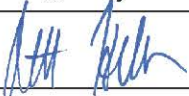


Appendix E: Preliminary WQMP

ENGINEER'S CERTIFICATION
WATER QUALITY MANAGEMENT PLAN

Preparer (Engineer) Certification			
Preparer (Engineer):			
Title	Project Manager	PE Registration #	87299
Company	DRC Engineering, Inc		
Address	160 S. Old Springs Road, Anaheim Hills, CA 92808		
Email	mhellesen@drc-eng.com		
Telephone #	714-685-6860 ext 364		
I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.			
Preparer Signature		Date	02/09/2023
Place Stamp Here			

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter design capture storm depth from Figure III.1, d (inches)	$d=$	0.90	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	$d_{HSC}=$	-	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}=$	.90	inches
Step 2: Calculate the DCV				
1	Enter Project area tributary to BMP (s), A (acres)	$A=$	3.4	acres
2	Enter Project Imperviousness, imp (unitless)	$imp=$	0.92	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C=$	0.84	
4	Calculate runoff volume, $V_{design} = (C \times d_{remainder} \times A \times 43560 \times (1/12))$	$V_{design}=$	9,331	cu-ft
Step 3: Design BMPs to ensure full retention of the DCV				
Step 3a: Determine design infiltration rate				
1	Enter measured infiltration rate, $K_{observed}^1$ (in/hr) (Appendix VII)	$K_{observed}=$		In/hr
2	Enter combined safety factor from Worksheet H, S_{total} (unitless)	$S_{total}=$		
3	Calculate design infiltration rate, $K_{design} = K_{observed} / S_{total}$	$K_{design}=$		In/hr
Step 3b: Determine minimum BMP footprint				
4	Enter drawdown time, T (max 48 hours)	$T=$		Hours
5	Calculate max retention depth that can be drawn down within the drawdown time (feet), $D_{max} = K_{design} \times T \times (1/12)$	$D_{max}=$		feet
6	Calculate minimum area required for BMP (sq-ft), $A_{min} = V_{design} / d_{max}$	$A_{min}=$		sq-ft

¹ $K_{observed}$ is the vertical infiltration measured in the field, before applying a factor of safety. If field testing measures a rate that is different than the vertical infiltration rate (for example, three-dimensional borehole percolation rate), then this rate must be adjusted by an acceptable method (for example, Porchet method) to yield the field estimate of vertical infiltration rate, $K_{observed}$. See Appendix VII.

Preliminary Water Quality Management Plan (WQMP)

Project Name:

1500 S RAYMOND AVENUE

Prepared for:

Rexford Industrial

11620 Wilshire Boulevard, 10th floor

Los Angeles, CA 90024

Prepared by:

DRC Engineering, Inc.

Engineer: Matthew Hellesen

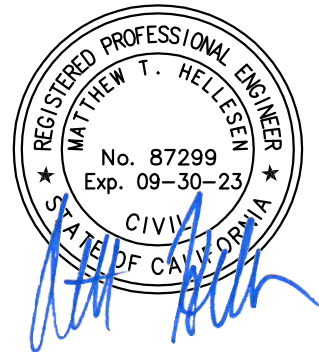
Registration No. 87299

160 S Old Springs Road

Anaheim Hills, CA 92808

(714) 685-6860

October 25, 2022



Water Quality Management Plan (WQMP)
1500 S Raymond Avenue

Project Owner's Certification			
Permit/ Application No.		Grading Permit No.	
Tract/Parcel Map No.		Building Permit No.	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			APN: 267-031-06

This Water Quality Management Plan (WQMP) has been prepared for Rexford Industrial by DRC Engineering, Inc.. The WQMP is intended to comply with the requirements of the local NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner: Brian Garcia			
Title	Director of Construction and Development		
Company	Rexford Industrial		
Address	11620 Wilshire Boulevard, 10 th floor		
Email	bgarcia@Rexfordindustrial.com		
Telephone #	424-440-2565		
Signature	 Digitally signed by Brian Garcia DN: C=US, E=bgarcia@rexfordindustrial.com, O=Rexford Industrial, OU=ODM, CN=Brian Garcia Date: 2022.12.22 16:00:26 -08'00'	12/22/22 Date	

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Section III Site Description	8
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Attachments

Attachment A... ..	Educational Materials
Attachment B.....	BMP Details
Attachment C.....	HCOC Calculations

Section I Discretionary Permit(s) and Water Quality Conditions

Provide discretionary permit and water quality information. *Refer to Section 2.1 in the Technical Guidance Document (TGD) available from the Orange County Stormwater Program (ocwatersheds.com).*

Project Information	
Permit/ Application No.	T.B.D.
Tract/Parcel Map No.	
Additional Information/ Comments:	
Water Quality Conditions	
Water Quality Conditions (list verbatim)	To be filled out once Conditions of Approval are received
Watershed-Based Plan Conditions	
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	N/A

Section II Project Description

II.1 Project Description

Provide a detailed project description including:

- Project areas;
- Land uses;
- Land cover;
- Design elements;
- A general description not broken down by drainage management areas (DMAs).

Include attributes relevant to determining applicable source controls. *Refer to Section 2.2 in the TGD for information that must be included in the project description.*

Description of Proposed Project				
Development Category (Verbatim from WQMP):	New development projects that create 10,000 square feet or more of impervious surface. This category includes commercial, industrial, residential housing subdivisions, mixed-use, and public projects on private or public property that falls under the planning and building authority or the permittees.			
Project Area (ft ²): 314,490	Number of Dwelling Units:	N/A	SIC Code:	4225
Narrative Project Description:	Construction of a 138,500 square foot warehouse building with associated truck & auto parking, drive aisles and landscaping. Project includes truck dock area 4' below finished floor for loading/unloading.			
Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	0.9 acres	12.5%	6.32 acres	87.5%
Post-Project Conditions	1.2 acres	16.6%	6.02 acres	83.4%
Drainage Patterns/Connections	Site currently surface flows to Burton Street and through curb opening catch basins flows to the south and outlets into Carbon Creek. Carbon Creek enters Raymond Retarding Basin and continues to the flow to the east. Carbon Creek converges with Coyote Creek, flows to the south and later converges with the San Gabriel River Estuary before flowing into the Pacific Ocean.			

II.2 Potential Stormwater Pollutants

Determine and list expected stormwater pollutants based on land uses and site activities. *Refer to Section 2.2.2 and Table 2.1 in the TGD for guidance.*

Pollutants of Concern			
Pollutant	Circle One: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid/ Sediment	☒ E	☐ N	On-site landscaping exists
Nutrients	☒ E	☐ N	On-site landscaping exists
Heavy Metals	☐ E	☒ N	No outdoor storage or metal roofs
Pathogens (Bacteria/Virus)	☐ E	☒ N	No food or animal waste products expected.
Pesticides	☒ E	☐ N	On-site landscaping exists
Oil and Grease	☒ E	☐ N	Automobile and truck parking on-site
Toxic Organic Compounds	☒ E	☐ N	
Trash and Debris	☒ E	☐ N	

II.3 Hydrologic Conditions of Concern

Determine if streams located downstream from the project area are determined to be potentially susceptible to hydromodification impacts. Refer to Section 2.2.3.1 in the TGD for **NOC** or Section 2.2.3.2 for **<SOC>**.

☐ No – Show map

☒ Yes – Describe applicable hydrologic conditions of concern below. Refer to Section 2.2.3 in the TGD.

Per Appendix XVI Fig-1, project is located in a potential area of erosion, habitat, and physical structure susceptibility. Carbon Creek has unstable channels downstream of project site. A comparison for the 2-year storm event pre vs post development (unmitigated) was analyzed using Advance Engineering Software (AES) at point of compliance. The results from the analysis are summarized in the table below for peak flow rate, runoff volume and time of concentration.

Unmitigated Flows			
Existing Condition (12.5% pervious)			
Drainage Designation	Q ₂ (CFS)	V ₂ (CF)	Tc ₂ (Min)
DMA – A, A-1, B, B-1, C, C-1	11.62	44,463	9.9
Proposed Condition (16.6% pervious)			
DMA – A1 -A5, B, C	11.54	42,930	9.4
Delta (%)	-0.7%	-3.5%	-5%

Per Section 5.3.1 of the Technical Guidance Document, the following calculations were developed:

1. $(V \text{ 2-year, post} / V \text{ 2-year, pre}) \leq 1.05$

$(42,930 \text{ cf} / 44,463 \text{ cf}) = 0.96 \leq 1.05$

2. $(Tc \text{ 2-year, pre} / Tc \text{ 2-year, post}) \leq 1.05$

$(9.9 \text{ min} / 9.4 \text{ min}) = 1.051 \leq 1.05$

The amount of impervious area is decreased from the existing to the proposed condition.

$$V_2 = C \times d \times A \times 43560 \text{ sf/ac} \times 1/12 \text{ in/ft}$$

V = runoff volume during the design storm event, cu-ft

C = runoff coefficient = $(0.75 \times \text{imp} + 0.15)$

imp = impervious fraction of drainage area (ranges from 0 to 1)

d = storm depth (inches)

A = tributary area (acres)

Existing Volume:

$$V_2 = .80 \times 2.6 \text{ in} \times 7.22 \text{ ac} \times 43560 \text{ sf/ac} \times 1/12 \text{ in/ft}$$

$$V_2 = 54,514 \text{ CF}$$

Proposed Volume:

$$V_2 = .78 \times 2.6 \text{ in} \times 7.22 \text{ ac} \times 43560 \text{ sf/ac} \times 1/12 \text{ in/ft}$$

$$V_2 = 53,151 \text{ CF}$$

II.4 Post Development Drainage Characteristics

Describe post development drainage characteristics. *Refer to Section 2.2.4 in the TGD.*

Post development project will be broken up into four watersheds two consisting of biofiltration units design to treat the treatment flow rate as size per work sheet D and one are consisting of a volume based biofiltration system which utilizes a detention field to store the DVC and then a biofiltration unit to filter the DVC within 48 hrs. Watershed C is a self-treating water shed consisting of 99% landscaping. The watersheds are titled A, B, C & D. High flows from Watershed A will bypass the detention chamber and outflow into the City of Fullerton 30" public RCP flowing to the south under the east of the site. The 30" RCP outlets into Carbon Creek and continues to follow existing conditions to Coyote Creek. Watershed B will overflow out of the proposed drain inlet located at the western driveway of the site after high flows bypass the detention and biofiltration units.. This will follow existing conditions as stormwater currently surface flows out of the existing driveway towards the west of the site.

II.5 Property Ownership/Management

Describe property ownership/management. *Refer to Section 2.2.5 in the TGD.*

The site will be owned and operated by Rexford Industrial. Several easements for public utilities and incidental purposes cross the site.

Section III Site Description

III.1 Physical Setting

Fill out table with relevant information. *Refer to Section 2.3.1 in the TGD.*

Planning Area/ Community Name	Carbon Creek, Coyote Creek, San Gabriel Estuary
Location/ Address	1500 S Raymond Avenue
	Fullerton, CA
Land Use	Warehouse
Zoning	M-P Manufacturing Park
Acreage	7.2
Predominant Soil Type	A

III.2 Site Characteristics

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable. *Refer to Section 2.3.2 in the TGD.*

Precipitation Zone	0.9
Topography	Site is currently a hotel and parking lot. Grades are relatively flat.
Drainage Patterns/Connections	Current site surface drains out to Burton Avenue and into catch basins outletting stormwater into Carbon Creek
Soil Type, Geology, and Infiltration Properties	Site is located in area designated soil Type A. The area south west of the Santa Ana Mountains is generally characterized as a broad complex, alluvial fan, which receives sediments from the Santa Ana River and its tributaries draining the Santa Ana and San Bernardino Mountains. The project is located within the North Basin Groundwater Protection Plume; therefore, Infiltration is not feasible.

Site Characteristics (continued)

<i>Hydrogeologic (Groundwater) Conditions</i>	<i>Groundwater was not encountered during subsurface exploration in 51.5' below ground surface</i>
<i>Geotechnical Conditions (relevant to infiltration)</i>	<i>Two constant head infiltration tests performed yielded infiltration rates of 24.3 in/hr and 110.6 in/hr</i>
<i>Off-Site Drainage</i>	<i>Currently there is no offsite run-on to the site.</i>
<i>Utility and Infrastructure Information</i>	<i>10' sewer easement through the middle of the site along with multiple dry utility easements, 12' storm drain easement at the east of the site,</i>

III.3 Watershed Description

Fill out table with relevant information and include information regarding BMP sizing, suitability, and feasibility, as applicable. *Refer to Section 2.3.3 in the TGD.*

Receiving Waters	Carbon Creek, Coyote Creek, San Gabriel Estuary
303(d) Listed Impairments	Copper (Dissolved), pH, Indicator Beacteria, Toxicity, Malathion, Iron, Nickel, Oxygen (Dissolved), Dioxin
Applicable TMDLs	Copper (Dissolved), Indicator Bacteria
Pollutants of Concern for the Project	Suspended-Solids/Sediment, Nutrients, Pesticides, Oil and Grease, Toxic Organic Compounds, Trash and Debris
Environmentally Sensitive and Special Biological Significant Areas	n/a

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

Describe project performance criteria. Several steps must be followed in order to determine what performance criteria will apply to a project. These steps include:

- If the project has an approved WIHMP or equivalent, then any watershed specific criteria must be used and the project can evaluate participation in the approved regional or sub-regional opportunities. The local Permittee planning or NPDES staff should be consulted regarding the existence of an approved WIHMP or equivalent.
- Determine applicable hydromodification control performance criteria. *Refer to Section 7.II-2.4.2.2 of the Model WQMP.*
- Determine applicable LID performance criteria. *Refer to Section 7.II-2.4.3 of the Model WQMP.*
- Determine applicable treatment control BMP performance criteria. *Refer to Section 7.II-3.2.2 of the Model WQMP.*
- Calculate the LID design storm capture volume for the project. *Refer to Section 7.II-2.4.3 of the Model WQMP.*

(NOC Permit Area only) Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?		YES ☐	NO ☒
If yes, describe WIHMP feasibility criteria or regional/sub-regional LID opportunities.			

Project Performance Criteria (continued)

If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)	• Post-development runoff volume for the two-year frequency storm does not exceed that of the predevelopment condition by more than five percent and • Time of concentration of post-development runoff for the two-year storm event is not less than that for the predevelopment condition by more than five percent.
List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)	Priority Projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85 th percentile, 24-hour storm event (Design Capture Volume)
List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)	Biotreatment – Modular Wetland Units
Calculate LID design storm capture volume for Project.	• Area A: 9,331 cubic feet • Area B: 0.32 cfs • Area C: Self Treating • Area D: 0.38 cfs

IV.2. SITE DESIGN AND DRAINAGE PLAN

Proposed site was divided into 4 main watersheds two (Areas B & D) are being treated via flow rate biotreatment with modular wetlands units. Area A is being detained by HDPE pipe located underneath drive aisle areas and treated by modular wetland units prior to being discharged into the public storm drain system. The fourth area (Area C) is a self-treating area that is comprised of 0.5 AC of landscaping. There is 420 SF of driveway located within Area C that will drain to Burton Street without being treated.

Area A consists of 3.4 acres with drainage surface flowing to inlets connected to an underground storm drain system. The storm drain flows to detention system A and then to modular wetland A, upon reaching the maximum height in the detention system, storm water will overflow into the existing 27" RCP located at the east of the site. Once leaving the modular wetland system the storm water will be pumped up and gravity flow into the existing 27" public storm drain pipe to the east.

