



**County of Orange/Santa Ana Region
Priority Project
Preliminary Water Quality Management Plan
(PWQMP)**

Project Name:

Street Lights Residential - Fullerton

229 E. Orangethorpe Ave.

Prepared for:

SLR Development, LLC

Adam Covington, Development Director of California

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Prepared by:



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Date Prepared: 10/8/20

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Fullerton Town Center

Project Owner's Certification			
Planning Application No. (If applicable)	PRJ2020-0004	Grading Permit No.	TBD
Tract/Parcel Map and Lot(s) No.		Building Permit No.	TBD
Address of Project Site and APN: 229 E. Orangethorpe Ave. (If no address, specify Tract/ Parcel Map and Lot Numbers)			APN 073-060-28 APN 073-060-64 APN 073-060-65

This Preliminary Water Quality Management Plan (PWQMP) has been prepared for Street Lights Residential, LLC by Joseph C. Truxaw and Associates, Inc. This PWQMP is intended to comply with the requirements of the County of Orange 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 , including the ongoing operation and maintenance of all best management practices (BMPs), 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: Street Lights Residential- Fullerton , LLC.			
Title	Adam Covington, Development Director California		
Company	Street Lights Residential Development, LLC		
Address	4180 La Jolla Village Drive, Suite 125 La Jolla, CA 92037		
Email	acovington@streetlightsres.com		
Telephone #	(858) 245-1937		
I understand my responsibility to implement the provisions of this WQMP including the ongoing operation and maintenance of the best management practices (BMPs) described herein.			
Owner Signature		Date	

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Preparer (Engineer): Craig S. Di Bias, PE			
Title	Civil Engineer	PE Registration #	75205
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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	
Place Stamp Here			

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Section I Permit(s) and Water Quality Conditions of Approval or Issuance

Provide discretionary or grading/building permit information and water quality conditions of approval, or permit issuance, applied to the project. If conditions are unknown, please request applicable conditions from staff. *Refer to Section 2.1 in the Technical Guidance Document (TGD) available on the OC Planning website (ocplanning.net).*

Project Information			
Permit/Application No. (If applicable)	TBD	Grading or Building Permit No. (If applicable)	TBD
Address of Project Site (or Tract Map and Lot Number if no address) and APN	229 E. Orangethorpe Ave.		
Water Quality Conditions of Approval or Issuance			
Water Quality Conditions of Approval or Issuance applied to this project.	None at this time.		
Preliminary WQMP			
Was a Conceptual Water Quality Management Plan previously approved for this project?	This document is the preliminary/conceptual WQMP		

Watershed-Based Plan Conditions	
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	The Project is located within the limits of the San Gabriel River Watershed. Established TDMLs for the project's receiving waters are as follows: San Gabriel River (Estuary) – Copper

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 Technical Guidance Document (TGD) for information that must be included in the project description.*

Description of Proposed Project				
Development Category (From Model WQMP, Table 7.11-2; or -3):	Priority Project, Category 8.- All significant redevelopment projects, where significant redevelopment is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. This redevelopment will result in an alteration of more than 50% of impervious surfaces of the previously existing development. The total lot size is 4.47 acres, the project drainage area is 5.0 acres, and the total disturbed area is 5.15 acres. Maintenance activities to maintain original line and grade around the project perimeter accounts for the difference in disturbed area and the area to be mitigated.			
Project (Disturbed) Area (ft ²): 224,149	Number of Dwelling Units: 392		SIC Code: ____	
Project Area (Disturbed)	Pervious		Impervious	
	Area (acres or sq. ft.)	Percentage	Area (acres or sq. ft.)	Percentage

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Pre-Project Conditions	0.23 acres	4.47 %	4.92 acres.	95.53 %
Post-Project Conditions	0.51 acres	9.90 %	4.64 acres.	90.10%
Drainage Patterns/Connections	In the pre-project condition, runoff from the east side of the project site is conveyed as sheet flow via concrete gutter in the parking lot to 2 storm drain inlets that drain to the northeast. Runoff is then conveyed to a 42-inch storm drain line located in Lemon Street and continues north to Fullerton Creek Channel (OCFCD Facility A03). All runoff is then conveyed westerly to Coyote Creek (OCFCD Facility A01) prior to discharging to the San Gabriel River and the Pacific Ocean to the south. Similarly runoff from the west side of the site is conveyed as sheet flow via concrete gutters in the parking lot to 2 storm drain inlets that drain to the west. Runoff continues to a 60-inch storm drain line located in Harbor Blvd and continues north to Fullerton Creek Channel (OCFCD Facility A03). All runoff is then conveyed westerly to Coyote Creek (OCFCD Facility A01) prior to discharging to the San Gabriel River and the Pacific Ocean to the south.			

Narrative Project Description: (Use as much space as necessary.)	The proposed Fullerton Town Center project consists of an approximately 5.15 acre site located at the northwest corner at the intersection of E Orange Thorpe Ave. and S. Lemon St. in the City of Fullerton. The site is bound to the north by AMC theatres and an existing parking lot, to the east by Lemon Street and drive through car wash, to the south by restaurant/commercial and an existing parking lot, and to the west by Pomona Ave and existing commercial retail/commercial business. The project proposes the construction of a 5-story multifamily housing with a 5.5-story parking garage, retail space, planter/landscaping areas, walkways, courtyard areas, parking spaces,. Total landscaping proposed for the redevelopment area is approximately 22,216ft². Parking will be provided within the parking garage northwest of the new housing buildings. Curbside parking will be provided around the perimeter of the building. Typical waste products from this project site include general trash and litter. All trash will be collected in refuse containers and emptied on a weekly (at minimum) and as needed basis, and removed for disposal by the contracting waste hauler. Two (2) proprietary biotreatment facilities, one located within DMA-A and one located in DMA-B, have been selected as part of the project's Low Impact Development (LID) BMP requirement. Due to the project site being located within the North Basin Groundwater Plume Protection area (per OC Land Records), retention tanks and the biotreatment facilities will be designed with a bottle tight design and/or impermeable liner. The proposed landscape areas will be irrigated with efficient irrigation systems and will be planted with drought-tolerant plant materials as selected by the project landscape architect. No vehicle or equipment service, repair or washing is to be conducted onsite. The outdoor activities that will be conducted include pedestrian access, outdoor leisure, outdoor BBQ and dining, swimming pool access and onsite traffic circulation.
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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 Technical Guidance Document (TGD) for guidance.*

Table 2.1, Anticipated and Potential Pollutants Generated by Land Use Type from the Technical Guidance Document (May 2011) lists the following Pollutants of Concern (POC's) associated with residential projects: Suspended Solid/Sediments, Nutrients, Pathogens (Bacteria/Virus), Pesticides, Oil & Grease and Trash & Debris.

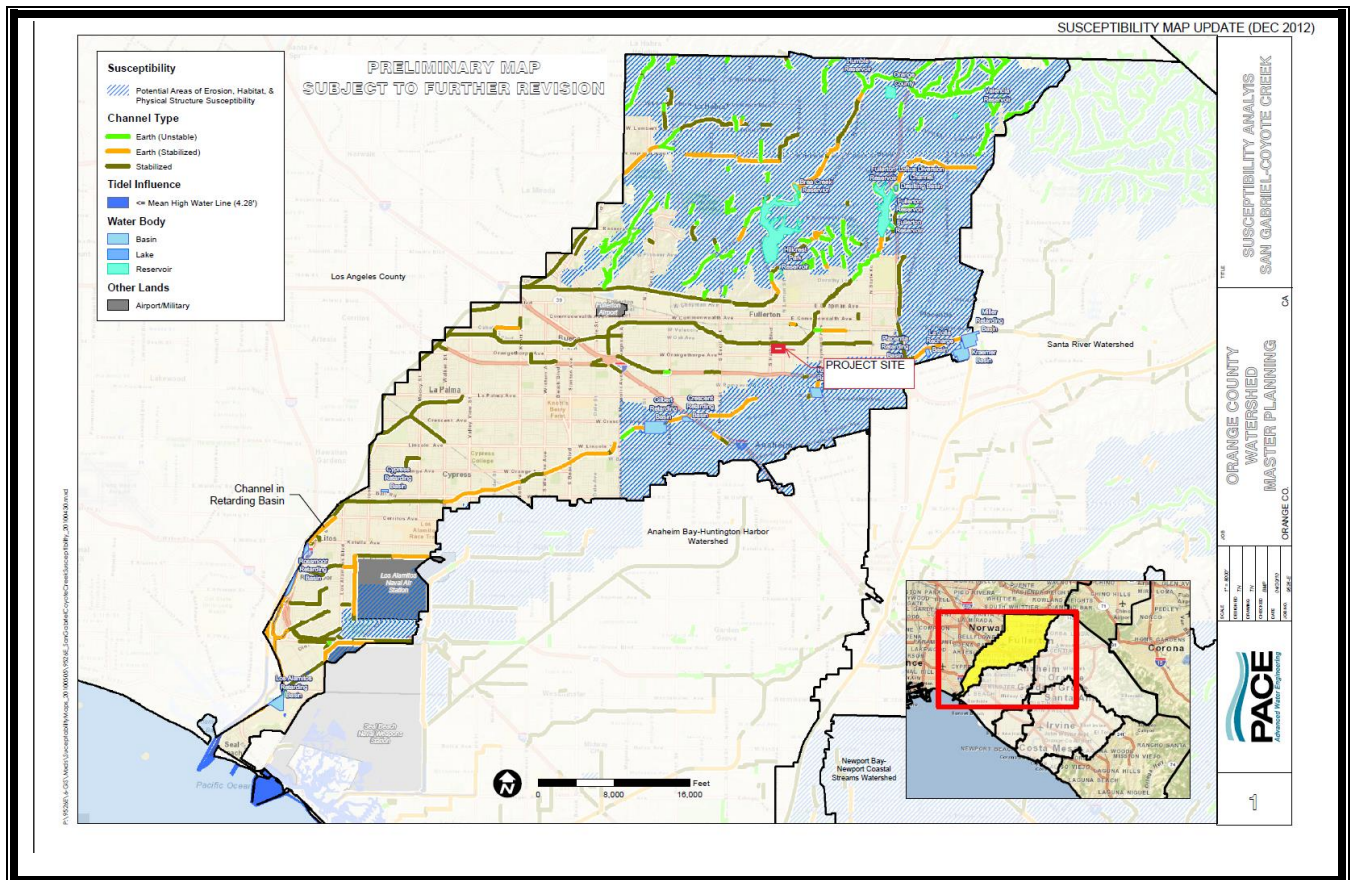
Pollutants of Concern			
Pollutant	Check One for each: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid/ Sediment	E ☒	N ☐	Potential sources of sediment include existing landscaping areas and disturbed earth surfaces.
Nutrients	E ☒	N ☐	Potential sources of nutrients include fertilizers, sediment and trash/debris.
Heavy Metals	E ☐	N ☒	Pollutant is not anticipated based on project's intended use.
Pathogens (Bacteria/Virus)	E ☒	N ☐	Potential sources of pathogens include food wastes and landscaping/sediment areas.
Pesticides	E ☒	N ☐	Potential sources of pesticides include landscaping areas
Oil and Grease	E ☒	N ☐	Potential source of oil and grease include the uncovered parking areas.
Toxic Organic Compounds	E ☐	N ☒	Pollutant is not anticipated based on project's intended use
Trash and Debris	E ☒	N ☐	Potential sources include common litter and trash cans from commercial users.

II.3 Hydrologic Conditions of Concern

Determine if streams located downstream from the project area are potentially susceptible to hydromodification impacts. *Refer to Section 2.2.3.1 in the Technical Guidance Document (TGD) for North Orange County or Section 2.2.3.2 for South Orange County.*

☒ No – Show map. The proposed project is not subject to the specific 2-year criteria or susceptibility maps as shown below. See attached Figure XVI.3 in Attachment B. Runoff from the site will be discharged to a fully improved storm drain system prior to discharging to lined BMP of the Fullerton Creek Channel, Coyote Creek and San Gabriel River, as shown in the following excerpt from Orange County Public Works, Land Records

☐ Yes – Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the Technical Guidance Document (TGD).*



II.4 Post Development Drainage Characteristics

Describe post development drainage characteristics. *Refer to Section 2.2.4 in the Technical Guidance Document (TGD).*

In the proposed condition, runoff from the project site will maintain pre-existing drainage routes, discharging to existing storm drain lines in E. Orangethorpe Avenue and S. Lemon St. via existing connections. Runoff is then conveyed northerly to the Fullerton Creek Channel (OCFCD Facility A03). All runoff is then conveyed westerly to Coyote Creek (OCFCD Facility A01) prior to discharging to the San Gabriel River and the Pacific Ocean to the south.

II.5 Property Ownership/Management

Describe property ownership/management. *Refer to Section 2.2.5 in the Technical Guidance Document (TGD).*

Street Lights Residential Development, LLC shall assume all inspection and maintenance responsibilities for all areas located within project limits until such time, site responsibilities have been transferred to the Property Owner Association. These responsibilities include the site's day to day operations, BMP and site inspections as well as maintenance of all BMPs as it relates to this WQMP. Inspection and maintenance activities and frequencies are provided in Section V of this WQMP

Funding for long term operations and maintenance of BMPs will be included within the general facility operations budget.

Section III Site Description

III.1 Physical Setting

Fill out table with relevant information. *Refer to Section 2.3.1 in the Technical Guidance Document (TGD).*

Name of Planned Community/Planning Area (if applicable)	Street Lights Residential -Fullerton
Location/Address	NW Corner of Orangethorpe Ave. & Lemon St.
	229 E. Orangethorpe Ave.
General Plan Land Use Designation	Existing: Retail/ Restaurant Proposed: Multi-Family Housing/ Retail
Zoning	Existing: C-2 General Commercial
Acreage of Project Site	5.15 acres
Predominant Soil Type	The soil type is "B" as determined from the NRCS Hydrologic Soils Groups of Orange County. See Figure XVI-2a in attachment C.

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 Technical Guidance Document (TGD).*

Site Characteristics	
Precipitation Zone	Site is located in the rainfall zone of 0.90 inch design capture storm depth per figure XVI 1 in attachment B.
Topography	In general, the project site slopes down from east to west with an average elevation difference of 3 feet.
Drainage Patterns/Connections	In the pre-development condition, runoff from the site flows both easterly and westerly. At the west side of the project area, runoff sheet flows to the west across parking areas and concrete gutters towards two storm drain curb inlets, where it is collected by a private storm drain system and ultimately collected by a municipal storm drain

	system as described in Section II.1, above. Runoff from the eastern portion of the site sheet flows into two storm drain inlets located within the parking lot, where it is collected by a private storm drain system and is ultimately connected to the municipal storm drain system as described in Section II.1, above. In the post-development condition, the southwest drainage area has been identified as DMA-A, and the northeast drainage area as DMA-B. Onsite runoff within DMA-A will be conveyed by a local storm drain system that is connected to a retention tank and proprietary biotreatment system. Due to shallow invert elevations of existing catch basins and pipes, flow will need to be pumped into the biofiltration system and pumped out to drain. Runoff in excess of the design capacity will bypass the biotreatment system and pumps and will flow directly from the retention tanks to the connection at the existing catch basin located at the southwest of the project site. A similar system will utilize for onsite runoff within DMA-B and will include retention tanks, proprietary biotreatment systems, and pumps. Runoff in excess of the design capacity will bypass the biotreatment system and pumps and will flow directly from the retention tank and tie-into the existing 22-inch private storm drain line.
Soil Type, Geology, and Infiltration Properties	Based on the Orange County Public Works Land Records, underlying soils consists primarily of Group "B" soils. Infiltration is not allowed due to the location of the site, the North Basin Groundwater Plume Protection area
Hydrogeologic (Groundwater) Conditions	As per Figure XVI -2d in attachment B, the depth to first groundwater is approximately 30 feet.
Geotechnical Conditions (relevant to infiltration)	Based on the Orange County Public Works Land Records, the site consists primarily of Group "B" soils. See above.
Off-Site Drainage	Run-on drainage will be redirected at the project limits via concrete gutters and crowned roads so that off-site flow continues towards existing drainage courses and does not intermingle with on-site flows.
Utility and Infrastructure Information	Existing wet and dry utilities onsite will be relocated at direction of the utility owners and in coordination with the installation of new connections proposed for this project.

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 Technical Guidance Document (TGD).*

Receiving Waters	Fullerton Creek Channel, Coyote Creek, San Gabriel River (Estuary)
303(d) Listed Impairments	Fullerton Creek – None Coyote Creek – Diazinon, Indicator Bacteria, pH, Toxicity, Copper, Lead, Ammonia San Gabriel River (Estuary) – Coliform Bacteria, pH
Applicable TMDLs	Fullerton Creek – None Coyote Creek – Copper, Lead, Zinc San Gabriel River (Estuary) – Copper
Pollutants of Concern for the Project	Pollutants of Concern: Suspended Solids/Sediment, Nutrients, Pathogens, Oil & Grease, Pesticides, Trash & Debris.
Environmentally Sensitive and Special Biological Significant Areas	There are no Areas of Special Biological Significance (ASBS) or ESA's within the project site. Coyote Creek and San Gabriel River (Estuary) are listed as impaired under Section 303(d) of the Clean Water Act and are therefore, designated as ESA's per the OC DAMP.

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. (Please ask your assigned planner or plan checker regarding whether your project is part 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.	There are currently no approved WIHMPs for the San Gabriel River-Coyote Creek Watershed		

Project Performance Criteria	
If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)	HCOC does not exist. Refer to Figure XVI-3a in attachment B.
List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)	7.II-2.4.3 Determine LID and Treatment Control BMP Performance Criteria • Priority Projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume). • A properly designed biotreatment system may only be considered if infiltration, harvest and use, and evapotranspiration (ET) cannot be feasibly implemented for the full design capture volume. In this case, infiltration, harvest and use, and ET practices must be implemented to the greatest extent feasible and biotreatment may be provided for the remaining design capture volume. A diversity of controls will be provided, if feasible, to achieve the greatest feasible retention of the Design Capture Volume, then if necessary, biotreatment of the remaining design capture volume. The Design Capture Storm Depth is the 85th percentile, 24-hr storm depth that, when applied to the project site results in the design capture volume. The design capture storm depth varies across the county and is shown in TGD Appendices III. The TGD provides information for determining the applicable “design capture storm depth” to apply to a project to calculate design capture volume as well as guidance for recommended hydrologic methods. Equivalent performances criteria have been synthesized from permit requirements with consideration of the MEP standard and analysis of local precipitation and ET patterns. The following performance criteria result in capture and retention and/or biotreatment of 80 percent of average annual stormwater runoff volume. The performance criteria for LID are stated as follows: • LID BMPs must be designed to retain, on-site, (infiltrate, harvest and use, or evapo-transpire) stormwater runoff up to 80 percent average annual capture efficiency • LID BMPs must be designed to: - o Retain, on-site, (infiltrate, harvest and use, or evapotranspire) stormwater runoff as feasible up to the Design Capture Volume, and - o Recover (i.e., draw down) the storage volume as soon as possible after a storm event (see criteria for maximizing drawdown rate in the TGD Appendix XI), and, if necessary - o Biotreat, on-site, additional runoff, as feasible, up to 80 percent average

	annual capture efficiency (cumulative, retention plus biotreatment), and, if necessary, instructions for calculating BMP sizing to meet these criteria are provided in the TGD and the TGD Appendices.
List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)	7.II-3.3.2 Determine Treatment Control BMP Water Quality Performance Criteria This section contains performance criteria for treatment control BMPs. Note that satisfaction of LID performance criteria also fully satisfies treatment control performance criteria. North County Requirements If it is not feasible to meet LID performance criteria through retention and/or biotreatment provided on-site or at a sub-regional/regional scale, then treatment control BMPs shall be provided on-site or offsite prior to discharge to waters of the US. Sizing of treatment control BMP(s) shall be based on either the unmet volume after claiming applicable water quality credits, if appropriate (See Section 7.II-3.1 Water Quality Credits) and as calculated in TGD Appendix VI. If treatment control BMPs can treat all of the remaining unmet volume and have a medium to high effectiveness for reducing the primary POCs, the project is considered to be in compliance; a waiver application and participation in an alternative program is not required.
Calculate LID design storm capture volume for Project.	LID DESIGN STORM CAPTURE VOLUME DMA-1. Priority projects must retain on-site stormwater runoff as feasible up to the Design Capture Volume (85th percentile, 24-hour storm event). If retention is infeasible, the project must biotreat, the additional runoff, as feasible, up to 80 percent average annual capture efficiency. As per TGD the volume will be: $V = d \times C \times A \times 43,560/12$ Where: d = Design Capture storm depth in inches, d = 0.95 in per Figure XVI-1 C = Runoff coefficient $C = (0.75 \times Imp + 0.15)$ Imp = Impervious in decimal Imp = 100 % A = area of DMA in acres See computations below

IV.2 Site Design and Drainage

Describe site design and drainage including

- A narrative of site design practices utilized or rationale for not using practices;
- A narrative of how site is designed to allow BMPs to be incorporated to the MEP
- A table of DMA characteristics and list of LID BMPs proposed in each DMA.
- Reference to the WQMP “BMP Exhibit.”
- Calculation of Design Capture Volume (DCV) for each drainage area.
- A listing of GIS coordinates for LID and Treatment Control BMPs.

Refer to Section 2.4.2 in the Technical Guidance Document (TGD).

On-site LID practices that should be considered:

- Proprietary Biotreatment facilities were selected for this project due to the location of the-site.

- Preserve Existing Drainage Patterns and Time of Concentration

See Hydrology Maps Pre- and Post-Development, showing the similarity among runoff volumes and time of concentration for existing and proposed conditions.

- Minimize Impervious Area

The proposed impervious area is the minimum area to perform activities of the site

- Disconnect Impervious Areas

Runoff from “connected” impervious surfaces commonly flow directly to a storm water retention system with Biotreatment. In this project impervious areas were disconnected.

- Minimize Construction Footprint

The required footprint of the building is shown.

- Re-vegetate Disturbed Areas

Disturbed areas are re-vegetated

There are several Self-Treating Areas (Landscape) defined as pervious areas that can treat rain falling directly on its surface via evapo-transpiration.

DMA-A, DMA-B

BIO-7: Proprietary Biotreatment

Proprietary biotreatment devices are devices that are manufactured to mimic natural systems such as proprietary biotreatment areas by incorporating plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their natural counterparts. Incoming flows are typically filtered through a planting media (mulch, compost, soil, plants, microbes, etc.) and either infiltrated or collected by an underdrain and delivered to the storm water conveyance system. Tree box filters are an increasingly common type of proprietary biotreatment device that are installed at curb level and filled with a proprietary biotreatment type soil. For low to moderate flows they operate similarly to proprietary biotreatment systems and are

bypassed during high flows. Tree box filters are highly adaptable solutions that can be used in all types of development and in all types of soils but are especially applicable to dense urban parking lots, street, and roadways.

The following requirements are included in the design:

Frequent maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.

Consult proprietors for specific criteria concerning the design and performance.

Proprietary biotreatment may include specific media to address pollutants of concern. However, for proprietary device to be considered a biotreatment device the media must be capable of supporting rigorous growth of vegetation.

Proprietary systems must be acceptable to the reviewing agency. Reviewing agencies shall have the discretion to request performance information. Reviewing agencies shall have the discretion to deny the use of a proprietary BMP on the grounds of performance, maintenance considerations, or other relevant factors.

In right of way areas, plant selection should not impair traffic lines of site. Local jurisdictions may also limit plant selection in keeping with landscaping themes.

The Bio Clean Modular Wetlands System Linear (MWS Linear) was selected for its compact footprint, high treatment capacity, and ease of maintenance. The proposed building footprint and exterior walkways limits the available pervious area that can be used to construct bioretention systems for stormwater treatment. The selected proprietary biotreatment system has been shown to provide similar pollutant removal performance compared to bioretention systems. This includes high performance in the removal of total suspended solids, Hydrocarbons, and Trash/Debris. A summary table of both systems performance is shown below. The proprietary biotreatment fact sheet can be found in attachment C. Bioretention system performance rankings taken from Table 4.2 of the TGD.

