drain Orifice						
No. of Orifices	1	1	1	1	1	1
Diameter (in)	4	2	4	2	4	1

*From finish grade

	Basin O-L	Basin O-M	Basin O-N	Basin O-O	Basin O-P	Basin O-Q	Basin O-R	Basin O-S
Spillway Height (ft)*	2	2	2	0.5	0.5	0.5	0.5	0.5
Spillway Size (sqft)	6	6	6	6	6	6	6	6
Amended Soil Depth (in)	18	18	18	18	18	18	18	18
Class 2 Perm. Depth (in)	12	12	12	12	12	12	12	12
Approx. Dimensions (L x W)	70'x30'	100'x65'	90'x79'	3'x700'	3'x400'	3'x300'	3'x300'	3'x400'
Top Orifice								
No. of Orifices	0	0	0	0	0	0	0	0
Diameter (in)	0	0	0	0	0	0	0	0
Invert Height (ft)*	0	0	0	0	0	0	0	0
Middle Orifice								
No. of Orifices	0	0	0	0	0	0	0	0
Diameter (in)	0	0	0	0	0	0	0	0
Invert Height (ft)*	0	0	0	0	0	0	0	0
Bottom Orifice								
No. of Orifices	2	2	2	0	0	0	0	0
Diameter (in)	2	2	2	0	0	0	0	0
Invert Height (ft)*	0.5	0.5	0.5	0	0	0	0	0
Sub-Drain Orifice								
No. of Orifices	1	1	1	1	1	1	1	1
Diameter (in)	3	2	2	2	2	1.5	1.5	1.5

*From finish grade

FLOW DURATION CURVE COMPARISON

The Flow Duration Curves (FDC) for the site were compared at POCs 1 -5 by exporting the hourly runoff time series results from SWMM to a spreadsheet. The FDC was compared between 10% of the existing condition Q_2 (based on accepting an assumption of high susceptibility for downstream channel erosion as required if no soils tests are completed) up to the existing condition Q_{10}. The Q_2 and Q_{10} were determined using a partial duration statistical analysis of the runoff time series in an Excel spreadsheet. The SWMM Model is a statistical analysis based on the Weibull Plotting Position Method.

The range between 10% of Q_2 and Q_{10} was divided into 100 equal time intervals; the number of hours that each flow rate was exceeded was counted from the hourly series. Additionally, the intermediate peaks with a return period "i" were obtained (Q_i with i=3 to 9). For the purpose of the plot, the values were presented as percentage of time exceeded for each flow rate.

The FDC comparison at POCs 1 - 5 are illustrated in Figure 1 & 3. POC 1 corresponds with the point located downstream of the discharge of Basins A, B, C, D, & F'. POC 2 corresponds with the point located downstream of the discharge of Basins E, F, G,H I, & J. POC 3 corresponds with the point downstream of the offsite discharge of Basin O-L. POC 4 corresponds with the point downstream of offsite basin O-M and O-N. POC 5 corresponds with the point downstream of offsite basins O-O, O-P, O-Q, O-R, and O-S.

As can be seen in Figures 1 & 2, the FDC for the proposed condition with nineteen (19) separate basins is within 110% of the curve for the existing condition. The additional runoff volume generated from developing the site will be released to the downstream storm drain at a flow rate below the 10% Q_2 lower threshold. Additionally, the project will not increase peak flow rates between the Q_2 and the Q_{10}, as shown in the graphic and also in the attached table.

SUMMARY & CONCLUSION

A summary of existing and proposed areas draining to each point of compliance (POC) are shown in the table below. The model includes the onsite project areas and offsite drainage areas. The increase in area draining to each POC is attributed grading and development of the property. Eleven biofiltration basins are proposed to mitigate increased flow frequencies as a result of development.

Area Summary

	Existing (AC)	Proposed (AC)
POC 1	403.9	402.5
POC2	2005.1	2006.5
POC 3	76.0	76.0
POC 4	3440.0	3440.0
POC 5	212.0	212.0
TOTAL	6137	6137

This study has demonstrated that the proposed biofiltration footprint at the Safari Highlands site is sufficient to meet the current HMP criteria if the biofiltration cross-section areas and volumes recommended within this attachment are incorporated within the proposed project site.

KEY ASSUMPTIONS

1. D Soils are representative of the existing conditions for a majority of the site.

ATTACHMENTS

1. Flow Duration Curve Analysis
2. Elevation vs. Area Curves vs. Discharge Curves to be used in SWMM
3. Biofiltration Details
4. SWMM Input Data (Existing and Proposed Models)
5. SWMM Screens and Explanation of Significant Variables
6. Drying Time of the Surface Layer of Biofiltration cells

Flow duration curve shall not exceed the existing conditions by more than 10% neither in peak flow nor duration.

The figure on the following page illustrates that the flow duration curve in post-development conditions after the proposed BMPs is below the existing flow duration curve. The flow duration curve table following the curve shows that if the interval 0.10Q 2 – Q 10 is divided in 100 sub-intervals, then a) the post development divided by pre-development durations are never larger than 110% (the permit allows up to 110%); and b) there are no more than 10 intervals in the range 101%-110% which would imply an excess over 10% of the length of the curve (the permit allows less than 10% of excesses measured as 101-110%).

Consequently, the design passes the hydromodification test.

It is important to note that the flow duration curve can be expressed in the "x" axis as percentage of time, hours per year, total number of hours, or any other similar time variable. As those variables only differ by a multiplying constant, their plot in logarithmic scale is going to look exactly the same and compliance can be observed regardless of the variable selected. The selection of a logarithmic scale in lieu of the normal scale is preferred, as differences between the pre-development and post-development curves can be seen more clearly in the entire range of analysis. Both graphics are presented for reference.

In terms of the "y" axis, the peak flow value is the variable of choice. As an additional analysis performed by H&A, not only the range of analysis is clearly depicted (10% of Q 2 to Q 10) but also all intermediate flows are shown (30% of Q 2 , 50% of Q 2 , Q 2 , Q 3 , Q 4 , Q 5 , Q 6 , Q 7 , Q 8 and Q 9) in order to demonstrate compliance at any range Q x – Q x+1 . It must be pointed out that one of the limitations of both the SWMM and SDHM models is that the intermediate analysis is not performed (to obtain Q i from i = 2 to 10). H&A performed the analysis using the Cunnane Plotting position Method (the preferred method in the HMP permit) from the "n" largest independent peak flows obtained from the continuous time series.

The largest "n" peak flows are attached in this appendix, as well as the values of Q_i with a return period "i", from i=2 to 10. The Q i values are also added into the flow-duration plot.

ATTACHMENT 1 - Flow Duration Curve Analysis, Plot & Table

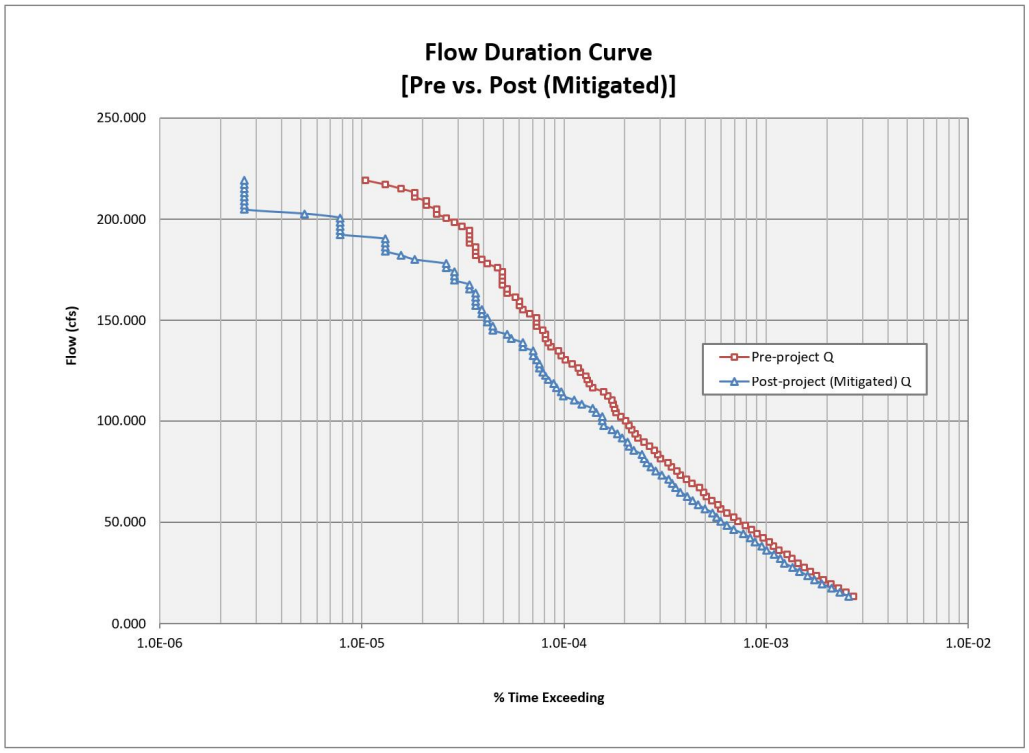


Figure 1 – POC 1 Flow Duration Curve

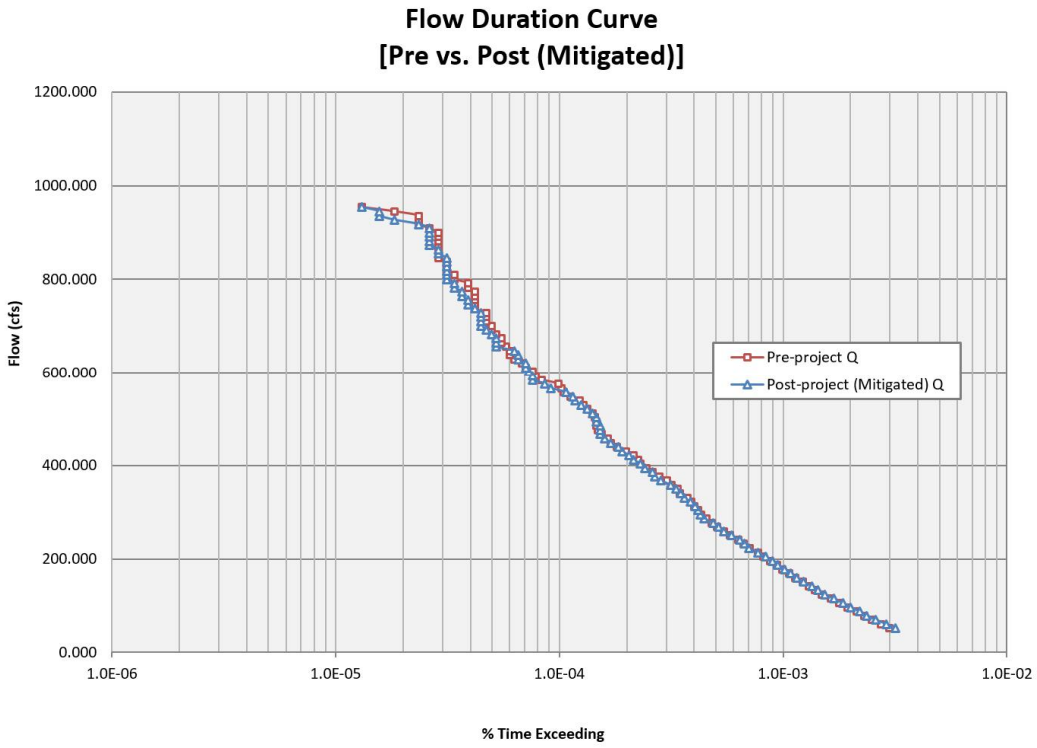


Figure 2 – POC2 Flow Duration Curves

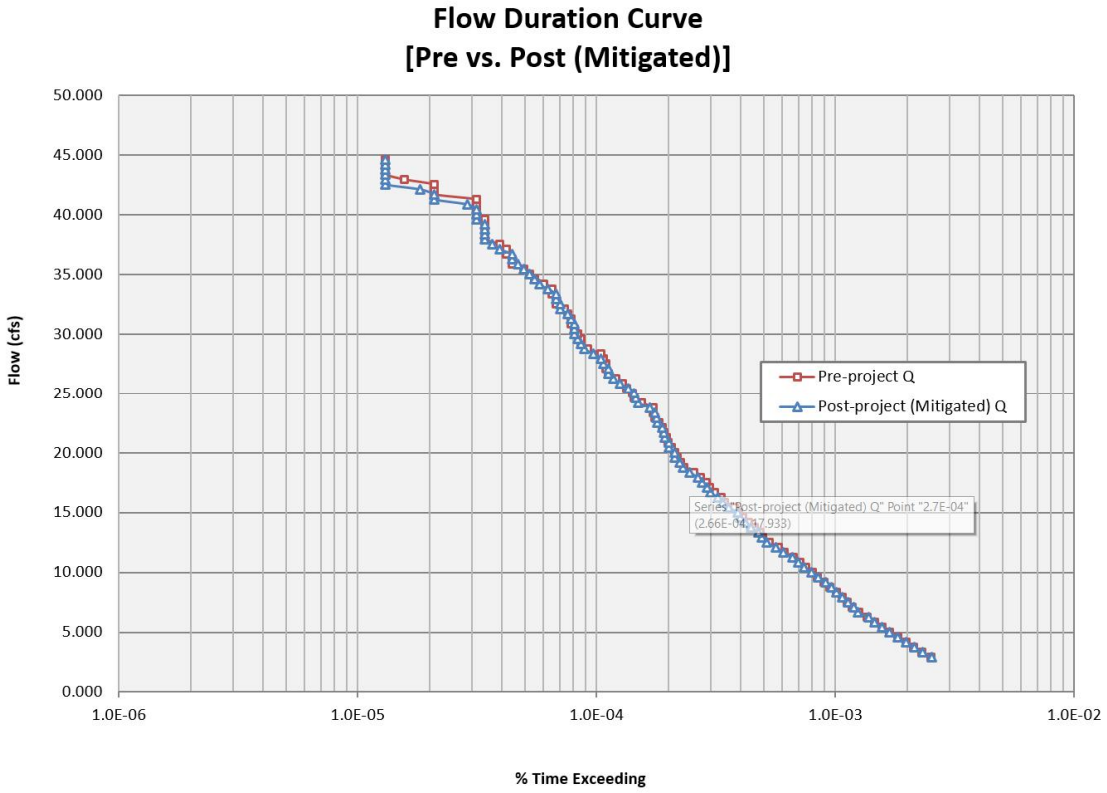


Figure 3 – POC 3 Flow Duration Curve

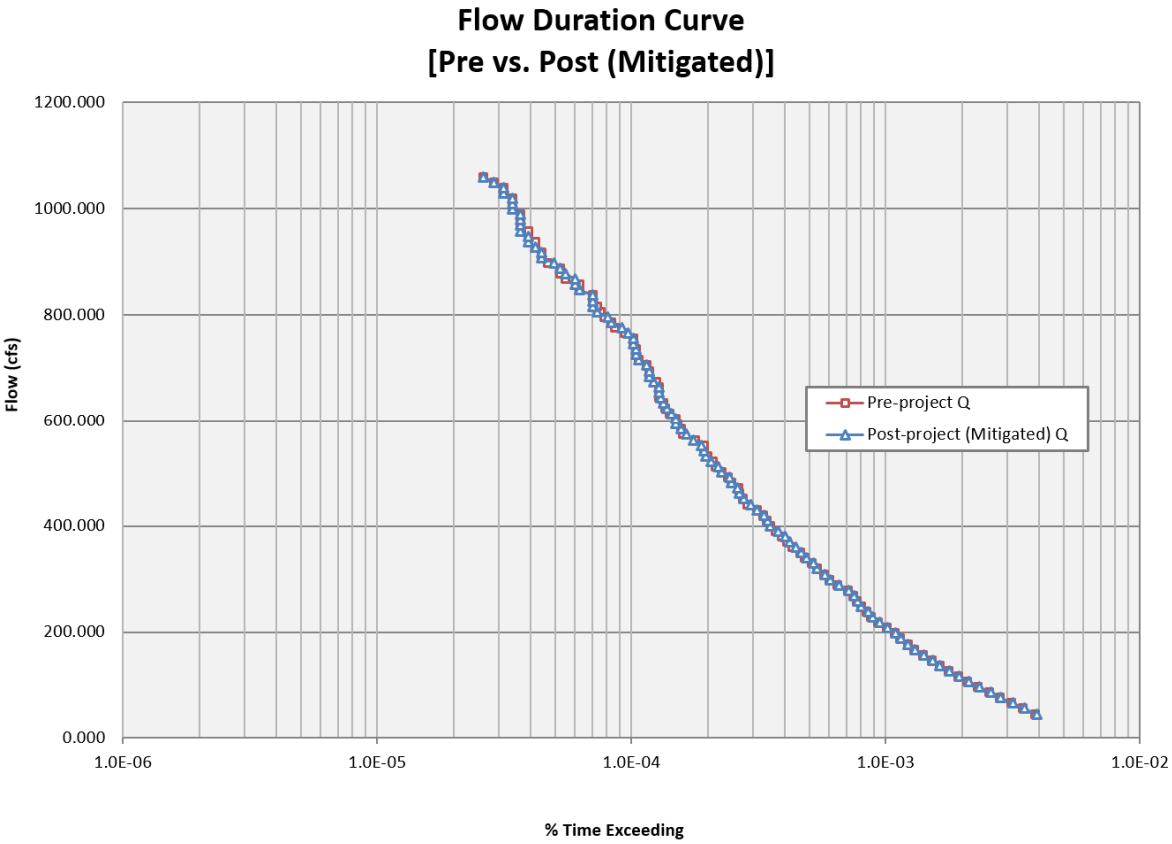


Figure 4 – POC 4 Flow Duration Curves

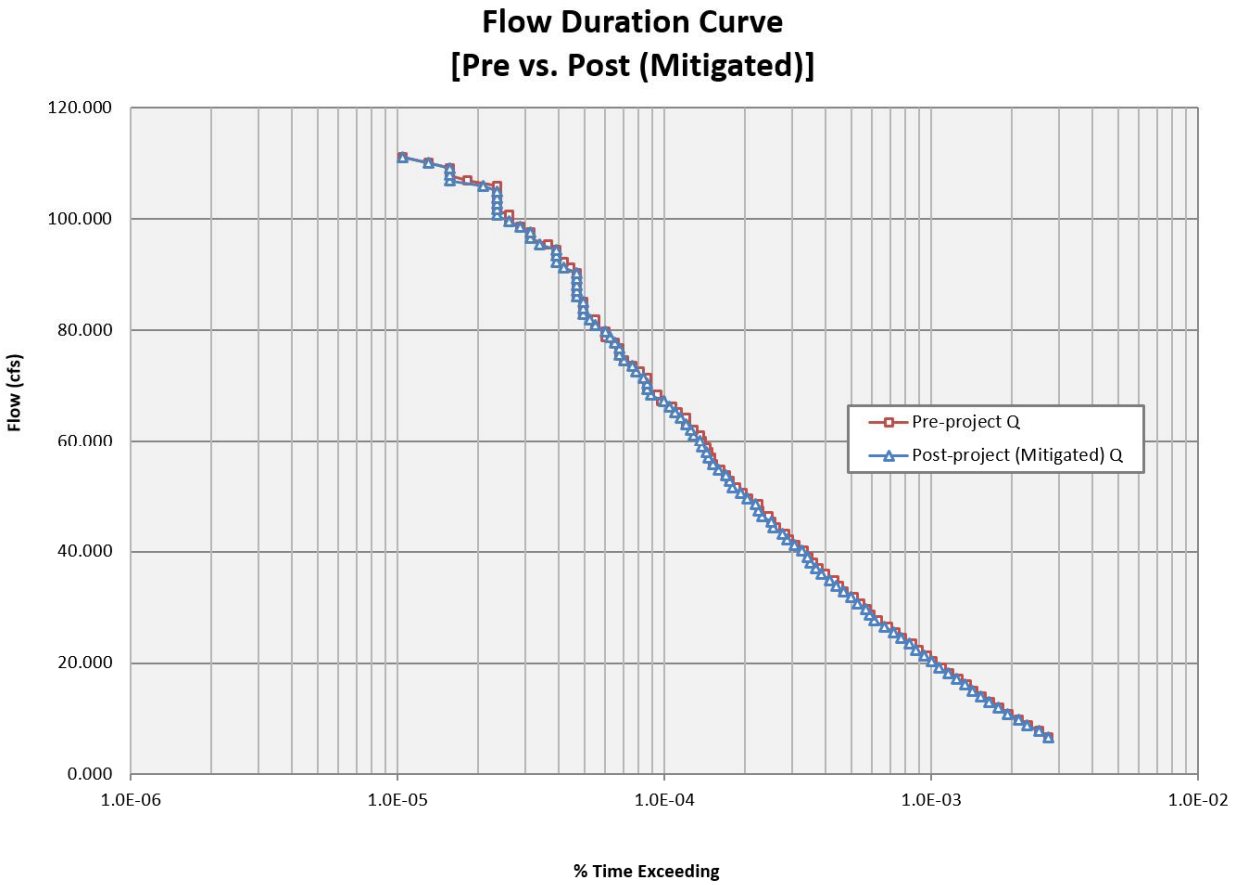


Figure 5 – POC 5 Flow Duration Curves

POC1

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	13.503	cfs
Q10 (Pre):	219.243	cfs
Ordinate #:	100	
Incremental Q (Pre):	2.05740	cfs
Total Hourly Data:	382751	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	13.503	1031	2.69E-03	977	2.55E-03	95%	Pass
1	15.560	953	2.49E-03	883	2.31E-03	93%	Pass
2	17.618	871	2.28E-03	805	2.10E-03	92%	Pass
3	19.675	802	2.10E-03	722	1.89E-03	90%	Pass
4	21.733	733	1.92E-03	662	1.73E-03	90%	Pass
5	23.790	677	1.77E-03	611	1.60E-03	90%	Pass
6	25.847	633	1.65E-03	558	1.46E-03	88%	Pass
7	27.905	592	1.55E-03	513	1.34E-03	87%	Pass
8	29.962	549	1.43E-03	470	1.23E-03	86%	Pass
9	32.020	513	1.34E-03	448	1.17E-03	87%	Pass
10	34.077	485	1.27E-03	419	1.09E-03	86%	Pass
11	36.134	444	1.16E-03	385	1.01E-03	87%	Pass
12	38.192	415	1.08E-03	361	9.43E-04	87%	Pass
13	40.249	397	1.04E-03	337	8.80E-04	85%	Pass
14	42.307	370	9.67E-04	316	8.26E-04	85%	Pass
15	44.364	344	8.99E-04	295	7.71E-04	86%	Pass
16	46.421	325	8.49E-04	265	6.92E-04	82%	Pass
17	48.479	303	7.92E-04	244	6.37E-04	81%	Pass
18	50.536	278	7.26E-04	228	5.96E-04	82%	Pass
19	52.594	265	6.92E-04	218	5.70E-04	82%	Pass
20	54.651	244	6.37E-04	208	5.43E-04	85%	Pass
21	56.708	228	5.96E-04	189	4.94E-04	83%	Pass
22	58.766	221	5.77E-04	175	4.57E-04	79%	Pass
23	60.823	206	5.38E-04	165	4.31E-04	80%	Pass
24	62.881	194	5.07E-04	155	4.05E-04	80%	Pass
25	64.938	187	4.89E-04	143	3.74E-04	76%	Pass
26	66.995	179	4.68E-04	136	3.55E-04	76%	Pass
27	69.053	164	4.28E-04	131	3.42E-04	80%	Pass
28	71.110	154	4.02E-04	125	3.27E-04	81%	Pass
29	73.168	144	3.76E-04	117	3.06E-04	81%	Pass
30	75.225	139	3.63E-04	109	2.85E-04	78%	Pass

31	77.282	130	3.40E-04	103	2.69E-04	79%	Pass
32	79.340	125	3.27E-04	98	2.56E-04	78%	Pass
33	81.397	115	3.00E-04	95	2.48E-04	83%	Pass
34	83.455	111	2.90E-04	90	2.35E-04	81%	Pass
35	85.512	107	2.80E-04	85	2.22E-04	79%	Pass
36	87.569	101	2.64E-04	80	2.09E-04	79%	Pass
37	89.627	95	2.48E-04	79	2.06E-04	83%	Pass
38	91.684	89	2.33E-04	74	1.93E-04	83%	Pass
39	93.742	86	2.25E-04	70	1.83E-04	81%	Pass
40	95.799	83	2.17E-04	66	1.72E-04	80%	Pass
41	97.856	80	2.09E-04	60	1.57E-04	75%	Pass
42	99.914	77	2.01E-04	59	1.54E-04	77%	Pass
43	101.971	73	1.91E-04	59	1.54E-04	81%	Pass
44	104.029	69	1.80E-04	55	1.44E-04	80%	Pass
45	106.086	68	1.78E-04	53	1.38E-04	78%	Pass
46	108.143	67	1.75E-04	47	1.23E-04	70%	Pass
47	110.201	66	1.72E-04	43	1.12E-04	65%	Pass
48	112.258	63	1.65E-04	38	9.93E-05	60%	Pass
49	114.316	60	1.57E-04	36	9.41E-05	60%	Pass
50	116.373	53	1.38E-04	35	9.14E-05	66%	Pass
51	118.430	51	1.33E-04	34	8.88E-05	67%	Pass
52	120.488	50	1.31E-04	32	8.36E-05	64%	Pass
53	122.545	49	1.28E-04	31	8.10E-05	63%	Pass
54	124.603	46	1.20E-04	30	7.84E-05	65%	Pass
55	126.660	45	1.18E-04	29	7.58E-05	64%	Pass
56	128.717	42	1.10E-04	29	7.58E-05	69%	Pass
57	130.775	39	1.02E-04	28	7.32E-05	72%	Pass
58	132.832	37	9.67E-05	27	7.05E-05	73%	Pass
59	134.890	36	9.41E-05	27	7.05E-05	75%	Pass
60	136.947	33	8.62E-05	24	6.27E-05	73%	Pass
61	139.004	32	8.36E-05	24	6.27E-05	75%	Pass
62	141.062	31	8.10E-05	21	5.49E-05	68%	Pass
63	143.119	31	8.10E-05	20	5.23E-05	65%	Pass
64	145.177	30	7.84E-05	17	4.44E-05	57%	Pass
65	147.234	28	7.32E-05	17	4.44E-05	61%	Pass
66	149.291	28	7.32E-05	16	4.18E-05	57%	Pass
67	151.349	28	7.32E-05	16	4.18E-05	57%	Pass
68	153.406	26	6.79E-05	15	3.92E-05	58%	Pass
69	155.464	24	6.27E-05	15	3.92E-05	63%	Pass
70	157.521	23	6.01E-05	14	3.66E-05	61%	Pass
71	159.578	23	6.01E-05	14	3.66E-05	61%	Pass
72	161.636	22	5.75E-05	14	3.66E-05	64%	Pass
73	163.693	20	5.23E-05	14	3.66E-05	70%	Pass
74	165.751	20	5.23E-05	13	3.40E-05	65%	Pass

75	167.808	19	4.96E-05	13	3.40E-05	68%	Pass
76	169.865	19	4.96E-05	11	2.87E-05	58%	Pass
77	171.923	19	4.96E-05	11	2.87E-05	58%	Pass
78	173.980	19	4.96E-05	11	2.87E-05	58%	Pass
79	176.038	18	4.70E-05	10	2.61E-05	56%	Pass
80	178.095	16	4.18E-05	10	2.61E-05	63%	Pass
81	180.152	15	3.92E-05	7	1.83E-05	47%	Pass
82	182.210	14	3.66E-05	6	1.57E-05	43%	Pass
83	184.267	14	3.66E-05	5	1.31E-05	36%	Pass
84	186.325	14	3.66E-05	5	1.31E-05	36%	Pass
85	188.382	13	3.40E-05	5	1.31E-05	38%	Pass
86	190.439	13	3.40E-05	5	1.31E-05	38%	Pass
87	192.497	13	3.40E-05	3	7.84E-06	23%	Pass
88	194.554	13	3.40E-05	3	7.84E-06	23%	Pass
89	196.612	12	3.14E-05	3	7.84E-06	25%	Pass
90	198.669	11	2.87E-05	3	7.84E-06	27%	Pass
91	200.726	10	2.61E-05	3	7.84E-06	30%	Pass
92	202.784	9	2.35E-05	2	5.23E-06	22%	Pass
93	204.841	9	2.35E-05	1	2.61E-06	11%	Pass
94	206.899	8	2.09E-05	1	2.61E-06	13%	Pass
95	208.956	8	2.09E-05	1	2.61E-06	13%	Pass
96	211.013	7	1.83E-05	1	2.61E-06	14%	Pass
97	213.071	7	1.83E-05	1	2.61E-06	14%	Pass
98	215.128	6	1.57E-05	1	2.61E-06	17%	Pass
99	217.186	5	1.31E-05	1	2.61E-06	20%	Pass
100	219.243	4	1.05E-05	1	2.61E-06	25%	Pass

POC2

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	51.452	cfs
Q10 (Pre):	953.884	cfs
Ordinate #:	100	
Incremental Q (Pre):	9.02433	cfs
Total Hourly Data:	382751	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	51.452	1145	2.99E-03	1215	3.17E-03	106%	Pass
1	60.476	1050	2.74E-03	1104	2.88E-03	105%	Pass
2	69.500	953	2.49E-03	994	2.60E-03	104%	Pass
3	78.525	880	2.30E-03	904	2.36E-03	103%	Pass
4	87.549	816	2.13E-03	839	2.19E-03	103%	Pass
5	96.573	743	1.94E-03	767	2.00E-03	103%	Pass
6	105.598	682	1.78E-03	706	1.84E-03	104%	Pass
7	114.622	625	1.63E-03	645	1.69E-03	103%	Pass
8	123.646	571	1.49E-03	589	1.54E-03	103%	Pass
9	132.671	529	1.38E-03	548	1.43E-03	104%	Pass
10	141.695	499	1.30E-03	514	1.34E-03	103%	Pass
11	150.719	468	1.22E-03	471	1.23E-03	101%	Pass
12	159.744	433	1.13E-03	440	1.15E-03	102%	Pass
13	168.768	407	1.06E-03	412	1.08E-03	101%	Pass
14	177.792	379	9.90E-04	387	1.01E-03	102%	Pass
15	186.817	358	9.35E-04	362	9.46E-04	101%	Pass
16	195.841	335	8.75E-04	342	8.94E-04	102%	Pass
17	204.865	312	8.15E-04	319	8.33E-04	102%	Pass
18	213.890	296	7.73E-04	295	7.71E-04	100%	Pass
19	222.914	270	7.05E-04	269	7.03E-04	100%	Pass
20	231.938	254	6.64E-04	257	6.71E-04	101%	Pass
21	240.963	241	6.30E-04	245	6.40E-04	102%	Pass
22	249.987	221	5.77E-04	224	5.85E-04	101%	Pass
23	259.011	208	5.43E-04	208	5.43E-04	100%	Pass
24	268.036	194	5.07E-04	196	5.12E-04	101%	Pass
25	277.060	183	4.78E-04	186	4.86E-04	102%	Pass
26	286.084	173	4.52E-04	169	4.42E-04	98%	Pass
27	295.109	164	4.28E-04	163	4.26E-04	99%	Pass
28	304.133	159	4.15E-04	159	4.15E-04	100%	Pass
29	313.157	153	4.00E-04	155	4.05E-04	101%	Pass
30	322.182	148	3.87E-04	147	3.84E-04	99%	Pass

31	331.206	143	3.74E-04	138	3.61E-04	97%	Pass
32	340.230	132	3.45E-04	133	3.47E-04	101%	Pass
33	349.255	129	3.37E-04	127	3.32E-04	98%	Pass
34	358.279	121	3.16E-04	120	3.14E-04	99%	Pass
35	367.303	116	3.03E-04	109	2.85E-04	94%	Pass
36	376.327	107	2.80E-04	102	2.66E-04	95%	Pass
37	385.352	100	2.61E-04	100	2.61E-04	100%	Pass
38	394.376	94	2.46E-04	92	2.40E-04	98%	Pass
39	403.400	88	2.30E-04	88	2.30E-04	100%	Pass
40	412.425	86	2.25E-04	82	2.14E-04	95%	Pass
41	421.449	82	2.14E-04	78	2.04E-04	95%	Pass
42	430.473	76	1.99E-04	73	1.91E-04	96%	Pass
43	439.498	69	1.80E-04	70	1.83E-04	101%	Pass
44	448.522	65	1.70E-04	65	1.70E-04	100%	Pass
45	457.546	63	1.65E-04	61	1.59E-04	97%	Pass
46	466.571	59	1.54E-04	58	1.52E-04	98%	Pass
47	475.595	57	1.49E-04	58	1.52E-04	102%	Pass
48	484.619	56	1.46E-04	58	1.52E-04	104%	Pass
49	493.644	56	1.46E-04	56	1.46E-04	100%	Pass
50	502.668	55	1.44E-04	56	1.46E-04	102%	Pass
51	511.692	54	1.41E-04	54	1.41E-04	100%	Pass
52	520.717	51	1.33E-04	51	1.33E-04	100%	Pass
53	529.741	49	1.28E-04	48	1.25E-04	98%	Pass
54	538.765	47	1.23E-04	45	1.18E-04	96%	Pass
55	547.790	43	1.12E-04	44	1.15E-04	102%	Pass
56	556.814	40	1.05E-04	41	1.07E-04	103%	Pass
57	565.838	39	1.02E-04	35	9.14E-05	90%	Pass
58	574.863	38	9.93E-05	33	8.62E-05	87%	Pass
59	583.887	32	8.36E-05	29	7.58E-05	91%	Pass
60	592.911	30	7.84E-05	29	7.58E-05	97%	Pass
61	601.936	29	7.58E-05	28	7.32E-05	97%	Pass
62	610.960	27	7.05E-05	27	7.05E-05	100%	Pass
63	619.984	26	6.79E-05	27	7.05E-05	104%	Pass
64	629.009	24	6.27E-05	25	6.53E-05	104%	Pass
65	638.033	23	6.01E-05	25	6.53E-05	109%	Pass
66	647.057	23	6.01E-05	24	6.27E-05	104%	Pass
67	656.082	22	5.75E-05	20	5.23E-05	91%	Pass
68	665.106	21	5.49E-05	20	5.23E-05	95%	Pass
69	674.130	21	5.49E-05	20	5.23E-05	95%	Pass
70	683.155	20	5.23E-05	19	4.96E-05	95%	Pass
71	692.179	19	4.96E-05	18	4.70E-05	95%	Pass
72	701.203	19	4.96E-05	17	4.44E-05	89%	Pass
73	710.228	18	4.70E-05	17	4.44E-05	94%	Pass
74	719.252	18	4.70E-05	17	4.44E-05	94%	Pass

75	728.276	18	4.70E-05	17	4.44E-05	94%	Pass
76	737.301	16	4.18E-05	16	4.18E-05	100%	Pass
77	746.325	16	4.18E-05	15	3.92E-05	94%	Pass
78	755.349	16	4.18E-05	15	3.92E-05	94%	Pass
79	764.374	16	4.18E-05	14	3.66E-05	88%	Pass
80	773.398	16	4.18E-05	14	3.66E-05	88%	Pass
81	782.422	15	3.92E-05	13	3.40E-05	87%	Pass
82	791.447	15	3.92E-05	13	3.40E-05	87%	Pass
83	800.471	13	3.40E-05	12	3.14E-05	92%	Pass
84	809.495	13	3.40E-05	12	3.14E-05	92%	Pass
85	818.520	12	3.14E-05	12	3.14E-05	100%	Pass
86	827.544	12	3.14E-05	12	3.14E-05	100%	Pass
87	836.568	12	3.14E-05	12	3.14E-05	100%	Pass
88	845.593	11	2.87E-05	12	3.14E-05	109%	Pass
89	854.617	11	2.87E-05	11	2.87E-05	100%	Pass
90	863.641	11	2.87E-05	11	2.87E-05	100%	Pass
91	872.665	11	2.87E-05	10	2.61E-05	91%	Pass
92	881.690	11	2.87E-05	10	2.61E-05	91%	Pass
93	890.714	11	2.87E-05	10	2.61E-05	91%	Pass
94	899.738	11	2.87E-05	10	2.61E-05	91%	Pass
95	908.763	10	2.61E-05	10	2.61E-05	100%	Pass
96	917.787	9	2.35E-05	9	2.35E-05	100%	Pass
97	926.811	9	2.35E-05	7	1.83E-05	78%	Pass
98	935.836	9	2.35E-05	6	1.57E-05	67%	Pass
99	944.860	7	1.83E-05	6	1.57E-05	86%	Pass
100	953.884	5	1.31E-05	5	1.31E-05	100%	Pass

POC3

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	2.912	cfs
Q10 (Pre):	44.636	cfs
Ordinate #:	100	
Incremental Q (Pre):	0.41724	cfs
Total Hourly Data:	382751	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	2.912	959	2.51E-03	971	2.54E-03	101%	Pass
1	3.329	883	2.31E-03	885	2.31E-03	100%	Pass
2	3.746	812	2.12E-03	819	2.14E-03	101%	Pass
3	4.164	757	1.98E-03	757	1.98E-03	100%	Pass
4	4.581	696	1.82E-03	697	1.82E-03	100%	Pass
5	4.998	647	1.69E-03	643	1.68E-03	99%	Pass
6	5.415	599	1.56E-03	600	1.57E-03	100%	Pass
7	5.833	559	1.46E-03	558	1.46E-03	100%	Pass
8	6.250	519	1.36E-03	526	1.37E-03	101%	Pass
9	6.667	478	1.25E-03	477	1.25E-03	100%	Pass
10	7.084	450	1.18E-03	457	1.19E-03	102%	Pass
11	7.502	428	1.12E-03	432	1.13E-03	101%	Pass
12	7.919	409	1.07E-03	410	1.07E-03	100%	Pass
13	8.336	385	1.01E-03	385	1.01E-03	100%	Pass
14	8.753	363	9.48E-04	367	9.59E-04	101%	Pass
15	9.171	343	8.96E-04	348	9.09E-04	101%	Pass
16	9.588	322	8.41E-04	324	8.47E-04	101%	Pass
17	10.005	306	7.99E-04	305	7.97E-04	100%	Pass
18	10.422	288	7.52E-04	284	7.42E-04	99%	Pass
19	10.840	271	7.08E-04	267	6.98E-04	99%	Pass
20	11.257	254	6.64E-04	253	6.61E-04	100%	Pass
21	11.674	234	6.11E-04	232	6.06E-04	99%	Pass
22	12.091	220	5.75E-04	216	5.64E-04	98%	Pass
23	12.508	203	5.30E-04	197	5.15E-04	97%	Pass
24	12.926	189	4.94E-04	188	4.91E-04	99%	Pass
25	13.343	185	4.83E-04	182	4.76E-04	98%	Pass
26	13.760	175	4.57E-04	170	4.44E-04	97%	Pass
27	14.177	165	4.31E-04	160	4.18E-04	97%	Pass
28	14.595	156	4.08E-04	153	4.00E-04	98%	Pass
29	15.012	151	3.95E-04	149	3.89E-04	99%	Pass
30	15.429	144	3.76E-04	137	3.58E-04	95%	Pass

31	15.846	131	3.42E-04	129	3.37E-04	98%	Pass
32	16.264	127	3.32E-04	123	3.21E-04	97%	Pass
33	16.681	119	3.11E-04	115	3.00E-04	97%	Pass
34	17.098	114	2.98E-04	111	2.90E-04	97%	Pass
35	17.515	110	2.87E-04	106	2.77E-04	96%	Pass
36	17.933	104	2.72E-04	102	2.66E-04	98%	Pass
37	18.350	98	2.56E-04	94	2.46E-04	96%	Pass
38	18.767	89	2.33E-04	88	2.30E-04	99%	Pass
39	19.184	86	2.25E-04	85	2.22E-04	99%	Pass
40	19.602	83	2.17E-04	81	2.12E-04	98%	Pass
41	20.019	81	2.12E-04	81	2.12E-04	100%	Pass
42	20.436	79	2.06E-04	77	2.01E-04	97%	Pass
43	20.853	76	1.99E-04	77	2.01E-04	101%	Pass
44	21.271	75	1.96E-04	74	1.93E-04	99%	Pass
45	21.688	73	1.91E-04	73	1.91E-04	100%	Pass
46	22.105	72	1.88E-04	72	1.88E-04	100%	Pass
47	22.522	70	1.83E-04	69	1.80E-04	99%	Pass
48	22.940	67	1.75E-04	68	1.78E-04	101%	Pass
49	23.357	66	1.72E-04	67	1.75E-04	102%	Pass
50	23.774	66	1.72E-04	64	1.67E-04	97%	Pass
51	24.191	59	1.54E-04	57	1.49E-04	97%	Pass
52	24.609	55	1.44E-04	56	1.46E-04	102%	Pass
53	25.026	54	1.41E-04	55	1.44E-04	102%	Pass
54	25.443	51	1.33E-04	52	1.36E-04	102%	Pass
55	25.860	49	1.28E-04	48	1.25E-04	98%	Pass
56	26.278	46	1.20E-04	45	1.18E-04	98%	Pass
57	26.695	43	1.12E-04	43	1.12E-04	100%	Pass
58	27.112	42	1.10E-04	43	1.12E-04	102%	Pass
59	27.529	42	1.10E-04	41	1.07E-04	98%	Pass
60	27.947	41	1.07E-04	40	1.05E-04	98%	Pass
61	28.364	40	1.05E-04	37	9.67E-05	93%	Pass
62	28.781	35	9.14E-05	34	8.88E-05	97%	Pass
63	29.198	33	8.62E-05	33	8.62E-05	100%	Pass
64	29.616	33	8.62E-05	32	8.36E-05	97%	Pass
65	30.033	32	8.36E-05	31	8.10E-05	97%	Pass
66	30.450	31	8.10E-05	31	8.10E-05	100%	Pass
67	30.867	30	7.84E-05	31	8.10E-05	103%	Pass
68	31.284	30	7.84E-05	30	7.84E-05	100%	Pass
69	31.702	29	7.58E-05	29	7.58E-05	100%	Pass
70	32.119	28	7.32E-05	27	7.05E-05	96%	Pass
71	32.536	26	6.79E-05	27	7.05E-05	104%	Pass
72	32.953	26	6.79E-05	26	6.79E-05	100%	Pass
73	33.371	25	6.53E-05	26	6.79E-05	104%	Pass
74	33.788	25	6.53E-05	24	6.27E-05	96%	Pass

75	34.205	23	6.01E-05	22	5.75E-05	96%	Pass
76	34.622	21	5.49E-05	21	5.49E-05	100%	Pass
77	35.040	20	5.23E-05	20	5.23E-05	100%	Pass
78	35.457	19	4.96E-05	19	4.96E-05	100%	Pass
79	35.874	17	4.44E-05	18	4.70E-05	106%	Pass
80	36.291	17	4.44E-05	17	4.44E-05	100%	Pass
81	36.709	16	4.18E-05	17	4.44E-05	106%	Pass
82	37.126	16	4.18E-05	15	3.92E-05	94%	Pass
83	37.543	15	3.92E-05	14	3.66E-05	93%	Pass
84	37.960	13	3.40E-05	13	3.40E-05	100%	Pass
85	38.378	13	3.40E-05	13	3.40E-05	100%	Pass
86	38.795	13	3.40E-05	13	3.40E-05	100%	Pass
87	39.212	13	3.40E-05	13	3.40E-05	100%	Pass
88	39.629	13	3.40E-05	12	3.14E-05	92%	Pass
89	40.047	12	3.14E-05	12	3.14E-05	100%	Pass
90	40.464	12	3.14E-05	12	3.14E-05	100%	Pass
91	40.881	12	3.14E-05	11	2.87E-05	92%	Pass
92	41.298	12	3.14E-05	8	2.09E-05	67%	Pass
93	41.716	8	2.09E-05	8	2.09E-05	100%	Pass
94	42.133	8	2.09E-05	7	1.83E-05	88%	Pass
95	42.550	8	2.09E-05	5	1.31E-05	63%	Pass
96	42.967	6	1.57E-05	5	1.31E-05	83%	Pass
97	43.385	5	1.31E-05	5	1.31E-05	100%	Pass
98	43.802	5	1.31E-05	5	1.31E-05	100%	Pass
99	44.219	5	1.31E-05	5	1.31E-05	100%	Pass
100	44.636	5	1.31E-05	5	1.31E-05	100%	Pass

POC4

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	45.643	cfs
Q10 (Pre):	1059.745	cfs
Ordinate #:	100	
Incremental Q (Pre):	10.14102	cfs
Total Hourly Data:	382751	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	45.643	1481	3.87E-03	1505	3.93E-03	102%	Pass
1	55.784	1320	3.45E-03	1341	3.50E-03	102%	Pass
2	65.925	1196	3.12E-03	1216	3.18E-03	102%	Pass
3	76.066	1073	2.80E-03	1087	2.84E-03	101%	Pass
4	86.207	977	2.55E-03	991	2.59E-03	101%	Pass
5	96.348	879	2.30E-03	892	2.33E-03	101%	Pass
6	106.489	800	2.09E-03	810	2.12E-03	101%	Pass
7	116.630	736	1.92E-03	747	1.95E-03	101%	Pass
8	126.771	677	1.77E-03	682	1.78E-03	101%	Pass
9	136.912	624	1.63E-03	625	1.63E-03	100%	Pass
10	147.053	580	1.52E-03	584	1.53E-03	101%	Pass
11	157.194	536	1.40E-03	539	1.41E-03	101%	Pass
12	167.335	496	1.30E-03	498	1.30E-03	100%	Pass
13	177.476	469	1.23E-03	468	1.22E-03	100%	Pass
14	187.617	437	1.14E-03	438	1.14E-03	100%	Pass
15	197.758	416	1.09E-03	418	1.09E-03	100%	Pass
16	207.899	387	1.01E-03	390	1.02E-03	101%	Pass
17	218.040	358	9.35E-04	363	9.48E-04	101%	Pass
18	228.181	336	8.78E-04	339	8.86E-04	101%	Pass
19	238.322	321	8.39E-04	327	8.54E-04	102%	Pass
20	248.463	306	7.99E-04	306	7.99E-04	100%	Pass
21	258.604	295	7.71E-04	297	7.76E-04	101%	Pass
22	268.745	285	7.45E-04	287	7.50E-04	101%	Pass
23	278.886	271	7.08E-04	274	7.16E-04	101%	Pass
24	289.028	247	6.45E-04	251	6.56E-04	102%	Pass
25	299.169	230	6.01E-04	232	6.06E-04	101%	Pass
26	309.310	219	5.72E-04	220	5.75E-04	100%	Pass
27	319.451	206	5.38E-04	206	5.38E-04	100%	Pass
28	329.592	196	5.12E-04	199	5.20E-04	102%	Pass
29	339.733	184	4.81E-04	187	4.89E-04	102%	Pass
30	349.874	176	4.60E-04	178	4.65E-04	101%	Pass

31	360.015	164	4.28E-04	169	4.42E-04	103%	Pass
32	370.156	157	4.10E-04	160	4.18E-04	102%	Pass
33	380.297	149	3.89E-04	154	4.02E-04	103%	Pass
34	390.438	141	3.68E-04	144	3.76E-04	102%	Pass
35	400.579	134	3.50E-04	135	3.53E-04	101%	Pass
36	410.720	130	3.40E-04	131	3.42E-04	101%	Pass
37	420.861	126	3.29E-04	127	3.32E-04	101%	Pass
38	431.002	119	3.11E-04	119	3.11E-04	100%	Pass
39	441.143	109	2.85E-04	113	2.95E-04	104%	Pass
40	451.284	105	2.74E-04	106	2.77E-04	101%	Pass
41	461.425	102	2.66E-04	102	2.66E-04	100%	Pass
42	471.566	101	2.64E-04	100	2.61E-04	99%	Pass
43	481.707	95	2.48E-04	95	2.48E-04	100%	Pass
44	491.848	92	2.40E-04	93	2.43E-04	101%	Pass
45	501.989	87	2.27E-04	87	2.27E-04	100%	Pass
46	512.130	82	2.14E-04	84	2.19E-04	102%	Pass
47	522.271	80	2.09E-04	79	2.06E-04	99%	Pass
48	532.412	76	1.99E-04	75	1.96E-04	99%	Pass
49	542.553	74	1.93E-04	74	1.93E-04	100%	Pass
50	552.694	74	1.93E-04	72	1.88E-04	97%	Pass
51	562.835	68	1.78E-04	67	1.75E-04	99%	Pass
52	572.976	61	1.59E-04	63	1.65E-04	103%	Pass
53	583.117	60	1.57E-04	60	1.57E-04	100%	Pass
54	593.258	58	1.52E-04	57	1.49E-04	98%	Pass
55	603.399	57	1.49E-04	57	1.49E-04	100%	Pass
56	613.540	54	1.41E-04	55	1.44E-04	102%	Pass
57	623.681	52	1.36E-04	53	1.38E-04	102%	Pass
58	633.822	51	1.33E-04	51	1.33E-04	100%	Pass
59	643.963	49	1.28E-04	50	1.31E-04	102%	Pass
60	654.104	49	1.28E-04	49	1.28E-04	100%	Pass
61	664.245	49	1.28E-04	49	1.28E-04	100%	Pass
62	674.386	48	1.25E-04	47	1.23E-04	98%	Pass
63	684.527	45	1.18E-04	45	1.18E-04	100%	Pass
64	694.668	45	1.18E-04	45	1.18E-04	100%	Pass
65	704.809	44	1.15E-04	44	1.15E-04	100%	Pass
66	714.951	41	1.07E-04	41	1.07E-04	100%	Pass
67	725.092	40	1.05E-04	40	1.05E-04	100%	Pass
68	735.233	40	1.05E-04	40	1.05E-04	100%	Pass
69	745.374	39	1.02E-04	39	1.02E-04	100%	Pass
70	755.515	39	1.02E-04	39	1.02E-04	100%	Pass
71	765.656	36	9.41E-05	37	9.67E-05	103%	Pass
72	775.797	33	8.62E-05	35	9.14E-05	106%	Pass
73	785.938	32	8.36E-05	32	8.36E-05	100%	Pass
74	796.079	30	7.84E-05	31	8.10E-05	103%	Pass

75	806.220	29	7.58E-05	28	7.32E-05	97%	Pass
76	816.361	28	7.32E-05	27	7.05E-05	96%	Pass
77	826.502	27	7.05E-05	27	7.05E-05	100%	Pass
78	836.643	27	7.05E-05	27	7.05E-05	100%	Pass
79	846.784	24	6.27E-05	24	6.27E-05	100%	Pass
80	856.925	24	6.27E-05	23	6.01E-05	96%	Pass
81	867.066	21	5.49E-05	23	6.01E-05	110%	Pass
82	877.207	20	5.23E-05	21	5.49E-05	105%	Pass
83	887.348	20	5.23E-05	20	5.23E-05	100%	Pass
84	897.489	18	4.70E-05	19	4.96E-05	106%	Pass
85	907.630	17	4.44E-05	17	4.44E-05	100%	Pass
86	917.771	17	4.44E-05	17	4.44E-05	100%	Pass
87	927.912	16	4.18E-05	16	4.18E-05	100%	Pass
88	938.053	16	4.18E-05	15	3.92E-05	94%	Pass
89	948.194	15	3.92E-05	15	3.92E-05	100%	Pass
90	958.335	15	3.92E-05	14	3.66E-05	93%	Pass
91	968.476	14	3.66E-05	14	3.66E-05	100%	Pass
92	978.617	14	3.66E-05	14	3.66E-05	100%	Pass
93	988.758	14	3.66E-05	14	3.66E-05	100%	Pass
94	998.899	13	3.40E-05	13	3.40E-05	100%	Pass
95	1009.040	13	3.40E-05	13	3.40E-05	100%	Pass
96	1019.181	13	3.40E-05	13	3.40E-05	100%	Pass
97	1029.322	12	3.14E-05	12	3.14E-05	100%	Pass
98	1039.463	12	3.14E-05	12	3.14E-05	100%	Pass
99	1049.604	11	2.87E-05	11	2.87E-05	100%	Pass
100	1059.745	10	2.61E-05	10	2.61E-05	100%	Pass

POC5

Low-flow Threshold:	10%	
0.1xQ2 (Pre):	6.728	cfs
Q10 (Pre):	111.122	cfs
Ordinate #:	100	
Incremental Q (Pre):	1.04394	cfs
Total Hourly Data:	382751	hours

The proposed BMP: PASSED

Interval	Pre-project Flow (cfs)	Pre-project Hours	Pre-project % Time Exceeding	Post-project Hours	Post-project % Time Exceeding	Percentage	Pass/Fail
0	6.728	1046	2.73E-03	1047	2.74E-03	100%	Pass
1	7.772	973	2.54E-03	972	2.54E-03	100%	Pass
2	8.816	882	2.30E-03	875	2.29E-03	99%	Pass
3	9.860	813	2.12E-03	810	2.12E-03	100%	Pass
4	10.904	746	1.95E-03	741	1.94E-03	99%	Pass
5	11.948	685	1.79E-03	680	1.78E-03	99%	Pass
6	12.992	635	1.66E-03	628	1.64E-03	99%	Pass
7	14.035	590	1.54E-03	587	1.53E-03	99%	Pass
8	15.079	549	1.43E-03	546	1.43E-03	99%	Pass
9	16.123	519	1.36E-03	513	1.34E-03	99%	Pass
10	17.167	482	1.26E-03	475	1.24E-03	99%	Pass
11	18.211	445	1.16E-03	442	1.15E-03	99%	Pass
12	19.255	417	1.09E-03	408	1.07E-03	98%	Pass
13	20.299	387	1.01E-03	384	1.00E-03	99%	Pass
14	21.343	368	9.61E-04	360	9.41E-04	98%	Pass
15	22.387	342	8.94E-04	334	8.73E-04	98%	Pass
16	23.431	323	8.44E-04	317	8.28E-04	98%	Pass
17	24.475	298	7.79E-04	294	7.68E-04	99%	Pass
18	25.519	280	7.32E-04	277	7.24E-04	99%	Pass
19	26.563	264	6.90E-04	255	6.66E-04	97%	Pass
20	27.607	241	6.30E-04	234	6.11E-04	97%	Pass
21	28.651	226	5.90E-04	224	5.85E-04	99%	Pass
22	29.695	219	5.72E-04	217	5.67E-04	99%	Pass
23	30.739	207	5.41E-04	203	5.30E-04	98%	Pass
24	31.782	196	5.12E-04	191	4.99E-04	97%	Pass
25	32.826	180	4.70E-04	179	4.68E-04	99%	Pass
26	33.870	173	4.52E-04	168	4.39E-04	97%	Pass
27	34.914	165	4.31E-04	159	4.15E-04	96%	Pass
28	35.958	153	4.00E-04	148	3.87E-04	97%	Pass
29	37.002	144	3.76E-04	141	3.68E-04	98%	Pass
30	38.046	138	3.61E-04	135	3.53E-04	98%	Pass

31	39.090	132	3.45E-04	131	3.42E-04	99%	Pass
32	40.134	127	3.32E-04	125	3.27E-04	98%	Pass
33	41.178	118	3.08E-04	117	3.06E-04	99%	Pass
34	42.222	112	2.93E-04	110	2.87E-04	98%	Pass
35	43.266	108	2.82E-04	106	2.77E-04	98%	Pass
36	44.310	100	2.61E-04	98	2.56E-04	98%	Pass
37	45.354	96	2.51E-04	96	2.51E-04	100%	Pass
38	46.398	94	2.46E-04	89	2.33E-04	95%	Pass
39	47.442	87	2.27E-04	86	2.25E-04	99%	Pass
40	48.486	86	2.25E-04	84	2.19E-04	98%	Pass
41	49.529	79	2.06E-04	78	2.04E-04	99%	Pass
42	50.573	75	1.96E-04	74	1.93E-04	99%	Pass
43	51.617	71	1.85E-04	69	1.80E-04	97%	Pass
44	52.661	67	1.75E-04	67	1.75E-04	100%	Pass
45	53.705	65	1.70E-04	65	1.70E-04	100%	Pass
46	54.749	62	1.62E-04	61	1.59E-04	98%	Pass
47	55.793	58	1.52E-04	58	1.52E-04	100%	Pass
48	56.837	57	1.49E-04	56	1.46E-04	98%	Pass
49	57.881	56	1.46E-04	55	1.44E-04	98%	Pass
50	58.925	55	1.44E-04	53	1.38E-04	96%	Pass
51	59.969	53	1.38E-04	52	1.36E-04	98%	Pass
52	61.013	52	1.36E-04	49	1.28E-04	94%	Pass
53	62.057	49	1.28E-04	48	1.25E-04	98%	Pass
54	63.101	46	1.20E-04	46	1.20E-04	100%	Pass
55	64.145	46	1.20E-04	44	1.15E-04	96%	Pass
56	65.189	43	1.12E-04	42	1.10E-04	98%	Pass
57	66.233	41	1.07E-04	40	1.05E-04	98%	Pass
58	67.276	37	9.67E-05	38	9.93E-05	103%	Pass
59	68.320	36	9.41E-05	34	8.88E-05	94%	Pass
60	69.364	33	8.62E-05	33	8.62E-05	100%	Pass
61	70.408	33	8.62E-05	33	8.62E-05	100%	Pass
62	71.452	33	8.62E-05	32	8.36E-05	97%	Pass
63	72.496	31	8.10E-05	30	7.84E-05	97%	Pass
64	73.540	29	7.58E-05	29	7.58E-05	100%	Pass
65	74.584	27	7.05E-05	27	7.05E-05	100%	Pass
66	75.628	26	6.79E-05	26	6.79E-05	100%	Pass
67	76.672	26	6.79E-05	26	6.79E-05	100%	Pass
68	77.716	25	6.53E-05	25	6.53E-05	100%	Pass
69	78.760	23	6.01E-05	24	6.27E-05	104%	Pass
70	79.804	23	6.01E-05	23	6.01E-05	100%	Pass
71	80.848	21	5.49E-05	21	5.49E-05	100%	Pass
72	81.892	21	5.49E-05	20	5.23E-05	95%	Pass
73	82.936	19	4.96E-05	19	4.96E-05	100%	Pass
74	83.980	19	4.96E-05	19	4.96E-05	100%	Pass

75	85.023	19	4.96E-05	19	4.96E-05	100%	Pass
76	86.067	18	4.70E-05	18	4.70E-05	100%	Pass
77	87.111	18	4.70E-05	18	4.70E-05	100%	Pass
78	88.155	18	4.70E-05	18	4.70E-05	100%	Pass
79	89.199	18	4.70E-05	18	4.70E-05	100%	Pass
80	90.243	18	4.70E-05	18	4.70E-05	100%	Pass
81	91.287	17	4.44E-05	16	4.18E-05	94%	Pass
82	92.331	16	4.18E-05	15	3.92E-05	94%	Pass
83	93.375	15	3.92E-05	15	3.92E-05	100%	Pass
84	94.419	15	3.92E-05	15	3.92E-05	100%	Pass
85	95.463	14	3.66E-05	13	3.40E-05	93%	Pass
86	96.507	12	3.14E-05	12	3.14E-05	100%	Pass
87	97.551	12	3.14E-05	12	3.14E-05	100%	Pass
88	98.595	11	2.87E-05	11	2.87E-05	100%	Pass
89	99.639	10	2.61E-05	10	2.61E-05	100%	Pass
90	100.683	10	2.61E-05	9	2.35E-05	90%	Pass
91	101.727	9	2.35E-05	9	2.35E-05	100%	Pass
92	102.770	9	2.35E-05	9	2.35E-05	100%	Pass
93	103.814	9	2.35E-05	9	2.35E-05	100%	Pass
94	104.858	9	2.35E-05	9	2.35E-05	100%	Pass
95	105.902	9	2.35E-05	8	2.09E-05	89%	Pass
96	106.946	7	1.83E-05	6	1.57E-05	86%	Pass
97	107.990	6	1.57E-05	6	1.57E-05	100%	Pass
98	109.034	6	1.57E-05	6	1.57E-05	100%	Pass
99	110.078	5	1.31E-05	5	1.31E-05	100%	Pass
100	111.122	4	1.05E-05	4	1.05E-05	100%	Pass

ATTACHMENT 2 - Elevation vs. Area Curves vs. Discharge Curves to be used in SWMM

Elevation vs. Area

For the portion of the flow diverted in the LID Control to the receiving detention basin, a pond is used to route the hydrographs. The elevation vs area curve in the model is calculated in Excel and imported into the model at a 0.1 ft interval range.