Area B consists of 1.6 acres with drainage surface flowing to inlets connected to an underground storm drain system. The storm drain flows to modular wetland B, upon reach maximum capacity of the modular wetland system, storm water will outflow of the drain inlet located near the west driveway. Storm water leaving the modular wetland system will be pumped up then gravity flow out a parkway drain located in Burton Street. Stormwater will then follow existing conditions and surface flow to the existing catch basin on Burton Street.

Area D is 1.7 AC and will use a modular wetland unit to treat the required flow rate of storm water that was sized using worksheet D. Storm water will be collected via the inlet located at the eastern driveway, roof drain runoff will be directed through curb face and will be collected by the same inlet. The inlet will route storm water to the modular wetland unit. Storm water exiting the Modular wetland system will gravity flow to the 27" public storm drain line located on the east side of the property. Overflow from area D will work its way out the driveway located on the east side of the property. All storm water will outlet into Carbon Creek downstream.

Drain inlets within the site will feature Kristar Filter inserts for pretreatment and will be marked with storm drain signage to limit dumping into the storm drain. Landscaping will feature efficient irrigation with common area litter control implemented after construction.

See WQMP Plot Plan on following page for further information.

2 year storm values were calculated using AES utilizing the rational method. The existing and proposed conditions are listed below:

Existing: 11.62 cfs

Proposed: 11.68 cfs

2 year storm values for time of concentration also calculated by AES are listed below:

Existing: 9.9 min.

Proposed: 9.4 min

In both cases there is a negligible difference (<5.0%) between existing and proposed conditions. Calculations can be found in Appendix C.

IV.3 LID BMP SELECTION AND PROJECT CONFORMANCE ANALYSIS

Each sub-section below documents that the proposed design features conform to the applicable project performance criteria via check boxes, tables, calculations, narratives, and/or references to worksheets. *Refer to Section 2.4.2.3 in the TGD for selecting LID BMPs and Section 2.4.3 in the TGD for conducting conformance analysis with project performance criteria.*

IV.3.1 Hydrologic Source Controls

If required HSCs are included, fill out applicable check box forms. If the retention criteria are otherwise met with other LID BMPs, include a statement indicating HSCs not required.

Name	Included?
Localized on-lot infiltration	☐
Impervious area dispersion (e.g. roof top disconnection)	☐
Street trees (canopy interception)	☐
Residential rain barrels (not actively managed)	☐
Green roofs/Brown roofs	☐
Blue roofs	☐
Impervious area reduction (e.g. permeable pavers, site design)	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐
Other:	☐

IV.3.2 Infiltration BMPs

Identify infiltration BMPs to be used in project. If design volume cannot be met state why BMPs cannot be met

Name	Included?
Bioretention without underdrains	☐
Rain gardens	☐
Porous landscaping	☐
Infiltration planters	☐
Retention swales	☐
Infiltration trenches	☐
Infiltration basins	☐
Drywells	☐
Subsurface infiltration galleries	☐
French drains	☐
Permeable asphalt	☐
Permeable concrete	☐
Permeable concrete pavers	☐
Other:	☐
Other:	☐

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with infiltration BMPs. If not document how much can be met with infiltration and document why it is not feasible to meet the full volume with infiltration BMPs.

The project is located within the North Basin Groundwater Protection Plume; therefore, per the OC Technical Guidance Document (TGD) section 2.4.2.4, infiltration is prohibited where a groundwater pollutant plume is under the site or in close proximity.

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

If the full Design Storm Capture Volume cannot be met with infiltration BMPs, describe any evapotranspiration, rainwater harvesting BMPs.

Name	Included?
All HSCs; <i>See Section IV.3.1</i>	☐
Surface-based infiltration BMPs	☐
Biotreatment BMPs	☐
Above-ground cisterns and basins	☐
Underground detention	☐
Other:	☐
Other:	☐
Other:	☐

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with evapotranspiration, rainwater harvesting BMPs in combination with infiltration BMPs. If not document how much can be met with either infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with either of these BMPs categories.

Per worksheet J, harvest and reuse is not feasible for our site due to the ratio of landscaping to impervious tributary area. Please see work sheet J in Attachment C.

Table X.8: Minimum Irrigated Area for Potential Partial Capture Feasibility

General Landscape Type	Conservation Design: $K_L = 0.35$			Active Turf Areas: $K_L = 0.7$		
<i>Closest ET Station</i>	<i>Irvine</i>	<i>Santa Ana</i>	<i>Laguna</i>	<i>Irvine</i>	<i>Santa Ana</i>	<i>Laguna</i>
Design Capture Storm Depth, inches	Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture, ac/ac					
0.60	0.66	0.68	0.72	0.33	0.34	0.36
0.65	0.72	0.73	0.78	0.36	0.37	0.39
0.70	0.77	0.79	0.84	0.39	0.39	0.42
0.75	0.83	0.84	0.90	0.41	0.42	0.45
0.80	0.88	0.90	0.96	0.44	0.45	0.48
0.85	0.93	0.95	1.02	0.47	0.48	0.51
0.90	0.99	1.01	1.08	0.49	0.51	0.54
0.95	1.04	1.07	1.14	0.52	0.53	0.57
1.00	1.10	1.12	1.20	0.55	0.56	0.60

Worksheet J: Summary of Harvested Water Demand and Feasibility

1	What demands for harvested water exist in the tributary area (check all that apply):			
2	Toilet and urinal flushing		☐	
3	Landscape irrigation		☒	
4	Other: _____		☐	
5	What is the design capture storm depth? (Figure III.1)	d	0.90	inches
6	What is the project size?	A	7.22	ac
7	What is the acreage of impervious area?	IA	6.02	ac
For projects with multiple types of demand (toilet flushing, indoor demand, and/or other demand)				
8	What is the minimum use required for partial capture? (Table X.6)		730	gpd
9	What is the project estimated wet season total daily use?		n/a	gpd
10	Is partial capture potentially feasible? (Line 9 > Line 8?)		No	
For projects with only toilet flushing demand				
11	What is the minimum TUTIA for partial capture? (Table X.7)		186	
12	What is the project estimated TUTIA?		n/a	

Worksheet J: Summary of Harvested Water Demand and Feasibility

13	Is partial capture potentially feasible? (Line 12 > Line 11?)	No	
For projects with only irrigation demand			
14	What is the minimum irrigation area required based on conservation landscape design? (Table X.8)	6.06	ac
15	What is the proposed project irrigated area? (multiply conservation landscaping by 1; multiply active turf by 2)	1.2	ac
16	Is partial capture potentially feasible? (Line 15 > Line 14?)	No	
Provide supporting assumptions and citations for controlling demand calculation:			

IV.3.4 Biotreatment BMPs

If the full Design Storm Capture Volume cannot be met with infiltration BMPs, and/or evapotranspiration and rainwater harvesting BMPs, describe biotreatment BMPs. Include sections for selection, suitability, sizing, and infeasibility, as applicable.

Name	Included?
Bioretention with underdrains	☐
Stormwater planter boxes with underdrains	☐
Rain gardens with underdrains	☐
Constructed wetlands	☐
Vegetated swales	☐
Vegetated filter strips	☐
Proprietary vegetated biotreatment systems	☒
Wet extended detention basin	☐
Dry extended detention basins	☐
Other:	☐
Other:	☐

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with infiltration, evapotranspiration, rainwater harvesting and/or biotreatment BMPs. If not document how much can be met with either infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with either of these BMPs categories.

Our Site will utilize biofiltration as a BMP. Worksheet B was used to calculate the dcv for Area A. Area a will implement a combination of detention pipes and modular wetland unit to capture and treat the required DCV. Area B & D will utilize the flowrate treatment size with work sheet D.

- Area A: 9,331 cubic feet. Per the manufacturer's specifications, the MWS Unit for this area is designed to draw down the 9,331 CF in 31 hrs.
- Area B: 0.32 cfs No volume is being stored that necessitates drawing down.
- Area D: 0.38 cfs No volume is being stored that necessitates drawing down.

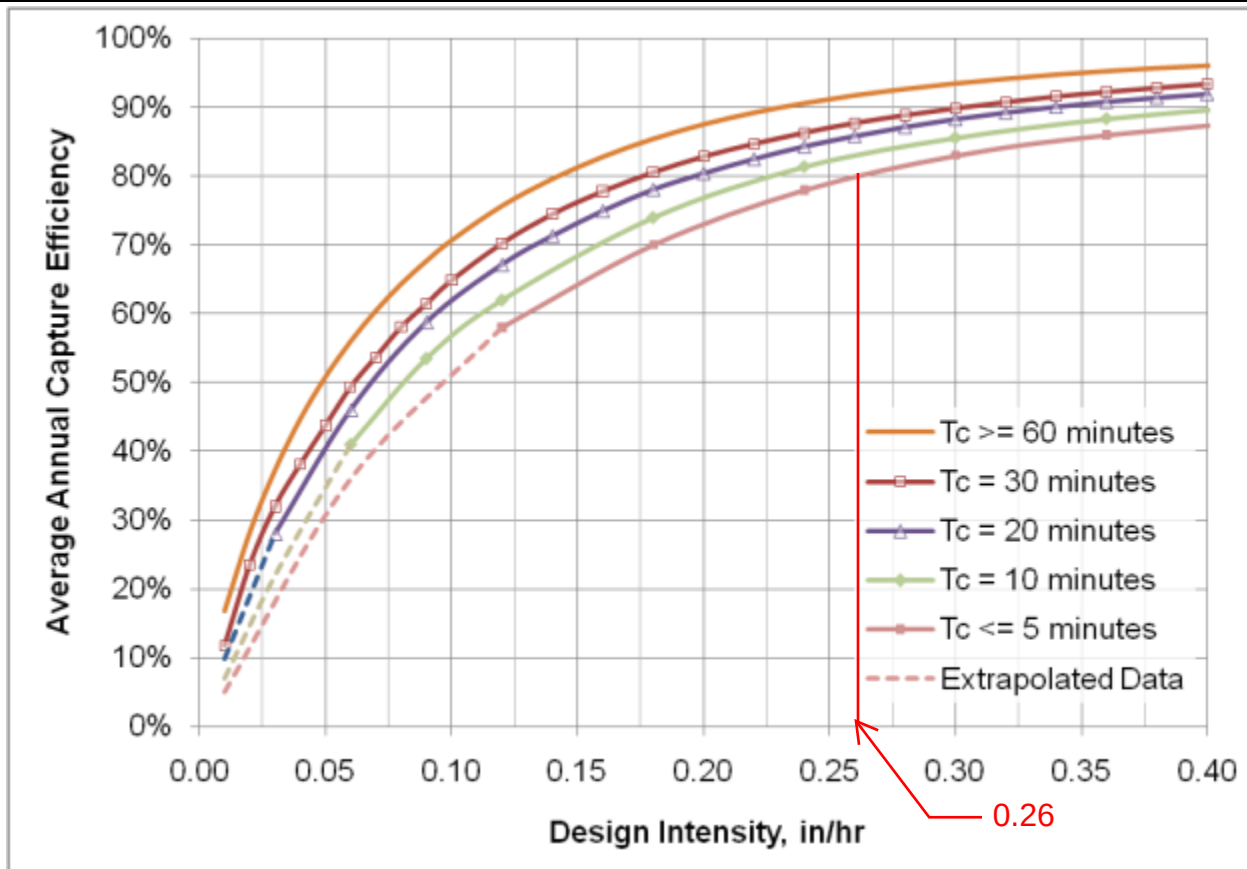
Please see copies of the worksheets in attachment B

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	$T_c =$	5	
2	Using Figure III.4 , determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	$I_1 =$	0.26	in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$	0	inches
4	Enter capture efficiency corresponding to d_{HSC} , Y_2 (Worksheet A)	$Y_2 =$	0	%
5	Using Figure III.4 , determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	$I_2 =$	0	
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	$I_{design} =$	0.26	
Step 2: Calculate the design flowrate				
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	1.6	acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$	.82	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	.76	
4	Calculate design flowrate, $Q_{design} = (C \times I_{design} \times A)$	$Q_{design} =$	.32	cfs
Supporting Calculations				
Describe system:				
This area is to be served by a MWS 8x12 box that has a 0.346 cfs treatment capacity				
Provide time of concentration assumptions:				
Assumed a 5 min TC which is the most conservative design.				

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Graphical Operations



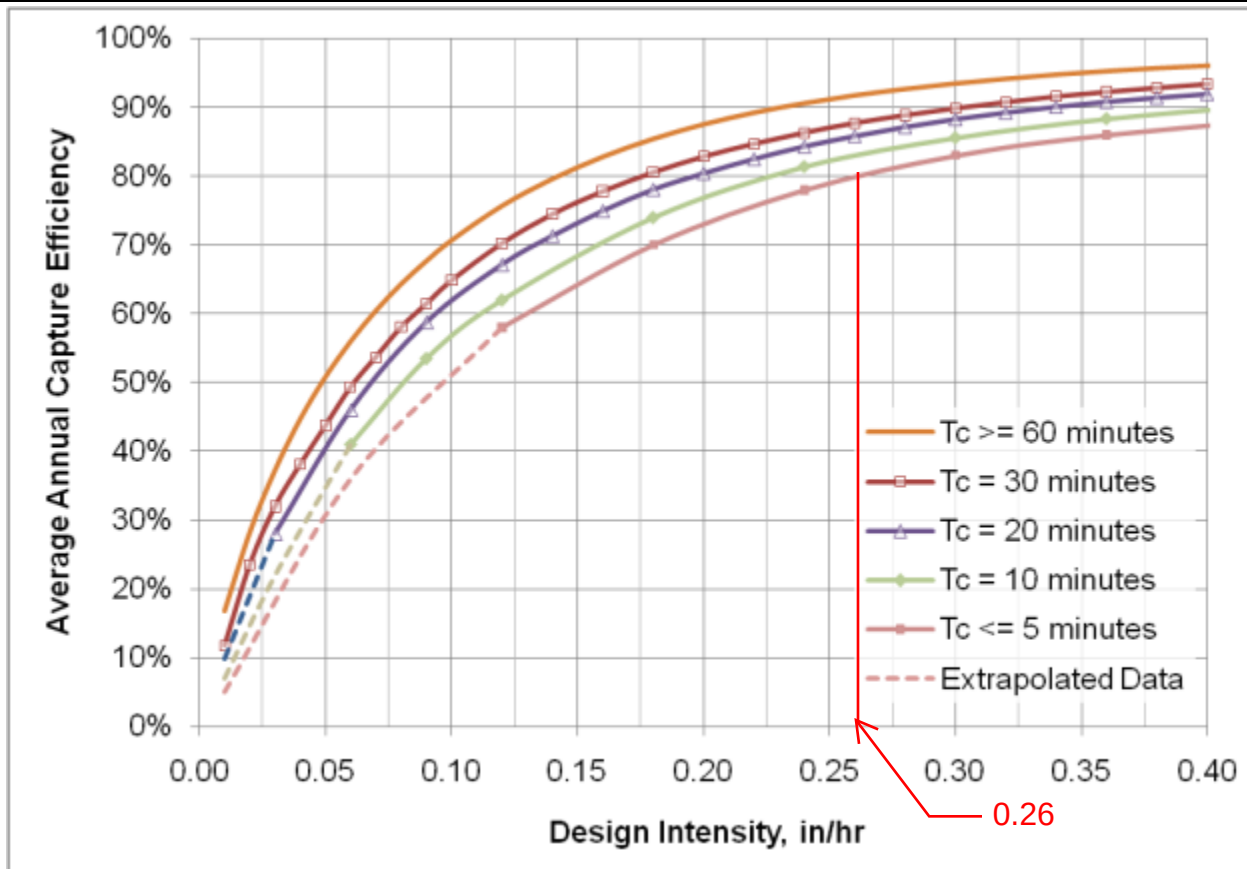
Provide supporting graphical operations. See Example [III.7](#).