Table 1.-Relative Treatment Performance Ratings of Biotreatment BMP's

Unit Operations Process	TSS	Nitrogen Compounds	Phosphorus	Heavy Metals	Oils and Grease	Trash and Debris
Bioretention System	H	L	L	H	H	H
MWS	H	L	M	M	H	H

Table 1.-DRAINAGE MANAGEMENT AREAS

DMA	SURFACE TYPE	AREA acres	PERVIOUS		IMPERVIOUS		PROPOSED LID BMP
DMA-A	ROOF-PAV.-LANDSCAPE	3.65	0.33 Acres	9.0 %	3.32 Acres	91.0 %	Proprietary Biotreatment
DMA-B	ROOF-PAV. -LANDSCAPE	1.35	0.18 acres	13.3 %	1.17 acres	86.7 %	Proprietary Biotreatment

See DMAs in "WQMP" exhibit

DMA-A. and DMA-B.- As per TGD the volume will be:

$$DCV = d \times C \times A \times 43,560/12$$

Where: DMAs

d = Design Capture storm depth in inches, d = 0.90 in per Figure XVI-1

C = Runoff coefficient $C = (0.75 \times Imp + 0.15)$

$$Imp = (3.32 \times 91.0 + 1.17 \times 86.7) / 5.0 = 80.71\%$$

$$C = (0.75 \times 0.8071 + 0.15) = 0.755$$

A = area of DMA = 5.0 acres

$$DCV = 0.90 \times 0.755 \times 5.0 \times 43,560/12 \quad \text{Total DCV} = 12,332.9 \text{ ft}^3$$

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 Technical Guidance Document (TGD) for selecting LID BMPs and Section 2.4.3 in the Technical Guidance Document (TGD) for conducting conformance analysis with project performance criteria.*

IV.3.1 Hydrologic Source Controls (HSCs)

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:	☐

The project does not propose the use of HSCs. The full design capture volume (DCV) is being treated with LID BMPs.

IV.3.2 Infiltration BMPs

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

Infiltration BMPs are LID BMPs that capture, store and infiltrate storm water runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. Examples of infiltration BMPs include infiltration trenches, bioretention without underdrains, drywells, permeable pavement, and underground infiltration galleries.

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.

Based on the project's location within the North Basin Groundwater Plume Protection area infiltration is not feasible for the project. Therefore, no infiltration BMPs have been proposed.

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

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

Evapotranspiration

Evapotranspiration BMPs are a class of retention BMPs that discharges stored volume predominately to ET, through some infiltration may occur. ET includes both evaporation and transpiration, and ET BMPs may incorporate one or more of these processes. BMPs must be designed to achieve the maximum feasible ET, where required to demonstrate that the maximum amount of water has been retained on-site. Since ET is not the sole process in the project's proposed BMP, specific design and sizing criteria have not been developed to estimate the effect of ET in the proposed biotreatment BMPs.

Harvest and Reuse

Harvest and Reuse (aka. Rainwater Harvesting) BMPs are LID BMPs that capture and store storm water runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. Harvest and use BMPs include both above-ground and below-ground cisterns. Examples of uses for harvested water include irrigation, toilet and urinal flushing, vehicle washing, evaporative cooling, industrial processes and other non-potable uses.

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 and/or rainwater harvesting BMPs in combination with infiltration BMPs. If not, document below how much can be met with infiltration BMPs, evapotranspiration, rainwater harvesting BMPs, or a combination, and document why it is not feasible to meet the full volume with these BMP categories.

The project does not propose the use of harvesting BMPs. Biotreatment BMPs will be employed to address the project's DCV.

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 included. Include sections for selection, suitability, sizing, and infeasibility, as applicable.

Biotreatment BMPs are a class of structural LID BMPs that treat suspended solids and dissolved pollutants in storm water using mechanisms characteristic of biologically active systems. These BMPs are considered treat and release facilities and include treatment mechanisms that employ soil microbes and plants. Additional benefits of these BMPs may include aesthetic enjoyment, recreational use, wildlife habitat and reduction in storm water volume.

Biotreatment BMPs have been selected for the project to address pollutants in project runoff prior to discharging to the storm drain system.

Name	Included?
Bioretention with underdrains	☐
Stormwater planter boxes with underdrains	☐
Rain gardens with underdrains	☐
Constructed wetlands	☐

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Vegetated swales	☐
Vegetated filter strips	☐
Proprietary vegetated biotreatment systems	☒
Wet extended detention basin	☐
Dry extended detention basins	☐
Other:	☐
Other:	☐

The project proposes the use of two (2) proprietary vegetated biotreatment systems have been selected for the project based on constraints for use of other LID BMPs (infiltration and harvest/reuse), site layout and pollutant removal efficiency.

Show calculations below to demonstrate if the LID Design Storm Capture Volume can be met with biotreatment BMPs.

DMA-A. and DMA-B.- As per TGD the volume will be:

$$DCV = d \times C \times A \times 43,560/12$$

Where: **DMA-A**

d = Design Capture storm depth in inches, d = 0.90 in per Figure XVI-1

C = Runoff coefficient C = (0.75 x Imp + 0.15)

$$Imp = 3.32/3.65 = 0.9096$$

$$C = (0.75 \times 0.9096 + 0.15) = 0.8322$$

A = area of DMA = 3.65 acres

$$DCV = 0.90 \times 0.8322 \times 3.65 \times 43,560/12 \quad \mathbf{DCV = 9,923.6 \text{ ft}^3}$$

Proprietary Bioretention systems were selected per volume-based treatment capacity (cu. ft.) @ 48—hour drain down. See product specifications in attachment C.

Selected model number: MWS-L-8' x 8' treatment capacity = **10,072 ft³**

DCV = 10,072 ft³ > 9,923.6 ft³ Treatment is complete

Contech CMP Retention tanks were sized to contain DCV. See product specifications in attachment C.

Design storage volume = **9,923.6 ft³**

Provided storage volume = **9,923.6 ft³**

Due to the need to pump in and out of the proprietary biotreatment systems, it must be verified that the feed pump can draw down the volume within the detention tanks within 48 hours at a rate that does not exceed the treatment system capacity.

Drawdown = 48 Hours

Flowrate (feed pump) = 9923.6 cf/ 48 hrs = 206.74 cf/hr = ~ 0.057cfs

MWS-L-8'x8' treatment flow = 0.231 cfs
 0.057 cfs < 0.231 cfs **Treatment is feasible.**

Where: **DMA-B**

d = Design Capture storm depth in inches, d = 0.90 in per Figure XVI-1

C = Runoff coefficient C = (0.75 x Imp + 0.15)

Imp = 1.17/1.35 = 0.8667

C = (0.75 x 0.8667 + 0.15) = 0.8000

A = area of DMA = 1.35 acres

DCV = 0.90 x 0.8000 x 1.35 x 43,560/12 **DCV = 3,528.5 ft³**

Proprietary Bioretention systems were selected per volume-based treatment capacity (cu. ft.) @ 48—hour drain down. See product specifications in attachment C.

Selected model number: MWS-L-4' x 8' treatment capacity = **5,036 ft³**

DCV = 5,036 ft³ > 3,528.5 ft³ Treatment is complete

Contech CMP Retention tanks were sized to contain DCV. See product specifications in attachment C.

Design storage volume = **3,528.5 ft³**

Provided storage volume = **3,405 ft³ ***

*Storm water cistern system capacity will be revised and updated as the Project pervious area is designed.

Drawdown = 48 Hours

Flowrate (feed pump) = 3405 cf/ 48 hrs = 70.94 cf/hr = ~ 0.02cfs

MWS-L-4'x8' treatment flow = 0.115 cfs

0.02 cfs < 0.115 cfs **Treatment is feasible.**

IV.3.5 Hydromodification Control BMPs

Describe hydromodification control BMPs. *See Section 5 of the Technical Guidance Document (TGD).* Include sections for selection, suitability, sizing, and infeasibility, as applicable. Detail compliance with Prior Conditions of Approval (if applicable).

Hydromodification Control BMPs	
BMP Name	BMP Description
Not Applicable	

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
Not Applicable

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
Not Applicable	

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)	☐	☒	No hazardous waste at the site
N6	Local Industrial Permit Compliance	☐	☒	No local industrial permit is required.
N7	Spill Contingency Plan	☐	☒	No spill contingency plan is required
N8	Underground Storage Tank Compliance	☐	☒	No underground storage tanks at the site.
N9	Hazardous Materials Disclosure Compliance	☐	☒	No hazardous materials at the site
N10	Uniform Fire Code Implementation	☐	☒	Property owner is not required to comply with Article 8o of the Uniform Fire Code.
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☐	☒	No loading docks are proposed
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	No retail gasoline outlets at the site

N1. Education for Property Owners - Copies of this manual shall be used by the owner of this site and shall be responsible for the training of their employees on proper BMP procedures that apply to their portion of the site. Information materials from the City of Fullerton on general house-keeping practices that contribute to the protection of stormwater quality will be provided to tenants by the

developer for distribution to employees. Such materials will also be available on an ongoing basis as needed. Store managers shall review and demonstrate good housekeeping practices to all new employees at the time of hiring, and stormwater pollution prevention topics shall also be reviewed with all employees during monthly staff meetings, or at least quarterly.

N2. Activity Restrictions - Documents shall be prepared by the owner for the purpose of surface water quality protection. Alternately, use restrictions may be developed by the buildings operator. These restrictions may include the following non-structural BMPs:

1. Use of pesticides and fertilizers shall be applied at the minimum rate recommended by the manufacturer, and shall be consistent with City and County guidelines for use of pesticides and fertilizers.
2. Walkways, driveways, patios and sidewalks should be swept instead of washed or hosed down. All debris collected shall be disposed of in approved trash receptacles and shall not be directed into sidewalk, parking lot, streets and storm drains. The frequency of Activity Restrictions is continuous.

N3. Common Area Landscape Management – Ongoing maintenance consistent with County Water Conservation Resolution, with the City of Fullerton model water efficient landscape ordinance, and fertilizer and pesticide usage consistent with County Management Guidelines for Use of Fertilizers and Pesticides shall be employed for the landscaped areas by the property owner. Refer to the Appendix in this manual regarding the conservation of water in landscaping and the “County of Orange Management Guidelines for Use of Fertilizers and Pesticides.” The Common Area Landscape Management will have a monthly frequency during regular maintenance.

N4. BMP Maintenance – The owner will be responsible for implementing each non-structural BMP and schedule cleaning and maintenance of all BMP structural facilities as shown on Section V.

N5. Title 22 CCR Compliance - No hazardous waste at the site.

N6. Local Industrial Permit Compliance - No local industrial permit is required.

N7. Spill Contingency Plan - No spill contingency plan is required.

N8. Underground Storage Tank Compliance – No underground storage tanks at this site.

N9. Hazardous Materials Disclosure Compliance - No hazardous materials at the site.

N10. Uniform Fire Code Implementation - Property owner is not required to comply with Article 80 of the Uniform Fire Code.

N11. Common Area Litter Control – The owner will be required to implement trash management and litter control procedures in the areas aimed at reducing pollution of drainage water. The required trash containers will be located in the trash enclosure and shall be emptied a minimum once a week or before if they are filled. The owner may contract with their landscape maintenance firm to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations by employees and

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reporting the violations to the property owners for investigation. The Common Area Litter Control will have a daily frequency during regular maintenance.

N12. Employee Training – Education program as it would apply to future employees of the residence. The developer shall provide copies of this WQMP to all tenants. The WQMP will remain at the place of business and be used by store managers to train employees in the practice of good housekeeping practices that promote clean stormwater. Refer to Section VII of this WQMP for educational program implementation objectives and suggestions. Also included in section VII are educational materials intended for reproduction and distribution to employees by the owner, The Employee Training will be when new employees are hired, and once every six months.

N13. Housekeeping of Loading Docks - No loading docks are proposed.

N14. Common Area Catch Basin Inspection - The owner shall have all onsite proposed catch basins inspected and, if necessary, cleaned prior to the wet season, no later than October 1st each year. Comply with procedures in the Appendix. A copy of the annual maintenance records shall be provided to the City by October 1st each year. The Common Area Parkway Drain inspection will have a monthly frequency.

N15. Street Sweeping Private Streets and Parking Lots – Sweeping of the private street will be the responsibility of the owner. The street sweeping frequency will be monthly. The Street Sweeping Private Streets will have a weekly frequency.

N16. Retail Gasoline Outlets - No retail gasoline outlets at the site.

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 are proposed
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	☐	☒	No slopes or channels to protect

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	energy dissipation			
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☐	☒	
S6	Dock areas	☐	☒	No dock areas are proposed
S7	Maintenance bays	☐	☒	No maintenance bays are proposed
S8	Vehicle wash areas	☐	☒	No vehicle wash areas are proposed
S9	Outdoor processing areas	☐	☒	No outdoor processing areas are proposed
S10	Equipment wash areas	☐	☒	No wash areas are proposed
S11	Fueling areas	☐	☒	No fueling areas are proposed
S12	Hillside landscaping	☐	☒	No hillside landscape is proposed
S13	Wash water control for food preparation areas	☐	☒	No food preparation at the site
S14	Community car wash racks	☐	☒	No car wash racks are proposed

S1.- Provide storm drain system stenciling and signage

1. Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
2. Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.
3. Maintain legibility of stencils and signs.

This BMP will have a frequency of once every 6 months.

S3. – Design and construct trash and waste storage areas to reduce pollution introduction. The grading plan has been designed such that drainage is directed around the trash enclosure. Runoff will not flow through the trash storage area.

This BMP will not require periodic maintenance.

S4. - Efficient Irrigation System. Projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the municipal storm drain system.

This BMP will have a frequency of once a week with maintenance activities.

IV.4 Alternative Compliance Plan (If Applicable)

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.*

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 Technical Guidance Document (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)	N/A			

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 Model WQMP.*

N/A No Alternative Compliance Measures in the Project.

No Wavier request is required.

Section V Inspection/Maintenance Responsibility for BMPs

Fill out information in table below. Prepare and attach an Operation and Maintenance Plan. Identify the funding 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.o in the Model WQMP.*

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
Education for Property Owner	Owner	Education program as it would apply to future employees of the Suites. The owner shall prepare manual(s) for employees of site.	Continuous. Provide regular training to field employees regarding all the BMPs proposed in the document.
Activity Restriction	Owner	The following activity restrictions will be used: Use of pesticides and fertilizers shall be applied at the minimum rate recommended by the manufacturer, and shall be consistent with the City and County guidelines for use of pesticides and fertilizers. Walkways, driveways, patios and sidewalks should be swept instead of washed or hosed down. All debris collected shall be disposed of in	Continuous

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		approved trash receptacles and shall not be directed into streets and storm drains.	
Common Area Landscape Maintenance	Owner	Manage landscaping in accordance with the City regulations, and with management guidelines for the use of fertilizers and pesticides and with the County of Orange	Monthly during regular maintenance
BMP Maintenance	Owner	The owner and employees will be instructed in environmental procedures regarding contamination and clean-up.	Per established maintenance BMP schedule.
Common Area Litter Control	Owner	A contract for trash management and litter control and landscape maintenance will be made with outside contractors as necessary	Daily, during regular maintenance. Litter patrol and emptying trash receptacles.
Employee Training	Owner	Educational materials	When new employees are hired, and once every six months.
Catch Basin inspection	Owner	Inspect proposed catch basin for debris and clean when required	Monthly and prior to October 1 st each year

Private Street Sweeping	Owner	A contract for street sweeping and litter control will be made with outside contractors as necessary. The contractor will routinely sweep, shovel, and dispose of litter in the trash. The contractor will use dry cleaning methods to prevent the discharge of pollutants into the stormwater conveyance system.	Sweep private alleys, monthly and prior to the storm season. Remove oil and petroleum hydrocarbons if any at the drive-way once every 6 months.
Storm Drain System Stencilling and Signage	Owner	Inspect for re-stencilling needs and re-stencil as necessary	Once every 6 months
Efficient Irrigation System	Owner	Verify that the runoff minimizing landscape design continues to function by checking that water sensors are functioning properly, that irrigation heads are adjusted properly to eliminate overspray to landscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year weather and day or night time temperatures.	Once a week with maintenance activities.

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Proprietary Biotreatment	Owner	Mow grass and remove weeds to limit unwanted vegetation as required. Remove litter and debris from the proprietary biotreatment area as required	Prior to October 1 st each year and weekly as part of landscape maintenance operations.
Impervious Area Dispersion	Owner	Trim plants and remove weeds to limit unwanted vegetation as required. Remove litter and debris from the landscape area as required.	Prior to October 1 st each year and weekly as part of landscape maintenance operations.

The funding for the treatment and structural BMPs will be provided by the owner through the current budget for Operation and Maintenance.

Responsible Party Information:

Name: Adam Covington Director of Development
Street Lights Residential Development, LLC
4180 La Jolla Village Drive, Suite 125
La Jolla, CA 92037
Acovington@streetlightsres.com

Phone Number: (858) 245-1937

Section VI BMP Exhibit (Site Plan)

VI.1 BMP Exhibit (Site Plan)

Include a BMP Exhibit (Site Plan) which includes the following minimum information:

- Insert in the title block (lower right hand corner) of BMP Exhibit: the WQMP Number (assigned by staff) and the grading/building or Planning Application permit numbers
- Project location (address, tract/lot number(s), etc.)
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural BMP locations
- Drainage delineations and flow information
- Delineate the area being treated by each structural BMP
- GIS coordinates for LID and Treatment Control BMPs
- Drainage connections
- BMP details
- Preparer name and stamp

Please do not include any areas outside of the project area or any information not related to drainage or water quality. The approved BMP Exhibit (Site Plan) shall be submitted as a plan sheet on all grading and building plan sets submitted for plan check review and approval. The BMP Exhibit shall be at the same size as the rest of the plan sheets in the submittal and shall have an approval stamp and signature prior to plan check submittal.

VI.2 Submittal and Recordation of Water Quality Management Plan

Following approval of the Final Project-Specific WQMP, three copies of the approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be submitted. In addition, these documents shall be submitted in a PDF format.

Each approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be recorded in the Orange County Clerk-Recorder's Office, prior to close-out of grading and/or building permit. Educational Materials are not required to be included.

Section VII Educational Materials

Refer to the Orange County Stormwater Program (ocwatersheds.com) for a library of materials available. Please only attach the educational materials specifically applicable to this 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)	☐	Landscape Maintenance SC-73	☒
Recycle at Your Local Used Oil Collection Center (Central County)	☐	Efficient Irrigation SD-12	☒
Recycle at Your Local Used Oil Collection Center (South 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

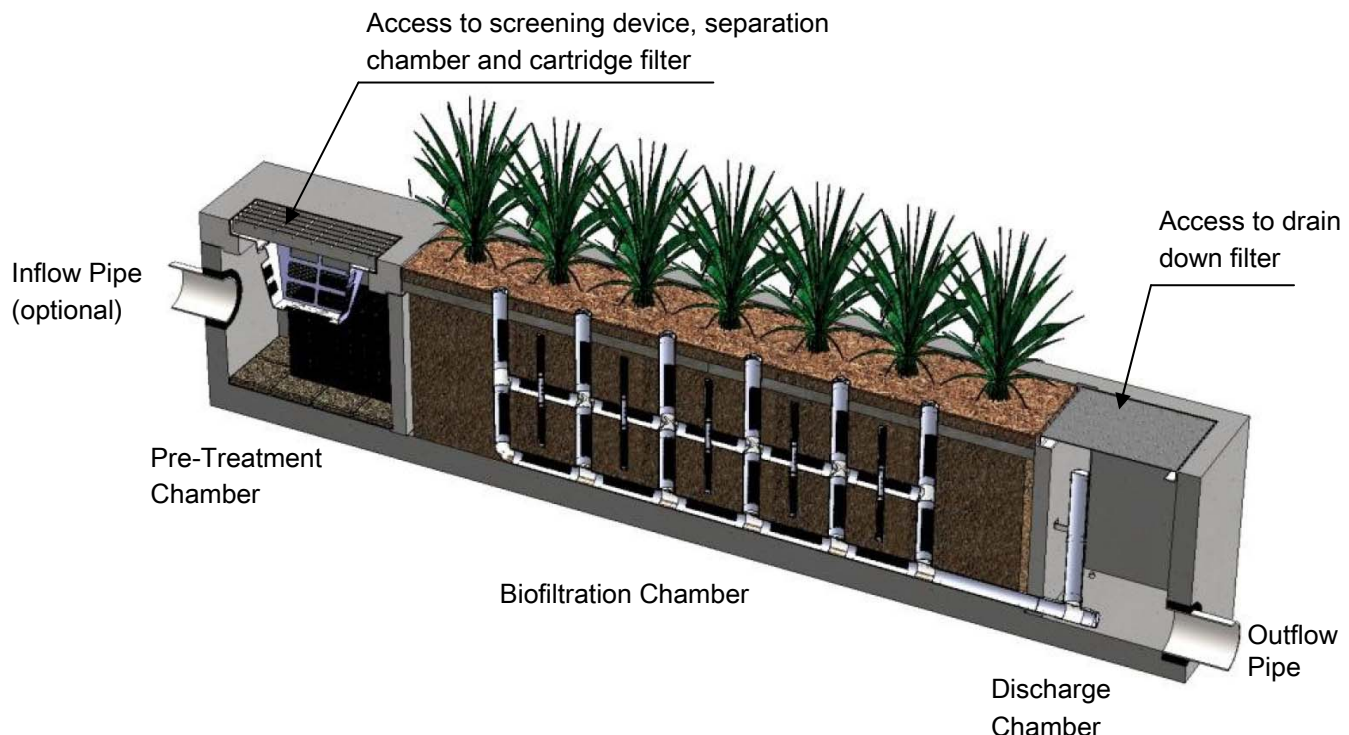
Education Materials

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

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

System Diagram



Maintenance Procedures

Screening Device

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

Separation Chamber

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

Cartridge Filters

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

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.



Maintenance Notes

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

Maintenance Procedure Illustration

Screening Device

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



Separation Chamber

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



Cartridge Filters

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



Drain Down Filter

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



Trim Vegetation

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





Inspection Form



Modular Wetland System, Inc.

P. 760.433-7640

F. 760-433-3176

E. Info@modularwetlands.com

www.modularwetlands.com



Inspection Report Modular Wetlands System



Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____

Phone () -

Inspector Name _____

Date ____ / ____ / ____ Time ____ AM / PM

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

Weather Condition _____

Additional Notes _____

For Office Use Only

(Reviewed By)

(Date)
Office personnel to complete section to the left.

Inspection Checklist

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

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

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

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

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____



Maintenance Report



Modular Wetland System, Inc.

P. 760.433-7640

F. 760-433-3176

E. Info@modularwetlands.com

www.modularwetlands.com



Cleaning and Maintenance Report Modular Wetlands System



Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____

Phone () -

Inspector Name _____

Date ____ / ____ / ____ Time ____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint

☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____

Additional Notes _____

For Office Use Only

(Reviewed By)

(Date)
Office personnel to complete section to the left.

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

Comments:

Do your part to prevent water pollution in our creeks, rivers, bays and ocean.



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of household hazardous waste can lead to water pollution. Batteries, electronics, paint, oil, gardening chemicals, cleaners and other hazardous materials cannot be thrown in the trash. They also must never be poured or thrown into yards, sidewalks, driveways, gutters or streets. Rain or other water could wash the materials into the storm drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

**NEVER DISPOSE
OF HOUSEHOLD
HAZARDOUS
WASTE IN THE
TRASH, STREET,
GUTTER,
STORM DRAIN
OR SEWER.**

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

**To Report Illegal Dumping of
Household Hazardous Waste
call 1-800-69-TOXIC**

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.



Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Disposal of Household Hazardous Waste



**The Ocean Begins at
Your Front Door**

P R O J E C T
Pollution
P R E V E N T I O N

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be “household hazardous waste” or “HHW.” HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

*WHEN POSSIBLE,
USE
NON-HAZARDOUS
OR
LESS-HAZARDOUS
PRODUCTS.*

Disposal of HHW down the drain, on the ground, into storm drains, or in the trash is illegal and unsafe.

Proper disposal of HHW is actually easy. Simply drop them off at a Household Hazardous Waste Collection Center (HHWCC) for free disposal and recycling. Many materials including anti-freeze, latex-based paint, motor oil and batteries can be recycled. Some centers have a “Stop & Swap” program that lets you take partially used home, garden, and automobile products free of charge. There are four HHWCCs in Orange County:

Anaheim:.....1071 N. Blue Gum St
Huntington Beach:17121 Nichols St
Irvine:.....6411 Oak Canyon
San Juan Capistrano:.... 32250 La Pata Ave

Centers are open Tuesday-Saturday, 9 a.m.-3 p.m. Centers are closed on rainy days and major holidays. For more information, call (714) 834-6752 or visit www.oclandfills.com.

Common household hazardous wastes

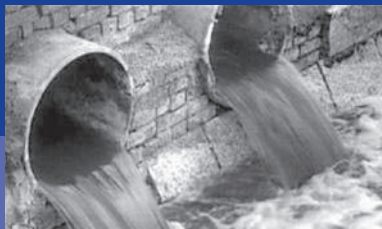
- Batteries
- Paint and paint products
- Adhesives
- Drain openers
- Household cleaning products
- Wood and metal cleaners and polishes
- Pesticides
- Fungicides/wood preservatives
- Automotive products (antifreeze, motor oil, fluids)
- Grease and rust solvents
- Fluorescent lamps
- Mercury (thermometers & thermostats)
- All forms of electronic waste including computers and microwaves
- Pool & spa chemicals
- Cleaners
- Medications
- Propane (camping & BBQ)
- Mercury-containing lamps

- Television & monitors (CRTs, flatscreens)

Tips for household hazardous waste

- Never dispose of HHW in the trash, street, gutter, storm drain or sewer.
- Keep these materials in closed, labeled containers and store materials indoors or under a cover.
- When possible, use non-hazardous products.
- Reuse products whenever possible or share with family and friends.
- Purchase only as much of a product as you'll need. Empty containers may be disposed of in the trash.
- HHW can be harmful to humans, pets and the environment. Report emergencies to 911.





Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Pet waste and pet care products can be washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never put pet waste or pet care products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

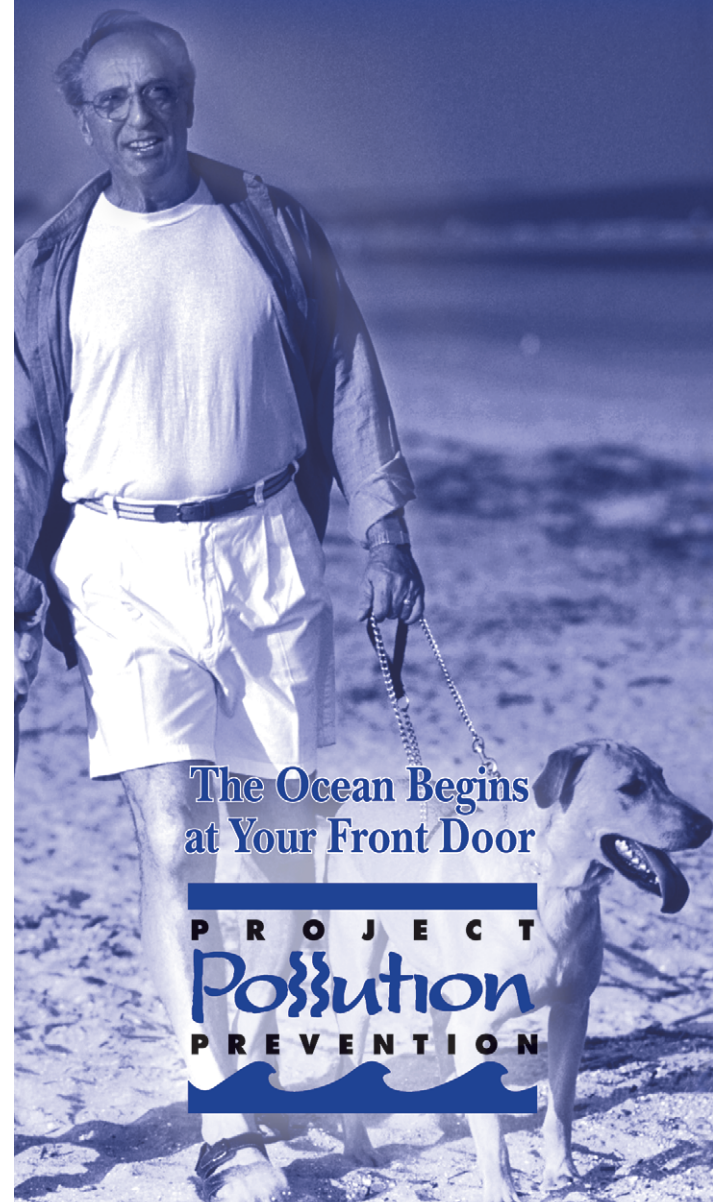
The tips contained in this brochure provide useful information to help prevent water pollution while caring for your pet. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for Pet Care



The Ocean Begins
at Your Front Door



Tips for Pet Care

Never let any pet care products or washwater run off your yard and into the street, gutter or storm drain.

Washing Your Pets

Even biodegradable soaps and shampoos can be harmful to marine life and the environment.

- If possible, bathe your pets indoors using less-toxic shampoos or have your pet professionally groomed. Follow instructions on the products and clean up spills.
- If you bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from running into the street, gutter or storm drain.



Flea Control

- Consider using oral or topical flea control products.
- If you use flea control products such as shampoos, sprays or collars, make sure to dispose of any unused products at a Household Hazardous Waste Collection Center. For location information, call (714) 834-6752.



Why You Should Pick Up After Your Pet

It's the law!
Every city has an ordinance requiring you to pick up after your pet. Besides being a nuisance, pet



waste can lead to water pollution, even if you live inland. During rainfall, pet waste left outdoors can wash into storm drains. This waste flows directly into our waterways and the ocean where it can harm human health, marine life and the environment.

As it decomposes, pet waste demands a high level of oxygen from water. This decomposition can contribute to killing marine life by reducing the amount of dissolved oxygen available to them.



Have fun with your pets, but please be a responsible pet owner by taking care of them and the environment.

- Take a bag with you on walks to pick up after your pet.
- Dispose of the waste in the trash or in a toilet.

Sewage Spill Regulatory Requirements

Allowing sewage to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts.

Here are the pertinent codes, fines, and agency contact information that apply.

Orange County Stormwater Program

24 Hour Water Pollution Reporting Hotline

1-877-89-SPILL (1-877-897-7455)

- County and city water quality ordinances prohibit discharges containing pollutants.

Orange County Health Care Agency Environmental Health

(714) 433-6419

California Health and Safety Code, Sections 5410-5416

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
 - must immediately notify the local health agency of the discharge.
 - shall reimburse the local health agency for services that protect the public's health and safety (water-contact receiving waters).
 - who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between \$500–\$1,000) and/or imprisonment for less than one year.

Regional Water Quality Control Board Santa Ana Region San Diego Region

(951) 782-4130

(858) 467-2952

- Requires the prevention, mitigation, response to and reporting of sewage spills.

California Office of Emergency Services

(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271
California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters shall immediately notify the Office of Emergency Services.
- Any person who fails to provide the notice required by this section is guilty of a misdemeanor and shall be punished by a fine (less than \$20,000) and/or imprisonment for not more than one year.



Sewage Spill Reference Guide

Your Responsibilities as a Private Property Owner

Residences
Businesses
Homeowner/Condominium Associations
Federal and State Complexes
Military Facilities



Orange County
Sanitation District



Health Care Agency
Environmental Health



www.ocwatersheds.com

This brochure was designed courtesy of the Orange County Sanitation District (OCSd).
For additional information, call (714) 962-2411, or visit their website at www.ocsd.com

What is a Sewage Spill?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways and beaches.

Common Causes of Sewage Spills

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps or undersized sewers can cause blockages.

Infiltration and inflow (I/I) impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

You Are Responsible for a Sewage Spill Caused by a Blockage or Break in Your Sewer Lines!

Time is of the essence in dealing with sewage spills. You are required to **immediately**:

Control and minimize the spill. Keep spills contained on private property and out of gutters, storm drains and public waterways by shutting off or not using the water.

Use sandbags, dirt and/or plastic sheeting to prevent sewage from entering the storm drain system.

Clear the sewer blockage. Always wear gloves and wash your hands. It is recommended that a plumbing professional be called for clearing blockages and making necessary repairs.

Always notify your city sewer/public works department or public sewer district of sewage spills. If the spill enters the storm drains also notify the Health Care Agency. In addition, if it exceeds 1,000 gallons notify the Office of Emergency Services. Refer to the numbers listed in this brochure.

Overflowing
cleanout pipe
located on
private property



You Could Be Liable

Allowing sewage from your home, business or property to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up and enforcement efforts. See Regulatory Codes & Fines section for pertinent codes and fines that apply.

What to Look For

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls or ground/landscape around a building.

Caution

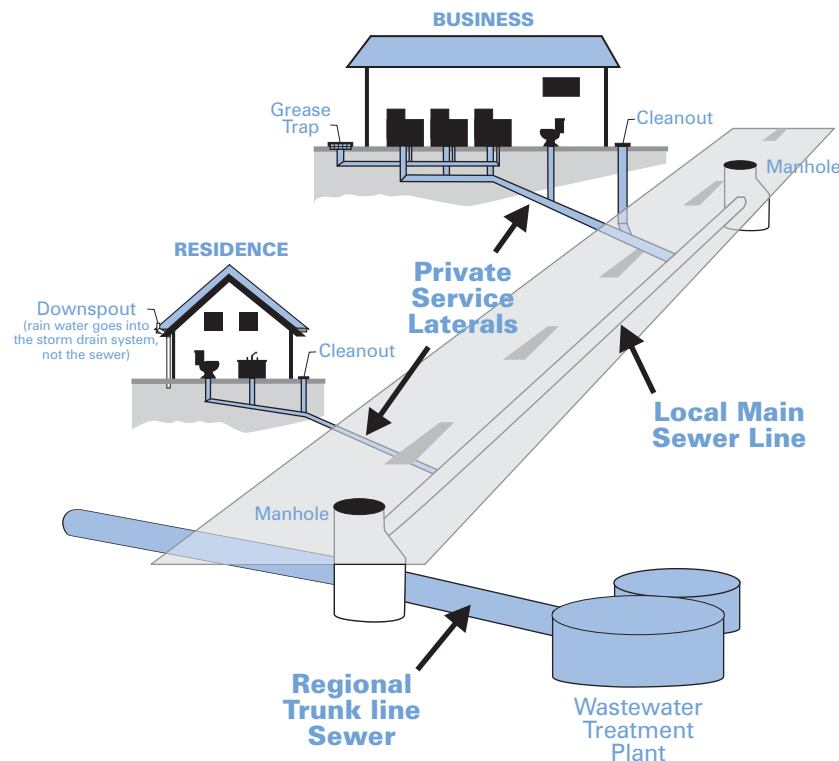
Keep people and pets away from the affected area. Untreated sewage has high levels of disease-causing viruses and bacteria. Call your local health care agency listed on the back for more information.

**If You See a Sewage Spill Occurring,
Notify Your City Sewer/Public Works
Department or Public Sewer District
IMMEDIATELY!**

How a Sewer System Works

A property owner's sewer pipes are called service laterals and are connected to larger local main and regional trunk lines. Service laterals run from the connection at the home to the connection with the public sewer (including the area under the street). These laterals are the responsibility of the property owner and must be maintained by the property owner. Many city agencies have adopted ordinances requiring maintenance of service laterals. Check with your city sewer/local public works department for more information.

Operation and maintenance of **local and regional sewer lines** are the responsibility of the city sewer/public works departments and public sewer districts.



How You Can Prevent Sewage Spills

- 1 Never put grease down garbage disposals, drains or toilets.**
- 2 Perform periodic cleaning to eliminate grease, debris and roots in your service laterals.**
- 3 Repair any structural problems in your sewer system and eliminate any rainwater infiltration/inflow leaks into your service laterals.**



Preventing Grease Blockages

The drain is not a dump! Recycle or dispose of grease properly and never pour grease down the drain.

Homeowners should mix fats, oils and grease with absorbent waste materials such as paper, coffee grounds, or kitty litter and place it in the trash. Wipe food scraps from plates and pans and dump them in the trash.

Restaurants and commercial food service establishments should always use "Kitchen Best Management Practices." These include:

- Collecting all cooking grease and liquid oil from pots, pans and fryers in covered grease containers for recycling.
- Scraping or dry-wiping excess food and grease from dishes, pots, pans and fryers into the trash.
- Installing drain screens on all kitchen drains.
- Having spill kits readily available for cleaning up spills.
- Properly maintaining grease traps or interceptors by having them serviced regularly. Check your local city codes.

Orange County Agency Responsibilities

- **City Sewer/Public Works Departments**—Responsible for protecting city property and streets, the local storm drain system, sewage collection system and other public areas.
- **Public Sewer/Sanitation District**—Responsible for collecting, treating and disposing of wastewater.
- **County of Orange Health Care Agency**—Responsible for protecting public health by closing ocean/bay waters and may close food-service businesses if a spill poses a threat to public health.
- **Regional Water Quality Control Boards**—Responsible for protecting State waters.
- **Orange County Stormwater Program**—Responsible for preventing harmful pollutants from being discharged or washed by stormwater runoff into the municipal storm drain system, creeks, bays and the ocean.

You Could Be Liable for Not Protecting the Environment

Local and state agencies have legal jurisdiction and enforcement authority to ensure that sewage spills are remedied.

They may respond and assist with containment, relieving pipe blockages, and/or clean-up of the sewage spill, especially if the spill is flowing into storm drains or onto public property.

A property owner may be charged for costs incurred by these agencies responding to spills from private properties.



Report Sewage Spills!

City Sewer/Public Works Departments

Aliso Viejo	(949) 425-2500
Anaheim	(714) 765-6860
Brea	(714) 990-7691
Buena Park	(714) 562-3655
Costa Mesa	(949) 645-8400
Cypress	(714) 229-6760
Dana Point	(949) 248-3562
Fountain Valley	(714) 593-4600
Fullerton	(714) 738-6897
Garden Grove	(714) 741-5375
Huntington Beach	(714) 536-5921
Irvine	(949) 453-5300
Laguna Beach	(949) 497-0765
Laguna Hills	(949) 707-2650
Laguna Niguel	(949) 362-4337
Laguna Woods	(949) 639-0500
La Habra	(562) 905-9792
Lake Forest	(949) 461-3480
La Palma	(714) 690-3310
Los Alamitos	(562) 431-3538
Mission Viejo	(949) 831-2500
Newport Beach	(949) 644-3011
Orange	(714) 532-6480
Orange County	(714) 567-6363
Placentia	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente	(949) 366-1553
San Juan Capistrano	(949) 443-6363
Santa Ana	(714) 647-3380
Seal Beach	(562) 431-2527
Stanton	(714) 379-9222
Tustin	(714) 962-2411
Villa Park	(714) 998-1500
Westminster	(714) 893-3553
Yorba Linda	(714) 961-7170

Public Sewer/Water Districts

Costa Mesa Sanitary District	(714) 393-4433/ (949) 645-8400
El Toro Water District	(949) 837-0660
Emerald Bay Service District	(949) 494-8571
Garden Grove Sanitary District	(714) 741-5375
Irvine Ranch Water District	(949) 453-5300
Los Alamitos/Rossmoor Sewer District	(562) 431-2223
Midway City Sanitary District (Westminster)	(714) 893-3553
Moulton Niguel Water District	(949) 831-2500
Orange County Sanitation District	(714) 962-2411
Santa Margarita Water District	(949) 459-6420
South Coast Water District	(949) 499-4555
South Orange County Wastewater Authority	(949) 234-5400
Sunset Beach Sanitary District	(562) 493-9932
Trabuco Canyon Sanitary District	(949) 858-0277
Yorba Linda Water District	(714) 777-3018

Other Agencies

Orange County Health Care Agency	(714) 433-6419
Office of Emergency Services	(800) 852-7550



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

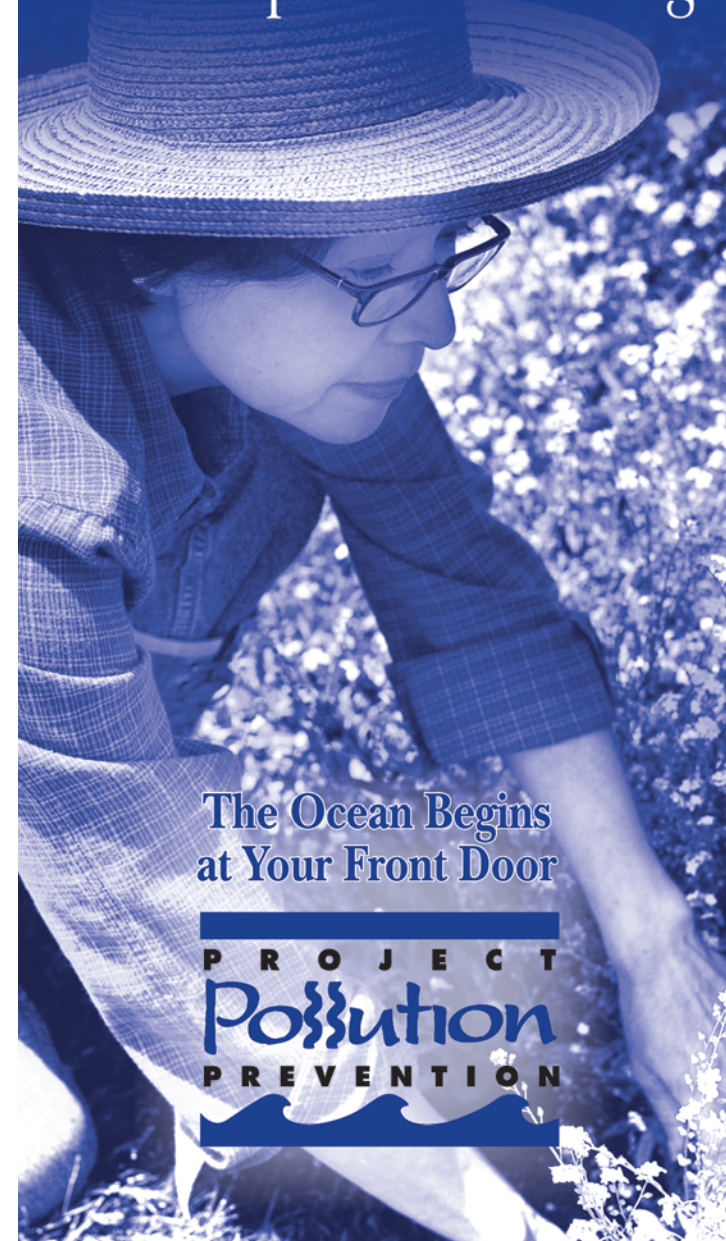
The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Landscape & Gardening



The Ocean Begins
at Your Front Door



Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.
- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.



Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.

- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.



- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.



- Rinse empty pesticide containers and re-use rinse water as you would use the

product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.

- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit www.ipm.ucdavis.edu.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oclandfills.com



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as pest control can lead to water pollution if you're not careful. Pesticide treatments must be planned and applied properly to ensure that pesticides do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pesticides into the ocean, so don't let it enter the storm drains. Pesticides can cause significant damage to our environment if used improperly. If you are thinking of using a pesticide to control a pest, there are some important things to consider.

For more information,
please call
University of California Cooperative
Extension Master Gardeners at
(714) 708-1646
or visit these Web sites:
www.uccemg.org
www.ipm.ucdavis.edu

For instructions on collecting a specimen
sample visit the Orange County
Agriculture Commissioner's website at:
http://www.ocagcomm.com/ser_lab.asp

To report a spill, call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

Information From:
Cheryl Wilen, Area IPM Advisor; Darren Haver,
Watershed Management Advisor; Mary
Louise Flint, IPM Education and Publication
Director; Pamela M. Geisel, Environmental
Horticulture Advisor; Carolyn L. Unruh,
University of California Cooperative
Extension staff writer. Photos courtesy of
the UC Statewide IPM Program and
Darren Haver.

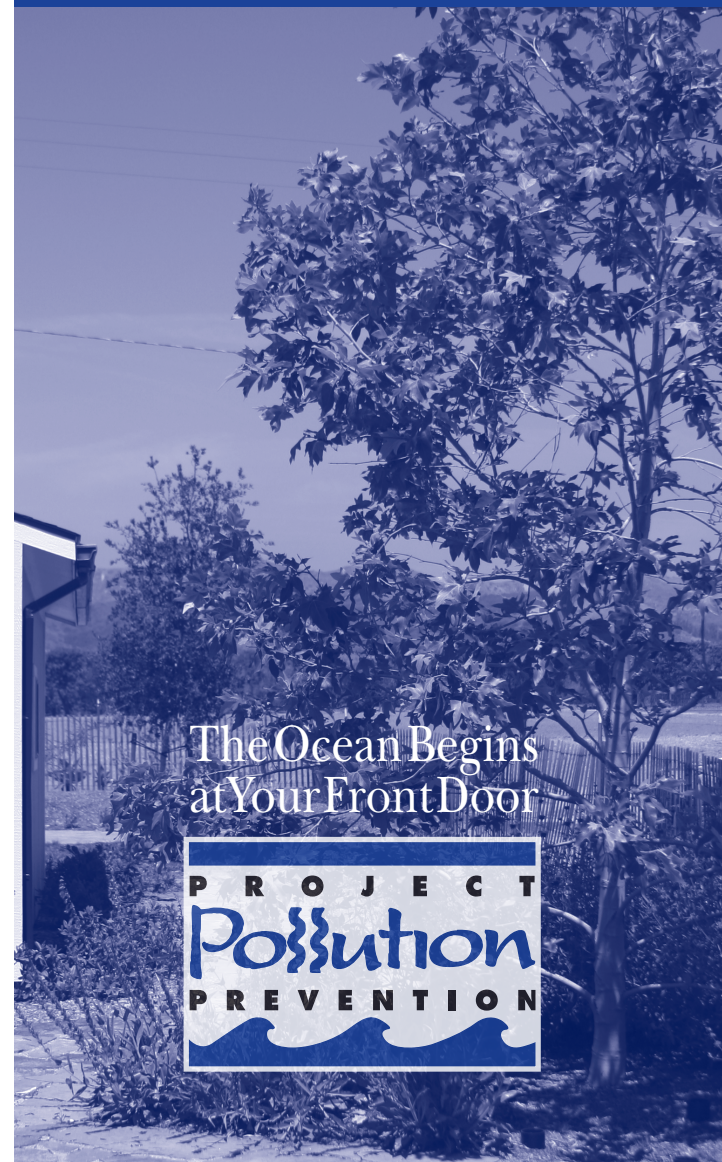
Funding for this brochure has been provided in full
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Costa-Machado Water Act of 2000 (Prop. 13).



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Help Prevent Ocean Pollution:

Responsible Pest Control



The Ocean Begins
at Your Front Door



Tips for Pest Control

Key Steps to Follow:

Step 1: Correctly identify the pest (insect, weed, rodent, or disease) and verify that it is actually causing the problem.



This is important because beneficial insects are often mistaken for pests and sprayed with pesticides needlessly.

Consult with a Certified Nursery

Professional at a local nursery or garden center or send a sample of the pest to the Orange County Agricultural Commissioner's Office.

Determine if the pest is still present – even though you see damage, the pest may have left.

Step 2: Determine how many pests are present and causing damage.



Small pest populations may be controlled more safely using non-pesticide techniques. These include removing food sources, washing off leaves with a strong stream of water, blocking entry into the home using caulking and replacing problem plants with ones less susceptible to pests.

Integrated Pest Management (IPM) usually combines several least toxic pest control methods for long-term prevention and management of pest problems without harming you, your family, or the environment.



Step 3: If a pesticide must be used, choose the least toxic chemical.

Obtain information on the least toxic pesticides that are effective at controlling the target pest from the UC Statewide Integrated Pest Management (IPM) Program's Web site at www.ipm.ucdavis.edu.

Seek out the assistance of a Certified Nursery Professional at a local nursery or garden center when selecting a pesticide. Purchase the smallest amount of pesticide available.

Apply the pesticide to the pest during its most vulnerable life stage. This information can be found on the pesticide label.

Step 4: Wear appropriate protective clothing.

Follow pesticide labels regarding specific types of protective equipment you should wear. Protective clothing should always be washed separately from other clothing.

Step 5: Continuously monitor external conditions when applying pesticides such as weather, irrigation, and the presence of children and animals.

Never apply pesticides when rain is predicted within the next 48 hours. Also, do not water after applying pesticides unless the directions say it is necessary.

Apply pesticides when the air is still; breezy conditions may cause the spray or dust to drift away from your targeted area.

In case of an emergency call 911 and/or the regional poison control number at (714) 634-5988 or (800) 544-4404 (CA only).

For general questions you may also visit www.calpoison.org.

Step 6: In the event of accidental spills, sweep up or use an absorbent agent to remove any excess pesticides. Avoid the use of water.

Be prepared. Have a broom, dust pan, or dry absorbent material, such as cat litter, newspapers or paper towels, ready to assist in cleaning up spills.

Contain and clean up the spill right away. Place contaminated materials in a doubled plastic bag. All materials used to clean up the spill should be properly disposed of according to your local Household Hazardous Waste Disposal site.

Step 7: Properly store and dispose of unused pesticides.

Purchase Ready-To-Use (RTU) products to avoid storing large concentrated quantities of pesticides.



Store unused chemicals in a locked cabinet.

Unused pesticide chemicals may be disposed of at a Household Hazardous Waste Collection Center.

Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.

Household Hazardous Waste
Collection Center
(714) 834-6752
www.oilandfills.com





For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Residential Pool, Landscape and Hardscape Drains



The Ocean Begins
at Your Front Door

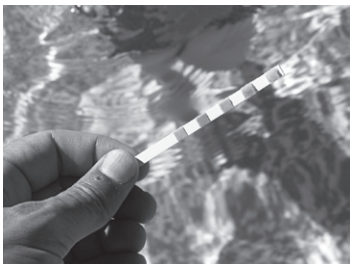


Tips for Residential Pool, Landscape and Hardscape Drains

Pool Maintenance

All pool water discharged to the curb, gutter or permitted pool drain from your property must meet the following water quality criteria:

- The residual chlorine does not exceed 0.1 mg/L (parts per million).
- The pH is between 6.5 and 8.5.
- The water is free of any unusual coloration.
- There is no discharge of filter media or acid cleaning wastes.