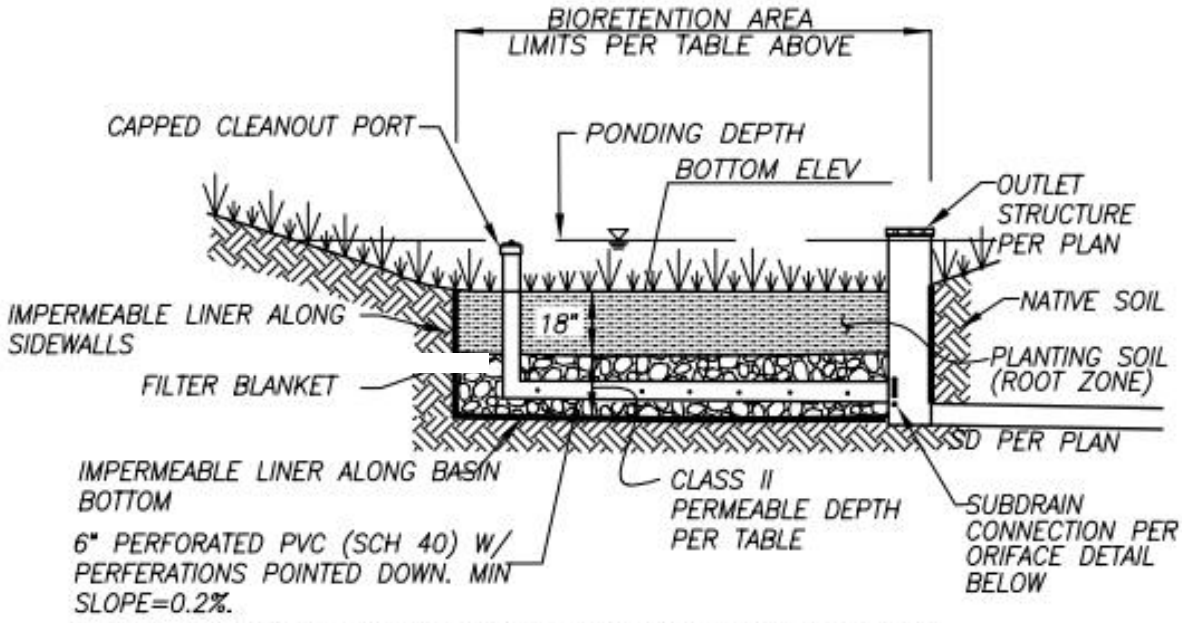
Elevation vs Discharge

The total discharge peak flow is imported from an Excel spreadsheet that calculated the elevation vs discharge of the multiple outlet system.

The orifices have been selected to maximize their size while still restricting flows to conform to the required 10% of the Q2 event flow as mandated in the Final Hydromodification Management Plan by Brown & Caldwell, dated March 2011. While we acknowledge that these orifices are small, to increase the size of these outlets would impact the basins' ability to restrict flows beneath the HMP thresholds, thus preventing the BMP from conformance with HMP requirements.

In order to prevent blockage of the orifices, a debris screen will be fitted to the base invert of the lower orifices located within the detention basin. Regular maintenance of the riser and orifices will be performed to ensure potential blockages are minimized. A detail of the orifice and riser structure is provided in Attachment 5 of this attachment. The stage-storage and stage-discharge calculations have been provided on the following pages.

ATTACHMENT 3 – Biofiltration Details



TYPICAL BIORETENTION SECTION

LIMITS @ TOE OF SLOPE NTS

ATTACHMENT 4 - SWMM Input Data (Existing and Proposed Models)

POC1 - EX	
Soil Type	D
Area (AC)	403.9
Flowpath (ft)	2664
Width (ft)	2664
% Slope	36
%Impervious	0
Suction Head (in)	9
Conductivity (in/hr)	0.025
Initial Deficit	0.33

POC2 - EX	
Soil Type	D
Area (AC)	2005.1
Flowpath (ft)	20534
Width (ft)	20534
% Slope	36
%Impervious	0
Suction Head (in)	9
Conductivity (in/hr)	0.025
Initial Deficit	0.33

POC3 - EX	
Soil Type	D
Area (AC)	76.0
Flowpath (ft)	3612
Width (ft)	3612
% Slope	20.3
%Impervious	0
Suction Head (in)	9
Conductivity (in/hr)	0.025
Initial Deficit	0.33

POC4 - EX	
Soil Type	D
Area (AC)	3440
Flowpath (ft)	24743
Width (ft)	24743
% Slope	6
%Impervious	0
Suction Head (in)	9
Conductivity (in/hr)	0.025
Initial Deficit	0.30

POC5 - EX	
Soil Type	D
Area (AC)	212
Flowpath (ft)	4766
Width (ft)	4766
% Slope	17.2
%Impervious	17.2
Suction Head (in)	9
Conductivity (in/hr)	0.025
Initial Deficit	0.33

POC 1 - PR											
	DMA A	BF-A	DMA B	BF-B	DMA C	BF-C	DMA D	BF-D	DMA E	BF-E	Bypass
Soil Type	D	A	D	A	D	A	D	A	D	A	D
Area (AC)	16.6	0.35	34.7	0.62	23.9	0.77	35	0.86	2.9	0.11	289.4
Flowpath (ft)	215	-	200	-	205	-	500	-	500	-	9769
Width (ft)	215	50	200	35	205	100	500	100	500	100	9769
% Slope	2	0	5	0	6	0	4	0	10	0	36
%Impervious	42	0	40	0	43	0	25	0	43	0	0
Suction Head (in)	9	1.5	9	1.5	9	1.5	9	1.5	9	1.5	9
Conductivity (in/hr)	0.025	0.3	0.025	0.3	0.025	0.025	0.025	0.3	0.025	0.025	0.025
Initial Deficit	0.30	0.33	0.30	0.33	0.30	0.33	0.30	0.33	0.30	0.33	0.30

POC 2 - PR

	DMA K	BF-K	DMA F	BF-F	DMA G	BF-G	DMA H	BF-H	DMA I	BF-I	DMA J	BF-J	Bypass
Soil Type	D	A	D	A	D	A	D	A	D	A	D	A	D
Area (AC)	44	1.2	14	0.34	64.5	1.27	19.5	0.54	102.4	2.05	9	9	1753.1
Flowpath (ft)	2057	-	1193	-	6532	-	1705	-	2762	-	500	-	20534
Width (ft)	2057	50	1193	35	6532	100	1705	100	2762	100	500	100	20534
% Slope	8	0	8	0	10	0	6	0	10	0	15	0	36
%Impervious	48	0	30	0	40	0	41	0	40	0	59	0	0
Suction Head (in)	9	1.5	9	1.5	9	1.5	9	1.5	9	1.5	9	1.5	6
Conductivity (in/hr)	0.025	0.3	0.025	0.3	0.075	0.025	0.025	0.3	0.075	0.025	0.075	0.025	0.1
Initial Deficit	0.3	0.33	0.3	0.33	0.3	0.33	0.3	0.33	0.3	0.33	0.3	0.33	0.31

POC3 - PR			
	BYP		DMA O-L
Soil Type	D		D
Area (AC)	74.8		1.4
Flowpath (ft)	3612		2066
Width (ft)	3612		2066
% Slope	20.3		14.4
%Impervious	0		95
Suction Head (in)	9		9
Conductivity (in/hr)	0.025		0.025
Initial Deficit	0.33		0.33

POC4 - PR					
	BYP	DMA O-N			DMA O-M
Soil Type	D	D			D
Area (AC)	3420.4	15			4.6
Flowpath (ft)	24743	2441			5212
Width (ft)	24743	2441			5212
% Slope	6	20			12.7
%Impervious	0	19			76
Suction Head (in)	9	9			9
Conductivity (in/hr)	0.025	0.025			0.025
Initial Deficit	0.33	0.33			0.33

POC 5 - PR											
	DMA O-O	BF-O-O	DMA O-P	BF-O-P	DMA O-Q	BF-O-Q	DMA O-R	BF-O-R	DMA O-S	BF-O-S	Bypass
Soil Type	D	A	D	A	D	A	D	A	D	A	D
Area (AC)	1.2	0.05	0.53	0.01	0.263	0.03	0.24	0.02	0.41	0.03	208.8
Flowpath (ft)	1547	50	486	50	222	50	203	50	558	50	4766
Width (ft)	1547	50	486	50	222	50	203	50	558	50	4766
% Slope	2.2	0	1.6	0	1	0	1	0	2.8	0	17.2
%Impervious	95	0	95	0	95	0	95	0	95	0	3.2
Suction Head (in)	9	1.5	9	1.5	9	1.5	9	1.5	9	1.5	9
Conductivity (in/hr)	0.025	0.3	0.025	0.3	0.025	0.025	0.025	0.3	0.025	0.025	0.025
Initial Deficit	0.33	0.3	0.33	0.3	0.33	0.3	0.33	0.30	0.33	0.3	0.33

ATTACHMENT 5 - SWMM Screens and Explanation of Significant Variables

Attached, the reader can see the screens associated with the EPA-SWMM Model in both pre-development and post-development conditions. Each portion, i.e., sub-catchments, outfalls, storage units, LID controls for the bio-retention cells, ponding on top of the bio-retention (modeled as a storage unit), weir as a discharge, and outfalls (point of compliance), are also shown.

Variables for modeling are associated with typical recommended values by the EPA-SWMM model, typical values found in the San Diego County BMP Design Manual. Recommended values for the SWMM model have been attained from the interim Orange County criteria established for their SWMM calibration. Currently, no recommended values have been established by the San Diego County HMP Permit for the SWMM Model.

Soil characteristics of the existing soils were determined from the USGS sources.

Some values incorporated within the SWMM model have been determined from the professional experience of H&A using conservative assumption that have a tendency to increase the size of the needed BMP and also generate a long-term runoff as a percentage of rainfall similar to those measured in gage stations in Southern California by the USGS.

Description of model parameters and assumptions:

N-Imperv – Manning's N for impervious surfaces

0.012 (typical)

N-Perv – Manning's N for pervious surfaces

0.05 (typical)

Dstore-Imperv – Depth of depression storage on impervious area (in)

0.02 (typical)

Dstore-Perv – Depth of depression storage on pervious area (in)

0.1 (typical)

%Zero-Imperv – Percentage of impervious area with no depression storage (%)

25 (typical)

Suction Head – Soil capillary suction head (in)

Conductivity – Soil saturated hydraulic comfuctivity (in/hr)

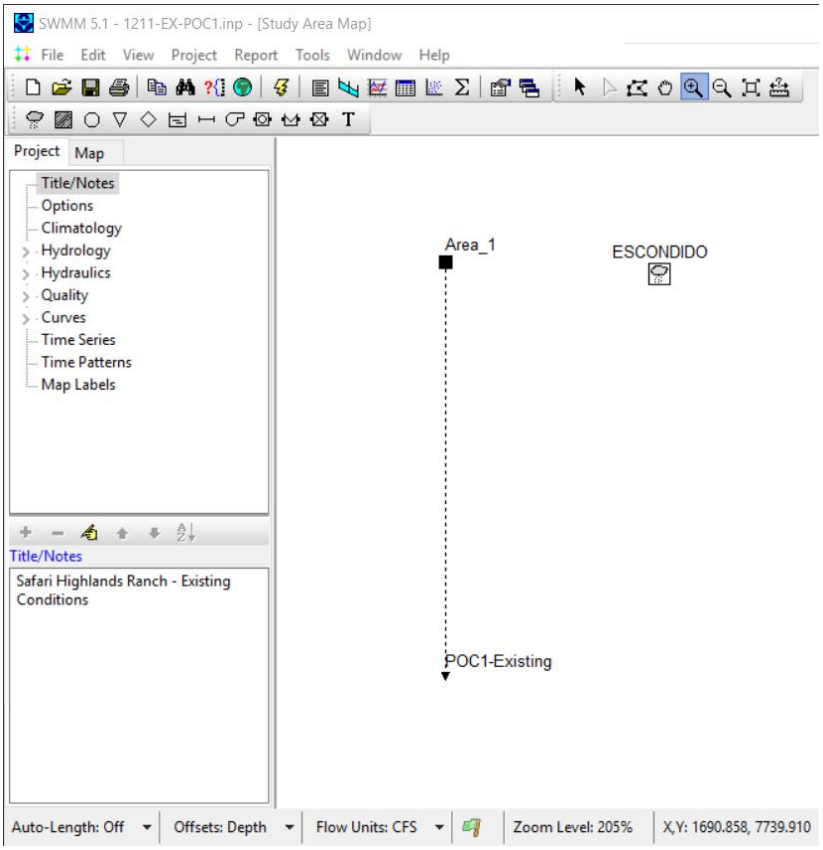
-75% of these values if subcatchment is graded/compacted

Initial Deficit – Initial moisture deficit (fraction)

Soil Type	Suction Head	Conductivity	Initial Deficit
A	1.5	0.3	0.30
B	3	0.2	0.31
C	6	0.1	0.32
D	9	0.025	0.33

NOTE : These values are based on the County of San Diego BMP Design Manual, Appendix G for SWMM and recommended values for the EPA SWMM program.

POC 1 – Pre-Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	VOLUME
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

User-assigned name of rain gage

Outfall POC1-Existing

Property	Value
Name	POC1-Existing
X-Coordinate	1081.360
Y-Coordinate	7778.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

Subcatchment outflow is routed onto (leave blank if not applicable)

Subcatchment Area_1

Property	Value
Name	Area_1
X-Coordinate	1081.360
Y-Coordinate	8095.894
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	POC1-Existing
Area	403.9
Width	2664
% Slope	36
% Imperv	0
N-Imperv	0.012
N-Perv	0.05
Dstore-Imperv	0.02
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Average surface slope (%)

Infiltration Editor

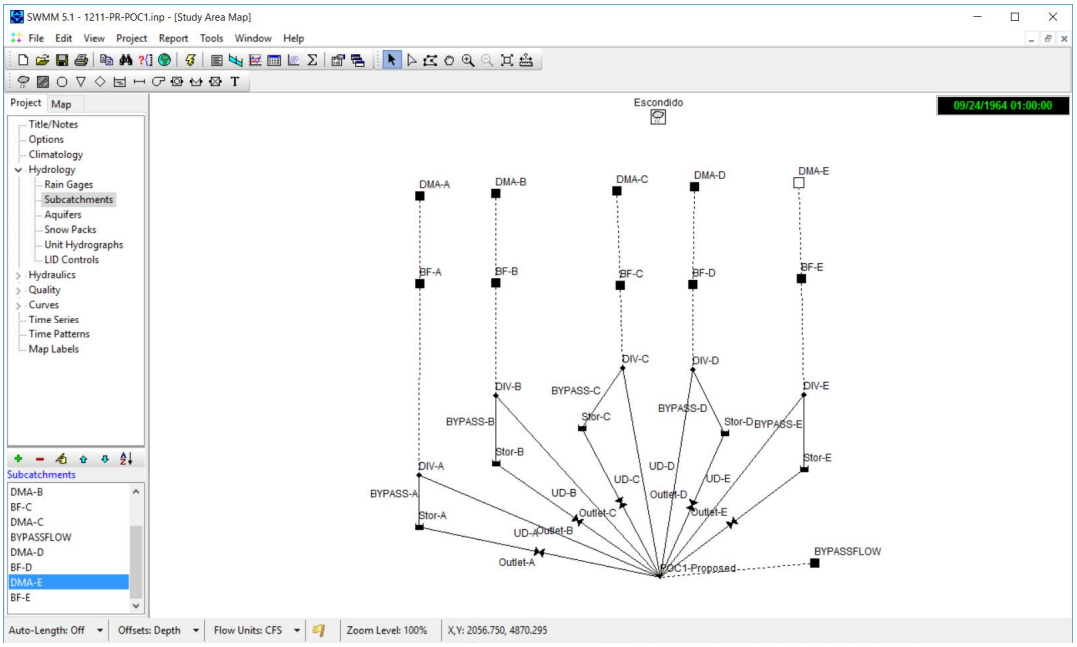
Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	.3

Soil capillary suction head (inches or mm)

OK Cancel Help

POC 1 – Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

Type of rainfall data recorded at rain gage

Outfall POC1-Proposed

Property	Value
Name	POC1-Proposed
X-Coordinate	1481.291
Y-Coordinate	4369.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment DMA-A

Property	Value
Name	DMA-A
X-Coordinate	922.814
Y-Coordinate	5202.933
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-A
Area	16.6
Width	215
% Slope	2
% Imperv	42
N-Imperv	.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-B

Property	Value
Name	DMA-B
X-Coordinate	1096.832
Y-Coordinate	5208.986
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-B
Area	34.7
Width	200
% Slope	5
% Imperv	40
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-C

Property	Value
Name	DMA-C
X-Coordinate	1373.747
Y-Coordinate	5215.038
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-C
Area	23.9
Width	205
% Slope	6
% Imperv	43
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-D

Property	Value
Name	DMA-D
X-Coordinate	1551.751
Y-Coordinate	5223.472
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-D
Area	35.0
Width	500
% Slope	4
% Imperv	25
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-E

Property	Value
Name	DMA-E
X-Coordinate	1791.389
Y-Coordinate	5233.197
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-E
Area	2.9
Width	500
% Slope	10
% Imperv	43
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BYPASSFLOW

Property	Value
Name	BYPASSFLOW
X-Coordinate	1828.238
Y-Coordinate	4362.884
Description	
Tag	
Rain Gage	Escondido
Outlet	POC1-Proposed
Area	289.4
Width	9769
% Slope	36
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Storage Unit Stor-A

Property	Value
Name	Stor-A
X-Coordinate	921.874
Y-Coordinate	4443.450
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	3.5
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-A

Storage Unit Stor-B

Property	Value
Name	Stor-B
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	8.5
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-B

Storage Unit Stor-C

Property	Value
Name	Stor-C
X-Coordinate	1295.061
Y-Coordinate	4670.287
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	8.5
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-C

Conduit UD-A

Property	Value
Name	UD-A
Inlet Node	DIV-A
Outlet Node	POC1-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Conduit UD-B

Property	Value
Name	UD-B
Inlet Node	DIV-B
Outlet Node	POC1-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Conduit UD-C

Property	Value
Name	UD-C
Inlet Node	DIV-C
Outlet Node	POC1-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Storage Unit Stor-D

Property	Value
Name	Stor-D
X-Coordinate	1621.911
Y-Coordinate	4658.182
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	10.5
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-D

Storage Unit Stor-F'

Property	Value
Name	Stor-F'
X-Coordinate	1801.982
Y-Coordinate	4576.469
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4.5
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-F'

Conduit UD-D

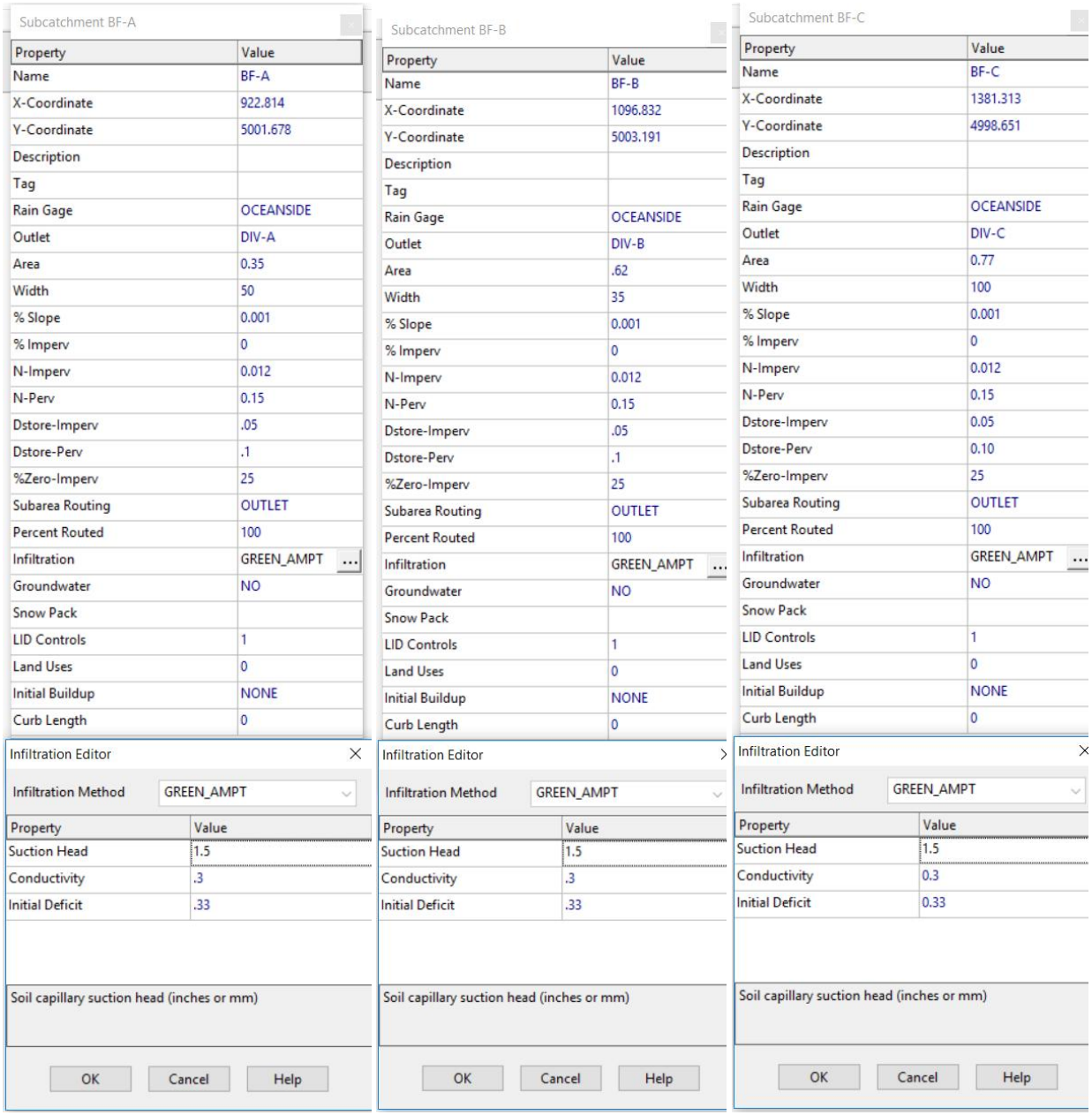
Property	Value
Name	UD-D
Inlet Node	DIV-D
Outlet Node	POC1-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Conduit UD-F'

Property	Value
Name	UD-F'
Inlet Node	DIV-F'
Outlet Node	POC1-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)


Subcatchment BF-A
Property
Value
Name
BF-A
X-Coordinate
922.814
Y-Coordinate
5001.678
Description
Tag
Rain Gage
OCEANSIDE
Outlet
DIV-A
Area
0.35
Width
50
% Slope
0.001
% Imperv
0
N-Imperv
0.012
N-Perv
0.15
Dstore-Imperv
.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
1
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
1.5
Conductivity
.3
Initial Deficit
.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help
Subcatchment BF-B
Property
Value
Name
BF-B
X-Coordinate
1096.832
Y-Coordinate
5003.191
Description
Tag
Rain Gage
OCEANSIDE
Outlet
DIV-B
Area
.62
Width
35
% Slope
0.001
% Imperv
0
N-Imperv
0.012
N-Perv
0.15
Dstore-Imperv
.05
Dstore-Perv
.1
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
1
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
1.5
Conductivity
.3
Initial Deficit
.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help
Subcatchment BF-C
Property
Value
Name
BF-C
X-Coordinate
1381.313
Y-Coordinate
4998.651
Description
Tag
Rain Gage
OCEANSIDE
Outlet
DIV-C
Area
0.77
Width
100
% Slope
0.001
% Imperv
0
N-Imperv
0.012
N-Perv
0.15
Dstore-Imperv
0.05
Dstore-Perv
0.10
%Zero-Imperv
25
Subarea Routing
OUTLET
Percent Routed
100
Infiltration
GREEN_AMPT
Groundwater
NO
Snow Pack
LID Controls
1
Land Uses
0
Initial Buildup
NONE
Curb Length
0
Infiltration Editor
Infiltration Method
GREEN_AMPT
Property
Value
Suction Head
1.5
Conductivity
0.3
Initial Deficit
0.33
Soil capillary suction head (inches or mm)
OK
Cancel
Help

Subcatchment BF-D

Property	Value
Name	BF-D
X-Coordinate	1549.278
Y-Coordinate	5000.164
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-D
Area	0.86
Width	100
% Slope	0.5
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BF-F'

Property	Value
Name	BF-F'
X-Coordinate	1797.442
Y-Coordinate	5013.783
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-F'
Area	0.11
Width	100
% Slope	0.5
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration parameters (click to edit)

Infiltration Editor

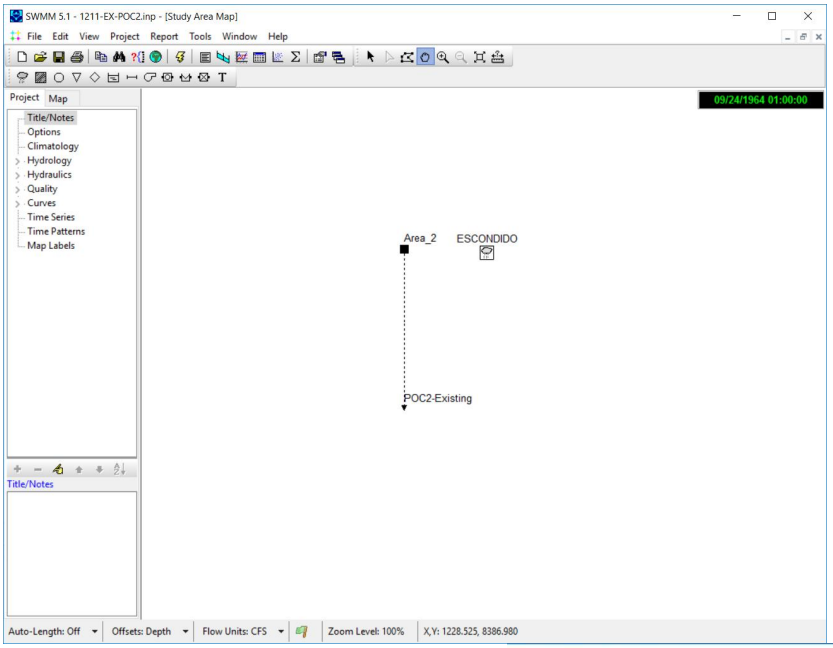
Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

POC 2 – Pre-Developed Condition



Rain Gage OCEANSIDE

Property	Value
Name	OCEANSIDE
X-Coordinate	1247.258
Y-Coordinate	8085.322
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	OCEANSIDE-RAIN
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

Outfall POC2-Existing

Property	Value
Name	POC2-Existing
X-Coordinate	1081.360
Y-Coordinate	7778.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment Area_2

Property	Value
Name	Area_2
X-Coordinate	1081.360
Y-Coordinate	8095.894
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	POC2-Existing
Area	2005.1
Width	20534
% Slope	36
% Imperv	0
N-Imperv	0.012
N-Perv	0.05
Dstore-Imperv	0.02
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

User-assigned name of subcatchment

Infiltration Editor

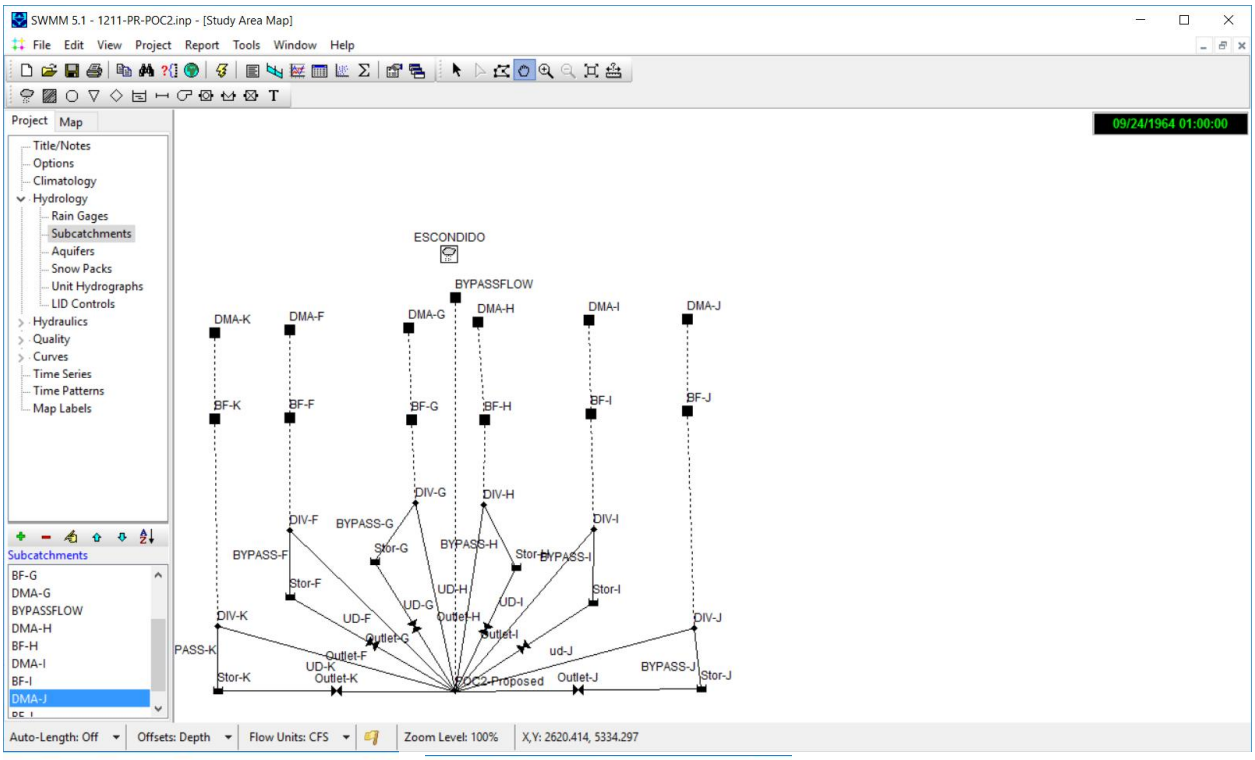
Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	.3

Soil capillary suction head (inches or mm)

OK Cancel Help

POC 2 – Developed Condition



Rain Gage ESCONDIDO

Property	Value
Name	ESCONDIDO
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

User-assigned name of rain gage

Outfall POC2-Proposed

Property	Value
Name	POC2-Proposed
X-Coordinate	1481.291
Y-Coordinate	4369.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment DMA-K

Property	Value
Name	DMA-K
X-Coordinate	922.814
Y-Coordinate	5202.933
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	BF-E
Area	44
Width	2057
% Slope	8
% Imperv	48
N-Imperv	.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-F

Property	Value
Name	DMA-F
X-Coordinate	1096.832
Y-Coordinate	5208.986
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	BF-F
Area	14
Width	1193
% Slope	8
% Imperv	30
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-G

Property	Value
Name	DMA-G
X-Coordinate	1373.747
Y-Coordinate	5215.038
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	BF-G
Area	64.5
Width	6532
% Slope	10
% Imperv	40
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-H

Property	Value
Name	DMA-H
X-Coordinate	1534.146
Y-Coordinate	5227.144
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	BF-H
Area	19.5
Width	1705
% Slope	6
% Imperv	41
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

nfiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
uction Head	9
onductivity	0.025
nitial Deficit	0.3

oil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-I

Property	Value
Name	DMA-I
X-Coordinate	1791.389
Y-Coordinate	5233.197
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	BF-I
Area	102.4
Width	2762
% Slope	10
% Imperv	40
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment DMA-J

Property	Value
Name	DMA-J
X-Coordinate	2019.882
Y-Coordinate	5234.710
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	BF-J
Area	9
Width	500
% Slope	15
% Imperv	59
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.3

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BYPASSFLOW

Property	Value
Name	BYPASSFLOW
X-Coordinate	1483.397
Y-Coordinate	5283.420
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	POC2-Proposed
Area	1753.1
Width	20534
% Slope	36
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.30

Soil capillary suction head (inches or mm)

OK Cancel Help

Storage Unit Stor-K

Property	Value
Name	Stor-K
X-Coordinate	930.380
Y-Coordinate	4372.188
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	6
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-K

Storage Unit Stor-F

Property	Value
Name	Stor-F
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	6
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-F

Storage Unit Stor-G

Property	Value
Name	Stor-G
X-Coordinate	1295.061
Y-Coordinate	4670.287
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	6
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-G

Conduit UD-K

Property	Value
Name	UD-K
Inlet Node	DIV-K
Outlet Node	POC2-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Conduit UD-F

Property	Value
Name	UD-F
Inlet Node	DIV-F
Outlet Node	POC2-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Conduit UD-G

Property	Value
Name	UD-G
Inlet Node	DIV-G
Outlet Node	POC2-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Storage Unit Stor-H

Property	Value
Name	Stor-H
X-Coordinate	1621.911
Y-Coordinate	4658.182
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	6
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-H

User-assigned name of storage unit

Storage Unit Stor-I

Property	Value
Name	Stor-I
X-Coordinate	1801.982
Y-Coordinate	4576.469
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	9
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-I

User-assigned name of storage unit

Storage Unit Stor-J

Property	Value
Name	Stor-J
X-Coordinate	2051.659
Y-Coordinate	4376.727
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-J

User-assigned name of storage unit

Conduit UD-H

Property	Value
Name	UD-H
Inlet Node	DIV-H
Outlet Node	POC2-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Conduit UD-I

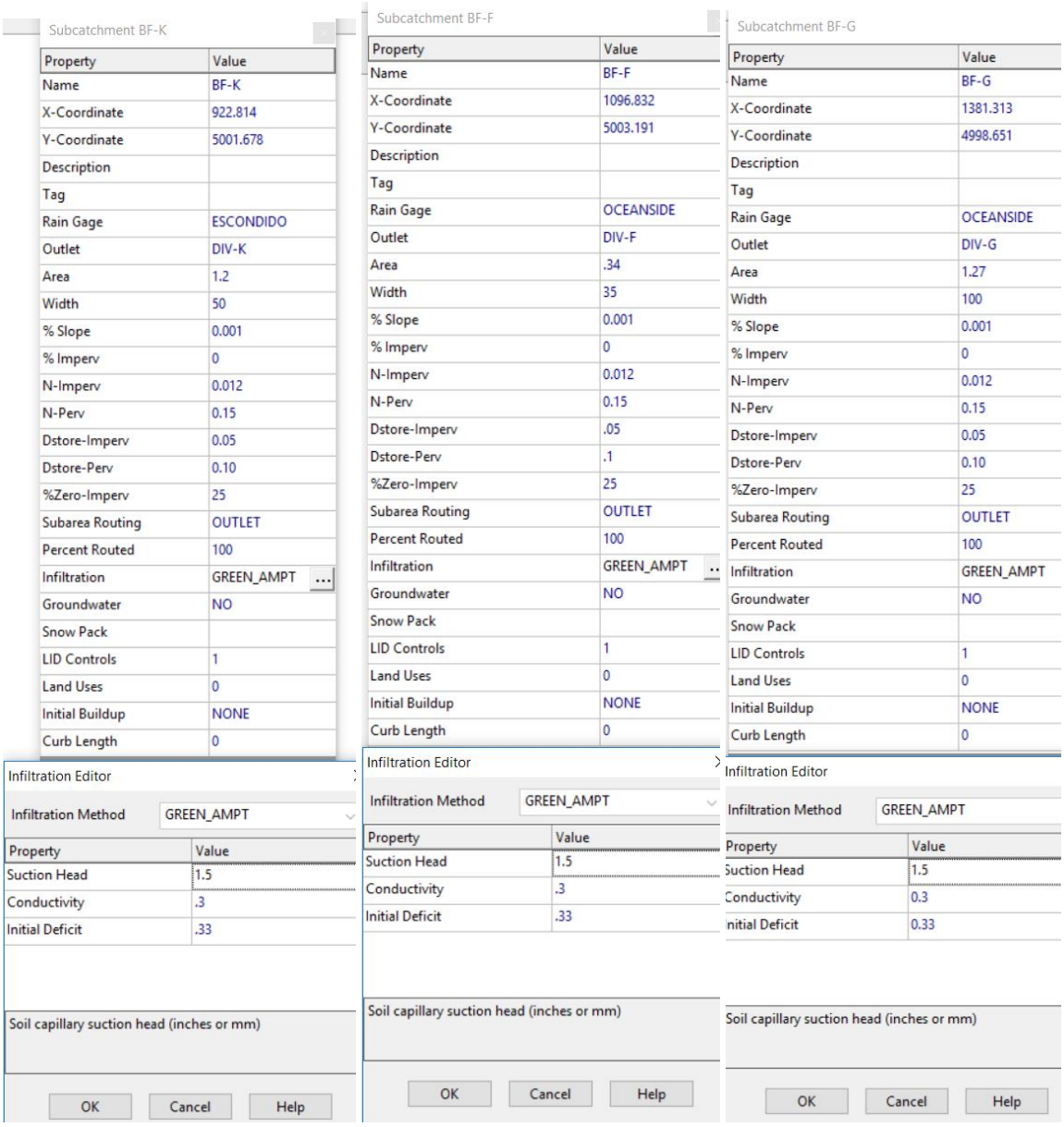
Property	Value
Name	UD-I
Inlet Node	DIV-I
Outlet Node	POC2-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Conduit ud-J

Property	Value
Name	ud-J
Inlet Node	DIV-J
Outlet Node	POC2-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	1
Length	400
Roughness	0.01
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)



Subcatchment BF-K

Property	Value
Name	BF-K
X-Coordinate	922.814
Y-Coordinate	5001.678
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	DIV-K
Area	1.2
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	.3
Initial Deficit	.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BF-F

Property	Value
Name	BF-F
X-Coordinate	1096.832
Y-Coordinate	5003.191
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	DIV-F
Area	.34
Width	35
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ..
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	.3
Initial Deficit	.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BF-G

Property	Value
Name	BF-G
X-Coordinate	1381.313
Y-Coordinate	4998.651
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	DIV-G
Area	1.27
Width	100
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BF-H

Property	Value
Name	BF-H
X-Coordinate	1549.278
Y-Coordinate	5000.164
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	DIV-H
Area	0.54
Width	500
% Slope	0.5
% Imperv	25
N-Imperv	0.01
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	0.05
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BF-I

Property	Value
Name	BF-I
X-Coordinate	1797.442
Y-Coordinate	5013.783
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	DIV-I
Area	2.05
Width	500
% Slope	0.5
% Imperv	25
N-Imperv	0.01
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	0.05
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

Subcatchment BF-J

Property	Value
Name	BF-J
X-Coordinate	2021.213
Y-Coordinate	5019.328
Description	
Tag	
Rain Gage	OCEANSIDE
Outlet	DIV-J
Area	0.36
Width	500
% Slope	0.5
% Imperv	25
N-Imperv	0.01
N-Perv	0.1
Dstore-Imperv	0.05
Dstore-Perv	0.05
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

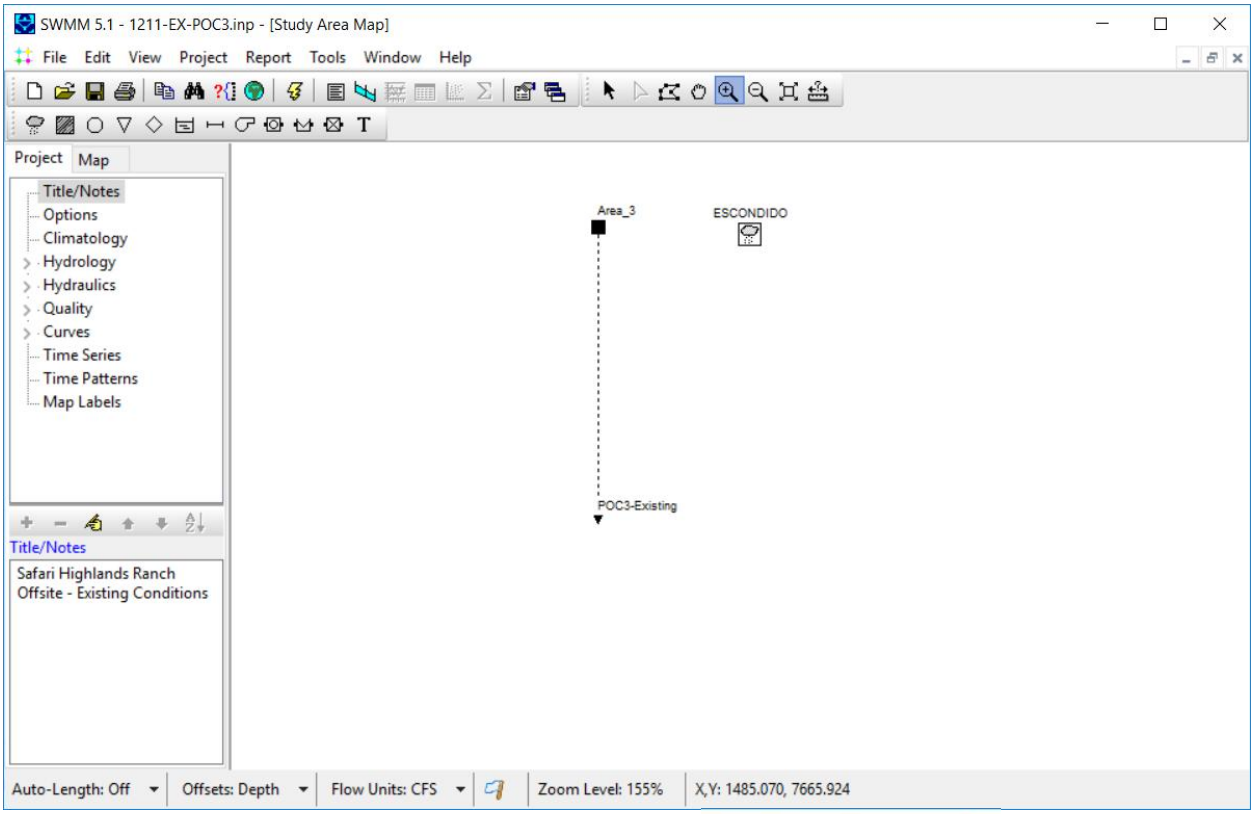
Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.33

Soil capillary suction head (inches or mm)

OK Cancel Help

POC 3 – Pre-Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	VOLUME
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

User-assigned name of rain gage

Outfall POC3-Existing

Property	Value
Name	POC3-Existing
X-Coordinate	1081.360
Y-Coordinate	7778.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment Area_3

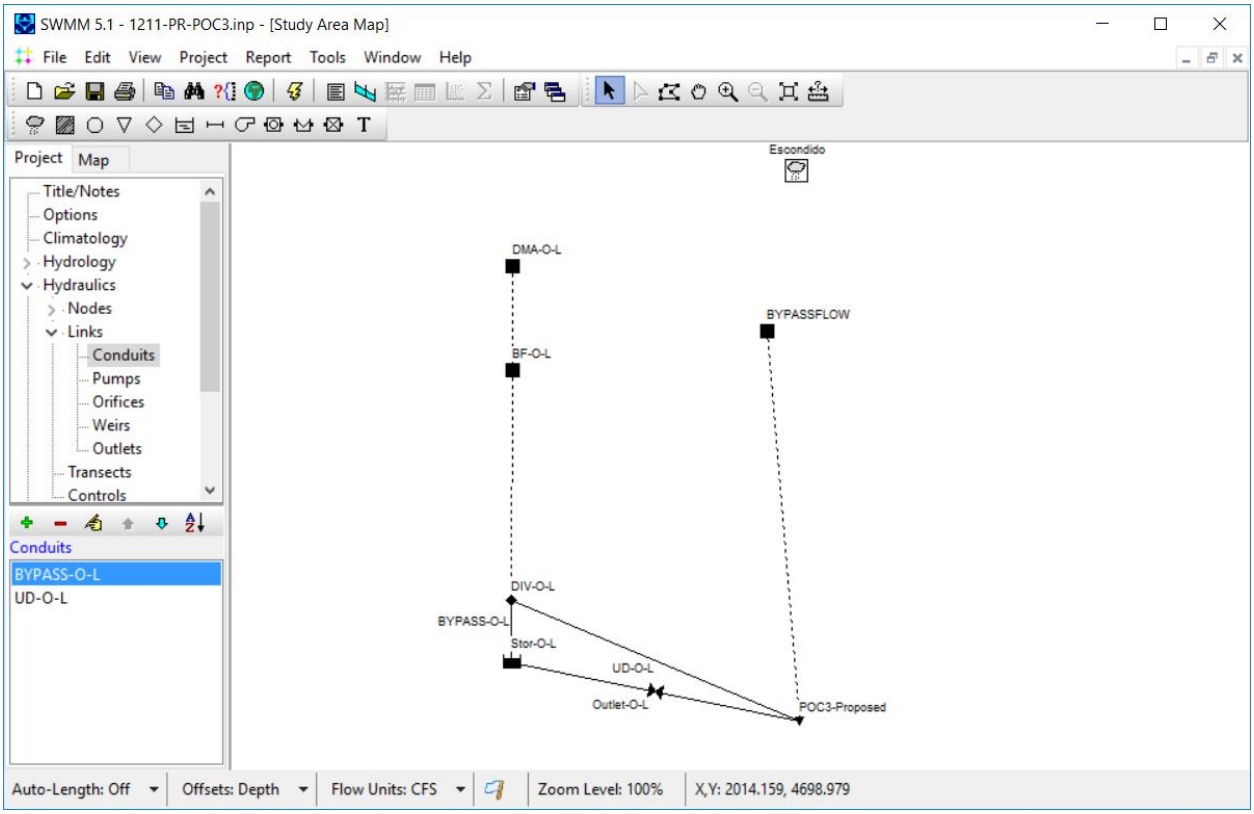
Property	Value
Name	Area_3
X-Coordinate	1081.360
Y-Coordinate	8095.894
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	POC3-Existing
Area	76.0
Width	3612
% Slope	20.3
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	.33

POC 3 – Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

Type of rainfall data recorded at rain gage

Outfall POC3-Proposed

Property	Value
Name	POC3-Proposed
X-Coordinate	1474.848
Y-Coordinate	4329.925
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Outfall	
Series Name	*

User-assigned name of outfall

Subcatchment DMA-O-L

Property	Value
Name	DMA-O-L
X-Coordinate	922.814
Y-Coordinate	5202.933
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-1
Area	1.4
Width	2066
% Slope	14.4
% Imperv	95
N-Imperv	.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Subcatchment BYPASSFLOW

Property	Value
Name	BYPASSFLOW
X-Coordinate	1411.714
Y-Coordinate	5076.785
Description	
Tag	
Rain Gage	Escondido
Outlet	POC3-Proposed
Area	74.8
Width	3612
% Slope	20.3
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Storage Unit Stor-O-L

Property	Value
Name	Stor-O-L
X-Coordinate	921.874
Y-Coordinate	4443.450
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	2.5
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-L

Conduit UD-O-L

Property	Value
Name	UD-O-L
Inlet Node	DIV-O-L
Outlet Node	POC3-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Subcatchment BF-O-L

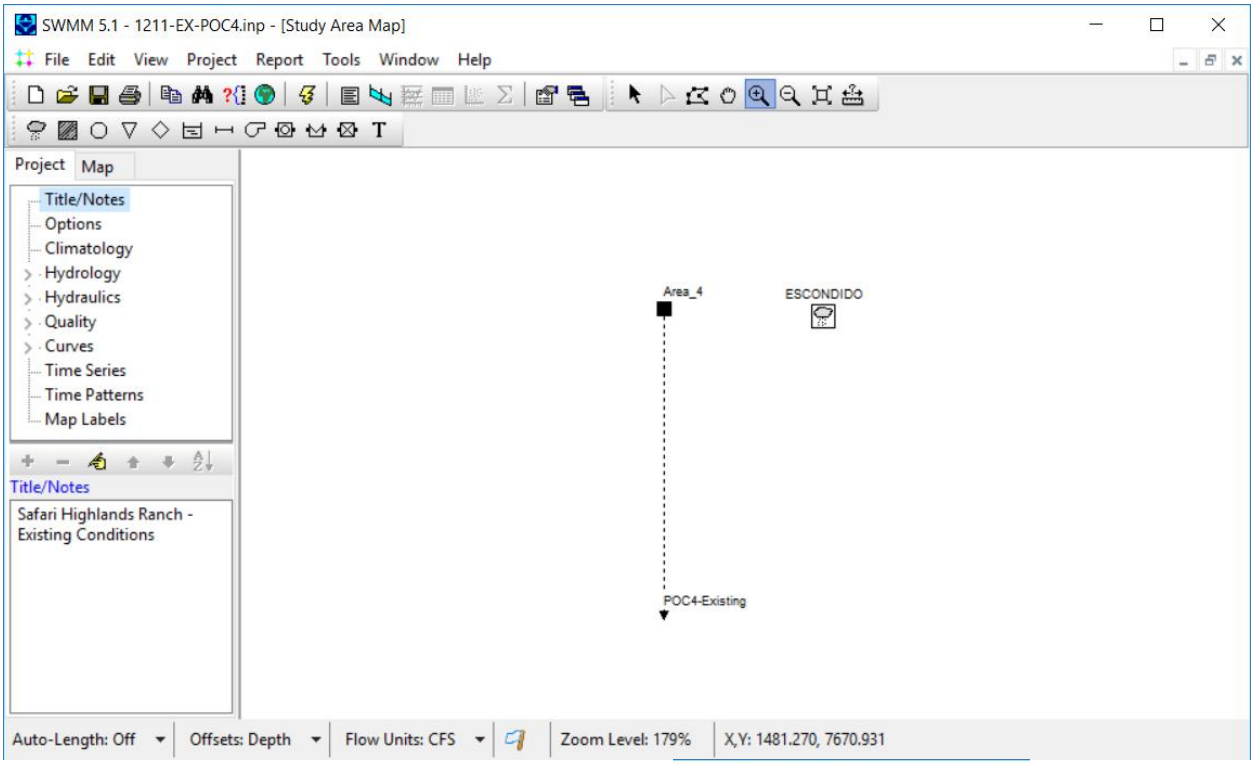
Property	Value
Name	BF-O-L
X-Coordinate	922.814
Y-Coordinate	5001.678
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-L
Area	0.0925
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	.3
Initial Deficit	.3

POC 4 – Pre-Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	VOLUME
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

User-assigned name of rain gage

Outfall POC4-Existing

Property	Value
Name	POC4-Existing
X-Coordinate	1081.360
Y-Coordinate	7778.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Out	
Series Name	*

Click to specify any pollutant removal supplied at the outfall

Subcatchment Area_4

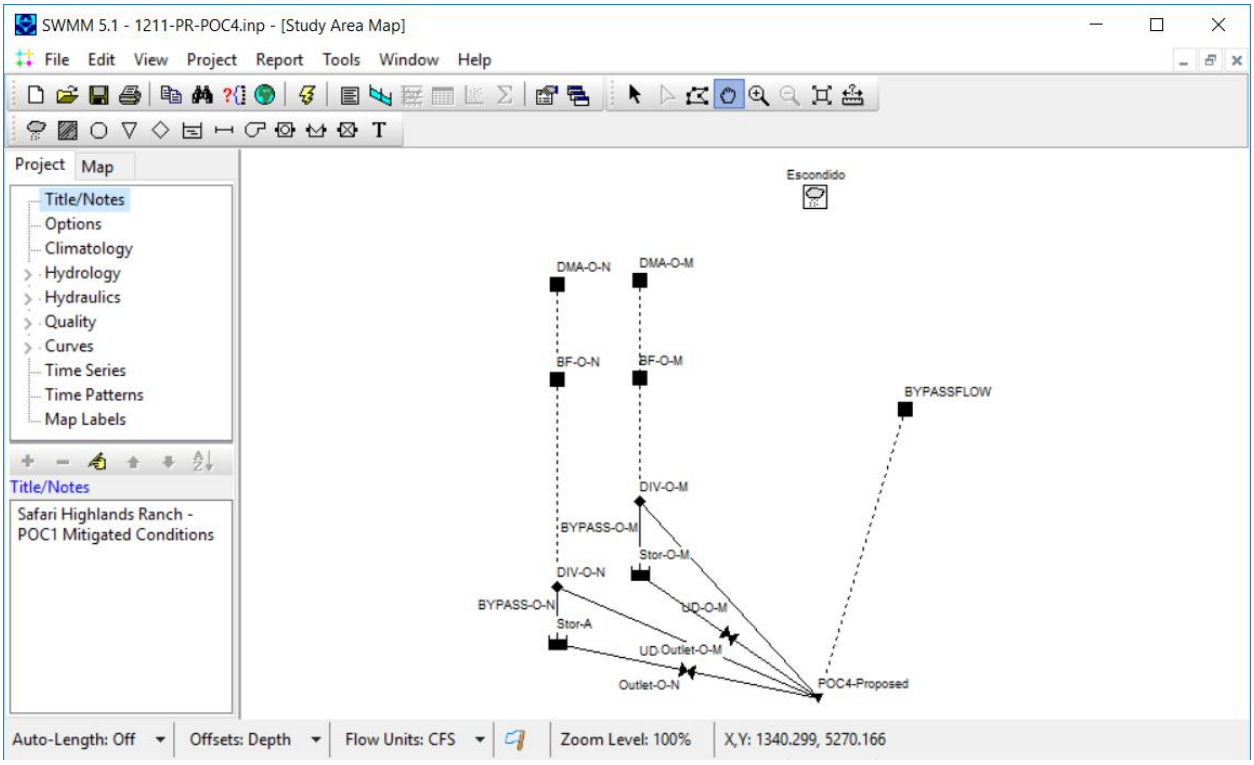
Property	Value
Name	Area_4
X-Coordinate	1081.360
Y-Coordinate	8095.894
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	POC4-Existing
Area	3440
Width	24743
% Slope	6
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	.33

POC 4 – Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

Type of rainfall data recorded at rain gage

Conduit UD-O-N

Property	Value
Name	UD-O-N
Inlet Node	DIV-O-N
Outlet Node	POC4-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

Culvert type code (leave blank for no culvert)

Subcatchment DMA-O-N

Property	Value
Name	DMA-O-N
X-Coordinate	922.814
Y-Coordinate	5202.933
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-N
Area	15
Width	2441
% Slope	20
% Imperv	19
N-Imperv	.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	0.33

Subcatchment DMA-O-M

Property	Value
Name	DMA-O-M
X-Coordinate	1096.832
Y-Coordinate	5208.986
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-M
Area	4.6
Width	5212
% Slope	12.7
% Imperv	76
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment BYPASSFLOW

Property	Value
Name	BYPASSFLOW
X-Coordinate	1658.347
Y-Coordinate	4937.494
Description	
Tag	
Rain Gage	Escondido
Outlet	POC4-Proposed
Area	3420.4
Width	24743
% Slope	6
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Storage Unit Stor-O-N

Property	Value
Name	Stor-O-N
X-Coordinate	921.874
Y-Coordinate	4443.450
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	2.5
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Cur	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-N

User-assigned name of storage unit

Storage Unit Stor-O-M

Property	Value
Name	Stor-O-M
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	2.5
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Cur	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-M

User-assigned name of storage unit

Conduit UD-O-N

Property	Value
Name	UD-O-N
Inlet Node	DIV-O-N
Outlet Node	POC4-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Conduit UD-O-M

Property	Value
Name	UD-O-M
Inlet Node	DIV-O-M
Outlet Node	POC4-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Subcatchment BF-O-N

Property	Value
Name	BF-O-N
X-Coordinate	922.814
Y-Coordinate	5001.678
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-N
Area	0.115
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	.3
Initial Deficit	.3

Subcatchment BF-O-M

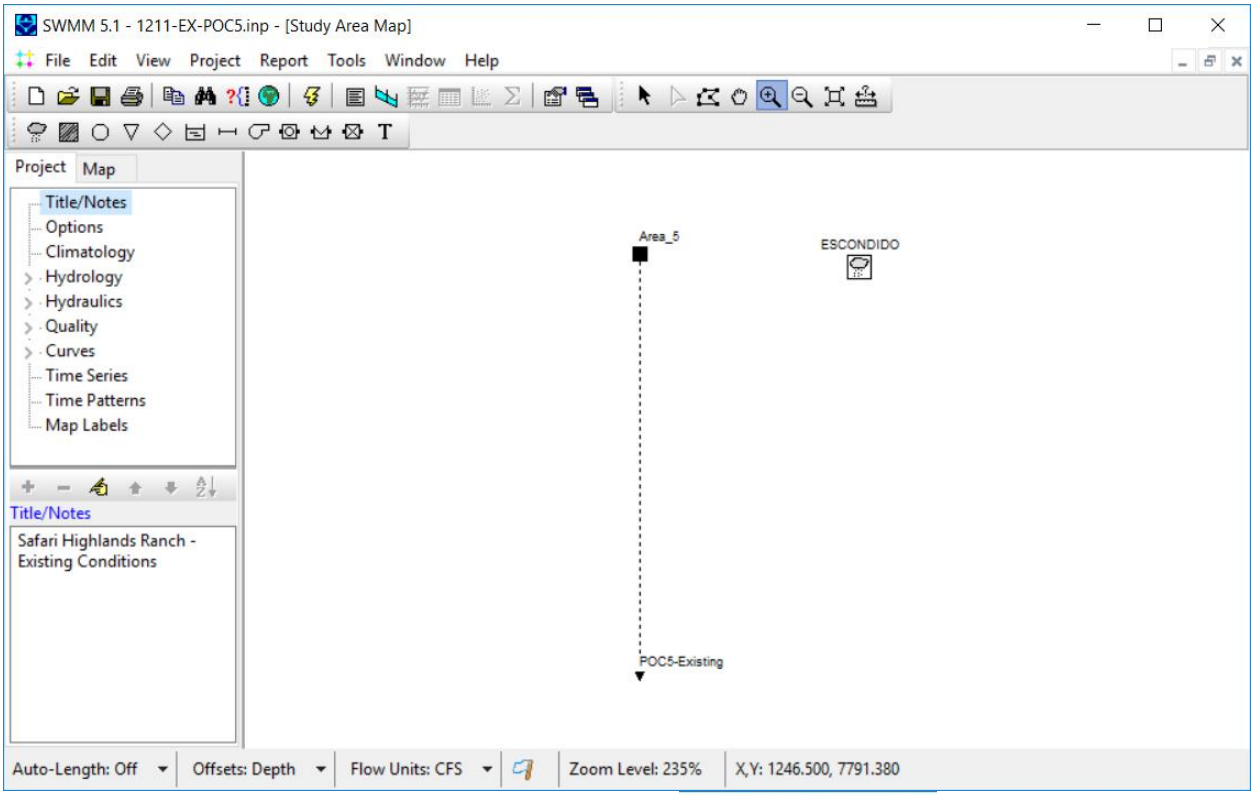
Property	Value
Name	BF-O-M
X-Coordinate	1096.832
Y-Coordinate	5003.191
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-M
Area	0.115
Width	35
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT

Property	Value
Suction Head	1.5
Conductivity	.3
Initial Deficit	.30

POC 5 – Pre-Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	VOLUME
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

User-assigned name of rain gage

Outfall POC5-Existing

Property	Value
Name	POC5-Existing
X-Coordinate	1081.360
Y-Coordinate	7778.736
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Out	
Series Name	*

Click to specify any pollutant removal supplied at the outfall

Subcatchment Area_5

Property	Value
Name	Area_5
X-Coordinate	1081.360
Y-Coordinate	8095.894
Description	
Tag	
Rain Gage	ESCONDIDO
Outlet	POC5-Existing
Area	212
Width	4766
% Slope	17.2
% Imperv	3.2
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.1
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Name of node or another subcatchment that receives runoff

Infiltration Editor

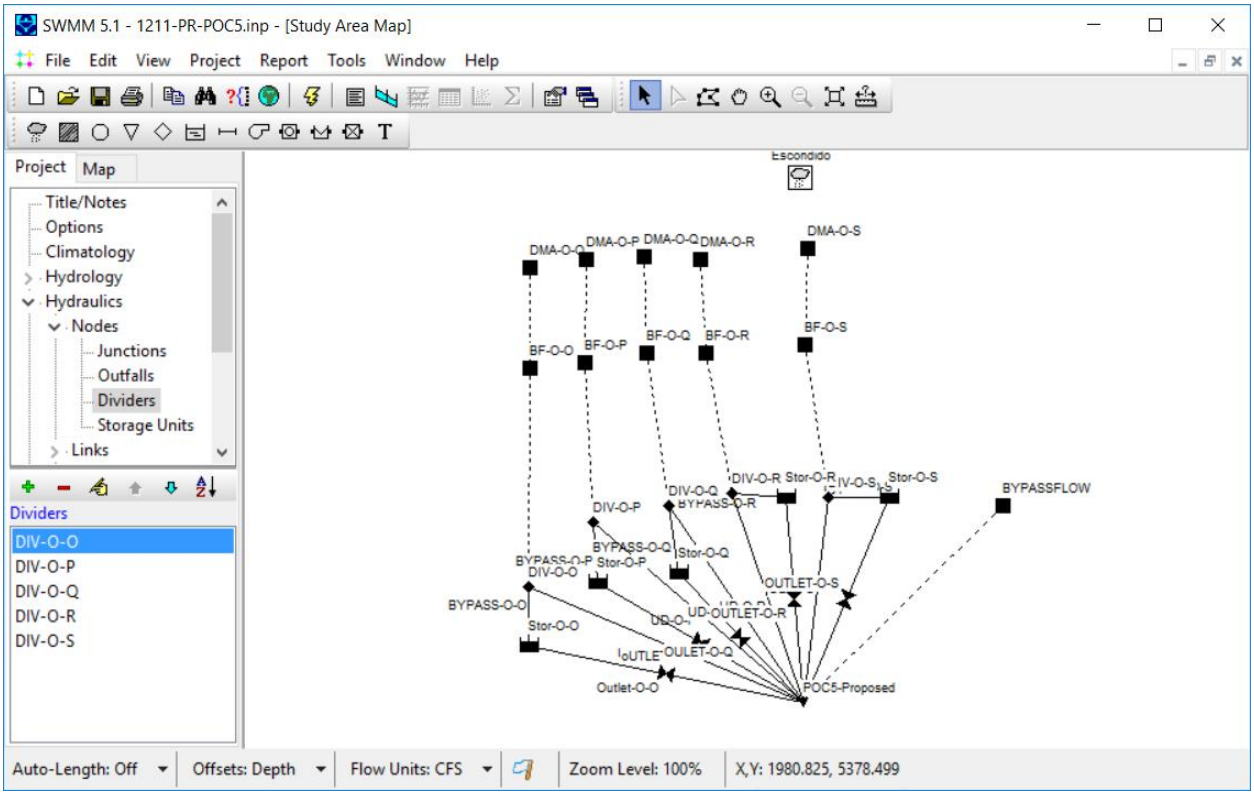
Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	.025
Initial Deficit	.33

Soil capillary suction head (inches or mm)

OK Cancel Help

POC 1 – Developed Condition



Rain Gage Escondido

Property	Value
Name	Escondido
X-Coordinate	1472.076
Y-Coordinate	5381.329
Description	
Tag	
Rain Format	INTENSITY
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	ESCONDIDO-RAINFALL
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

Type of rainfall data recorded at rain gage

Outfall POC5-Proposed

Property	Value
Name	POC5-Proposed
X-Coordinate	1474.848
Y-Coordinate	4329.925
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Tide Gate	NO
Route To	
Type	FREE
Fixed Outfall	
Fixed Stage	0
Tidal Outfall	
Curve Name	*
Time Series Out	
Series Name	*

User-assigned name of outfall

Subcatchment DMA-O-O

Property	Value
Name	DMA-O-O
X-Coordinate	922.814
Y-Coordinate	5202.933
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-O
Area	1.2
Width	1547
% Slope	2.2
% Imperv	95
N-Imperv	.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT
Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment DMA-O-P

Property	Value
Name	DMA-O-P
X-Coordinate	1036.014
Y-Coordinate	5219.908
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-P
Area	0.533
Width	486
% Slope	1.6
% Imperv	95
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT
Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment DMA-O-Q

Property	Value
Name	DMA-O-Q
X-Coordinate	1153.580
Y-Coordinate	5226.298
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-Q
Area	0.263
Width	222
% Slope	1
% Imperv	95
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method	GREEN_AMPT
Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment DMA-O-Q

Property	Value
Name	DMA-O-Q
X-Coordinate	1153.580
Y-Coordinate	5226.298
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-Q
Area	0.263
Width	222
% Slope	1
% Imperv	95
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment DMA-O-R

Property	Value
Name	DMA-O-R
X-Coordinate	1266.035
Y-Coordinate	5221.186
Description	
Tag	
Rain Gage	Escondido
Outlet	BF-O-R
Area	0.238
Width	203
% Slope	1
% Imperv	95
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment DMA-O-S

Property	Value
Name	DMA-O-S
X-Coordinate	1483.276
Y-Coordinate	5241.633
Description	
Tag	
Rain Gage	Escondido
Outlet	bf-O-S
Area	0.41
Width	558
% Slope	2.8
% Imperv	95
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method: GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Subcatchment BYPASSFLOW

Property	Value
Name	BYPASSFLOW
X-Coordinate	1874.650
Y-Coordinate	4725.308
Description	
Tag	
Rain Gage	Escondido
Outlet	POC5-Proposed
Area	208.8
Width	4766
% Slope	17.2
% Imperv	3.2
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method GREEN_AMPT

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

Storage Unit Stor-O-O

Property	Value
Name	Stor-O-O
X-Coordinate	921.874
Y-Coordinate	4443.450
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-O

User-assigned name of storage unit

Storage Unit Stor-O-P

Property	Value
Name	Stor-O-P
X-Coordinate	1059.016
Y-Coordinate	4570.740
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-P

User-assigned name of storage unit

Storage Unit Stor-O-Q

Property	Value
Name	Stor-O-Q
X-Coordinate	1222.586
Y-Coordinate	4589.908
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-Q

User-assigned name of storage unit

Conduit UD-O-O

Property	Value
Name	UD-O-O
Inlet Node	DIV-O-O
Outlet Node	POC5-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Conduit UD-O-P

Property	Value
Name	UD-O-P
Inlet Node	DIV-O-P
Outlet Node	POC5-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	200
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Conduit UD-O-Q

Property	Value
Name	UD-O-Q
Inlet Node	DIV-O-Q
Outlet Node	POC5-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	400
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Storage Unit Stor-O-R

Property	Value
Name	Stor-O-R
X-Coordinate	1437.272
Y-Coordinate	4740.699
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-R

User-assigned name of storage unit

Storage Unit Stor-O-S

Property	Value
Name	Stor-O-S
X-Coordinate	1645.568
Y-Coordinate	4743.255
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-S

User-assigned name of storage unit

Conduit UD-O-R

Property	Value
Name	UD-O-R
Inlet Node	DIV-O-R
Outlet Node	POC5-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.5
Length	400
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Conduit UD-O-S

Property	Value
Name	UD-O-S
Inlet Node	DIV-O-S
Outlet Node	POC5-Proposed
Description	
Tag	
Shape	CIRCULAR
Max. Depth	0.05
Length	400
Roughness	0.013
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coef	0
Exit Loss Coeff.	0
Avg. Loss Coeff	0
Seepage Loss R	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Subcatchment BF-O-O

Property	Value
Name	BF-O-O
X-Coordinate	922.814
Y-Coordinate	5001.678
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-O
Area	0.0459
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	.05
Dstore-Perv	.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method GREEN_AM

Property	Value
Suction Head	1.5
Conductivity	.3
Initial Deficit	.3

Subcatchment BF-O-P

Property	Value
Name	BF-O-P
X-Coordinate	1033.459
Y-Coordinate	5014.168
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-P
Area	.0138
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method GREEN_AM

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Subcatchment BF-O-Q

Property	Value
Name	BF-O-Q
X-Coordinate	1157.414
Y-Coordinate	5033.336
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-Q
Area	0.0275
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method GREEN_AM

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Subcatchment BF-O-R

Property	Value
Name	BF-O-R
X-Coordinate	1278.814
Y-Coordinate	5033.336
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-R
Area	0.0207
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method GREEN_A

Property	Value
Suction Head	1.5
Conductivity	0.3
Initial Deficit	0.3

Subcatchment BF-O-S

Property	Value
Name	BF-O-S
X-Coordinate	1476.887
Y-Coordinate	5049.949
Description	
Tag	
Rain Gage	Escondido
Outlet	DIV-O-S
Area	0.0275
Width	50
% Slope	0.001
% Imperv	0
N-Imperv	0.012
N-Perv	0.15
Dstore-Imperv	0.05
Dstore-Perv	0.10
%Zero-Imperv	25
Subarea Routin	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT ...
Groundwater	NO
Snow Pack	
LID Controls	1
Land Uses	0
Initial Buildup	NONE
Curb Length	0

Infiltration Editor

Infiltration Method GREEN_AMP

Property	Value
Suction Head	9
Conductivity	0.025
Initial Deficit	0.33

EXPLANATION OF SELECTED VARIABLES

Parameters for the pre- and post-developed models include soil type D in accordance with the San Diego County Hydrology Manual and the USGS Soil Survey Map (attached at the end of this appendix). Suction head, conductivity and initial deficit corresponds to average values expected for the soil types, according to sources consulted, professional experience, and approximate values obtained from the BMP Design Manual.