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	$T_c =$	5	
2	Using Figure III.4 , determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	$I_1 =$	0.26	in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$	0	inches
4	Enter capture efficiency corresponding to d_{HSC} , Y_2 (Worksheet A)	$Y_2 =$	0	%
5	Using Figure III.4 , determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	$I_2 =$	0	
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	$I_{design} =$	0.26	
Step 2: Calculate the design flowrate				
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	1.7	acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$	.95	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	.86	
4	Calculate design flowrate, $Q_{design} = (C \times I_{design} \times A)$	$Q_{design} =$	.38	cfs
Supporting Calculations				
Describe system:				
This area is to be served by a MWS 8x16 box that has a 0.462 cfs treatment capacity				
Provide time of concentration assumptions:				
Assumed a 5 min TC which is the most conservative design.				

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Graphical Operations



Provide supporting graphical operations. See Example [III.7](#).

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.



Model #	Dimensions	WetlandMEDIA Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-6	4' x 6'	32 sq. ft.	0.073
MWS-L-4-8	4' x 8'	50 sq. ft.	0.115
MWS-L-4-13	4' x 13'	63 sq. ft.	0.144
MWS-L-4-15	4' x 15'	76 sq. ft.	0.175
MWS-L-4-17	4' x 17'	90 sq. ft.	0.206
MWS-L-4-19	4' x 19'	103 sq. ft.	0.237
MWS-L-4-21	4' x 21'	117 sq. ft.	0.268
MWS-L-6-8	7' x 9'	64 sq. ft.	0.147
MWS-L-8-8	8' x 8'	100 sq. ft.	0.230
MWS-L-8-12	8' x 12'	151 sq. ft.	0.346
MWS-L-8-16	8' x 16'	201 sq. ft.	0.462
MWS-L-8-20	9' x 21'	252 sq. ft.	0.577
MWS-L-8-24	9' x 25'	302 sq. ft.	0.693



Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-6-8	3191	6382
MWS-L-8-8	5036	10073
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145
MWS-L-8-20	12560	25120
MWS-L-8-24	15108	30216

IV.3.5 Hydromodification Control BMPs

Describe hydromodification control BMPs. See Section 5 TGD. Include sections for selection, suitability, sizing, and infeasibility, as applicable. Detail compliance with Prior Conditions of Approval.

Hydromodification Control BMPs	
BMP Name	BMP Description

IV.3.6 Regional/Sub-Regional LID BMPs

Describe regional/sub-regional LID BMPs in which the project will participate. *Refer to Section 7.II-2.4.3.2 of the Model WQMP.*

Regional/Sub-Regional LID BMPs

IV.3.7 Treatment Control BMPs

Treatment control BMPs can only be considered if the project conformance analysis indicates that it is not feasible to retain the full design capture volume with LID BMPs. Describe treatment control BMPs including sections for selection, sizing, and infeasibility, as applicable.

Treatment Control BMPs	
BMP Name	BMP Description
Kristar FloGard Plus	Filter insert for each catch basin/ drop inlet

IV.3.8 Non-structural Source Control BMPs

Fill out non-structural source control check box forms or provide a brief narrative explaining if non-structural source controls were not used.

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Hazardous materials will not be used, handled, or stored on this site.
N6	Local Industrial Permit Compliance	☐	☒	This BMPT is not applicable. The City of Fullerton does not issue water quality permits.
N7	Spill Contingency Plan	☒	☐	
N8	Underground Storage Tank Compliance	☒	☐	
N9	Hazardous Materials Disclosure Compliance	☐	☒	Hazardous materials will not be used, handled, or stored on this site.
N10	Uniform Fire Code Implementation	☐	☒	Hazardous materials will not be used, handled, or stored on this site.
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☒	☐	
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	Not a gas station

Worksheet B: Simple Design Capture Volume Sizing Method

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter design capture storm depth from Figure III.1, d (inches)	$d=$	0.90	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	$d_{HSC}=$	-	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}=$	.90	inches
Step 2: Calculate the DCV				
1	Enter Project area tributary to BMP (s), A (acres)	$A=$	3.4	acres
2	Enter Project Imperviousness, imp (unitless)	$imp=$	0.92	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C=$	0.84	
4	Calculate runoff volume, $V_{design} = (C \times d_{remainder} \times A \times 43560 \times (1/12))$	$V_{design}=$	9,331	cu-ft
Step 3: Design BMPs to ensure full retention of the DCV				
Step 3a: Determine design infiltration rate				
1	Enter measured infiltration rate, $K_{observed}^1$ (in/hr) (Appendix VII)	$K_{observed}=$		In/hr
2	Enter combined safety factor from Worksheet H, S_{total} (unitless)	$S_{total}=$		
3	Calculate design infiltration rate, $K_{design} = K_{observed} / S_{total}$	$K_{design}=$		In/hr
Step 3b: Determine minimum BMP footprint				
4	Enter drawdown time, T (max 48 hours)	$T=$		Hours
5	Calculate max retention depth that can be drawn down within the drawdown time (feet), $D_{max} = K_{design} \times T \times (1/12)$	$D_{max}=$		feet
6	Calculate minimum area required for BMP (sq-ft), $A_{min} = V_{design} / d_{max}$	$A_{min}=$		sq-ft

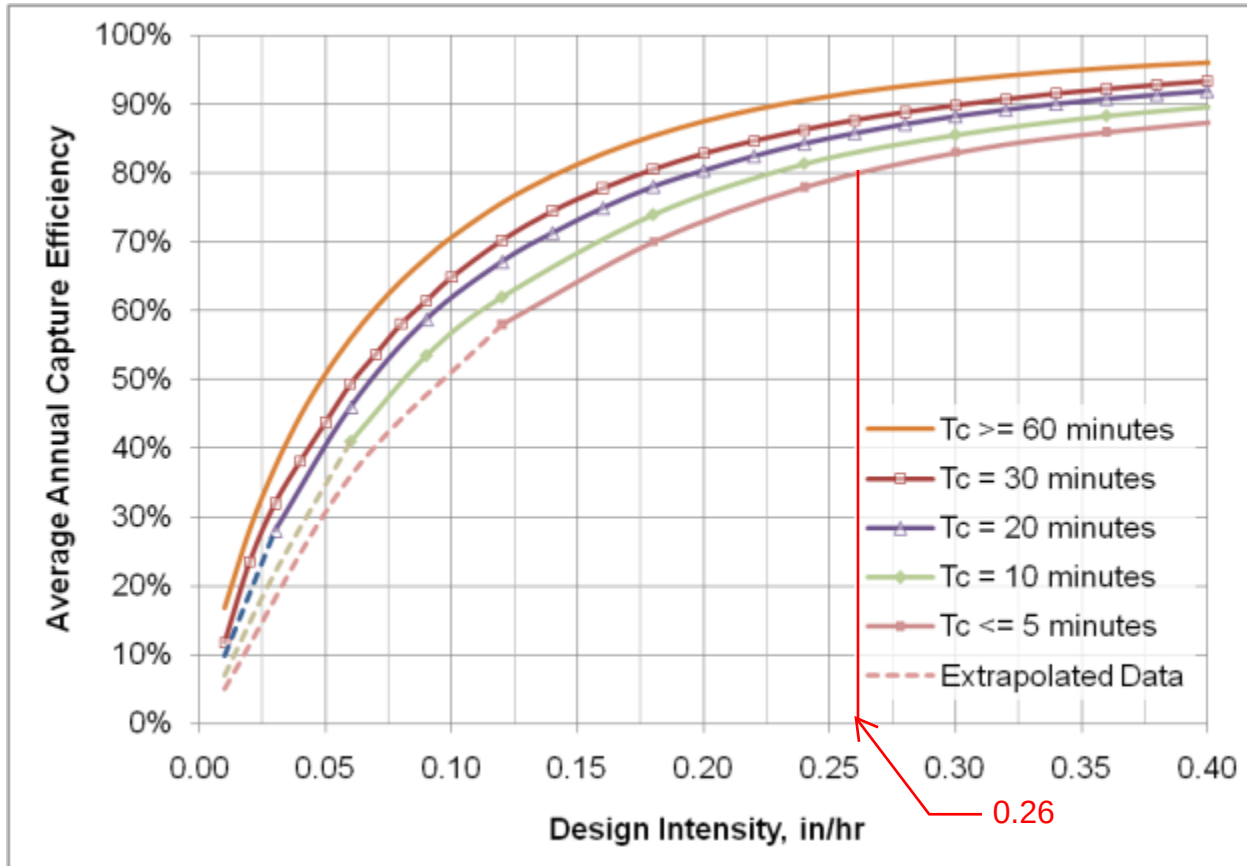
¹ $K_{observed}$ is the vertical infiltration measured in the field, before applying a factor of safety. If field testing measures a rate that is different than the vertical infiltration rate (for example, three-dimensional borehole percolation rate), then this rate must be adjusted by an acceptable method (for example, Porchet method) to yield the field estimate of vertical infiltration rate, $K_{observed}$. See Appendix VII.

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	$T_c =$	5	
2	Using Figure III.4 , determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	$I_1 =$	0.26	in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$	0	inches
4	Enter capture efficiency corresponding to d_{HSC} , Y_2 (Worksheet A)	$Y_2 =$	0	%
5	Using Figure III.4 , determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	$I_2 =$	0	
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	$I_{design} =$	0.26	
Step 2: Calculate the design flowrate				
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	1.6	acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$	.82	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	.76	
4	Calculate design flowrate, $Q_{design} = (C \times I_{design} \times A)$	$Q_{design} =$	.32	cfs
Supporting Calculations				
Describe system:				
This area is to be served by a MWS 8x12 box that has a 0.346 cfs treatment capacity				
Provide time of concentration assumptions:				
Assumed a 5 min TC which is the most conservative design.				

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Graphical Operations



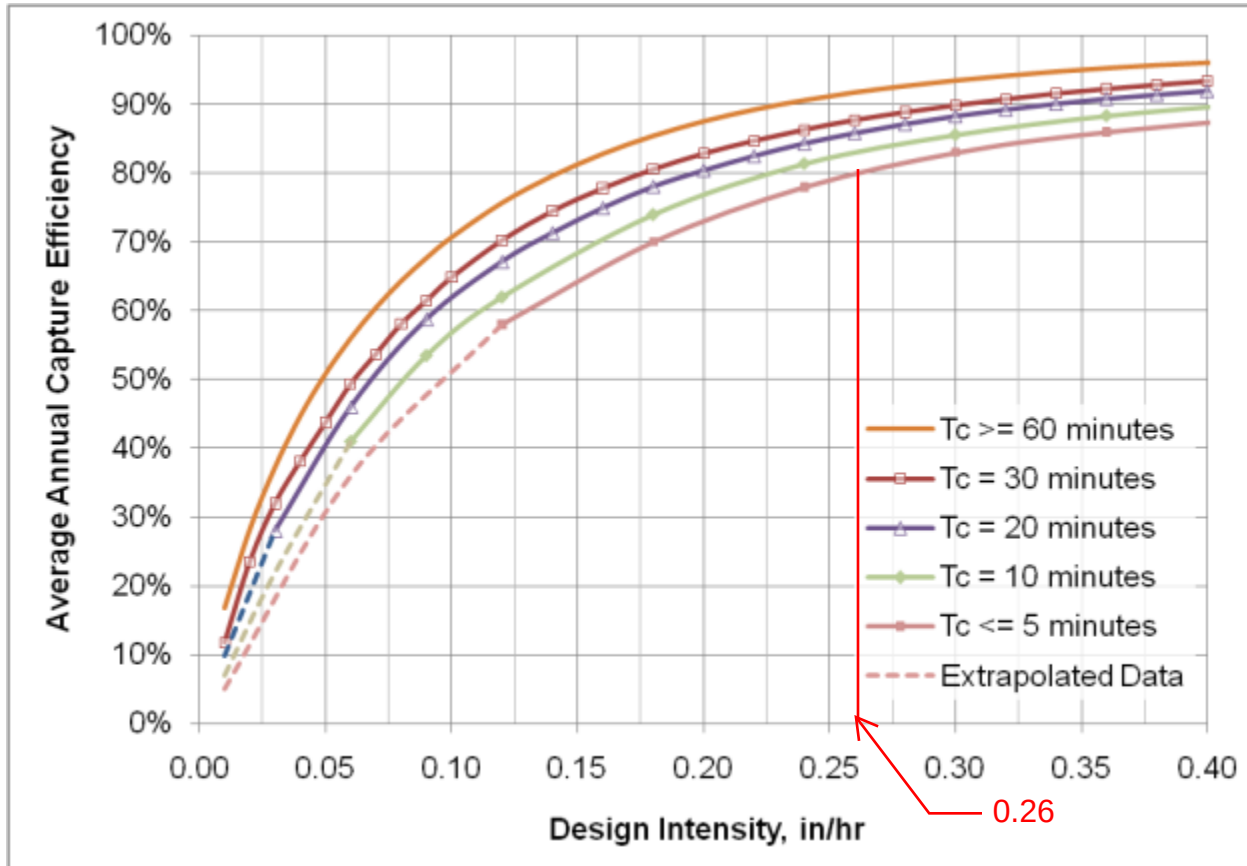
Provide supporting graphical operations. See Example [III.7](#).

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	$T_c =$	5	
2	Using Figure III.4 , determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	$I_1 =$	0.26	in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$	0	inches
4	Enter capture efficiency corresponding to d_{HSC} , Y_2 (Worksheet A)	$Y_2 =$	0	%
5	Using Figure III.4 , determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	$I_2 =$	0	
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	$I_{design} =$	0.26	
Step 2: Calculate the design flowrate				
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	1.7	acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$	.95	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	.86	
4	Calculate design flowrate, $Q_{design} = (C \times I_{design} \times A)$	$Q_{design} =$	.38	cfs
Supporting Calculations				
Describe system:				
This area is to be served by a MWS 8x16 box that has a 0.462 cfs treatment capacity				
Provide time of concentration assumptions:				
Assumed a 5 min TC which is the most conservative design.				

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Graphical Operations



Provide supporting graphical operations. See Example [III.7](#).

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.



Model #	Dimensions	WetlandMEDIA Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-6	4' x 6'	32 sq. ft.	0.073
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MWS-L-4-13	4' x 13'	63 sq. ft.	0.144
MWS-L-4-15	4' x 15'	76 sq. ft.	0.175
MWS-L-4-17	4' x 17'	90 sq. ft.	0.206
MWS-L-4-19	4' x 19'	103 sq. ft.	0.237
MWS-L-4-21	4' x 21'	117 sq. ft.	0.268
MWS-L-6-8	7' x 9'	64 sq. ft.	0.147
MWS-L-8-8	8' x 8'	100 sq. ft.	0.230
MWS-L-8-12	8' x 12'	151 sq. ft.	0.346
MWS-L-8-16	8' x 16'	201 sq. ft.	0.462
MWS-L-8-20	9' x 21'	252 sq. ft.	0.577
MWS-L-8-24	9' x 25'	302 sq. ft.	0.693



Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-6-8	3191	6382
MWS-L-8-8	5036	10073
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145
MWS-L-8-20	12560	25120
MWS-L-8-24	15108	30216

IV.3.9 Structural Source Control BMPs

Fill out structural source control check box forms or provide a brief narrative explaining if Structural source controls were not used.