Some cities have ordinances that do not allow pool water to be discharged to the storm drain. Check with your city.

Landscape and Hardscape Drains

The following recommendations will help reduce or prevent pollutants from your landscape and hardscape drains from entering the street, gutter or storm drain. Unlike water that enters the sewer (from sinks and toilets), water that enters a landscape or hardscape drain is not treated before entering our creeks, rivers, bays and ocean.

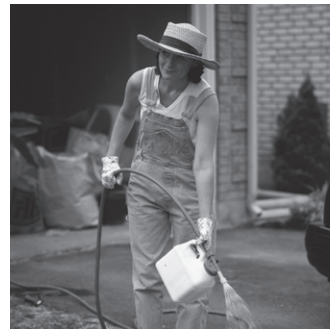
Household Activities

- Do not rinse spills of materials or chemicals to any drain.
- Use dry cleanup methods such as applying cat litter or another absorbent material, then sweep it up and dispose of it in the trash. If the material is hazardous, dispose of it at a Household Hazardous Waste Collection Center (HHWCC). For locations, call (714) 834-6752 or visit www.oclandfills.com.
- Do not hose down your driveways, sidewalks or patios to your landscape or hardscape drain. Sweep up debris and dispose of it in the trash.
- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash.

- Do not store items such as cleaners, batteries, automotive fluids, paint products, TVs, or computer monitors uncovered outdoors. Take them to a HHWCC for disposal.

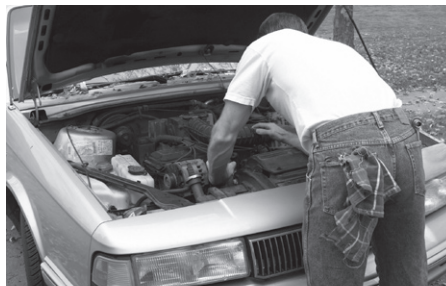
Yard Maintenance

- Do not overwater. Water by hand or set automated irrigation systems to reflect seasonal water needs.
- Follow directions on pesticides and fertilizers (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Cultivate your garden often to control weeds and reduce the need to use chemicals.



Vehicle Maintenance

- Never pour oil or antifreeze down your landscape or hardscape drain. Recycle these substances at a service station, a waste collection center or used oil recycling center. For locations, contact the Used Oil Program at 1-800-CLEANUP or visit www.CLEANUP.org.
- Whenever possible, take your vehicle to a commercial car wash.
- If you do wash your vehicle at home, do not allow the washwater to go down your landscape or hardscape drain. Instead, dispose of it in the sanitary sewer (a sink or toilet) or onto an absorbent surface such as your lawn.
- Use a spray nozzle that will shut off the water when not in use.





Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☒



Supplemental Information***Further Detail of the BMP******Waste Management***

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm



Design Objectives

- ☒ Maximize Infiltration
- ☒ Provide Retention
- ☒ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.



- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
 - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
 - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
 - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
 - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

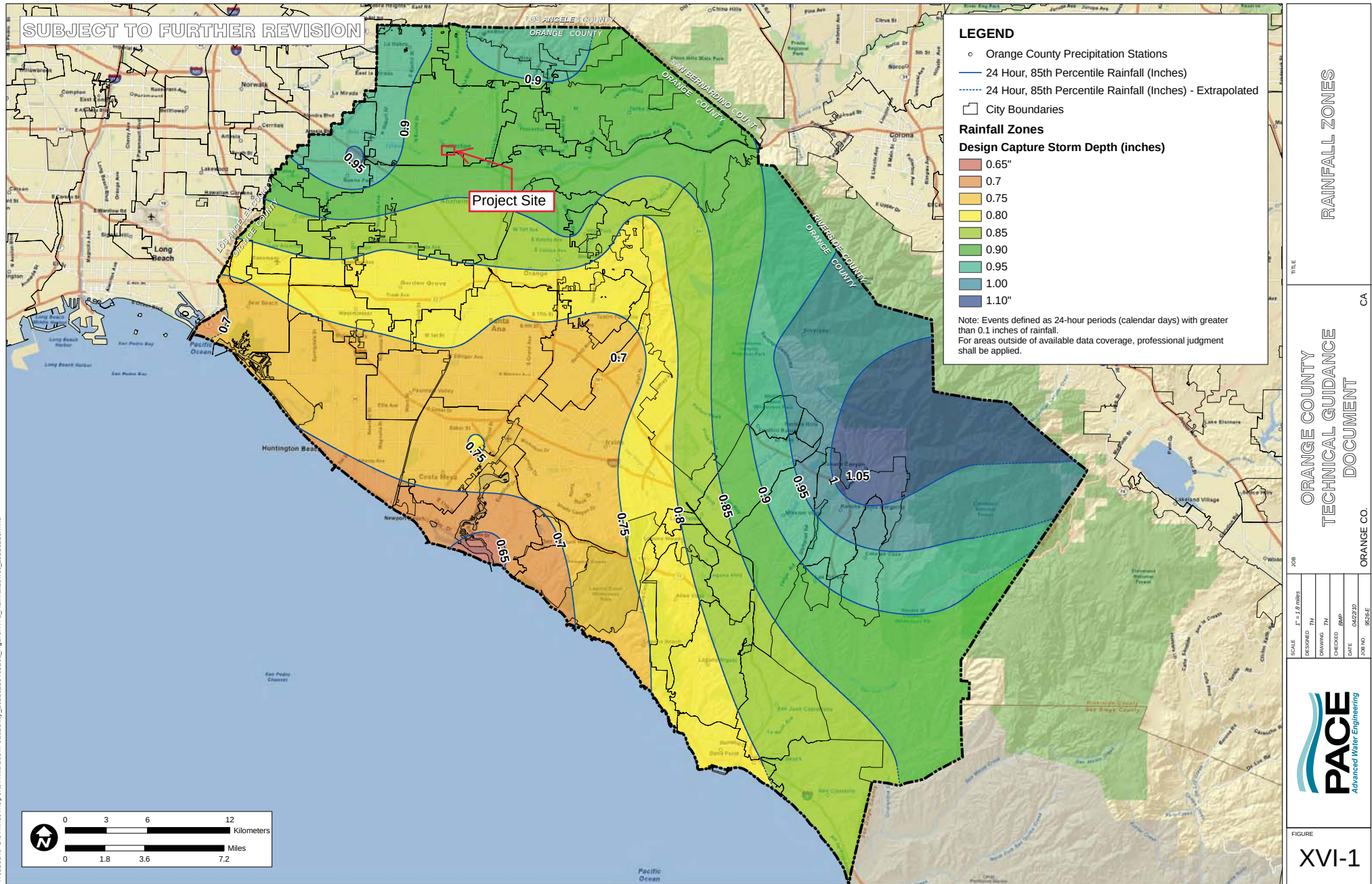
Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

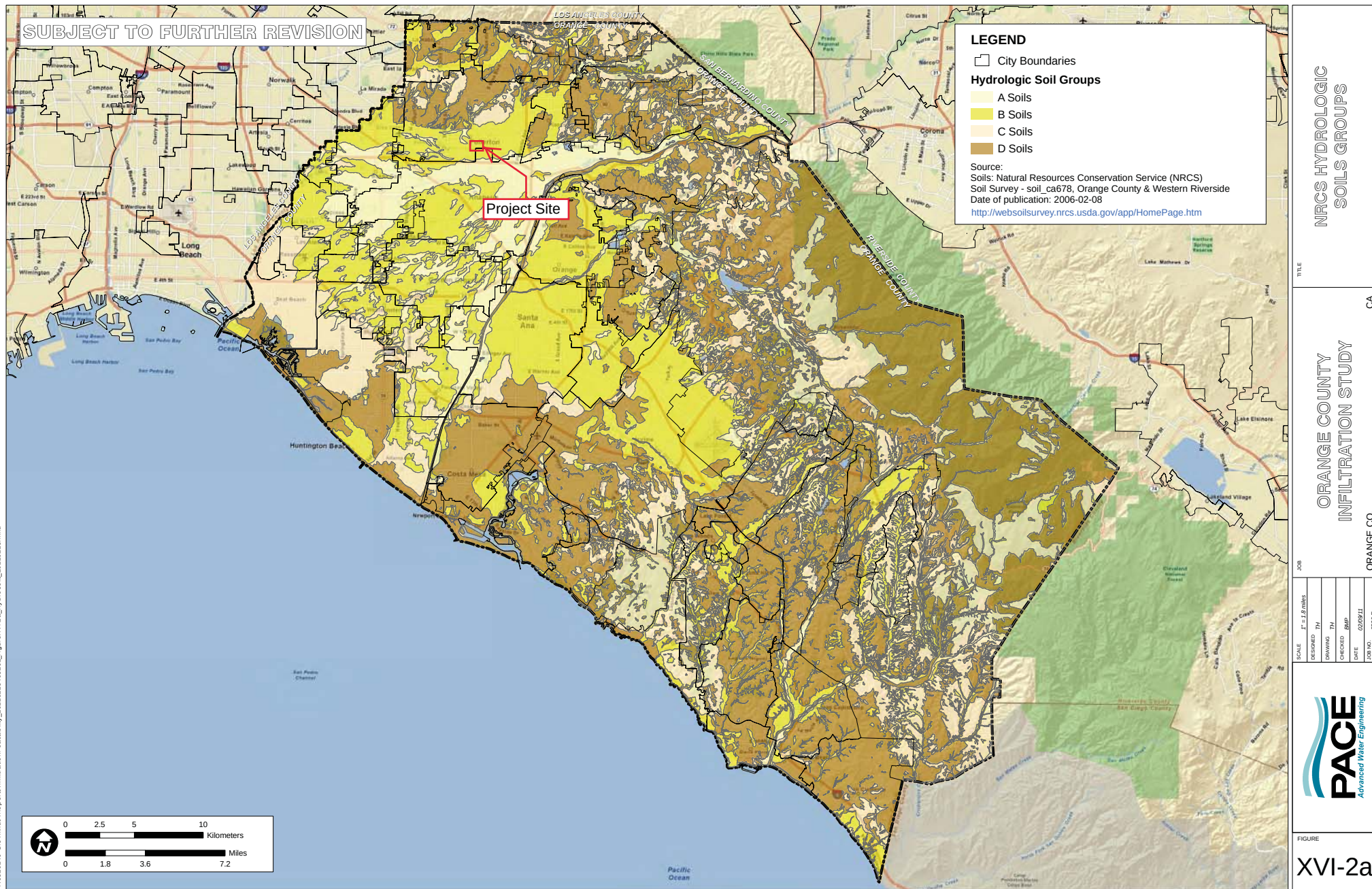
Attachment B

TGD Exhibits

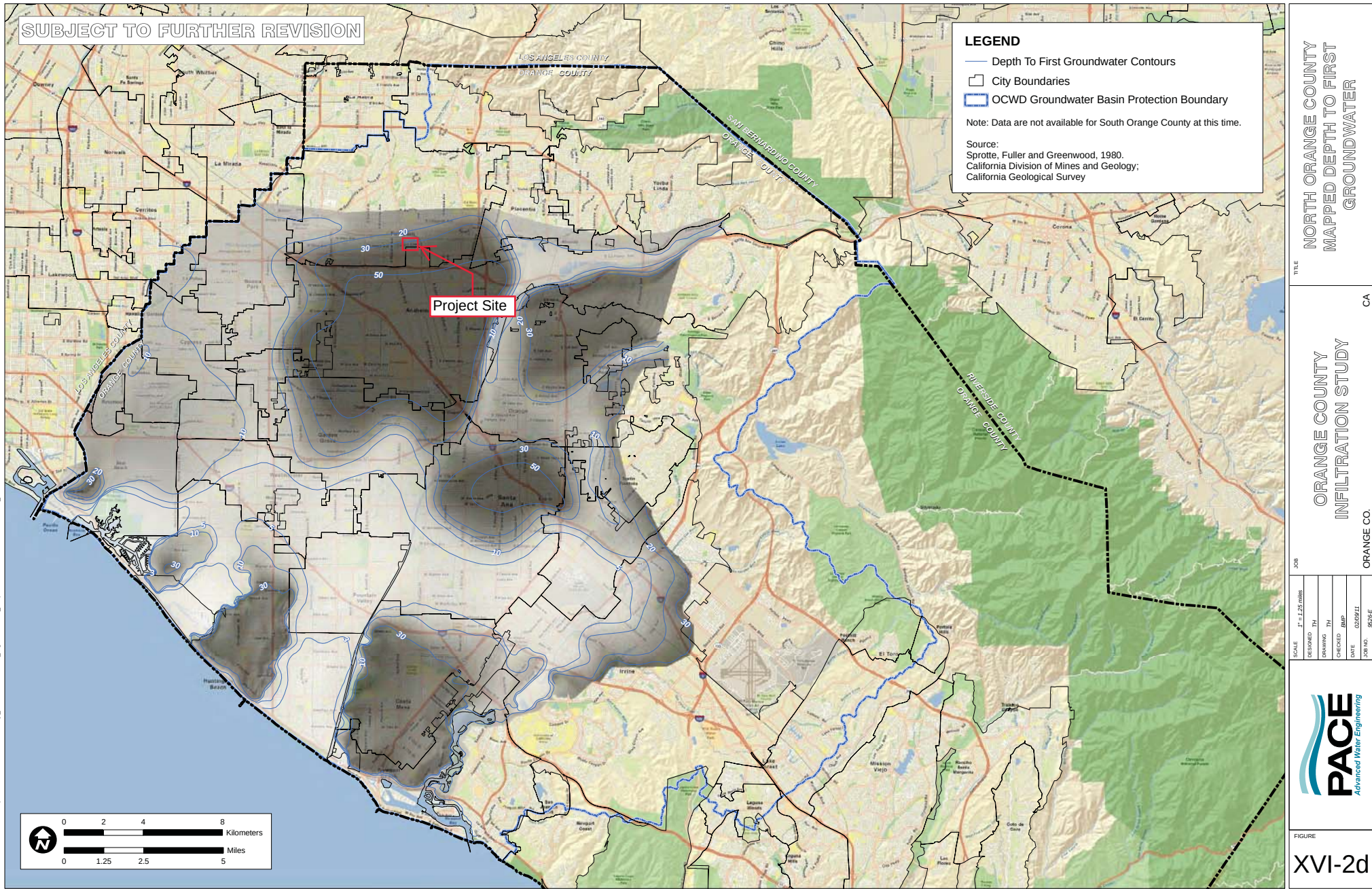
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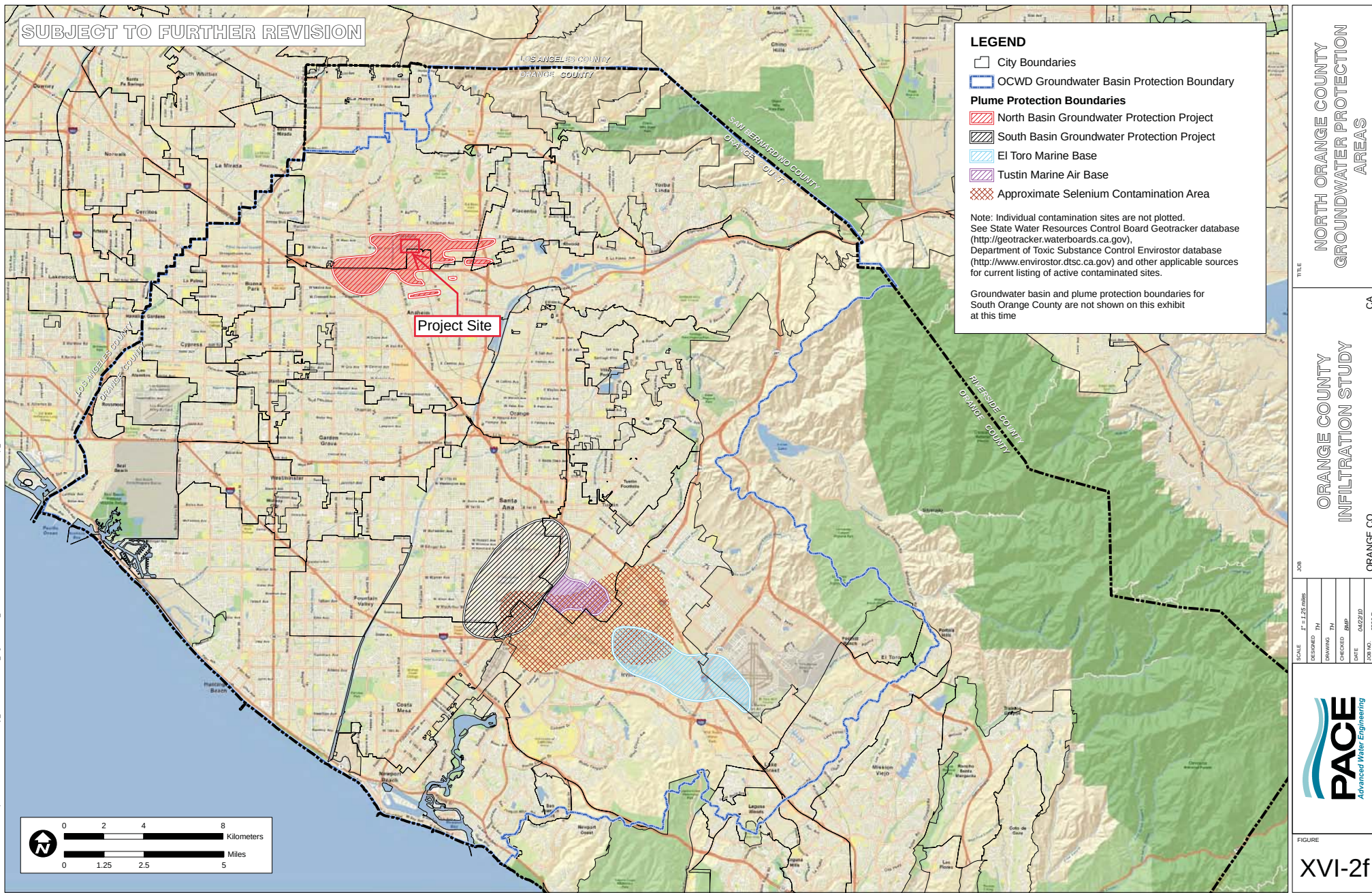
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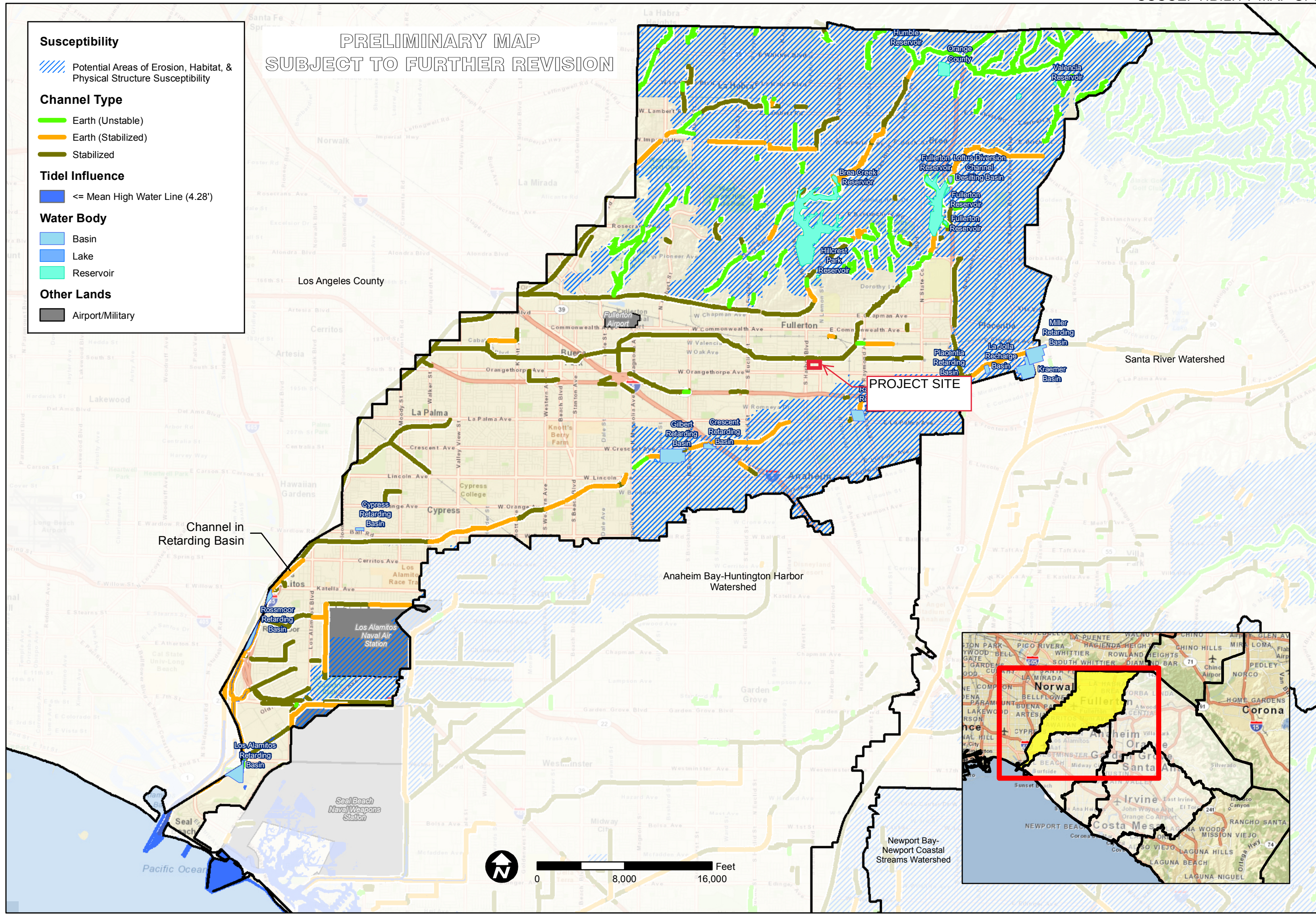
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Susceptibility

/// Potential Areas of Erosion, Habitat, & Physical Structure Susceptibility

Channel Type

- Earth (Unstable)
- Earth (Stabilized)
- Stabilized

Tidal Influence

≤ Mean High Water Line (4.28')

Water Body

- Basin
- Lake
- Reservoir

Other Lands

Airport/Military

PRELIMINARY MAP
SUBJECT TO FURTHER REVISION

PROJECT SITE

Channel in Retarding Basin

Anaheim Bay-Huntington Harbor Watershed

Santa River Watershed

Newport Bay-Newport Coastal Streams Watershed



0 8,000 16,000 Feet

ORANGE COUNTY
WATERSHED
MASTER PLANNING

SUSCEPTIBILITY ANALYSIS
SAN GABRIEL-COYOTE CREEK

SCALE	1" = 800'
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	04/30/10
JOB NO.	9526-E



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)	$d =$	0.9	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$	N/A	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 - Line 2)	$d_{remainder} =$	0.9	inches
Step 2: Calculate the DCV				
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	217,800	acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$	80.71	
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	0.755	
4	Calculate runoff volume, $V_{design} = (C \times d_{remainder} \times A \times 43560 \times (1/12))$	$V_{design} =$	12,333	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)	$K_{observed} =$	N/A	In/hr
2	Enter combined safety factor from Worksheet H, S_{total} (unitless)	$S_{total} =$	N/A	
3	Calculate design infiltration rate, $K_{design} = K_{observed} / S_{total}$	$K_{design} =$	N/A	In/hr
Step 3b: Determine minimum BMP footprint				
4	Enter drawdown time, T (max 48 hours)	$T =$	N/A	Hours
5	Calculate max retention depth that can be drawn down within the drawdown time (feet), $D_{max} = K_{design} \times T \times (1/12)$	$D_{max} =$	N/A	feet
6	Calculate minimum area required for BMP (sq-ft), $A_{min} = V_{design} / d_{max}$	$A_{min} =$	N/A	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.

PROPRIETARY BIOTREATMENT USED

DMA-A - MWS-L-8-8 48-HOUR DRAINDOWN
TREATMENT CAPACITY
= 10,072 cf

DMA-B - MWS-L-4-8 48-HOUR DRAINDOWN
TREATMENT CAPACITY
= 5,036

10,072 cf + 5,036 cf = 15,108 cf > 12,333 cf

Attachment C

References and PWQMP Exhibit

Modular Wetlands System™ Linear

Biofiltration

Comprehensive Stormwater Solutions

Bio  Clean
A Forterra Company



OVERVIEW

The Bio Clean Modular Wetlands System™ Linear (MWS Linear) represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pretreatment, the MWS Linear incorporates an advanced pretreatment chamber that includes separation and pre-filter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber, in turn reducing maintenance costs and improving performance.