H&A selected infiltration values, such that the percentage of total precipitation that becomes runoff, is realistic for soil type D and slightly smaller than measured values for Southern California watersheds.

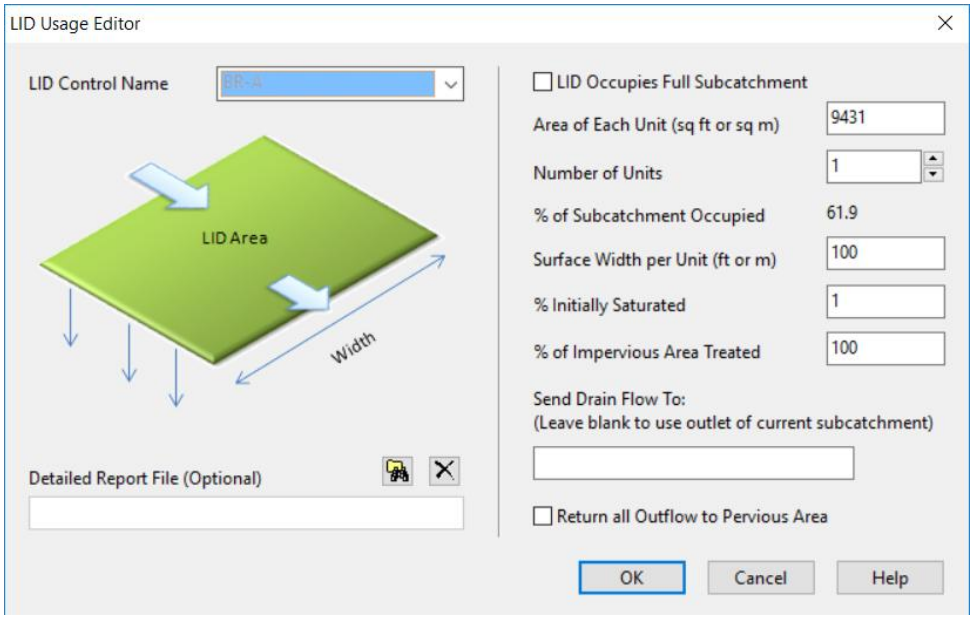
Selection of a Kinematic Approach: As the continuous model is based on hourly rainfall, and the time of concentration for the pre-development and post-development conditions is significantly smaller than 60 minutes, precise routing of the flows through the impervious surfaces, the underdrain pipe system, and the discharge pipe was considered unnecessary. The truncation error of the precipitation into hourly steps is much more significant than the precise routing in a system where the time of concentration is much smaller than 1 hour.

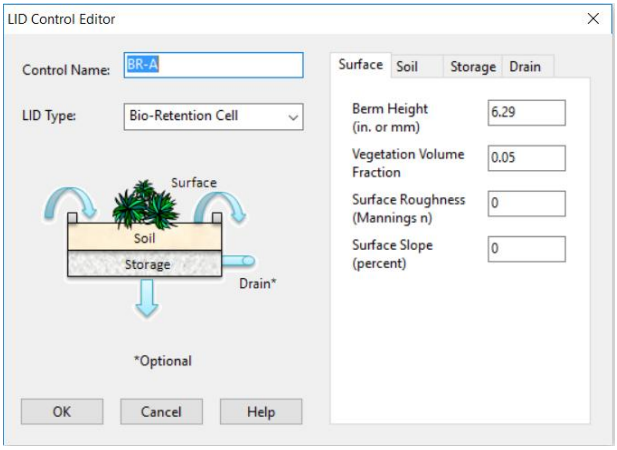
Sub-catchments BF-A, BF-B, BF-C, BF-D, BF-E, BF-F, BF-K, BF-G, BF-H, BF-I, BF-J, BF-O-L, BF-OM, BF-ON, BF-O-P, BF-O-Q, BF-O-R, BF-O-S.

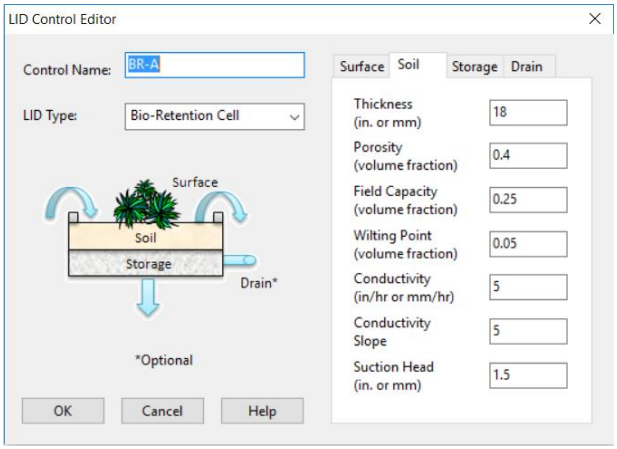
The area of Prop-X + BF-X must be equal to the area of the development tributary to that particular bio-retention facility. Five (5) decimal places were given regarding the areas of the biofiltration to insure that the area used by the program for the LID subroutine corresponds exactly with these tributaries.

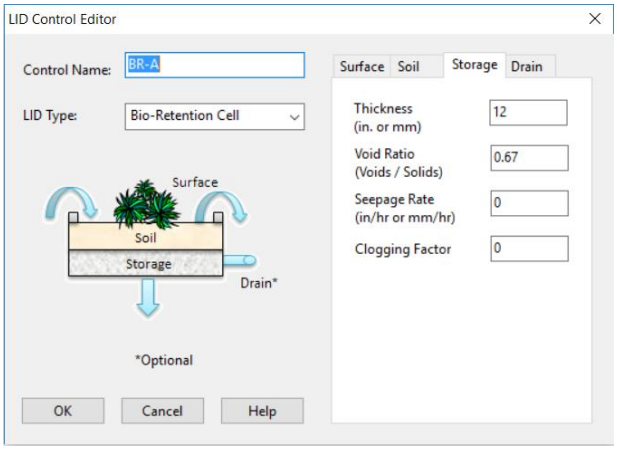
POC1

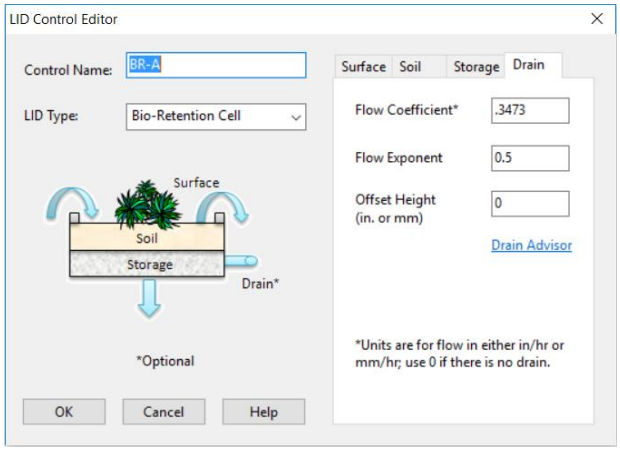
BIOFILTRATION BASIN A



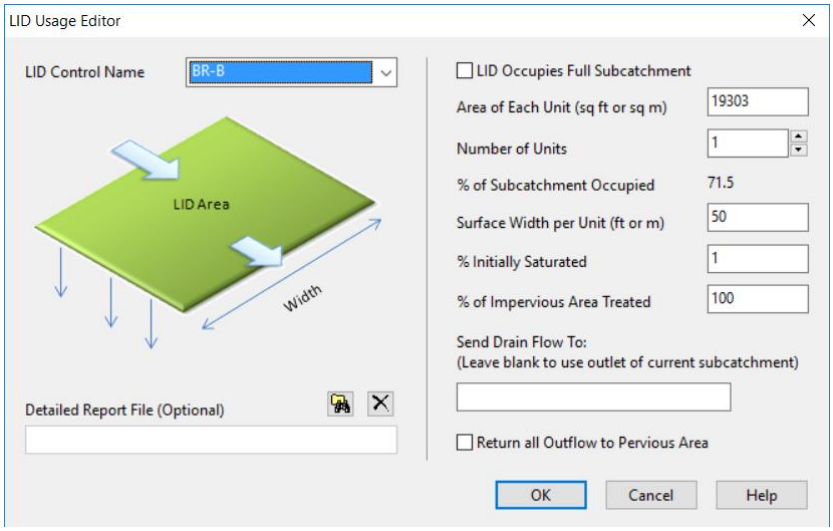


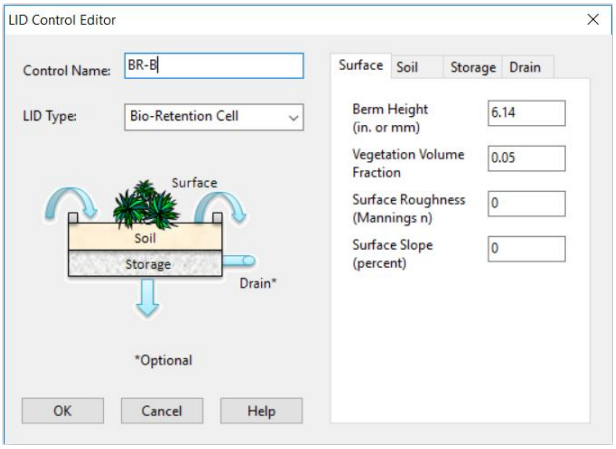


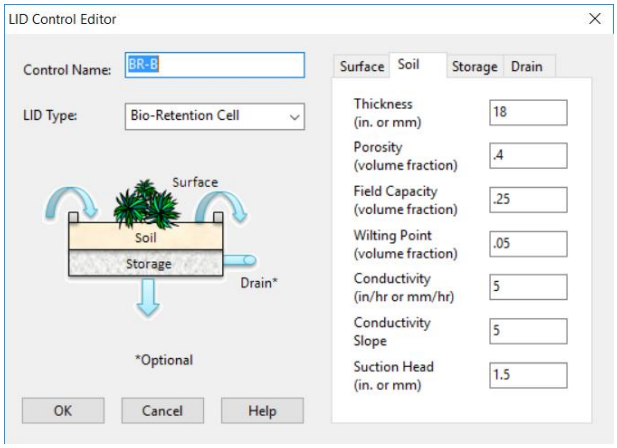


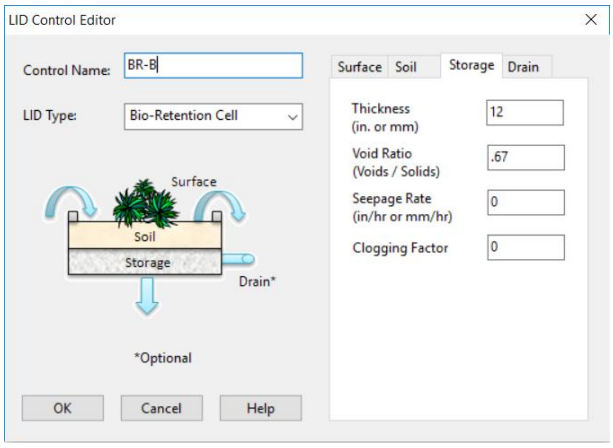


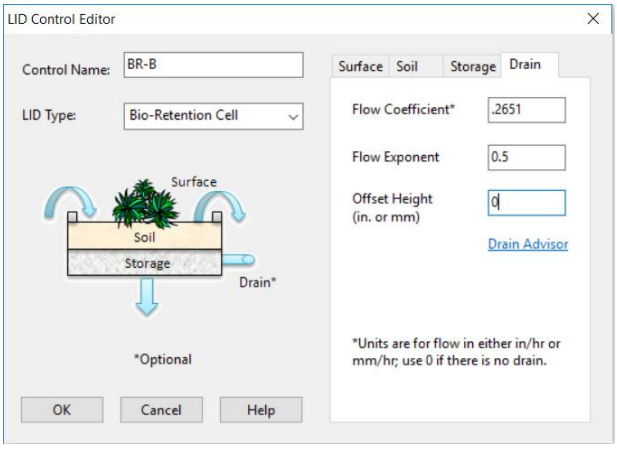
BIOFILTRATION BASIN B



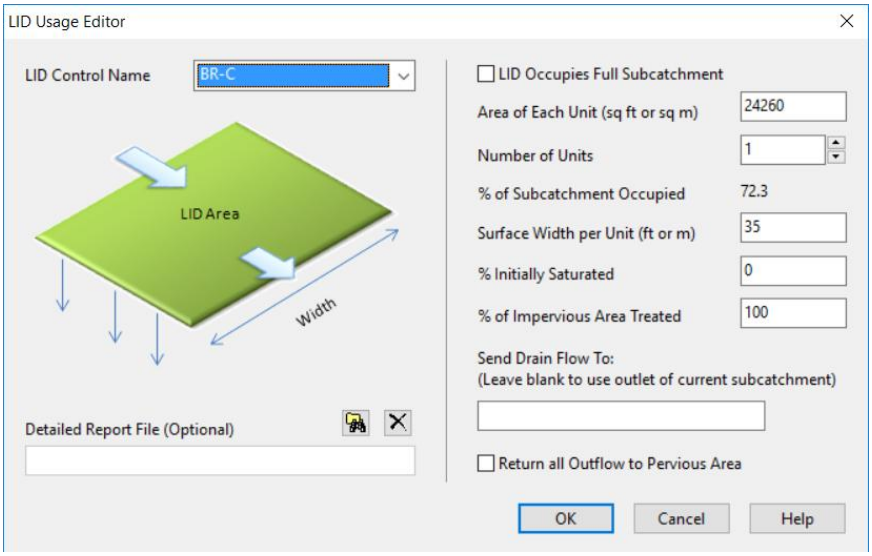


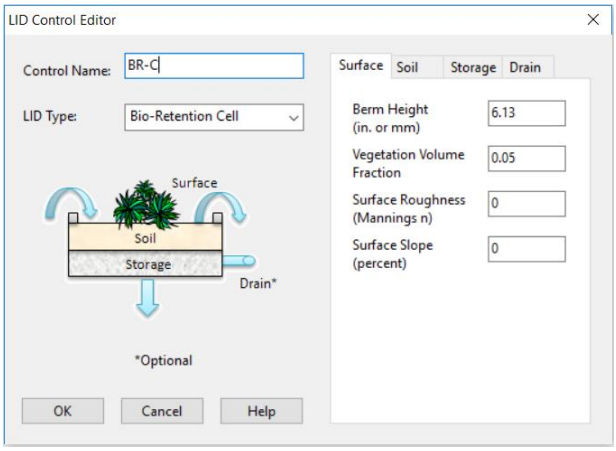


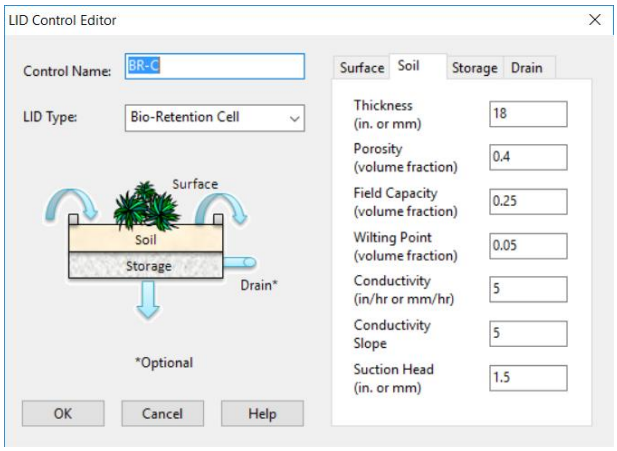


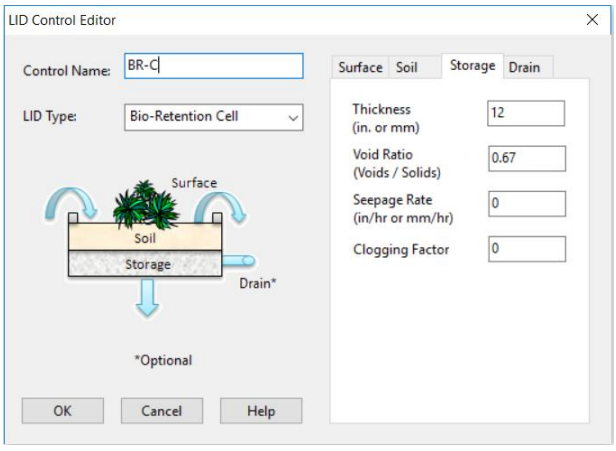


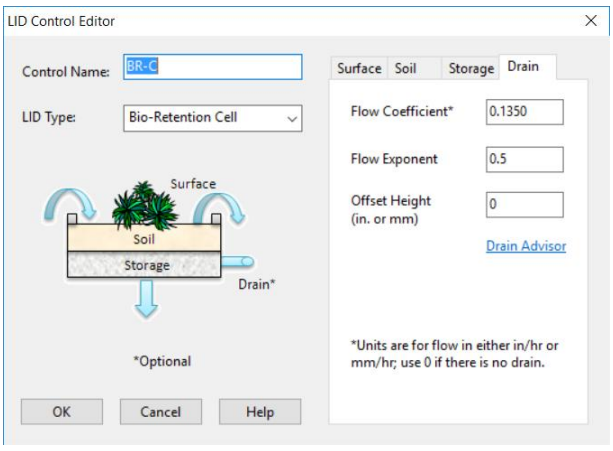
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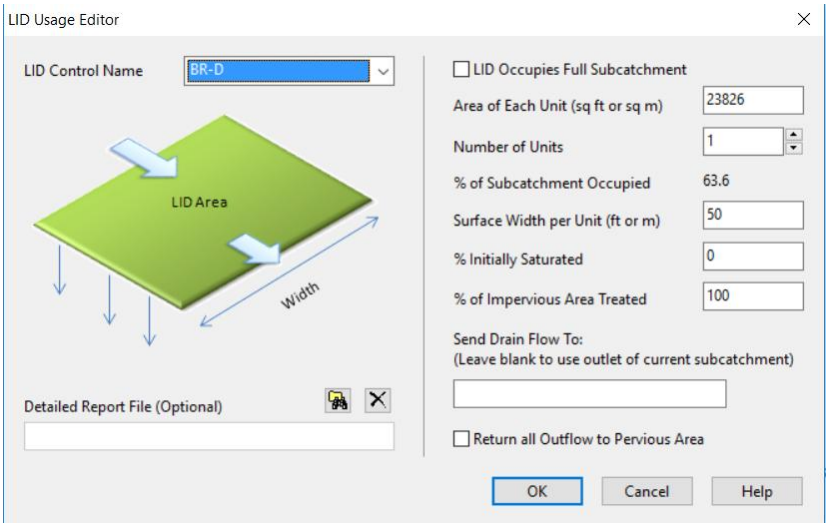


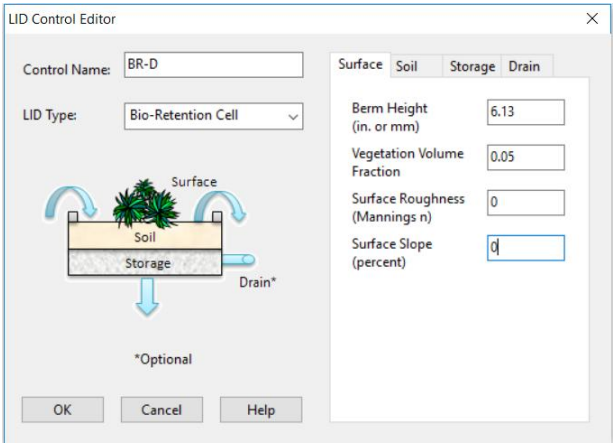


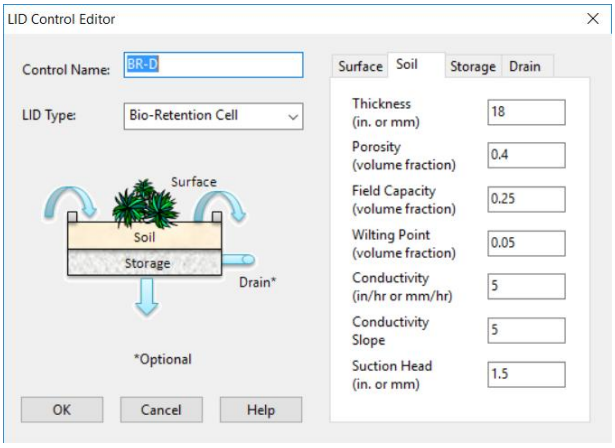


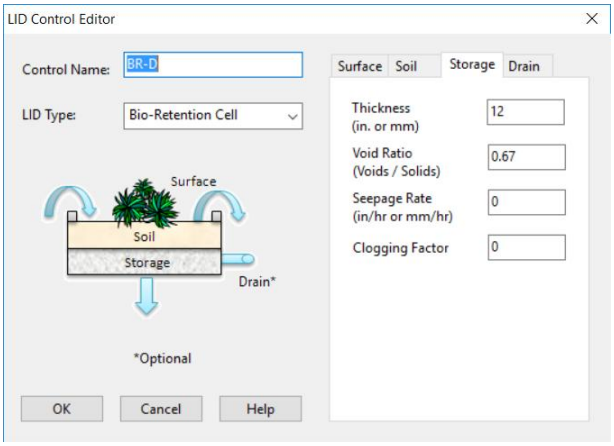


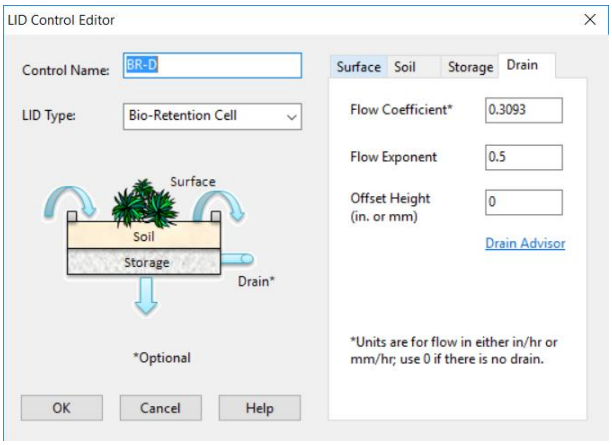
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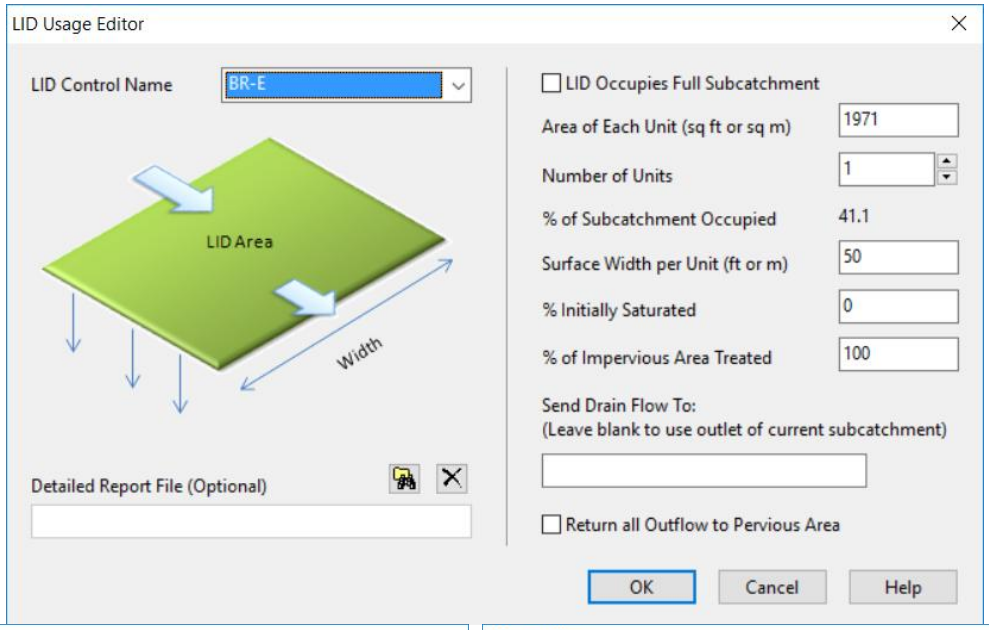


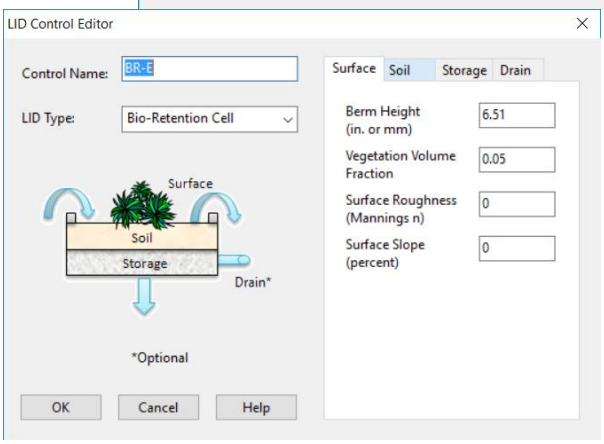


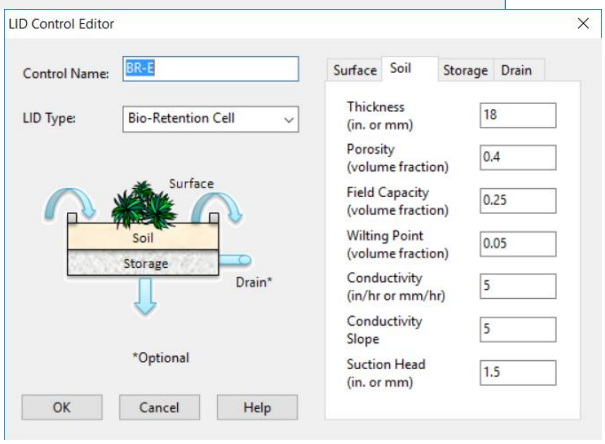


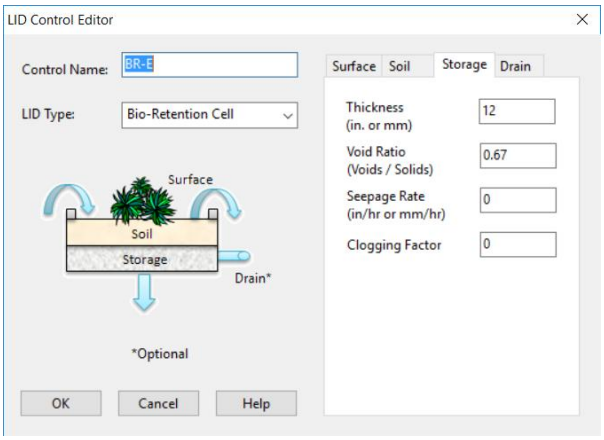


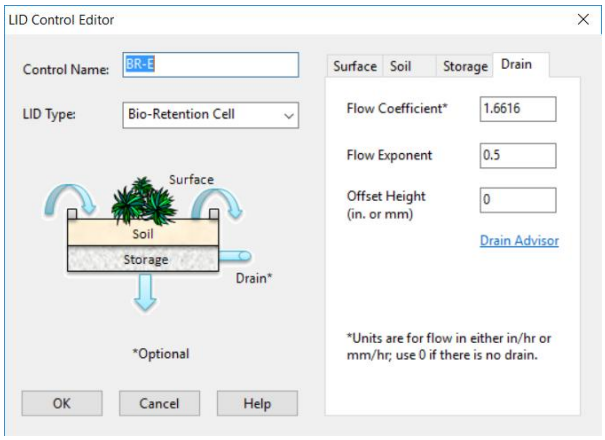
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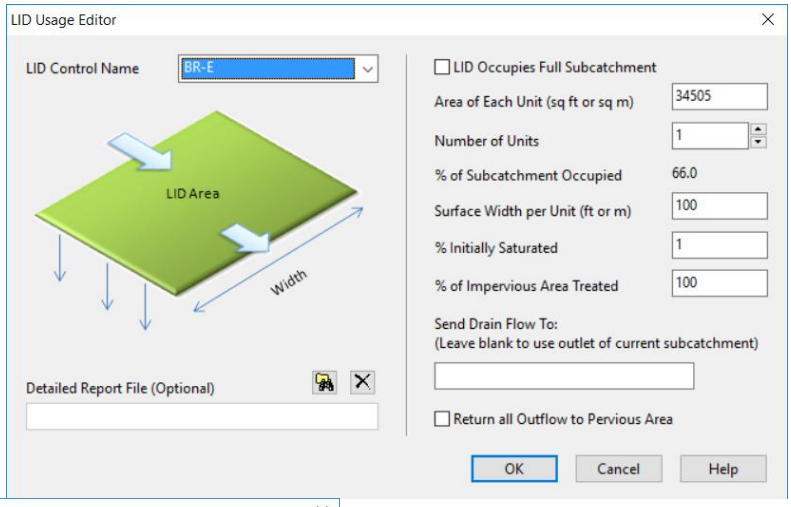


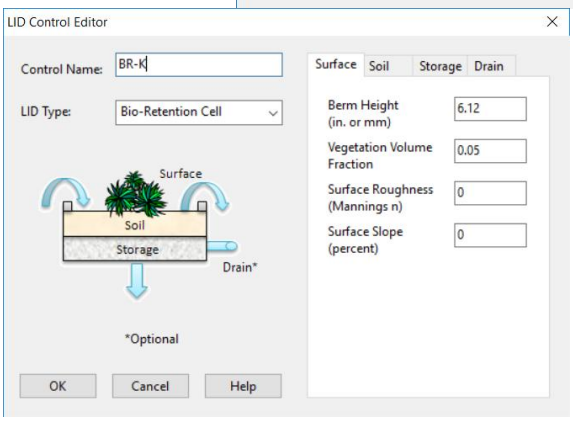


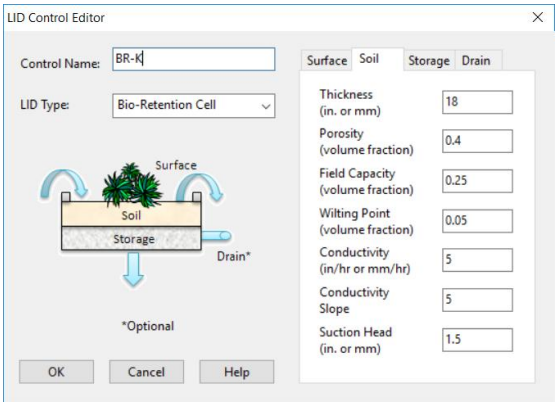


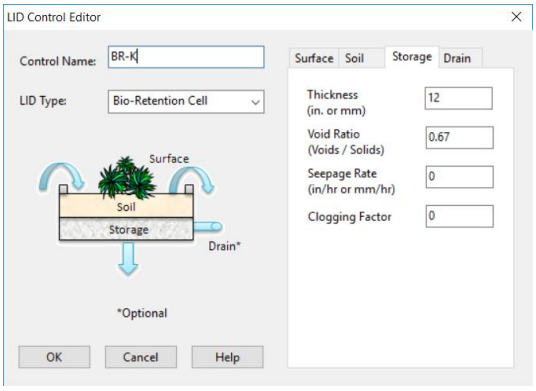
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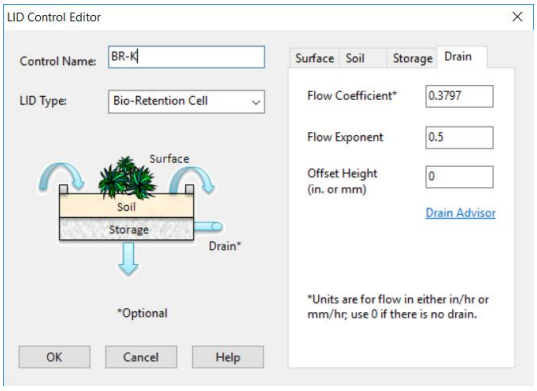
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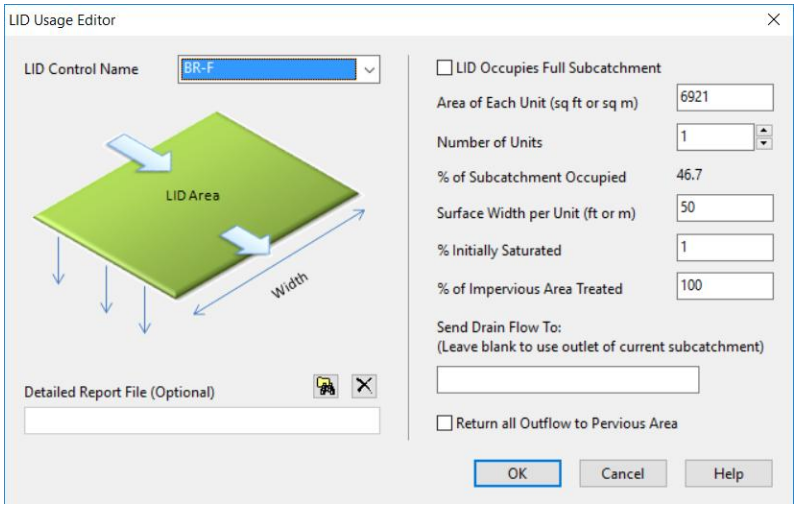


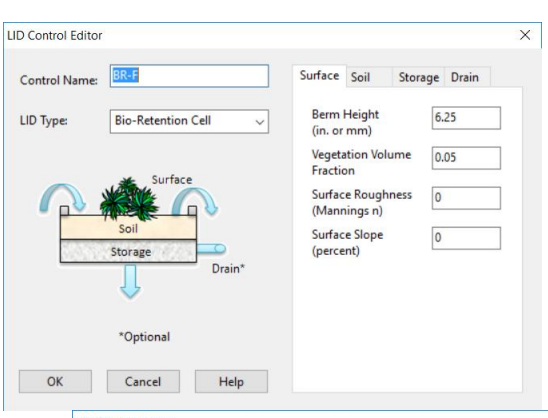


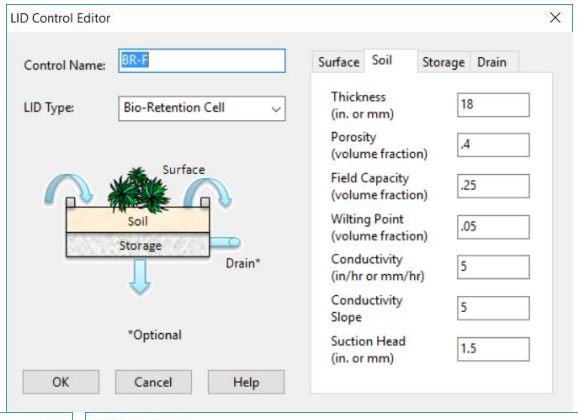


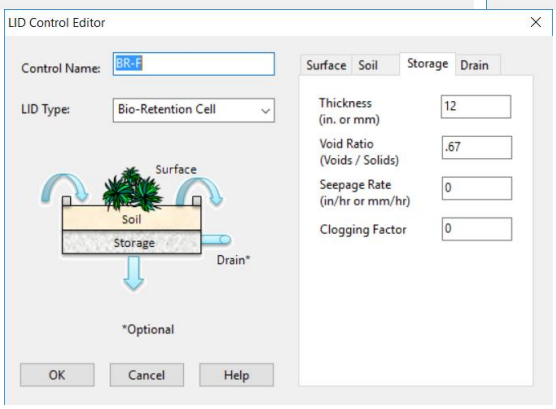


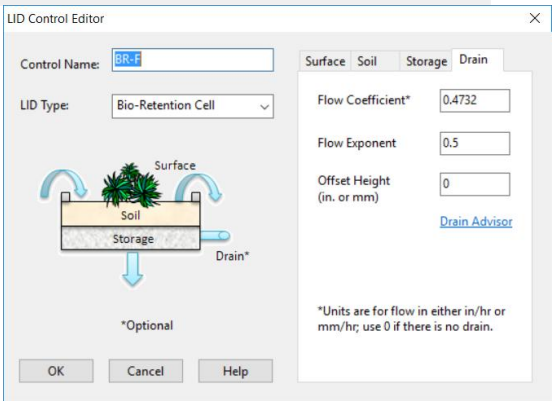
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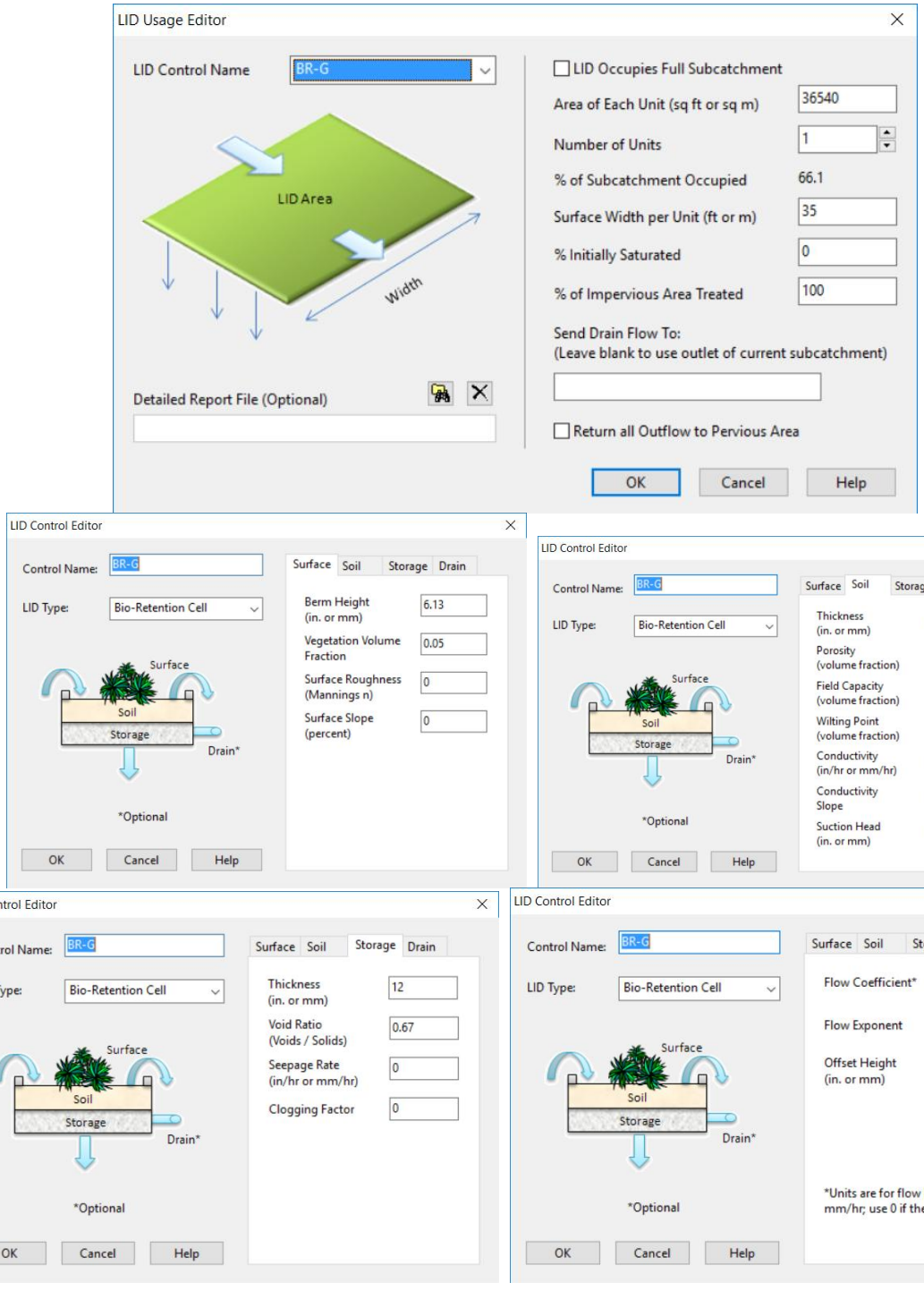




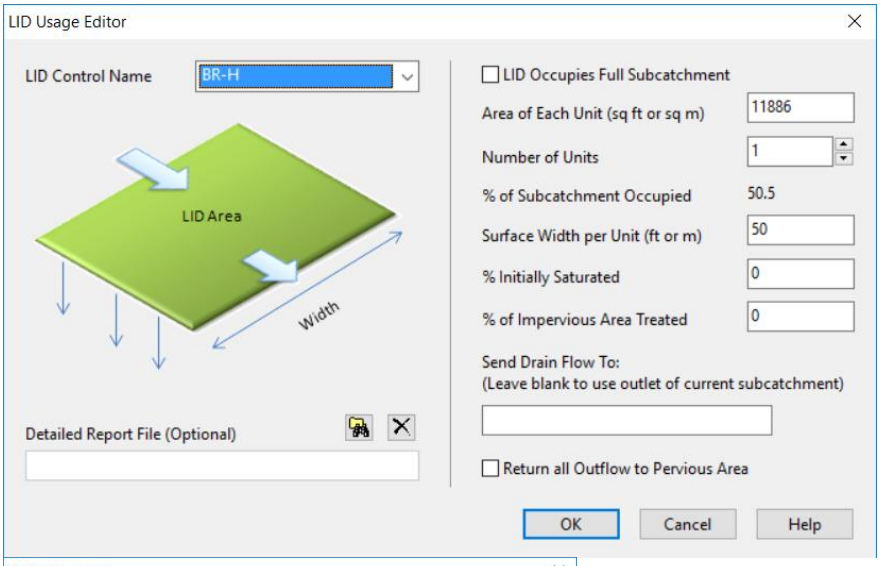


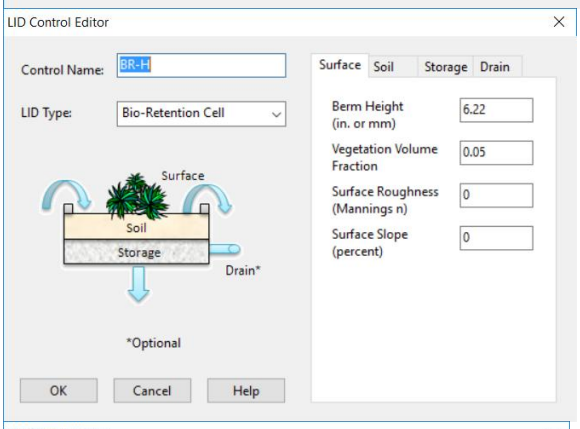


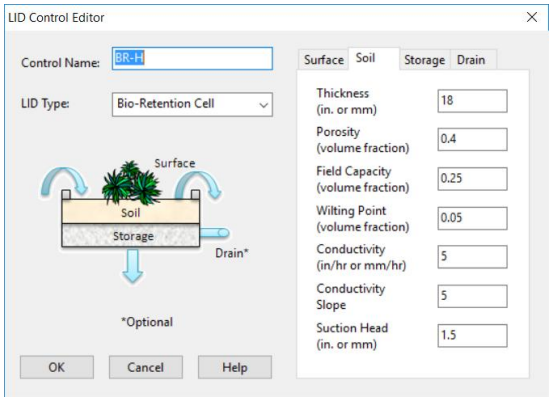
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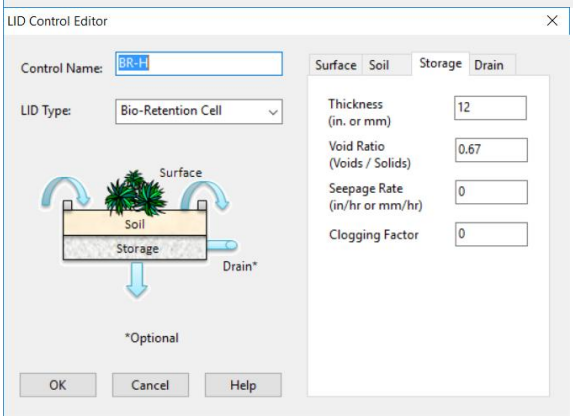


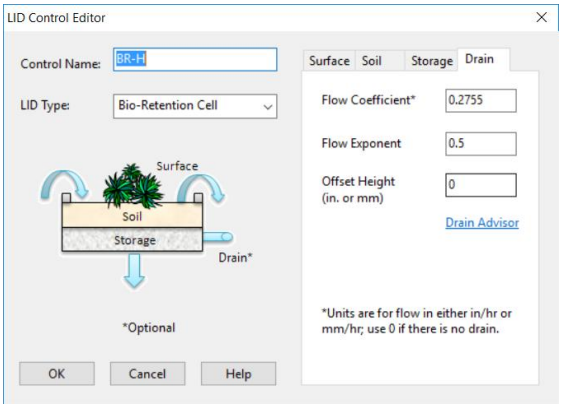
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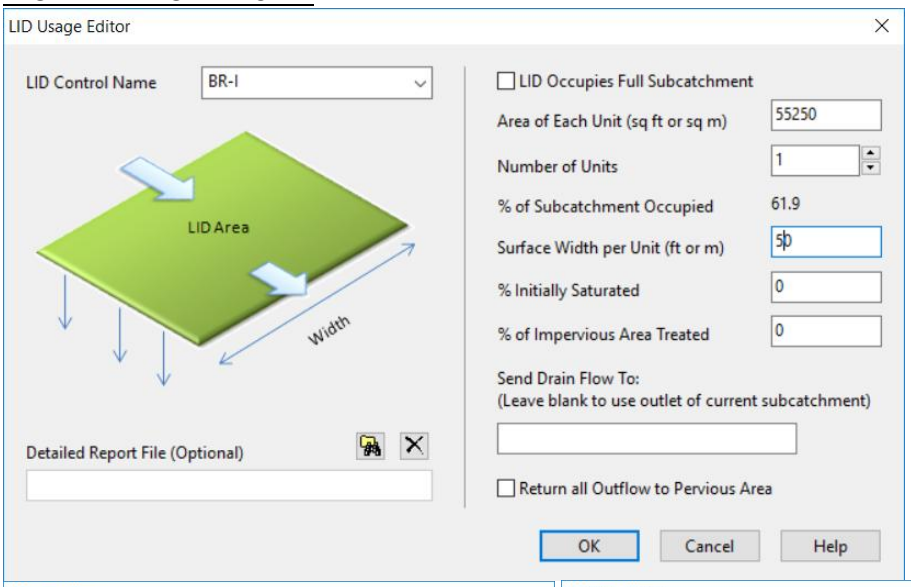


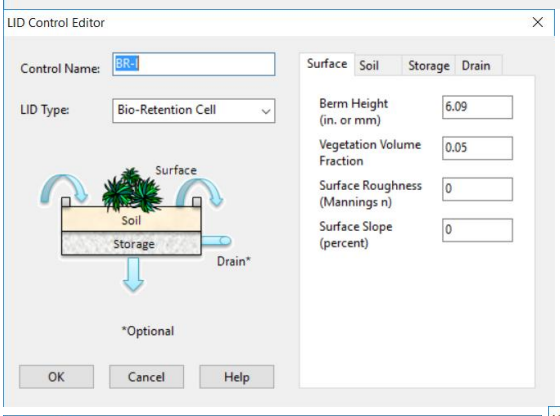


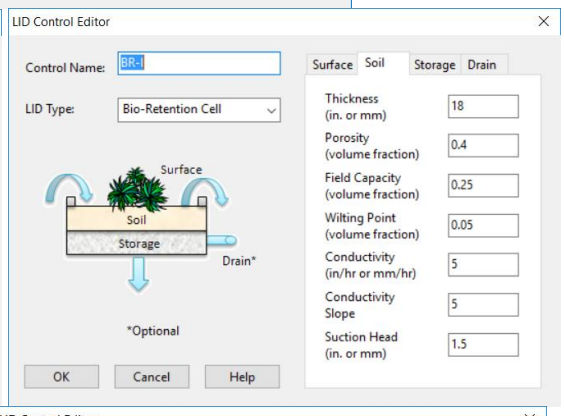


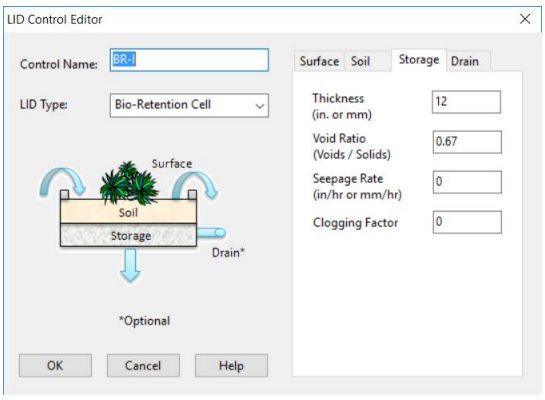


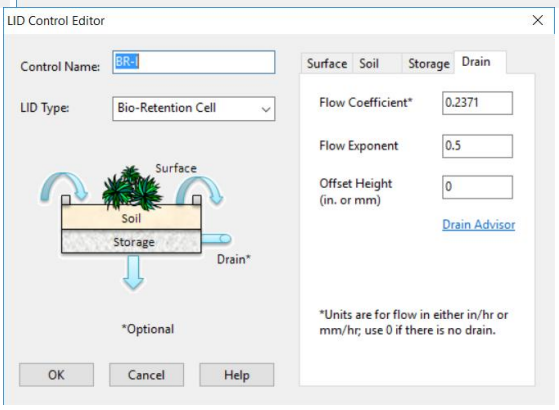
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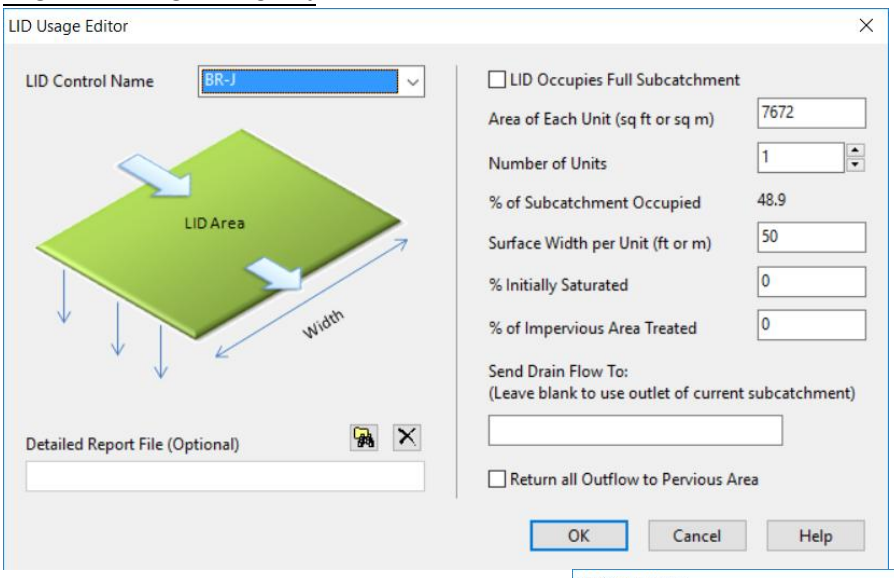