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor material storage areas.
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☐	☒	No slopes or channels on-site
S6	Dock areas	☒	☐	
S7	Maintenance bays	☐	☒	No maintenance bays on-site
S8	Vehicle wash areas	☐	☒	No vehicle wash areas on-site
S9	Outdoor processing areas	☐	☒	No outdoor processing areas
S10	Equipment wash areas	☐	☒	No equipment wash areas
S11	Fueling areas	☐	☒	No fueling areas
S12	Hillside landscaping	☐	☒	No hillsides on site
S13	Wash water control for food preparation areas	☐	☒	No food preparation areas on-site
S14	Community car wash racks	☐	☒	No car washing on-site

IV.4 ALTERNATIVE COMPLIANCE PLAN (IF APPLICABLE)

IV.4.1 Water Quality Credits

Determine if water quality credits are applicable for the project. *Refer to Section 3.1 of the Model WQMP for description of credits and Appendix VI of the TGD for calculation methods for applying water quality credits.*

Description of Proposed Project				
Project Types that Qualify for Water Quality Credits (Select all that apply):				
☐ Redevelopment projects that reduce the overall impervious footprint of the project site.	☐ Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.		☐ Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).	
☐ Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).		☐ Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned		☐ Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).
☐ Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	☐ Developments in a city center area.	☐ Developments in historic districts or historic preservation areas.	☐ Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	☐ In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.
Calculation of Water Quality Credits (if applicable)				

IV.4.2 Alternative Compliance Plan Information

Describe an alternative compliance plan (if applicable). Include alternative compliance obligations (i.e., gallons, pounds) and describe proposed alternative compliance measures. *Refer to Section 7.II 3.0 in the WQMP.*

Section V Inspection/Maintenance Responsibility for BMPs

Fill out information in table below. Prepare and attach an Operation and Maintenance Plan. Identify the mechanism through which BMPs will be maintained. Inspection and maintenance records must be kept for a minimum of five years for inspection by the regulatory agencies. *Refer to Section 7.II 4.0 in the Model WQMP.*

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N1/N12 Education of Property Owners, Tenants and Occupants/Employee Training	Rexford Industrial	Education of employees/owner(s) shall be done within 4 weeks of startup and continue on an annual refreshing basis with each new onsite employee/owner(s) being given a water quality orientation using this WQMP as reference within two weeks of hire date. Education of current employees shall be done within 4 weeks of startup with each new onsite employee being given a water quality orientation using this WQMP as reference within two weeks of hire date.	Ongoing. Ensure all employees are adhering to the activity restrictions and are not engaged in activities that can have a negative impact on storm water. Refresh instructions given on an annual basis.
N2 Activity Restrictions	Rexford Industrial	There shall be no discharges of fertilizer, pesticides, or wastes to streets or storm drains. There shall be no blowing or sweeping of debris into storm drain. All debris shall be collected and relocated to an approved landfill. In addition, onsite activities shall be limited to the requirements of this WQMP as described herein.	Daily. Ensure all employees are adhering to the activity restrictions and are not engaged in activities that can have a negative impact on storm water.
N3 Common Area Landscape Management	Rexford Industrial	Landscape maintenance will consist of trimming and replanting of vegetation, repair and maintenance of irrigation systems, and appropriate use of fertilizers and pesticides.	Landscape maintenance shall be performed on a weekly basis. Irrigation systems shall be inspected weekly for leaks. Leaks shall be repaired as soon as they are observed.

N4 BMP Maintenance	Rexford Industrial	The proposed treatment BMPs will be maintained as outlined in Appendix D of this report.	As outlined in Appendix D of this report.
N7 Spill Contingency Plan	Rexford Industrial	The owner and tenant shall inspect for completeness, replace materials as needed and keep a log with the spill kit to record date of inspection and steps taken at inspection.	Spill kit shall be inspected on a quarterly basis and materials shall be replaced as required to maintain complete kit and after every use.
N11 Common Area Litter Control	Rexford Industrial	The owner will contract with a maintenance firm to provide weekly landscape maintenance that will include litter removal and picking up grass and plant clippings. During routine maintenance all trash and debris will be picked up and placed in waste receptacles. All receptacles shall have lids that will be kept closed at all times.	Weekly.
N14 Common area Catch Basin Inspection	Rexford Industrial	Inspect area in around catch basin for trash/debris and clean when debris is present.	Once prior to the rainy season (by Oct. 1st) and every four months thereafter.
N15 Street Sweeping Private Streets and Parking Lots	Rexford Industrial	Access roads and drive aisles shall be swept on a regular basis to remove debris.	Weekly to remove debris in drive aisle/access roads or more frequently as needed. Areas with less traffic to be done a minimum of once a month.
S1 Storm drain stencil and signage	Rexford Industrial	Inspect for legibility and re-stencil when needed.	Annually.
S4 Efficient Irrigation	Rexford Industrial	Inspect irrigation equipment. Check water sensors and adjust irrigation heads and timing monthly.	Monthly.

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Kristar Fossil Filter Inserts (inlet)	Rexford Industrial	Inspect filter and replace per manufacturer's (Kristar) recommendations found in Attachment A)	Per manufacturer's (Kristar) recommendations found in Attachment A.
Modular Wetland Units	Rexford Industrial	Follow O & M guide as provided and required by the manufacturer.	Per manufacturer's (MWS) recommendations found in Attachment A.
Subsurface detention galleries (solid wall pipe"	Rexford Industrial	Inspect before and after rainy season for trash/debris in system inlet & outlet and clean as necessary per manufacturer's recommendations.	Once every six (6) months. See Attachment A.

Section VI Site Plan and Drainage Plan

VI.1 SITE PLAN AND DRAINAGE PLAN

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural BMP locations
- Drainage delineations and flow information
- Drainage connections
- BMP details

LEGEND:

- LANDSCAPE AREA
- DRAINAGE BOUNDARY/
LIMITS OF GRADING
- DIRECTION OF FLOW
- A
34

DRAINAGE AREA NAME
DRAINAGE AREA SIZE (ACRES)

BMP NOTES:

BMP	DESCRIPTION	DETAILS FOUND AT:
1	EFFICIENT IRRIGATION	LANDSCAPING PLANS
2	48"Ø PIPE DETENTION SYSTEM	UTILITY PLAN
3	STORM DRAIN SIGNAGE (SD-13)	UTILITY PLAN
4	GRATE INLET W/KRISTAR FILTER INSERT	UTILITY PLAN
5	COMMON AREA LITTER CONTROL/TRASH RECEPTACLES WITH LIDS.	LANDSCAPING PLANS
6	MODULAR WETLAND SYSTEM	UTILITY PLAN

DETENTION SYSTEM DET-A		MODULAR WETLAND SYSTEM MWS-A	
REQUIRED DESIGN CAPTURE VOLUME (DCV)	9,331 CF	REQUIRED DESIGN CAPTURE VOLUME (DCV)	9,331 CF
DETENTION VOLUME PROVIDED	10,180 CF	MAX DISCHARGE RATE	0.08 CFS
		DRAW DOWN TIME	31 HRS

MODULAR WETLAND SYSTEM MWS-B		MODULAR WETLAND SYSTEM MWS-D	
TREATMENT FLOW RATE	0.32 CFS	TREATMENT FLOW RATE	0.38 CFS
TREATMENT FLOW RATE PROVIDED	0.32 CFS	TREATMENT FLOW RATE PROVIDED	0.38 CFS



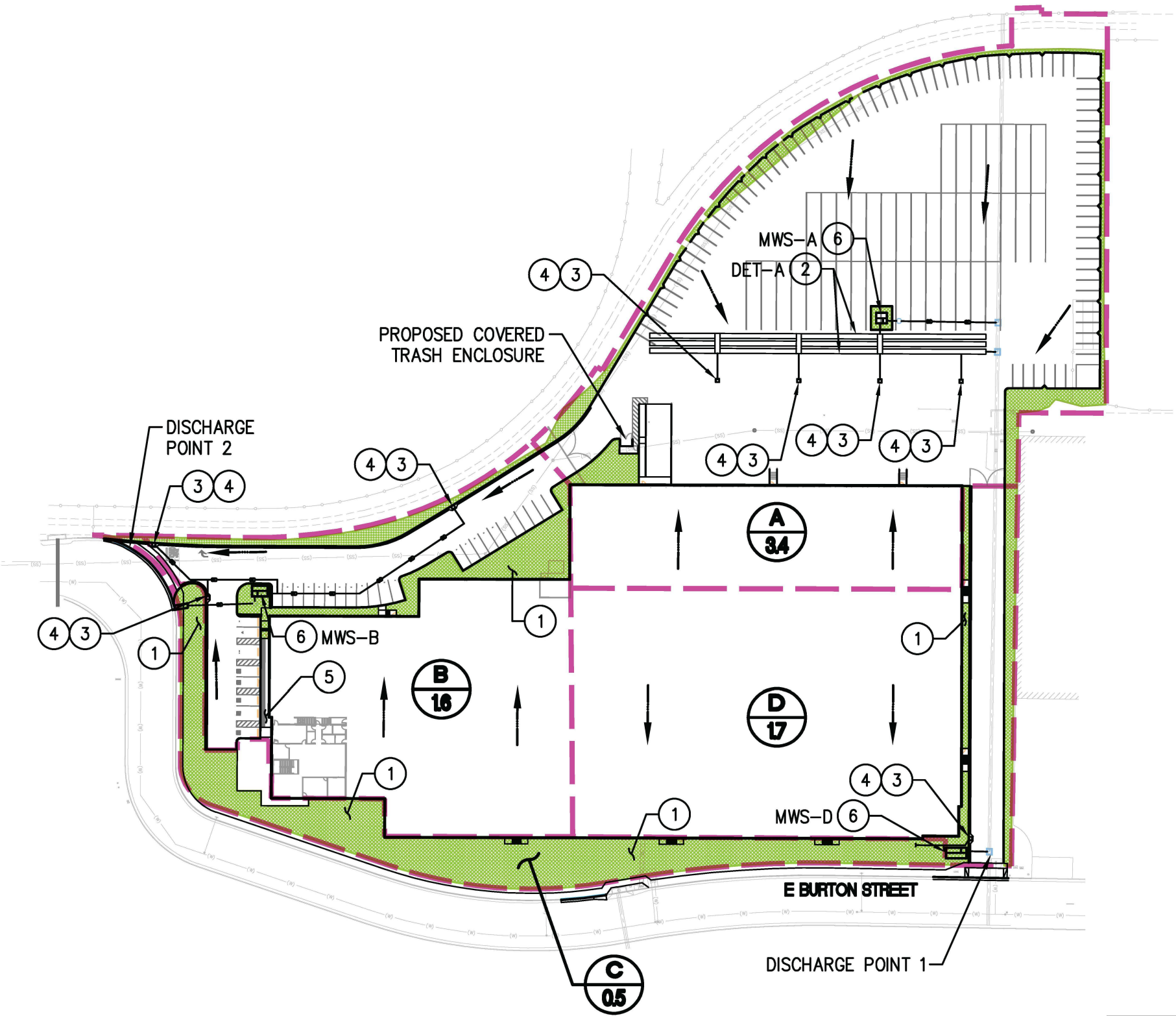
SCALE: 1"=100'

1500 S RAYMOND AVENUE
WQMP PLOT PLAN
FULLERTON, CA

ORC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning

160 S. Old Springs Road, Ste. 210
Anaheim Hills, California 92808
(714) 685-6860

TOTAL DISTURBED AREA = 7.2 AC



Section VII Educational Materials

Refer to the Orange County Stormwater Program (ocwatersheds.com) for a library of materials available. For the copy submitted to the Permittee, only attach the educational materials specifically applicable to the project. Other materials specific to the project may be included as well and must be attached.

Education Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	☐	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☐
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☐
Homeowners Guide for Sustainable Water Use	☐	Proper Maintenance Practices for Your Business	☐
Household Tips	☐	Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste	☐		
Recycle at Your Local Used Oil Collection Center (North County)	☐		☐
Tips for Maintaining a Septic Tank System	☐		☐
Responsible Pest Control	☐		☐
Sewer Spill	☐		☐
Tips for the Home Improvement Projects	☐		☐
Tips for Horse Care	☐		☐
Tips for Landscaping and Gardening	☐		☐
Tips for Pet Care	☐		☐
Tips for Pool Maintenance	☐		☐
Tips for Residential Pool, Landscape and Hardscape Drains	☐		☐
Tips for Projects Using Paint	☐		☐