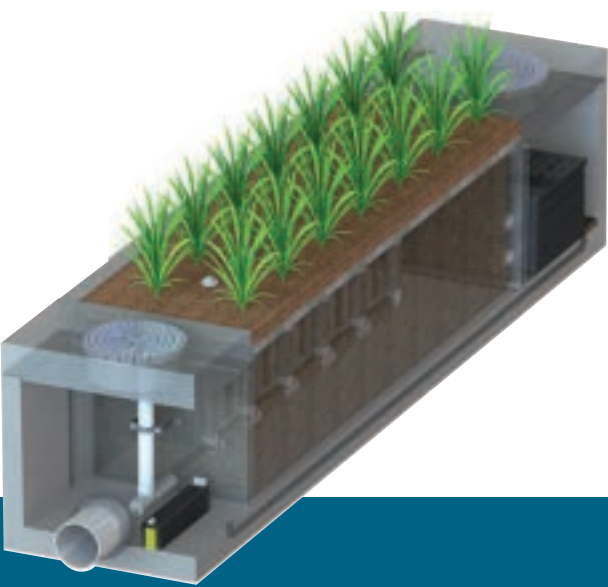
The Urban Impact

For hundreds of years, natural wetlands surrounding our shores have played an integral role as nature’s stormwater treatment

system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.

Plant A Wetland

Without natural wetlands, our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature’s presence and rejuvenate waterways in urban areas.



PERFORMANCE

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons, and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With its advanced pretreatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses nature’s ability to process, transform, and remove even the most harmful pollutants.

66% REMOVAL OF DISSOLVED ZINC	69% REMOVAL OF TOTAL ZINC	38% REMOVAL OF DISSOLVED COPPER	64% REMOVAL OF TOTAL PHOSPHORUS	
45% REMOVAL OF NITROGEN	50% REMOVAL OF TOTAL COPPER	95% REMOVAL OF MOTOR OIL	67% REMOVAL OF ORTHO PHOSPHORUS	85% REMOVAL OF TSS

APPROVALS

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation and perhaps the world.



WASHINGTON STATE TAPE APPROVED

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft² loading rate. The highest performing BMP on the market for all main pollutant categories.



DEQ ASSIGNMENT

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Regulation technical criteria.



MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED

Granted Environmental Site Design (ESD) status for new construction, redevelopment, and retrofitting when designed in accordance with the design manual.



MASTEP EVALUATION

The University of Massachusetts at Amherst – Water Resources Research Center issued a technical evaluation report noting removal rates up to 84% TSS, 70% total phosphorus, 68.5% total zinc, and more.



RHODE ISLAND DEM APPROVED

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% pathogens, 30% total phosphorus, and 30% total nitrogen.

ADVANTAGES

- HORIZONTAL FLOW BIOFILTRATION
- GREATER FILTER SURFACE AREA
- PRETREATMENT CHAMBER
- PATENTED PERIMETER VOID AREA
- FLOW CONTROL
- NO DEPRESSED PLANTER AREA
- AUTO DRAINDOWN MEANS NO MOSQUITO VECTOR

OPERATION

The MWS Linear is the most efficient and versatile biofiltration system on the market, and it is the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure 1 and Figure 2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

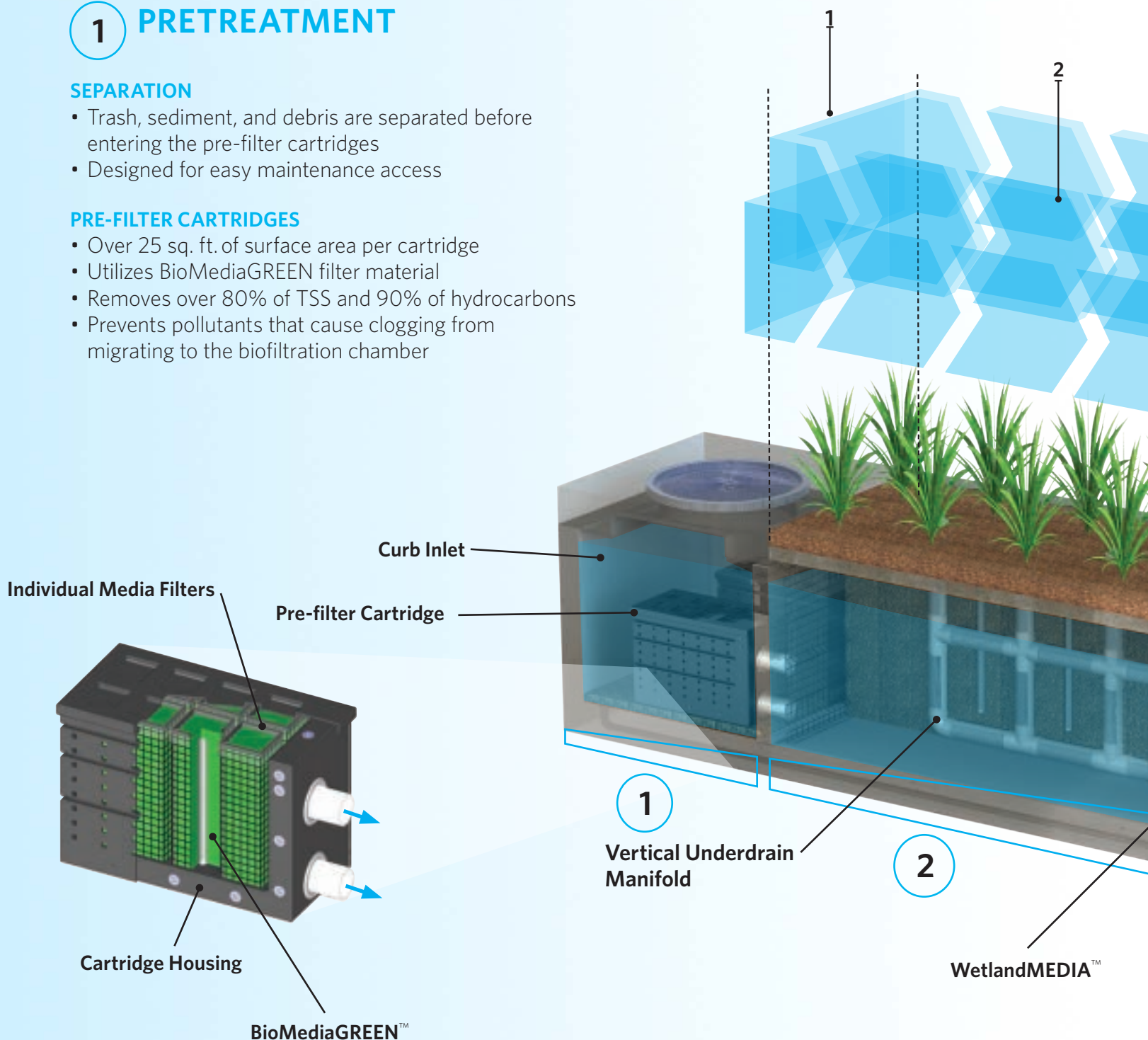
1 PRETREATMENT

SEPARATION

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

PRE-FILTER CARTRIDGES

- Over 25 sq. ft. of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS and 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



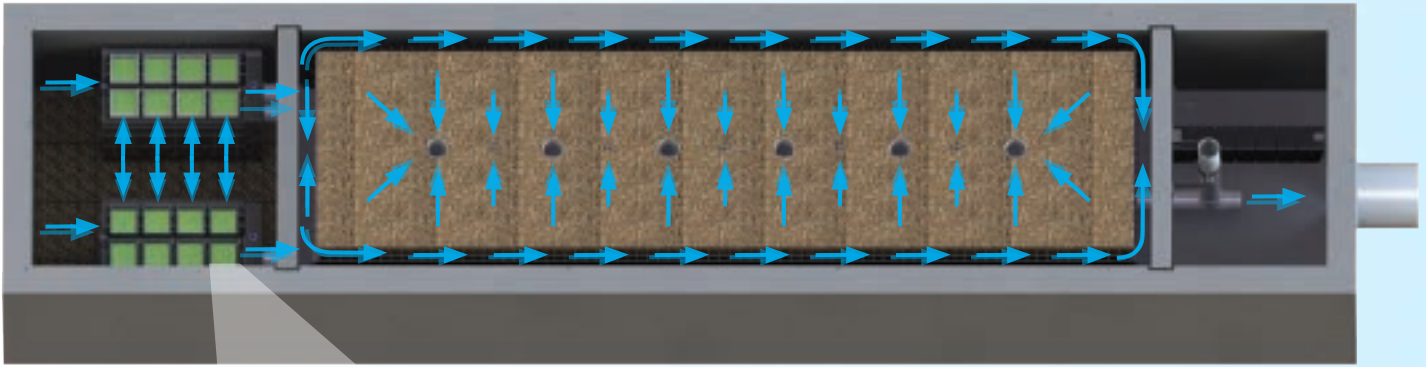


Figure 2,
Top View

2x to 3x more surface area than traditional downward flow bioretention systems.

2

BIOFILTRATION

HORIZONTAL FLOW

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

PATENTED PERIMETER VOID AREA

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides
- Maximizes surface area of the media for higher treatment capacity

WETLANDMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and lightweight

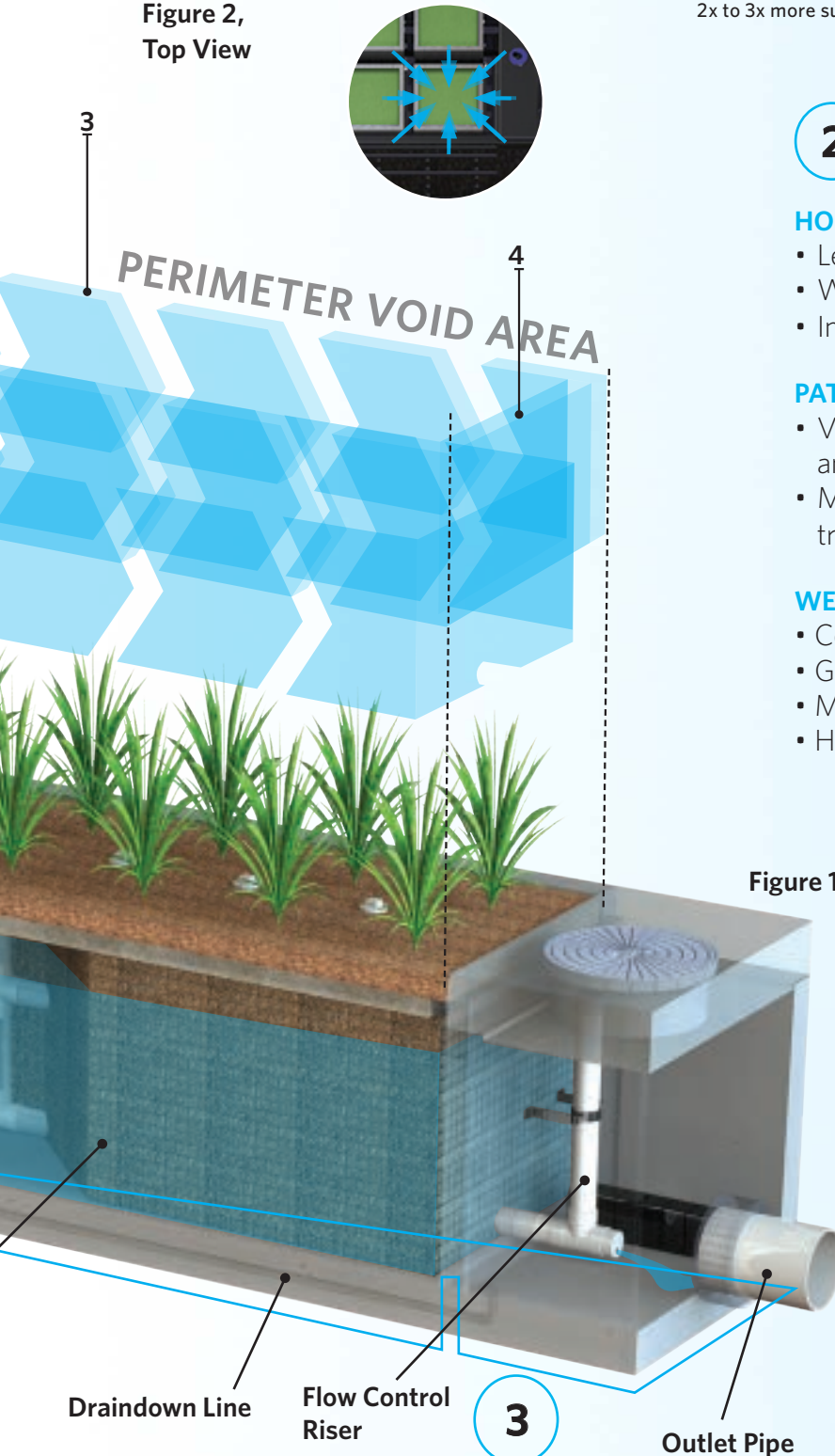


Figure 1

3

DISCHARGE

FLOW CONTROL

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity
- Extends the life of the media and improves performance

DRAINDOWN FILTER

- The draindown is an optional feature that completely drains the pretreatment chamber
- Water that drains from the pretreatment chamber between storm events will be treated



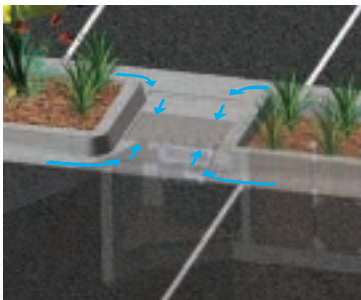
CONFIGURATIONS

The MWS Linear is the preferred biofiltration system of civil engineers across the country due to its versatile design. This highly versatile system has available “pipe-in” options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.



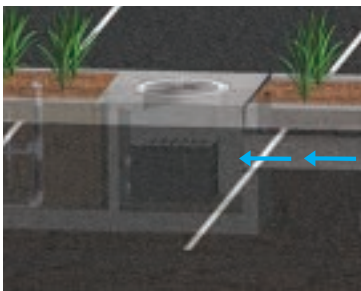
CURB TYPE

The Curb Type configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions. Length of curb opening varies based on model and size.



GRATE TYPE

The Grate Type configuration offers the same features and benefits as the Curb Type but with a grated/drop inlet above the systems pretreatment chamber. It has the added benefit of allowing pedestrian access over the inlet. ADA-compliant grates are available to assure easy and safe access. The Grate Type can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



VAULT TYPE

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pretreatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the “pipe-in” design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.



DOWNSPOUT TYPE

The Downspout Type is a variation of the Vault Type and is designed to accept a vertical downspout pipe from rooftop and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter, and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

ORIENTATIONS

SIDE-BY-SIDE

The Side-By-Side orientation places the pretreatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.



END-TO-END

The End-To-End orientation places the pretreatment and discharge chambers on opposite ends of the biofiltration chamber, therefore minimizing the width of the system to 5 ft. (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is that bypass must be external.



BYPASS

INTERNAL BYPASS WEIR (SIDE-BY-SIDE ONLY)

The Side-By-Side orientation places the pretreatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pretreatment chamber directly to the discharge chamber.

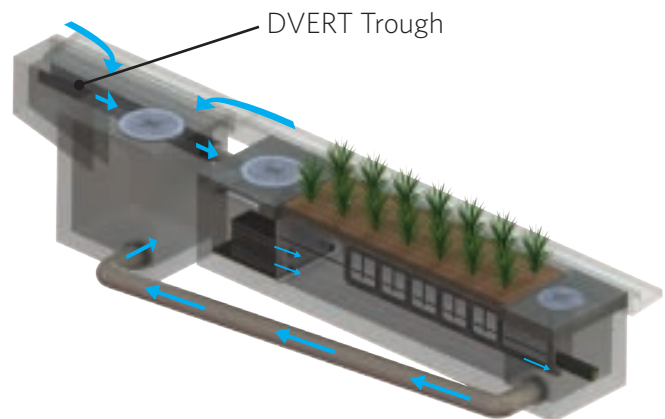
EXTERNAL DIVERSION WEIR STRUCTURE

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

FLOW-BY-DESIGN

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT LOW FLOW DIVERSION



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allow the MWS Linear to be installed anywhere space is available.

SPECIFICATIONS

FLOW-BASED

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 (sq.ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4' x 4'	23	0.052
MWS-L-4-6	4' x 6'	32	0.073
MWS-L-4-8	4' x 8'	50	0.115
MWS-L-4-13	4' x 13'	63	0.144
MWS-L-4-15	4' x 15'	76	0.175
MWS-L-4-17	4' x 17'	90	0.206
MWS-L-4-19	4' x 19'	103	0.237
MWS-L-4-21	4' x 21'	117	0.268
MWS-L-6-8	7' x 9'	64	0.147
MWS-L-8-8	8' x 8'	100	0.230
MWS-L-8-12	8' x 12'	151	0.346
MWS-L-8-16	8' x 16'	201	0.462
MWS-L-8-20	9' x 21'	252	0.577
MWS-L-8-24	9' x 25'	302	0.693

SPECIFICATIONS

VOLUME-BASED

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 DRAINDOWN	TREATMENT CAPACITY (cu. ft.) @ 48-HOUR DRAINDOWN
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036 DMA-B
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	10072 DMA-A
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145
MWS-L-8-20	12560	25120
MWS-L-8-24	15108	30216

APPLICATIONS

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.



INDUSTRIAL

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA-mandated effluent limits for dissolved metals and other pollutants.



RESIDENTIAL

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



STREETS

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and it offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.



PARKING LOTS

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.



COMMERCIAL

Compared to bioretention systems, the MWS Linear can treat far more area in less space, meeting treatment and volume control requirements.



MIXED USE

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications include:

- Agriculture
- Reuse
- Low Impact Development
- Waste Water

PLANT SELECTION

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



A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by visiting biocleanenvironmental.com/plants.

INSTALLATION



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

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

MAINTENANCE



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

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



398 Via El Centro
Oceanside, CA 92058
855.566.3938
stormwater@forterrabp.com
biocleanenvironmental.com

STORM WATER COLLECTION AND TREATMENT SYSTEM

FULLERTON TOWN CENTER - ORANGETHORPE AVE & LEMON STREET

SPECIFICATION FOR DUAL-WALL CORRUGATED POLYETHYLENE PIPE

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DUAL-WALL CORRUGATED POLYETHYLENE (PE) PIPE DETAILED IN THE PROJECT PLANS.

DESCRIPTION
PRODUCT IS A DUAL-WALL CORRUGATED POLYETHYLENE PIPE WITH A SMOOTH INTERIOR WALL AND ANNULAR CORRUGATED EXTERIOR WALL, MEETING THE STANDARDS OF AASHTO M294, TYPE S OR ASTM F2306. PIPE SHALL BE MANUFACTURED USING HIGH DENSITY POLYETHYLENE (HDPE) MEETING THE MINIMUM REQUIREMENTS OF CELL CLASSIFICATION 435400C, AS INDICATED IN ASTM D3350. CARBON BLACK CONTENT SHALL BE 2 - 4%.

HDPE PIPE MATERIAL SHALL BE TESTED FOR SLOW CRACK GROWTH RESISTANCE USING THE NOTCHED CONSTANT LIGAMENT STRESS TEST AS SPECIFIED IN SECTION 9.4 OF AASHTO M294 AND SECTION 5.1 OF ASTM F2306. AVERAGE FAILURE TIME OF THE FIVE TEST SPECIMENS SHALL NOT BE LESS THAN 24 HOURS.

HYDRAULIC DESIGN, MANNING'S "N" VALUE SHALL BE 0.012 FOR PIPE DIAMETERS INCLUDED WITHIN THIS SPECIFICATION.

JOINTS
PIPE SHALL BE JOINED USING BELL AND SPIGOT TYPE JOINTS MEETING AASHTO M252, M294 OR ASTM 2306, AND WATERTIGHT ACCORDING TO ASTM 3212. GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477 AND SHALL BE INSTALLED BY THE MANUFACTURER. DURING INSTALLATION, A MANUFACTURER-APPROVED JOINT LUBRICANT SHALL BE APPLIED TO THE BELL AND GASKET JOINT. TO ENSURE WATERTIGHT PERFORMANCE, JOINTS SHALL BE ASSEMBLED ACCORDING TO THE MANUFACTURER'S REQUIREMENTS.

FITTINGS
FITTINGS SHALL MEET THE REQUIREMENTS OF AASHTO M252, M294 OR ASTM 2306. STANDARD FITTINGS ARE AVAILABLE FROM THE MANUFACTURER. CUSTOM FITTINGS MAY BE FABRICATED TO PROJECT SPECIFIC REQUIREMENTS.

INSTALLATION

INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321, "PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS" AND PIPE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.

A NON-WOVEN GEOTEXTILE FILTER FABRIC OR OTHER MEASURES SHOULD BE TAKEN TO PREVENT NATIVE SOIL FROM MIGRATING INTO THE INITIAL BACKFILL MATERIAL, WHEN REQUIRED.

TRENCH BOTTOM (FOUNDATION) WITH UNSTABLE OR UNYIELDING MATERIAL SHALL BE EXCAVATED TO A DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL. FOR UNSTABLE MATERIALS, GEOTEXTILE MAY BE USED TO STABILIZE THE TRENCH BOTTOM, IF DIRECTED BY THE ENGINEER.

SUITABLE BEDDING MATERIAL SHALL BE CLASS I OR II, AS SPECIFIED BY ASTM D2321. MINIMUM BEDDING THICKNESS SHALL BE 4" (100 mm) AS MEASURED FROM OUTER PIPE DIAMETER.

INITIAL BACKFILL MATERIAL SHALL BE CLASS I OR II, AS SPECIFIED BY ASTM D2321. COMPACTION AND BACKFILL LIFTS SHALL BE IN ACCORDANCE WITH ASTM D2321. INITIAL BACKFILL SHALL EXTEND TO NOT LESS THAN 6" (150 mm) ABOVE THE TOP OF THE PIPE.

MINIMUM COVER FOR UP TO H-25 TRAFFIC APPLICATIONS:
- 12" FOR PIPE DIAMETER UP TO 36" DIAMETER
- 15" FOR 42" DIAMETER
- 18" FOR 48" AND 60" DIAMETER.
MINIMUM COVER SHALL BE MEASURED FROM THE TOP OF THE PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO THE TOP OF RIGID PAVEMENT. ADDITIONAL COVER MAY BE REQUIRED FOR CONSTRUCTION LOADS, FOR VEHICLES OVER 75T (68 metric tons) OR TO PREVENT FLOATATION.

FINAL BACKFILL MATERIAL SHALL BE SUITABLE MATERIALS AS DIRECTED BY THE ENGINEER OR AS INDICATED BY MANUFACTURER. FOR AREAS SUBJECTED TO HEAVY TRAFFIC LOADING, A HIGHER DEGREE OF COMPACTION IS NECESSARY AND A SEPARATION LAYER OF NON-WOVEN GEOTEXTILE MAY BE REQUIRED. COMPACTION LEVELS AND/OR GEOTEXTILE MAY BE SPECIFIED AT THE DISCRETION OF THE DESIGN ENGINEER OR MANUFACTURER'S REPRESENTATIVE.

CONSULT THE MANUFACTURER'S INSTALLATION MANUAL FOR ADDITIONAL INFORMATION

GENERAL NOTES

PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR TO REVIEW MANUFACTURER'S INSTALLATION GUIDE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR PROJECT ENGINEER TO ENSURE THAT ALL QUESTIONS ABOUT INSTALLATION ARE ADDRESSED PRIOR TO APPROVAL OF SYSTEM. ALL DETAILS FOR INSTALLATION ARE LOCATED IN THIS DRAWING PACKAGE, OR UPON REQUEST TO PIPING MANUFACTURER. ANY QUESTIONS CONCERNING THESE STANDARD DETAILS CAN BE ADDRESSED BY THE PIPE MANUFACTURER'S REPRESENTATIVE PRIOR TO APPROVAL.

ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS AND INLETS SHALL BE VERIFIED BY THE ENGINEER OF RECORD.

CONTRACTOR(S) SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO INSTALL THE STORMWATER COLLECT SYSTEM AND APPURTANANCES IN ACCORDANCE WITH THE DRAWINGS AND AS SPECIFIED HEREIN.

PRIOR TO INSTALLATION OF THE SYSTEM A PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED. THOSE REQUIRED TO ATTEND ARE THE SUPPLIER OF THE SYSTEM, THE GENERAL CONTRACTOR, SUB-CONTRACTORS AND THE ENGINEER.

SYSTEM TO MEET AASHTO HS20/HS25 LIVE LOADING, PER AASHTO LRFD SECTION 12.

ACCESS COVERS TO MEET AASHTO M306 LOAD RATING.

CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

PRIOR TO SYSTEM START-UP, ANY ACCUMULATED WATER, DEBRIS AND SOILS SHALL BE REMOVED FROM THE STORMWATER CISTERNS, PIPING AND MECHANICAL SYSTEMS.

BELOW GRADE SYSTEM MARKING TAPE, IF REQUIRED BY LOCAL ORDINANCE, CAN BE SUPPLIED UPON REQUEST. CONTACT SFWW WITH REQUIREMENT DETAILS.