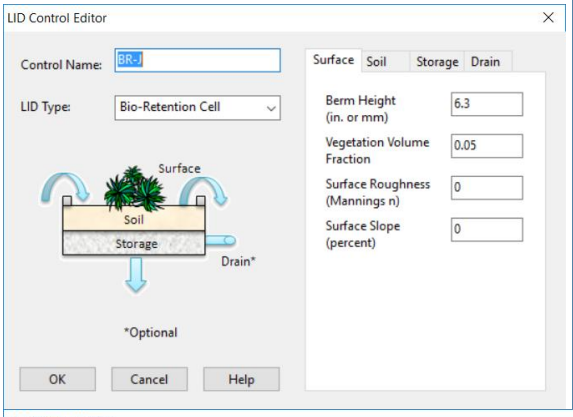


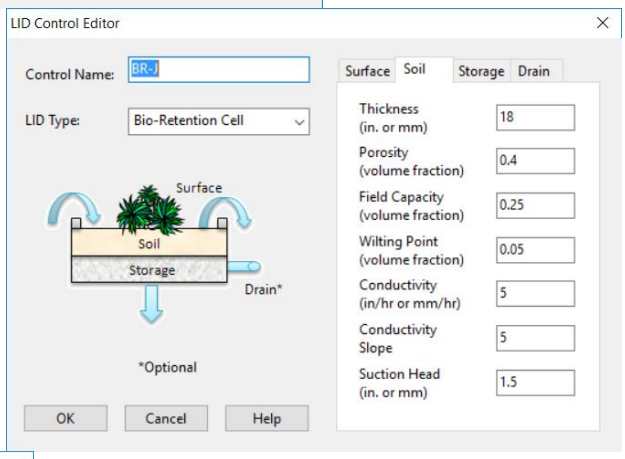


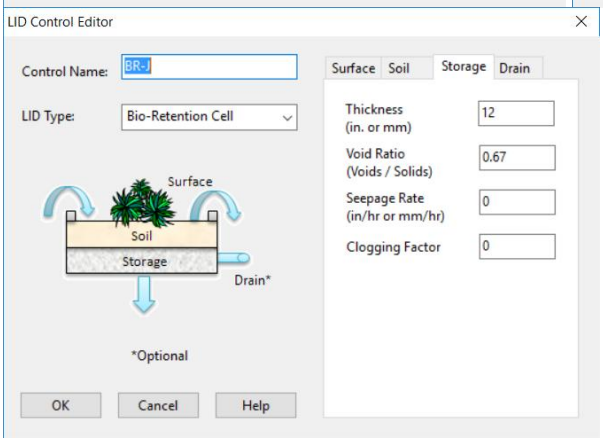


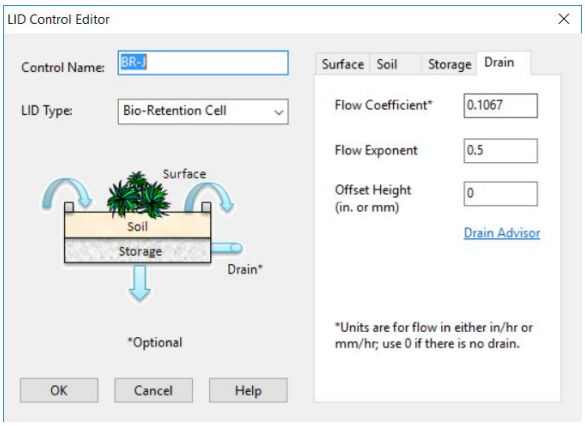
BIOFILTRATION BASIN J





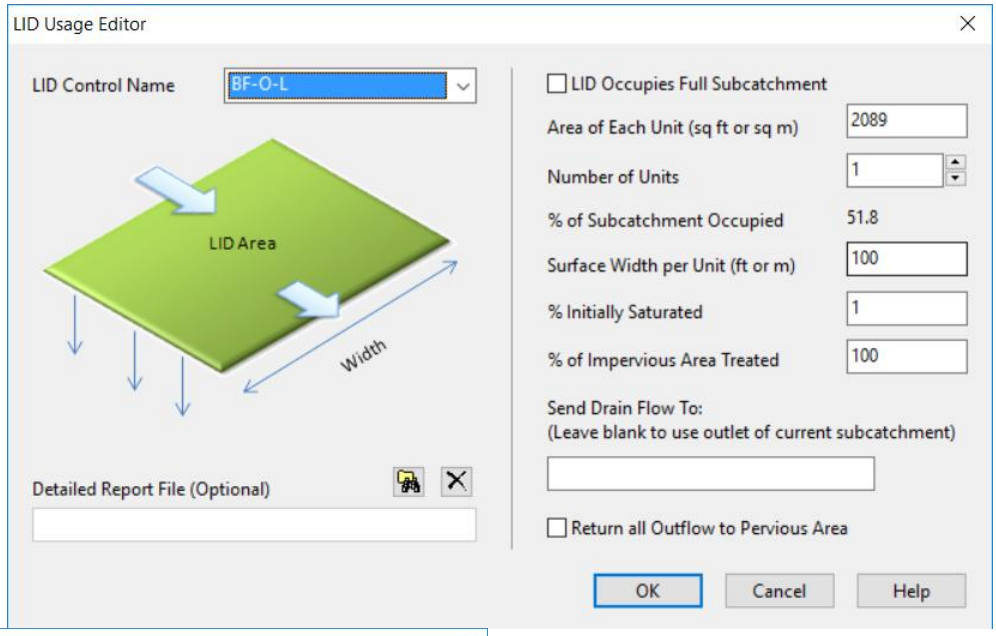


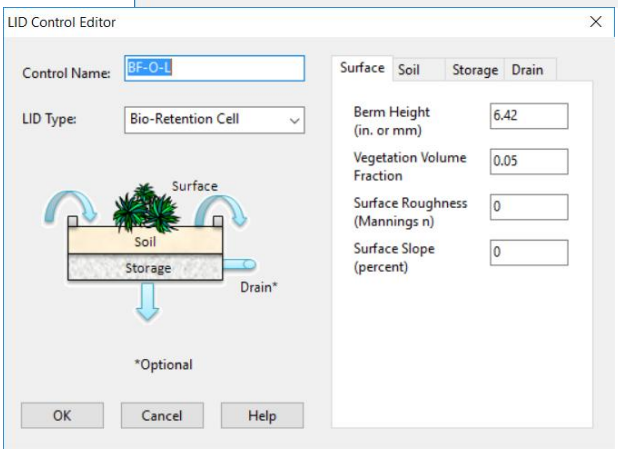


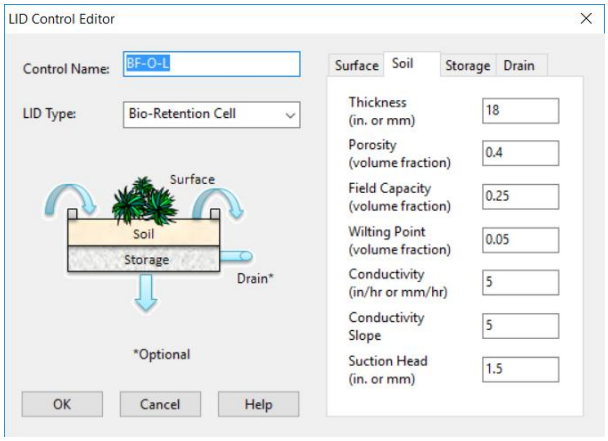


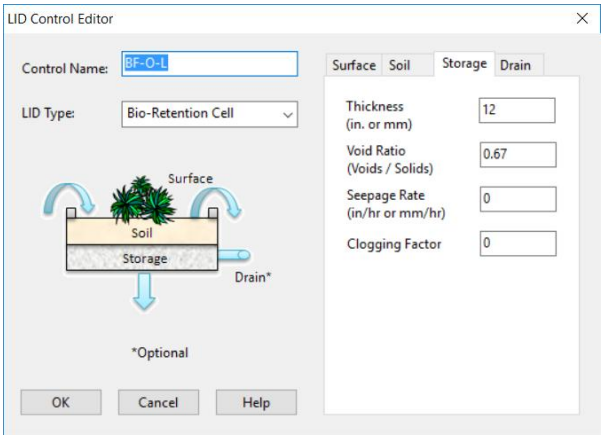
POC3

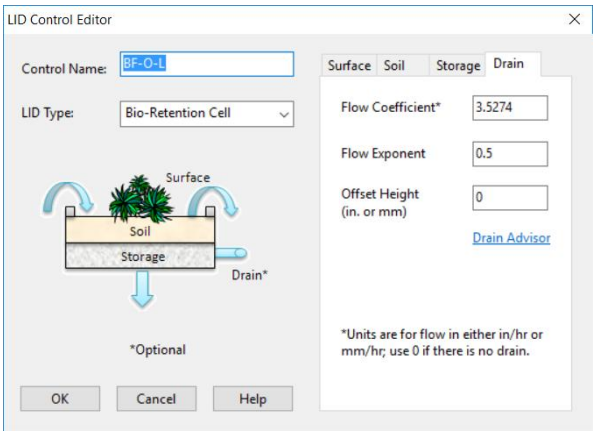
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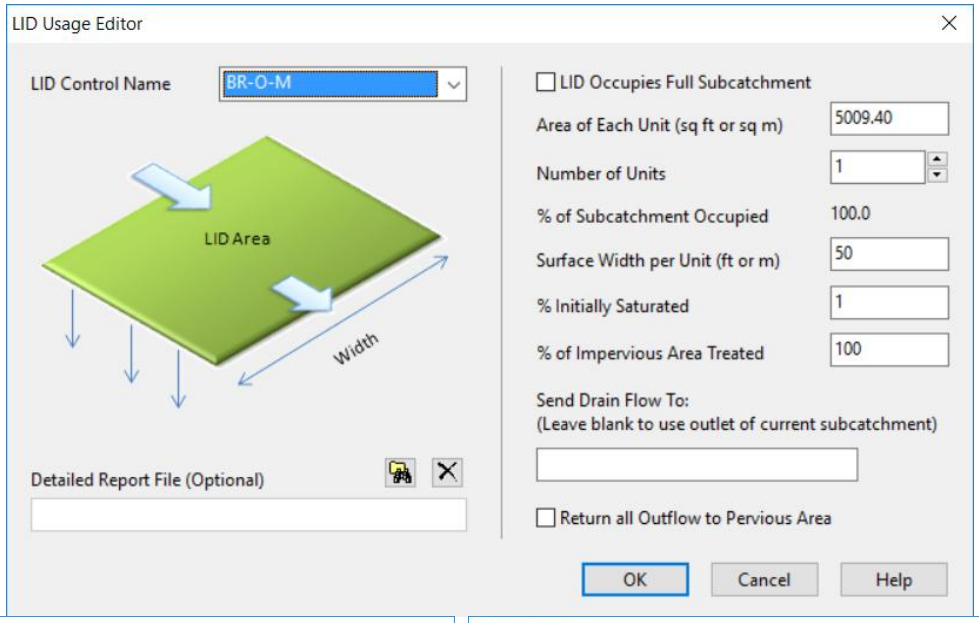


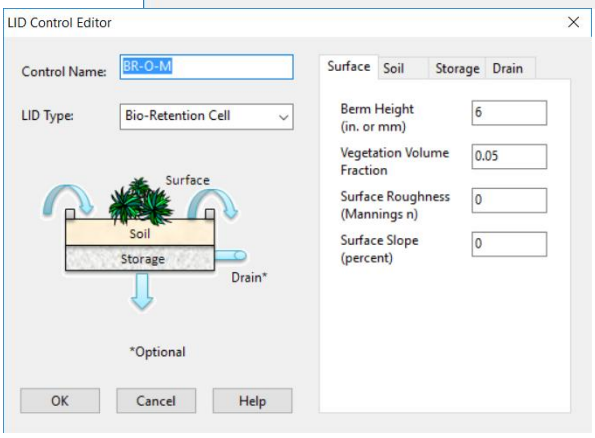


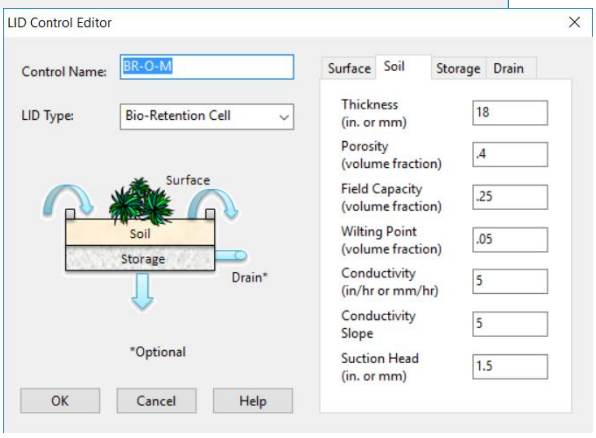


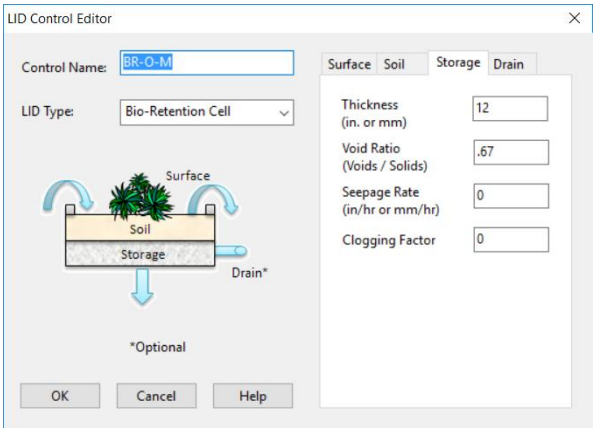
POC4

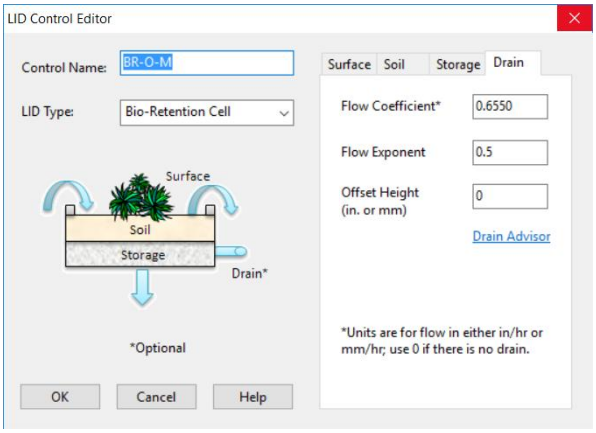
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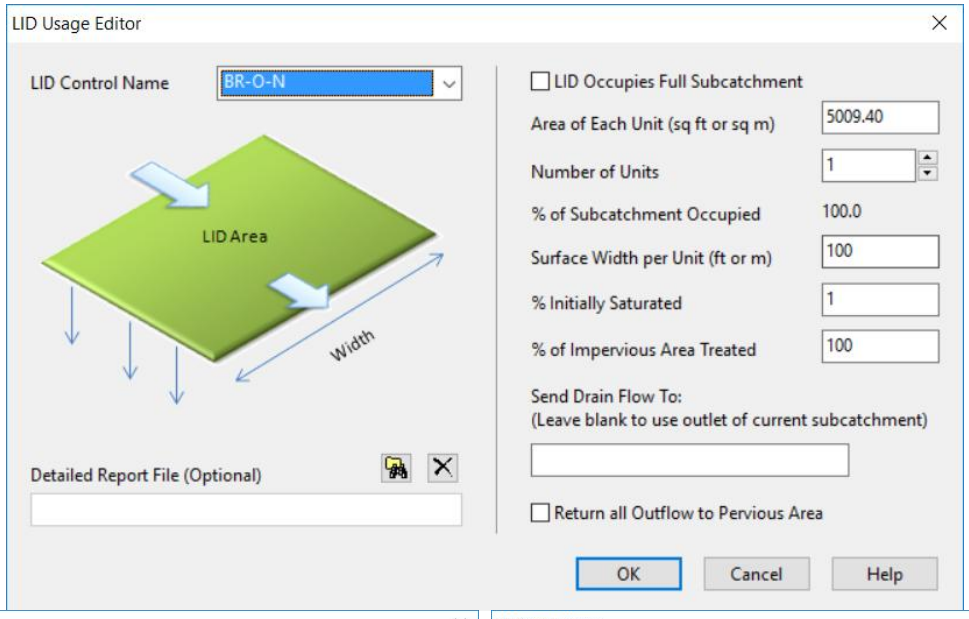


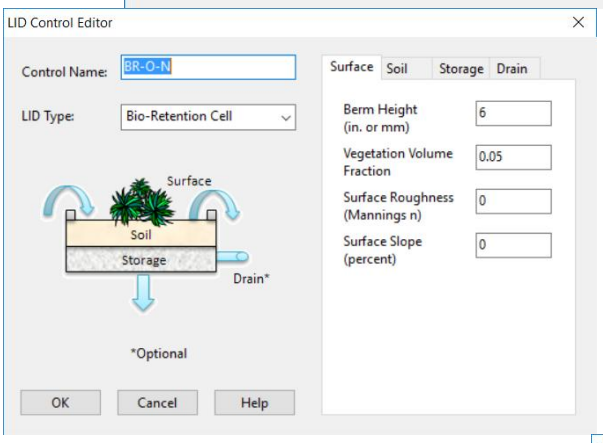


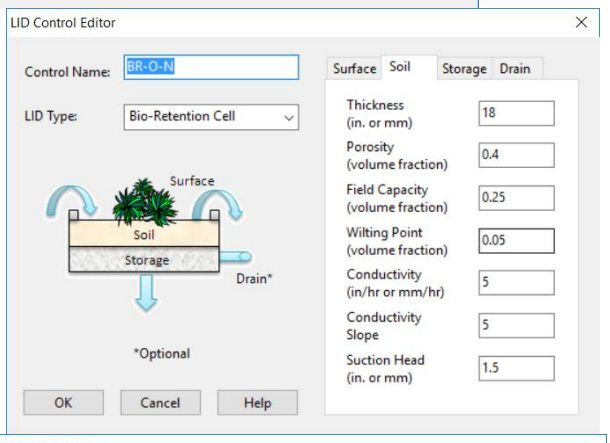


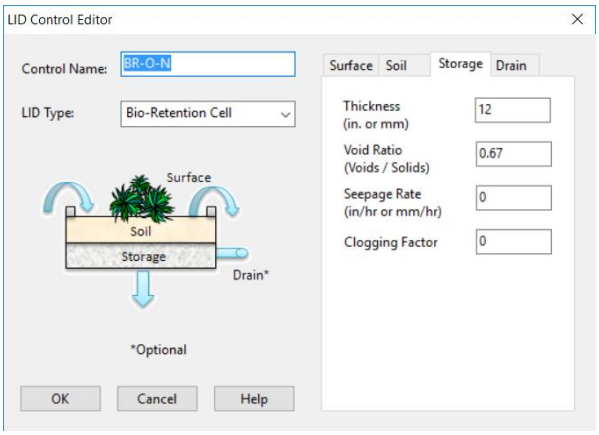


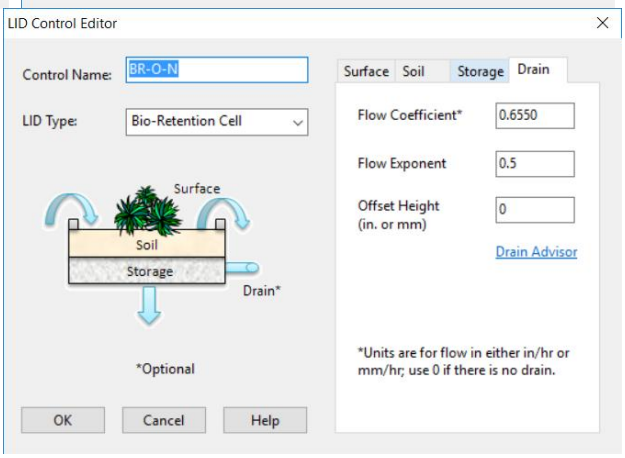
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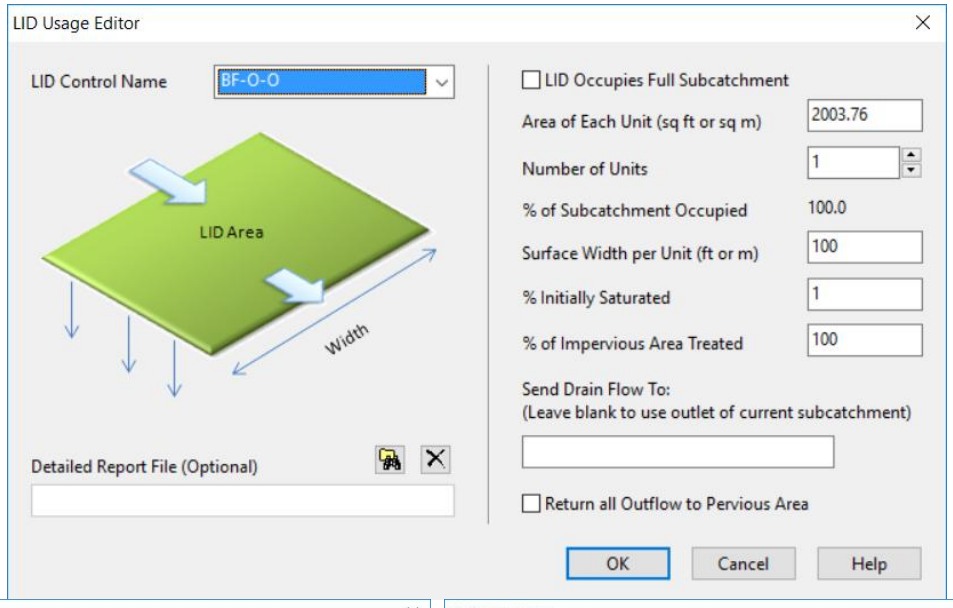


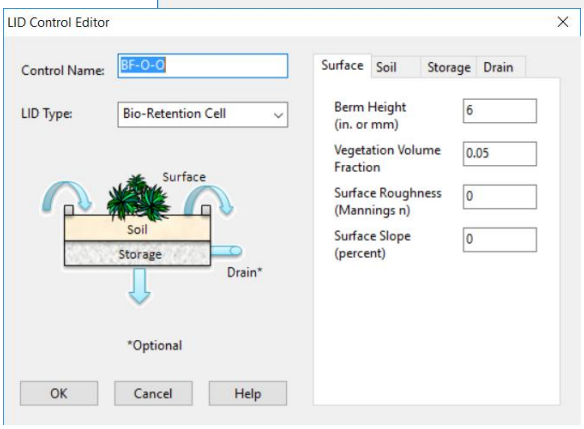


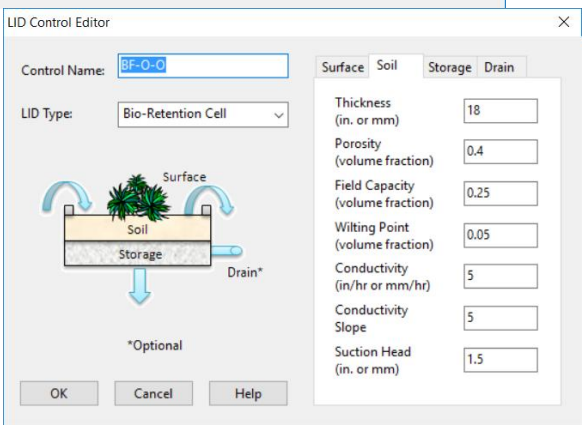


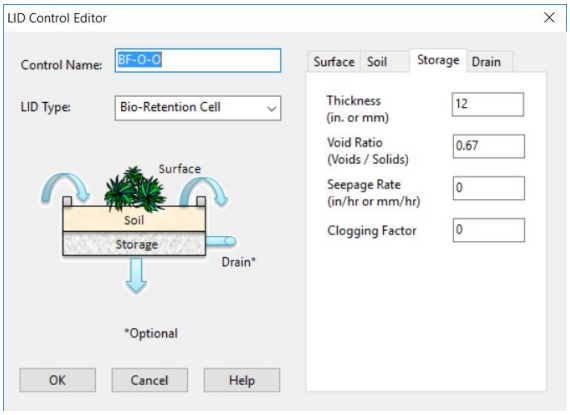
POC5

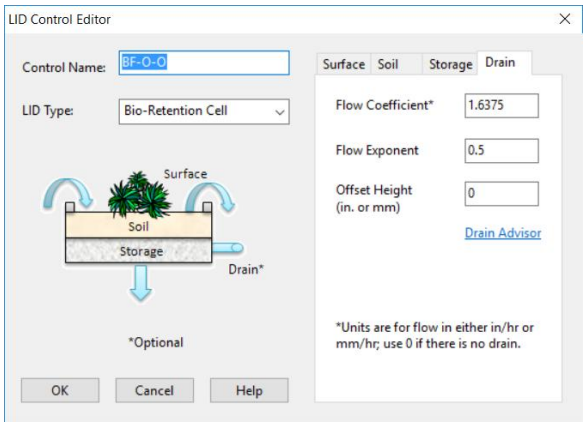
BIOFILTRATION BASIN O-O



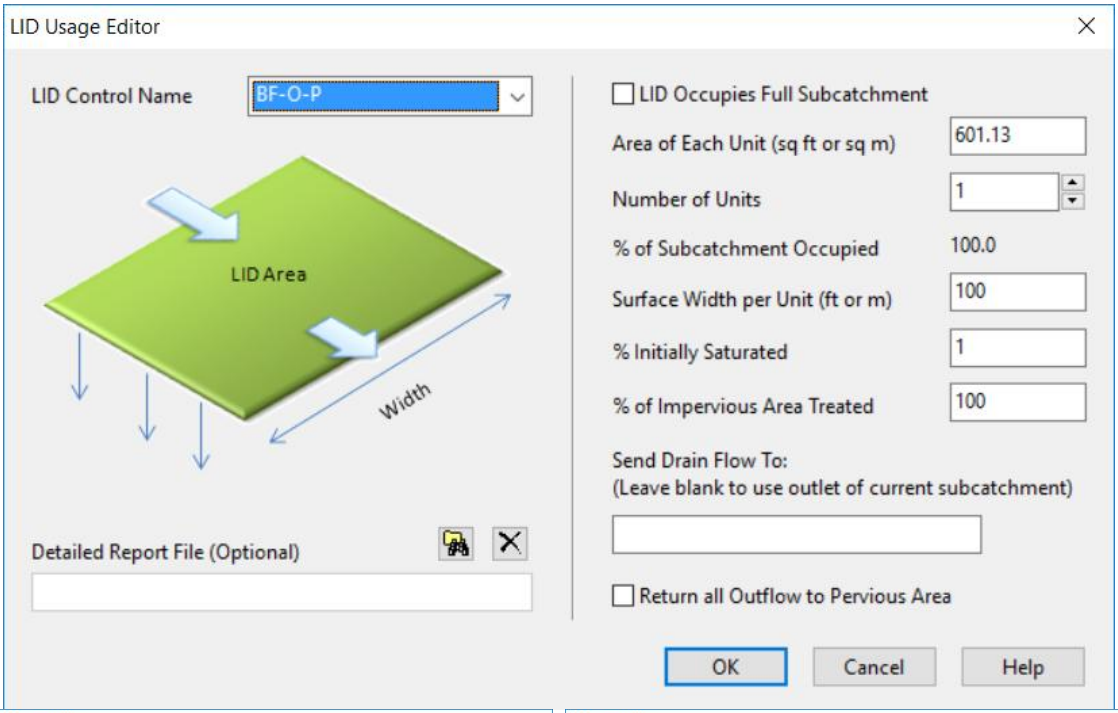


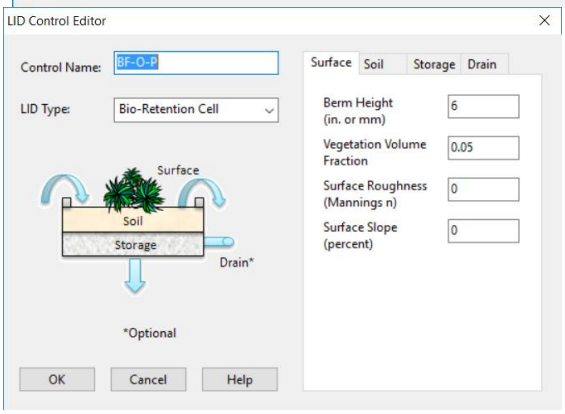


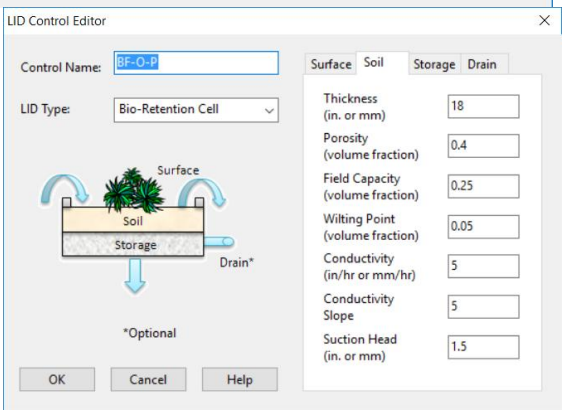


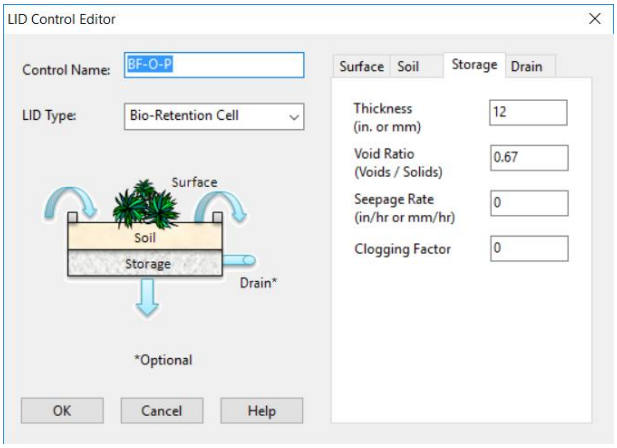


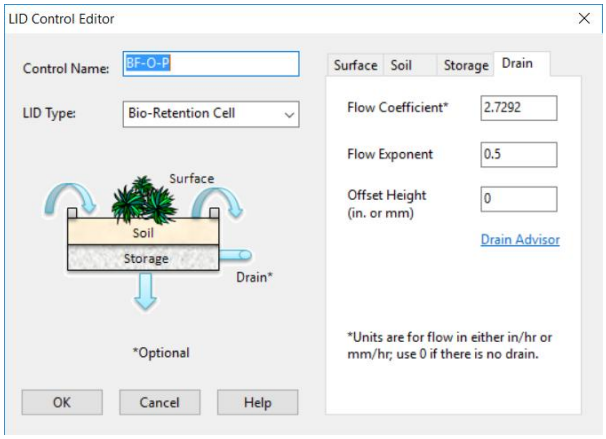
BIOFILTRATION BASIN O-P



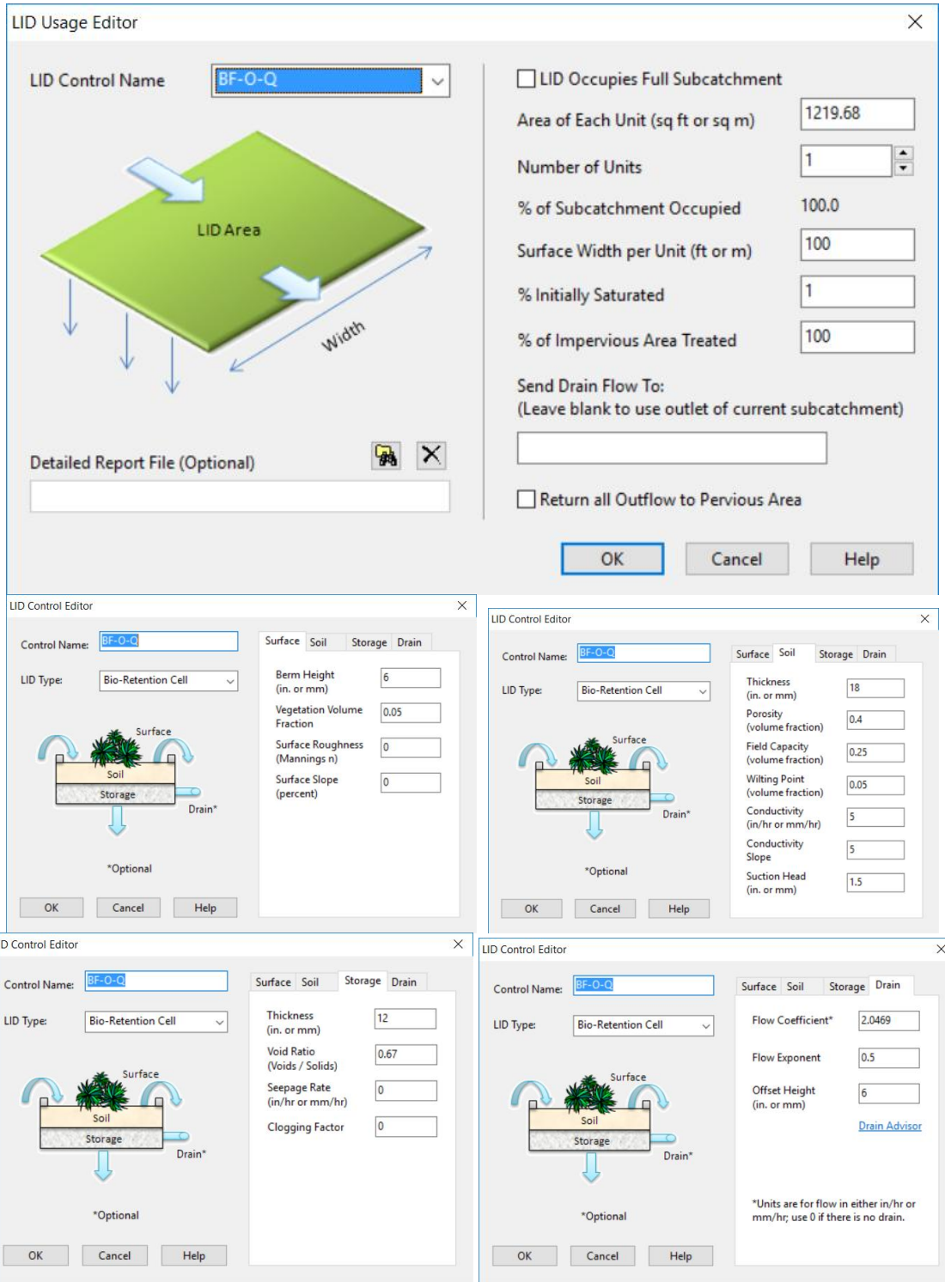




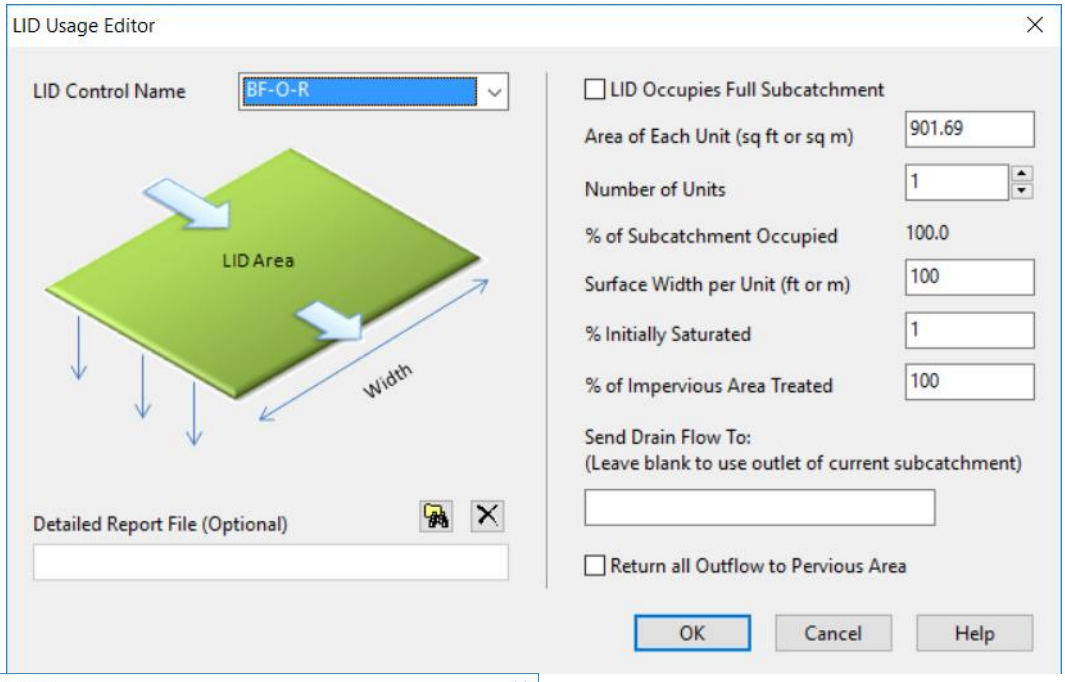


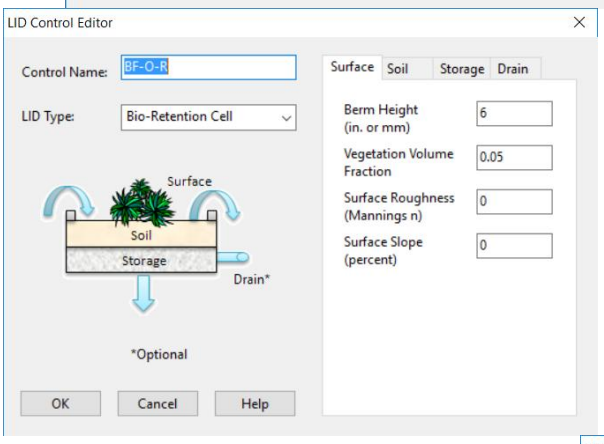


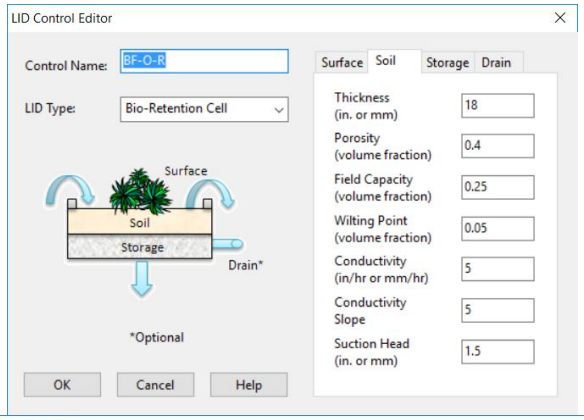
BIOFILTRATION BASIN O-Q

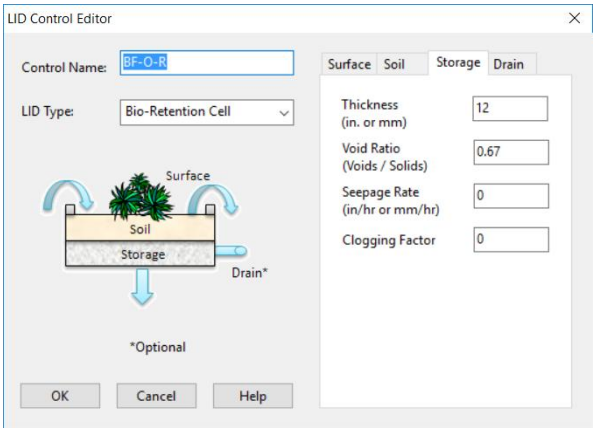


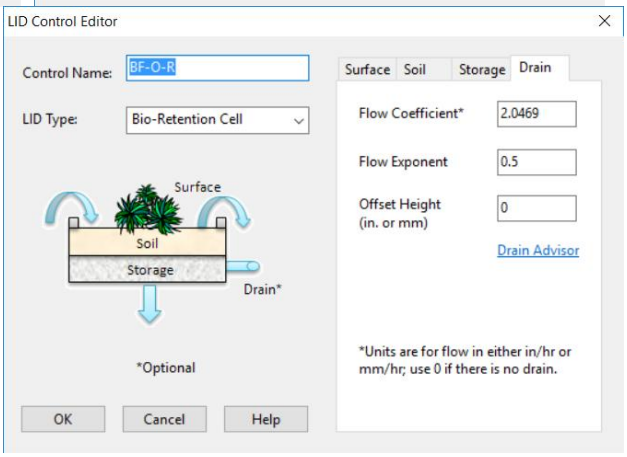
BIOFILTRATION BASIN O-R



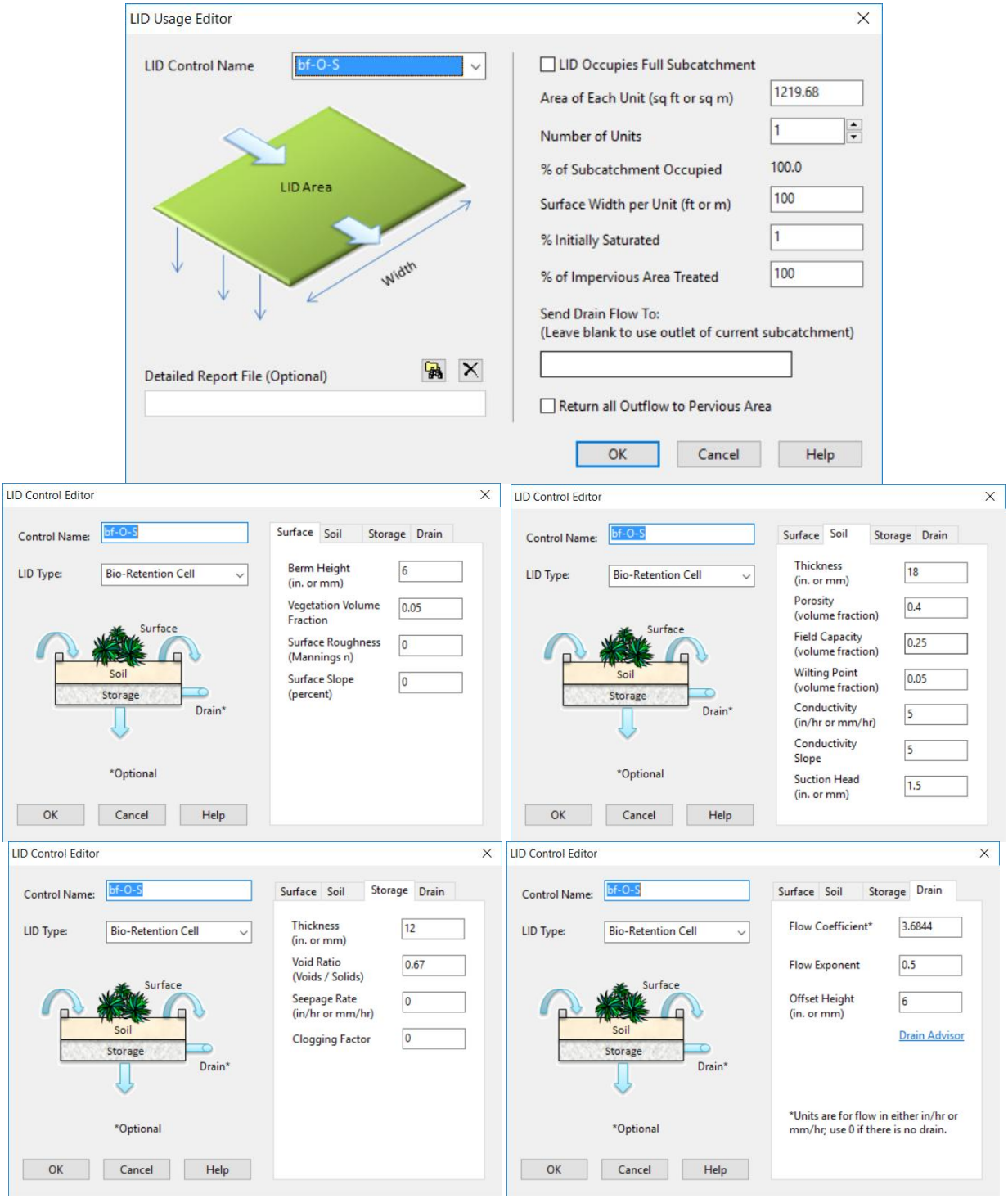








BIOFILTRATION BASIN O-S



LID Control Editor: Explanation of Significant Variables

Height:
The storage depth variable within the SWMM model is representative of the storage volume provided beneath the engineered soil and mulch components of the biofiltration facility. This storage volume is comprised of a gravel located bed beneath a layer of engineered soil.

Porosity:
A porosity value of 0.4 has been selected for the model. The amended soil is to be highly sandy in content in order to have a saturated hydraulic conductivity of approximately 5 in/hr.

H&A considers such a value to be slightly high; however, in order to comply with the HMP Permit, the value recommended by the Copermittees for the porosity of amended soil is 0.4, per Appendix A of the Final Hydromodification Management Plan by Brown & Caldwell, dated March 2011.

Void Ratio:
The ratio of the void volume divided by the soil volume is directly related to porosity as n/(1-n). As the underdrain layer is composed of gravel, a porosity value of 0.4 has been selected, which results in a void ratio of 0.4/(1-0.4) = 0.67 for the gravel detention layer.

Clogging factor:
A clogging factor was not used (0 indicates that there is no clogging assumed within the model). The reason for this is related to the fairness of a comparison with the SDHM model and the HMP sizing tables: a clogging factor was not considered, and instead, a conservative value of infiltration was recommended.

Drain (Flow) coefficient:
The flow coefficient in the SWMM Model is the coefficient needed to transform the orifice equation into a general power law equation of the form:

$$q = C(H - H_D)^n \quad (1)$$

where q is the peak flow in in/hr, n is the exponent (typically 0.5 for orifice equation), H D is the elevation of the centroid of the orifice in inches (assumed equal to the invert of the orifice for small orifices and in our design equal to 0) and H is the depth of the water in inches.

The general orifice equation can be expressed as:

$$Q = \frac{\pi}{4} c_g \frac{D^2}{144} \sqrt{2g \frac{(H - H_D)}{12}} \quad (2)$$

where Q is the peak flow in cfs, D is the diameter in inches, c g is the typical discharge coefficient for orifices (0.61-0.63 for thin walls and around 0.75-0.8 for thick walls), g is the acceleration of gravity in ft/s^2, and H and H D are defined above and are also used in inches in Equation (2).

Cutoff Flow:

This is the only significant variable in the diversion, as the type of diversion is defined by this value. Any excess of flow over this value will be diverted into a pond subroutine (the surface stage of the bio-retention basin) and routed there. The determination of this value equates to the value obtained with equation (2) above, plus 1%, when H = depth of gravel layer and H_D=0 (orifice situated at the datum). Thus, once flows exceed the maximum discharge the LID orifice experiences a head of the storage depth, ponding occurs within the biofiltration basin, routing these additional flows via the pond riser.

POC1

Divider DIV-A

Property	Value
Name	DIV-A
X-Coordinate	921.874
Y-Coordinate	4563.077
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-A
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-B

Property	Value
Name	DIV-B
X-Coordinate	1098.345
Y-Coordinate	4744.434
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-B
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.279
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Initial water depth in junction (ft)

Divider DIV-C

Property	Value
Name	DIV-C
X-Coordinate	1388.879
Y-Coordinate	4806.475
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-C
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-D

Property	Value
Name	DIV-D
X-Coordinate	1547.764
Y-Coordinate	4803.449
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-D
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.401
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-E

Property	Value
Name	DIV-E
X-Coordinate	1803.495
Y-Coordinate	4745.947
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-E
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

User-assigned name of divider

POC2

Divider DIV-K

Property	Value
Name	DIV-K
X-Coordinate	930.380
Y-Coordinate	4521.994
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-K
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-F

Property	Value
Name	DIV-F
X-Coordinate	1098.345
Y-Coordinate	4744.434
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-F
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.098
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

User-assigned name of divider

Divider DIV-G

Property	Value
Name	DIV-G
X-Coordinate	1388.879
Y-Coordinate	4806.475
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-G
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.098
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

User-assigned name of divider

Divider DIV-H

Property	Value
Name	DIV-H
X-Coordinate	1547.764
Y-Coordinate	4803.449
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-H
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	.098
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

User-assigned name of divider

Divider DIV-I

Property	Value
Name	DIV-I
X-Coordinate	1803.495
Y-Coordinate	4745.947
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-I
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.098
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

User-assigned name of divider

Divider DIV-J

Property	Value
Name	DIV-J
X-Coordinate	2035.668
Y-Coordinate	4517.752
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-J
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.098
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

User-assigned name of divider

POC3

Divider DIV-O-L

Property	Value
Name	DIV-O-L
X-Coordinate	921.874
Y-Coordinate	4563.077
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Depth	0
Ponded Area	0
Diverted Link	BYPASS-O-L
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.401
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

POC4

Divider DIV-O-N

Property	Value
Name	DIV-O-N
X-Coordinate	921.874
Y-Coordinate	4563.077
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	BYPASS-O-N
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-O-M

Property	Value
Name	DIV-O-M
X-Coordinate	1098.345
Y-Coordinate	4744.434
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	BYPASS-O-M
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

POC5

Divider DIV-O-O

Property	Value
Name	DIV-O-O
X-Coordinate	921.874
Y-Coordinate	4563.077
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	BYPASS-O-O
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-O-P

Property	Value
Name	DIV-O-P
X-Coordinate	1050.071
Y-Coordinate	4690.861
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	BYPASS-O-P
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.179
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-O-Q

Property	Value
Name	DIV-O-Q
X-Coordinate	1202.140
Y-Coordinate	4724.087
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	BYPASS-O-Q
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.101
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-O-R

Property	Value
Name	DIV-O-R
X-Coordinate	1329.929
Y-Coordinate	4750.922
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	BYPASS-O-R
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.101
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Divider DIV-O-S

Property	Value
Name	DIV-O-S
X-Coordinate	1524.169
Y-Coordinate	4743.255
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Surcharge Dept	0
Ponded Area	0
Diverted Link	bypass-O-S
Type	CUTOFF
Cutoff Divider	
Cutoff Flow	0.101
Tabular Divider	
Curve Name	*
Weir Divider	
Min. Flow	0
Max. Depth	0
Coefficient	0

Discharge coefficient for a WEIR divider

Note:
The complete storage and rating curves and the respective explanation is shown at the end of this appendix. A variable area vs. elevation storage curve was used for the final model, and a discharge that is a function of the outlet structure in the surface was used also.

POC1

BASIN A

Storage Unit Stor-A

Property	Value
Name	Stor-A
X-Coordinate	930.380
Y-Coordinate	4372.188
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4.5
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-A

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-A

Description:

	Depth (ft)	Area (ft2)
1	0	10353
2	0.05	10445
3	0.1	10537
4	0.15	10630
5	0.2	10722
6	0.25	10814
7	0.3	10906
8	0.35	10998
9	0.4	11091
10	0.45	11183
11	0.5	11275

View... Load... Save... OK Cancel Help

Outlet Outlet-A

Property	Value
Name	Outlet-A
Inlet Node	Stor-A
Outlet Node	POC1-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-A

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-A

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.05	0.01
3	0.1	0.01
4	0.15	0.02
5	0.2	0.02
6	0.25	0.02
7	0.3	0.03
8	0.35	0.03
9	0.4	0.03
10	0.45	0.03
11	0.5	0.04

View... Load... Save... OK Cancel Help

BASIN B

Storage Unit Stor-B

Property	Value
Name	Stor-B
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-B

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-B

Description:

	Depth (ft)	Area (ft2)
1	0	20224
2	0.05	20316
3	0.1	20408
4	0.15	20500
5	0.2	20592
6	0.25	20684
7	0.3	20776
8	0.35	20868
9	0.4	20960
10	0.45	21052
11	0.5	21144

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Outlet Outlet-B

Property	Value
Name	Outlet-B
Inlet Node	Stor-B
Outlet Node	POC1-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-B

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-B

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.05	0.01
3	0.1	0.01
4	0.15	0.02
5	0.2	0.02
6	0.25	0.02
7	0.3	0.03
8	0.35	0.03
9	0.4	0.03
10	0.45	0.03
11	0.5	0.04

View... Load... Save... OK Cancel Help

BASIN C

Storage Unit Stor-C

Property	Value
Name	Stor-C
X-Coordinate	1295.061
Y-Coordinate	4670.287
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-C

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-C

Description:

	Depth (ft)	Area (ft2)
1	0	15941
2	0.25	16371
3	0.5	16800
4	0.75	17254
5	1	17707
6	1.25	18161
7	1.5	18614
8	1.75	19083
9	2	19552
10	2.25	20020
11	2.5	20489

View... Load... Save... OK Cancel Help

Outlet Outlet-C

Property	Value
Name	Outlet-C
Inlet Node	Stor-C
Outlet Node	POC1-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-C

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-C

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.05	0.01
3	0.1	0.01
4	0.15	0.02
5	0.2	0.02
6	0.25	0.02
7	0.3	0.03
8	0.35	0.03
9	0.4	0.03
10	0.45	0.03
11	0.5	0.04

View... Load... Save... OK Cancel Help

BASIN D

Storage Unit Stor-D

Property	Value
Name	Stor-D
X-Coordinate	1621.911
Y-Coordinate	4658.182
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-D

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-C

Description:

	Depth (ft)	Area (ft2)
1	0	25274
2	0.05	25375
3	0.1	25477
4	0.15	25578
5	0.2	25679
6	0.25	25781
7	0.3	25882
8	0.35	25983
9	0.4	26084
10	0.45	26186
11	0.5	26287

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Outlet Outlet-D

Property	Value
Name	Outlet-D
Inlet Node	Stor-D
Outlet Node	POC1-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	FUNCTIONAL/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	*

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-D

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.05	0.01
3	0.1	0.01
4	0.15	0.02
5	0.2	0.02
6	0.25	0.02
7	0.3	0.03
8	0.35	0.03
9	0.4	0.03
10	0.45	0.03
11	0.5	0.04

View... Load... Save... OK Cancel Help

BASIN E

Storage Unit Stor-E

Property	Value
Name	Stor-E
X-Coordinate	1801.982
Y-Coordinate	4576.469
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4.5
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-E

User-assigned name of storage unit

Storage Curve Editor

Curve Name: BASIN-E

Description:

	Depth (ft)	Area (ft2)
1	0	15672
2	0.25	16111
3	0.5	16550
4	0.75	16999
5	1	17448
6	1.25	17896
7	1.5	18345
8	1.75	18814
9	2	19282
10	2.25	19751
11	2.5	20219

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Outlet Outlet-E

Property	Value
Name	Outlet-E
Inlet Node	Stor-E
Outlet Node	POC1-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Dishc-E

User-assigned name of outlet

Rating Curve Editor

Curve Name: Dishc-E

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.25	0.0872
3	0.5	0.1379
4	0.75	0.1744
5	1	0.2045
6	1.25	0.2307
7	1.5	0.2542
8	1.75	0.2757
9	2	0.2957
10	2.25	0.3144
11	2.5	0.3320

View... Load... Save... OK Cancel Help

POC2

BASIN K

Storage Unit Stor-K

Property	Value
Name	Stor-K
X-Coordinate	930.380
Y-Coordinate	4372.188
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	6
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-K

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-K

Description:

	Depth (ft)	Area (ft2)
1	0	35882
2	0.25	36571
3	0.5	37259
4	0.75	37970
5	1	38681
6	1.25	39392
7	1.5	40103
8	1.75	40827
9	2	41551
10	2.25	42274
11	2.5	42998

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Outlet Outlet-K

Property	Value
Name	Outlet-K
Inlet Node	Stor-K
Outlet Node	POC2-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-K

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-K

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.25	0.17
3	0.5	0.28
4	0.75	0.35
5	1	0.41
6	1.25	0.46
7	1.5	0.51
8	1.75	0.55
9	2	0.59
10	2.25	0.63
11	2.5	0.66

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BASIN F

Storage Unit Stor-F

Property	Value
Name	Stor-F
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	4
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-F

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-F

Description:

	Depth (ft)	Area (ft2)
1	0	7490
2	0.05	7547
3	0.1	7604
4	0.15	7661
5	0.2	7718
6	0.25	7775
7	0.3	7831
8	0.35	7888
9	0.4	7945
10	0.45	8002
11	0.5	8059

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Outlet Outlet-F

Property	Value
Name	Outlet-F
Inlet Node	Stor-F
Outlet Node	POC2-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-F

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-F

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.25	0.04
3	0.5	0.07
4	0.75	0.09
5	1	0.10
6	1.25	0.12
7	1.5	0.13
8	1.75	0.14
9	2	0.15
10	2.25	3.10
11	2.5	8.48

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BASIN G

Conduit BYPASS-G

Property	Value
Name	BYPASS-G
Inlet Node	DIV-G
Outlet Node	Stor-G
Description	
Tag	
Shape	DUMMY
Max. Depth	0
Length	400
Roughness	0.01
Inlet Offset	0
Outlet Offset	0
Initial Flow	0
Maximum Flow	0
Entry Loss Coeff.	0
Exit Loss Coeff.	0
Avg. Loss Coeff.	0
Seepage Loss Rate	0
Flap Gate	NO
Culvert Code	

User-assigned name of Conduit

Storage Curve Editor

Curve Name: Basin-G

Description:

	Depth (ft)	Area (ft2)
1	0	38066
2	0.05	38218
3	0.1	38371
4	0.15	38523
5	0.2	38676
6	0.25	38828
7	0.3	38981
8	0.35	39133
9	0.4	39286
10	0.45	39438
11	0.5	39591

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Outlet Outlet-G

Property	Value
Name	Outlet-G
Inlet Node	Stor-G
Outlet Node	POC2-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-G

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-G

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.25	0.04
3	0.5	0.07
4	0.75	1.53
5	1	4.43
6	1.25	6.01
7	1.5	7.25
8	1.75	9.03
9	2	11.41
10	2.25	13.05
11	2.5	17.39

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BASIN H

Storage Unit Stor-H

Property	Value
Name	Stor-H
X-Coordinate	1621.911
Y-Coordinate	4658.182
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-H

X coordinate of storage unit on study area map

Storage Curve Editor

Curve Name: BASIN-H

Description:

	Depth (ft)	Area (ft2)
1	0	12749
2	0.05	12835
3	0.1	12921
4	0.15	13007
5	0.2	13094
6	0.25	13180
7	0.3	13266
8	0.35	13352
9	0.4	13439
10	0.45	13525
11	0.5	13611

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Outlet Outlet-H

Property	Value
Name	Outlet-H
Inlet Node	Stor-H
Outlet Node	POC2-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-H

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-H

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.25	0.52
3	0.5	0.83
4	0.75	2.02
5	1	2.99
6	1.25	3.66
7	1.5	4.22
8	1.75	4.71
9	2	5.16
10	2.25	5.56
11	2.5	5.94

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BASIN I

Storage Unit Stor-I

Property	Value
Name	Stor-I
X-Coordinate	1801.982
Y-Coordinate	4576.469
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	BASIN-I

X coordinate of storage unit on study area map

Storage Curve Editor

Curve Name: BASIN-I

Description:

	Depth (ft)	Area (ft2)
1	0	56977
2	0.05	57150
3	0.1	57322
4	0.15	57495
5	0.2	57667
6	0.25	57840
7	0.3	58013
8	0.35	58185
9	0.4	58358
10	0.45	58530
11	0.5	58703

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Outlet Outlet-I

Property	Value
Name	Outlet-I
Inlet Node	Stor-I
Outlet Node	POC2-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Dishc-I

User-assigned name of outlet

Rating Curve Editor

Curve Name: Dishc-I

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.25	0.04
3	0.5	0.07
4	0.75	0.57
5	1	0.99
6	1.25	1.26
7	1.5	1.48
8	1.75	2.90
9	2	4.80
10	2.25	5.91
11	2.5	6.82

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BASIN J

Storage Unit Stor-J

Property	Value
Name	Stor-J
X-Coordinate	2051.659
Y-Coordinate	4376.727
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	FUNCTIONAL
Functional Curve	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	*

X coordinate of storage unit on study area map

Storage Curve Editor

Curve Name: BASIN-J

Description:

	Depth (ft)	Area (ft2)
1	0	8434
2	0.25	8815
3	0.5	9196
4	0.75	9600
5	1	10005
6	1.25	10409
7	1.5	10813
8	1.75	11330
9	2	11847
10	2.25	12364
11	2.5	12881

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Outlet Outlet-J

Property	Value
Name	Outlet-J
Inlet Node	Stor-J
Outlet Node	POC2-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curve	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	disch-J

User-assigned name of outlet

Rating Curve Editor

Curve Name: disch-J

Description:

	Head (ft)	Outflow (CFS)
1	0	0.00
2	0.25	0.04
3	0.5	0.07
4	0.75	1.06
5	1	1.87
6	1.25	2.39
7	1.5	2.82
8	1.75	4.43
9	2	6.49
10	2.25	7.75
11	2.5	8.79

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POC3

BASIN O-L

Storage Unit Stor-O-L

Property	Value
Name	Stor-O-L
X-Coordinate	921.874
Y-Coordinate	4443.450
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	2.5
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Cur	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-L

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-L

Description:

	Depth (ft)	Area (ft2)
1	0	2380
2	0.25	2525
3	0.5	2670
4	0.75	2832
5	1	2994
6	1.25	3155
7	1.5	3317
8	1.75	3495
9	2	3673
10	2.25	3851
11	2.5	4029

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Outlet Outlet-O-L

Property	Value
Name	Outlet-O-L
Inlet Node	Stor-O-L
Outlet Node	POC3-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Cur	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-1

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-1

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.25	0.0872
3	0.5	0.1379
4	0.75	0.1744
5	1	0.2045
6	1.25	0.2307
7	1.5	0.2542
8	1.75	4.4382
9	2	12.0690
10	2.25	21.9434
11	2.5	33.6320

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POC4

BASIN O-M

Storage Unit Stor-O-M

Property	Value
Name	Stor-O-M
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	2.5
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-M

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-M

Description:

	Depth (ft)	Area (ft2)
1	0	5000
2	0.25	5000
3	0.5	5000
4	0.75	5000
5	1	5000
6	1.25	5000
7	1.5	5000
8	1.75	5000
9	2	5000
10	2.25	5000
11	2.5	5000

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Outlet Outlet-O-M

Property	Value
Name	Outlet-O-M
Inlet Node	Stor-O-M
Outlet Node	POC4-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curv	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-M

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-O-M

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.25	0.0872
3	0.5	0.1379
4	0.75	0.1744
5	1	0.2045
6	1.25	0.2307
7	1.5	0.2542
8	1.75	4.4382
9	2	12.0690
10	2.25	21.9434
11	2.5	33.6320

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Storage Unit Stor-O-M

Property	Value
Name	Stor-O-M
X-Coordinate	1098.345
Y-Coordinate	4590.088
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	2.5
Initial Depth	0
Ponded Area	9748
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-M

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-N

Description:

	Depth (ft)	Area (ft2)
1	0	5000
2	0.25	5000
3	0.5	5000
4	0.75	5000
5	1	5000
6	1.25	5000
7	1.5	5000
8	1.75	5000
9	2	5000
10	2.25	5000
11	2.5	5000

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Outlet Outlet-O-N

Property	Value
Name	Outlet-O-N
Inlet Node	Stor-O-N
Outlet Node	POC4-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curv	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-N

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-O-N

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.25	0.0872
3	0.5	0.1379
4	0.75	0.1744
5	1	0.2045
6	1.25	0.2307
7	1.5	0.2542
8	1.75	4.4382
9	2	12.0690
10	2.25	21.9434
11	2.5	33.6320

View... Load... Save... OK Cancel Help

POC5

BASIN O-O

Storage Unit Stor-O-O

Property	Value
Name	Stor-O-O
X-Coordinate	921.874
Y-Coordinate	4443.450
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	42385
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Cur	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-O

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-O

Description:

	Depth (ft)	Area (ft2)
1	0	2000
2	0.1	2000
3	0.2	2000
4	0.3	2000
5		
6		
7		
8		
9		
10		
11		

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Outlet Outlet-O-O

Property	Value
Name	Outlet-O-O
Inlet Node	Stor-O-O
Outlet Node	POC5-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Cur	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-O

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-O-O

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.1	1.0530
3	0.2	2.9784
4	0.3	5.4717
5		
6		
7		
8		
9		
10		
11		

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BASIN O-P

Storage Unit Stor-O-P

Property	Value
Name	Stor-O-P
X-Coordinate	1059.016
Y-Coordinate	4570.740
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-P

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-P

Description:

	Depth (ft)	Area (ft2)
1	0	1200
2	0.1	1200
3	0.2	1200
4	0.3	1200
5		
6		
7		
8		
9		
10		
11		

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Outlet oUTLET-O-P

Property	Value
Name	oUTLET-O-P
Inlet Node	Stor-O-P
Outlet Node	POC5-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curv	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-P

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-O-P

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.1	1.0530
3	0.2	2.9784
4	0.3	5.4717
5		
6		
7		
8		
9		
10		
11		

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BASIN O-Q

Storage Unit Stor-O-Q

Property	Value
Name	Stor-O-Q
X-Coordinate	1222.586
Y-Coordinate	4589.908
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-Q

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-Q

Description:

	Depth (ft)	Area (ft2)
1	0	900
2	0.1	900
3	0.2	900
4	0.3	900
5		
6		
7		
8		
9		
10		
11		

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Outlet OULET-O-Q

Property	Value
Name	OULET-O-Q
Inlet Node	Stor-O-Q
Outlet Node	POC5-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curv	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-Q

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-O-Q

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.1	1.0530
3	0.2	2.9784
4	0.3	5.4717
5		
6		
7		
8		
9		
10		
11		

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BASIN O-R

Storage Unit Stor-O-R

Property	Value
Name	Stor-O-R
X-Coordinate	1437.272
Y-Coordinate	4740.699
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-R

User-assigned name of storage unit

Storage Curve Editor

Curve Name: Basin-O-R

Description:

	Depth (ft)	Area (ft2)
1	0	900
2	0.1	900
3	0.2	900
4	0.3	900
5		
6		
7		
8		
9		
10		
11		

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Outlet OUTLET-O-R

Property	Value
Name	OUTLET-O-R
Inlet Node	Stor-O-R
Outlet Node	POC5-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curv	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-R

User-assigned name of outlet

Rating Curve Editor

Curve Name: Disch-O-R

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.1	1.0530
3	0.2	2.9784
4	0.3	5.4717
5		
6		
7		
8		
9		
10		
11		

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BASIN O-S

Storage Unit Stor-O-S

Property	Value
Name	Stor-O-S
X-Coordinate	1645.568
Y-Coordinate	4743.255
Description	
Tag	
Inflows	NO
Treatment	NO
Invert El.	0
Max. Depth	0.33
Initial Depth	0
Ponded Area	0
Evap. Factor	0
Seepage Loss	NO
Storage Curve	TABULAR
Functional Curv	
Coefficient	1000
Exponent	0
Constant	0
Tabular Curve	
Curve Name	Basin-O-S

User-assigned name of storage unit

Rating Curve Editor

Curve Name: Disch-O-S

Description:

	Head (ft)	Outflow (CFS)
1	0	0.0000
2	0.1	1.0530
3	0.2	2.9784
4	0.3	5.4717
5		
6		
7		
8		
9		
10		
11		

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Outlet OUTLET-O-S

Property	Value
Name	OUTLET-O-S
Inlet Node	Stor-O-S
Outlet Node	POC5-Proposed
Description	
Tag	
Inlet Offset	0
Flap Gate	NO
Rating Curve	TABULAR/DEPTH
Functional Curv	
Coefficient	10.0
Exponent	0.5
Tabular Curve	
Curve Name	Disch-O-S

User-assigned name of outlet

Storage Curve Editor

Curve Name: Basin-O-S

Description:

	Depth (ft)	Area (ft2)
1	0	1200
2	0.1	1200
3	0.2	1200
4	0.3	1200
5		
6		
7		
8		
9		
10		
11		

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ATTACHMENT 6 - Drying Time of the Surface Layer of Biofiltration cells

The LID subroutine of the SWMM Model does not increase the discharge of the lower LID orifice once the storage layer is full (in other words, it does not consider the influence of the pressure in the amended soil layer). The discharge of the lower LID orifice when the surface layer is full is considered constant by the model and equal to the discharge of the lower orifice when the storage layer is full (equal to the cutoff flows).