Attachment A - Educational Materials

Attachment B – BMP Details

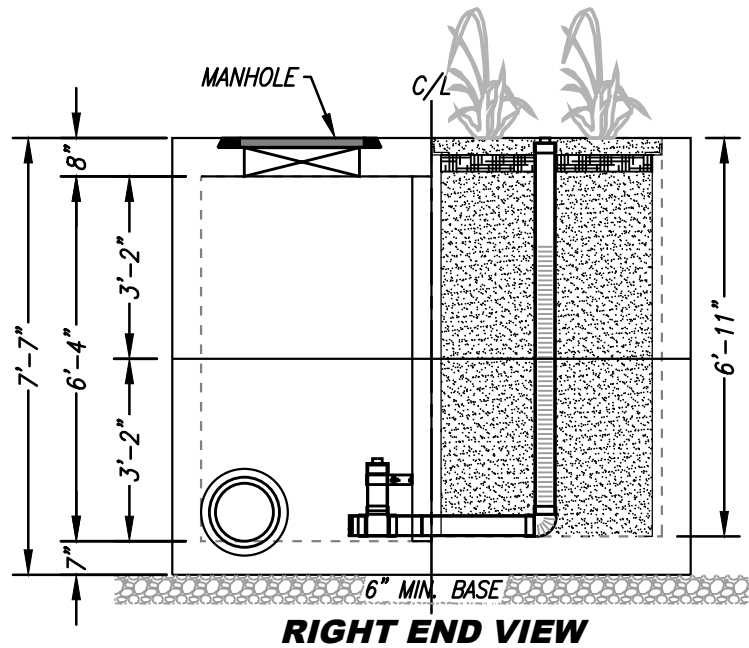
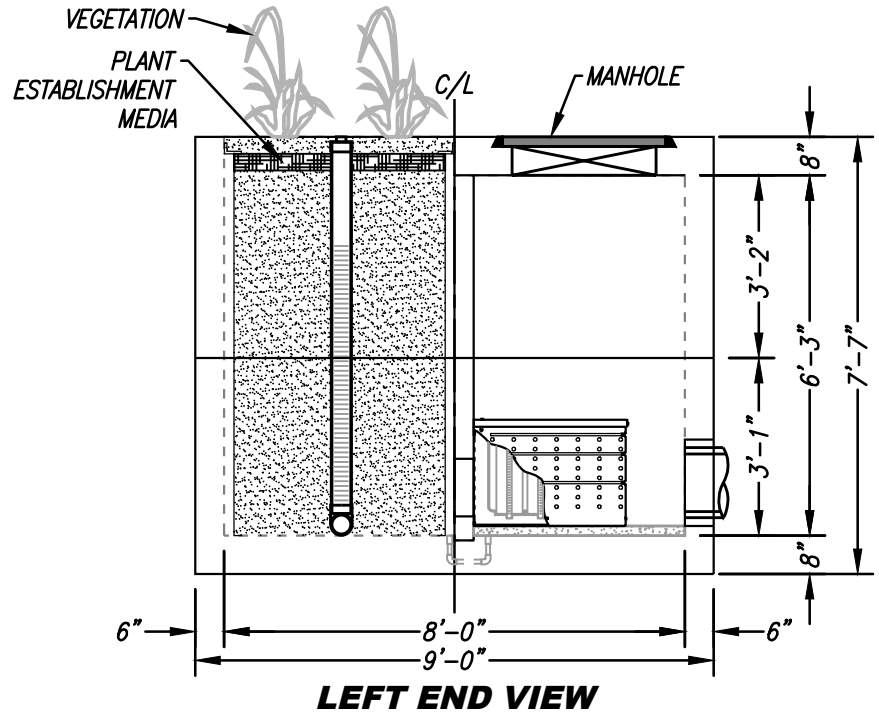
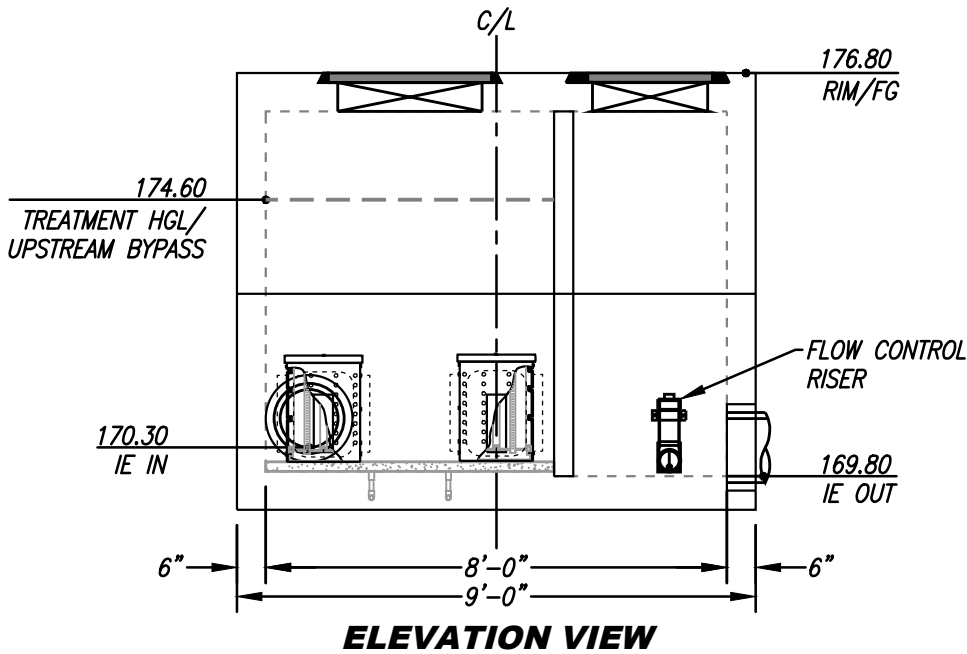
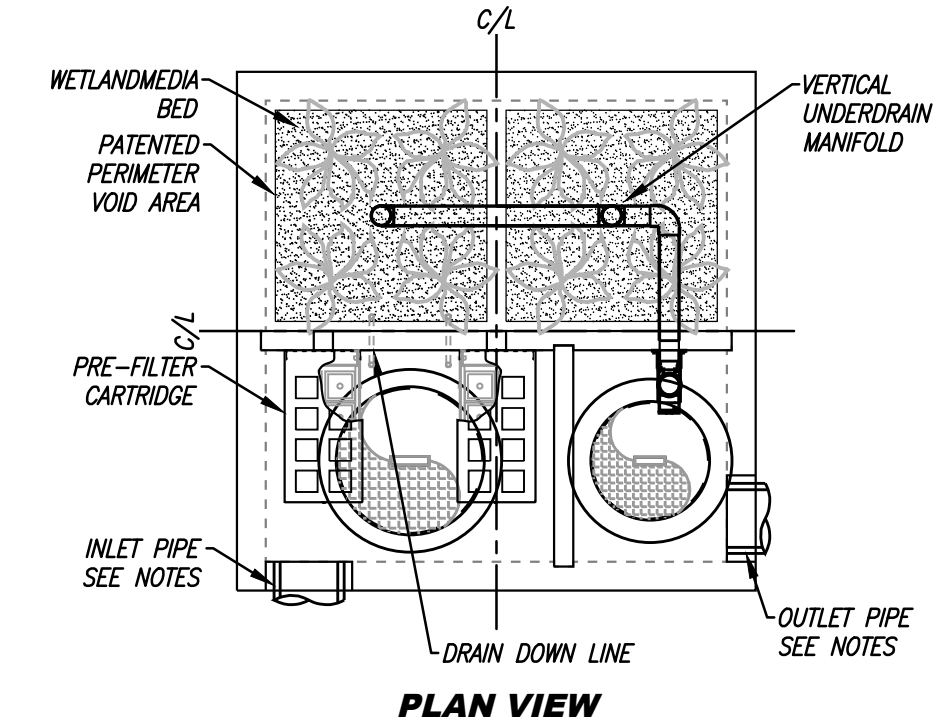
SITE SPECIFIC DATA			
PROJECT NUMBER		733163	
PROJECT NAME		REXFORD – PROPOSED INDUSTRIAL BUILDING	
PROJECT LOCATION		FULLERTON, CA	
STRUCTURE ID		MWS-A	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
9,331		N/A	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			N/A
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	170.30	PVC	12”
OUTLET PIPE	169.80	PVC	12”
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	176.80	176.80	176.80
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	ø30”	OPEN PLANTER	ø24”
WETLANDMEDIA VOLUME (CY)			7.01
ORIFICE SIZE (DIA. INCHES)			ø1.19”
NOTES: PRELIMINARY NOT FOR CONSTRUCTION. EOR MUST PROVIDE UPSTREAM PEAK FLOW BYPASS ELEVATION.			

INSTALLATION NOTES

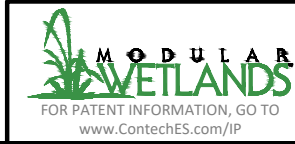
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



REQUIRED TREATMENT VOLUME (CF)	9,331
DRAINDOWN DURATION (HOURS)	31
MAX DISCHARGE RATE PER MWS UNIT(GPM)	36.94
OPERATING HEAD (FT)	4.8
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	OR 0.26



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ENGINEERED SOLUTIONS LLC
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MWS-L-8-8-6'-11"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

11/18/22 MATT WOOLERY

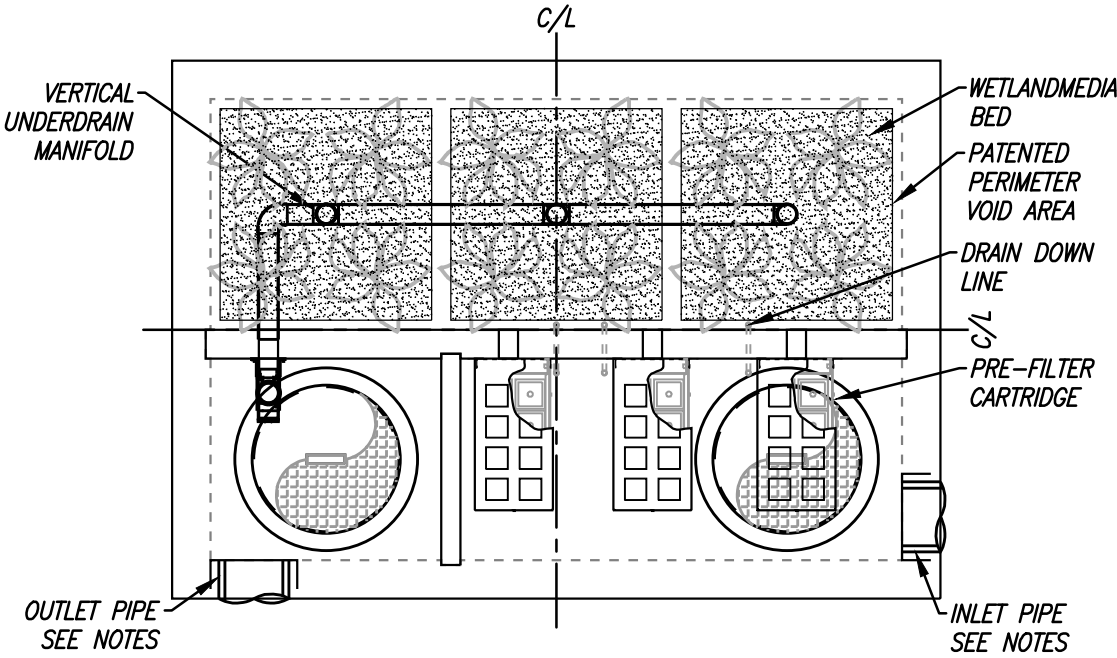
SITE SPECIFIC DATA			
PROJECT NUMBER		733163	
PROJECT NAME		REXFORD – PROPOSED INDUSTRIAL BUILDING	
PROJECT LOCATION		FULLERTON, CA	
STRUCTURE ID		MWS-B	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.320	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			TBD
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	170.97	PVC	12”
OUTLET PIPE	169.60	PVC	12”
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	177.18	177.18	177.18
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	ø30”	OPEN PLANTER	ø30”
WETLANDMEDIA VOLUME (CY)			11.40
ORIFICE SIZE (DIA. INCHES)			ø2.61”
NOTES: PRELIMINARY NOT FOR CONSTRUCTION. EOR TO PROVIDE PEAK FLOW RATE FOR INTERNAL BYPASS OR UPSTREAM BYPASS METHOD.			

INSTALLATION NOTES

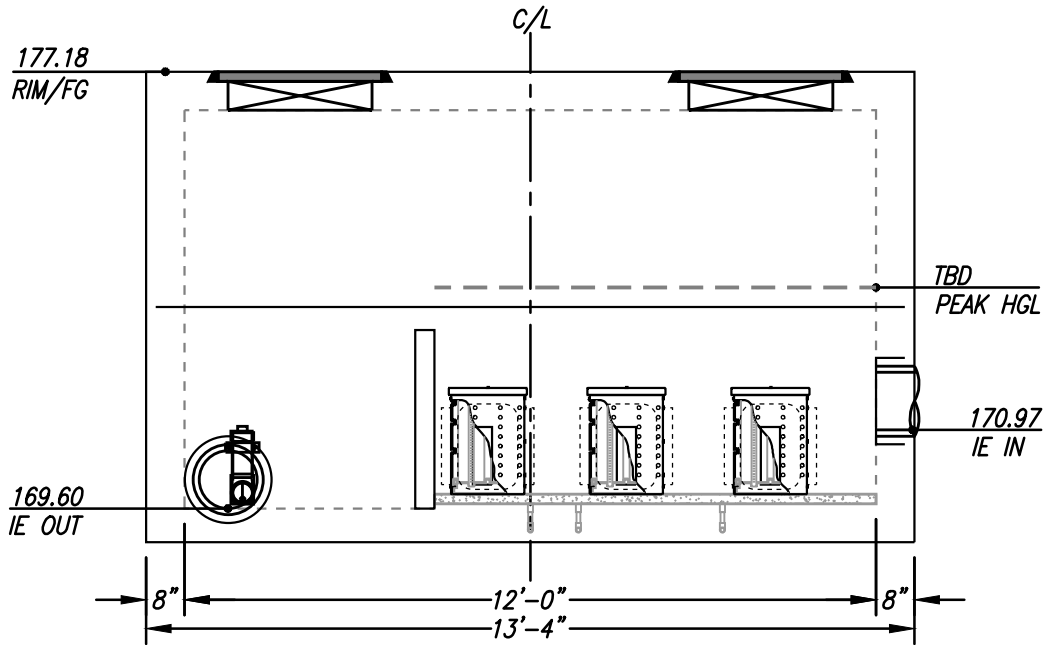
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GENERAL NOTES

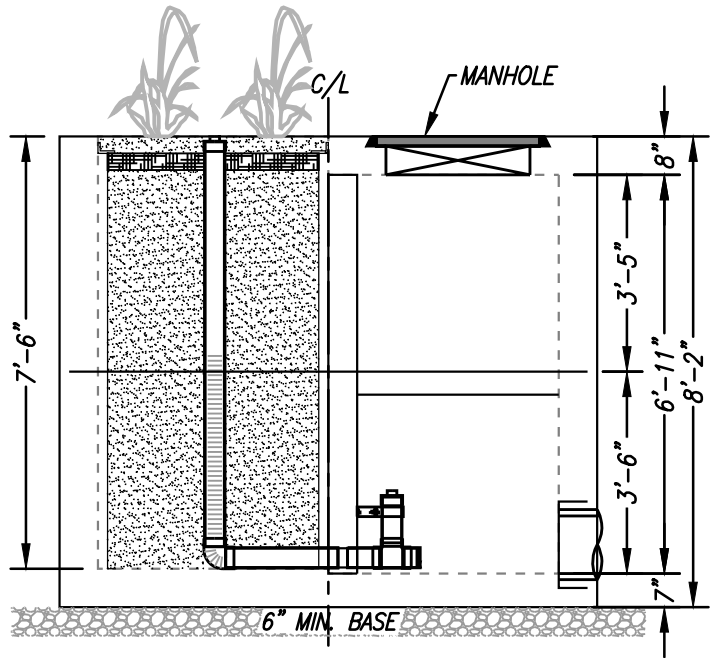
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2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.



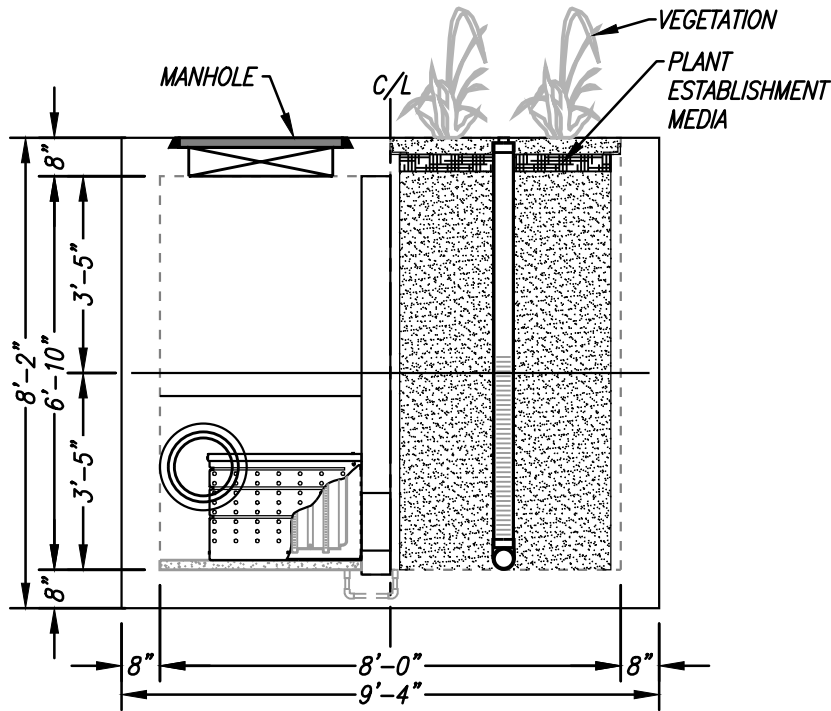
PLAN VIEW



ELEVATION VIEW



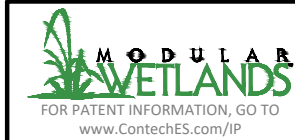
LEFT END VIEW



RIGHT END VIEW

INTERNAL BYPASS DISCLOSURE:

THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR GUIDANCE ONLY.