	NAME	DATE	TITLE: FULLERTON TOWN CENTER STORMWATER MANAGEMENT SYSTEM		
DRAWN	CKL	10/7/20			
CHECKED	MDF	10/7/20			
ENG APPR.	CKL	10/7/20			
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SANTA FE WINWATER COMPANY. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SANTA FE WINWATER COMPANY IS PROHIBITED.			SIZE B	DWG. NO.	REV
			SHEET 1 OF 9		

4

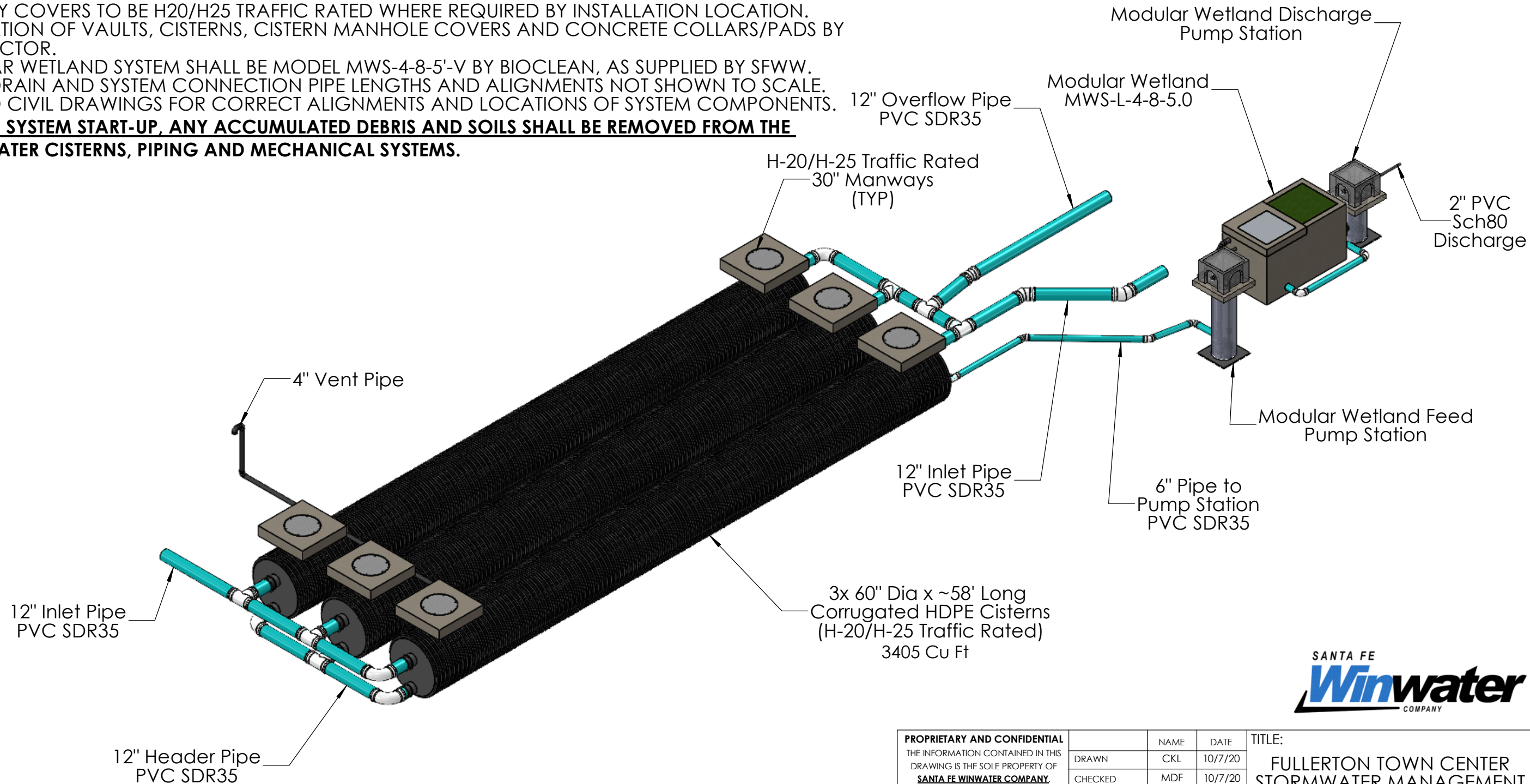
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NOTES:

- 1. ALL COMPONENTS OF SYSTEM TO BE PROVIDED BY SANTA FE WINWATER COMPANY AND INSTALLED BY CONTRACTOR UNLESS OTHERWISE SHOWN.
- 2. PROVIDE 120V ELECTRICAL CONNECTION TO MECHANICAL SYSTEMS PER EQUIPMENT SPECIFICATIONS.
- 3. FLOATATION PREVENTION MEASURES, IF REQUIRED BY SITE SITE CONDITIONS, TO BE DESIGNED BY CONTRACTOR AND SUBMITTED TO SANTA FE WINWATER FOR REVIEW.
- 4. SUBMERSIBLE PUMPS TO BE SFWW EPD-3MS1 WITH DUPLEX PUMP CONTROLLER SFWW WD1P-4. LOCATE CONTROLLER PER DIRECTION BY ENGINEER OR OWNER.
- 5. LEVEL SWITCHES TO BE SFWW 14-F-1922.
- 6. MANWAY COVERS TO BE H20/H25 TRAFFIC RATED WHERE REQUIRED BY INSTALLATION LOCATION.
- 7. INSTALLATION OF VAULTS, CISTERNS, CISTERN MANHOLE COVERS AND CONCRETE COLLARS/PADS BY CONTRACTOR.
- 8. MODULAR WETLAND SYSTEM SHALL BE MODEL MWS-4-8-5'-V BY BIOCLEAR, AS SUPPLIED BY SFWW.
- 9. STORM DRAIN AND SYSTEM CONNECTION PIPE LENGTHS AND ALIGNMENTS NOT SHOWN TO SCALE. REFER TO CIVIL DRAWINGS FOR CORRECT ALIGNMENTS AND LOCATIONS OF SYSTEM COMPONENTS.
- 10. **PRIOR TO SYSTEM START-UP, ANY ACCUMULATED DEBRIS AND SOILS SHALL BE REMOVED FROM THE STORMWATER CISTERNS, PIPING AND MECHANICAL SYSTEMS.**



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	DRAWN	CKL	10/7/20		
	CHECKED	MDF	10/7/20		
	ENG APPR.	CKL	10/7/20		
	REV			SIZE B	SHEET 2 OF 9

4

3

2

1



4

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NOTES:

- 1. ALL COMPONENTS OF SYSTEM TO BE PROVIDED BY SANTA FE WINWATER COMPANY AND INSTALLED BY CONTRACTOR UNLESS OTHERWISE SHOWN.
- 2. PROVIDE 120V ELECTRICAL CONNECTION TO MECHANICAL SYSTEMS PER EQUIPMENT SPECIFICATIONS.
- 3. FLOATATION PREVENTION MEASURES, IF REQUIRED BY SITE SITE CONDITIONS, TO BE DESIGNED BY CONTRACTOR AND SUBMITTED TO SANTA FE WINWATER FOR REVIEW.
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- 5. LEVEL SWITCHES TO BE SFWW 14-F-1922.
- 6. MANWAY COVERS TO BE H20/H25 TRAFFIC RATED WHERE REQUIRED BY INSTALLATION LOCATION.
- 7. INSTALLATION OF VAULTS, CISTERNS, CISTERN MANHOLE COVERS AND CONCRETE COLLARS/PADS BY CONTRACTOR.
- 8. MODULAR WETLAND SYSTEM SHALL BE MODEL MWS-8-8-5'-V BY BIOCLEAN, AS SUPPLIED BY SFWW.
- 9. STORM DRAIN AND SYSTEM CONNECTION PIPE LENGTHS AND ALIGNMENTS NOT SHOWN TO SCALE. REFER TO CIVIL DRAWINGS FOR CORRECT ALIGNMENTS AND LOCATIONS OF SYSTEM COMPONENTS.
- 10. **PRIOR TO SYSTEM START-UP, ANY ACCUMULATED DEBRIS AND SOILS SHALL BE REMOVED FROM THE STORMWATER CISTERNS, PIPING AND MECHANICAL SYSTEMS.**

H-20/H-25 Traffic Rated
30" Manways
(TYP)

12" Inlet Pipe
PVC SDR35

4" Vent
Pipe

Modular Wetland Feed
Pump Station

Modular Wetland
MWS-L-8-8-5.0

2" PVC
Sch80
Discharge

Modular Wetland
Discharge
Pump Station

12" Inlet Pipe
PVC SDR35

12" Overflow Pipe
PVC SDR35

2x 60" Dia x ~253' Long
Corrugated HDPE Cisterns
(H-20/H-25 Traffic Rated)
9923.6 Cu Ft



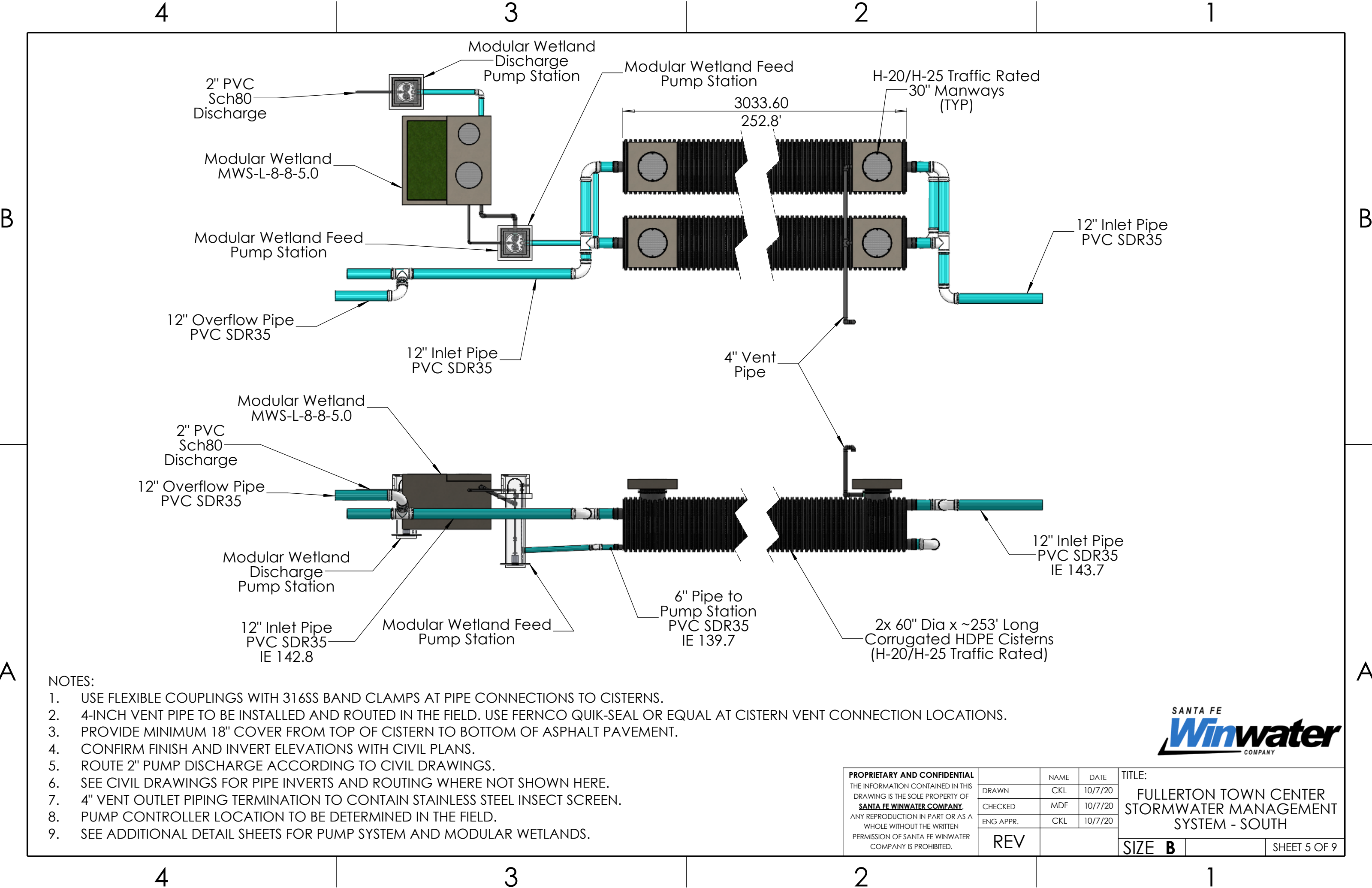
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SANTA FE WINWATER COMPANY. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SANTA FE WINWATER COMPANY IS PROHIBITED.		NAME	DATE	TITLE: FULLERTON TOWN CENTER STORMWATER MANAGEMENT SYSTEM - SOUTH	
	DRAWN	CKL	10/7/20		
	CHECKED	MDF	10/7/20		
	ENG APPR.	CKL	10/7/20		
	REV			SIZE B	SHEET 4 OF 9

4

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NOTES:

- 1. USE FLEXIBLE COUPLINGS WITH 316SS BAND CLAMPS AT PIPE CONNECTIONS TO CISTERNS.
- 2. 4-INCH VENT PIPE TO BE INSTALLED AND ROUTED IN THE FIELD. USE FERNCO QUIK-SEAL OR EQUAL AT CISTERN VENT CONNECTION LOCATIONS.
- 3. PROVIDE MINIMUM 18" COVER FROM TOP OF CISTERN TO BOTTOM OF ASPHALT PAVEMENT.
- 4. CONFIRM FINISH AND INVERT ELEVATIONS WITH CIVIL PLANS.
- 5. ROUTE 2" PUMP DISCHARGE ACCORDING TO CIVIL DRAWINGS.
- 6. SEE CIVIL DRAWINGS FOR PIPE INVERTS AND ROUTING WHERE NOT SHOWN HERE.
- 7. 4" VENT OUTLET PIPING TERMINATION TO CONTAIN STAINLESS STEEL INSECT SCREEN.
- 8. PUMP CONTROLLER LOCATION TO BE DETERMINED IN THE FIELD.
- 9. SEE ADDITIONAL DETAIL SHEETS FOR PUMP SYSTEM AND MODULAR WETLANDS.



PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SANTA FE WINWATER COMPANY. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SANTA FE WINWATER COMPANY IS PROHIBITED.		NAME	DATE	TITLE: FULLERTON TOWN CENTER STORMWATER MANAGEMENT SYSTEM - SOUTH	
	DRAWN	CKL	10/7/20		
	CHECKED	MDF	10/7/20		
	ENG APPR.	CKL	10/7/20		
	REV			SIZE B	SHEET 5 OF 9

4

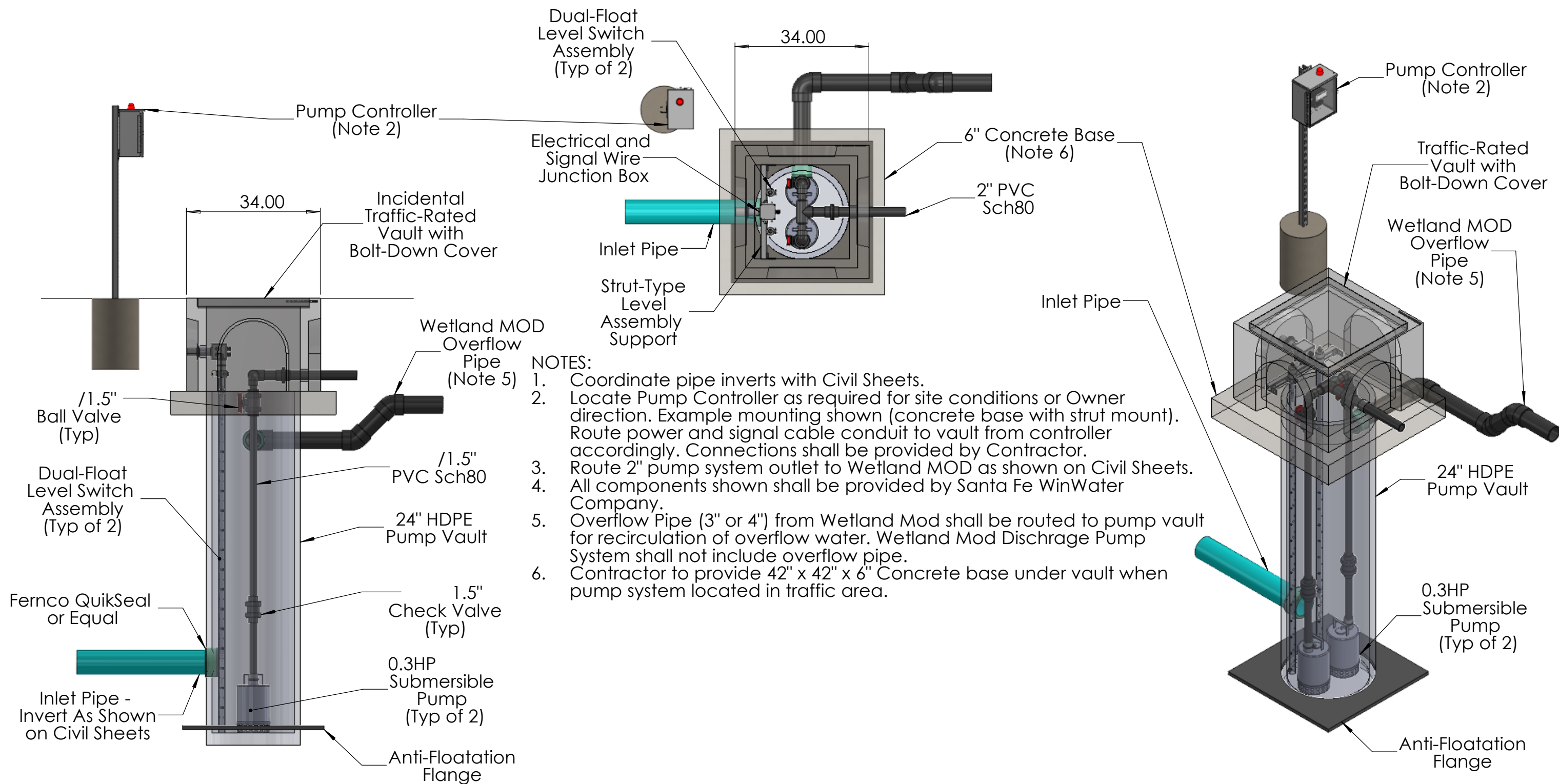
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SANTA FE
Winwater
COMPANY

PROPRIETARY AND CONFIDENTIAL
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WHOLE WITHOUT THE WRITTEN
PERMISSION OF SANTA FE WINWATER
COMPANY IS PROHIBITED.

	NAME	DATE
DRAWN	CKL	7/28/20
CHECKED	MJF	7/28/20
ENG APPR.	CKL	7/28/20
REV		

TITLE:
**Wetland MOD Feed /
Discharge Pump System:
0.3HP**

SIZE **B** SHEET 6 OF 9

4

3

2

1

North System:

Storage Volume = 3405 cu ft

Drawdown Time = 48 hours

Flowrate = 3405 cf / 48 hrs = 70.94 cf/hr = ~0.02 cfs or 9 gpm

North System

Modular Wetland Feed Pump

Headloss Calculations		
Fitting	Qty / Length	Headloss
Reducer	1	.01
Pipe (1.5")	9.5	.08
Check Valve	1	.1
90 Elbow	3	.04
Tee (Main to Branch)	1	.03
Pipe (2")	8	.02
Exit	1	.01
Elevation Head		9.58
Total Headloss @ 9 gpm		9.88

North System

Modular Wetland Discharge Pump

Headloss Calculations		
Fitting	Qty / Length	Headloss
Reducer	1	.01
Pipe (1.5")	4.5	.05
Check Valve	1	.1
90 Elbow	2	.03
Tee (Main to Branch)	1	.03
Pipe (2")	18.6	.05
Exit	1	.01
Elevation Head		5
Total Headloss @ 9 gpm		5.27

South System:

Storage Volume = 9923.6 cu ft

Drawdown Time = 48 hours

Flowrate = 9923.6 cf / 48 hrs = 206.74 cf/hr = ~0.057 cfs or 25.6 gpm

South System

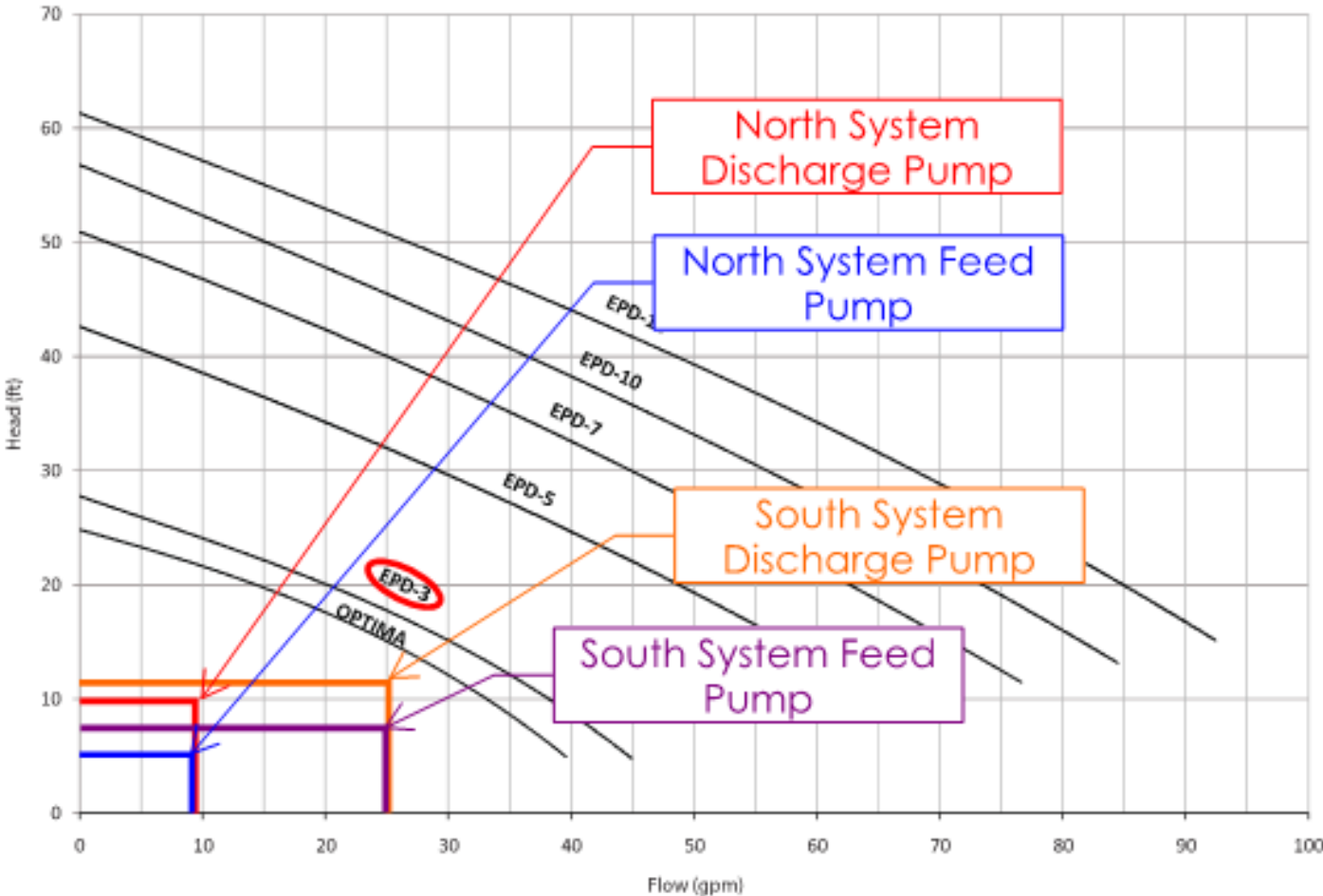
Modular Wetland Feed Pump

Headloss Calculations		
Fitting	Qty / Length	Headloss
Reducer	1	0.06
Pipe (1.5")	9.5	.59
Check Valve	1	.84
90 Elbow	3	.96
Tee (Main to Branch)	1	.22
Pipe (2")	8	.14
Exit	1	.12
Elevation Head		9.58
Total Headloss @ 25.6 gpm		11.88

South System

Modular Wetland Discharge Pump

Headloss Calculations		
Fitting	Qty / Length	Headloss
Reducer	1	.06
Pipe (1.5")	4.5	.28
Check Valve	1	.84
90 Elbow	3	.11
Tee (Main to Branch)	1	.22
Pipe (2")	55.5	1.0
Exit	1	.12
Elevation Head		5
Total Headloss @ 25.6 gpm		7.62



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	DRAWN	CKL	10/7/20		
	CHECKED	MJF	10/7/20		
	ENG APPR.	CKL	10/7/20		
	REV			SIZE B	SHEET 7 OF 9