The drying time interval between an elevation yi and another elevation $yi - \Delta y$ can be obtained by:

$$\Delta t_i(hours) = \frac{(Q(yi)+Q(yi-\Delta y))}{7200\ (V(yi)-V(yi-\Delta y))} = \frac{Q_{ave}}{3600\ \Delta V}$$

$$t = \sum_{i=1}^{n} \Delta t_i\ (hours)$$

Q_{ave} represents the average discharge between elevation y_i and y_{i+1} obtained by $\frac{Q(yi)+Q(yi-\Delta y)}{2}$ where ΔV represents the fraction of the volume that must be discharged at a peak flow $Q_{ave}(V(yi) - V(yi - \Delta y))$.

The volume and the discharge change as the elevation changes; the calculation takes into account this change.

POC1

BASIN A DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
4.00	94.68	52954.50	0.0
3.75	77.57	48720.63	0.0
3.50	61.64	44611.00	0.0
3.25	46.99	40625.63	0.1
3.00	33.73	36764.50	0.1
2.75	22.04	33028.63	0.1
2.50	12.17	29419.00	0.2
2.25	4.54	25935.63	0.3
2.00	0.35	22578.50	0.7
1.75	0.33	19343.91	3.3
1.50	0.30	16228.13	6.0
1.25	0.27	13231.16	8.9
1.00	0.24	10353.00	12.1
0.75	0.19	7591.88	15.7
0.50	0.10	4946.00	20.9
0.25	0.10	2415.38	28.0
0.00	0.10	0.00	34.8

BASIN B DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
9.00	142.4	240835.5	0.0
8.50	104.3	222861.6	0.0
8.00	70.5	205463.0	0.1
7.50	41.8	188631.1	0.2
7.00	19.4	172357.5	0.3
6.50	6.6	156640.5	0.7
6.00	5.3	141478.5	1.4
5.50	3.6	126865.4	2.3
5.00	0.6	112795.0	4.1
4.50	0.6	99256.4	10.6
4.00	0.5	86238.5	17.0
3.50	0.5	73739.1	23.6
3.00	0.5	61756.0	30.3
2.50	0.4	50273.6	37.2
2.00	0.4	39276.5	44.3
1.50	0.4	28757.0	52.0
1.00	0.3	18707.5	60.7
0.50	0.1	9123.4	72.9
0.00	0.1	0.0	89.8

BASIN C DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
9.00	183.8	214438.0	0.0
8.50	141.7	197801.5	0.0
8.00	103.5	181806.0	0.1
7.50	69.7	166430.4	0.1
7.00	40.9	151653.5	0.2
6.50	18.3	137457.0	0.3
6.00	5.3	123822.5	0.6
5.50	3.5	110736.4	1.5
5.00	0.5	98185.0	3.2
4.50	0.5	86164.9	9.4
4.00	0.5	74672.5	15.7
3.50	0.5	63690.0	22.1
3.00	0.4	53199.5	28.6
2.50	0.4	43189.4	35.4
2.00	0.4	33648.0	42.5
1.50	0.3	24567.8	50.2
1.00	0.2	15941.0	59.0
0.50	0.1	7755.8	72.6
0.00	0.1	0.0	94.5

BASIN D DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
11.00	74.5	279946.5	0.0
10.00	23.9	243573.5	0.2
9.00	10.9	209709.0	0.7
8.00	9.4	178209.5	1.6
7.00	7.7	148936.0	2.6
6.00	5.4	121783.0	3.7
5.00	0.7	96679.5	6.0
4.00	0.6	73576.5	16.2
3.00	0.5	52401.0	26.4
2.00	0.5	33119.0	37.1
1.00	0.3	15671.5	49.0
0.00	0.2	0.0	64.6

BASIN E DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
5.00	61.7	15167.5	0.0
4.50	33.7	12811.3	0.0
4.00	12.2	10662.5	0.0
3.50	0.4	8714.6	0.1
3.00	0.4	6961.0	1.4
2.50	0.3	5388.9	2.7
2.00	0.3	3985.5	4.0
1.50	0.2	2747.1	5.4
1.00	0.2	1670.0	6.9
0.50	0.0	754.3	9.6
0.00	0.0	0.0	17.7

POC2

BASIN K DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
6.00	80.31	258651.50	0.0
5.50	45.02	232967.50	0.1
5.00	17.68	208071.50	0.3
4.50	2.54	183950.38	1.0
4.00	2.11	160591.00	3.8
3.50	1.52	137982.38	7.2
3.00	0.52	116113.50	13.2
2.50	0.50	94976.38	24.7
2.00	0.48	74563.00	36.3
1.50	0.45	54867.00	48.0
1.00	0.42	35882.00	60.1
0.50	0.35	17596.75	73.2
0.00	0.35	0.00	87.1

BASIN F DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
6.00	154.40	64103.50	0.0
5.50	122.58	56844.63	0.0
5.00	93.32	49954.00	0.0
4.50	66.85	43434.88	0.1
4.00	43.52	37290.50	0.1
3.50	23.81	31506.50	0.1
3.00	8.58	26068.50	0.2
2.50	0.25	20959.25	0.5
2.00	0.23	16161.50	6.2
1.50	0.20	11672.63	12.0
1.00	0.17	7490.00	18.4
0.50	0.10	3602.75	26.5
0.00	0.10	0.00	36.6

BASIN G DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
6.00	163.77	274101.50	0.0
5.50	131.74	246901.13	0.1
5.00	102.27	220555.00	0.1
4.50	75.62	195036.25	0.2
4.00	52.17	170318.00	0.3
3.50	32.49	146385.88	0.5
3.00	17.74	123225.50	0.7
2.50	11.77	100820.88	1.1
2.00	7.61	79156.00	1.8
1.50	4.78	58235.88	2.7
1.00	0.42	38065.50	4.8
0.50	0.35	18651.38	18.8
0.00	0.35	0.00	33.5

BASIN H DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
6.00	109.34	105498.50	0.0
5.50	70.48	93887.00	0.0
5.00	38.75	82789.50	0.1
4.50	16.61	72220.88	0.2
4.00	11.26	62196.00	0.4
3.50	9.20	52703.38	0.7
3.00	6.04	43731.50	1.0
2.50	5.25	35264.63	1.4
2.00	4.32	27287.00	1.9
1.50	3.09	19785.88	2.4
1.00	0.93	12748.50	3.4
0.50	0.10	6158.63	7.0
0.00	0.10	0.00	24.3

BASIN I DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
9.00	352.71	647267.00	0.0
8.50	291.33	603010.13	0.0
8.00	234.13	559724.50	0.1
7.50	181.44	517419.88	0.1
7.00	133.69	476106.00	0.2
6.50	91.46	435802.50	0.3
6.00	55.65	396529.00	0.5
5.50	27.75	358276.13	0.7
5.00	12.04	321034.50	1.2
4.50	11.04	284786.50	2.1
4.00	9.94	249514.50	3.0
3.50	8.68	215176.25	4.1
3.00	7.17	181729.50	5.2
2.50	5.15	149178.75	6.7
2.00	1.83	117528.50	9.2
1.50	1.34	86790.63	14.6
1.00	0.42	56977.00	24.0
0.50	0.35	28057.00	44.8
0.00	0.35	0.00	66.9

BASIN J DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
4.00	39.22	44481.00	0.0
3.75	26.13	40685.66	0.0
3.50	15.80	37054.63	0.1
3.25	9.74	33587.91	0.2
3.00	8.82	30285.50	0.3
2.75	7.77	27129.88	0.4
2.50	6.51	24103.50	0.5
2.25	4.45	21206.38	0.6
2.00	2.85	18438.50	0.8
1.75	2.42	15785.78	1.1
1.50	1.89	13234.13	1.4
1.25	1.09	10783.53	1.9
1.00	0.09	8434.00	3.0
0.75	0.07	6182.63	10.6
0.50	0.03	4026.50	23.2
0.25	0.03	1965.63	45.4
0.00	0.03	0.00	66.5

POC3

BASIN O-L DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
3.00	33.73	9046.00	0.0
2.75	22.04	8061.00	0.0
2.50	12.17	7120.50	0.0
2.25	4.54	6224.50	0.1
2.00	0.35	5373.00	0.2
1.75	0.33	4563.97	0.8
1.50	0.30	3795.38	1.5
1.25	0.27	3067.22	2.2
1.00	0.24	2379.50	2.9
0.75	0.19	1730.16	3.8
0.50	0.10	1117.13	5.0
0.25	0.10	540.41	6.6
0.00	0.10	0.00	8.1

POC4

BASIN O-M DRAWDOWN			
Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
3.00	33.73	19125.00	0.0
2.75	22.04	17199.38	0.0
2.50	12.17	15336.50	0.0
2.25	4.54	13536.38	0.1
2.00	0.35	11799.00	0.3
1.75	0.33	10122.28	1.7
1.50	0.30	8504.13	3.1
1.25	0.27	6944.53	4.6
1.00	0.24	5443.50	6.2
0.75	0.19	3999.47	8.1
0.50	0.10	2610.88	10.9
0.25	0.10	1277.72	14.6
0.00	0.10	0.00	18.2

BASIN O-N DRAWDOWN			
Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
3.00	33.73	19433.00	0.0
2.75	22.04	17467.44	0.0
2.50	12.17	15566.75	0.1
2.25	4.54	13730.94	0.1
2.00	0.35	11960.00	0.3
1.75	0.33	10251.84	1.7
1.50	0.30	8604.38	3.2
1.25	0.27	7017.59	4.7
1.00	0.24	5491.50	6.3
0.75	0.19	4026.47	8.3
0.50	0.10	2622.88	11.0
0.25	0.10	1280.72	14.8
0.00	0.10	0.00	18.4

POC5

BASIN O-O DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
0.50	0.10	1000.00	0.0
0.45	0.10	900.00	0.3
0.40	0.10	800.00	0.6
0.35	0.10	700.00	0.8
0.30	0.10	600.00	1.1
0.25	0.10	500.00	1.4
0.20	0.10	400.00	1.7
0.15	0.10	300.00	2.0
0.10	0.10	200.00	2.3
0.05	0.10	100.00	2.5
0.00	0.10	0.00	2.8

BASIN O-P DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
0.50	0.10	600.00	0.0
0.45	0.10	540.00	0.2
0.40	0.10	480.00	0.3
0.35	0.10	420.00	0.5
0.30	0.10	360.00	0.7
0.25	0.10	300.00	0.8
0.20	0.10	240.00	1.0
0.15	0.10	180.00	1.2
0.10	0.10	120.00	1.4
0.05	0.10	60.00	1.5
0.00	0.10	0.00	1.7

BASIN O-Q DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
0.50	0.10	450.00	0.0
0.45	0.10	405.00	0.1
0.40	0.10	360.00	0.3
0.35	0.10	315.00	0.4
0.30	0.10	270.00	0.5
0.25	0.10	225.00	0.6
0.20	0.10	180.00	0.8
0.15	0.10	135.00	0.9
0.10	0.10	90.00	1.0
0.05	0.10	45.00	1.1
0.00	0.10	0.00	1.3

BASIN O-R DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
0.50	0.10	450.00	0.0
0.45	0.10	405.00	0.1
0.40	0.10	360.00	0.3
0.35	0.10	315.00	0.4
0.30	0.10	270.00	0.5
0.25	0.10	225.00	0.6
0.20	0.10	180.00	0.8
0.15	0.10	135.00	0.9
0.10	0.10	90.00	1.0
0.05	0.10	45.00	1.1
0.00	0.10	0.00	1.3

BASIN O-S DRAWDOWN

Ponding Depth (FT)	Qout Total (CFS)	V in basin (CU FT)	Total Drawdown Time (HR)
0.50	0.10	600.00	0.0
0.45	0.10	540.00	0.2
0.40	0.10	480.00	0.3
0.35	0.10	420.00	0.5
0.30	0.10	360.00	0.7
0.25	0.10	300.00	0.8
0.20	0.10	240.00	1.0
0.15	0.10	180.00	1.2
0.10	0.10	120.00	1.4
0.05	0.10	60.00	1.5
0.00	0.10	0.00	1.7

BASIN A Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "
Number:	2	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.00 ft
Middle orifice diameter:	0.5 "	Emergency weir:	
number of orif:	0	Invert:	2.00 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	1.00 ft	Riser Box LxW	2x3

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	1.20	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	2.40	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	3.60	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	4.80	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	6.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	7.20	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	8.40	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	9.60	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	10.80	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	12.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	13.20	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	14.40	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	15.60	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	16.80	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	18.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	19.20	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	20.40	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	21.60	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	22.80	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	24.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	25.20	0.15	0.06	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.63
2.1	9.60	26.40	0.30	0.12	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.32
2.15	9.90	27.60	0.45	0.18	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	1.93	2.20
2.2	10.20	28.80	0.60	0.24	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	2.98	3.25
2.25	10.50	30.00	0.75	0.30	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.44
2.3	10.80	31.20	0.90	0.36	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.75
2.35	11.10	32.40	1.05	0.42	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	6.90	7.18
2.4	11.40	33.60	1.20	0.48	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.71
2.45	11.70	34.80	1.35	0.54	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.34
2.5	12.00	36.00	1.50	0.60	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	11.77	12.07
2.55	12.30	37.20	1.65	0.66	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	13.58	13.88
2.6	12.60	38.40	1.80	0.72	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	15.48	15.78
2.65	12.90	39.60	1.95	0.78	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	17.45	17.76
2.7	13.20	40.80	2.10	0.84	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	19.50	19.81
2.75	13.50	42.00	2.25	0.90	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	21.63	21.94
2.8	13.80	43.20	2.40	0.96	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	23.83	24.15
2.85	14.10	44.40	2.55	1.02	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	26.10	26.42
2.9	14.40	45.60	2.70	1.08	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	28.43	28.76
2.95	14.70	46.80	2.85	1.14	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	30.83	31.16
3	15.00	48.00	3.00	1.20	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	33.30	33.63
3.05	15.30	49.20	3.15	1.26	0.34	1057.04	0.34	0.00	0.00	0.00	0.00	0.00	0.00	35.83	36.16
3.1	15.60	50.40	3.30	1.32	0.34	1174.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	38.42	38.76
3.15	15.90	51.60	3.45	1.38	0.34	1302.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	41.07	41.41
3.2	16.20	52.80	3.60	1.44	0.35	1441.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	43.77	44.12
3.25	16.50	54.00	3.75	1.50	0.35	1592.07	0.35	0.00	0.00	0.00	0.00	0.00	0.00	46.54	46.89
3.3	16.80	55.20	3.90	1.56	0.35	1754.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	49.36	49.71
3.35	17.10	56.40	4.05	1.62	0.36	1930.25	0.36	0.00	0.00	0.00	0.00	0.00	0.00	52.23	52.59
3.4	17.40	57.60	4.20	1.68	0.36	2119.52	0.36	0.00	0.00	0.00	0.00	0.00	0.00	55.16	55.52
3.45	17.70	58.80	4.35	1.74	0.36	2323.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00	58.14	58.50
3.5	18.00	60.00	4.50	1.80	0.36	2542.37	0.36	0.00	0.00	0.00	0.00	0.00	0.00	61.18	61.54
3.55	18.30	61.20	4.65	1.86	0.37	2777.60	0.37	0.00	0.00	0.00	0.00	0.00	0.00	64.26	64.63
3.6	18.60	62.40	4.80	1.92	0.37	3029.85	0.37	0.00	0.00	0.00	0.00	0.00	0.00	67.39	67.77
3.65	18.90	63.60	4.95	1.98	0.37	3300.02	0.37	0.00	0.00	0.00	0.00	0.00	0.00	70.58	70.95
3.7	19.20	64.80	5.10	2.04	0.38	3589.06	0.38	0.00	0.00	0.00	0.00	0.00	0.00	73.81	74.19
3.75	19.50	66.00	5.25	2.10	0.38	3897.92	0.38	0.00	0.00	0.00	0.00	0.00	0.00	77.09	77.47
3.8	19.80	67.20	5.40	2.16	0.38	4227.60	0.38	0.00	0.00	0.00	0.00	0.00	0.00	80.42	80.80
3.85	20.10	68.40	5.55	2.22	0.39	4579.14	0.39	0.00	0.00	0.00	0.00	0.00	0.00	83.79	84.18
3.9	20.40	69.60	5.70	2.28	0.39	4953.61	0.39	0.00	0.00	0.00	0.00	0.00	0.00	87.21	87.60
3.95	20.70	70.80	5.85	2.34	0.39	5352.09	0.39	0.00	0.00	0.00	0.00	0.00	0.00	90.68	91.07
4	21.00	72.00	6.00	2.40	0.39	5775.73	0.39	0.00	0.00	0.00	0.00	0.00	0.00	94.19	94.58

BASIN B Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	9.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	6.50 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

h	H/D-low	H/D-mid	H/D-top	H/D-peak	Qlow-orif	Qlow-weir	Qtot-low	Qmid-orif	Qmid-weir	Qtot-med	Qtop-orif	Qtop-weir	Qtot-top	Qpeak-top	Qtot
(ft)	-	-	-	-	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.007
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.024
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.050
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.073
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.087
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.099
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.110
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.120
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.129
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.138
1.05	3.30	0.60	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.146
1.1	3.60	1.20	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.154
1.15	3.90	1.80	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.161
1.2	4.20	2.40	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.168
1.25	4.50	3.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.174
1.3	4.80	3.60	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.181
1.35	5.10	4.20	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.187
1.4	5.40	4.80	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.193
1.45	5.70	5.40	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.199
1.5	6.00	6.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.205
1.55	6.30	6.60	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.210
1.6	6.60	7.20	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.215
1.65	6.90	7.80	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.221
1.7	7.20	8.40	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.226
1.75	7.50	9.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.231
1.8	7.80	9.60	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.236
1.85	8.10	10.20	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.240
1.9	8.40	10.80	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.245
1.95	8.70	11.40	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.250
2	9.00	12.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.254
2.05	9.30	12.60	0.00	0.00	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.259
2.1	9.60	13.20	0.00	0.00	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.263
2.15	9.90	13.80	0.00	0.00	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.267
2.2	10.20	14.40	0.00	0.00	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.272
2.25	10.50	15.00	0.00	0.00	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.276
2.3	10.80	15.60	0.00	0.00	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.280
2.35	11.10	16.20	0.00	0.00	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.284
2.4	11.40	16.80	0.00	0.00	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.288
2.45	11.70	17.40	0.00	0.00	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.292
2.5	12.00	18.00	0.00	0.00	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.296
2.55	12.30	18.60	0.00	0.00	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.300
2.6	12.60	19.20	0.00	0.00	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.303
2.65	12.90	19.80	0.00	0.00	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.307
2.7	13.20	20.40	0.00	0.00	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.311
2.75	13.50	21.00	0.00	0.00	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.314
2.8	13.80	21.60	0.00	0.00	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.318
2.85	14.10	22.20	0.00	0.00	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.322
2.9	14.40	22.80	0.00	0.00	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.325
2.95	14.70	23.40	0.00	0.00	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.329
3	15.00	24.00	0.00	0.00	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.332
3.05	15.30	24.60	0.00	0.00	0.34	1057.04	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.335
3.1	15.60	25.20	0.00	0.00	0.34	1174.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.339
3.15	15.90	25.80	0.00	0.00	0.34	1302.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.342
3.2	16.20	26.40	0.00	0.00	0.35	1441.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.346
3.25	16.50	27.00	0.00	0.00	0.35	1592.07	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.349
3.3	16.80	27.60	0.00	0.00	0.35	1754.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.352
3.35	17.10	28.20	0.00	0.00	0.36	1930.25	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.355
3.4	17.40	28.80	0.00	0.00	0.36	2119.52	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.358
3.45	17.70	29.40	0.00	0.00	0.36	2323.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.362
3.5	18.00	30.00	0.00	0.00	0.36	2542.37	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.365
3.55	18.30	30.60	0.00	0.00	0.37	2777.60	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.368
3.6	18.60	31.20	0.00	0.00	0.37	3029.85	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.371
3.65	18.90	31.80	0.00	0.00	0.37	3300.02	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.374
3.7	19.20	32.40	0.00	0.00	0.38	3589.06	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.377

BASIN B Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	9.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	6.50 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

3.75	19.50	33.00	0.00	0.00	0.38	3897.92	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.380
3.8	19.80	33.60	0.00	0.00	0.38	4227.60	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.383
3.85	20.10	34.20	0.00	0.00	0.39	4579.14	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.386
3.9	20.40	34.80	0.00	0.00	0.39	4953.61	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.389
3.95	20.70	35.40	0.00	0.00	0.39	5352.09	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.392
4	21.00	36.00	0.00	0.00	0.39	5775.73	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.395
4.05	21.30	36.60	0.00	0.00	0.40	6225.69	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.398
4.1	21.60	37.20	0.00	0.00	0.40	6703.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.401
4.15	21.90	37.80	0.00	0.00	0.40	7209.43	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.403
4.2	22.20	38.40	0.00	0.00	0.41	7745.72	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.406
4.25	22.50	39.00	0.00	0.00	0.41	8313.37	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.409
4.3	22.80	39.60	0.00	0.00	0.41	8913.73	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.412
4.35	23.10	40.20	0.00	0.00	0.41	9548.18	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.415
4.4	23.40	40.80	0.00	0.00	0.42	10218.16	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.417
4.45	23.70	41.40	0.00	0.00	0.42	10925.13	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.420
4.5	24.00	42.00	0.00	0.00	0.42	11670.60	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.423
4.55	24.30	42.60	0.00	0.00	0.43	12456.12	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.425
4.6	24.60	43.20	0.00	0.00	0.43	13283.27	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.428
4.65	24.90	43.80	0.00	0.00	0.43	14153.68	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.431
4.7	25.20	44.40	0.00	0.00	0.43	15069.03	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.433
4.75	25.50	45.00	0.00	0.00	0.44	16031.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.436
4.8	25.80	45.60	0.00	0.00	0.44	17041.42	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.439
4.85	26.10	46.20	0.00	0.00	0.44	18102.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.441
4.9	26.40	46.80	0.00	0.00	0.44	19214.67	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.444
4.95	26.70	47.40	0.00	0.00	0.45	20381.26	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.446
5	27.00	48.00	0.00	0.00	0.45	21603.72	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.449
5.05	27.30	48.60	0.15	0.00	0.45	22884.03	0.45	0.00	0.00	0.00	0.00	0.06	0.06	0.00	0.510
5.1	27.60	49.20	0.30	0.00	0.45	24224.21	0.45	0.00	0.00	0.00	0.00	0.22	0.22	0.00	0.678
5.15	27.90	49.80	0.45	0.00	0.46	25626.34	0.46	0.00	0.00	0.00	0.00	0.48	0.48	0.00	0.941
5.2	28.20	50.40	0.60	0.00	0.46	27092.54	0.46	0.00	0.00	0.00	0.94	0.83	0.83	0.00	1.284
5.25	28.50	51.00	0.75	0.00	0.46	28624.96	0.46	0.00	0.00	0.00	1.48	1.23	1.23	0.00	1.692
5.3	28.80	51.60	0.90	0.00	0.46	30225.83	0.46	0.00	0.00	0.00	1.87	1.68	1.68	0.00	2.145
5.35	29.10	52.20	1.05	0.00	0.47	31897.42	0.47	0.00	0.00	0.00	2.19	2.16	2.16	0.00	2.628
5.4	29.40	52.80	1.20	0.00	0.47	33642.02	0.47	0.00	0.00	0.00	2.48	2.65	2.48	0.00	2.945
5.45	29.70	53.40	1.35	0.00	0.47	35462.01	0.47	0.00	0.00	0.00	2.73	3.14	2.73	0.00	3.200
5.5	30.00	54.00	1.50	0.00	0.47	37359.80	0.47	0.00	0.00	0.00	2.96	3.60	2.96	0.00	3.433
5.55	30.30	54.60	1.65	0.00	0.48	39337.85	0.48	0.00	0.00	0.00	3.17	4.03	3.17	0.00	3.650
5.6	30.60	55.20	1.80	0.00	0.48	41398.68	0.48	0.00	0.00	0.00	3.37	4.40	3.37	0.00	3.853
5.65	30.90	55.80	1.95	0.00	0.48	43544.86	0.48	0.00	0.00	0.00	3.56	4.72	3.56	0.00	4.045
5.7	31.20	56.40	2.10	0.00	0.48	45778.99	0.48	0.00	0.00	0.00	3.74	4.98	3.74	0.00	4.227
5.75	31.50	57.00	2.25	0.00	0.49	48103.77	0.49	0.00	0.00	0.00	3.92	5.17	3.92	0.00	4.401
5.8	31.80	57.60	2.40	0.00	0.49	50521.91	0.49	0.00	0.00	0.00	4.08	5.30	4.08	0.00	4.567
5.85	32.10	58.20	2.55	0.00	0.49	53036.19	0.49	0.00	0.00	0.00	4.24	5.37	4.24	0.00	4.728
5.9	32.40	58.80	2.70	0.00	0.49	55649.44	0.49	0.00	0.00	0.00	4.39	5.40	4.39	0.00	4.882
5.95	32.70	59.40	2.85	0.00	0.49	58364.57	0.49	0.00	0.00	0.00	4.54	5.42	4.54	0.00	5.032
6	33.00	60.00	3.00	0.00	0.50	61184.51	0.50	0.00	0.00	0.00	4.68	5.43	4.68	0.00	5.177
6.05	33.30	60.60	3.15	0.00	0.50	64112.26	0.50	0.00	0.00	0.00	4.82	5.49	4.82	0.00	5.317
6.1	33.60	61.20	3.30	0.00	0.50	67150.88	0.50	0.00	0.00	0.00	4.95	5.63	4.95	0.00	5.454
6.15	33.90	61.80	3.45	0.00	0.50	70303.49	0.50	0.00	0.00	0.00	5.08	5.90	5.08	0.00	5.587
6.2	34.20	62.40	3.60	0.00	0.51	73573.27	0.51	0.00	0.00	0.00	5.21	6.36	5.21	0.00	5.717
6.25	34.50	63.00	3.75	0.00	0.51	76963.43	0.51	0.00	0.00	0.00	5.34	7.09	5.34	0.00	5.844
6.3	34.80	63.60	3.90	0.00	0.51	80477.28	0.51	0.00	0.00	0.00	5.46	8.15	5.46	0.00	5.968
6.35	35.10	64.20	4.05	0.00	0.51	84118.16	0.51	0.00	0.00	0.00	5.58	9.64	5.58	0.00	6.089
6.4	35.40	64.80	4.20	0.00	0.52	87889.48	0.52	0.00	0.00	0.00	5.69	11.66	5.69	0.00	6.208
6.45	35.70	65.40	4.35	0.00	0.52	91794.72	0.52	0.00	0.00	0.00	5.81	14.33	5.81	0.00	6.325
6.5	36.00	66.00	4.50	0.00	0.52	95837.39	0.52	0.00	0.00	0.00	5.92	17.76	5.92	0.00	6.439
6.55	36.30	66.60	4.65	0.06	0.52	100021.10	0.52	0.00	0.00	0.00	6.03	22.10	6.03	0.37	6.923
6.6	36.60	67.20	4.80	0.12	0.52	104349.50	0.52	0.00	0.00	0.00	6.14	27.51	6.14	1.05	7.714
6.65	36.90	67.80	4.95	0.18	0.53	108826.31	0.53	0.00	0.00	0.00	6.24	34.13	6.24	1.93	8.704
6.7	37.20	68.40	5.10	0.24	0.53	113455.30	0.53	0.00	0.00	0.00	6.35	42.17	6.35	2.98	9.854
6.75	37.50	69.00	5.25	0.30	0.53	118240.31	0.53	0.00	0.00	0.00	6.45	51.80	6.45	4.16	11.143
6.8	37.80	69.60	5.40	0.36	0.53	123185.27	0.53	0.00	0.00	0.00	6.55	63.25	6.55	5.47	12.556
6.85	38.10	70.20	5.55	0.42	0.53	128294.13	0.53	0.00	0.00	0.00	6.65	76.74	6.65	6.90	14.081
6.9	38.40	70.80	5.70	0.48	0.54	133570.94	0.54	0.00	0.00	0.00	6.75	92.52	6.75	8.42	15.710
6.95	38.70	71.40	5.85	0.54	0.54	139019.80	0.54	0.00	0.00	0.00	6.85	110.85	6.85	10.05	17.437
7	39.00	72.00	6.00	0.60	0.54	144644.87	0.54	0.00	0.00	0.00	6.94	132.00	6.94	11.77	19.255
7.05	39.30	72.60	6.15	0.66	0.54	150450.39	0.54	0.00	0.00	0.00	7.04	156.29	7.04	13.58	21.161
7.1	39.60	73.20	6.30	0.72	0.55	156440.68	0.55	0.00	0.00	0.00	7.13	184.02	7.13	15.48	23.149
7.15	39.90	73.80	6.45	0.78	0.55	162620.08	0.55	0.00	0.00	0.00	7.22	215.54	7.22	17.45	25.217
7.2	40.20	74.40	6.60	0.84	0.55	168993.06	0.55	0.00	0.00	0.00	7.31	251.20	7.31	19.50	27.362
7.25	40.50	75.00	6.75	0.90	0.55	175564.11	0.55	0.00	0.00	0.00	7.40	291.38	7.40	21.63	29.580
7.3	40.80	75.60	6.90	0.96	0.55	182337.81	0.55	0.00	0.00	0.00	7.49	336.48	7.49	23.83	31.868
7.35	41.10	76.20	7.05	1.02	0.56	189318.81	0.56	0.00	0.00	0.00	7.57	386.93	7.57	26.10	34.226
7.4	41.40	76.80	7.20	1.08	0.56	196511.83	0.56	0.00	0.00	0.00	7.66	443.16	7.66	28.43	36.651
7.45	41.70	77.40	7.35	1.14	0.56	203921.66	0.56	0.00	0.00	0.00	7.75	505.66	7.75	30.83	39.140
7.5	42.00	78.00	7.50	1.20	0.56	211553.15	0.56	0.00	0.00	0.00	7.83	574.90	7.83	33.30	41.692
7.55	42.30	78.60	7.65	1.26	0.56	219411.24	0.56	0.00	0.00	0.00	7.91	651.41	7.91	35.83	44.306
7.6	42.60	79.20	7.80	1.32	0.57	227500.93	0.57	0.00	0.00	0.00	8.00	735.72	8.00	38.42	46.980

BASIN B Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	9.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	6.50 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

7.65	42.90	79.80	7.95	1.38	0.57	235827.31	0.57	0.00	0.00	0.00	8.08	828.41	8.08	41.07	49.713
7.7	43.20	80.40	8.10	1.44	0.57	244395.52	0.57	0.00	0.00	0.00	8.16	930.05	8.16	43.77	52.503
7.75	43.50	81.00	8.25	1.50	0.57	253210.79	0.57	0.00	0.00	0.00	8.24	1041.28	8.24	46.54	55.349
7.8	43.80	81.60	8.40	1.56	0.57	262278.42	0.57	0.00	0.00	0.00	8.32	1162.73	8.32	49.36	58.251
7.85	44.10	82.20	8.55	1.62	0.58	271603.79	0.58	0.00	0.00	0.00	8.40	1295.09	8.40	52.23	61.206
7.9	44.40	82.80	8.70	1.68	0.58	281192.34	0.58	0.00	0.00	0.00	8.48	1439.04	8.48	55.16	64.214
7.95	44.70	83.40	8.85	1.74	0.58	291049.62	0.58	0.00	0.00	0.00	8.55	1595.32	8.55	58.14	67.275
8	45.00	84.00	9.00	1.80	0.58	301181.21	0.58	0.00	0.00	0.00	8.63	1764.69	8.63	61.18	70.386
8.05	45.30	84.60	9.15	1.86	0.58	311592.80	0.58	0.00	0.00	0.00	8.70	1947.94	8.70	64.26	73.548
8.1	45.60	85.20	9.30	1.92	0.59	322290.15	0.59	0.00	0.00	0.00	8.78	2145.89	8.78	67.39	76.760
8.15	45.90	85.80	9.45	1.98	0.59	333279.11	0.59	0.00	0.00	0.00	8.85	2359.38	8.85	70.58	80.020
8.2	46.20	86.40	9.60	2.04	0.59	344565.58	0.59	0.00	0.00	0.00	8.93	2589.30	8.93	73.81	83.328
8.25	46.50	87.00	9.75	2.10	0.59	356155.57	0.59	0.00	0.00	0.00	9.00	2836.56	9.00	77.09	86.683
8.3	46.80	87.60	9.90	2.16	0.59	368055.15	0.59	0.00	0.00	0.00	9.07	3102.10	9.07	80.42	90.085
8.35	47.10	88.20	10.05	2.22	0.60	380270.47	0.60	0.00	0.00	0.00	9.15	3386.92	9.15	83.79	93.533
8.4	47.40	88.80	10.20	2.28	0.60	392807.78	0.60	0.00	0.00	0.00	9.22	3692.01	9.22	87.21	97.027
8.45	47.70	89.40	10.35	2.34	0.60	405673.40	0.60	0.00	0.00	0.00	9.29	4018.44	9.29	90.68	100.565
8.5	48.00	90.00	10.50	2.40	0.60	418873.72	0.60	0.00	0.00	0.00	9.36	4367.27	9.36	94.19	104.147
8.55	48.30	90.60	10.65	2.46	0.60	432415.24	0.60	0.00	0.00	0.00	9.43	4739.63	9.43	97.74	107.773
8.6	48.60	91.20	10.80	2.52	0.60	446304.52	0.60	0.00	0.00	0.00	9.50	5136.68	9.50	101.34	111.442
8.65	48.90	91.80	10.95	2.58	0.61	460548.20	0.61	0.00	0.00	0.00	9.57	5559.59	9.57	104.98	115.153
8.7	49.20	92.40	11.10	2.64	0.61	475153.04	0.61	0.00	0.00	0.00	9.64	6009.61	9.64	108.66	118.907
8.75	49.50	93.00	11.25	2.70	0.61	490125.84	0.61	0.00	0.00	0.00	9.70	6487.99	9.70	112.39	122.702
8.8	49.80	93.60	11.40	2.76	0.61	505473.51	0.61	0.00	0.00	0.00	9.77	6996.03	9.77	116.15	126.538
8.85	50.10	94.20	11.55	2.82	0.61	521203.04	0.61	0.00	0.00	0.00	9.84	7535.09	9.84	119.96	130.415
8.9	50.40	94.80	11.70	2.88	0.62	537321.52	0.62	0.00	0.00	0.00	9.90	8106.54	9.90	123.81	134.332
8.95	50.70	95.40	11.85	2.94	0.62	553836.11	0.62	0.00	0.00	0.00	9.97	8711.81	9.97	127.70	138.290
9	51.00	96.00	12.00	3.00	0.62	570754.05	0.62	0.00	0.00	0.00	10.04	9352.35	10.04	131.63	142.286

BASIN C Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	9.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	6.00 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	0.60	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	1.20	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	1.80	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	2.40	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	3.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	3.60	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	4.20	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	4.80	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	5.40	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	6.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	6.60	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	7.20	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	7.80	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	8.40	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	9.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	9.60	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	10.20	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	10.80	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	11.40	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	12.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	12.60	0.00	0.00	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2.1	9.60	13.20	0.00	0.00	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2.15	9.90	13.80	0.00	0.00	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
2.2	10.20	14.40	0.00	0.00	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
2.25	10.50	15.00	0.00	0.00	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.3	10.80	15.60	0.00	0.00	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.35	11.10	16.20	0.00	0.00	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.4	11.40	16.80	0.00	0.00	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2.45	11.70	17.40	0.00	0.00	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2.5	12.00	18.00	0.00	0.00	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.55	12.30	18.60	0.00	0.00	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.6	12.60	19.20	0.00	0.00	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.65	12.90	19.80	0.00	0.00	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.7	13.20	20.40	0.00	0.00	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.75	13.50	21.00	0.00	0.00	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.8	13.80	21.60	0.00	0.00	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
2.85	14.10	22.20	0.00	0.00	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
2.9	14.40	22.80	0.00	0.00	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
2.95	14.70	23.40	0.00	0.00	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
3	15.00	24.00	0.00	0.00	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
3.05	15.30	24.60	0.00	0.00	0.34	1057.04	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.1	15.60	25.20	0.00	0.00	0.34	1174.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.15	15.90	25.80	0.00	0.00	0.34	1302.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.2	16.20	26.40	0.00	0.00	0.35	1441.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.25	16.50	27.00	0.00	0.00	0.35	1592.07	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.3	16.80	27.60	0.00	0.00	0.35	1754.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.35	17.10	28.20	0.00	0.00	0.36	1930.25	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.4	17.40	28.80	0.00	0.00	0.36	2119.52	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.45	17.70	29.40	0.00	0.00	0.36	2323.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.5	18.00	30.00	0.00	0.00	0.36	2542.37	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.55	18.30	30.60	0.00	0.00	0.37	2777.60	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
3.6	18.60	31.20	0.00	0.00	0.37	3029.85	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37

BASIN C Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "	top	9.00
Number:	2	Number:	12		
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	6.00 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

3.65	18.90	31.80	0.00	0.00	0.37	3300.02	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
3.7	19.20	32.40	0.00	0.00	0.38	3589.06	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
3.75	19.50	33.00	0.00	0.00	0.38	3897.92	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
3.8	19.80	33.60	0.00	0.00	0.38	4227.60	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
3.85	20.10	34.20	0.00	0.00	0.39	4579.14	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
3.9	20.40	34.80	0.00	0.00	0.39	4953.61	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
3.95	20.70	35.40	0.00	0.00	0.39	5352.09	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
4	21.00	36.00	0.00	0.00	0.39	5775.73	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
4.05	21.30	36.60	0.00	0.00	0.40	6225.69	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
4.1	21.60	37.20	0.00	0.00	0.40	6703.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
4.15	21.90	37.80	0.00	0.00	0.40	7209.43	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
4.2	22.20	38.40	0.00	0.00	0.41	7745.72	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.25	22.50	39.00	0.00	0.00	0.41	8313.37	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.3	22.80	39.60	0.00	0.00	0.41	8913.73	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.35	23.10	40.20	0.00	0.00	0.41	9548.18	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.4	23.40	40.80	0.00	0.00	0.42	10218.16	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
4.45	23.70	41.40	0.00	0.00	0.42	10925.13	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
4.5	24.00	42.00	0.00	0.00	0.42	11670.60	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
4.55	24.30	42.60	0.00	0.00	0.43	12456.12	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.6	24.60	43.20	0.00	0.00	0.43	13283.27	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.65	24.90	43.80	0.00	0.00	0.43	14153.68	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.7	25.20	44.40	0.00	0.00	0.43	15069.03	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.75	25.50	45.00	0.00	0.00	0.44	16031.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.8	25.80	45.60	0.00	0.00	0.44	17041.42	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.85	26.10	46.20	0.00	0.00	0.44	18102.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.9	26.40	46.80	0.00	0.00	0.44	19214.67	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.95	26.70	47.40	0.00	0.00	0.45	20381.26	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
5	27.00	48.00	0.00	0.00	0.45	21603.72	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
5.05	27.30	48.60	0.15	0.00	0.45	22884.03	0.45	0.00	0.00	0.00	0.00	0.06	0.06	0.00	0.51
5.1	27.60	49.20	0.30	0.00	0.45	24224.21	0.45	0.00	0.00	0.00	0.00	0.22	0.22	0.00	0.68
5.15	27.90	49.80	0.45	0.00	0.46	25626.34	0.46	0.00	0.00	0.00	0.00	0.48	0.48	0.00	0.94
5.2	28.20	50.40	0.60	0.00	0.46	27092.54	0.46	0.00	0.00	0.00	0.94	0.83	0.83	0.00	1.28
5.25	28.50	51.00	0.75	0.00	0.46	28624.96	0.46	0.00	0.00	0.00	1.48	1.23	1.23	0.00	1.69
5.3	28.80	51.60	0.90	0.00	0.46	30225.83	0.46	0.00	0.00	0.00	1.87	1.68	1.68	0.00	2.15
5.35	29.10	52.20	1.05	0.00	0.47	31897.42	0.47	0.00	0.00	0.00	2.19	2.16	2.16	0.00	2.63
5.4	29.40	52.80	1.20	0.00	0.47	33642.02	0.47	0.00	0.00	0.00	2.48	2.65	2.48	0.00	2.94
5.45	29.70	53.40	1.35	0.00	0.47	35462.01	0.47	0.00	0.00	0.00	2.73	3.14	2.73	0.00	3.20
5.5	30.00	54.00	1.50	0.00	0.47	37359.80	0.47	0.00	0.00	0.00	2.96	3.60	2.96	0.00	3.43
5.55	30.30	54.60	1.65	0.00	0.48	39337.85	0.48	0.00	0.00	0.00	3.17	4.03	3.17	0.00	3.65
5.6	30.60	55.20	1.80	0.00	0.48	41398.68	0.48	0.00	0.00	0.00	3.37	4.40	3.37	0.00	3.85
5.65	30.90	55.80	1.95	0.00	0.48	43544.86	0.48	0.00	0.00	0.00	3.56	4.72	3.56	0.00	4.04
5.7	31.20	56.40	2.10	0.00	0.48	45778.99	0.48	0.00	0.00	0.00	3.74	4.98	3.74	0.00	4.23
5.75	31.50	57.00	2.25	0.00	0.49	48103.77	0.49	0.00	0.00	0.00	3.92	5.17	3.92	0.00	4.40
5.8	31.80	57.60	2.40	0.00	0.49	50521.91	0.49	0.00	0.00	0.00	4.08	5.30	4.08	0.00	4.57
5.85	32.10	58.20	2.55	0.00	0.49	53036.19	0.49	0.00	0.00	0.00	4.24	5.37	4.24	0.00	4.73
5.9	32.40	58.80	2.70	0.00	0.49	55649.44	0.49	0.00	0.00	0.00	4.39	5.40	4.39	0.00	4.88
5.95	32.70	59.40	2.85	0.00	0.49	58364.57	0.49	0.00	0.00	0.00	4.54	5.42	4.54	0.00	5.03
6	33.00	60.00	3.00	0.00	0.50	61184.51	0.50	0.00	0.00	0.00	4.68	5.43	4.68	0.00	5.18
6.05	33.30	60.60	3.15	0.06	0.50	64112.26	0.50	0.00	0.00	0.00	4.82	5.49	4.82	0.37	5.69
6.1	33.60	61.20	3.30	0.12	0.50	67150.88	0.50	0.00	0.00	0.00	4.95	5.63	4.95	1.05	6.51
6.15	33.90	61.80	3.45	0.18	0.50	70303.49	0.50	0.00	0.00	0.00	5.08	5.90	5.08	1.93	7.52
6.2	34.20	62.40	3.60	0.24	0.51	73573.27	0.51	0.00	0.00	0.00	5.21	6.36	5.21	2.98	8.70
6.25	34.50	63.00	3.75	0.30	0.51	76963.43	0.51	0.00	0.00	0.00	5.34	7.09	5.34	4.16	10.01
6.3	34.80	63.60	3.90	0.36	0.51	80477.28	0.51	0.00	0.00	0.00	5.46	8.15	5.46	5.47	11.44
6.35	35.10	64.20	4.05	0.42	0.51	84118.16	0.51	0.00	0.00	0.00	5.58	9.64	5.58	6.90	12.98
6.4	35.40	64.80	4.20	0.48	0.52	87889.48	0.52	0.00	0.00	0.00	5.69	11.66	5.69	8.42	14.63
6.45	35.70	65.40	4.35	0.54	0.52	91794.72	0.52	0.00	0.00	0.00	5.81	14.33	5.81	10.05	16.38
6.5	36.00	66.00	4.50	0.60	0.52	95837.39	0.52	0.00	0.00	0.00	5.92	17.76	5.92	11.77	18.21
6.55	36.30	66.60	4.65	0.66	0.52	100021.10	0.52	0.00	0.00	0.00	6.03	22.10	6.03	13.58	20.13
6.6	36.60	67.20	4.80	0.72	0.52	104349.50	0.52	0.00	0.00	0.00	6.14	27.51	6.14	15.48	22.14
6.65	36.90	67.80	4.95	0.78	0.53	108826.31	0.53	0.00	0.00	0.00	6.24	34.13	6.24	17.45	24.22
6.7	37.20	68.40	5.10	0.84	0.53	113455.30	0.53	0.00	0.00	0.00	6.35	42.17	6.35	19.50	26.38
6.75	37.50	69.00	5.25	0.90	0.53	118240.31	0.53	0.00	0.00	0.00	6.45	51.80	6.45	21.63	28.61
6.8	37.80	69.60	5.40	0.96	0.53	123185.27	0.53	0.00	0.00	0.00	6.55	63.25	6.55	23.83	30.91
6.85	38.10	70.20	5.55	1.02	0.53	128294.13	0.53	0.00	0.00	0.00	6.65	76.74	6.65	26.10	33.28
6.9	38.40	70.80	5.70	1.08	0.54	133570.94	0.54	0.00	0.00	0.00	6.75	92.52	6.75	28.43	35.72
6.95	38.70	71.40	5.85	1.14	0.54	139019.80	0.54	0.00	0.00	0.00	6.85	110.85	6.85	30.83	38.22
7	39.00	72.00	6.00	1.20	0.54	144644.87	0.54	0.00	0.00	0.00	6.94	132.00	6.94	33.30	40.78
7.05	39.30	72.60	6.15	1.26	0.54	150450.39	0.54	0.00	0.00	0.00	7.04	156.29	7.04	35.83	43.41
7.1	39.60	73.20	6.30	1.32	0.55	156440.68	0.55	0.00	0.00	0.00	7.13	184.02	7.13	38.42	46.09
7.15	39.90	73.80	6.45	1.38	0.55	162620.08	0.55	0.00	0.00	0.00	7.22	215.54	7.22	41.07	48.83
7.2	40.20	74.40	6.60	1.44	0.55	168993.06	0.55	0.00	0.00	0.00	7.31	251.20	7.31	43.77	51.63
7.25	40.50	75.00	6.75	1.50	0.55	175564.11	0.55	0.00	0.00	0.00	7.40	291.38	7.40	46.54	54.49
7.3	40.80	75.60	6.90	1.56	0.55	182337.81	0.55	0.00	0.00	0.00	7.49	336.48	7.49	49.36	57.40
7.35	41.10	76.20	7.05	1.62	0.56	189318.81	0.56	0.00	0.00	0.00	7.57	386.93	7.57	52.23	60.36
7.4	41.40	76.80	7.20	1.68	0.56	196511.83	0.56	0.00	0.00	0.00	7.66	443.16	7.66	55.16	63.38

BASIN C Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	9.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	6.00 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

7.45	41.70	77.40	7.35	1.74	0.56	203921.66	0.56	0.00	0.00	0.00	7.75	505.66	7.75	58.14	66.45
7.5	42.00	78.00	7.50	1.80	0.56	211553.15	0.56	0.00	0.00	0.00	7.83	574.90	7.83	61.18	69.57
7.55	42.30	78.60	7.65	1.86	0.56	219411.24	0.56	0.00	0.00	0.00	7.91	651.41	7.91	64.26	72.74
7.6	42.60	79.20	7.80	1.92	0.57	227500.93	0.57	0.00	0.00	0.00	8.00	735.72	8.00	67.39	75.96
7.65	42.90	79.80	7.95	1.98	0.57	235827.31	0.57	0.00	0.00	0.00	8.08	828.41	8.08	70.58	79.22
7.7	43.20	80.40	8.10	2.04	0.57	244395.52	0.57	0.00	0.00	0.00	8.16	930.05	8.16	73.81	82.54
7.75	43.50	81.00	8.25	2.10	0.57	253210.79	0.57	0.00	0.00	0.00	8.24	1041.28	8.24	77.09	85.90
7.8	43.80	81.60	8.40	2.16	0.57	262278.42	0.57	0.00	0.00	0.00	8.32	1162.73	8.32	80.42	89.31
7.85	44.10	82.20	8.55	2.22	0.58	271603.79	0.58	0.00	0.00	0.00	8.40	1295.09	8.40	83.79	92.76
7.9	44.40	82.80	8.70	2.28	0.58	281192.34	0.58	0.00	0.00	0.00	8.48	1439.04	8.48	87.21	96.26
7.95	44.70	83.40	8.85	2.34	0.58	291049.62	0.58	0.00	0.00	0.00	8.55	1595.32	8.55	90.68	99.81
8	45.00	84.00	9.00	2.40	0.58	301181.21	0.58	0.00	0.00	0.00	8.63	1764.69	8.63	94.19	103.40
8.05	45.30	84.60	9.15	2.46	0.58	311592.80	0.58	0.00	0.00	0.00	8.70	1947.94	8.70	97.74	107.03
8.1	45.60	85.20	9.30	2.52	0.59	322290.15	0.59	0.00	0.00	0.00	8.78	2145.89	8.78	101.34	110.70
8.15	45.90	85.80	9.45	2.58	0.59	333279.11	0.59	0.00	0.00	0.00	8.85	2359.38	8.85	104.98	114.42
8.2	46.20	86.40	9.60	2.64	0.59	344565.58	0.59	0.00	0.00	0.00	8.93	2589.30	8.93	108.66	118.18
8.25	46.50	87.00	9.75	2.70	0.59	356155.57	0.59	0.00	0.00	0.00	9.00	2836.56	9.00	112.39	121.98
8.3	46.80	87.60	9.90	2.76	0.59	368055.15	0.59	0.00	0.00	0.00	9.07	3102.10	9.07	116.15	125.82
8.35	47.10	88.20	10.05	2.82	0.60	380270.47	0.60	0.00	0.00	0.00	9.15	3386.92	9.15	119.96	129.70
8.4	47.40	88.80	10.20	2.88	0.60	392807.78	0.60	0.00	0.00	0.00	9.22	3692.01	9.22	123.81	133.63
8.45	47.70	89.40	10.35	2.94	0.60	405673.40	0.60	0.00	0.00	0.00	9.29	4018.44	9.29	127.70	137.59
8.5	48.00	90.00	10.50	3.00	0.60	418873.72	0.60	0.00	0.00	0.00	9.36	4367.27	9.36	131.63	141.59
8.55	48.30	90.60	10.65	3.06	0.60	432415.24	0.60	0.00	0.00	0.00	9.43	4739.63	9.43	135.60	145.63
8.6	48.60	91.20	10.80	3.12	0.60	446304.52	0.60	0.00	0.00	0.00	9.50	5136.68	9.50	139.61	149.71
8.65	48.90	91.80	10.95	3.18	0.61	460548.20	0.61	0.00	0.00	0.00	9.57	5559.59	9.57	143.65	153.83
8.7	49.20	92.40	11.10	3.24	0.61	475153.04	0.61	0.00	0.00	0.00	9.64	6009.61	9.64	147.74	157.98
8.75	49.50	93.00	11.25	3.30	0.61	490125.84	0.61	0.00	0.00	0.00	9.70	6487.99	9.70	151.86	162.17
8.8	49.80	93.60	11.40	3.36	0.61	505473.51	0.61	0.00	0.00	0.00	9.77	6996.03	9.77	156.02	166.40
8.85	50.10	94.20	11.55	3.42	0.61	521203.04	0.61	0.00	0.00	0.00	9.84	7535.09	9.84	160.22	170.67
8.9	50.40	94.80	11.70	3.48	0.62	537321.52	0.62	0.00	0.00	0.00	9.90	8106.54	9.90	164.45	174.97
8.95	50.70	95.40	11.85	3.54	0.62	553836.11	0.62	0.00	0.00	0.00	9.97	8711.81	9.97	168.72	179.31
9	51.00	96.00	12.00	3.60	0.62	570754.05	0.62	0.00	0.00	0.00	10.04	9352.35	10.04	173.03	183.69

BASIN D Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	11.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	9.50 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

h	H/D-low	H/D-mid	H/D-top	H/D-peak	Qlow-orif	Qlow-weir	Qtot-low	Qmid-orif	Qmid-weir	Qtot-med	Qtop-orif	Qtop-weir	Qtot-top	Qpeak-top	Qtot
(ft)	-	-	-	-	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	0.60	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	1.20	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	1.80	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	2.40	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	3.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	3.60	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	4.20	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	4.80	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	5.40	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	6.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	6.60	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	7.20	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	7.80	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	8.40	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	9.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	9.60	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	10.20	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	10.80	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	11.40	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	12.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	12.60	0.00	0.00	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2.1	9.60	13.20	0.00	0.00	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2.15	9.90	13.80	0.00	0.00	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
2.2	10.20	14.40	0.00	0.00	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
2.25	10.50	15.00	0.00	0.00	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.3	10.80	15.60	0.00	0.00	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.35	11.10	16.20	0.00	0.00	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.4	11.40	16.80	0.00	0.00	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2.45	11.70	17.40	0.00	0.00	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2.5	12.00	18.00	0.00	0.00	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.55	12.30	18.60	0.00	0.00	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.6	12.60	19.20	0.00	0.00	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.65	12.90	19.80	0.00	0.00	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.7	13.20	20.40	0.00	0.00	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.75	13.50	21.00	0.00	0.00	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.8	13.80	21.60	0.00	0.00	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
2.85	14.10	22.20	0.00	0.00	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
2.9	14.40	22.80	0.00	0.00	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
2.95	14.70	23.40	0.00	0.00	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
3	15.00	24.00	0.00	0.00	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
3.05	15.30	24.60	0.00	0.00	0.34	1057.04	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.1	15.60	25.20	0.00	0.00	0.34	1174.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.15	15.90	25.80	0.00	0.00	0.34	1302.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.2	16.20	26.40	0.00	0.00	0.35	1441.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.25	16.50	27.00	0.00	0.00	0.35	1592.07	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.3	16.80	27.60	0.00	0.00	0.35	1754.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.35	17.10	28.20	0.00	0.00	0.36	1930.25	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.4	17.40	28.80	0.00	0.00	0.36	2119.52	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.45	17.70	29.40	0.00	0.00	0.36	2323.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.5	18.00	30.00	0.00	0.00	0.36	2542.37	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.55	18.30	30.60	0.00	0.00	0.37	2777.60	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
3.6	18.60	31.20	0.00	0.00	0.37	3029.85	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
3.65	18.90	31.80	0.00	0.00	0.37	3300.02	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
3.7	19.20	32.40	0.00	0.00	0.38	3589.06	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
3.75	19.50	33.00	0.00	0.00	0.38	3897.92	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
3.8	19.80	33.60	0.00	0.00	0.38	4227.60	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
3.85	20.10	34.20	0.00	0.00	0.39	4579.14	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
3.9	20.40	34.80	0.00	0.00	0.39	4953.61	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39