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TREATMENT FLOW (CFS)	0.320
OPERATING HEAD (FT)	3.1
PRETREATMENT LOADING RATE (GPM/SF)	1.9
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-8-12-7'-6"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

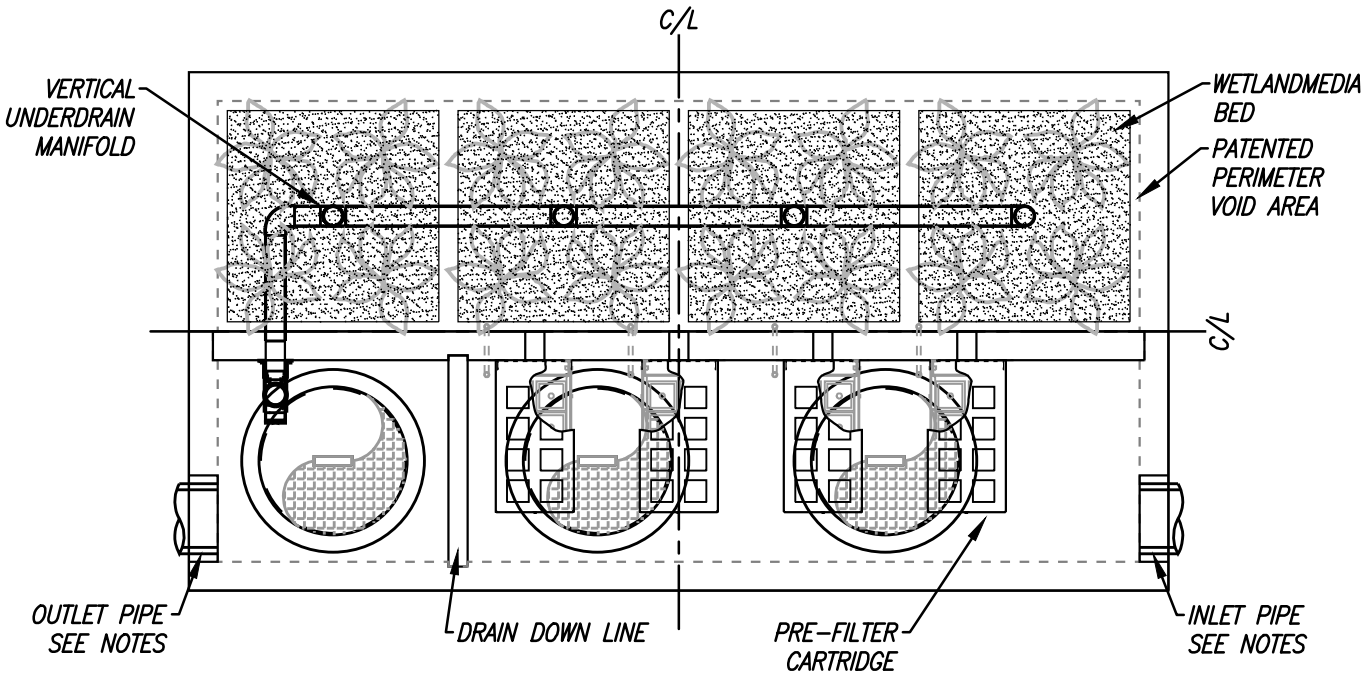
SITE SPECIFIC DATA			
PROJECT NUMBER		733163	
PROJECT NAME		REXFORD – PROPOSED INDUSTRIAL BUILDING	
PROJECT LOCATION		FULLERTON, CA	
STRUCTURE ID		MWS-D	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.380	
TREATMENT HGL AVAILABLE (FT)			N/K
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			TBD
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	171.58	PVC	12”
OUTLET PIPE	169.87	PVC	12”
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	174.20	174.20	174.20
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	2EA Ø30”	OPEN PLANTER	Ø30”
WETLANDMEDIA VOLUME (CY)			8.61
ORIFICE SIZE (DIA. INCHES)			Ø2.92”
NOTES: PRELIMINARY NOT FOR CONSTRUCTION. EOR TO PROVIDE PEAK FLOW RATE FOR INTERNAL BYPASS OR UPSTREAM BYPASS METHOD.			

INSTALLATION NOTES

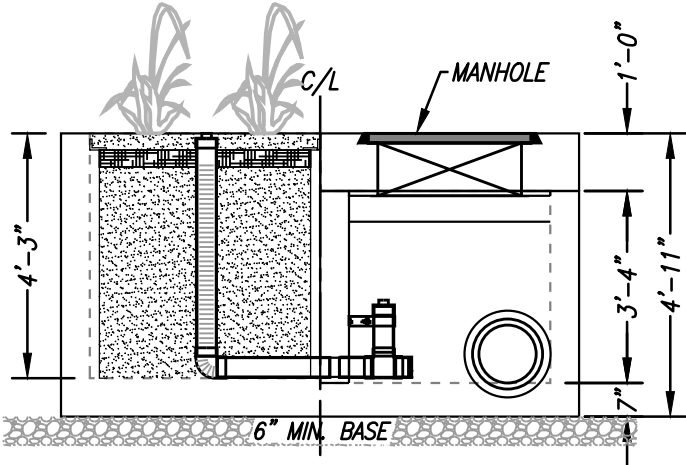
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GENERAL NOTES

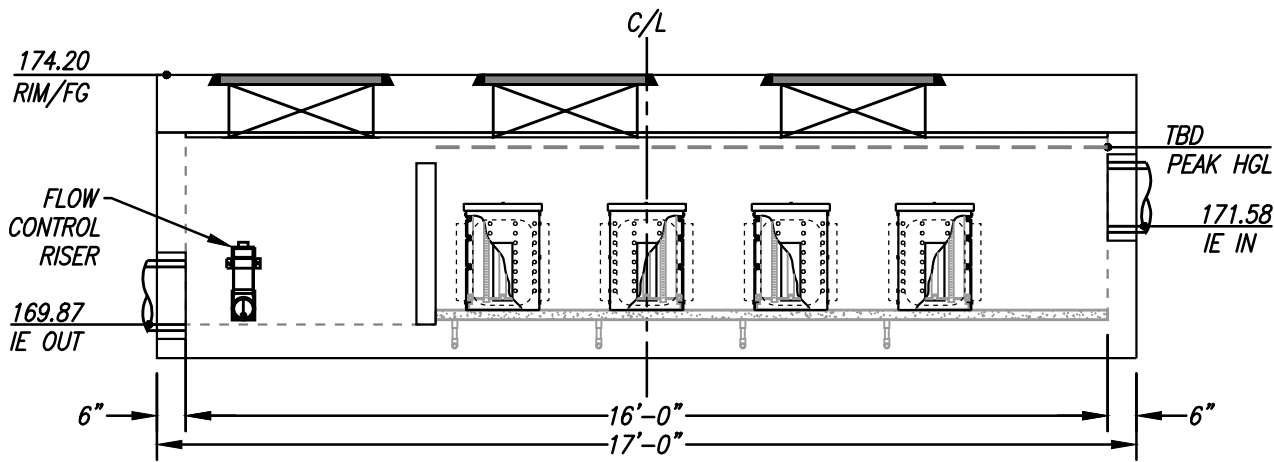
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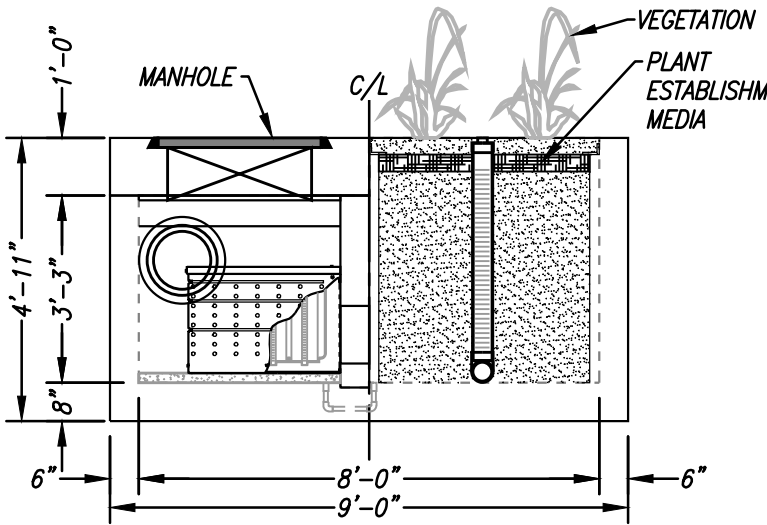
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INTERNAL BYPASS DISCLOSURE:

THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR GUIDANCE ONLY.



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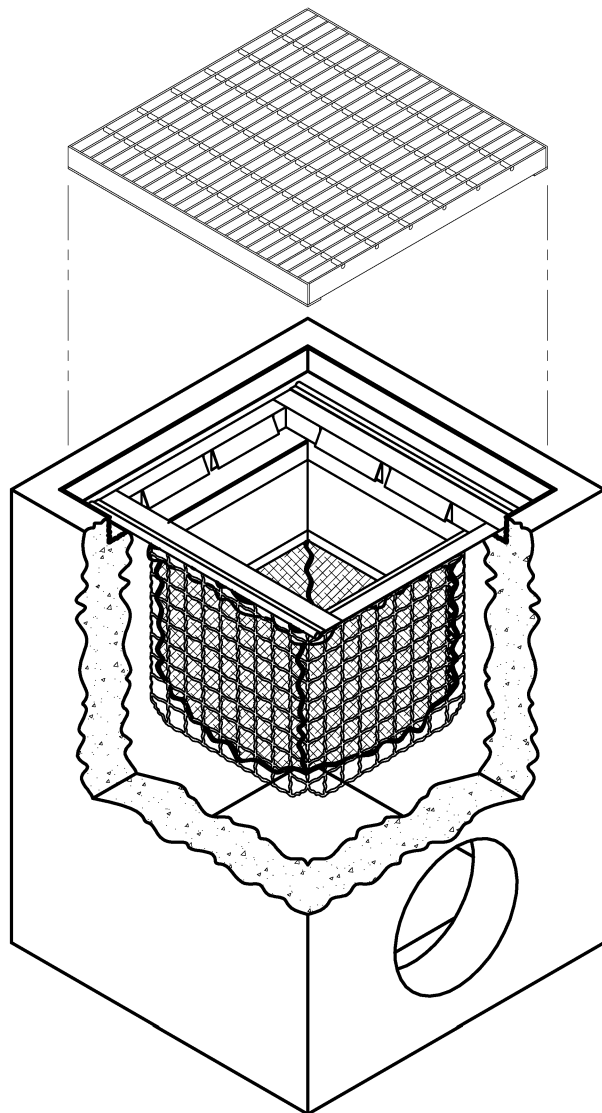


www.ContechES.com

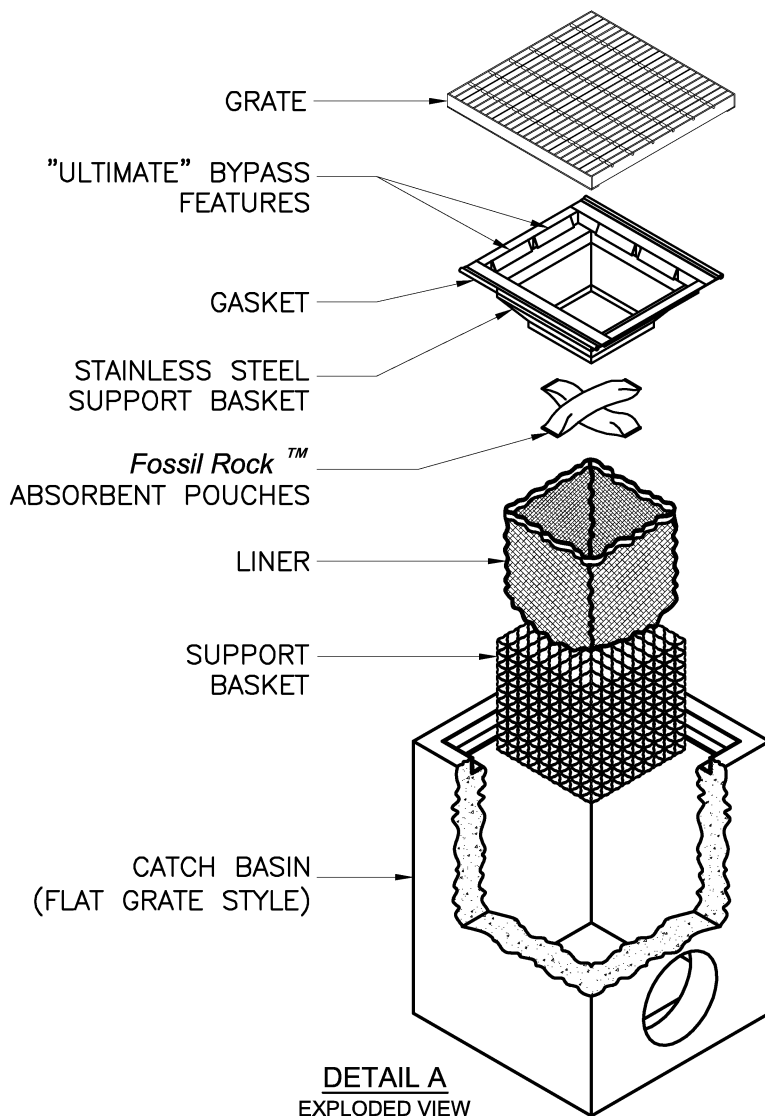
TREATMENT FLOW (CFS)	0.380
OPERATING HEAD (FT)	2.8
PRETREATMENT LOADING RATE (GPM/SF)	1.7
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-8-16-4'-3"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

11/18/22 MATT WOOLERY



FLOGARD+PLUS® FILTER
-INSTALLED INTO CATCH BASIN-



NOTES:

1. FloGard®+Plus (frame mount) high capacity catch basin inserts are available in most sizes and styles (see specifier chart, sheet 2 of 2). Refer to the FloGard®+Plus (wall mount) insert for devices to fit non-standard, or combination style catch basins.
2. Filter insert shall have both an "initial" filtering bypass and "ultimate" high flow bypass feature.
3. Filter support frame shall be constructed from stainless steel Type 304.
4. Allow a minimum of 2.0 feet, of clearance between the bottom of the grate and top of outlet pipe(s), or refer to the FloGard® insert for "shallow" installations.
5. Filter medium shall be *Fossil Rock™*, installed and maintained in accordance with manufacturer specifications.
6. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
7. Filtered flow r/rate includes a safety factor of two.