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.115	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	36" X 36"	OPEN PLANTER	N/A
NOTES:			

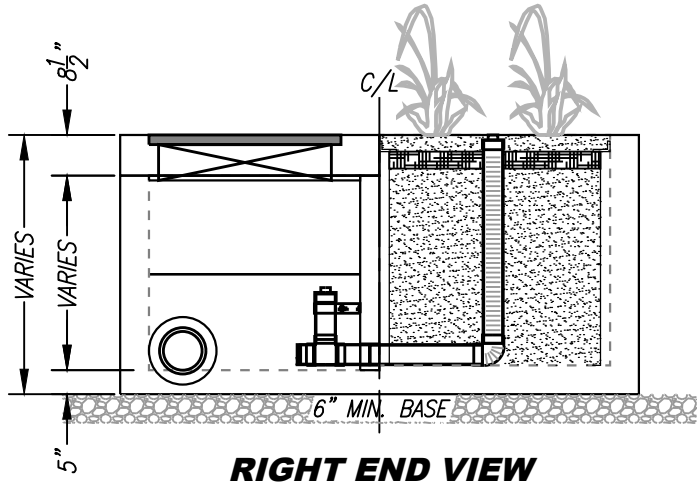
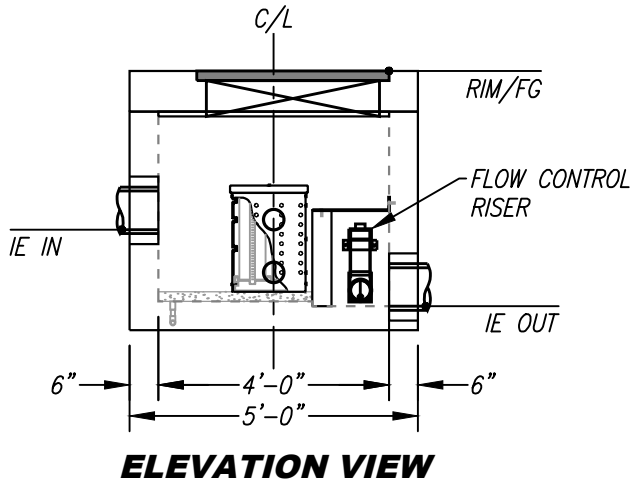
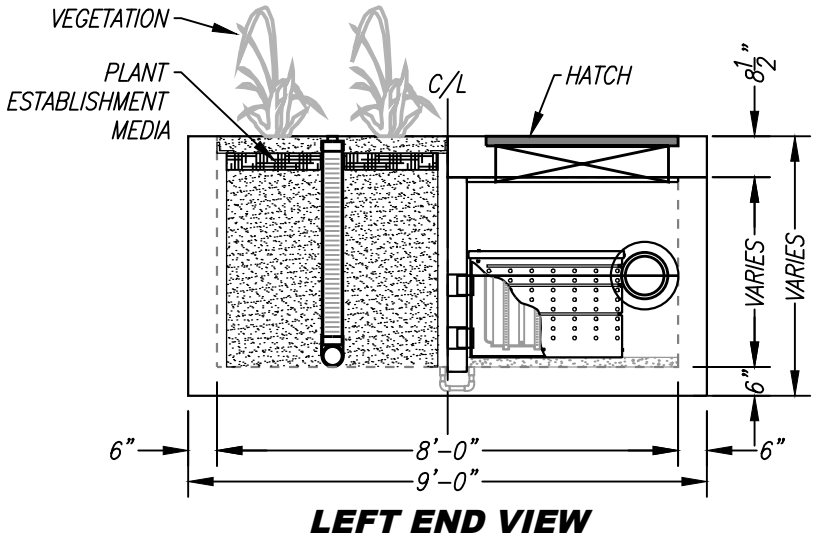
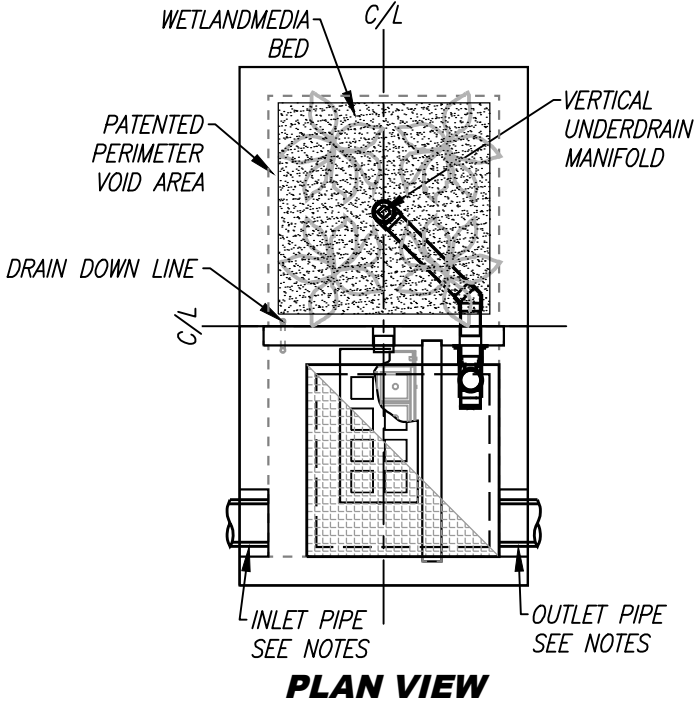
* PRELIMINARY NOT FOR CONSTRUCTION

INSTALLATION NOTES

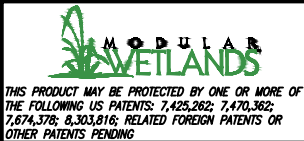
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS 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 WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH 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. MANUFACTURERS WARRANTY IS VOID WITH OUT 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.



TREATMENT FLOW (CFS)	0.115
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0



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MWS-L-4-8-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.231	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN		
FRAME & COVER	ø30"	OPEN PLANTER	ø24"
NOTES:			

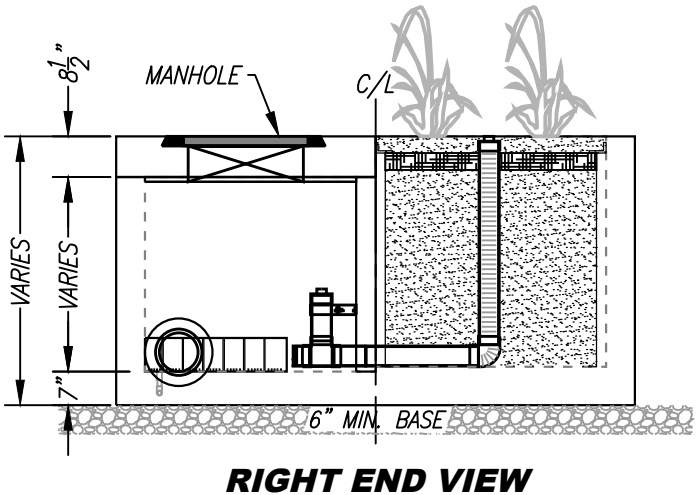
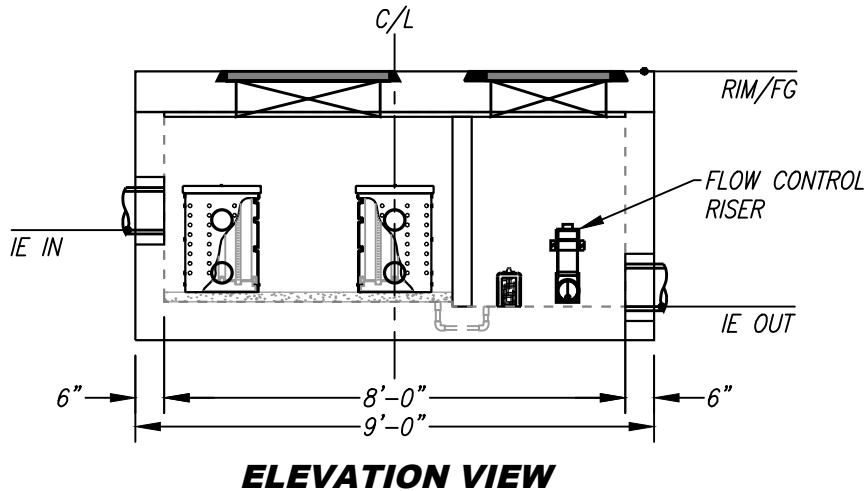
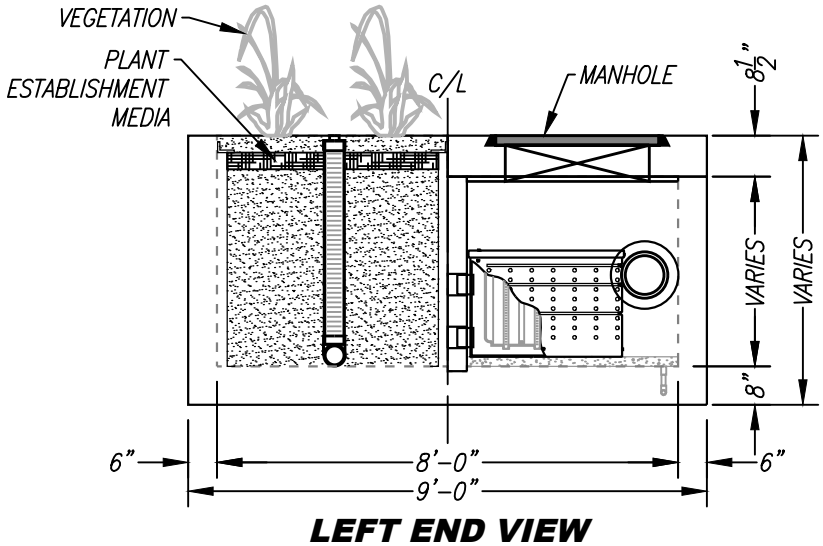
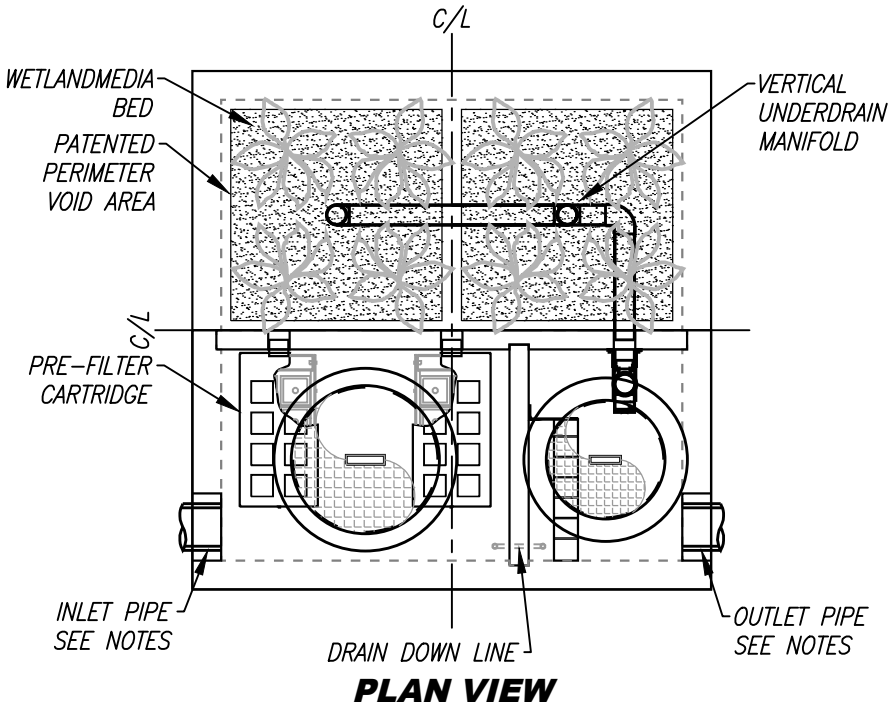
* PRELIMINARY NOT FOR CONSTRUCTION

INSTALLATION NOTES

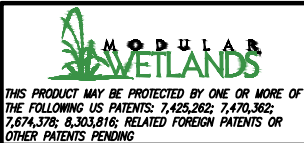
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS 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 WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH 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. MANUFACTURERS WARRANTY IS VOID WITH OUT 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.



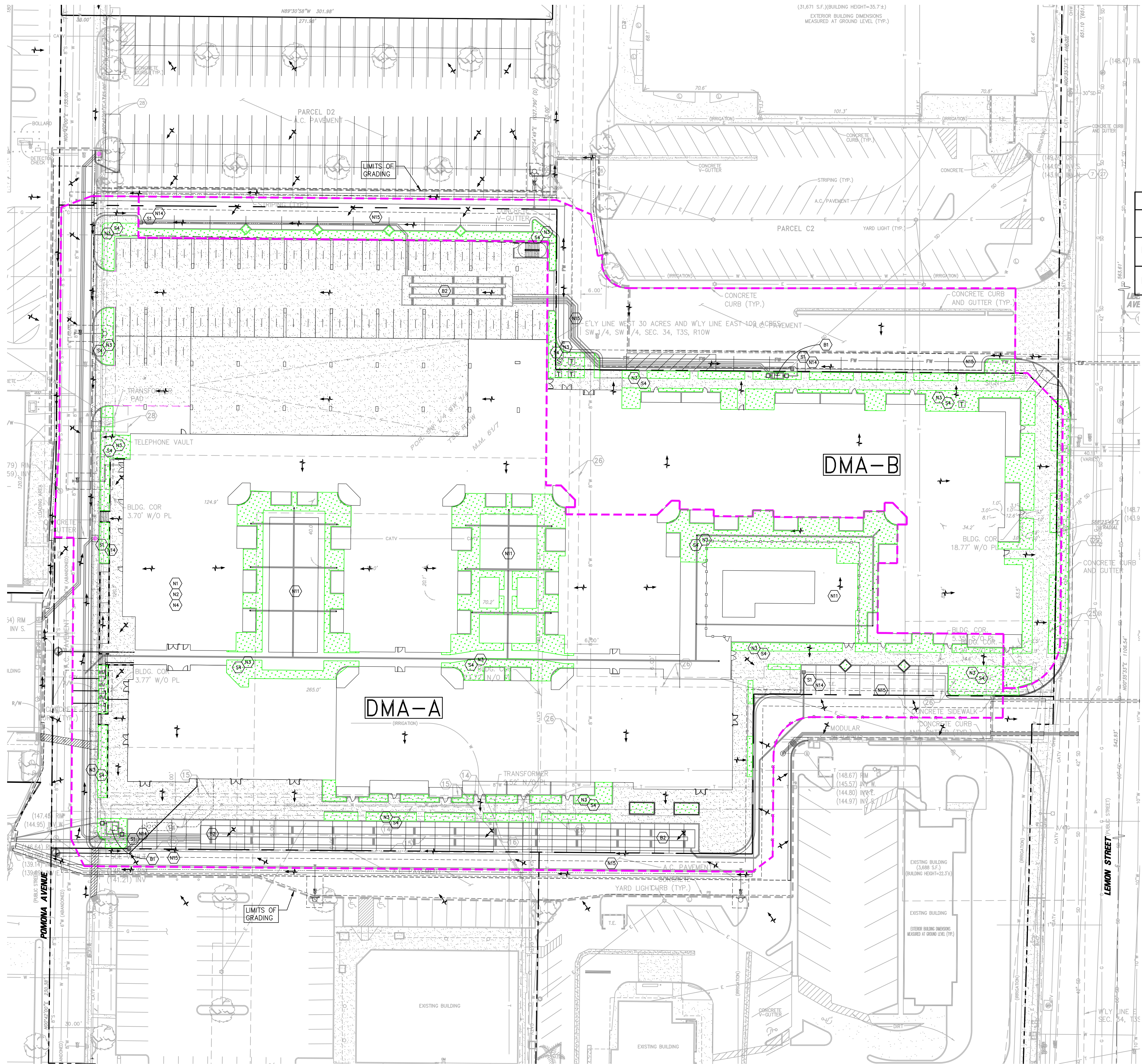
TREATMENT FLOW (CFS)	0.231
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0



PROPRIETARY AND CONFIDENTIAL:
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MWS-L-8-8-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

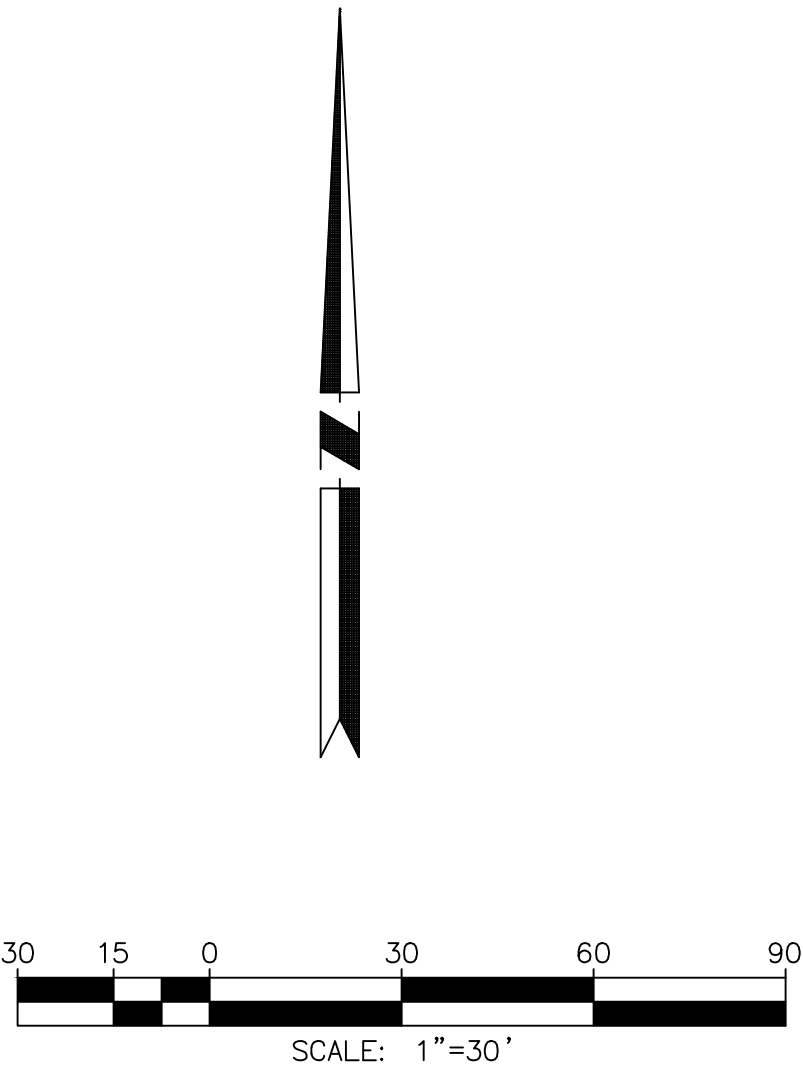


TOTAL DISTURBED AREA			
224,334 SF		5.15 AC	
PRE-DEVELOPMENT			
SURFACE TYPE	AREA SF.	AREA AC.	%
IMPERVIOUS	214,315	4.92	95.53 %
PERVIOUS	10,019	0.23	4.47 %
POST-DEVELOPMENT			
SURFACE TYPE	AREA SF.	AREA AC.	%
IMPERVIOUS	202,118	4.64	90.10 %
PERVIOUS	22,216	0.51	9.90%

BMP SUMMARY TABLE				
	BMP TYPE	VOLUME REQ. (CU. FT.)	VOLUME PROVIDED (CU. FT.)	GPS COORDINATES (LAT., LONG.)
DMA-A	STORMWATER RETENTION SYSTEM & PROPRIETARY BIOFILTRATION	9,924	9,924	33.860272, -117.92073
DMA-B	STORMWATER RETENTION SYSTEM & PROPRIETARY BIOFILTRATION	3,529	3,529*	33.86087, -117.9206

*RETENTION TANK TO HOLD DESIGN STORAGE

- LEGEND**
- N1 EDUCATION FOR PROPERTY OWNERS, TENANTS AND OCCUPANTS
 - N2 ACTIVITY RESTRICTIONS
 - N3 COMMON AREA LANDSCAPE MANAGEMENT
 - N4 BMP MAINTENANCE
 - N11 COMMON AREA LITTER CONTROL
 - N12 EMPLOYEE TRAINING
 - N14 COMMON AREA CATCH BASIN INSPECTION
 - N15 STREET SWEEPING PRIVATE STREETS AND PARKING LOTS
 - N- DENOTES NON-STRUCTURAL MEASURES
 - S1 PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE
 - S3 OUTDOOR TRASH AREA
 - S4 EFFICIENT IRRIGATION SYSTEM
 - S- DENOTES STRUCTURAL MEASURES
 - B1 PROPRIETARY BIOTREATMENT
 - B2 STORMWATER DETENTION SYSTEM
 - B- DENOTES BIOTREATMENT BMPs
 - PATTERN OF FLOW
 - LIMITS OF DISTURBED AREA FOR THIS WQMP
 - PERVIOUS LANDSCAPE AREA
 - LIMITS OF DMA



PRELIMINARY WATER QUALITY
MANAGEMENT PLAN
FULLERTON TOWN CENTER
NW CORNER OF ORANGETHORPE AVE. & LEMON STREET

CONCEPTUAL IMPROVEMENT PLANS

FOR

STREET LIGHTS RESIDENTIAL – FULLERTON

229 E. ORANGETHORPE AVE.

FULLERTON, CA

GRADING NOTES

- THE CODES IN EFFECT ARE: 2013 CBC, 2013 CPC, 2013 CALGREEN. SEE CITY OF FULLERTON ORDINANCE NO. 2947, (SECTIONS 14.03.90, 14.03.20, 14.03.21, 14.03.23).
- PER CALIFORNIA LAW/CIVIL CODE SECTION 832: EACH COTERMINOUS OWNER IS ENTITLED TO THE LATERAL AND SUBJACENT SUPPORT WHICH HIS LAND RECEIVES FROM THE ADJOINING LAND, SUBJECT TO THE RIGHT OF THE OWNER OF THE ADJOINING LAND TO MAKE PROPER AND USUAL EXCAVATIONS ON THE SAME FOR PURPOSES OF CONSTRUCTION OR IMPROVEMENT, UNDER THE FOLLOWING CONDITIONS:
 - ANY OWNER OF LAND OR HIS LESSEE INTENDING TO MAKE OR TO PERMIT AN EXCAVATION SHALL GIVE REASONABLE NOTICE TO THE OWNER OR OWNERS OF ADJOINING LANDS AND OF BUILDINGS OR OTHER STRUCTURES, STATING THE DEPTH TO WHICH SUCH EXCAVATION IS INTENDED TO BE MADE, AND WHEN THE EXCAVATING WILL BEGIN.
 - IN MAKING ANY EXCAVATION, ORDINARY CARE AND SKILL SHALL BE USED, AND REASONABLE PRECAUTIONS TAKEN TO SUSTAIN THE ADJOINING LAND AS SUCH, WITHOUT REGARD TO ANY BUILDING OR OTHER STRUCTURE WHICH MAY BE THEREON, AND THERE SHALL BE NO LIABILITY FOR DAMAGE DONE TO ANY SUCH BUILDING OR OTHER STRUCTURE BY REASON OF THE EXCAVATION, EXCEPT AS OTHERWISE PROVIDED OR ALLOWED BY LAW.
 - IF AT ANY TIME IT APPEARS THAT THE EXCAVATION IS TO BE OF A GREATER DEPTH THAN ARE THE WALLS OR FOUNDATIONS OF ANY ADJOINING BUILDING OR OTHER STRUCTURE, AND IS TO BE SO CLOSE AS TO ENDANGER THE BUILDING OR OTHER STRUCTURE IN ANY WAY, THEN THE OWNER OF THE BUILDING OR OTHER STRUCTURE MUST BE ALLOWED AT LEAST 30 DAYS, IF HE SO DESIRES, IN WHICH TO TAKE MEASURES TO PROTECT THE SAME FROM ANY DAMAGE, OR IN WHICH TO EXTEND THE FOUNDATIONS THEREOF, AND HE MUST BE GIVEN FOR THE SAME PURPOSES REASONABLE LICENSE TO ENTER ON THE LAND ON WHICH THE EXCAVATION IS TO BE OR IS BEING MADE, IN SUCH CASE DEVELOPER IS TO CONTACT THE SOILS ENGINEER TO REVIEW THE SITUATION AND PROVIDE RECOMMENDATIONS, IF NECESSARY, TO MINIMIZE DISTRESS TO ANY ADJACENT STRUCTURES.
 - IF THE EXCAVATION IS INTENDED TO BE OR IS DEEPER THAN THE STANDARD DEPTH OF FOUNDATIONS, WHICH DEPTH IS DEFINED TO BE A DEPTH OF NINE FEET BELOW THE ADJACENT CURB LEVEL, AT THE POINT WHERE THE JOINT PROPERTY LINE INTERSECTS THE CURB AND IF ON THE LAND OF THE COTERMINOUS OWNER THERE IS ANY BUILDING OR OTHER STRUCTURE THE WALL OR FOUNDATION OF WHICH GOES TO STANDARD DEPTH OR DEEPER THEN THE OWNER OF THE LAND ON WHICH THE EXCAVATION IS BEING MADE SHALL, IF GIVEN THE NECESSARY LICENSE TO ENTER ON THE ADJOINING LAND, PROTECT THE SAID ADJOINING LAND AND ANY SUCH BUILDING OR OTHER STRUCTURE THEREON WITHOUT COST TO THE OWNER THEREOF, FROM ANY DAMAGE BY REASON OF THE EXCAVATION, AND SHALL BE LIABLE TO THE OWNER OF SUCH PROPERTY FOR ANY SUCH DAMAGE, EXCEPTING ONLY FOR MINOR SETTLEMENT CRACKS IN BUILDINGS OR OTHER STRUCTURES.
 - COMPLY WITH NOTIFICATION OF ADJOINING PROPERTY BY GIVING A 10-DAY WRITTEN NOTICE TO THE ADJACENT PROPERTY OWNERS OF INTENT TO EXCAVATE WHERE EXCAVATION IS DEEPER THAN THE FOUNDATION OF ADJOINING BUILDING OR LOCATED CLOSER TO PROPERTY LINE THAN THE DEPTH OF EXCAVATION. THE CIVIL ENGINEER SHALL BE RESPONSIBLE FOR THE PREPARATION OF THE PLANS, CALCULATIONS AND/OR ANY DOCUMENTATION. COPIED OR REPRODUCED STAMP AND SIGNATURE IS NOT ACCEPTABLE. INDICATE EXPIRATION DATE OF LICENSE ALSO. NO ADDITIONAL RED/BLUE MARKS, NOTES OR DRAWINGS WRITTEN ON THE PLAN UNLESS ACKNOWLEDGED BY A RESPONSIBLE ENGINEER WITH HIS "WET" PRINTED SIGNATURE AND DATED WHERE ALL MARKS ARE ADDED AND CLOUDED.
- THIS GRADING PERMIT IS ISSUED SUBJECT TO THE CONDITION THAT THIS GRADING WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A CIVIL ENGINEER, REGISTERED IN THE STATE OF CALIFORNIA, AND IN COMPLIANCE WITH THE PROVISIONS OF APPENDIX J OF THE CALIFORNIA BUILDING CODE, 2013 EDITION, AS AMENDED BY THE CITY OF FULLERTON. UPON COMPLETION OF GRADING, PRIOR TO THE ISSUANCE OF THE BUILDING PERMITS, THE CIVIL ENGINEER SHALL SUBMIT A SIGNED CERTIFICATION TO THE DIRECTOR OF DEVELOPMENT SERVICES THAT THE GRADING WORK WAS PERFORMED SUBSTANTIALLY IN ACCORDANCE WITH THESE PLANS AND, IN HIS CONSIDERED OPINION, NO CONDITION EXISTS WHICH WOULD LEAD TO INSTABILITY OF SLOPES OR TO EXCESSIVE EROSION. THE NAME OF THE CIVIL ENGINEER RESPONSIBLE FOR THE ABOVE CONDITIONS UPON THE GRADING WORK PROPOSED IN THIS PERMIT IS CRAIG S. DI BIAS, R.C.E. NO. 75205.