BASIN D Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	11.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	9.50 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

3.95	20.70	35.40	0.00	0.00	0.39	5352.09	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
4	21.00	36.00	0.00	0.00	0.39	5775.73	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
4.05	21.30	36.60	0.00	0.00	0.40	6225.69	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
4.1	21.60	37.20	0.00	0.00	0.40	6703.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
4.15	21.90	37.80	0.00	0.00	0.40	7209.43	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
4.2	22.20	38.40	0.00	0.00	0.41	7745.72	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.25	22.50	39.00	0.00	0.00	0.41	8313.37	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.3	22.80	39.60	0.00	0.00	0.41	8913.73	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.35	23.10	40.20	0.00	0.00	0.41	9548.18	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
4.4	23.40	40.80	0.00	0.00	0.42	10218.16	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
4.45	23.70	41.40	0.00	0.00	0.42	10925.13	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
4.5	24.00	42.00	0.00	0.00	0.42	11670.60	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
4.55	24.30	42.60	0.00	0.00	0.43	12456.12	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.6	24.60	43.20	0.00	0.00	0.43	13283.27	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.65	24.90	43.80	0.00	0.00	0.43	14153.68	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.7	25.20	44.40	0.00	0.00	0.43	15069.03	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
4.75	25.50	45.00	0.00	0.00	0.44	16031.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.8	25.80	45.60	0.00	0.00	0.44	17041.42	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.85	26.10	46.20	0.00	0.00	0.44	18102.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.9	26.40	46.80	0.00	0.00	0.44	19214.67	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44
4.95	26.70	47.40	0.00	0.00	0.45	20381.26	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
5	27.00	48.00	0.00	0.00	0.45	21603.72	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
5.05	27.30	48.60	0.15	0.00	0.45	22884.03	0.45	0.00	0.00	0.00	0.00	0.06	0.06	0.00	0.51
5.1	27.60	49.20	0.30	0.00	0.45	24224.21	0.45	0.00	0.00	0.00	0.00	0.22	0.22	0.00	0.68
5.15	27.90	49.80	0.45	0.00	0.46	25626.34	0.46	0.00	0.00	0.00	0.00	0.48	0.48	0.00	0.94
5.2	28.20	50.40	0.60	0.00	0.46	27092.54	0.46	0.00	0.00	0.00	0.94	0.83	0.83	0.00	1.28
5.25	28.50	51.00	0.75	0.00	0.46	28624.96	0.46	0.00	0.00	0.00	1.48	1.23	1.23	0.00	1.69
5.3	28.80	51.60	0.90	0.00	0.46	30225.83	0.46	0.00	0.00	0.00	1.87	1.68	1.68	0.00	2.15
5.35	29.10	52.20	1.05	0.00	0.47	31897.42	0.47	0.00	0.00	0.00	2.19	2.16	2.16	0.00	2.63
5.4	29.40	52.80	1.20	0.00	0.47	33642.02	0.47	0.00	0.00	0.00	2.48	2.65	2.48	0.00	2.94
5.45	29.70	53.40	1.35	0.00	0.47	35462.01	0.47	0.00	0.00	0.00	2.73	3.14	2.73	0.00	3.20
5.5	30.00	54.00	1.50	0.00	0.47	37359.80	0.47	0.00	0.00	0.00	2.96	3.60	2.96	0.00	3.43
5.55	30.30	54.60	1.65	0.00	0.48	39337.85	0.48	0.00	0.00	0.00	3.17	4.03	3.17	0.00	3.65
5.6	30.60	55.20	1.80	0.00	0.48	41398.68	0.48	0.00	0.00	0.00	3.37	4.40	3.37	0.00	3.85
5.65	30.90	55.80	1.95	0.00	0.48	43544.86	0.48	0.00	0.00	0.00	3.56	4.72	3.56	0.00	4.04
5.7	31.20	56.40	2.10	0.00	0.48	45778.99	0.48	0.00	0.00	0.00	3.74	4.98	3.74	0.00	4.23
5.75	31.50	57.00	2.25	0.00	0.49	48103.77	0.49	0.00	0.00	0.00	3.92	5.17	3.92	0.00	4.40
5.8	31.80	57.60	2.40	0.00	0.49	50521.91	0.49	0.00	0.00	0.00	4.08	5.30	4.08	0.00	4.57
5.85	32.10	58.20	2.55	0.00	0.49	53036.19	0.49	0.00	0.00	0.00	4.24	5.37	4.24	0.00	4.73
5.9	32.40	58.80	2.70	0.00	0.49	55649.44	0.49	0.00	0.00	0.00	4.39	5.40	4.39	0.00	4.88
5.95	32.70	59.40	2.85	0.00	0.49	58364.57	0.49	0.00	0.00	0.00	4.54	5.42	4.54	0.00	5.03
6	33.00	60.00	3.00	0.00	0.50	61184.51	0.50	0.00	0.00	0.00	4.68	5.43	4.68	0.00	5.18
6.05	33.30	60.60	3.15	0.00	0.50	64112.26	0.50	0.00	0.00	0.00	4.82	5.49	4.82	0.00	5.32
6.1	33.60	61.20	3.30	0.00	0.50	67150.88	0.50	0.00	0.00	0.00	4.95	5.63	4.95	0.00	5.45
6.15	33.90	61.80	3.45	0.00	0.50	70303.49	0.50	0.00	0.00	0.00	5.08	5.90	5.08	0.00	5.59
6.2	34.20	62.40	3.60	0.00	0.51	73573.27	0.51	0.00	0.00	0.00	5.21	6.36	5.21	0.00	5.72
6.25	34.50	63.00	3.75	0.00	0.51	76963.43	0.51	0.00	0.00	0.00	5.34	7.09	5.34	0.00	5.84
6.3	34.80	63.60	3.90	0.00	0.51	80477.28	0.51	0.00	0.00	0.00	5.46	8.15	5.46	0.00	5.97
6.35	35.10	64.20	4.05	0.00	0.51	84118.16	0.51	0.00	0.00	0.00	5.58	9.64	5.58	0.00	6.09
6.4	35.40	64.80	4.20	0.00	0.52	87889.48	0.52	0.00	0.00	0.00	5.69	11.66	5.69	0.00	6.21
6.45	35.70	65.40	4.35	0.00	0.52	91794.72	0.52	0.00	0.00	0.00	5.81	14.33	5.81	0.00	6.32
6.5	36.00	66.00	4.50	0.00	0.52	95837.39	0.52	0.00	0.00	0.00	5.92	17.76	5.92	0.00	6.44
6.55	36.30	66.60	4.65	0.00	0.52	100021.10	0.52	0.00	0.00	0.00	6.03	22.10	6.03	0.00	6.55
6.6	36.60	67.20	4.80	0.00	0.52	104349.50	0.52	0.00	0.00	0.00	6.14	27.51	6.14	0.00	6.66
6.65	36.90	67.80	4.95	0.00	0.53	108826.31	0.53	0.00	0.00	0.00	6.24	34.13	6.24	0.00	6.77
6.7	37.20	68.40	5.10	0.00	0.53	113455.30	0.53	0.00	0.00	0.00	6.35	42.17	6.35	0.00	6.88
6.75	37.50	69.00	5.25	0.00	0.53	118240.31	0.53	0.00	0.00	0.00	6.45	51.80	6.45	0.00	6.98
6.8	37.80	69.60	5.40	0.00	0.53	123185.27	0.53	0.00	0.00	0.00	6.55	63.25	6.55	0.00	7.08
6.85	38.10	70.20	5.55	0.00	0.53	128294.13	0.53	0.00	0.00	0.00	6.65	76.74	6.65	0.00	7.19
6.9	38.40	70.80	5.70	0.00	0.54	133570.94	0.54	0.00	0.00	0.00	6.75	92.52	6.75	0.00	7.29
6.95	38.70	71.40	5.85	0.00	0.54	139019.80	0.54	0.00	0.00	0.00	6.85	110.85	6.85	0.00	7.38
7	39.00	72.00	6.00	0.00	0.54	144644.87	0.54	0.00	0.00	0.00	6.94	132.00	6.94	0.00	7.48
7.05	39.30	72.60	6.15	0.00	0.54	150450.39	0.54	0.00	0.00	0.00	7.04	156.29	7.04	0.00	7.58
7.1	39.60	73.20	6.30	0.00	0.55	156440.68	0.55	0.00	0.00	0.00	7.13	184.02	7.13	0.00	7.67
7.15	39.90	73.80	6.45	0.00	0.55	162620.08	0.55	0.00	0.00	0.00	7.22	215.54	7.22	0.00	7.77
7.2	40.20	74.40	6.60	0.00	0.55	168993.06	0.55	0.00	0.00	0.00	7.31	251.20	7.31	0.00	7.86
7.25	40.50	75.00	6.75	0.00	0.55	175564.11	0.55	0.00	0.00	0.00	7.40	291.38	7.40	0.00	7.95
7.3	40.80	75.60	6.90	0.00	0.55	182337.81	0.55	0.00	0.00	0.00	7.49	336.48	7.49	0.00	8.04
7.35	41.10	76.20	7.05	0.00	0.56	189318.81	0.56	0.00	0.00	0.00	7.57	386.93	7.57	0.00	8.13
7.4	41.40	76.80	7.20	0.00	0.56	196511.83	0.56	0.00	0.00	0.00	7.66	443.16	7.66	0.00	8.22
7.45	41.70	77.40	7.35	0.00	0.56	203921.66	0.56	0.00	0.00	0.00	7.75	505.66	7.75	0.00	8.31
7.5	42.00	78.00	7.50	0.00	0.56	211553.15	0.56	0.00	0.00	0.00	7.83	574.90	7.83	0.00	8.39
7.55	42.30	78.60	7.65	0.00	0.56	219411.24	0.56	0.00	0.00	0.00	7.91	651.41	7.91	0.00	8.48
7.6	42.60	79.20	7.80	0.00	0.57	227500.93	0.57	0.00	0.00	0.00	8.00	735.72	8.00	0.00	8.56
7.65	42.90	79.80	7.95	0.00	0.57	235827.31	0.57	0.00	0.00	0.00	8.08	828.41	8.08	0.00	8.65
7.7	43.20	80.40	8.10	0.00	0.57	244395.52	0.57	0.00	0.00	0.00	8.16	930.05	8.16	0.00	8.73
7.75	43.50	81.00	8.25	0.00	0.57	253210.79	0.57	0.00	0.00	0.00	8.24	1041.28	8.24	0.00	8.81
7.8	43.80	81.60	8.40	0.00	0.57	262278.42	0.57	0.00	0.00	0.00	8.32	1162.73	8.32	0.00	8.89
7.85	44.10	82.20	8.55	0.00	0.58	271603.79	0.58	0.00	0.00	0.00	8.40	1295.09	8.40	0.00	8.97
7.9	44.40	82.80	8.70	0.00	0.58	281192.34	0.58	0.00	0.00	0.00	8.48	1439.04	8.48	0.00	9.05
7.95	44.70	83.40	8.85	0.00	0.58	291049.62	0.58	0.00	0.00	0.00	8.55	1595.32	8.55	0.00	9.13
8	45.00	84.00	9.00	0.00	0.58	301181.21	0.58	0.00	0.00	0.00	8.63	1764.69	8.63	0.00	9.21
8.05	45.30	84.60	9.15	0.00	0.58	311592.80	0.58	0.00	0.00	0.00	8.70	1947.94	8.70	0.00	9.29

BASIN D Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	2	Number:	12	top	11.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	5.00 ft		
Middle orifice diameter:	1 "	Emergency weir:			
number of orif:	0	Invert:	9.50 ft		
Cg-middle:	0.61	Weir Length (ft)	10.0 ft		
invert elev:	1.00 ft	Riser Box LxW	2x3		

8.1	45.60	85.20	9.30	0.00	0.59	322290.15	0.59	0.00	0.00	0.00	8.78	2145.89	8.78	0.00	9.37
8.15	45.90	85.80	9.45	0.00	0.59	333279.11	0.59	0.00	0.00	0.00	8.85	2359.38	8.85	0.00	9.44
8.2	46.20	86.40	9.60	0.00	0.59	344565.58	0.59	0.00	0.00	0.00	8.93	2589.30	8.93	0.00	9.52
8.25	46.50	87.00	9.75	0.00	0.59	356155.57	0.59	0.00	0.00	0.00	9.00	2836.56	9.00	0.00	9.59
8.3	46.80	87.60	9.90	0.00	0.59	368055.15	0.59	0.00	0.00	0.00	9.07	3102.10	9.07	0.00	9.67
8.35	47.10	88.20	10.05	0.00	0.60	380270.47	0.60	0.00	0.00	0.00	9.15	3386.92	9.15	0.00	9.74
8.4	47.40	88.80	10.20	0.00	0.60	392807.78	0.60	0.00	0.00	0.00	9.22	3692.01	9.22	0.00	9.81
8.45	47.70	89.40	10.35	0.00	0.60	405673.40	0.60	0.00	0.00	0.00	9.29	4018.44	9.29	0.00	9.89
8.5	48.00	90.00	10.50	0.00	0.60	418873.72	0.60	0.00	0.00	0.00	9.36	4367.27	9.36	0.00	9.96
8.55	48.30	90.60	10.65	0.00	0.60	432415.24	0.60	0.00	0.00	0.00	9.43	4739.63	9.43	0.00	10.03
8.6	48.60	91.20	10.80	0.00	0.60	446304.52	0.60	0.00	0.00	0.00	9.50	5136.68	9.50	0.00	10.10
8.65	48.90	91.80	10.95	0.00	0.61	460548.20	0.61	0.00	0.00	0.00	9.57	5559.59	9.57	0.00	10.17
8.7	49.20	92.40	11.10	0.00	0.61	475153.04	0.61	0.00	0.00	0.00	9.64	6009.61	9.64	0.00	10.24
8.75	49.50	93.00	11.25	0.00	0.61	490125.84	0.61	0.00	0.00	0.00	9.70	6487.99	9.70	0.00	10.31
8.8	49.80	93.60	11.40	0.00	0.61	505473.51	0.61	0.00	0.00	0.00	9.77	6996.03	9.77	0.00	10.38
8.85	50.10	94.20	11.55	0.00	0.61	521203.04	0.61	0.00	0.00	0.00	9.84	7535.09	9.84	0.00	10.45
8.9	50.40	94.80	11.70	0.00	0.62	537321.52	0.62	0.00	0.00	0.00	9.90	8106.54	9.90	0.00	10.52
8.95	50.70	95.40	11.85	0.00	0.62	553836.11	0.62	0.00	0.00	0.00	9.97	8711.81	9.97	0.00	10.59
9	51.00	96.00	12.00	0.00	0.62	570754.05	0.62	0.00	0.00	0.00	10.04	9352.35	10.04	0.00	10.66
9.05	51.30	96.60	12.15	0.00	0.62	588082.69	0.62	0.00	0.00	0.00	10.10	10029.67	10.10	0.00	10.72
9.1	51.60	97.20	12.30	0.00	0.62	605829.45	0.62	0.00	0.00	0.00	10.17	10745.31	10.17	0.00	10.79
9.15	51.90	97.80	12.45	0.00	0.63	624001.86	0.63	0.00	0.00	0.00	10.23	11500.86	10.23	0.00	10.86
9.2	52.20	98.40	12.60	0.00	0.63	642607.52	0.63	0.00	0.00	0.00	10.30	12297.96	10.30	0.00	10.92
9.25	52.50	99.00	12.75	0.00	0.63	661654.13	0.63	0.00	0.00	0.00	10.36	13138.26	10.36	0.00	10.99
9.3	52.80	99.60	12.90	0.00	0.63	681149.47	0.63	0.00	0.00	0.00	10.42	14023.49	10.42	0.00	11.05
9.35	53.10	100.20	13.05	0.00	0.63	701101.43	0.63	0.00	0.00	0.00	10.48	14955.42	10.48	0.00	11.12
9.4	53.40	100.80	13.20	0.00	0.63	721517.97	0.63	0.00	0.00	0.00	10.55	15935.84	10.55	0.00	11.18
9.45	53.70	101.40	13.35	0.00	0.64	742407.16	0.64	0.00	0.00	0.00	10.61	16966.61	10.61	0.00	11.25
9.5	54.00	102.00	13.50	0.00	0.64	763777.15	0.64	0.00	0.00	0.00	10.67	18049.63	10.67	0.00	11.31
9.55	54.30	102.60	13.65	0.06	0.64	785636.18	0.64	0.00	0.00	0.00	10.73	19186.84	10.73	0.37	11.74
9.6	54.60	103.20	13.80	0.12	0.64	807992.61	0.64	0.00	0.00	0.00	10.79	20380.23	10.79	1.05	12.49
9.65	54.90	103.80	13.95	0.18	0.64	830854.87	0.64	0.00	0.00	0.00	10.85	21631.84	10.85	1.93	13.43
9.7	55.20	104.40	14.10	0.24	0.64	854231.49	0.64	0.00	0.00	0.00	10.91	22943.77	10.91	2.98	14.54
9.75	55.50	105.00	14.25	0.30	0.65	878131.09	0.65	0.00	0.00	0.00	10.97	24318.14	10.97	4.16	15.78
9.8	55.80	105.60	14.40	0.36	0.65	902562.40	0.65	0.00	0.00	0.00	11.03	25757.14	11.03	5.47	17.15
9.85	56.10	106.20	14.55	0.42	0.65	927534.24	0.65	0.00	0.00	0.00	11.09	27263.01	11.09	6.90	18.64
9.9	56.40	106.80	14.70	0.48	0.65	953055.52	0.65	0.00	0.00	0.00	11.15	28838.04	11.15	8.42	20.23
9.95	56.70	107.40	14.85	0.54	0.65	979135.25	0.65	0.00	0.00	0.00	11.21	30484.57	11.21	10.05	21.92
10	57.00	108.00	15.00	0.60	0.66	1005782.55	0.66	0.00	0.00	0.00	11.27	32204.97	11.27	11.77	23.70
10.05	57.30	108.60	15.15	0.66	0.66	1033006.63	0.66	0.00	0.00	0.00	11.33	34001.71	11.33	13.58	25.57
10.1	57.60	109.20	15.30	0.72	0.66	1060816.80	0.66	0.00	0.00	0.00	11.39	35877.26	11.39	15.48	27.52
10.15	57.90	109.80	15.45	0.78	0.66	1089222.46	0.66	0.00	0.00	0.00	11.44	37834.19	11.44	17.45	29.55
10.2	58.20	110.40	15.60	0.84	0.66	1118233.12	0.66	0.00	0.00	0.00	11.50	39875.09	11.50	19.50	31.67
10.25	58.50	111.00	15.75	0.90	0.66	1147858.39	0.66	0.00	0.00	0.00	11.56	42002.61	11.56	21.63	33.85
10.3	58.80	111.60	15.90	0.96	0.67	1178107.98	0.67	0.00	0.00	0.00	11.61	44219.48	11.61	23.83	36.11
10.35	59.10	112.20	16.05	1.02	0.67	1208991.71	0.67	0.00	0.00	0.00	11.67	46528.46	11.67	26.10	38.43
10.4	59.40	112.80	16.20	1.08	0.67	1240519.48	0.67	0.00	0.00	0.00	11.73	48932.36	11.73	28.43	40.83
10.45	59.70	113.40	16.35	1.14	0.67	1272701.32	0.67	0.00	0.00	0.00	11.78	51434.08	11.78	30.83	43.29
10.5	60.00	114.00	16.50	1.20	0.67	1305547.34	0.67	0.00	0.00	0.00	11.84	54036.55	11.84	33.30	45.81
10.55	60.30	114.60	16.65	1.26	0.67	1339067.77	0.67	0.00	0.00	0.00	11.89	56742.77	11.89	35.83	48.40
10.6	60.60	115.20	16.80	1.32	0.68	1373272.93	0.68	0.00	0.00	0.00	11.95	59555.79	11.95	38.42	51.04
10.65	60.90	115.80	16.95	1.38	0.68	1408173.27	0.68	0.00	0.00	0.00	12.00	62478.72	12.00	41.07	53.75
10.7	61.20	116.40	17.10	1.44	0.68	1443779.32	0.68	0.00	0.00	0.00	12.06	65514.74	12.06	43.77	56.51
10.75	61.50	117.00	17.25	1.50	0.68	1480101.71	0.68	0.00	0.00	0.00	12.11	68667.09	12.11	46.54	59.33
10.8	61.80	117.60	17.40	1.56	0.68	1517151.22	0.68	0.00	0.00	0.00	12.17	71939.04	12.17	49.36	62.21
10.85	62.10	118.20	17.55	1.62	0.68	1554938.68	0.68	0.00	0.00	0.00	12.22	75333.96	12.22	52.23	65.14
10.9	62.40	118.80	17.70	1.68	0.69	1593475.07	0.69	0.00	0.00	0.00	12.27	78855.27	12.27	55.16	68.12
10.95	62.70	119.40	17.85	1.74	0.69	1632771.46	0.69	0.00	0.00	0.00	12.33	82506.45	12.33	58.14	71.16
11	63.00	120.00	18.00	1.80	0.69	1672839.04	0.69	0.00	0.00	0.00	12.38	86291.03	12.38	61.18	74.25

BASIN E Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "
Number:	2	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.00 ft
Middle orifice diameter:	1 "	Emergency weir:	
number of orif:	0	Invert:	3.50 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	1.00 ft	Riser Box LxW	2x3

top 5.00

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	0.60	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	1.20	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	1.80	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	2.40	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	3.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	3.60	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	4.20	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	4.80	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	5.40	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	6.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	6.60	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	7.20	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	7.80	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	8.40	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	9.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	9.60	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	10.20	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	10.80	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	11.40	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	12.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	12.60	0.15	0.00	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2.1	9.60	13.20	0.30	0.00	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
2.15	9.90	13.80	0.45	0.00	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
2.2	10.20	14.40	0.60	0.00	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
2.25	10.50	15.00	0.75	0.00	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.3	10.80	15.60	0.90	0.00	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.35	11.10	16.20	1.05	0.00	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
2.4	11.40	16.80	1.20	0.00	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2.45	11.70	17.40	1.35	0.00	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
2.5	12.00	18.00	1.50	0.00	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.55	12.30	18.60	1.65	0.00	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.6	12.60	19.20	1.80	0.00	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30
2.65	12.90	19.80	1.95	0.00	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.7	13.20	20.40	2.10	0.00	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.75	13.50	21.00	2.25	0.00	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
2.8	13.80	21.60	2.40	0.00	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
2.85	14.10	22.20	2.55	0.00	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
2.9	14.40	22.80	2.70	0.00	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
2.95	14.70	23.40	2.85	0.00	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
3	15.00	24.00	3.00	0.00	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
3.05	15.30	24.60	3.15	0.00	0.34	1057.04	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.1	15.60	25.20	3.30	0.00	0.34	1174.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.15	15.90	25.80	3.45	0.00	0.34	1302.83	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
3.2	16.20	26.40	3.60	0.00	0.35	1441.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.25	16.50	27.00	3.75	0.00	0.35	1592.07	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.3	16.80	27.60	3.90	0.00	0.35	1754.68	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
3.35	17.10	28.20	4.05	0.00	0.36	1930.25	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.4	17.40	28.80	4.20	0.00	0.36	2119.52	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.45	17.70	29.40	4.35	0.00	0.36	2323.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.5	18.00	30.00	4.50	0.00	0.36	2542.37	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
3.55	18.30	30.60	4.65	0.06	0.37	2777.60	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.74
3.6	18.60	31.20	4.80	0.12	0.37	3029.85	0.37	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.42
3.65	18.90	31.80	4.95	0.18	0.37	3300.02	0.37	0.00	0.00	0.00	0.00	0.00	0.00	1.93	2.31
3.7	19.20	32.40	5.10	0.24	0.38	3589.06	0.38	0.00	0.00	0.00	0.00	0.00	0.00	2.98	3.36
3.75	19.50	33.00	5.25	0.30	0.38	3897.92	0.38	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.54
3.8	19.80	33.60	5.40	0.36	0.38	4227.60	0.38	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.85
3.85	20.10	34.20	5.55	0.42	0.39	4579.14	0.39	0.00	0.00	0.00	0.00	0.00	0.00	6.90	7.28

BASIN E Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "
Number:	2	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.00 ft
Middle orifice diameter:	1 "	Emergency weir:	
number of orif:	0	Invert:	3.50 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	1.00 ft	Riser Box LxW	2x3

top 5.00

3.9	20.40	34.80	5.70	0.48	0.39	4953.61	0.39	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.81
3.95	20.70	35.40	5.85	0.54	0.39	5352.09	0.39	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.44
4	21.00	36.00	6.00	0.60	0.39	5775.73	0.39	0.00	0.00	0.00	0.00	0.00	0.00	11.77	12.17
4.05	21.30	36.60	6.15	0.66	0.40	6225.69	0.40	0.00	0.00	0.00	0.00	0.00	0.00	13.58	13.98
4.1	21.60	37.20	6.30	0.72	0.40	6703.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00	15.48	15.88
4.15	21.90	37.80	6.45	0.78	0.40	7209.43	0.40	0.00	0.00	0.00	0.00	0.00	0.00	17.45	17.85
4.2	22.20	38.40	6.60	0.84	0.41	7745.72	0.41	0.00	0.00	0.00	0.00	0.00	0.00	19.50	19.91
4.25	22.50	39.00	6.75	0.90	0.41	8313.37	0.41	0.00	0.00	0.00	0.00	0.00	0.00	21.63	22.04
4.3	22.80	39.60	6.90	0.96	0.41	8913.73	0.41	0.00	0.00	0.00	0.00	0.00	0.00	23.83	24.24
4.35	23.10	40.20	7.05	1.02	0.41	9548.18	0.41	0.00	0.00	0.00	0.00	0.00	0.00	26.10	26.51
4.4	23.40	40.80	7.20	1.08	0.42	10218.16	0.42	0.00	0.00	0.00	0.00	0.00	0.00	28.43	28.85
4.45	23.70	41.40	7.35	1.14	0.42	10925.13	0.42	0.00	0.00	0.00	0.00	0.00	0.00	30.83	31.25
4.5	24.00	42.00	7.50	1.20	0.42	11670.60	0.42	0.00	0.00	0.00	0.00	0.00	0.00	33.30	33.72
4.55	24.30	42.60	7.65	1.26	0.43	12456.12	0.43	0.00	0.00	0.00	0.00	0.00	0.00	35.83	36.25
4.6	24.60	43.20	7.80	1.32	0.43	13283.27	0.43	0.00	0.00	0.00	0.00	0.00	0.00	38.42	38.85
4.65	24.90	43.80	7.95	1.38	0.43	14153.68	0.43	0.00	0.00	0.00	0.00	0.00	0.00	41.07	41.50
4.7	25.20	44.40	8.10	1.44	0.43	15069.03	0.43	0.00	0.00	0.00	0.00	0.00	0.00	43.77	44.21
4.75	25.50	45.00	8.25	1.50	0.44	16031.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	46.54	46.97
4.8	25.80	45.60	8.40	1.56	0.44	17041.42	0.44	0.00	0.00	0.00	0.00	0.00	0.00	49.36	49.80
4.85	26.10	46.20	8.55	1.62	0.44	18102.02	0.44	0.00	0.00	0.00	0.00	0.00	0.00	52.23	52.67
4.9	26.40	46.80	8.70	1.68	0.44	19214.67	0.44	0.00	0.00	0.00	0.00	0.00	0.00	55.16	55.61
4.95	26.70	47.40	8.85	1.74	0.45	20381.26	0.45	0.00	0.00	0.00	0.00	0.00	0.00	58.14	58.59
5	27.00	48.00	9.00	1.80	0.45	21603.72	0.45	0.00	0.00	0.00	0.00	0.00	0.00	61.18	61.62

BASIN F Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	1	Number:	0	top	6.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	3.00 ft		
Middle orifice diameter:	2 "	Emergency weir:			
number of orif:	0	Invert:	2.50 ft		
Cg-middle:	0.61	Weir Length (ft)	7.1 ft		
invert elev:	1.00 ft	Riser Box diameter	3		

h	H/D-low	H/D-mid	H/D-top	H/D-peak	Qlow-orif	Qlow-weir	Qtot-low	Qmid-orif	Qmid-weir	Qtot-med	Qtop-orif	Qtop-weir	Qtot-top	Qpeak-top	Qtot
(ft)	-	-	-	-	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.6	0.60	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.65	0.90	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.7	1.20	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
0.75	1.50	0.00	0.00	0.00	0.04	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
0.8	1.80	0.00	0.00	0.00	0.05	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.85	2.10	0.00	0.00	0.00	0.06	0.07	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
0.9	2.40	0.00	0.00	0.00	0.06	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
0.95	2.70	0.00	0.00	0.00	0.06	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
1	3.00	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
1.05	3.30	0.30	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
1.1	3.60	0.60	0.00	0.00	0.08	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
1.15	3.90	0.90	0.00	0.00	0.08	0.12	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
1.2	4.20	1.20	0.00	0.00	0.08	0.17	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
1.25	4.50	1.50	0.00	0.00	0.09	0.26	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
1.3	4.80	1.80	0.00	0.00	0.09	0.41	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
1.35	5.10	2.10	0.00	0.00	0.09	0.62	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
1.4	5.40	2.40	0.00	0.00	0.10	0.93	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
1.45	5.70	2.70	0.00	0.00	0.10	1.36	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
1.5	6.00	3.00	0.00	0.00	0.10	1.94	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
1.55	6.30	3.30	0.00	0.00	0.11	2.71	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
1.6	6.60	3.60	0.00	0.00	0.11	3.70	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
1.65	6.90	3.90	0.00	0.00	0.11	4.96	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
1.7	7.20	4.20	0.00	0.00	0.11	6.53	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
1.75	7.50	4.50	0.00	0.00	0.12	8.47	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
1.8	7.80	4.80	0.00	0.00	0.12	10.84	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
1.85	8.10	5.10	0.00	0.00	0.12	13.70	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
1.9	8.40	5.40	0.00	0.00	0.12	17.13	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
1.95	8.70	5.70	0.00	0.00	0.12	21.20	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
2	9.00	6.00	0.00	0.00	0.13	26.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
2.05	9.30	6.30	0.00	0.00	0.13	31.61	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
2.1	9.60	6.60	0.00	0.00	0.13	38.14	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
2.15	9.90	6.90	0.00	0.00	0.13	45.70	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
2.2	10.20	7.20	0.00	0.00	0.14	54.39	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
2.25	10.50	7.50	0.00	0.00	0.14	64.34	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
2.3	10.80	7.80	0.00	0.00	0.14	75.67	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
2.35	11.10	8.10	0.00	0.00	0.14	88.53	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
2.4	11.40	8.40	0.00	0.00	0.14	103.06	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
2.45	11.70	8.70	0.00	0.00	0.15	119.42	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
2.5	12.00	9.00	0.00	0.00	0.15	137.77	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
2.55	12.30	9.30	0.00	0.08	0.15	158.29	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.41
2.6	12.60	9.60	0.00	0.17	0.15	181.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.90
2.65	12.90	9.90	0.00	0.25	0.15	206.59	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.37	1.52
2.7	13.20	10.20	0.00	0.34	0.16	234.76	0.16	0.00	0.00	0.00	0.00	0.00	0.00	2.10	2.26
2.75	13.50	10.50	0.00	0.42	0.16	265.90	0.16	0.00	0.00	0.00	0.00	0.00	0.00	2.94	3.10
2.8	13.80	10.80	0.00	0.51	0.16	300.23	0.16	0.00	0.00	0.00	0.00	0.00	0.00	3.87	4.02
2.85	14.10	11.10	0.00	0.59	0.16	337.99	0.16	0.00	0.00	0.00	0.00	0.00	0.00	4.87	5.03
2.9	14.40	11.40	0.00	0.68	0.16	379.44	0.16	0.00	0.00	0.00	0.00	0.00	0.00	5.95	6.11
2.95	14.70	11.70	0.00	0.76	0.16	424.82	0.16	0.00	0.00	0.00	0.00	0.00	0.00	7.10	7.27
3	15.00	12.00	0.00	0.85	0.17	474.42	0.17	0.00	0.00	0.00	0.00	0.00	0.00	8.32	8.48
3.05	15.30	12.30	0.15	0.93	0.17	528.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	9.60	9.76
3.1	15.60	12.60	0.30	1.02	0.17	587.42	0.17	0.00	0.00	0.00	0.00	0.00	0.00	10.93	11.10
3.15	15.90	12.90	0.45	1.10	0.17	651.41	0.17	0.00	0.00	0.00	0.00	0.00	0.00	12.33	12.50
3.2	16.20	13.20	0.60	1.19	0.17	720.84	0.17	0.00	0.00	0.00	0.00	0.00	0.00	13.78	13.95
3.25	16.50	13.50	0.75	1.27	0.17	796.03	0.17	0.00	0.00	0.00	0.00	0.00	0.00	15.28	15.46
3.3	16.80	13.80	0.90	1.36	0.18	877.34	0.18	0.00	0.00	0.00	0.00	0.00	0.00	16.83	17.01
3.35	17.10	14.10	1.05	1.44	0.18	965.12	0.18	0.00	0.00	0.00	0.00	0.00	0.00	18.44	18.61
3.4	17.40	14.40	1.20	1.53	0.18	1059.76	0.18	0.00	0.00	0.00	0.00	0.00	0.00	20.09	20.27
3.45	17.70	14.70	1.35	1.61	0.18	1161.65	0.18	0.00	0.00	0.00	0.00	0.00	0.00	21.78	21.97
3.5	18.00	15.00	1.50	1.70	0.18	1271.19	0.18	0.00	0.00	0.00	0.00	0.00	0.00	23.53	23.71
3.55	18.30	15.30	1.65	1.78	0.18	1388.80	0.18	0.00	0.00	0.00	0.00	0.00	0.00	25.31	25.50
3.6	18.60	15.60	1.80	1.87	0.19	1514.93	0.19	0.00	0.00	0.00	0.00	0.00	0.00	27.14	27.33
3.65	18.90	15.90	1.95	1.95	0.19	1650.01	0.19	0.00	0.00	0.00	0.00	0.00	0.00	29.01	29.20
3.7	19.20	16.20	2.10	2.04	0.19	1794.53	0.19	0.00	0.00	0.00	0.00	0.00	0.00	30.93	31.11
3.75	19.50	16.50	2.25	2.12	0.19	1948.96	0.19	0.00	0.00	0.00	0.00	0.00	0.00	32.88	33.07
3.8	19.80	16.80	2.40	2.21	0.19	2113.80	0.19	0.00	0.00	0.00	0.00	0.00	0.00	34.87	35.06
3.85	20.10	17.10	2.55	2.29	0.19	2289.57	0.19	0.00	0.00	0.00	0.00	0.00	0.00	36.90	37.10

BASIN F Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "		
Number:	1	Number:	0	top	6.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	3.00 ft		
Middle orifice diameter:	2 "	Emergency weir:			
number of orif:	0	Invert:	2.50 ft		
Cg-middle:	0.61	Weir Length (ft)	7.1 ft		
invert elev:	1.00 ft	Riser Box diameter	3		

3.9	20.40	17.40	2.70	2.38	0.19	2476.80	0.19	0.00	0.00	0.00	0.00	0.00	0.00	38.97	39.17
3.95	20.70	17.70	2.85	2.46	0.20	2676.05	0.20	0.00	0.00	0.00	0.00	0.00	0.00	41.08	41.27
4	21.00	18.00	3.00	2.55	0.20	2887.86	0.20	0.00	0.00	0.00	0.00	0.00	0.00	43.22	43.42
4.05	21.30	18.30	3.15	2.63	0.20	3112.84	0.20	0.00	0.00	0.00	0.00	0.00	0.00	45.40	45.60
4.1	21.60	18.60	3.30	2.72	0.20	3351.59	0.20	0.00	0.00	0.00	0.00	0.00	0.00	47.61	47.81
4.15	21.90	18.90	3.45	2.80	0.20	3604.71	0.20	0.00	0.00	0.00	0.00	0.00	0.00	49.86	50.07
4.2	22.20	19.20	3.60	2.89	0.20	3872.86	0.20	0.00	0.00	0.00	0.00	0.00	0.00	52.15	52.35
4.25	22.50	19.50	3.75	2.97	0.20	4156.69	0.20	0.00	0.00	0.00	0.00	0.00	0.00	54.46	54.67
4.3	22.80	19.80	3.90	3.06	0.21	4456.87	0.21	0.00	0.00	0.00	0.00	0.00	0.00	56.82	57.02
4.35	23.10	20.10	4.05	3.14	0.21	4774.09	0.21	0.00	0.00	0.00	0.00	0.00	0.00	59.20	59.41
4.4	23.40	20.40	4.20	3.23	0.21	5109.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00	61.62	61.82
4.45	23.70	20.70	4.35	3.31	0.21	5462.57	0.21	0.00	0.00	0.00	0.00	0.00	0.00	64.06	64.27
4.5	24.00	21.00	4.50	3.40	0.21	5835.30	0.21	0.00	0.00	0.00	0.00	0.00	0.00	66.54	66.75
4.55	24.30	21.30	4.65	3.48	0.21	6228.06	0.21	0.00	0.00	0.00	0.00	0.00	0.00	69.05	69.27
4.6	24.60	21.60	4.80	3.57	0.21	6641.63	0.21	0.00	0.00	0.00	0.00	0.00	0.00	71.60	71.81
4.65	24.90	21.90	4.95	3.65	0.22	7076.84	0.22	0.00	0.00	0.00	0.00	0.00	0.00	74.17	74.38
4.7	25.20	22.20	5.10	3.74	0.22	7534.51	0.22	0.00	0.00	0.00	0.00	0.00	0.00	76.77	76.99
4.75	25.50	22.50	5.25	3.82	0.22	8015.51	0.22	0.00	0.00	0.00	0.00	0.00	0.00	79.40	79.62
4.8	25.80	22.80	5.40	3.91	0.22	8520.71	0.22	0.00	0.00	0.00	0.00	0.00	0.00	82.06	82.28
4.85	26.10	23.10	5.55	3.99	0.22	9051.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	84.75	84.97
4.9	26.40	23.40	5.70	4.08	0.22	9607.34	0.22	0.00	0.00	0.00	0.00	0.00	0.00	87.47	87.69
4.95	26.70	23.70	5.85	4.16	0.22	10190.63	0.22	0.00	0.00	0.00	0.00	0.00	0.00	90.22	90.44
5	27.00	24.00	6.00	4.25	0.22	10801.86	0.22	0.00	0.00	0.00	0.00	0.00	0.00	93.00	93.22
5.05	27.30	24.30	6.15	4.33	0.23	11442.02	0.23	0.00	0.00	0.00	0.00	0.00	0.00	95.80	96.03
5.1	27.60	24.60	6.30	4.42	0.23	12112.11	0.23	0.00	0.00	0.00	0.00	0.00	0.00	98.63	98.86
5.15	27.90	24.90	6.45	4.50	0.23	12813.17	0.23	0.00	0.00	0.00	0.00	0.00	0.00	101.49	101.72
5.2	28.20	25.20	6.60	4.59	0.23	13546.27	0.23	0.00	0.00	0.00	0.00	0.00	0.00	104.38	104.61
5.25	28.50	25.50	6.75	4.67	0.23	14312.48	0.23	0.00	0.00	0.00	0.00	0.00	0.00	107.29	107.52
5.3	28.80	25.80	6.90	4.76	0.23	15112.92	0.23	0.00	0.00	0.00	0.00	0.00	0.00	110.23	110.46
5.35	29.10	26.10	7.05	4.84	0.23	15948.71	0.23	0.00	0.00	0.00	0.00	0.00	0.00	113.19	113.43
5.4	29.40	26.40	7.20	4.93	0.23	16821.01	0.23	0.00	0.00	0.00	0.00	0.00	0.00	116.19	116.42
5.45	29.70	26.70	7.35	5.01	0.24	17731.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	119.20	119.44
5.5	30.00	27.00	7.50	5.10	0.24	18679.90	0.24	0.00	0.00	0.00	0.00	0.00	0.00	122.25	122.48
5.55	30.30	27.30	7.65	5.18	0.24	19668.93	0.24	0.00	0.00	0.00	0.00	0.00	0.00	125.32	125.55
5.6	30.60	27.60	7.80	5.27	0.24	20699.34	0.24	0.00	0.00	0.00	0.00	0.00	0.00	128.41	128.65
5.65	30.90	27.90	7.95	5.35	0.24	21772.43	0.24	0.00	0.00	0.00	0.00	0.00	0.00	131.53	131.77
5.7	31.20	28.20	8.10	5.44	0.24	22889.50	0.24	0.00	0.00	0.00	0.00	0.00	0.00	134.67	134.91
5.75	31.50	28.50	8.25	5.52	0.24	24051.88	0.24	0.00	0.00	0.00	0.00	0.00	0.00	137.84	138.08
5.8	31.80	28.80	8.40	5.61	0.24	25260.95	0.24	0.00	0.00	0.00	0.00	0.00	0.00	141.04	141.28
5.85	32.10	29.10	8.55	5.69	0.25	26518.09	0.25	0.00	0.00	0.00	0.00	0.00	0.00	144.25	144.50
5.9	32.40	29.40	8.70	5.77	0.25	27824.72	0.25	0.00	0.00	0.00	0.00	0.00	0.00	147.49	147.74
5.95	32.70	29.70	8.85	5.86	0.25	29182.28	0.25	0.00	0.00	0.00	0.00	0.00	0.00	150.76	151.01
6	33.00	30.00	9.00	5.94	0.25	30592.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	154.05	154.30

BASIN G Discharge -

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	5 "		
Number:	1	Number:	6	top	6.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	2.00 ft		
Middle orifice diameter:	5 "	Emergency weir:			
number of orif:	12	Invert:	2.75 ft		
Cg-middle:	0.61	Weir Length (ft)	7.1 ft		
invert elev:	1.00 ft	Riser Box LxW	3		

h	H/D-low	H/D-mid	H/D-top	H/D-peak	Qlow-orif	Qlow-weir	Qtot-low	Qmid-orif	Qmid-weir	Qtot-med	Qtop-orif	Qtop-weir	Qtot-top	Qpeak-top	Qtot
(ft)	-	-	-	-	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.6	0.60	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.65	0.90	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.7	1.20	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
0.75	1.50	0.00	0.00	0.00	0.04	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
0.8	1.80	0.00	0.00	0.00	0.05	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.85	2.10	0.00	0.00	0.00	0.06	0.07	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
0.9	2.40	0.00	0.00	0.00	0.06	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
0.95	2.70	0.00	0.00	0.00	0.06	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
1	3.00	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
1.05	3.30	0.12	0.00	0.00	0.07	0.08	0.07	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.14
1.1	3.60	0.24	0.00	0.00	0.08	0.09	0.08	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.33
1.15	3.90	0.36	0.00	0.00	0.08	0.12	0.08	0.00	0.55	0.55	0.00	0.00	0.00	0.00	0.64
1.2	4.20	0.48	0.00	0.00	0.08	0.17	0.08	0.00	0.96	0.96	0.00	0.00	0.00	0.00	1.04
1.25	4.50	0.60	0.00	0.00	0.09	0.26	0.09	1.63	1.44	1.44	0.00	0.00	0.00	0.00	1.53
1.3	4.80	0.72	0.00	0.00	0.09	0.41	0.09	2.43	2.00	2.00	0.00	0.00	0.00	0.00	2.09
1.35	5.10	0.84	0.00	0.00	0.09	0.62	0.09	3.01	2.61	2.61	0.00	0.00	0.00	0.00	2.71
1.4	5.40	0.96	0.00	0.00	0.10	0.93	0.10	3.51	3.27	3.27	0.00	0.00	0.00	0.00	3.37
1.45	5.70	1.08	0.00	0.00	0.10	1.36	0.10	3.94	3.95	3.95	0.00	0.00	0.00	0.00	4.05
1.5	6.00	1.20	0.00	0.00	0.10	1.94	0.10	4.33	4.63	4.33	0.00	0.00	0.00	0.00	4.43
1.55	6.30	1.32	0.00	0.00	0.11	2.71	0.11	4.68	5.31	4.68	0.00	0.00	0.00	0.00	4.79
1.6	6.60	1.44	0.00	0.00	0.11	3.70	0.11	5.01	5.97	5.01	0.00	0.00	0.00	0.00	5.12
1.65	6.90	1.56	0.00	0.00	0.11	4.96	0.11	5.32	6.59	5.32	0.00	0.00	0.00	0.00	5.43
1.7	7.20	1.68	0.00	0.00	0.11	6.53	0.11	5.62	7.17	5.62	0.00	0.00	0.00	0.00	5.73
1.75	7.50	1.80	0.00	0.00	0.12	8.47	0.12	5.90	7.69	5.90	0.00	0.00	0.00	0.00	6.01
1.8	7.80	1.92	0.00	0.00	0.12	10.84	0.12	6.16	8.15	6.16	0.00	0.00	0.00	0.00	6.28
1.85	8.10	2.04	0.00	0.00	0.12	13.70	0.12	6.42	8.53	6.42	0.00	0.00	0.00	0.00	6.54
1.9	8.40	2.16	0.00	0.00	0.12	17.13	0.12	6.66	8.84	6.66	0.00	0.00	0.00	0.00	6.78
1.95	8.70	2.28	0.00	0.00	0.12	21.20	0.12	6.90	9.08	6.90	0.00	0.00	0.00	0.00	7.02
2	9.00	2.40	0.00	0.00	0.13	26.00	0.13	7.13	9.25	7.13	0.00	0.00	0.00	0.00	7.25
2.05	9.30	2.52	0.12	0.00	0.13	31.61	0.13	7.35	9.36	7.35	0.00	0.03	0.03	0.00	7.51
2.1	9.60	2.64	0.24	0.00	0.13	38.14	0.13	7.56	9.42	7.56	0.00	0.13	0.13	0.00	7.82
2.15	9.90	2.76	0.36	0.00	0.13	45.70	0.13	7.77	9.45	7.77	0.00	0.28	0.28	0.00	8.18
2.2	10.20	2.88	0.48	0.00	0.14	54.39	0.14	7.98	9.47	7.98	0.00	0.48	0.48	0.00	8.59
2.25	10.50	3.00	0.60	0.00	0.14	64.34	0.14	8.17	9.49	8.17	0.82	0.72	0.72	0.00	9.03
2.3	10.80	3.12	0.72	0.00	0.14	75.67	0.14	8.37	9.56	8.37	1.21	1.00	1.00	0.00	9.51
2.35	11.10	3.24	0.84	0.00	0.14	88.53	0.14	8.56	9.72	8.56	1.51	1.31	1.31	0.00	10.01
2.4	11.40	3.36	0.96	0.00	0.14	103.06	0.14	8.74	9.99	8.74	1.75	1.63	1.63	0.00	10.52
2.45	11.70	3.48	1.08	0.00	0.15	119.42	0.15	8.93	10.44	8.93	1.97	1.97	1.97	0.00	11.04
2.5	12.00	3.60	1.20	0.00	0.15	137.77	0.15	9.10	11.12	9.10	2.16	2.32	2.16	0.00	11.41
2.55	12.30	3.72	1.32	0.00	0.15	158.29	0.15	9.28	12.08	9.28	2.34	2.66	2.34	0.00	11.77
2.6	12.60	3.84	1.44	0.00	0.15	181.17	0.15	9.45	13.41	9.45	2.51	2.99	2.51	0.00	12.11
2.65	12.90	3.96	1.56	0.00	0.15	206.59	0.15	9.62	15.18	9.62	2.66	3.30	2.66	0.00	12.43
2.7	13.20	4.08	1.68	0.00	0.16	234.76	0.16	9.78	17.47	9.78	2.81	3.59	2.81	0.00	12.75
2.75	13.50	4.20	1.80	0.00	0.16	265.90	0.16	9.95	20.37	9.95	2.95	3.85	2.95	0.00	13.05
2.8	13.80	4.32	1.92	0.08	0.16	300.23	0.16	10.11	24.00	10.11	3.08	4.07	3.08	0.26	13.61
2.85	14.10	4.44	2.04	0.17	0.16	337.99	0.16	10.26	28.45	10.26	3.21	4.27	3.21	0.74	14.38
2.9	14.40	4.56	2.16	0.25	0.16	379.44	0.16	10.42	33.86	10.42	3.33	4.42	3.33	1.37	15.28
2.95	14.70	4.68	2.28	0.34	0.16	424.82	0.16	10.57	40.34	10.57	3.45	4.54	3.45	2.10	16.29
3	15.00	4.80	2.40	0.42	0.17	474.42	0.17	10.72	48.05	10.72	3.56	4.63	3.56	2.94	17.39
3.05	15.30	4.92	2.52	0.51	0.17	528.52	0.17	10.87	57.13	10.87	3.67	4.68	3.67	3.87	18.58
3.1	15.60	5.04	2.64	0.59	0.17	587.42	0.17	11.02	67.73	11.02	3.78	4.71	3.78	4.87	19.84
3.15	15.90	5.16	2.76	0.68	0.17	651.41	0.17	11.16	80.04	11.16	3.89	4.73	3.89	5.95	21.17
3.2	16.20	5.28	2.88	0.76	0.17	720.84	0.17	11.30	94.23	11.30	3.99	4.73	3.99	7.10	22.57
3.25	16.50	5.40	3.00	0.85	0.17	796.03	0.17	11.44	110.50	11.44	4.09	4.75	4.09	8.32	24.02
3.3	16.80	5.52	3.12	0.93	0.18	877.34	0.18	11.58	129.04	11.58	4.18	4.78	4.18	9.60	25.54
3.35	17.10	5.64	3.24	1.02	0.18	965.12	0.18	11.72	150.09	11.72	4.28	4.86	4.28	10.93	27.11
3.4	17.40	5.76	3.36	1.10	0.18	1059.76	0.18	11.86	173.87	11.86	4.37	5.00	4.37	12.33	28.74
3.45	17.70	5.88	3.48	1.19	0.18	1161.65	0.18	11.99	200.62	11.99	4.46	5.22	4.46	13.78	30.41
3.5	18.00	6.00	3.60	1.27	0.18	1271.19	0.18	12.13	230.60	12.13	4.55	5.56	4.55	15.28	32.14
3.55	18.30	6.12	3.72	1.36	0.18	1388.80	0.18	12.26	264.08	12.26	4.64	6.04	4.64	16.83	33.91
3.6	18.60	6.24	3.84	1.44	0.19	1514.93	0.19	12.39	301.33	12.39	4.72	6.71	4.72	18.44	35.73
3.65	18.90	6.36	3.96	1.53	0.19	1650.01	0.19	12.52	342.67	12.52	4.81	7.59	4.81	20.09	37.60
3.7	19.20	6.48	4.08	1.61	0.19	1794.53	0.19	12.64	388.39	12.64	4.89	8.73	4.89	21.78	39.51
3.75	19.50	6.60	4.20	1.70	0.19	1948.96	0.19	12.77	438.82	12.77	4.97	10.19	4.97	23.53	41.46
3.8	19.80	6.72	4.32	1.78	0.19	2113.80	0.19	12.89	494.31	12.89	5.05	12.00	5.05	25.31	43.45
3.85	20.10	6.84	4.44	1.87	0.19	2289.57	0.19	13.02	555.21	13.02	5.13	14.23	5.13	27.14	45.49

BASIN G Discharge -

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	5 "		
Number:	1	Number:	6	top	6.00
Cg-low:	0.61	Cg-low:	0.61		
invert elev:	0.50 ft	invert elev:	2.00 ft		
Middle orifice diameter:	5 "	Emergency weir:			
number of orif:	12	Invert:	2.75 ft		
Cg-middle:	0.61	Weir Length (ft)	7.1 ft		
invert elev:	1.00 ft	Riser Box LxW	3		

3.9	20.40	6.96	4.56	1.95	0.19	2476.80	0.19	13.14	621.89	13.14	5.21	16.93	5.21	29.01	47.56
3.95	20.70	7.08	4.68	2.04	0.20	2676.05	0.20	13.26	694.75	13.26	5.29	20.17	5.29	30.93	49.67
4	21.00	7.20	4.80	2.12	0.20	2887.86	0.20	13.38	774.18	13.38	5.36	24.03	5.36	32.88	51.82
4.05	21.30	7.32	4.92	2.21	0.20	3112.84	0.20	13.50	860.60	13.50	5.43	28.56	5.43	34.87	54.01
4.1	21.60	7.44	5.04	2.29	0.20	3351.59	0.20	13.62	954.46	13.62	5.51	33.87	5.51	36.90	56.23
4.15	21.90	7.56	5.16	2.38	0.20	3604.71	0.20	13.74	1056.20	13.74	5.58	40.02	5.58	38.97	58.49
4.2	22.20	7.68	5.28	2.46	0.20	3872.86	0.20	13.85	1166.30	13.85	5.65	47.11	5.65	41.08	60.79
4.25	22.50	7.80	5.40	2.55	0.20	4156.69	0.20	13.97	1285.25	13.97	5.72	55.25	5.72	43.22	63.12
4.3	22.80	7.92	5.52	2.63	0.21	4456.87	0.21	14.08	1413.56	14.08	5.79	64.52	5.79	45.40	65.48
4.35	23.10	8.04	5.64	2.72	0.21	4774.09	0.21	14.20	1551.76	14.20	5.86	75.05	5.86	47.61	67.88
4.4	23.40	8.16	5.76	2.80	0.21	5109.08	0.21	14.31	1700.39	14.31	5.93	86.94	5.93	49.86	70.31
4.45	23.70	8.28	5.88	2.89	0.21	5462.57	0.21	14.42	1860.01	14.42	6.00	100.31	6.00	52.15	72.77
4.5	24.00	8.40	6.00	2.97	0.21	5835.30	0.21	14.53	2031.21	14.53	6.06	115.30	6.06	54.46	75.27
4.55	24.30	8.52	6.12	3.06	0.21	6228.06	0.21	14.64	2214.60	14.64	6.13	132.04	6.13	56.82	77.80
4.6	24.60	8.64	6.24	3.14	0.21	6641.63	0.21	14.75	2410.80	14.75	6.19	150.67	6.19	59.20	80.36
4.65	24.90	8.76	6.36	3.23	0.22	7076.84	0.22	14.86	2620.45	14.86	6.26	171.33	6.26	61.62	82.95
4.7	25.20	8.88	6.48	3.31	0.22	7534.51	0.22	14.97	2844.22	14.97	6.32	194.19	6.32	64.06	85.57
4.75	25.50	9.00	6.60	3.40	0.22	8015.51	0.22	15.07	3082.79	15.07	6.38	219.41	6.38	66.54	88.22
4.8	25.80	9.12	6.72	3.48	0.22	8520.71	0.22	15.18	3336.88	15.18	6.45	247.16	6.45	69.05	90.90
4.85	26.10	9.24	6.84	3.57	0.22	9051.01	0.22	15.29	3607.22	15.29	6.51	277.61	6.51	71.60	93.61
4.9	26.40	9.36	6.96	3.65	0.22	9607.34	0.22	15.39	3894.55	15.39	6.57	310.95	6.57	74.17	96.35
4.95	26.70	9.48	7.08	3.74	0.22	10190.63	0.22	15.49	4199.65	15.49	6.63	347.37	6.63	76.77	99.12
5	27.00	9.60	7.20	3.82	0.22	10801.86	0.22	15.60	4523.31	15.60	6.69	387.09	6.69	79.40	101.91
5.05	27.30	9.72	7.32	3.91	0.23	11442.02	0.23	15.70	4866.37	15.70	6.75	430.30	6.75	82.06	104.74
5.1	27.60	9.84	7.44	3.99	0.23	12112.11	0.23	15.80	5229.65	15.80	6.81	477.23	6.81	84.75	107.59
5.15	27.90	9.96	7.56	4.08	0.23	12813.17	0.23	15.90	5614.04	15.90	6.87	528.10	6.87	87.47	110.47
5.2	28.20	10.08	7.68	4.16	0.23	13546.27	0.23	16.00	6020.41	16.00	6.93	583.15	6.93	90.22	113.38
5.25	28.50	10.20	7.80	4.25	0.23	14312.48	0.23	16.10	6449.68	16.10	6.98	642.63	6.98	93.00	116.31
5.3	28.80	10.32	7.92	4.33	0.23	15112.92	0.23	16.20	6902.80	16.20	7.04	706.78	7.04	95.80	119.28
5.35	29.10	10.44	8.04	4.42	0.23	15948.71	0.23	16.30	7380.73	16.30	7.10	775.88	7.10	98.63	122.26
5.4	29.40	10.56	8.16	4.50	0.23	16821.01	0.23	16.40	7884.46	16.40	7.15	850.19	7.15	101.49	125.28
5.45	29.70	10.68	8.28	4.59	0.24	17731.01	0.24	16.50	8415.00	16.50	7.21	930.00	7.21	104.38	128.32
5.5	30.00	10.80	8.40	4.67	0.24	18679.90	0.24	16.59	8973.40	16.59	7.27	1015.61	7.27	107.29	131.39
5.55	30.30	10.92	8.52	4.76	0.24	19668.93	0.24	16.69	9560.73	16.69	7.32	1107.30	7.32	110.23	134.48
5.6	30.60	11.04	8.64	4.84	0.24	20699.34	0.24	16.79	10178.07	16.79	7.38	1205.40	7.38	113.19	137.59
5.65	30.90	11.16	8.76	4.93	0.24	21772.43	0.24	16.88	10826.56	16.88	7.43	1310.22	7.43	116.19	140.74
5.7	31.20	11.28	8.88	5.01	0.24	22889.50	0.24	16.98	11507.33	16.98	7.48	1422.11	7.48	119.20	143.90
5.75	31.50	11.40	9.00	5.10	0.24	24051.88	0.24	17.07	12221.57	17.07	7.54	1541.40	7.54	122.25	147.10
5.8	31.80	11.52	9.12	5.18	0.24	25260.95	0.24	17.16	12970.48	17.16	7.59	1668.44	7.59	125.32	150.31
5.85	32.10	11.64	9.24	5.27	0.25	26518.09	0.25	17.26	13755.29	17.26	7.64	1803.61	7.64	128.41	153.55
5.9	32.40	11.76	9.36	5.35	0.25	27824.72	0.25	17.35	14577.26	17.35	7.69	1947.27	7.69	131.53	156.82
5.95	32.70	11.88	9.48	5.44	0.25	29182.28	0.25	17.44	15437.69	17.44	7.75	2099.82	7.75	134.67	160.11
6	33.00	12.00	9.60	5.52	0.25	30592.25	0.25	17.53	16337.88	17.53	7.80	2261.66	7.80	137.84	163.42

BASIN O-L Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "
Number:	2	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	2.00 ft
Middle orifice diameter:	0.5 "	Emergency weir:	
number of orif:	0	Invert:	2.00 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	1.00 ft	Riser Box LxW	2x3

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	1.20	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	2.40	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	3.60	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	4.80	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	6.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	7.20	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	8.40	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	9.60	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	10.80	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	12.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	13.20	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	14.40	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	15.60	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	16.80	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	18.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	19.20	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	20.40	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	21.60	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	22.80	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	24.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	25.20	0.15	0.06	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.63
2.1	9.60	26.40	0.30	0.12	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.32
2.15	9.90	27.60	0.45	0.18	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	1.93	2.20
2.2	10.20	28.80	0.60	0.24	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	2.98	3.25
2.25	10.50	30.00	0.75	0.30	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.44
2.3	10.80	31.20	0.90	0.36	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.75
2.35	11.10	32.40	1.05	0.42	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	6.90	7.18
2.4	11.40	33.60	1.20	0.48	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.71
2.45	11.70	34.80	1.35	0.54	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.34
2.5	12.00	36.00	1.50	0.60	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	11.77	12.07
2.55	12.30	37.20	1.65	0.66	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	13.58	13.88
2.6	12.60	38.40	1.80	0.72	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	15.48	15.78
2.65	12.90	39.60	1.95	0.78	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	17.45	17.76
2.7	13.20	40.80	2.10	0.84	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	19.50	19.81
2.75	13.50	42.00	2.25	0.90	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	21.63	21.94
2.8	13.80	43.20	2.40	0.96	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	23.83	24.15
2.85	14.10	44.40	2.55	1.02	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	26.10	26.42
2.9	14.40	45.60	2.70	1.08	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	28.43	28.76
2.95	14.70	46.80	2.85	1.14	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	30.83	31.16
3	15.00	48.00	3.00	1.20	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	33.30	33.63