U.S. PATENT # 6,00,023 & 6,877,029

TITLE

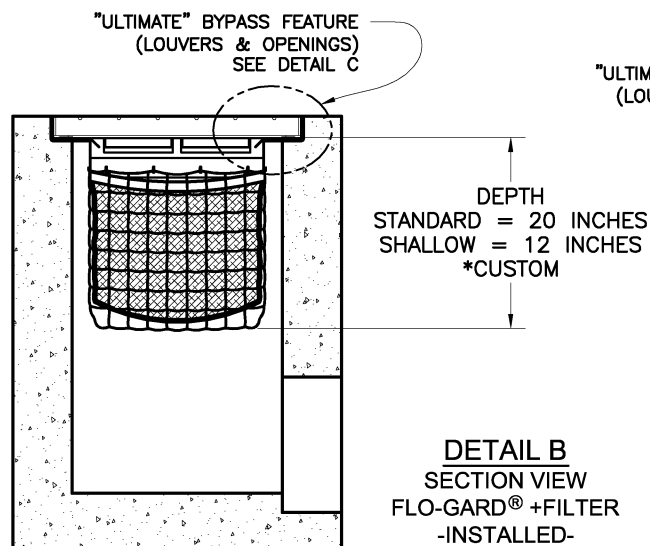
FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Flat Grated Inlet Style)



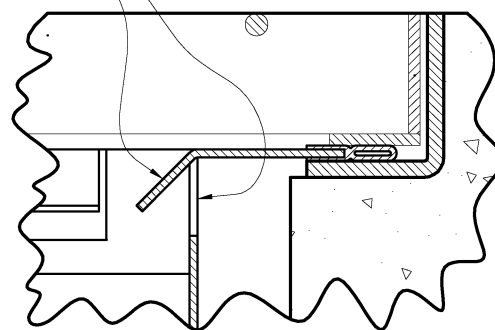
KriStar Enterprises, Inc.

360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	SHEET
FGP-0001	D	0059 JPR	12/30/08	1 OF 2



"ULTIMATE" BYPASS FEATURE
(LOUVERS & OPENINGS)



DETAIL C
"ULTIMATE"
BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columns is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-1530F	15 X 30	15 X 35	6.9	2.3	1.6	FGP-1530F8	1.3	.9
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-1624F	16 X 24	16 X 26	5.0	1.5	1.2	FGP-1624F8	.85	.7
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1820F	16 X 19	18 X 21	5.9	2.1	1.4	FGP-1820F8	1.2	.8
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-2142F	21 X 40	24 X 40	9.1	4.3	2.4	FGP-2142F8	2.45	1.35
FGP-2148F	19 X 46	22 X 48	9.8	4.7	2.6	FGP-2148F8	2.7	1.5
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-2440F	24 X 36	28 X 40	8.3	4.2	2.3	FGP-2440F8	2.4	1.3
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85
FGP-1836FGO	18 X 36	20 X 40	6.9	2.3	1.6	FGP-1836F8GO	1.3	.9
FGP-2436FGO	20 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8GO	1.95	1.15
FGP-48FGO	18 X 48	20 X 54	6.3	2.2	1.5	FGP-48F8GO	1.25	.85

TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Flat Grated Inlet Style)



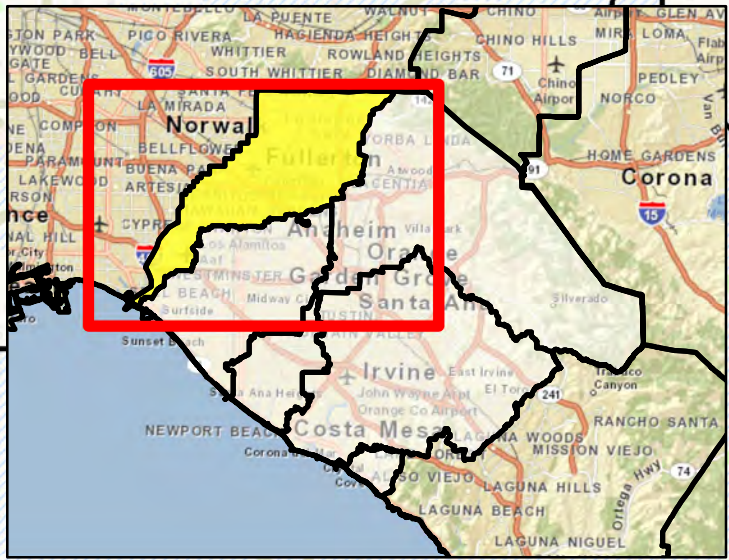
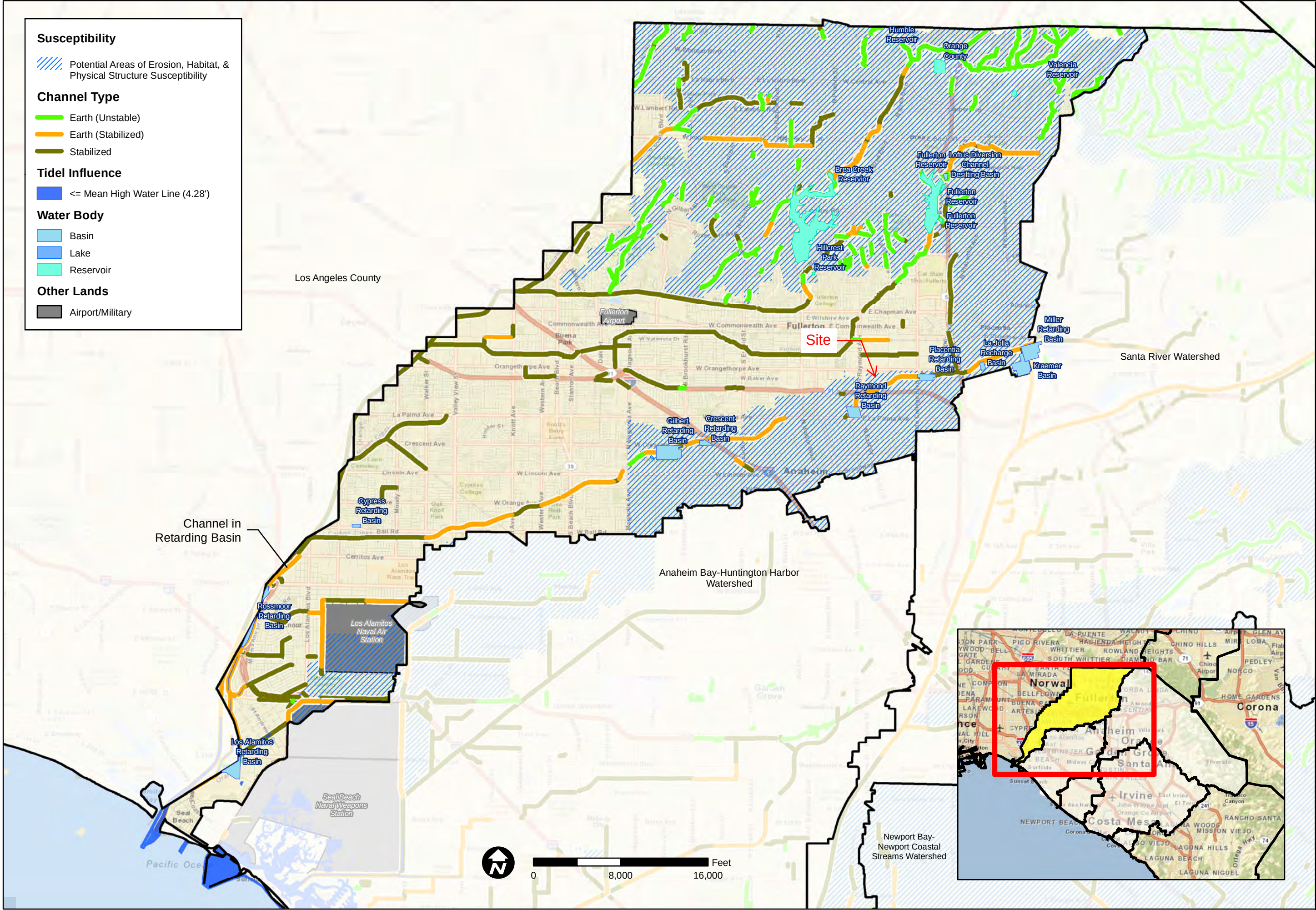
KriStar Enterprises, Inc.

360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO. FGP-0001	REV D	ECO 0059 JPR 12/30/08	DATE JPR 11/3/06	SHEET 2 OF 2
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Attachment C – HCOC Calculations

P:\9526E\6-GIS\MapDocs\Susceptibility\9526E_SanGabrielCoyoteCreekSusceptibility_20100430.mxd



TITLE		SUSCEPTIBILITY ANALYSIS SAN GABRIEL-COYOTE CREEK	
JOB		ORANGE COUNTY WATERSHED MASTER PLANNING ORANGE CO. CA	
SCALE	1" = 8000'	DESIGNED	TH
		DRAWING	TH
		CHECKED	BMP
		DATE	04/30/10
		JOB NO.	9526-E
PACE Advanced Water Engineering		1	

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
(c) Copyright 1983-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1510

Analysis prepared by:

DRC Engineering, Inc.
160 South Old Springs Road, Suite 210
Anaheim Hills, CA 92808
714-685-6860

***** DESCRIPTION OF STUDY *****
* 22-375 REXFORD INDUSTRIAL *
* 2-YEAR *
* EXISTING *

FILE NAME: 22375E.DAT
TIME/DATE OF STUDY: 11:20 07/26/2022

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 12.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

	HALF- WIDTH	CROWN TO CROSSFALL	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
NO.	(FT)	(FT)						
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

+-----+
| WATERSHED A |
| |
| |
+-----+

FLOW PROCESS FROM NODE 1.00 TO NODE 1.10 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 141.00
ELEVATION DATA: UPSTREAM(FEET) = 179.80 DOWNSTREAM(FEET) = 179.10

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION\ CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.359

* 2 YEAR RAINFALL INTENSITY (INCH / HR) = 1.972

SUBAREA T_c AND LOSS RATE DATA (AMC I) :

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH / HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
COMMERCIAL	A	0.20	0.40	0.100	17	6.36

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH / HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

SUBAREA RUNOFF (CFS) = 0.35

TOTAL AREA (ACRES) = 0.20 PEAK FLOW RATE (CFS) = 0.35

FLOW PROCESS FROM NODE 1.10 TO NODE 2.00 IS CODE = 91

>>>>> COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA <<<<<

=====

UPSTREAM NODE ELEVATION (FEET) = 179.10

DOWNSTREAM NODE ELEVATION (FEET) = 173.81

CHANNEL LENGTH THRU SUBAREA (FEET) = 586.00

"V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.120

PAVEMENT LIP (FEET) = 0.020 MANNING'S N = .0150

PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.04000

MAXIMUM DEPTH (FEET) = 0.50

* 2 YEAR RAINFALL INTENSITY (INCH / HR) = 1.489

SUBAREA LOSS RATE DATA (AMC I) :

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH / HR)	A_p (DECIMAL)	SCS CN
COMMERCIAL	A	2.60	0.40	0.100	17

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH / HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100

TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 1.94

TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET / SEC.) = 2.44

AVERAGE FLOW DEPTH (FEET) = 0.24 FLOOD WIDTH (FEET) = 8.03

"V" GUTTER FLOW TRAVEL TIME (MIN.) = 4.01 T_c (MIN.) = 10.37

SUBAREA AREA (ACRES) = 2.60 SUBAREA RUNOFF (CFS) = 3.39

EFFECTIVE AREA (ACRES) = 2.80 AREA-AVERAGED F_m (INCH / HR) = 0.04

AREA-AVERAGED F_p (INCH / HR) = 0.40 AREA-AVERAGED A_p = 0.10

TOTAL AREA (ACRES) = 2.8 PEAK FLOW RATE (CFS) = 3.65

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH (FEET) = 0.30 FLOOD WIDTH (FEET) = 10.91

FLOW VELOCITY (FEET / SEC.) = 2.73 DEPTH * VELOCITY (FT * FT / SEC) = 0.81

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 2.00 = 727.00 FEET.

FLOW PROCESS FROM NODE 2.00 TO NODE 2.00 IS CODE = 1

>>>>> DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<<

=====

TOTAL NUMBER OF STREAMS = 3

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

TIME OF CONCENTRATION (MIN.) = 10.37

RAINFALL INTENSITY (INCH / HR) = 1.49

AREA-AVERAGED F_m (INCH / HR) = 0.04

AREA-AVERAGED F_p (INCH / HR) = 0.40

AREA-AVERAGED A_p = 0.10

EFFECTIVE STREAM AREA(ACRES) = 2.80
TOTAL STREAM AREA(ACRES) = 2.80
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.65

FLOW PROCESS FROM NODE 3.00 TO NODE 3.10 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 65.00
ELEVATION DATA: UPSTREAM(FEET) = 180.30 DOWNSTREAM(FEET) = 180.20

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.897
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 2.059
SUBAREA T_c AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
COMMERCIAL	A	0.10	0.40	0.100	17	5.90

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100
SUBAREA RUNOFF(CFS) = 0.18
TOTAL AREA(ACRES) = 0.10 PEAK FLOW RATE(CFS) = 0.18

FLOW PROCESS FROM NODE 3.10 TO NODE 4.00 IS CODE = 91

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<

=====

UPSTREAM NODE ELEVATION(FEET) = 180.20
DOWNSTREAM NODE ELEVATION(FEET) = 173.40
CHANNEL LENGTH THRU SUBAREA(FEET) = 624.00
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.120
PAVEMENT LIP(FEET) = 0.020 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.04000
MAXIMUM DEPTH(FEET) = 0.50
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.527
SUBAREA LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN
COMMERCIAL	A	2.50	0.40	0.100	17

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.64
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.58
AVERAGE FLOW DEPTH(FEET) = 0.22 FLOOD WIDTH(FEET) = 6.97
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 4.03 T_c (MIN.) = 9.92
SUBAREA AREA(ACRES) = 2.50 SUBAREA RUNOFF(CFS) = 3.35
EFFECTIVE AREA(ACRES) = 2.60 AREA-AVERAGED F_m (INCH/HR) = 0.04
AREA-AVERAGED F_p (INCH/HR) = 0.40 AREA-AVERAGED A_p = 0.10
TOTAL AREA(ACRES) = 2.6 PEAK FLOW RATE(CFS) = 3.48

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.28 FLOOD WIDTH(FEET) = 10.21
FLOW VELOCITY(FEET/SEC.) = 2.92 DEPTH*VELOCITY(FT*FT/SEC) = 0.83
LONGEST FLOWPATH FROM NODE 3.00 TO NODE 4.00 = 689.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 1

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-----
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=====
TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 9.92
RAINFALL INTENSITY(INCH/HR) = 1.53
AREA-AVERAGED Fm(INCH/HR) = 0.04
AREA-AVERAGED Fp(INCH/HR) = 0.40
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 2.60
TOTAL STREAM AREA(ACRES) = 2.60
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.48

*****
FLOW PROCESS FROM NODE 5.00 TO NODE 5.10 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 230.00
ELEVATION DATA: UPSTREAM(FEET) = 176.10 DOWNSTREAM(FEET) = 175.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.792
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.755
SUBAREA Tc AND LOSS RATE DATA(AMC I ):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL A 1.70 0.40 0.100 17 7.79
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 2.62
TOTAL AREA(ACRES) = 1.70 PEAK FLOW RATE(CFS) = 2.62

*****
FLOW PROCESS FROM NODE 5.10 TO NODE 6.00 IS CODE = 91
-----
>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
=====
UPSTREAM NODE ELEVATION(FEET) = 175.00
DOWNSTREAM NODE ELEVATION(FEET) = 174.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 230.00
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.120
PAVEMENT LIP(FEET) = 0.020 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.04000
MAXIMUM DEPTH(FEET) = 0.50
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.549
SUBAREA LOSS RATE DATA(AMC I ):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
COMMERCIAL A 1.70 0.40 0.100 17
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.78
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.03
AVERAGE FLOW DEPTH(FEET) = 0.34 FLOOD WIDTH(FEET) = 13.09
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 9.68
SUBAREA AREA(ACRES) = 1.70 SUBAREA RUNOFF(CFS) = 2.31
EFFECTIVE AREA(ACRES) = 3.40 AREA-AVERAGED Fm(INCH/HR) = 0.04

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AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 3.4 PEAK FLOW RATE (CFS) = 4.62

END OF SUBAREA "V" GUTTER HYDRAULICS:

DEPTH (FEET) = 0.37 FLOOD WIDTH (FEET) = 14.29
FLOW VELOCITY (FEET/SEC.) = 2.11 DEPTH*VELOCITY (FT*FT/SEC) = 0.77
LONGEST FLOWPATH FROM NODE 5.00 TO NODE 6.00 = 460.00 FEET.

FLOW PROCESS FROM NODE 6.00 TO NODE 6.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

=====

TOTAL NUMBER OF STREAMS = 3
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
TIME OF CONCENTRATION (MIN.) = 9.68
RAINFALL INTENSITY (INCH/HR) = 1.55
AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA (ACRES) = 3.40
TOTAL STREAM AREA (ACRES) = 3.40
PEAK FLOW RATE (CFS) AT CONFLUENCE = 4.62

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.65	10.37	1.489	0.40 (0.04)	0.10	2.8	1.00
2	3.48	9.92	1.527	0.40 (0.04)	0.10	2.6	3.00
3	4.62	9.68	1.549	0.40 (0.04)	0.10	3.4	5.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 3 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11.62	9.68	1.549	0.40 (0.04)	0.10	8.6	5.00
2	11.62	9.92	1.527	0.40 (0.04)	0.10	8.7	3.00
3	11.48	10.37	1.489	0.40 (0.04)	0.10	8.8	1.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 11.62 Tc (MIN.) = 9.92
EFFECTIVE AREA (ACRES) = 8.68 AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.10
TOTAL AREA (ACRES) = 8.8
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 6.00 = 727.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 8.8 TC (MIN.) = 9.92
EFFECTIVE AREA (ACRES) = 8.68 AREA-AVERAGED Fm (INCH/HR) = 0.04
AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE (CFS) = 11.62

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	11.62	9.68	1.549	0.40 (0.04)	0.10	8.6	5.00
2	11.62	9.92	1.527	0.40 (0.04)	0.10	8.7	3.00

3	11.48	10.37	1.489	0.40 (0.04)	0.10	8.8	1.00
=====							
=====							
END OF RATIONAL METHOD ANALYSIS							

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
(c) Copyright 1983-2015 Advanced Engineering Software (aes)
Ver. 22.0 Release Date: 07/01/2015 License ID 1510

Analysis prepared by:

DRC Engineering, Inc.
160 South Old Springs Road, Suite 210
Anaheim, CA 92808
714-685-6860

***** DESCRIPTION OF STUDY *****

* DRC Project No. 22-375 *
* 2-Year *
* *

FILE NAME: 375P002.DAT
TIME/DATE OF STUDY: 08:24 11/22/2022

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 8.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT-/PARK- SIDE / SIDE/ WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0313	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 100.00 TO NODE 101.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 284.00
ELEVATION DATA: UPSTREAM(FEET) = 180.52 DOWNSTREAM(FEET) = 175.10

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.428
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
SUBAREA T_c AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	T_c (MIN.)
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COMMERCIAL          A          3.30      0.40      0.100      17      6.43
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 5.70
TOTAL AREA(ACRES) = 3.30 PEAK FLOW RATE(CFS) = 5.70

*****
FLOW PROCESS FROM NODE 200.00 TO NODE 201.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 485.00
ELEVATION DATA: UPSTREAM(FEET) = 178.70 DOWNSTREAM(FEET) = 174.35

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.260
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.589
SUBAREA Tc AND LOSS RATE DATA(AMC I ):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS  Tc
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
COMMERCIAL            A          1.65      0.40      0.100      17  9.26
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 2.31
TOTAL AREA(ACRES) = 1.65 PEAK FLOW RATE(CFS) = 2.31

*****
FLOW PROCESS FROM NODE 300.00 TO NODE 301.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 42.00
ELEVATION DATA: UPSTREAM(FEET) = 178.70 DOWNSTREAM(FEET) = 174.00

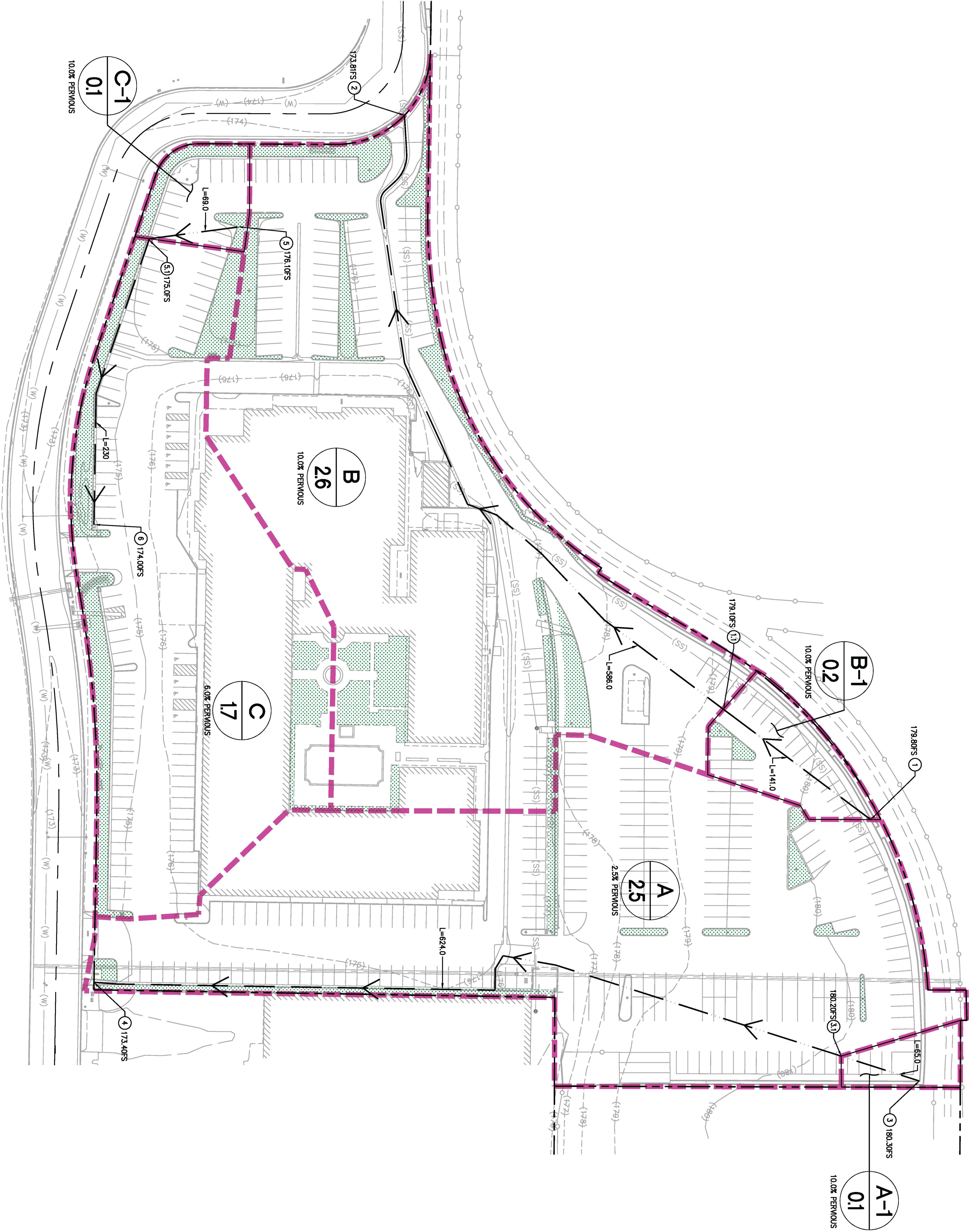
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.000
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 2.264
SUBAREA Tc AND LOSS RATE DATA(AMC I ):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS  Tc
LAND USE              GROUP  (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
RESIDENTIAL
".4 DWELLING/ACRE"    A          0.53      0.40      0.900      17  5.00
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
SUBAREA RUNOFF(CFS) = 0.91
TOTAL AREA(ACRES) = 0.53 PEAK FLOW RATE(CFS) = 0.91

*****
FLOW PROCESS FROM NODE 400.00 TO NODE 401.00 IS CODE = 21
-----
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 282.00
ELEVATION DATA: UPSTREAM(FEET) = 175.98 DOWNSTREAM(FEET) = 173.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.752
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.760
SUBAREA Tc AND LOSS RATE DATA(AMC I ):
DEVELOPMENT TYPE/      SCS SOIL  AREA      Fp      Ap      SCS  Tc

```

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
COMMERCIAL	A	1.74	0.40	0.100	17	7.75
SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.100						
SUBAREA RUNOFF (CFS) = 2.69						
TOTAL AREA (ACRES) = 1.74 PEAK FLOW RATE (CFS) = 2.69						
=====						
END OF STUDY SUMMARY:						
TOTAL AREA (ACRES) = 1.7 TC (MIN.) = 7.75						
EFFECTIVE AREA (ACRES) = 1.74 AREA-AVERAGED F_m (INCH/HR) = 0.04						
AREA-AVERAGED F_p (INCH/HR) = 0.40 AREA-AVERAGED A_p = 0.100						
PEAK FLOW RATE (CFS) = 2.69						
=====						
=====						
END OF RATIONAL METHOD ANALYSIS						

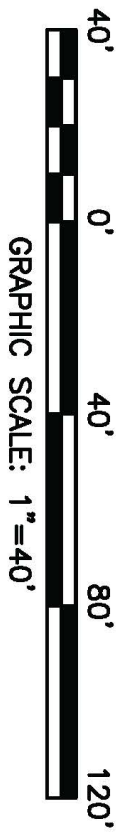


LEGEND:

LANDSCAPE AREA

DRAINAGE BOUNDARY/
LIMITS OF GRADING

DRAINAGE FLOW PATH



PROJECT: **REXFORD INDUSTRIAL WAREHOUSE**
1500 S RAYMOND AVENUE
FULLERTON, CA

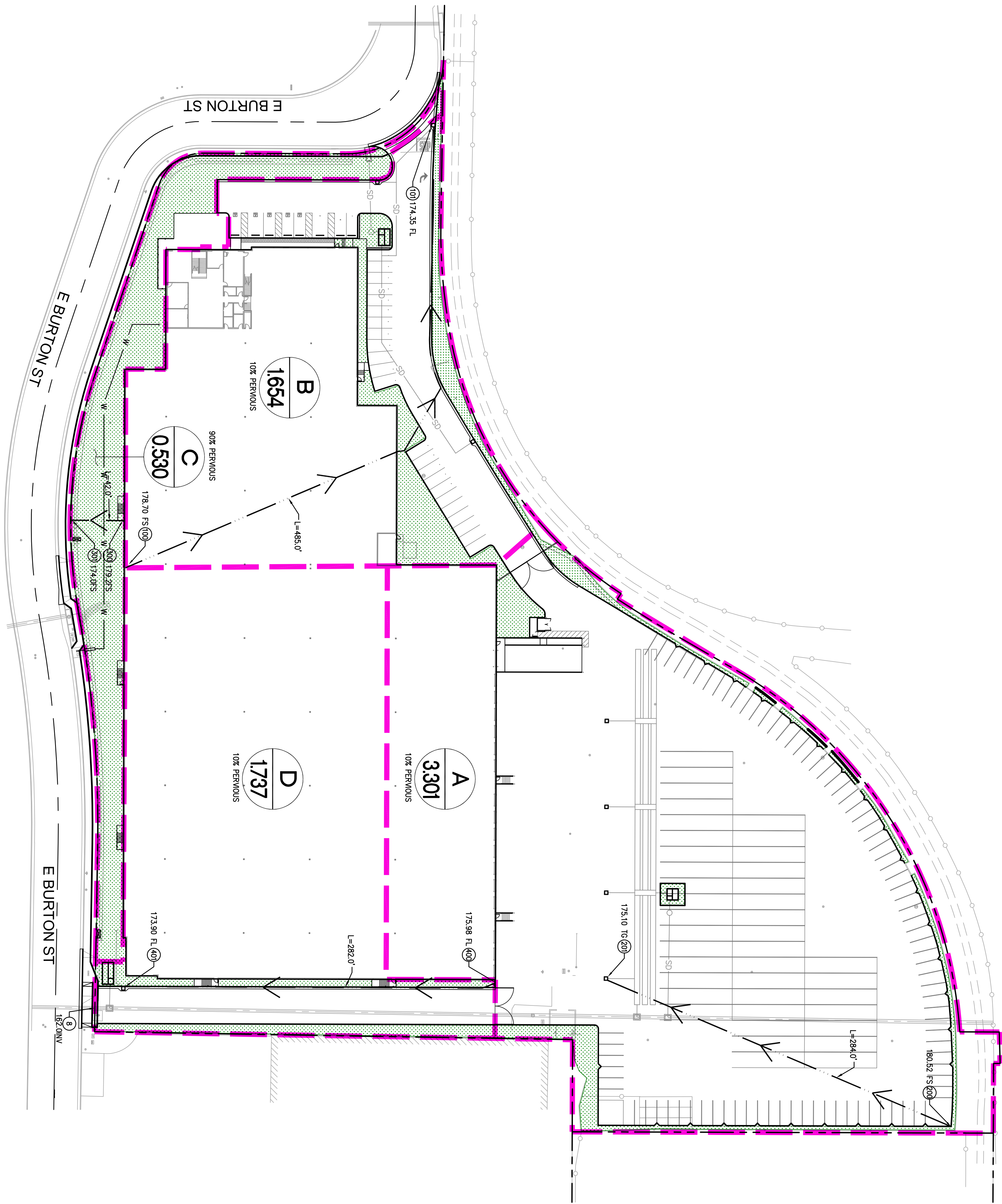
DRAWING NAME: **EXISTING HYDROLOGY MAP**

NO.:	REVISION:	DATE:



160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

NOT FOR CONSTRUCTION



LEGEND:

LANDSCAPE AREA

DRAINAGE BOUNDARY/
LIMITS OF GRADING

DRAINAGE FLOW PATH

160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

ORC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning

NO.	REVISION:	DATE:

PROJECT:	REXFORD INDUSTRIAL WAREHOUSE 1500 S RAYMOND AVENUE FULLERTON, CA
DRAWING NAME:	PROPOSED HYDROLOGY MAP

ISSUE: HYDROLOGY

DATE: 11/21/2022

CHECKED: KH DRAWN: KH

DRAWING FILE: 22375/HW

PROJECT NO.: 22-375

SHEET NUMBER:

1

OF 1 SHEETS

SCALE: AS SHOWN