BASIN O-M Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "	
Number:	2	Number:	0	
Cg-low:	0.61	Cg-low:	0.61	
invert elev:	0.50 ft	invert elev:	2.00 ft	
Middle orifice diameter:	0.5 "	Emergency weir:		
number of orif:	0	Invert:	2.00 ft	
Cg-middle:	0.61	Weir Length (ft)	10.0 ft	
invert elev:	1.00 ft	Riser Box LxW	2x3	

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	1.20	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	2.40	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	3.60	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	4.80	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	6.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	7.20	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	8.40	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	9.60	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	10.80	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	12.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	13.20	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	14.40	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	15.60	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	16.80	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	18.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	19.20	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	20.40	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	21.60	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	22.80	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	24.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	25.20	0.15	0.06	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.63
2.1	9.60	26.40	0.30	0.12	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.32
2.15	9.90	27.60	0.45	0.18	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	1.93	2.20
2.2	10.20	28.80	0.60	0.24	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	2.98	3.25
2.25	10.50	30.00	0.75	0.30	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.44
2.3	10.80	31.20	0.90	0.36	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.75
2.35	11.10	32.40	1.05	0.42	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	6.90	7.18
2.4	11.40	33.60	1.20	0.48	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.71
2.45	11.70	34.80	1.35	0.54	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.34
2.5	12.00	36.00	1.50	0.60	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	11.77	12.07
2.55	12.30	37.20	1.65	0.66	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	13.58	13.88
2.6	12.60	38.40	1.80	0.72	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	15.48	15.78
2.65	12.90	39.60	1.95	0.78	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	17.45	17.76
2.7	13.20	40.80	2.10	0.84	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	19.50	19.81
2.75	13.50	42.00	2.25	0.90	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	21.63	21.94
2.8	13.80	43.20	2.40	0.96	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	23.83	24.15
2.85	14.10	44.40	2.55	1.02	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	26.10	26.42
2.9	14.40	45.60	2.70	1.08	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	28.43	28.76
2.95	14.70	46.80	2.85	1.14	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	30.83	31.16
3	15.00	48.00	3.00	1.20	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	33.30	33.63

BASIN O-N Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	4 "	
Number:	2	Number:	0	
Cg-low:	0.61	Cg-low:	0.61	
invert elev:	0.50 ft	invert elev:	2.00 ft	
Middle orifice diameter:	0.5 "	Emergency weir:		
number of orif:	0	Invert:	2.00 ft	
Cg-middle:	0.61	Weir Length (ft)	10.0 ft	
invert elev:	1.00 ft	Riser Box LxW	2x3	

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.6	0.60	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.65	0.90	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.7	1.20	0.00	0.00	0.00	0.07	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
0.75	1.50	0.00	0.00	0.00	0.09	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
0.8	1.80	0.00	0.00	0.00	0.10	0.13	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
0.85	2.10	0.00	0.00	0.00	0.11	0.15	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
0.9	2.40	0.00	0.00	0.00	0.12	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
0.95	2.70	0.00	0.00	0.00	0.13	0.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
1	3.00	0.00	0.00	0.00	0.14	0.16	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
1.05	3.30	1.20	0.00	0.00	0.15	0.17	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.1	3.60	2.40	0.00	0.00	0.15	0.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
1.15	3.90	3.60	0.00	0.00	0.16	0.24	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
1.2	4.20	4.80	0.00	0.00	0.17	0.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.25	4.50	6.00	0.00	0.00	0.17	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1.3	4.80	7.20	0.00	0.00	0.18	0.81	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1.35	5.10	8.40	0.00	0.00	0.19	1.24	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.4	5.40	9.60	0.00	0.00	0.19	1.86	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19
1.45	5.70	10.80	0.00	0.00	0.20	2.73	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.5	6.00	12.00	0.00	0.00	0.20	3.89	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1.55	6.30	13.20	0.00	0.00	0.21	5.42	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
1.6	6.60	14.40	0.00	0.00	0.22	7.40	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.65	6.90	15.60	0.00	0.00	0.22	9.91	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
1.7	7.20	16.80	0.00	0.00	0.23	13.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.75	7.50	18.00	0.00	0.00	0.23	16.94	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
1.8	7.80	19.20	0.00	0.00	0.24	21.68	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.85	8.10	20.40	0.00	0.00	0.24	27.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
1.9	8.40	21.60	0.00	0.00	0.25	34.26	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
1.95	8.70	22.80	0.00	0.00	0.25	42.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2	9.00	24.00	0.00	0.00	0.25	51.99	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
2.05	9.30	25.20	0.15	0.06	0.26	63.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.63
2.1	9.60	26.40	0.30	0.12	0.26	76.29	0.26	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.32
2.15	9.90	27.60	0.45	0.18	0.27	91.40	0.27	0.00	0.00	0.00	0.00	0.00	0.00	1.93	2.20
2.2	10.20	28.80	0.60	0.24	0.27	108.78	0.27	0.00	0.00	0.00	0.00	0.00	0.00	2.98	3.25
2.25	10.50	30.00	0.75	0.30	0.28	128.67	0.28	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.44
2.3	10.80	31.20	0.90	0.36	0.28	151.34	0.28	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.75
2.35	11.10	32.40	1.05	0.42	0.28	177.06	0.28	0.00	0.00	0.00	0.00	0.00	0.00	6.90	7.18
2.4	11.40	33.60	1.20	0.48	0.29	206.12	0.29	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.71
2.45	11.70	34.80	1.35	0.54	0.29	238.84	0.29	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.34
2.5	12.00	36.00	1.50	0.60	0.30	275.55	0.30	0.00	0.00	0.00	0.00	0.00	0.00	11.77	12.07
2.55	12.30	37.20	1.65	0.66	0.30	316.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	13.58	13.88
2.6	12.60	38.40	1.80	0.72	0.30	362.33	0.30	0.00	0.00	0.00	0.00	0.00	0.00	15.48	15.78
2.65	12.90	39.60	1.95	0.78	0.31	413.17	0.31	0.00	0.00	0.00	0.00	0.00	0.00	17.45	17.76
2.7	13.20	40.80	2.10	0.84	0.31	469.51	0.31	0.00	0.00	0.00	0.00	0.00	0.00	19.50	19.81
2.75	13.50	42.00	2.25	0.90	0.31	531.79	0.31	0.00	0.00	0.00	0.00	0.00	0.00	21.63	21.94
2.8	13.80	43.20	2.40	0.96	0.32	600.46	0.32	0.00	0.00	0.00	0.00	0.00	0.00	23.83	24.15
2.85	14.10	44.40	2.55	1.02	0.32	675.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	26.10	26.42
2.9	14.40	45.60	2.70	1.08	0.33	758.88	0.33	0.00	0.00	0.00	0.00	0.00	0.00	28.43	28.76
2.95	14.70	46.80	2.85	1.14	0.33	849.65	0.33	0.00	0.00	0.00	0.00	0.00	0.00	30.83	31.16
3	15.00	48.00	3.00	1.20	0.33	948.85	0.33	0.00	0.00	0.00	0.00	0.00	0.00	33.30	33.63

BASIN O-O Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	6 "
Number:	0	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	3.00 ft
Middle orifice diameter:	3 "	Emergency weir:	
number of orif:	0	Invert:	0.50 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	2.00 ft	Riser Box LxW	2x3

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37
0.6	0.60	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.05
0.65	0.90	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.93
0.7	1.20	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98	2.98
0.75	1.50	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.16
0.8	1.80	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.47
0.85	2.10	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	6.90
0.9	2.40	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.42
0.95	2.70	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.05
1	3.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.77	11.77

BASIN O-P Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "		Top orifice diameter:		6 "
Number:	0		Number:		0
Cg-low:	0.61		Cg-low:		0.61
invert elev:	0.50 ft		invert elev:		3.00 ft
Middle orifice diameter:	3 "		Emergency weir:		
number of orif:	0		Invert:	0.50 ft	
Cg-middle:	0.61		Weir Length (ft)	10.0 ft	
invert elev:	2.00 ft		Riser Box LxW	2x3	

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37
0.6	0.60	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.05
0.65	0.90	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.93
0.7	1.20	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98	2.98
0.75	1.50	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.16
0.8	1.80	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.47
0.85	2.10	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	6.90
0.9	2.40	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.42
0.95	2.70	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.05
1	3.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.77	11.77

BASIN O-Q Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	6 "
Number:	0	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	3.00 ft
Middle orifice diameter:	3 "	Emergency weir:	
number of orif:	0	Invert:	0.50 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	2.00 ft	Riser Box LxW	2x3

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37
0.6	0.60	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.05
0.65	0.90	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.93
0.7	1.20	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98	2.98
0.75	1.50	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.16
0.8	1.80	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.47
0.85	2.10	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	6.90
0.9	2.40	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.42
0.95	2.70	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.05
1	3.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.77	11.77

BASIN O-R Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "		Top orifice diameter:		6 "
Number:	0		Number:		0
Cg-low:	0.61		Cg-low:		0.61
invert elev:	0.50 ft		invert elev:		3.00 ft
Middle orifice diameter:	3 "		Emergency weir:		
number of orif:	0		Invert:	0.50 ft	
Cg-middle:	0.61		Weir Length (ft)	10.0 ft	
invert elev:	2.00 ft		Riser Box LxW	2x3	

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37
0.6	0.60	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.05
0.65	0.90	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.93
0.7	1.20	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98	2.98
0.75	1.50	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.16
0.8	1.80	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.47
0.85	2.10	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	6.90
0.9	2.40	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.42
0.95	2.70	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.05
1	3.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.77	11.77

BASIN O-S Discharge

Discharge vs Elevation Table

Bottom orifice diameter:	2 "	Top orifice diameter:	6 "
Number:	0	Number:	0
Cg-low:	0.61	Cg-low:	0.61
invert elev:	0.50 ft	invert elev:	3.00 ft
Middle orifice diameter:	3 "	Emergency weir:	
number of orif:	0	Invert:	0.50 ft
Cg-middle:	0.61	Weir Length (ft)	10.0 ft
invert elev:	2.00 ft	Riser Box LxW	2x3

h (ft)	H/D-low -	H/D-mid -	H/D-top -	H/D-peak -	Qlow-orif (cfs)	Qlow-weir (cfs)	Qtot-low (cfs)	Qmid-orif (cfs)	Qmid-weir (cfs)	Qtot-med (cfs)	Qtop-orif (cfs)	Qtop-weir (cfs)	Qtot-top (cfs)	Qpeak-top (cfs)	Qtot (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.55	0.30	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37
0.6	0.60	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	1.05
0.65	0.90	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.93
0.7	1.20	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98	2.98
0.75	1.50	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16	4.16
0.8	1.80	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	5.47
0.85	2.10	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	6.90
0.9	2.40	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.42
0.95	2.70	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.05	10.05
1	3.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.77	11.77

BASIN A STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	9431	-
0.05	9523	474
0.1	9615	952
0.15	9708	1,435
0.2	9800	1,923
0.25	9892	2,415
0.3	9984	2,912
0.35	10076	3,414
0.4	10169	3,920
0.45	10261	4,431
0.5	10353	4,946
0.55	10445	5,466
0.6	10537	5,991
0.65	10630	6,520
0.7	10722	7,053
0.75	10814	7,592
0.8	10906	8,135
0.85	10998	8,682
0.9	11091	9,235
0.95	11183	9,792
1	11275	10,353
1.05	11370	10,919
1.1	11465	11,490
1.15	11560	12,066
1.2	11655	12,646
1.25	11750	13,231
1.3	11845	13,821
1.35	11940	14,416
1.4	12035	15,015
1.45	12130	15,619
1.5	12226	16,228
1.55	12321	16,842
1.6	12416	17,460
1.65	12511	18,083
1.7	12606	18,711
1.75	12701	19,344
1.8	12796	19,981
1.85	12891	20,623
1.9	12986	21,270
1.95	13081	21,922
2	13176	22,579
2.05	13277	23,240
2.1	13378	23,906
2.15	13479	24,578

BASIN A STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.2	13580	25,254
2.25	13681	25,936
2.3	13782	26,622
2.35	13883	27,314
2.4	13984	28,011
2.45	14085	28,712
2.5	14186	29,419
2.55	14287	30,131
2.6	14388	30,848
2.65	14489	31,570
2.7	14590	32,297
2.75	14691	33,029
2.8	14792	33,766
2.85	14893	34,508
2.9	14994	35,255
2.95	15095	36,007
3	15196	36,765
3.05	15295	37,527
3.1	15395	38,294
3.15	15494	39,066
3.2	15594	39,843
3.25	15693	40,626
3.3	15792	41,413
3.35	15892	42,205
3.4	15991	43,002
3.45	16091	43,804
3.5	16190	44,611
3.55	16289	45,423
3.6	16389	46,240
3.65	16488	47,062
3.7	16588	47,889
3.75	16687	48,721
3.8	16786	49,557
3.85	16886	50,399
3.9	16985	51,246
3.95	17085	52,098
4	17184	52,955

BASIN B STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	17786	-
0.05	17878	892
0.1	17970	1,788
0.15	18062	2,689
0.2	18155	3,594
0.25	18247	4,504
0.3	18339	5,419
0.35	18431	6,338
0.4	18523	7,262
0.45	18615	8,190
0.5	18708	9,123
0.55	18800	10,061
0.6	18892	11,003
0.65	18984	11,950
0.7	19076	12,902
0.75	19168	13,858
0.8	19260	14,819
0.85	19353	15,784
0.9	19445	16,754
0.95	19537	17,728
1	19629	18,708
1.05	19723	19,691
1.1	19817	20,680
1.15	19911	21,673
1.2	20005	22,671
1.25	20099	23,674
1.3	20193	24,681
1.35	20287	25,693
1.4	20381	26,710
1.45	20475	27,731
1.5	20569	28,757
1.55	20663	29,788
1.6	20757	30,823
1.65	20851	31,864
1.7	20945	32,908
1.75	21039	33,958
1.8	21133	35,012
1.85	21227	36,071
1.9	21321	37,135
1.95	21415	38,203
2	21509	39,277
2.05	21606	40,354
2.1	21703	41,437
2.15	21800	42,525
2.2	21897	43,617
2.25	21994	44,714

BASIN B STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	22091	45,817
2.35	22188	46,924
2.4	22285	48,035
2.45	22382	49,152
2.5	22480	50,274
2.55	22577	51,400
2.6	22674	52,531
2.65	22771	53,667
2.7	22868	54,808
2.75	22965	55,954
2.8	23062	57,105
2.85	23159	58,260
2.9	23256	59,421
2.95	23353	60,586
3	23450	61,756
3.05	23553	62,931
3.1	23657	64,111
3.15	23760	65,297
3.2	23863	66,487
3.25	23966	67,683
3.3	24070	68,884
3.35	24173	70,090
3.4	24276	71,301
3.45	24379	72,518
3.5	24483	73,739
3.55	24586	74,966
3.6	24689	76,198
3.65	24792	77,435
3.7	24896	78,677
3.75	24999	79,924
3.8	25102	81,177
3.85	25205	82,434
3.9	25309	83,697
3.95	25412	84,965
4	25515	86,239
4.05	25619	87,517
4.1	25723	88,800
4.15	25827	90,089
4.2	25932	91,383
4.25	26036	92,682
4.3	26140	93,987
4.35	26244	95,296
4.4	26348	96,611
4.45	26452	97,931
4.5	26557	99,256
4.55	26661	100,587

BASIN B STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	26765	101,922
4.65	26869	103,263
4.7	26973	104,609
4.75	27077	105,961
4.8	27181	107,317
4.85	27286	108,679
4.9	27390	110,046
4.95	27494	111,418
5	27598	112,795
5.05	27707	114,178
5.1	27815	115,566
5.15	27924	116,959
5.2	28032	118,358
5.25	28141	119,762
5.3	28249	121,172
5.35	28358	122,587
5.4	28466	124,008
5.45	28575	125,434
5.5	28684	126,865
5.55	28792	128,302
5.6	28901	129,745
5.65	29009	131,192
5.7	29118	132,645
5.75	29226	134,104
5.8	29335	135,568
5.85	29443	137,038
5.9	29552	138,512
5.95	29660	139,993
6	29769	141,479
6.05	29880	142,970
6.1	29991	144,467
6.15	30102	145,969
6.2	30213	147,477
6.25	30324	148,990
6.3	30435	150,509
6.35	30546	152,034
6.4	30657	153,564
6.45	30768	155,099
6.5	30879	156,641
6.55	30990	158,187
6.6	31101	159,740
6.65	31212	161,297
6.7	31323	162,861
6.75	31434	164,430
6.8	31545	166,004
6.85	31656	167,584

BASIN B STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
6.9	31767	169,170
6.95	31878	170,761
7	31989	172,358
7.05	32101	173,960
7.1	32212	175,568
7.15	32324	177,181
7.2	32436	178,800
7.25	32547	180,425
7.3	32659	182,055
7.35	32771	183,690
7.4	32882	185,332
7.45	32994	186,979
7.5	33106	188,631
7.55	33217	190,289
7.6	33329	191,953
7.65	33440	193,622
7.7	33552	195,297
7.75	33664	196,977
7.8	33775	198,663
7.85	33887	200,355
7.9	33999	202,052
7.95	34110	203,755
8	34222	205,463
8.05	34337	207,177
8.1	34452	208,897
8.15	34567	210,622
8.2	34682	212,353
8.25	34797	214,090
8.3	34912	215,833
8.35	35027	217,582
8.4	35142	219,336
8.45	35257	221,096
8.5	35373	222,862
8.55	35488	224,633
8.6	35603	226,410
8.65	35718	228,193
8.7	35833	229,982
8.75	35948	231,777
8.8	36063	233,577
8.85	36178	235,383
8.9	36293	237,195
8.95	36408	239,012
9	36523	240,836

BASIN C STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	15082	-
0.05	15168	756
0.1	15254	1,517
0.15	15340	2,282
0.2	15426	3,051
0.25	15512	3,824
0.3	15597	4,602
0.35	15683	5,384
0.4	15769	6,170
0.45	15855	6,961
0.5	15941	7,756
0.55	16027	8,555
0.6	16113	9,358
0.65	16199	10,166
0.7	16285	10,978
0.75	16371	11,795
0.8	16456	12,615
0.85	16542	13,440
0.9	16628	14,270
0.95	16714	15,103
1	16800	15,941
1.05	16891	16,783
1.1	16981	17,630
1.15	17072	18,481
1.2	17163	19,337
1.25	17254	20,198
1.3	17344	21,063
1.35	17435	21,932
1.4	17526	22,806
1.45	17616	23,685
1.5	17707	24,568
1.55	17798	25,455
1.6	17888	26,348
1.65	17979	27,244
1.7	18070	28,145
1.75	18161	29,051
1.8	18251	29,961
1.85	18342	30,876
1.9	18433	31,796
1.95	18523	32,720
2	18614	33,648
2.05	18708	34,581
2.1	18802	35,519
2.15	18895	36,461
2.2	18989	37,408
2.25	19083	38,360

BASIN C STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	19177	39,317
2.35	19270	40,278
2.4	19364	41,244
2.45	19458	42,214
2.5	19552	43,189
2.55	19645	44,169
2.6	19739	45,154
2.65	19833	46,143
2.7	19927	47,137
2.75	20020	48,136
2.8	20114	49,139
2.85	20208	50,147
2.9	20302	51,160
2.95	20395	52,177
3	20489	53,200
3.05	20587	54,226
3.1	20686	55,258
3.15	20784	56,295
3.2	20883	57,337
3.25	20981	58,383
3.3	21079	59,435
3.35	21178	60,491
3.4	21276	61,553
3.45	21375	62,619
3.5	21473	63,690
3.55	21571	64,766
3.6	21670	65,847
3.65	21768	66,933
3.7	21867	68,024
3.75	21965	69,120
3.8	22063	70,220
3.85	22162	71,326
3.9	22260	72,437
3.95	22359	73,552
4	22457	74,673
4.05	22563	75,798
4.1	22668	76,929
4.15	22774	78,065
4.2	22879	79,206
4.25	22985	80,353
4.3	23090	81,505
4.35	23196	82,662
4.4	23301	83,824
4.45	23407	84,992
4.5	23513	86,165
4.55	23618	87,343

BASIN C STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	23724	88,527
4.65	23829	89,715
4.7	23935	90,910
4.75	24040	92,109
4.8	24146	93,314
4.85	24251	94,524
4.9	24357	95,739
4.95	24462	96,959
5	24568	98,185
5.05	24675	99,416
5.1	24782	100,652
5.15	24889	101,894
5.2	24996	103,141
5.25	25103	104,394
5.3	25210	105,652
5.35	25317	106,915
5.4	25424	108,183
5.45	25531	109,457
5.5	25638	110,736
5.55	25744	112,021
5.6	25851	113,311
5.65	25958	114,606
5.7	26065	115,907
5.75	26172	117,213
5.8	26279	118,524
5.85	26386	119,841
5.9	26493	121,162
5.95	26600	122,490
6	26707	123,823
6.05	26819	125,161
6.1	26932	126,504
6.15	27044	127,854
6.2	27157	129,209
6.25	27269	130,570
6.3	27381	131,936
6.35	27494	133,308
6.4	27606	134,685
6.45	27719	136,068
6.5	27831	137,457
6.55	27943	138,851
6.6	28056	140,251
6.65	28168	141,657
6.7	28281	143,068
6.75	28393	144,485
6.8	28505	145,907
6.85	28618	147,336

BASIN C STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
6.9	28730	148,769
6.95	28843	150,209
7	28955	151,654
7.05	29075	153,104
7.1	29195	154,561
7.15	29314	156,024
7.2	29434	157,492
7.25	29554	158,967
7.3	29674	160,448
7.35	29793	161,934
7.4	29913	163,427
7.45	30033	164,926
7.5	30153	166,430
7.55	30272	167,941
7.6	30392	169,458
7.65	30512	170,980
7.7	30632	172,509
7.75	30751	174,043
7.8	30871	175,584
7.85	30991	177,130
7.9	31111	178,683
7.95	31230	180,241
8	31350	181,806
8.05	31478	183,377
8.1	31606	184,954
8.15	31735	186,537
8.2	31863	188,127
8.25	31991	189,724
8.3	32119	191,326
8.35	32247	192,936
8.4	32376	194,551
8.45	32504	196,173
8.5	32632	197,802
8.55	32760	199,436
8.6	32888	201,078
8.65	33017	202,725
8.7	33145	204,379
8.75	33273	206,040
8.8	33401	207,706
8.85	33529	209,380
8.9	33658	211,059
8.95	33786	212,746
9	33914	214,438

BASIN D STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	14793	-
0.05	14881	742
0.1	14969	1,488
0.15	15057	2,239
0.2	15144	2,994
0.25	15232	3,753
0.3	15320	4,517
0.35	15408	5,285
0.4	15496	6,058
0.45	15584	6,835
0.5	15672	7,616
0.55	15759	8,402
0.6	15847	9,192
0.65	15935	9,987
0.7	16023	10,786
0.75	16111	11,589
0.8	16199	12,397
0.85	16286	13,209
0.9	16374	14,025
0.95	16462	14,846
1	16550	15,672
1.05	16640	16,501
1.1	16730	17,335
1.15	16819	18,174
1.2	16909	19,017
1.25	16999	19,865
1.3	17089	20,717
1.35	17178	21,574
1.4	17268	22,435
1.45	17358	23,301
1.5	17448	24,171
1.55	17537	25,045
1.6	17627	25,925
1.65	17717	26,808
1.7	17807	27,696
1.75	17896	28,589
1.8	17986	29,486
1.85	18076	30,387
1.9	18166	31,293
1.95	18255	32,204
2	18345	33,119
2.05	18439	34,039
2.1	18532	34,963
2.15	18626	35,892
2.2	18720	36,825
2.25	18814	37,764

BASIN D STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	18907	38,707
2.35	19001	39,655
2.4	19095	40,607
2.45	19188	41,564
2.5	19282	42,526
2.55	19376	43,492
2.6	19469	44,463
2.65	19563	45,439
2.7	19657	46,420
2.75	19751	47,405
2.8	19844	48,395
2.85	19938	49,389
2.9	20032	50,388
2.95	20125	51,392
3	20219	52,401
3.05	20315	53,414
3.1	20410	54,432
3.15	20506	55,455
3.2	20602	56,483
3.25	20697	57,516
3.3	20793	58,553
3.35	20889	59,595
3.4	20984	60,642
3.45	21080	61,693
3.5	21176	62,750
3.55	21271	63,811
3.6	21367	64,877
3.65	21462	65,947
3.7	21558	67,023
3.75	21654	68,103
3.8	21749	69,188
3.85	21845	70,278
3.9	21941	71,373
3.95	22036	72,472
4	22132	73,577
4.05	22229	74,686
4.1	22326	75,799
4.15	22423	76,918
4.2	22520	78,042
4.25	22618	79,170
4.3	22715	80,303
4.35	22812	81,442
4.4	22909	82,585
4.45	23006	83,733
4.5	23103	84,885
4.55	23200	86,043

BASIN D STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	23297	87,205
4.65	23394	88,373
4.7	23491	89,545
4.75	23589	90,722
4.8	23686	91,904
4.85	23783	93,090
4.9	23880	94,282
4.95	23977	95,478
5	24074	96,680
5.05	24177	97,886
5.1	24280	99,097
5.15	24383	100,314
5.2	24486	101,535
5.25	24589	102,762
5.3	24692	103,994
5.35	24795	105,232
5.4	24898	106,474
5.45	25001	107,721
5.5	25104	108,974
5.55	25206	110,232
5.6	25309	111,495
5.65	25412	112,763
5.7	25515	114,036
5.75	25618	115,314
5.8	25721	116,598
5.85	25824	117,886
5.9	25927	119,180
5.95	26030	120,479
6	26133	121,783
6.05	26235	123,092
6.1	26337	124,407
6.15	26439	125,726
6.2	26541	127,050
6.25	26643	128,380
6.3	26745	129,715
6.35	26847	131,055
6.4	26949	132,399
6.45	27051	133,749
6.5	27153	135,105
6.55	27255	136,465
6.6	27357	137,830
6.65	27459	139,200
6.7	27561	140,576
6.75	27663	141,957
6.8	27765	143,342
6.85	27867	144,733

BASIN D STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
6.9	27969	146,129
6.95	28071	147,530
7	28173	148,936
7.05	28283	150,347
7.1	28393	151,764
7.15	28503	153,187
7.2	28613	154,615
7.25	28723	156,048
7.3	28833	157,487
7.35	28943	158,931
7.4	29053	160,381
7.45	29163	161,837
7.5	29274	163,298
7.55	29384	164,764
7.6	29494	166,236
7.65	29604	167,713
7.7	29714	169,196
7.75	29824	170,685
7.8	29934	172,179
7.85	30044	173,678
7.9	30154	175,183
7.95	30264	176,694
8	30374	178,210
8.05	30487	179,731
8.1	30599	181,258
8.15	30712	182,791
8.2	30824	184,329
8.25	30937	185,873
8.3	31049	187,423
8.35	31162	188,978
8.4	31274	190,539
8.45	31387	192,106
8.5	31500	193,678
8.55	31612	195,256
8.6	31725	196,839
8.65	31837	198,428
8.7	31950	200,023
8.75	32062	201,623
8.8	32175	203,229
8.85	32287	204,841
8.9	32400	206,458
8.95	32512	208,081
9	32625	209,709
9.05	32749	211,343
9.1	32873	212,984
9.15	32997	214,631

BASIN D STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
9.2	33121	216,284
9.25	33245	217,943
9.3	33369	219,608
9.35	33493	221,280
9.4	33617	222,957
9.45	33741	224,641
9.5	33865	226,331
9.55	33988	228,028
9.6	34112	229,730
9.65	34236	231,439
9.7	34360	233,154
9.75	34484	234,875
9.8	34608	236,602
9.85	34732	238,336
9.9	34856	240,075
9.95	34980	241,821
10	35104	243,574
10.05	35231	245,332
10.1	35358	247,097
10.15	35485	248,868
10.2	35612	250,645
10.25	35739	252,429
10.3	35865	254,219
10.35	35992	256,015
10.4	36119	257,818
10.45	36246	259,627
10.5	36373	261,443
10.55	36500	263,265
10.6	36627	265,093
10.65	36754	266,927
10.7	36881	268,768
10.75	37008	270,615
10.8	37134	272,469
10.85	37261	274,329
10.9	37388	276,195
10.95	37515	278,068
11	37642	279,947

BASIN E STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	1347	-
0.05	1379	68
0.1	1412	138
0.15	1444	209
0.2	1476	282
0.25	1509	357
0.3	1541	433
0.35	1573	511
0.4	1605	590
0.45	1638	672
0.5	1670	754
0.55	1702	839
0.6	1735	924
0.65	1767	1,012
0.7	1799	1,101
0.75	1832	1,192
0.8	1864	1,284
0.85	1896	1,378
0.9	1928	1,474
0.95	1961	1,571
1	1993	1,670
1.05	2025	1,770
1.1	2058	1,873
1.15	2090	1,976
1.2	2122	2,082
1.25	2154	2,188
1.3	2187	2,297
1.35	2219	2,407
1.4	2251	2,519
1.45	2283	2,632
1.5	2316	2,747
1.55	2348	2,864
1.6	2380	2,982
1.65	2412	3,102
1.7	2445	3,223
1.75	2477	3,346
1.8	2509	3,471
1.85	2541	3,597
1.9	2574	3,725
1.95	2606	3,854
2	2638	3,986
2.05	2672	4,118
2.1	2706	4,253
2.15	2739	4,389
2.2	2773	4,527
2.25	2807	4,666

BASIN E STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	2841	4,807
2.35	2874	4,950
2.4	2908	5,095
2.45	2942	5,241
2.5	2976	5,389
2.55	3009	5,538
2.6	3043	5,690
2.65	3077	5,843
2.7	3111	5,997
2.75	3144	6,154
2.8	3178	6,312
2.85	3212	6,472
2.9	3246	6,633
2.95	3279	6,796
3	3313	6,961
3.05	3352	7,128
3.1	3391	7,296
3.15	3430	7,467
3.2	3468	7,639
3.25	3507	7,814
3.3	3546	7,990
3.35	3585	8,168
3.4	3624	8,348
3.45	3663	8,531
3.5	3702	8,715
3.55	3740	8,901
3.6	3779	9,089
3.65	3818	9,279
3.7	3857	9,470
3.75	3896	9,664
3.8	3935	9,860
3.85	3973	10,058
3.9	4012	10,257
3.95	4051	10,459
4	4090	10,663
4.05	4132	10,868
4.1	4173	11,076
4.15	4215	11,285
4.2	4256	11,497
4.25	4298	11,711
4.3	4339	11,927
4.35	4381	12,145
4.4	4422	12,365
4.45	4464	12,587
4.5	4505	12,811
4.55	4547	13,038

BASIN E STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	4588	13,266
4.65	4630	13,496
4.7	4671	13,729
4.75	4713	13,963
4.8	4754	14,200
4.85	4796	14,439
4.9	4837	14,680
4.95	4879	14,923
5	4920	15,168

BASIN F STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	6921	-
0.05	6978	347
0.1	7035	698
0.15	7092	1,051
0.2	7149	1,407
0.25	7206	1,766
0.3	7262	2,128
0.35	7319	2,492
0.4	7376	2,859
0.45	7433	3,230
0.5	7490	3,603
0.55	7547	3,979
0.6	7604	4,357
0.65	7661	4,739
0.7	7718	5,124
0.75	7775	5,511
0.8	7831	5,901
0.85	7888	6,294
0.9	7945	6,690
0.95	8002	7,088
1	8059	7,490
1.05	8120	7,894
1.1	8182	8,302
1.15	8243	8,713
1.2	8304	9,126
1.25	8365	9,543
1.3	8427	9,963
1.35	8488	10,386
1.4	8549	10,812
1.45	8610	11,241
1.5	8672	11,673
1.55	8733	12,108
1.6	8794	12,546
1.65	8855	12,987
1.7	8917	13,431
1.75	8978	13,879
1.8	9039	14,329
1.85	9100	14,783
1.9	9162	15,239
1.95	9223	15,699
2	9284	16,162
2.05	9346	16,627
2.1	9409	17,096
2.15	9471	17,568
2.2	9533	18,043
2.25	9596	18,521

BASIN F STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	9658	19,003
2.35	9720	19,487
2.4	9782	19,975
2.45	9845	20,465
2.5	9907	20,959
2.55	9969	21,456
2.6	10032	21,956
2.65	10094	22,459
2.7	10156	22,966
2.75	10219	23,475
2.8	10281	23,987
2.85	10343	24,503
2.9	10405	25,022
2.95	10468	25,544
3	10530	26,069
3.05	10599	26,597
3.1	10668	27,128
3.15	10738	27,664
3.2	10807	28,202
3.25	10876	28,744
3.3	10945	29,290
3.35	11014	29,839
3.4	11084	30,391
3.45	11153	30,947
3.5	11222	31,507
3.55	11291	32,069
3.6	11360	32,636
3.65	11430	33,205
3.7	11499	33,779
3.75	11568	34,355
3.8	11637	34,935
3.85	11706	35,519
3.9	11776	36,106
3.95	11845	36,697
4	11914	37,291
4.05	11989	37,888
4.1	12064	38,489
4.15	12139	39,094
4.2	12214	39,703
4.25	12289	40,316
4.3	12364	40,932
4.35	12439	41,552
4.4	12514	42,176
4.45	12589	42,804
4.5	12664	43,435
4.55	12738	44,070

BASIN F STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	12813	44,709
4.65	12888	45,351
4.7	12963	45,998
4.75	13038	46,648
4.8	13113	47,301
4.85	13188	47,959
4.9	13263	48,620
4.95	13338	49,285
5	13413	49,954
5.05	13487	50,626
5.1	13560	51,303
5.15	13634	51,983
5.2	13708	52,666
5.25	13781	53,353
5.3	13855	54,044
5.35	13929	54,739
5.4	14002	55,437
5.45	14076	56,139
5.5	14150	56,845
5.55	14223	57,554
5.6	14297	58,267
5.65	14370	58,984
5.7	14444	59,704
5.75	14518	60,428
5.8	14591	61,156
5.85	14665	61,887
5.9	14739	62,622
5.95	14812	63,361
6	14886	64,104

BASIN G STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	36540	-
0.05	36693	1,831
0.1	36845	3,669
0.15	36998	5,515
0.2	37150	7,369
0.25	37303	9,230
0.3	37455	11,099
0.35	37608	12,976
0.4	37760	14,860
0.45	37913	16,752
0.5	38066	18,651
0.55	38218	20,558
0.6	38371	22,473
0.65	38523	24,396
0.7	38676	26,325
0.75	38828	28,263
0.8	38981	30,208
0.85	39133	32,161
0.9	39286	34,122
0.95	39438	36,090
1	39591	38,066
1.05	39741	40,049
1.1	39891	42,040
1.15	40041	44,038
1.2	40191	46,044
1.25	40341	48,057
1.3	40491	50,078
1.35	40641	52,106
1.4	40791	54,142
1.45	40941	56,185
1.5	41091	58,236
1.55	41240	60,294
1.6	41390	62,360
1.65	41540	64,433
1.7	41690	66,514
1.75	41840	68,602
1.8	41990	70,698
1.85	42140	72,801
1.9	42290	74,912
1.95	42440	77,030
2	42590	79,156
2.05	42738	81,289
2.1	42886	83,430
2.15	43034	85,578

BASIN G STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.2	43182	87,733
2.25	43330	89,896
2.3	43478	92,066
2.35	43626	94,244
2.4	43774	96,429
2.45	43922	98,621
2.5	44070	100,821
2.55	44217	103,028
2.6	44365	105,243
2.65	44513	107,465
2.7	44661	109,694
2.75	44809	111,931
2.8	44957	114,175
2.85	45105	116,426
2.9	45253	118,685
2.95	45401	120,952
3	45549	123,226
3.05	45703	125,507
3.1	45858	127,796
3.15	46012	130,093
3.2	46166	132,397
3.25	46321	134,709
3.3	46475	137,029
3.35	46629	139,357
3.4	46784	141,692
3.45	46938	144,035
3.5	47093	146,386
3.55	47247	148,744
3.6	47401	151,111
3.65	47556	153,484
3.7	47710	155,866
3.75	47864	158,255
3.8	48019	160,653
3.85	48173	163,057
3.9	48327	165,470
3.95	48482	167,890
4	48636	170,318
4.05	48796	172,754
4.1	48956	175,198
4.15	49116	177,649
4.2	49276	180,109
4.25	49437	182,577
4.3	49597	185,053
4.35	49757	187,537

BASIN G STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.4	49917	190,029
4.45	50077	192,528
4.5	50237	195,036
4.55	50397	197,552
4.6	50557	200,076
4.65	50717	202,608
4.7	50877	205,148
4.75	51038	207,696
4.8	51198	210,251
4.85	51358	212,815
4.9	51518	215,387
4.95	51678	217,967
5	51838	220,555
5.05	52009	223,151
5.1	52180	225,756
5.15	52351	228,369
5.2	52521	230,991
5.25	52692	233,621
5.3	52863	236,260
5.35	53034	238,908
5.4	53205	241,564
5.45	53376	244,228
5.5	53547	246,901
5.55	53717	249,583
5.6	53888	252,273
5.65	54059	254,972
5.7	54230	257,679
5.75	54401	260,395
5.8	54572	263,119
5.85	54742	265,852
5.9	54913	268,593
5.95	55084	271,343
6	55255	274,102

BASIN H STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	11886	-
0.05	11972	596
0.1	12059	1,197
0.15	12145	1,802
0.2	12231	2,412
0.25	12317	3,025
0.3	12404	3,643
0.35	12490	4,266
0.4	12576	4,892
0.45	12662	5,523
0.5	12749	6,159
0.55	12835	6,798
0.6	12921	7,442
0.65	13007	8,090
0.7	13094	8,743
0.75	13180	9,400
0.8	13266	10,061
0.85	13352	10,726
0.9	13439	11,396
0.95	13525	12,070
1	13611	12,749
1.05	13704	13,431
1.1	13797	14,119
1.15	13889	14,811
1.2	13982	15,508
1.25	14075	16,209
1.3	14168	16,915
1.35	14260	17,626
1.4	14353	18,341
1.45	14446	19,061
1.5	14539	19,786
1.55	14631	20,515
1.6	14724	21,249
1.65	14817	21,988
1.7	14910	22,731
1.75	15002	23,478
1.8	15095	24,231
1.85	15188	24,988
1.9	15281	25,750
1.95	15373	26,516
2	15466	27,287
2.05	15564	28,063
2.1	15662	28,843
2.15	15760	29,629
2.2	15857	30,419
2.25	15955	31,215

BASIN H STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	16053	32,015
2.35	16151	32,820
2.4	16249	33,630
2.45	16347	34,445
2.5	16445	35,265
2.55	16542	36,089
2.6	16640	36,919
2.65	16738	37,753
2.7	16836	38,593
2.75	16934	39,437
2.8	17032	40,286
2.85	17129	41,140
2.9	17227	41,999
2.95	17325	42,863
3	17423	43,732
3.05	17527	44,605
3.1	17631	45,484
3.15	17735	46,368
3.2	17840	47,258
3.25	17944	48,152
3.3	18048	49,052
3.35	18152	49,957
3.4	18256	50,867
3.45	18360	51,783
3.5	18465	52,703
3.55	18569	53,629
3.6	18673	54,560
3.65	18777	55,496
3.7	18881	56,438
3.75	18985	57,385
3.8	19089	58,336
3.85	19194	59,294
3.9	19298	60,256
3.95	19402	61,223
4	19506	62,196
4.05	19615	63,174
4.1	19724	64,157
4.15	19832	65,146
4.2	19941	66,141
4.25	20050	67,140
4.3	20159	68,146
4.35	20267	69,156
4.4	20376	70,172
4.45	20485	71,194
4.5	20594	72,221
4.55	20702	73,253

BASIN H STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	20811	74,291
4.65	20920	75,334
4.7	21029	76,383
4.75	21137	77,437
4.8	21246	78,497
4.85	21355	79,562
4.9	21464	80,632
4.95	21572	81,708
5	21681	82,790
5.05	21784	83,876
5.1	21887	84,968
5.15	21989	86,065
5.2	22092	87,167
5.25	22195	88,274
5.3	22298	89,386
5.35	22401	90,504
5.4	22503	91,626
5.45	22606	92,754
5.5	22709	93,887
5.55	22812	95,025
5.6	22915	96,168
5.65	23017	97,316
5.7	23120	98,470
5.75	23223	99,629
5.8	23326	100,792
5.85	23429	101,961
5.9	23531	103,135
5.95	23634	104,314
6	23737	105,499

BASIN I STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	55251	-
0.05	55424	2,767
0.1	55596	5,542
0.15	55769	8,326
0.2	55941	11,119
0.25	56114	13,921
0.3	56287	16,731
0.35	56459	19,549
0.4	56632	22,377
0.45	56804	25,212
0.5	56977	28,057
0.55	57150	30,910
0.6	57322	33,772
0.65	57495	36,642
0.7	57667	39,521
0.75	57840	42,409
0.8	58013	45,305
0.85	58185	48,210
0.9	58358	51,124
0.95	58530	54,046
1	58703	56,977
1.05	58888	59,917
1.1	59073	62,866
1.15	59258	65,824
1.2	59442	68,792
1.25	59627	71,768
1.3	59812	74,754
1.35	59997	77,749
1.4	60182	80,754
1.45	60367	83,768
1.5	60552	86,791
1.55	60736	89,823
1.6	60921	92,864
1.65	61106	95,915
1.7	61291	98,975
1.75	61476	102,044
1.8	61661	105,122
1.85	61845	108,210
1.9	62030	111,307
1.95	62215	114,413
2	62400	117,529
2.05	62580	120,653
2.1	62760	123,787
2.15	62940	126,929
2.2	63120	130,081
2.25	63301	133,241

BASIN I STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	63481	136,411
2.35	63661	139,589
2.4	63841	142,777
2.45	64021	145,973
2.5	64201	149,179
2.55	64381	152,393
2.6	64561	155,617
2.65	64741	158,849
2.7	64921	162,091
2.75	65102	165,342
2.8	65282	168,601
2.85	65462	171,870
2.9	65642	175,147
2.95	65822	178,434
3	66002	181,730
3.05	66180	185,034
3.1	66359	188,348
3.15	66537	191,670
3.2	66715	195,001
3.25	66894	198,341
3.3	67072	201,691
3.35	67250	205,049
3.4	67428	208,416
3.45	67607	211,791
3.5	67785	215,176
3.55	67963	218,570
3.6	68142	221,973
3.65	68320	225,384
3.7	68498	228,805
3.75	68677	232,234
3.8	68855	235,672
3.85	69033	239,119
3.9	69211	242,576
3.95	69390	246,041
4	69568	249,515
4.05	69763	252,998
4.1	69958	256,491
4.15	70154	259,994
4.2	70349	263,506
4.25	70544	267,029
4.3	70739	270,561
4.35	70934	274,102
4.4	71130	277,654
4.45	71325	281,215
4.5	71520	284,787
4.55	71715	288,367

BASIN I STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.6	71910	291,958
4.65	72106	295,558
4.7	72301	299,169
4.75	72496	302,789
4.8	72691	306,418
4.85	72886	310,058
4.9	73082	313,707
4.95	73277	317,366
5	73472	321,035
5.05	73674	324,713
5.1	73877	328,402
5.15	74079	332,101
5.2	74281	335,810
5.25	74483	339,529
5.3	74686	343,258
5.35	74888	346,997
5.4	75090	350,747
5.45	75292	354,506
5.5	75495	358,276
5.55	75697	362,056
5.6	75899	365,846
5.65	76101	369,646
5.7	76304	373,456
5.75	76506	377,276
5.8	76708	381,107
5.85	76910	384,947
5.9	77113	388,798
5.95	77315	392,658
6	77517	396,529
6.05	77723	400,410
6.1	77929	404,301
6.15	78135	408,203
6.2	78341	412,115
6.25	78547	416,037
6.3	78753	419,970
6.35	78959	423,912
6.4	79165	427,865
6.45	79371	431,829
6.5	79577	435,803
6.55	79783	439,787
6.6	79989	443,781
6.65	80195	447,785
6.7	80401	451,800
6.75	80607	455,826
6.8	80813	459,861
6.85	81019	463,907

BASIN I STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
6.9	81225	467,963
6.95	81431	472,029
7	81637	476,106
7.05	81835	480,193
7.1	82033	484,290
7.15	82231	488,396
7.2	82430	492,513
7.25	82628	496,639
7.3	82826	500,775
7.35	83024	504,922
7.4	83222	509,078
7.45	83420	513,244
7.5	83619	517,420
7.55	83817	521,606
7.6	84015	525,802
7.65	84213	530,007
7.7	84411	534,223
7.75	84609	538,448
7.8	84807	542,684
7.85	85006	546,929
7.9	85204	551,184
7.95	85402	555,449
8	85600	559,725
8.05	85794	564,009
8.1	85989	568,304
8.15	86183	572,608
8.2	86377	576,922
8.25	86571	581,246
8.3	86766	585,579
8.35	86960	589,922
8.4	87154	594,275
8.45	87348	598,638
8.5	87543	603,010
8.55	87737	607,392
8.6	87931	611,784
8.65	88125	616,185
8.7	88320	620,596
8.75	88514	625,017
8.8	88708	629,448
8.85	88902	633,888
8.9	89097	638,338
8.95	89291	642,798
9	89485	647,267

BASIN J STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	7672	-
0.05	7748	386
0.1	7824	775
0.15	7901	1,168
0.2	7977	1,565
0.25	8053	1,966
0.3	8129	2,370
0.35	8205	2,779
0.4	8282	3,191
0.45	8358	3,607
0.5	8434	4,027
0.55	8510	4,450
0.6	8586	4,878
0.65	8663	5,309
0.7	8739	5,744
0.75	8815	6,183
0.8	8891	6,625
0.85	8967	7,072
0.9	9044	7,522
0.95	9120	7,976
1	9196	8,434
1.05	9277	8,896
1.1	9358	9,362
1.15	9439	9,832
1.2	9519	10,306
1.25	9600	10,784
1.3	9681	11,266
1.35	9762	11,752
1.4	9843	12,242
1.45	9924	12,736
1.5	10005	13,234
1.55	10085	13,736
1.6	10166	14,243
1.65	10247	14,753
1.7	10328	15,267
1.75	10409	15,786
1.8	10490	16,308
1.85	10570	16,835
1.9	10651	17,365
1.95	10732	17,900
2	10813	18,439
2.05	10916	18,982
2.1	11020	19,530
2.15	11123	20,084
2.2	11227	20,642
2.25	11330	21,206

BASIN J STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.3	11433	21,775
2.35	11537	22,350
2.4	11640	22,929
2.45	11744	23,514
2.5	11847	24,104
2.55	11950	24,698
2.6	12054	25,299
2.65	12157	25,904
2.7	12261	26,514
2.75	12364	27,130
2.8	12467	27,751
2.85	12571	28,377
2.9	12674	29,008
2.95	12778	29,644
3	12881	30,286
3.05	13012	30,933
3.1	13144	31,587
3.15	13275	32,247
3.2	13407	32,914
3.25	13538	33,588
3.3	13670	34,268
3.35	13801	34,955
3.4	13933	35,648
3.45	14064	36,348
3.5	14196	37,055
3.55	14327	37,768
3.6	14458	38,487
3.65	14590	39,214
3.7	14721	39,946
3.75	14853	40,686
3.8	14984	41,432
3.85	15116	42,184
3.9	15247	42,943
3.95	15379	43,709
4	15510	44,481

BASIN K STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	34505	-
0.05	34643	1,729
0.1	34780	3,464
0.15	34918	5,207
0.2	35056	6,956
0.25	35194	8,712
0.3	35331	10,475
0.35	35469	12,245
0.4	35607	14,022
0.45	35744	15,806
0.5	35882	17,597
0.55	36020	19,394
0.6	36157	21,199
0.65	36295	23,010
0.7	36433	24,828
0.75	36571	26,653
0.8	36708	28,485
0.85	36846	30,324
0.9	36984	32,170
0.95	37121	34,022
1	37259	35,882
1.05	37401	37,749
1.1	37543	39,622
1.15	37686	41,503
1.2	37828	43,391
1.25	37970	45,286
1.3	38112	47,188
1.35	38254	49,097
1.4	38397	51,013
1.45	38539	52,937
1.5	38681	54,867
1.55	38823	56,805
1.6	38965	58,749
1.65	39108	60,701
1.7	39250	62,660
1.75	39392	64,626
1.8	39534	66,599
1.85	39676	68,580
1.9	39819	70,567
1.95	39961	72,561
2	40103	74,563
2.05	40248	76,572
2.1	40393	78,588
2.15	40537	80,611

BASIN K STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
2.2	40682	82,642
2.25	40827	84,679
2.3	40972	86,724
2.35	41116	88,776
2.4	41261	90,836
2.45	41406	92,902
2.5	41551	94,976
2.55	41695	97,058
2.6	41840	99,146
2.65	41985	101,242
2.7	42130	103,344
2.75	42274	105,454
2.8	42419	107,572
2.85	42564	109,696
2.9	42709	111,828
2.95	42853	113,967
3	42998	116,114
3.05	43146	118,267
3.1	43294	120,428
3.15	43442	122,596
3.2	43590	124,772
3.25	43738	126,955
3.3	43886	129,146
3.35	44034	131,344
3.4	44182	133,549
3.45	44330	135,762
3.5	44478	137,982
3.55	44625	140,210
3.6	44773	142,445
3.65	44921	144,687
3.7	45069	146,937
3.75	45217	149,194
3.8	45365	151,459
3.85	45513	153,731
3.9	45661	156,010
3.95	45809	158,297
4	45957	160,591
4.05	46109	162,893
4.1	46262	165,202
4.15	46414	167,519
4.2	46566	169,843
4.25	46719	172,175
4.3	46871	174,515
4.35	47023	176,863

BASIN K STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
4.4	47176	179,218
4.45	47328	181,580
4.5	47481	183,950
4.55	47633	186,328
4.6	47785	188,714
4.65	47938	191,107
4.7	48090	193,507
4.75	48242	195,916
4.8	48395	198,332
4.85	48547	200,755
4.9	48699	203,186
4.95	48852	205,625
5	49004	208,072
5.05	49162	210,526
5.1	49319	212,988
5.15	49477	215,458
5.2	49634	217,935
5.25	49792	220,421
5.3	49950	222,915
5.35	50107	225,416
5.4	50265	227,925
5.45	50422	230,442
5.5	50580	232,968
5.55	50738	235,500
5.6	50895	238,041
5.65	51053	240,590
5.7	51210	243,147
5.75	51368	245,711
5.8	51526	248,283
5.85	51683	250,864
5.9	51841	253,452
5.95	51998	256,048
6	52156	258,652

BASIN O-L STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	2089	-
0.05	2118	105
0.1	2147	212
0.15	2176	320
0.2	2205	429
0.25	2234	540
0.3	2263	653
0.35	2292	767
0.4	2321	882
0.45	2350	999
0.5	2380	1,117
0.55	2409	1,237
0.6	2438	1,358
0.65	2467	1,481
0.7	2496	1,605
0.75	2525	1,730
0.8	2554	1,857
0.85	2583	1,986
0.9	2612	2,115
0.95	2641	2,247
1	2670	2,380
1.05	2702	2,514
1.1	2735	2,650
1.15	2767	2,787
1.2	2799	2,926
1.25	2832	3,067
1.3	2864	3,210
1.35	2896	3,354
1.4	2929	3,499
1.45	2961	3,647
1.5	2994	3,795
1.55	3026	3,946
1.6	3058	4,098
1.65	3091	4,252
1.7	3123	4,407
1.75	3155	4,564
1.8	3188	4,723
1.85	3220	4,883
1.9	3252	5,045
1.95	3285	5,208
2	3317	5,373
2.05	3353	5,540
2.1	3388	5,708
2.15	3424	5,879
2.2	3459	6,051
2.25	3495	6,225
2.3	3531	6,400
2.35	3566	6,578
2.4	3602	6,757
2.45	3637	6,938
2.5	3673	7,121
2.55	3709	7,305
2.6	3744	7,491
2.65	3780	7,679
2.7	3815	7,869
2.75	3851	8,061
2.8	3887	8,254
2.85	3922	8,450
2.9	3958	8,647
2.95	3993	8,845
3	4029	9,046

BASIN O-M STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	5000	-
0.05	5044	251
0.1	5089	504
0.15	5133	760
0.2	5177	1,018
0.25	5222	1,278
0.3	5266	1,540
0.35	5310	1,804
0.4	5355	2,071
0.45	5399	2,340
0.5	5444	2,611
0.55	5488	2,884
0.6	5532	3,160
0.65	5577	3,437
0.7	5621	3,717
0.75	5665	3,999
0.8	5710	4,284
0.85	5754	4,570
0.9	5798	4,859
0.95	5843	5,150
1	5887	5,444
1.05	5934	5,739
1.1	5981	6,037
1.15	6028	6,337
1.2	6074	6,640
1.25	6121	6,945
1.3	6168	7,252
1.35	6215	7,561
1.4	6262	7,873
1.45	6309	8,188
1.5	6356	8,504
1.55	6402	8,823
1.6	6449	9,144
1.65	6496	9,468
1.7	6543	9,794
1.75	6590	10,122
1.8	6637	10,453
1.85	6683	10,786
1.9	6730	11,121
1.95	6777	11,459
2	6824	11,799
2.05	6874	12,141
2.1	6924	12,486
2.15	6975	12,834
2.2	7025	13,184
2.25	7075	13,536
2.3	7125	13,891
2.35	7175	14,249
2.4	7226	14,609
2.45	7276	14,971
2.5	7326	15,337
2.55	7376	15,704
2.6	7426	16,074
2.65	7477	16,447
2.7	7527	16,822
2.75	7577	17,199
2.8	7627	17,579
2.85	7677	17,962
2.9	7728	18,347
2.95	7778	18,735
3	7828	19,125

BASIN O-N STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	5000	-
0.05	5049	251
0.1	5098	505
0.15	5147	761
0.2	5197	1,020
0.25	5246	1,281
0.3	5295	1,544
0.35	5344	1,810
0.4	5393	2,079
0.45	5442	2,350
0.5	5492	2,623
0.55	5541	2,899
0.6	5590	3,177
0.65	5639	3,458
0.7	5688	3,741
0.75	5737	4,026
0.8	5786	4,315
0.85	5836	4,605
0.9	5885	4,898
0.95	5934	5,194
1	5983	5,492
1.05	6032	5,792
1.1	6080	6,095
1.15	6129	6,400
1.2	6177	6,708
1.25	6226	7,018
1.3	6274	7,330
1.35	6323	7,645
1.4	6371	7,962
1.45	6420	8,282
1.5	6469	8,604
1.55	6517	8,929
1.6	6566	9,256
1.65	6614	9,586
1.7	6663	9,917
1.75	6711	10,252
1.8	6760	10,589
1.85	6808	10,928
1.9	6857	11,269
1.95	6905	11,614
2	6954	11,960
2.05	7006	12,309
2.1	7058	12,661
2.15	7110	13,015
2.2	7162	13,372
2.25	7214	13,731
2.3	7265	14,093
2.35	7317	14,457
2.4	7369	14,825
2.45	7421	15,194
2.5	7473	15,567
2.55	7525	15,942
2.6	7577	16,319
2.65	7629	16,699
2.7	7681	17,082
2.75	7733	17,467
2.8	7784	17,855
2.85	7836	18,246
2.9	7888	18,639
2.95	7940	19,035
3	7992	19,433

BASIN O-O STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	2000	-
0.05	2000	100
0.1	2000	200
0.15	2000	300
0.2	2000	400
0.25	2000	500
0.3	2000	600
0.35	2000	700
0.4	2000	800
0.45	2000	900
0.5	2000	1,000
0.55	2000	1,100
0.6	2000	1,200
0.65	2000	1,300
0.7	2000	1,400
0.75	2000	1,500
0.8	2000	1,600
0.85	2000	1,700
0.9	2000	1,800
0.95	2000	1,900
1	2000	2,000

BASIN O-P STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	1200	-
0.05	1200	60
0.1	1200	120
0.15	1200	180
0.2	1200	240
0.25	1200	300
0.3	1200	360
0.35	1200	420
0.4	1200	480
0.45	1200	540
0.5	1200	600
0.55	1200	660
0.6	1200	720
0.65	1200	780
0.7	1200	840
0.75	1200	900
0.8	1200	960
0.85	1200	1,020
0.9	1200	1,080
0.95	1200	1,140
1	1200	1,200

BASIN O-Q STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	900	-
0.05	900	45
0.1	900	90
0.15	900	135
0.2	900	180
0.25	900	225
0.3	900	270
0.35	900	315
0.4	900	360
0.45	900	405
0.5	900	450
0.55	900	495
0.6	900	540
0.65	900	585
0.7	900	630
0.75	900	675
0.8	900	720
0.85	900	765
0.9	900	810
0.95	900	855
1	900	900

BASIN O-R STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	900	-
0.05	900	45
0.1	900	90
0.15	900	135
0.2	900	180
0.25	900	225
0.3	900	270
0.35	900	315
0.4	900	360
0.45	900	405
0.5	900	450
0.55	900	495
0.6	900	540
0.65	900	585
0.7	900	630
0.75	900	675
0.8	900	720
0.85	900	765
0.9	900	810
0.95	900	855
1	900	900

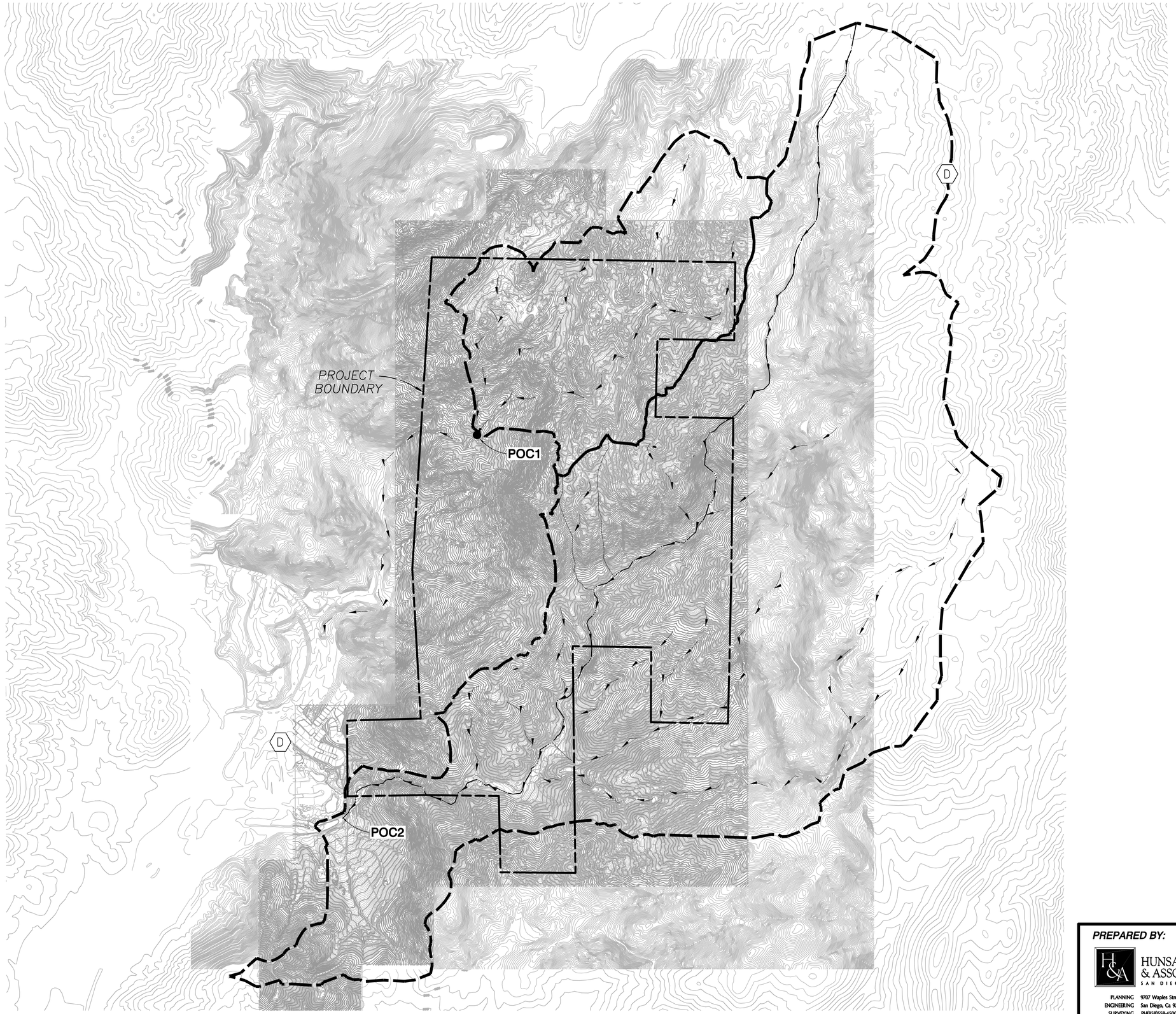
BASIN O-S STAGE STORAGE		
Depth (ft)	Area (sq ft)	Volume (cu ft)
0	1200	-
0.05	1200	60
0.1	1200	120
0.15	1200	180
0.2	1200	240
0.25	1200	300
0.3	1200	360
0.35	1200	420
0.4	1200	480
0.45	1200	540
0.5	1200	600
0.55	1200	660
0.6	1200	720
0.65	1200	780
0.7	1200	840
0.75	1200	900
0.8	1200	960
0.85	1200	1,020
0.9	1200	1,080
0.95	1200	1,140
1	1200	1,200

PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

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)



LEGEND

PROJECT BOUNDARY

DRAINAGE BOUNDARY

DIRECTION OF FLOW

0 800 1600 2400

SCALE 1" = 800'

PREPARED BY:

HUNSAKER & ASSOCIATES SAN DIEGO, INC

PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 · FX(858)558-1414

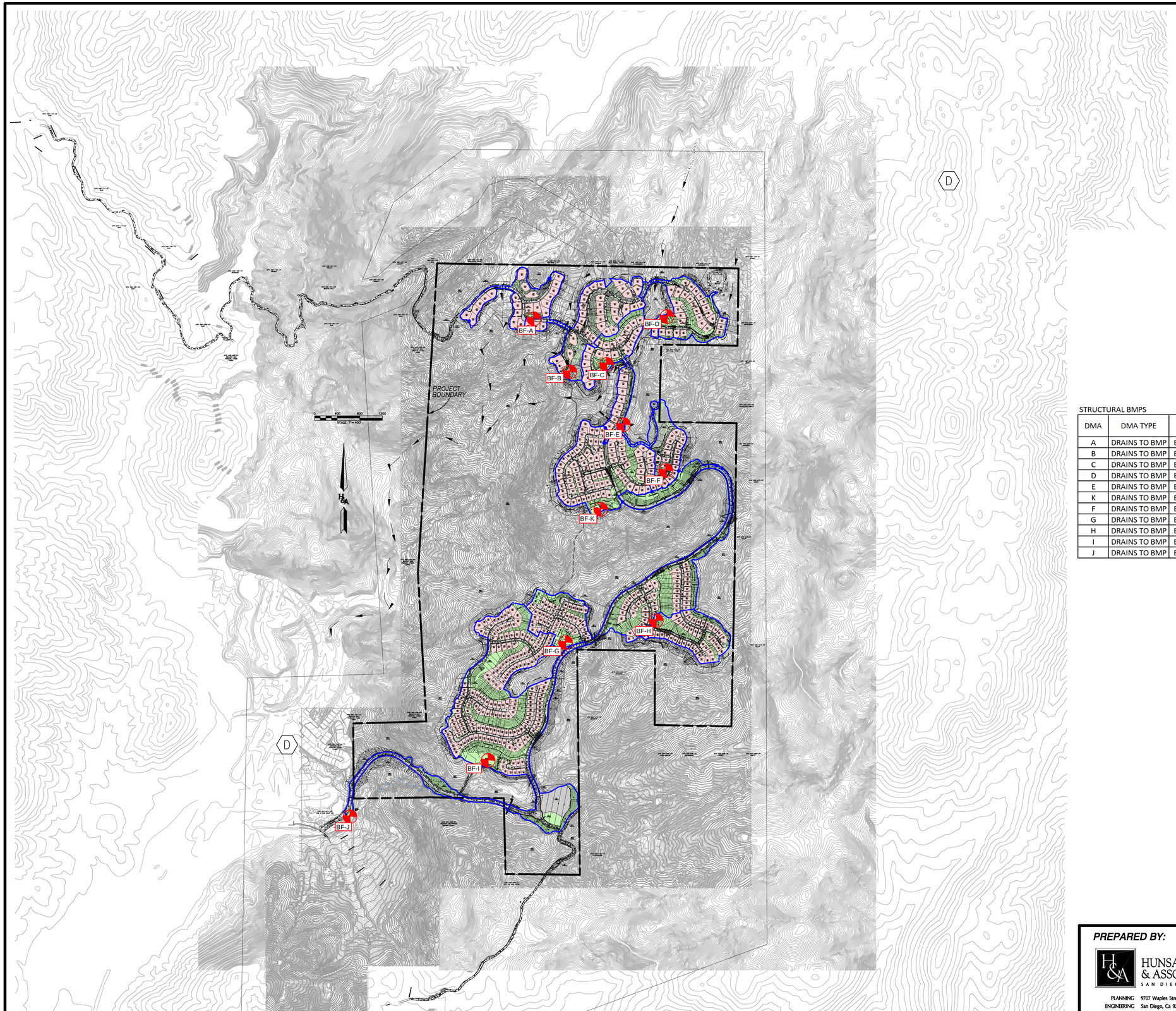
ATTACHMENT 2B
EXISTING HMP EXHIBIT
FOR
SAFARI HIGHLANDS

CITY OF ESCONDIDO, CA

SHEET 1 OF 3

W.O. 2374-0017

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LEGEND

PROJECT BOUNDARY

DMA BOUNDARY

DRAINAGE BOUNDARY

DIRECTION OF FLOW

PERVIOUS AREAS

STREETS

LOT (50% IMPERVIOUS)

HYDROLOGIC SOIL TYPE (D)

STRUCTURAL BMPS

BIOFILTRATION BASIN

NOTES

NO GROUNDWATER FOUND ONSITE

STRUCTURAL BMPS

DMA	DMA TYPE	BMP	BMP ID	REQUIRED DCV (CUFT)	PROVIDED DCV (CUFT)	REQUIRED FOOTPRINT (SQFT)	PROVIDED FOOTPRINT (SQFT)
A	DRAINS TO BMP	BIOFILTRATION	BF-A	19826	29471	10618	11370
B	DRAINS TO BMP	BIOFILTRATION	BF-B	32543	50067	17364	17785
C	DRAINS TO BMP	BIOFILTRATION	BF-C	26064	39096	13969	15082
D	DRAINS TO BMP	BIOFILTRATION	BF-D	22685	34028	12282	14794
E	DRAINS TO BMP	BIOFILTRATION	BF-E	3147	4726	1680	1676
K	DRAINS TO BMP	BIOFILTRATION	BF-K	50862	76293	27635	34505
F	DRAINS TO BMP	BIOFILTRATION	BF-F	11453	17180	6160	6920
G	DRAINS TO BMP	BIOFILTRATION	BF-G	66240	99359	35369	36540
H	DRAINS TO BMP	BIOFILTRATION	BF-H	20308	30461	10894	11886
I	DRAINS TO BMP	BIOFILTRATION	BF-I	106361	159542	56655	56819
J	DRAINS TO BMP	BIOFILTRATION	BF-J	12436	18654	6700	7672

0 800 1600 2400
SCALE 1"= 800'

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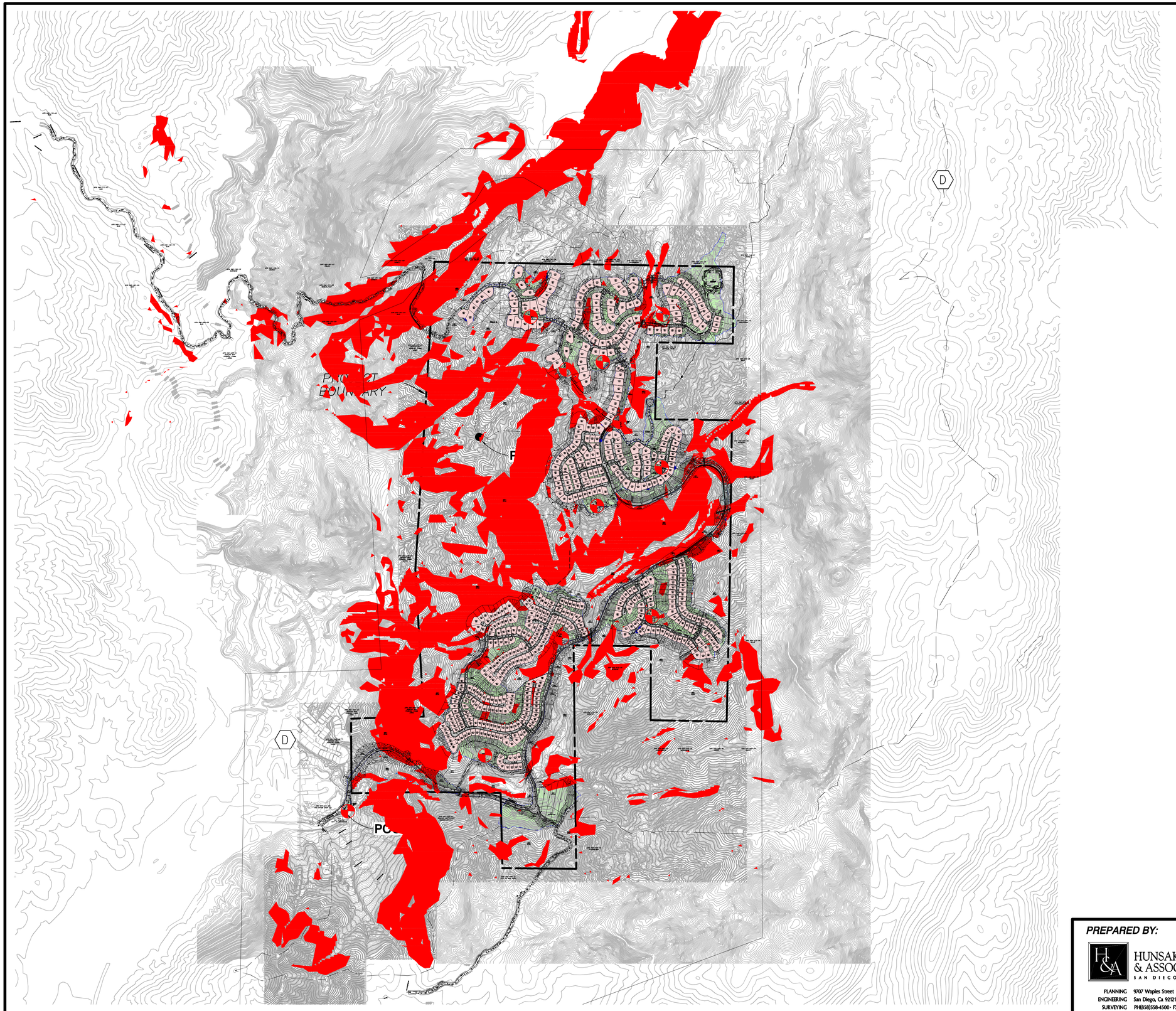
ATTACHMENT 2B
PROPOSED HMP EXHIBIT
FOR
SAFARI HIGHLANDS

CITY OF ESCONDIDO, CA

SHEET 2 OF 3

W.O. 2374-0017

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LEGEND

- PROJECT BOUNDARY
- DMA BOUNDARY
- DIRECTION OF FLOW
- PERVIOUS AREAS
- STREETS
- LOT (50% IMPERVIOUS)
- HYDROLOGIC SOIL TYPE
- POTENTIAL CCSYA
- STRUCTURAL BMPS
- BIOFILTRATION BASIN

NOTES

NO GROUNDWATER FOUND ONSITE

0 800 1600 2400

SCALE 1" = 800'

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ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 · FX(858)558-1414

ATTACHMENT 2B
PROPOSED HMP EXHIBIT
W/ CCSYA

SAFARI HIGHLANDS

CITY OF ESCONDIDO, CA

SHEET 3 OF 3

W.O. 2374-0017

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POC5

POC4

POC3

LEGEND

PROJECT BOUNDARY

DRAINAGE BOUNDARY

DIRECTION OF FLOW

0 700 1400 2100

SCALE 1" = 700'

PREPARED BY:

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ATTACHMENT 2B
EXISTING HMP EXHIBIT
FOR
OFFSITE ACCESS ROAD

CITY OF ESCONDIDO, CA

SHEET 1 OF 2

W.O. 2374-0017

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DMA O-S
DMA O-R
DMA O-Q
DMA O-P
DMA O-O
DMA O-M
DMA O-L
DMA O-N
POC5
POC4
POC3
D
SEE ONSITE EXHIBIT FOR PROPOSED HMP

LEGEND

- PROJECT BOUNDARY
- DMA BOUNDARY
- DRAINAGE BOUNDARY
- DIRECTION OF FLOW
- PERVIOUS AREAS
- STREETS
- LOT (50% IMPERVIOUS)
- HYDROLOGIC SOIL TYPE (D)
- STRUCTURAL BMPS
- BIOFILTRATION BASIN
- USACE US WATERS 50' BUFFER
- NOTES
- NO GROUNDWATER FOUND ONSITE

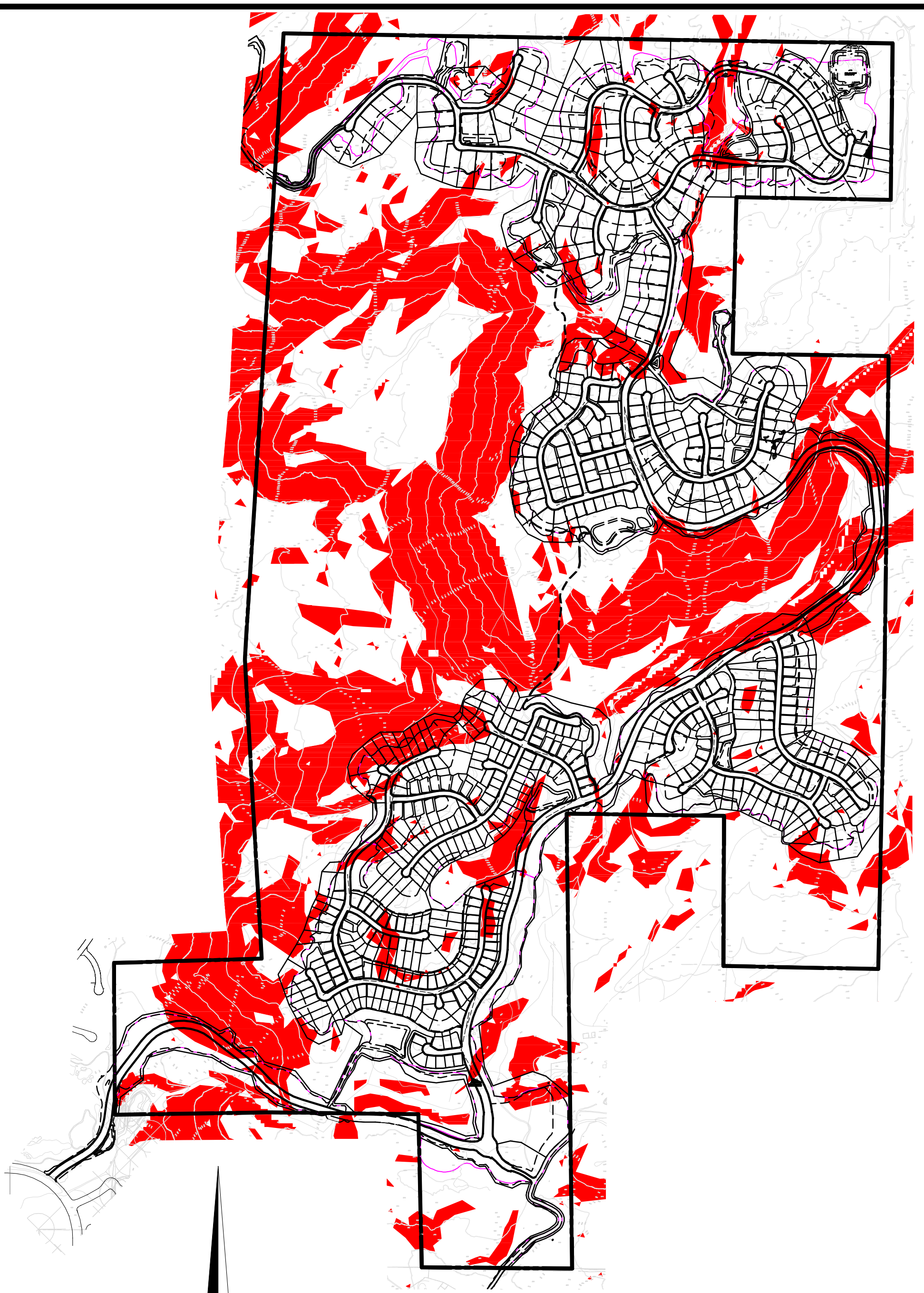
PREPARED BY:
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PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 FX(858)558-1414

ATTACHMENT 2B
PROPOSED HMP EXHIBIT FOR
OFFSITE ACCESS ROAD

CITY OF ESCONDIDO, CA

SHEET 2 OF 2

W.O. 2374-0017



LEGEND

POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS ONSITE
359 AC

DATE OF PREPARATION 7/21/15

PREPARED BY:

HUNSAKER & ASSOCIATES
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ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 FX(858)558-1414

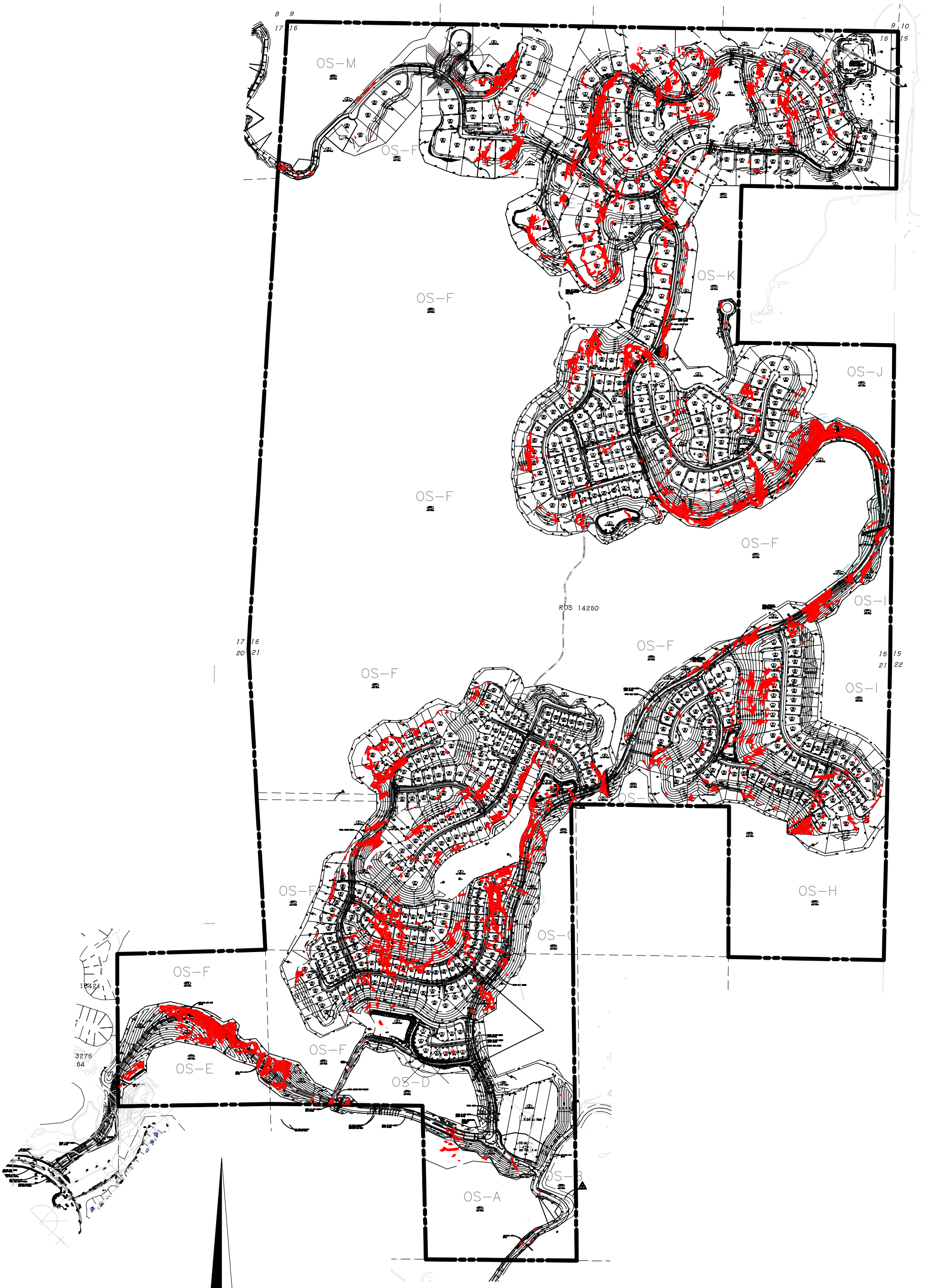
ATTACHMENT 2C
REGIONAL WMAA

SAFARI HIGHLANDS RANCH

CITY OF ESCONDIDO, CALIFORNIA

W.O. 2374-0017

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LEGEND

CRITICAL COARSE SEDIMENT YIELD AREAS(GLUs) WITHIN GRADING LIMITS
46 AC

GLU: CB-SCRUB/SHRUB-4

PREPARED BY:

HUNSAKER & ASSOCIATES
SAN DIEGO, INC

PLANNING 9707 Waples Street
ENGINEERING San Diego, Ca 92121
SURVEYING PH(858)558-4500 FX(858)558-1414

ATTACHMENT 2C
GLU ANALYSIS MAP
SAFARI HIGHLANDS RANCH

CITY OF ESCONDIDO, CALIFORNIA

W.O. 2374-0017

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ATTACHMENT 3

Structural BMP Maintenance Information

This is the cover sheet for Attachment 3.

Indicate which Items are Included behind this cover sheet:

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

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PRIORITY DEVELOPMENT PROJECT (PDP) SWQMP

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

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

Attachment 3a: Structural BMP Maintenance Plan

Maintenance Program for Biofiltration Basins	
BMP Access: Access Road/Roadway	
Inspection Frequency/Indications:	Regular Inspections q Before wet season begins (September); q Every 60 days during wet season (September-April); q After wet season (April). Performance Inspections q After rainfall events greater than 0.5 inch
Maintenance Indications Connections	**Maintenance Activities Connections**
q Damage to inlet/outlet, sideslopes, headwall, or other structures	q Repair inlet/outlet structures, side slopes, fences, or other structural elements as needed to maintain performance of the facility.
q Over-grown vegetation, emergent woody vegetation and/or weeds	q Trim vegetation to average height of 12 inches and remove trimmings. q Remove emergent trees and other vegetation that are not part of bioretention basin plan and weeds q Re-seed and re-plan barren areas prior to rainy season q Install erosion blanket on barren spots if re-vegetation is not successful
q Sediment accumulation over 3 inches	q Remove sediment accumulation at or near plant height
q Accumulation of sediment, litter, or debris in infiltration basin, pretreatment device, or on permeable pavement surface	q Remove and properly dispose of accumulated materials
q Poor vegetation establishment	q Re-seed, re-plant, or re-establish vegetation per original plans
q Overgrown vegetation	q Mow or trim as appropriate, but not less than design height of the vegetation per original plans when applicable
q Erosion due to concentrated irrigation flow	q Repair/re-seed/re-plant eroded areas and adjust the irrigation system
q Irrigation due to concentrated storm water runoff flow	q Repair/re-seed/re-plant eroded areas, and make appropriate corrective measures such as adding erosion control blankets, adding stone at flow entry points, or minor re-grading to restore proper drainage according to the original plan. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.
q Standing water in vegetated swales	q Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, loosening or replacing top soil to allow for better infiltration, or minor re-grading for proper drainage. If the issue is not corrected by restoring the BMP to the original plan and grade, the [City Engineer] shall be contacted prior to any additional repairs or reconstruction.
q Standing water in bioretention, biofiltration with partial retention, or biofiltration areas, or flow-through planter boxes for longer than 96 hours following a storm event*	q Make appropriate corrective measures such as adjusting irrigation system, removing obstructions of debris or invasive vegetation, clearing underdrains (where applicable), or repairing/replacing clogged or compacted soils.
q Obstructed inlet or outlet structure	q Clear obstructions
q Damage to structural components such as weirs, inlet or outlet strucuture	q Repair or replace as applicable
Recommended Equipment	All BMP maintenance is recommended to be accomplished using hand tools (IE. shovel, rake, whellbarrow, etc.) to avoid disturbance and compaction of the biofiltration basin

Attachment 3a: Structural BMP Maintenance Plan

Waste Disposal	Sediment, other pollutants, and all other waste shall be properly disposed of in a licensed landfill or by another appropriate disposal method in accordance with local, state, and federal regulations.

Maintenance Program for Inlet Stenciling	
BMP Access: Street	
Inspection Frequency/Indications:	Regular Maintenance Inspections q Before wet season begins (September); q After wet season (April).
Maintenance Indications	**Maintenance Activities**
q Inlet stenciling/signage begins to weather or fade	q Re-stamp signage
q Broken or damaged structure	q Repair or replace signage structure

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ATTACHMENT 4

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

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City of Escondido Storm Water Structural BMP Verification Form Page 1 of 4	
Project Summary Information	
Project Name	Safari Highlands Ranch
Record ID (e.g., grading/improvement plan number)	SUB15-0019
Project Address	W Zoo Rd. San Diego, CA
Assessor's Parcel Number(s) (APN(s))	
Project Watershed (Complete Hydrologic Unit, Area, and Subarea Name with Numeric Identifier)	905.32 San Dieguito HU, San Pasqual HA, Las Lomas Muertas HSA
Maintenance Notification / Agreement No.	
Responsible Party for Construction Phase	
Developer's Name	Hunsaker & Associates – San Diego, INC.
Address	9707 Waples St. San Diego, CA 92121
Email Address	RMartin@HunsakerSD.com
Phone Number	858-558-4500
Engineer of Work	Raymond L. Martin
Engineer's Phone Number	858-558-4500
Responsible Party for Ongoing Maintenance	
Owner's Name(s)*	Safari Highlands Ranch, LLC
Address	380 Stevens Ave, Suite 307 Solana Beach, CA 92075
Email Address	
Phone Number	
*Note: If a corporation or LLC, provide information for principal partner or Agent for Service of Process. If an HOA, provide information for the Board or property manager at time of project closeout.	

City of Escondido Storm Water Structural BMP Verification Form Page 2 of 4				
Stormwater Structural Pollutant Control & Hydromodification Control BMPs* (List all from SWQMP)				
Description/Type of Structural BMP	**Plan Sheet #**	**Structural BMP ID#**	**Maintenance Agreement Recorded Doc #**	**Revisions**
Biofiltration		BF-A		
Biofiltration		BF-B		
Biofiltration		BF-C		
Biofiltration		BF-D		
Biofiltration		BF-K		
Biofiltration		BF-F		
Biofiltration		BF-E		
Biofiltration		BF-G		
Biofiltration		BF-H		
Biofiltration		BF-I		
Biofiltration		BF-J		
Biofiltration		BF-O-L		
Biofiltration		BF-O-M		
Biofiltration		BF-O-N		
Biofiltration		BF-O-O		
Biofiltration		BF-O-P		
Biofiltration		BF-O-Q		
Biofiltration		BF-O-R		
Biofiltration		BF-O-S		
*All Priority Development Projects (PDPs) require a Structural BMP				

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

City of Escondido Storm Structural BMP Verification Form Page 3 of 4

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

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

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

Please sign your name and seal.

Professional Engineer's Printed Name:

_____

Professional Engineer's Signed Name:

_____

Date: _____

[SEAL]

City of Escondido Storm Water Structural BMP Verification Form Page 4 of 4

CITY - OFFICIAL USE ONLY:

Permit #:_____

City Inspector: _____

Date Project has/expects to close: _____

Date verification received from Engineer of Work (EOW): _____

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

City Inspector's Signature: _____ Date: _____

FOR Environmental Programs:

Date Received from Field Engineering:_____

Environmental Programs Submittal Reviewer:_____

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

List **acceptable** Structural BMPs:

Environmental Programs Reviewer's Signature: _____

Date: _____

ATTACHMENT 5

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

This is the cover sheet for Attachment 5.

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

The plans must identify:

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

ATTACHMENT 6

Supporting Documentation

Optional Additional Analysis
When Potential 'Critical Coarse Sediment Yield Areas' ("CCSYA")
are present on site

Optional Additional Analysis When Potential 'Critical Coarse Sediment Yield Areas' ("CCSYA") are Present Onsite

Following three steps are involved in the optional analysis per Escondido Storm Water Design Manual, Appendix H, to determine whether the Safari Highlands project site is a Significant Source of Bed Sediment Supply to the channel receiving runoff and includes the following components:

A. Site soil assessment, including an analysis and comparison of the Bed Sediment in the receiving channel and the onsite channel;

B. Determination of the capability of the channels on the project site to deliver the site Bed Sediment (if present) to the receiving channel; and

C. Present and potential future condition of the receiving channel.

A. Site soil assessment, including an analysis and comparison of the Bed Sediment in the channel receiving runoff and the onsite channels;

The geotechnical analysis was not done to assess the soils onsite and in the channels to meet the requirements of conditions of step A. The decision to not do the soil analysis was based on clear signs of fine silty sand and coarse sand on site. We are opting to accept that a high probability rating for the onsite coarse sediment to the onsite channels in lieu of geotechnical analysis.

B. Determination of the capability of the channels on the project site to deliver the site Bed Sediment Supply (if present) to the channel receiving runoff from the project site

The WMAA mapping showed presence of potential critical coarse sediment polygons. We performed GLU analysis onsite to determine the critical coarse sediment yield areas and verified the GLUs to be CB-SCRUB/SHRUB-4. Two onsite reaches, Reach 1(R1) and Reach 2(R2) as shown on Potential CCSYA Optional Analysis Exhibit (Attachment 6) were observed to qualitatively assess the sediment delivery potential of the channels on the project site to deliver the Bed Sediment Supply to the channel receiving runoff from the project site. Optional procedures for determining Bed Sediment delivery potential or ratio discussed in the Appendix H are optional and were not performed. Hydraulic analysis with HEC-RAS was done per direction of the City reviewer to provide backup computational data and as an alternative to optional procedures discussed on Appendix H. Hydraulic Analysis with HEC-RAS was performed at two locations were aggradation of coarse sediment was observed to assess flow velocities for a 10-yr storm event. The velocities for Reach 1 were in the range of 2fps-5.5fps and for Reach2 were less than 2fps which have very low or no potential to move the coarse sediment through these flatter areas of the two reaches.

This assessment also considered several factors effecting the sediment transport/delivery potential including the sediment source, proximity to the receiving stream, onsite channel density. These factors were assessed to plan for optional analysis site visit and verified onsite. Project watershed area, slope, length, land use and land cover, and rainfall intensity was assessed to compute peak storm runoff. Inline structures like bridges, culverts and grade controls structure also limit the transport of sediment as discussed below.

It appears that coarse sediment may reach the onsite channel based on topographical observations but there is low potential for sediment transport and sediment supply to downstream offsite receiving channel based on the channel conditions. The site inspection showed signs of coarse sediment along with fine sediment present in the upstream reaches of the onsite channels. The transport of coarse sediment material seems to be prevented by flatter terrain at two locations along the flow path and inline structures present downstream of the two reaches. The downstream reaches of the two onsite channels show signs of loose coarse sediment deposits indicating an active transport and aggradation process but only up to the bridge culverts. Reach 1 has an Arizona crossing with CMP culverts and Reach 2 has a culvert over a bridge crossing at Rockwood Road which prevents the sediment from transporting downstream and where the coarse sediment transport is intercepted. The vegetative cover is very dense and increases the channel roughness, resulting in reduced velocities of stormwater moving through the channel which limits erosion potential and does not facilitate transport of denser coarse sedimentation to the downstream receiving channel. Therefore, in our opinion, the potential to deliver sediment to the downstream receiving waters is low.

C. Present and potential future condition of the channel receiving runoff from the project site.

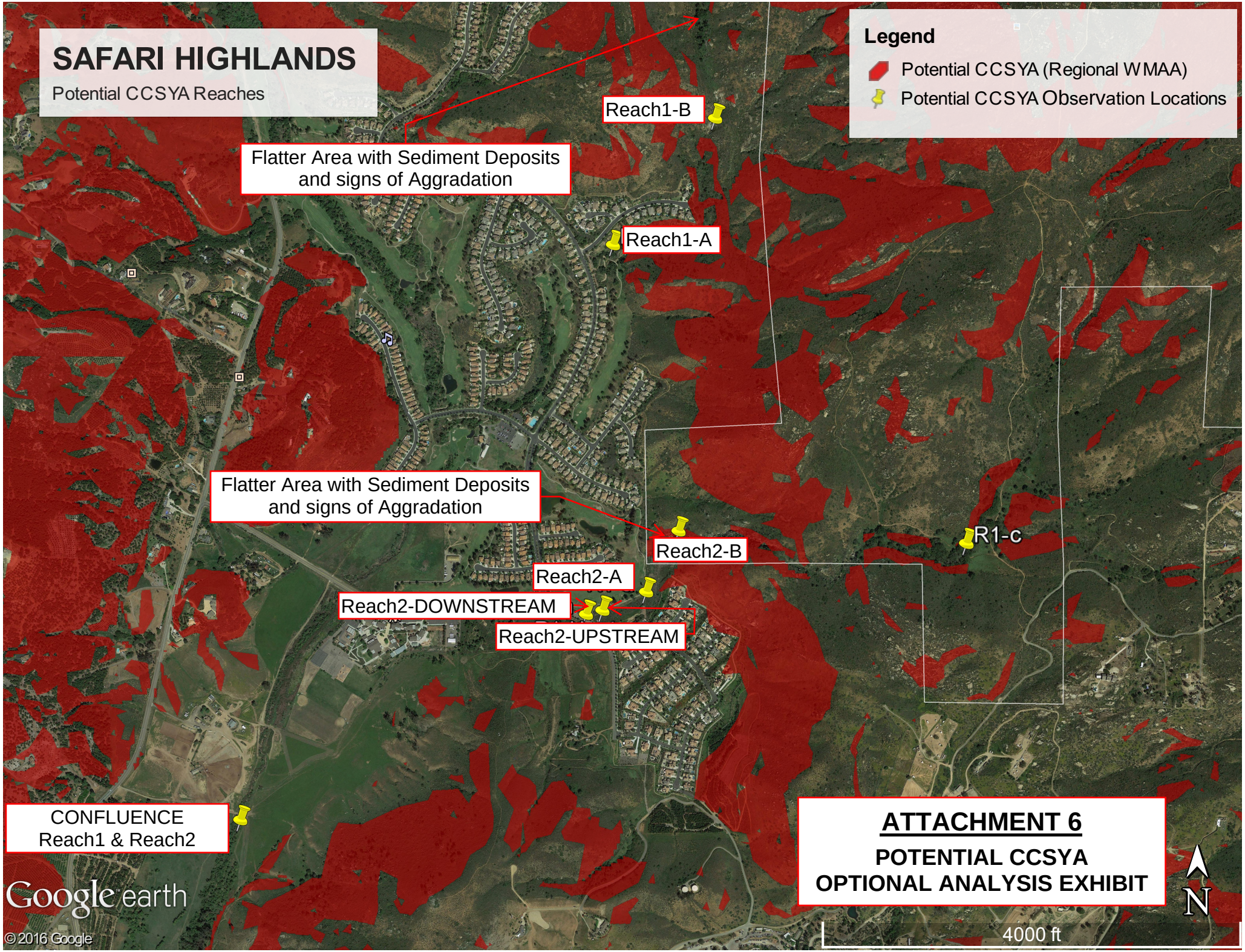
Both Reaches of the onsite channel and the channel downstream leaving the project site was visually inspected for bank stability, degree of incision, signs of aggradation and degradation of bed material. Each of these channels is covered with dense vegetative cover as discussed above. There are also rock formations at some locations within the channel proving additional scour protection and stability. The inspection showed no signs of channel bed or banks incision. The project preserves major portions of the existing channels and also 87% of the mapped areas supplying coarse sediment draining to the onsite channel reaches. Our observation of this area indicated no signs of instability due to sediment deposition or scour, nor signs of sensitivity to changes in bed material load. Hydromodification management measures included in the project design assure comparable flow rates through these channels in the future. Therefore, the condition of the receiving channel is expected to remain stable and the potential for adverse response based on a change in bed sediment load due to onsite development is low.

Conclusions;

The triad assessment results using the BMP Manual provide the following values;

A. Site soil assessment - High probability
B. Sediment delivery capacity – Low probability
C. Present and Future Condition – Low probability

Therefore the predominant score is low and the project site is not significant source of sediment bed material; hence site design considerations are not recommended for the site to mitigate for CCSYAs. It should be noted that site design implements preservation of some of the channels, as would be considered for projects with predominantly “medium” values. Therefore, we conclude that the site is not a critical source of coarse sediment supply and development of the site as proposed on the project tentative map may proceed without adverse response in the downstream.


SAFARI HIGHLANDS
Potential CCSYA Reaches
Legend
Potential CCSYA (Regional WMAA)
Potential CCSYA Observation Locations
Reach1-B
Flatter Area with Sediment Deposits and signs of Aggradation
Reach1-A
Flatter Area with Sediment Deposits and signs of Aggradation
Reach2-B
R1-c
Reach2-A
Reach2-DOWNSTREAM
Reach2-UPSTREAM
CONFLUENCE Reach1 & Reach2
ATTACHMENT 6
POTENTIAL CCSYA OPTIONAL ANALYSIS EXHIBIT
N
4000 ft
Google earth
© 2016 Google

SITE PHOTOGRAPHS

SAFARI HIGHLANDS RANCH - REACH1

Wooden Bridge over Arizona Crossing Near Reach1-A





Coarse sediment was observed to be deposited upstream of the crossing.



SAFARI HIGHLANDS RANCH - REACH2

Flatter slope areas upstream of the Rockwood Road Bridge

Most coarse sediment was trapped at this location. Coarse sediment was observed to be deposited about 6-12inch deep layer and limits the transport of coarse sediment downstream to the Rockwood Road Culvert.



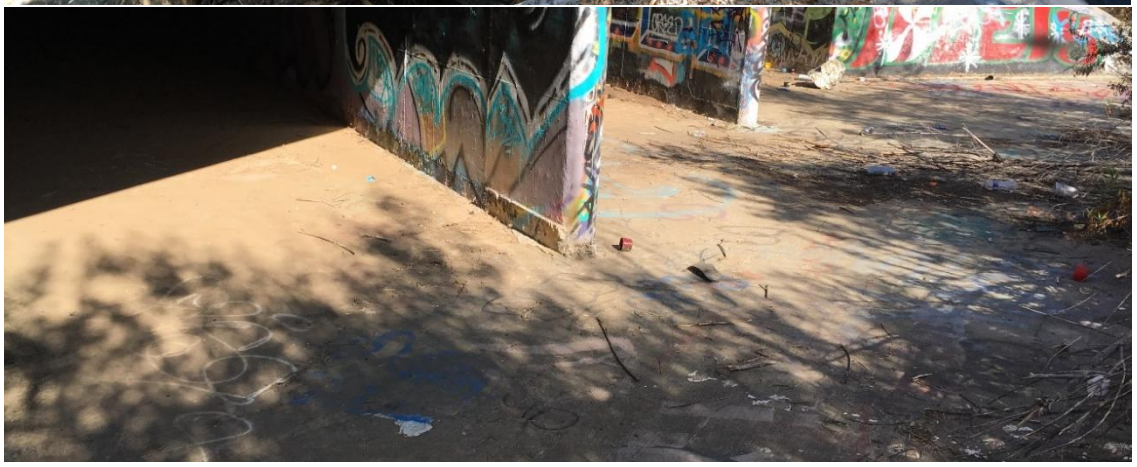




REACH2-Upstream of Rockwood Road Culvert

coarse sediment observed to be trapped between the riprap rock





REACH2-Dowstream side of Rockwood Road Culvert



As seen in the exhibits there was some coarse sediment observed to be trapped between the riprap rock upstream of the Rockwood Road Culvert but there was no sign of similar coarse sediment downstream of the Rockwood Road Culvert. It is our conclusion that the coarse sediment does not reach the downstream reaches in existing condition and is not critical to the downstream reaches.

HEC-RAS ANALYSIS

CCSYA SECTIONS – REACH1

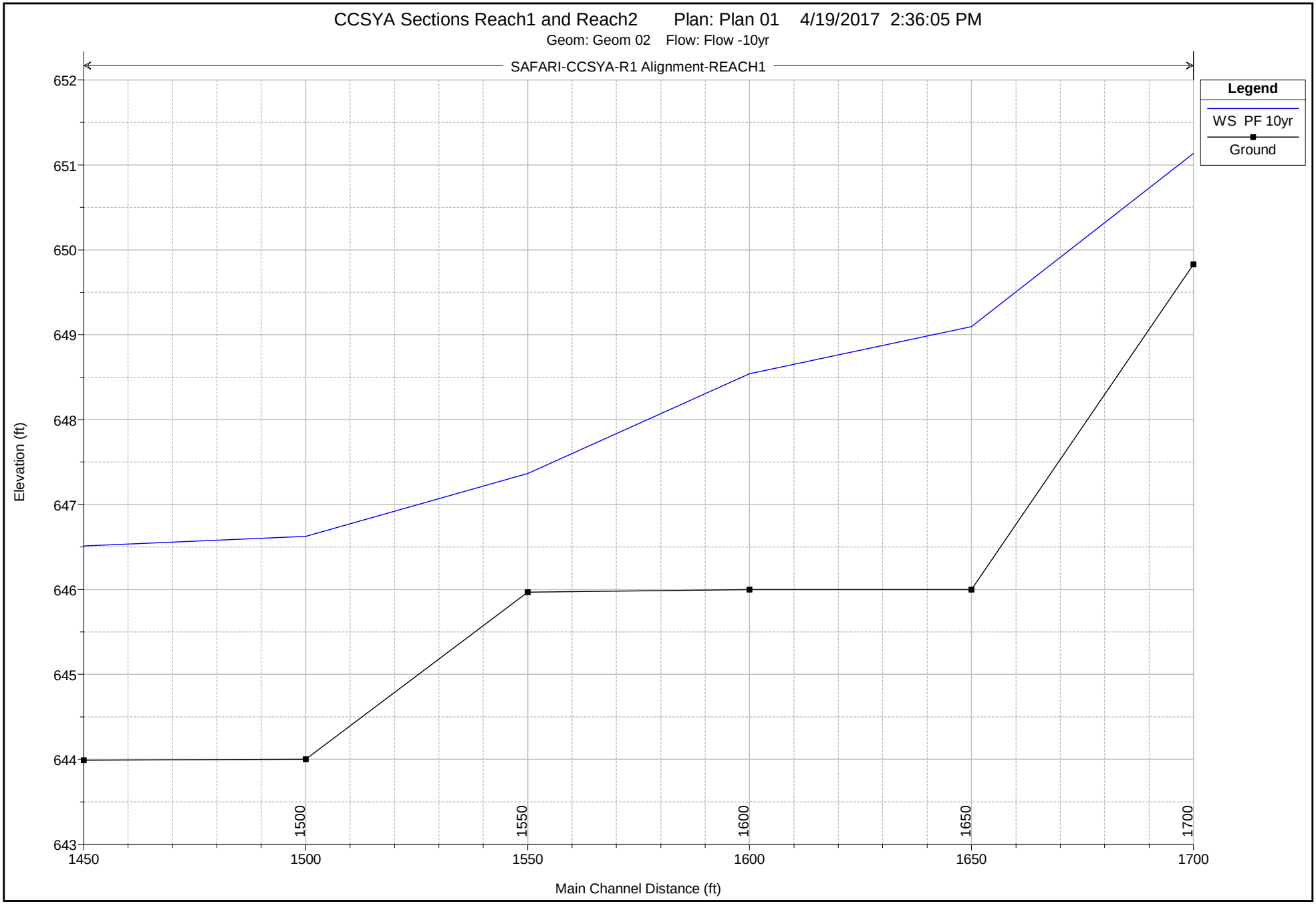


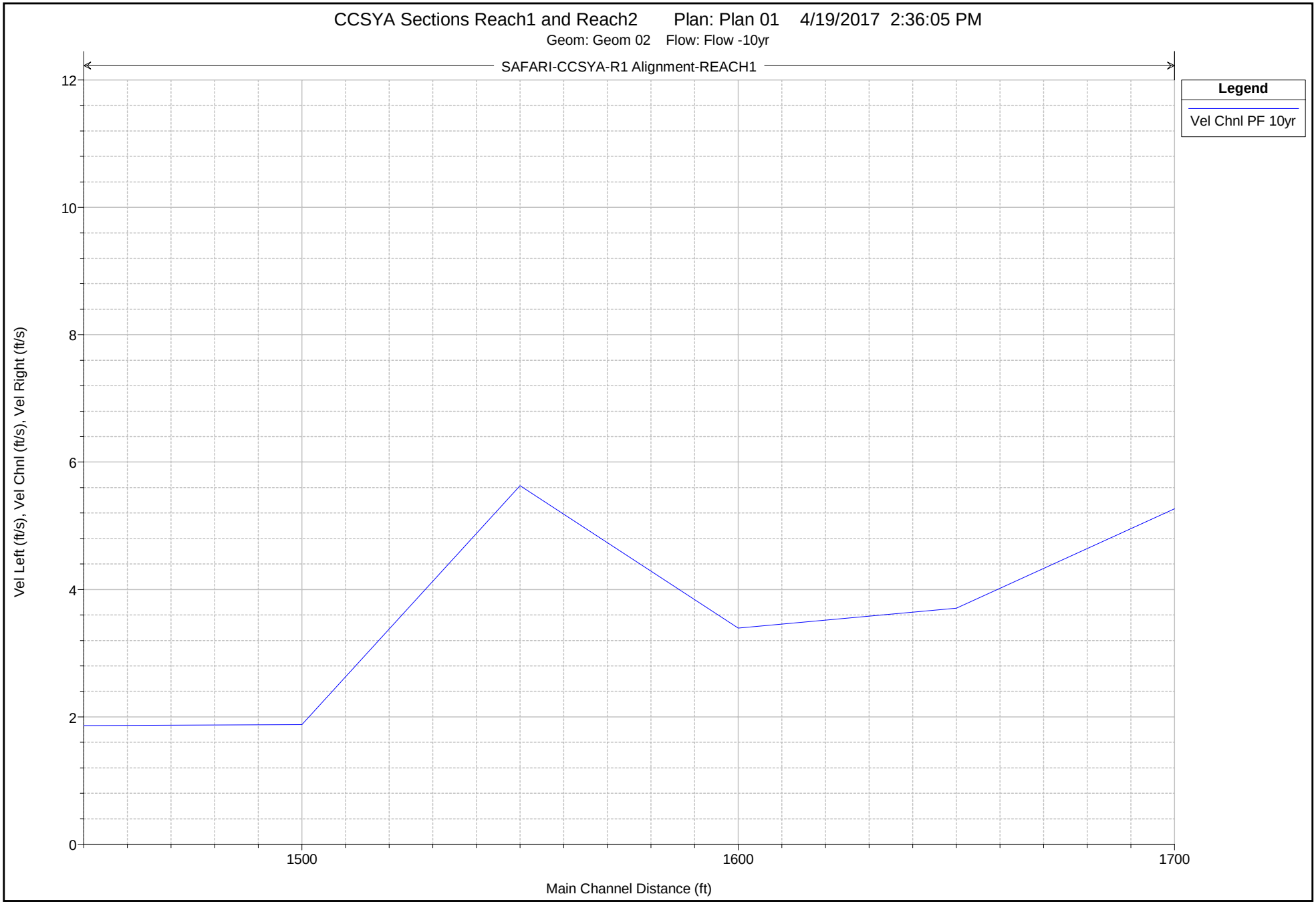
CCSYA SECTIONS – REACH2

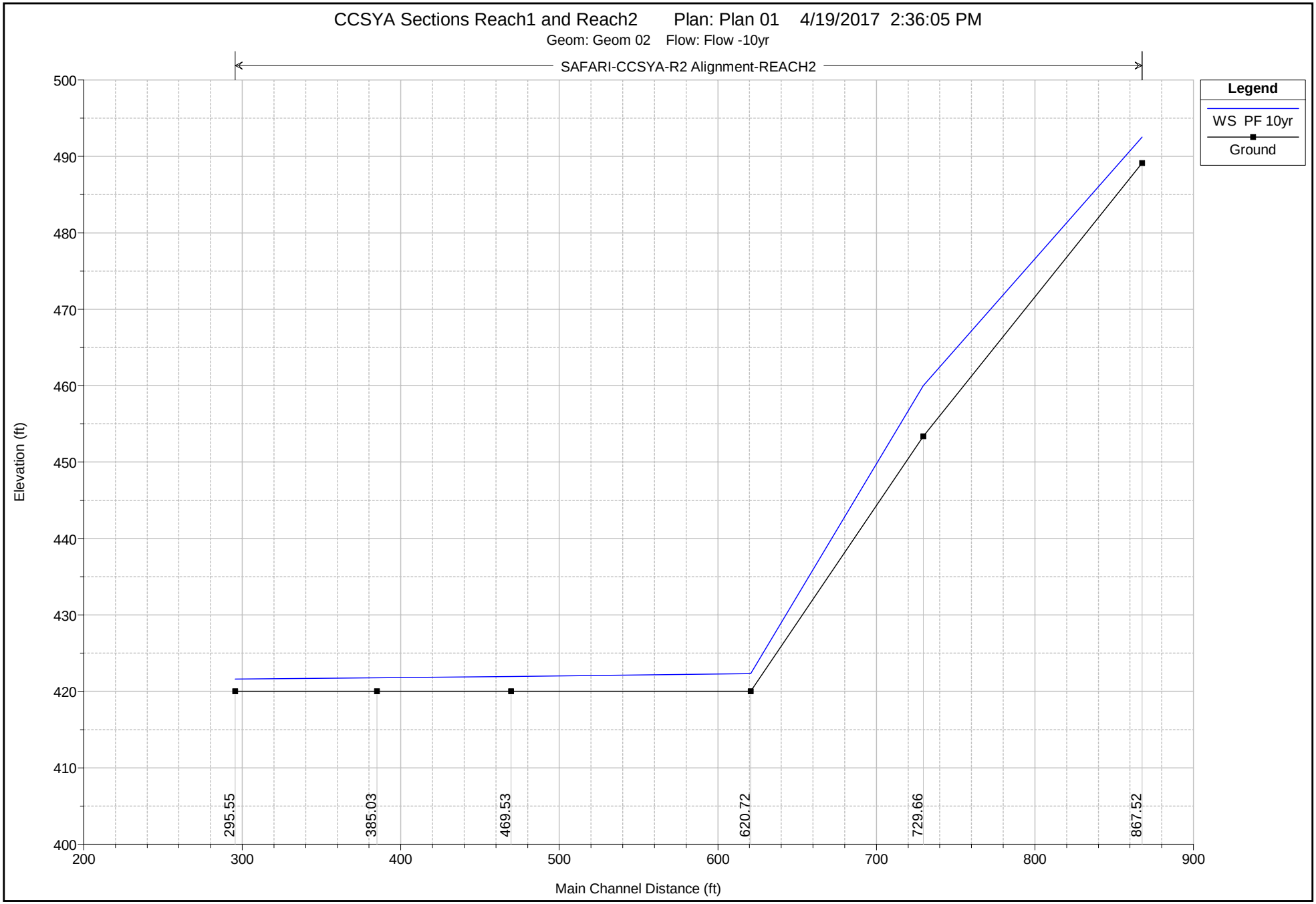


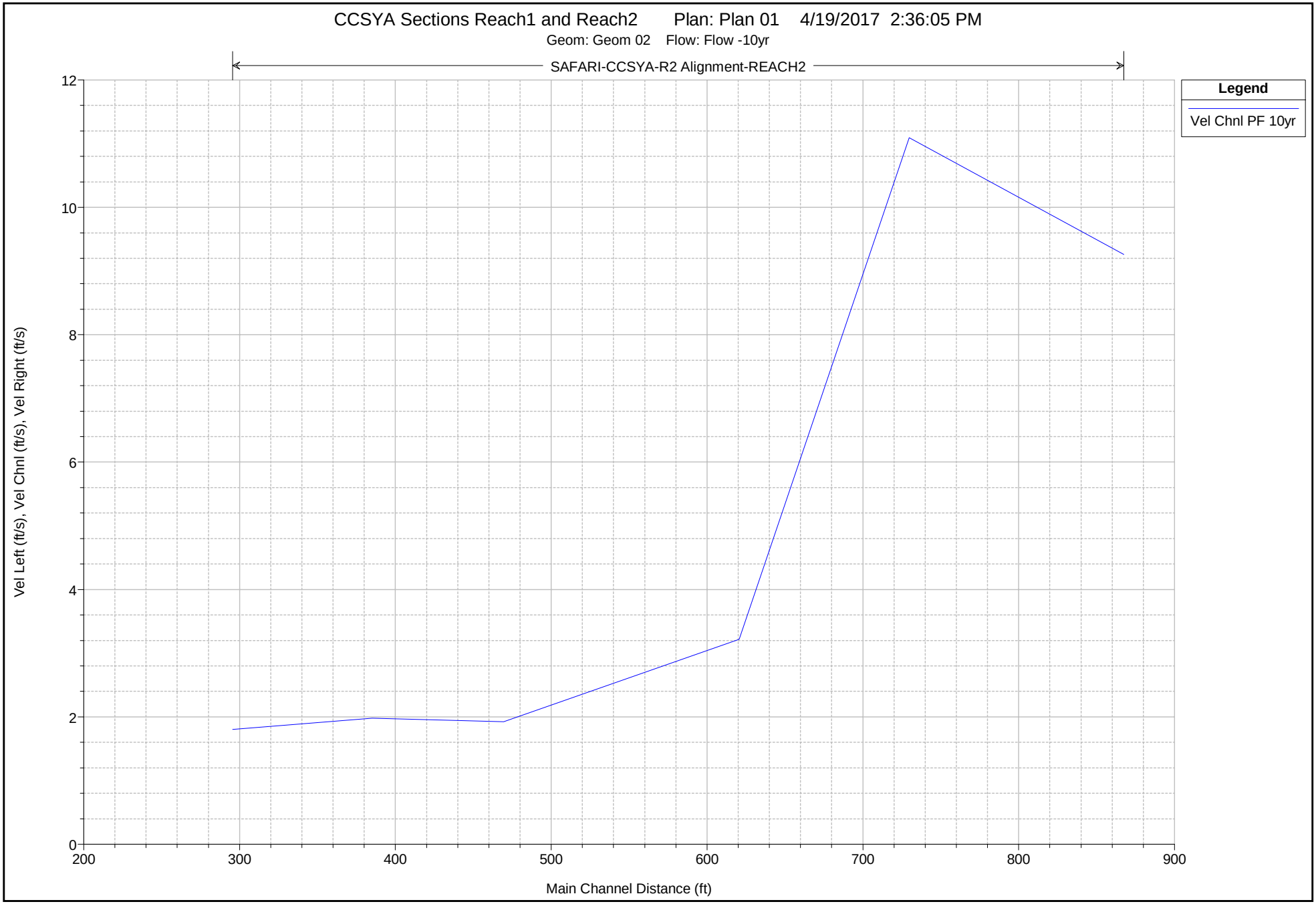
HEC-RAS Plan: Plan 01 Profile: PF 10yr

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SAFARI-CCSYA-R2	Alignment-REACH2	867.52	PF 10yr	930.00	489.14	492.52	492.52	493.85	0.028098	9.26	100.43	38.13	1.01
SAFARI-CCSYA-R2	Alignment-REACH2	729.66	PF 10yr	930.00	453.39	459.99	459.99	461.90	0.029617	11.09	83.83	21.96	1.00
SAFARI-CCSYA-R2	Alignment-REACH2	620.72	PF 10yr	930.00	420.00	422.34		422.50	0.005821	3.22	288.92	169.69	0.43
SAFARI-CCSYA-R2	Alignment-REACH2	469.53	PF 10yr	930.00	420.00	421.96		422.02	0.001765	1.92	484.00	252.91	0.24
SAFARI-CCSYA-R2	Alignment-REACH2	385.03	PF 10yr	930.00	420.00	421.80		421.86	0.002091	1.98	469.35	265.90	0.26
SAFARI-CCSYA-R2	Alignment-REACH2	295.55	PF 10yr	930.00	420.00	421.62	420.65	421.67	0.002001	1.80	516.05	326.47	0.25
SAFARI-CCSYA-R1	Alignment-REACH1	1700	PF 10yr	190.00	649.83	651.14	651.14	651.57	0.039388	5.27	36.07	42.59	1.01
SAFARI-CCSYA-R1	Alignment-REACH1	1650	PF 10yr	190.00	646.00	649.10		649.31	0.014615	3.71	51.24	48.08	0.63
SAFARI-CCSYA-R1	Alignment-REACH1	1600	PF 10yr	190.00	646.00	648.54	647.81	648.72	0.009384	3.39	56.00	43.05	0.52
SAFARI-CCSYA-R1	Alignment-REACH1	1550	PF 10yr	190.00	645.97	647.37	647.37	647.86	0.037380	5.63	33.74	34.58	1.01
SAFARI-CCSYA-R1	Alignment-REACH1	1500	PF 10yr	190.00	644.00	646.62		646.68	0.002506	1.88	101.07	70.31	0.28
SAFARI-CCSYA-R1	Alignment-REACH1	1450	PF 10yr	190.00	643.99	646.51	645.24	646.57	0.002002	1.86	102.00	61.02	0.25


CCSYA Sections Reach1 and Reach2 Plan: Plan 01 4/19/2017 2:36:05 PM
Geom: Geom 02 Flow: Flow -10yr
SAFARI-CCSYA-R1 Alignment-REACH1
Legend
WS PF 10yr
Ground
Elevation (ft)
652
651
650
649
648
647
646
645
644
643
1450
1500
1550
1600
1650
1700
Main Channel Distance (ft)


CCSYA Sections Reach1 and Reach2 Plan: Plan 01 4/19/2017 2:36:05 PM
Geom: Geom 02 Flow: Flow -10yr
SAFARI-CCSYA-R1 Alignment-REACH1
Legend
Vel Chnl PF 10yr
Vel Left (ft/s), Vel Chnl (ft/s), Vel Right (ft/s)
Main Channel Distance (ft)
0
2
4
6
8
10
12
1500
1600
1700


CCSYA Sections Reach1 and Reach2 Plan: Plan 01 4/19/2017 2:36:05 PM
Geom: Geom 02 Flow: Flow -10yr
SAFARI-CCSYA-R2 Alignment-REACH2
Legend
WS PF 10yr
Ground
Elevation (ft)
Main Channel Distance (ft)
500
490
480
470
460
450
440
430
420
410
400
200
300
400
500
600
700
800
900
295.55
385.03
469.53
620.72
729.66
867.52


CCSYA Sections Reach1 and Reach2 Plan: Plan 01 4/19/2017 2:36:05 PM
Geom: Geom 02 Flow: Flow -10yr
SAFARI-CCSYA-R2 Alignment-REACH2
Legend
Vel Chnl PF 10yr
Vel Left (ft/s), Vel Chnl (ft/s), Vel Right (ft/s)
Main Channel Distance (ft)
0
2
4
6
8
10
12
200
300
400
500
600
700
800
900

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