"I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED UNDER MY SUPERVISION AND BASED UPON GEOLOGIC AND/OR SOILS INVESTIGATION."

CRAIG S. DI BIAS, R.C.E. NO. 75205

- THE SUPERVISING ENGINEER SHALL PROVIDE A MINIMUM OF ONE BLUE TOP SET AT THE HIGHEST POINT IN THE FINISH DRAINING SWALE. THESE ELEVATIONS SHALL BE NOTED ON THE BUILDING

- CIVIL ENGINEER/HIS REPRESENTATIVE (SURVEYOR) WILL BE ON JOB SITE TO CONFIRM GRADING OPERATION TO BE ACCOMPLISHED IN ACCORDANCE WITH APPROVED GRADING PLANS. OR THE CIVIL ENGINEER SHALL BE AVAILABLE DURING GRADING AND CONSTRUCTION TO VERIFY COMPLIANCE WITH THE PLANS, LINES, GRADES AND ELEVATIONS FOR SURVEY CONTROLS, SPECIFICATIONS AND THE CODE AND ANY SPECIAL CONDITIONS OF THE PERMIT WITHIN THE PURVIEW OF THE CIVIL ENGINEER. THE CIVIL ENGINEER OR LICENSED SURVEYOR SHALL SET NECESSARY SURVEY STAKES TO VERIFY LINES, AND GRADES AS SHOWN ON PLANS.
- SCHEDULE PRE-GRADE MEETING ON SITE TO INCLUDE GRADING INSPECTOR OF THE CITY OF FULLERTON, PLUS GRADING CIVIL ENGINEER, GEOTECHNICAL/SOILS ENGINEER AND
- PROVIDE PROTECTION TO PEDESTRIANS AND PUBLIC DURING CONSTRUCTION OR DEMOLITION PER APPENDIX J, BY BARRICADES, RAILINGS, FENCES AND/OR CANOPIES OR AS OTHERWISE REQUIRED BY THE CITY OF FULLERTON (CUSTOMERS, EMPLOYEES, ETC.) SAFETY. SHOW A MINIMUM 6'-0" HIGH FENCE A MINIMUM DISTANCE OF MORE THAN ONE-HALF THE HEIGHT OF CONSTRUCTION AWAY FROM THE CONSTRUCTION OR USE ANY OTHER APPROVED PROTECTION MEANS AND DEVICES.
- AS FILLS ARE PLACED, SLOPE BENCHING SHALL BE PROVIDED IF NATURAL GRADE IS OVER 5 HORIZONTAL TO 1 VERTICAL. BENCHING SHALL BE A MINIMUM OF 5' IN WIDTH, 15' IN WIDTH AT THE TOE WITH 5' EXPOSED.
- ALL EXISTING FILLS SHALL BE APPROVED BY THE GRADING INSPECTOR OR REMOVED BEFORE ANY ADDITIONAL FILLS ARE ADDED.
- DUST SHALL BE CONTROLLED BY WATERING.
- THE EXISTING IRRIGATION LINES AND CISTERNS SHALL BE REMOVED, OR CRUSHED IN PLACE AND BACKFILLED, AND APPROVED BY THE GRADING INSPECTOR AND SOIL
- APPROVED EROSION AND SEDIMENTATION PROTECTION DEVICES SHALL BE PROVIDED AND MAINTAINED AND SHALL BE IN PLACE AT THE END OF EACH DAY'S WORK.
- SHEDDING FACILITIES SHALL BE MAINTAINED ON THE SITE FROM BEGINNING TO COMPLETION OF GRADING OPERATIONS PER CITY OF FULLERTON REGULATION ON CONSTRUCTION
- THE LOCATION AND PROTECTION OF ALL UTILITIES IS THE RESPONSIBILITY OF THE PERMITTEE.
- THE PERMITTEE SHALL NOTIFY THE DEPARTMENT OF DEVELOPMENT SERVICES WHEN THE GRADING OPERATION IS READY FOR ROUGH GRADE INSPECTION, WHEN ALL WORK INCLUDING INSTALLATION OF ALL DRAINAGE STRUCTURES AND PROTECTIVE DEVICES HAS BEEN COMPLETED AND REQUIRED REPORTS HAVE BEEN SUBMITTED.

- GRADING INSPECTION DURING INSTALLATION IS REQUIRED FOR ALL DRAIN DEVICES. FILL TERRACE BENCHES AND FILL SLOPES MUST BE APPROVED BY THE SOIL ENGINEER AND DESIGN ENGINEER PRIOR TO TERRACE PAVING.
- DRAINAGE PIPE THAT WILL UNDERLAY STRUCTURES MUST BE REINFORCED CONCRETE OR CAST IRON AND THE STRUCTURE FOUNDATIONS MUST BE ENGINEERED BY A FOUNDATION ENGINEER. THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR DEPUTY INSPECTION DURING CONSTRUCTION OF THE PIPE AND WILL CERTIFY TO THE STABILITY AND THAT THE WORK WAS DONE TO HIS SATISFACTION.
- SUBMISSION OF PROFESSIONAL OPINION THAT THE SUBSOILS HAVE SUFFICIENT STABILITY TO HOLD THE ADDITIONAL WEIGHT OF THE PROPOSED FILLS WITHOUT SETTLEMENT THAT WILL CAUSE DAMAGE TO PROPOSED IMPROVEMENTS MUST BE SUBMITTED TO THE CITY OF FULLERTON PUBLIC WORKS ENGINEERING DEPARTMENT PRIOR TO PLACEMENT OF FILL.

- ALL TRENCH BACKFILLS IN PUBLIC PROPERTY WHERE PRIVATE PROPERTY STRUCTURES OR SLOPES BEAR ON THEM FOR SUPPORT SHALL BE CERTIFIED BY THE SITE SOIL TESTING FIRM. THE SOIL CERTIFICATION SHALL INCLUDE THE STABILITY OF THE BACKFILL AND THAT THE COMPACTION IS 90% OF THE MAXIMUM DRY DENSITY USING THE AASHTO T180/ASTM D1557 MODIFIED TO USE 3 LAYERS IN LIEU OF 5 LAYERS.
- ALL TRENCH BACKFILLS IN PUBLIC PROPERTY WHERE PRIVATE PROPERTY STRUCTURES OR SLOPES BEAR ON THEM FOR SUPPORT SHALL BE CERTIFIED BY THE SITE SOIL TESTING FIRM.
- THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST SHALL MAINTAIN PERIODIC INSPECTIONS AND SUBMIT A COMPLETE REPORT AND MAP UPON COMPLETION OF THE ROUGH GRADING.
- ALL CUT SLOPES SHALL BE INVESTIGATED BOTH DURING AND AFTER GRADING BY AN ENGINEERING GEOLOGIST TO DETERMINE IF ANY SLOPE STABILITY PROBLEM EXISTS. SHOULD EXCAVATION DISCLOSE ANY GEOLOGICAL HAZARDS OR POTENTIAL GEOLOGICAL HAZARDS, THE ENGINEERING GEOLOGIST SHALL RECOMMEND NECESSARY TREATMENT TO THE ENGINEERING DEPARTMENT FOR APPROVAL.

- WHERE SUPPORT OR BUTTRESSING OF CUT AND NATURAL SLOPES IS DETERMINED TO BE NECESSARY BY THE ENGINEERING GEOLOGIST AND SOIL ENGINEER, THE SOIL ENGINEER WILL SUBMIT DESIGN, LOCATION AND CALCULATIONS TO THE ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION. THE ENGINEERING GEOLOGIST AND SOIL ENGINEERING WILL INSPECT AND CONTROL THE CONSTRUCTION OF THE BUTTRESSING AND CERTIFY TO THE STABILITY OF THE SLOPE AND ADJACENT STRUCTURES UPON COMPLETION.
- THE DESIGN ENGINEER SHALL EXERCISE SUFFICIENT SUPERVISORY CONTROL DURING GRADING AND CONSTRUCTION TO INSURE COMPLIANCE WITH THE APPROVED PLANS.

- ALL LOTS SHALL DRAIN TO STREETS, ALLEYS OR APPROVED DRAINAGE. WAY _____ 1/2% MINIMUM FOR ASPHALT, 3/4% FOR CONCRETE (P.C.C.), 1% MINIMUM FOR DIRT. (1/4 TO 1/2 IS 2%)
- ALL DIRT, SAND, MUD, OR DEBRIS DEPOSITED OR SPILLED UPON PUBLIC STREETS DURING ANY GRADING, HAULING, OR EXPORT OPERATIONS SHALL BE IMMEDIATELY CLEANED UP BY THE DEVELOPER, HIS CONTRACTOR, SUBCONTRACTORS, OR AGENTS TO THE SATISFACTION OF THE CITY ENGINEER. FAILURE TO DO SO WILL BE CAUSE FOR STOPPING OF ALL SUCH GRADING, HAULING, OR EXPORT WORK BY THE CITY UNTIL SUCH TIME AS THE STREETS ARE CLEANED.
- NO EXPORTING OF EXCESS CUT OR DIRT WILL BE ALLOWED WITHOUT THE DEVELOPER, OR APPROPRIATE CONTRACTOR FIRST OBTAINING A PERMIT TO DO SO FROM THE ENGINEERING DEPARTMENT. SUCH A PERMIT SHALL PRESCRIBE APPROVED ROUTES, HOURS OF OPERATION, TRAFFIC CONTROL REQUIREMENTS, STREET PROTECTION DEPOSITS, ETC.
- ALL ROOF, PAD AND SLOPE DRAINAGE SHOULD BE COLLECTED AND DIRECTED AWAY FROM THE PROPOSED FOUNDATIONS AND STRUCTURES, AND SLOPES TO APPROVED DISPOSAL AREAS.
- NO CONCENTRATED OUTLET FLOW TO SLOPING GRADE. OUTLET AREAS WITH CONCENTRATED DRAIN OUTLET FLOW MUST BE PROTECTED AT POINT OF DISCHARGE WITH APPROVED MEANS AND DEVICES, OTHERWISE IT IS NOT ALLOWED.

- FOR EXISTING SURFACE SLOPE CONDITION WHERE SURFACE WATER SLOPES DOWN AND DRAINS BEYOND PROPERTY LINE TO ADJACENT DRAINAGE LOT, PROVIDE PLAN SHOWING ROOF AND SURFACE WATER SLOPES AND DRAINAGE TO WHERE AND HOW MUCH VOLUME AND NEW PROPOSED ROOF AND WATER SURFACE SLOPE DRAINING TO WHERE AND HOW MUCH VOLUME. IF EXISTING CONTOUR AT REAR AND SIDE PART OF LOTS REMAIN THE SAME AND ROOF AND SURFACE WATER DRAIN IS LESS IN NEW GRADING THAN EXISTING GRADING, PROPOSED GRADING IS OK WITHOUT EASEMENT OR LETTER FROM ADJACENT OWNER, THEN ADJACENT LOTS CAN DRAIN TO HIS PROPERTY BEYOND OTHER LOTS PROPERTY. NEEDS EXISTING TOPOGRAPHY AND CONTOUR LINES, AND NEW TOPOGRAPHY AND CONTOUR LINES. ALSO PROVIDE HYDRAULIC CALCULATIONS TO SHOW THAT THE VOLUME OF DISCHARGE AND VELOCITY FOR THE PROPOSED GRADING IS THE SAME OR LESS THAN THE EXISTING GRADE.
- PLANT DROUGHT-RESISTANT PLANT AT SLOPING LOT SO THAT LOT WON'T BE DRY FROM CONSTANT WATERING AND MAY AFFECT SURFACE WATER DRAINAGE BEYOND PROPERTY MORE.

- GRADING FOUNDATION MUST COMPLY WITH ALL THE RECOMMENDATIONS ON THE SUBMITTED SOILS INVESTIGATIONS REPORT DONE BY PROFESSIONAL SERVICE INDUSTRIES, INC., PROJECT NO. 05591624, DATED NOVEMBER 19, 2015.
- PRIOR TO THE POURING OF FOUNDATION, FOOTING, SLAB/PAVEMENT OR ISSUANCE OF GRADING PERMIT, PROVIDE THE FOLLOWING:

- SOIL'S REPORT FROM THE SOIL'S ENGINEER TO CERTIFY THE PROPER COMPACTION, EXCAVATION AND PREPARATION OF SOIL FOR THE FOUNDATION, AND COMPLIANCE WITH ALL THE REQUIREMENTS OF SOIL'S REPORT SUBMITTED AND ANY ADDENDUM AND/OR SUBSEQUENT SOIL'S REPORT. USE BUILDING DEPARTMENT STANDARD CERTIFICATION FORM. SOIL'S ENGINEER TO WET STAMP, WET SIGN AND INDICATE EXPIRATION DATE OF HIS LICENSE ON THE CERTIFICATION FORM (THIS IS REQUIRED WHEN THERE IS SOIL COMPACTION INVOLVE AND/OR SOIL'S REPORT REQUIRED IT.)
 - ROUGH GRADING CERTIFICATION FROM LICENSED (GRADING) CIVIL ENGINEER. USE BUILDING ENGINEERING DEPARTMENT STANDARD CERTIFICATION FORM. CIVIL ENGINEER TO WET STAMP, WET SIGN AND INDICATE EXPIRATION DATE OF HIS LICENSE ON THE CERTIFICATION FORM. APPENDIX J
 - ROUGH GRADING INSPECTION APPROVAL FROM THE CITY. APPENDIX J
- PRIOR TO THE POURING OF FOUNDATION, FOOTING, SLAB/PAVEMENT OR ISSUANCE OF BUILDING PERMIT, PROVIDE THE FOLLOWING:
 - SOIL'S REPORT FROM THE SOIL'S ENGINEER TO CERTIFY THE PROPER COMPACTION, EXCAVATION AND PREPARATION OF SOIL FOR THE FOUNDATION, AND COMPLIANCE WITH ALL THE REQUIREMENTS OF SOIL'S REPORT SUBMITTED AND ANY ADDENDUM AND/OR SUBSEQUENT SOIL'S REPORT. USE CITY OF FULLERTON PUBLIC WORKS ENGINEERING DEPARTMENT STANDARD CERTIFICATION FORM. SOIL'S ENGINEER TO WET STAMP, WET SIGN AND INDICATE EXPIRATION DATE OF HIS LICENSE ON THE CERTIFICATION FORM (THIS IS REQUIRED WHEN THERE IS SOIL COMPACTION INVOLVE AND/OR SOIL'S REPORT REQUIRED IT.)
 - OBSERVATION, AND/OR TESTING AND WRITTEN REPORT SUBMITTAL PUBLIC WORKS ENGINEERING DEPARTMENT SHOULD BE PERFORMED BY THE GEOTECHNICAL CONSULTANT OR HIS AUTHORIZED REPRESENTATIVE TO PROVIDE DOCUMENTATION AND CERTIFICATION OF COMPLIANCE TO ALL THE REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE SUBMITTED SOIL'S REPORT AND ANY SUBSEQUENT SOIL REPORT ADDENDA. OBSERVATION, INSPECTION AND/OR TESTING AND REPORT SUBMITTAL SHOULD BE PERFORMED BY THE GEOTECHNICAL CONSULTANT OR HIS REPRESENTATIVE AT EACH OF THE FOLLOWING STAGES AND TO COMPLY WITH ALL THE REQUIREMENTS AND RECOMMENDATION OF THE SOILS REPORT AND APPENDIX J.

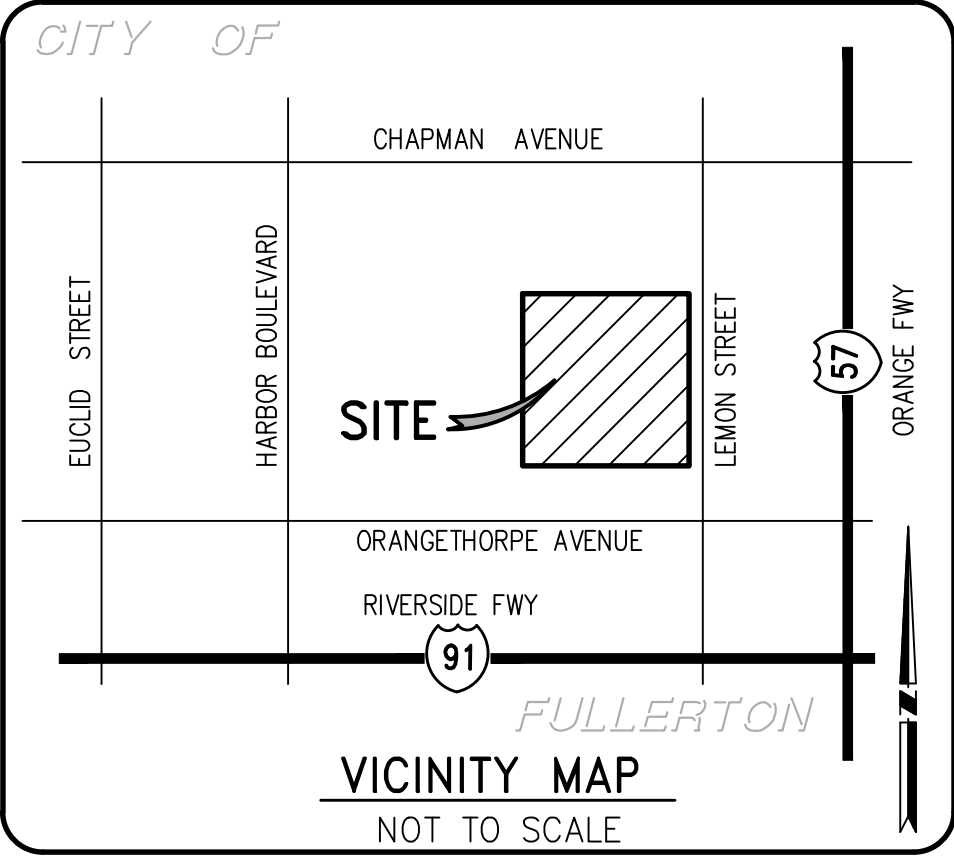
- SITE PREPARATION, CLEARING , GRUBBING AND REMOVAL FROM THE SITE VEGETATION, TRASH, DEBRIS AND ANY DELETERIOUS MATERIALS WITHIN THE CONSTRUCTION SITE.
- DURING BENCHING AND FILL OPERATIONS, KEY EXCAVATIONS, PAD OVER-EXCAVATIONS AND CUT SLOPE EXCAVATIONS, OR TEMPORARY EXCAVATIONS.
- EXPOSED SUB-GRADE GROUND SURFACE AFTER OVER EXCAVATION FOR SUITABILITY OR FURTHER PREPARATION TO RECEIVE AND TO SERVE AS STRUCTURAL FILL SUB-GRADE.
- AT THE COMPLETION OF ROUGH GRADING TO CONDUCT ADDITIONAL SAMPLING, LABORATORY TESTING AND ANALYSIS FOR FINAL SOIL PRECISE GRADING OR FOUNDATION DESIGN RECOMMENDATIONS.
- APPROVAL OF ANY IMPORTED FILL MATERIAL USED PRIOR TO IMPORTATION TO SITE.
- DURING PRECISE GRADING/RECERTIFICATION.
- REMOVAL OF ALL UNSUITABLE MATERIALS AND SOILS.

- OVEREXCAVATION AND PROCESSING (I.E. SCARIFYING, MOISTURE CONDITIONING, BACKFILL AND RECOMPACTING) OF ALL WEATHERED AND DISTURBED NEAR SURFACE FILL OR NON-FILL SOIL MATERIAL.
 - EXPOSED SURFACE OF COMPLETED OVEREXCAVATION.
 - AFTER EXCAVATION FOR FOOTINGS OF BUILDINGS, RETAINING WALLS, AND FREESTANDING WALLS, AND PRIOR TO POURING CONCRETE.
 - DURING SUBDRAIN INSTALLATION, AND FILTER MATERIALS FOR RETAINING WALLS, IF ANY, AND PRIOR TO PLACEMENT OF BACKFILL.
 - DURING PLACEMENT OF BACKFILL FOR AREA DRAIN, INTERIOR PLUMBING AND UTILITY LINE TRENCHES, AND RETAINING WALLS, IF ANY.
 - DURING COMPACTION OF ALL FILLS, AFTER OVER-EXCAVATION.
 - AFTER PRESOAKING BUILDING PAD AND OTHER FLATWORK SUBGRADE AND PRIOR TO POURING SLABS.
 - DURING PLACEMENT OF MITIGATION MEASURES FOR EXPANSIVE SOIL MATERIAL ON SITE.
 - DURING SLOPE OR EROSION REPAIR, IF ANY
 - TEMPORARY EXCAVATION.
 - REMOVAL OF UNSUITABLE SOILS.
 - BACKFILL PLACEMENT AND COMPACTION.
 - SURFACE AND SUBSURFACE DRAINAGE INSTALLATION.
 - FOUNDATION EXCAVATION.
 - WHEN ANY UNUSUAL SOIL CONDITIONS ARE ENCOUNTERED DURING ANY CONSTRUCTION OPERATION SUBSEQUENT TO ISSUANCE OF THIS REPORT.
- GEOTECHNICAL OBSERVATION, AND INSPECTION/TESTING MUST COMPLY WITH ALL THE REQUIREMENTS AND RECOMMENDATION OF THE SOIL'S ENGINEER. SEE CHAPTER 33 AND APPENDIX J

- THE OWNER SHALL EMPLOY THE GEOTECHNICAL ENGINEER OR HIS APPROVED REPRESENTATIVE RESPONSIBLE FOR THE DESIGN, OR ANOTHER GEOTECHNICAL ENGINEER DESIGNATED BY THE GEOTECHNICAL ENGINEER OF RECORD TO PERFORM GEOTECHNICAL OBSERVATION TESTING AS DEFINED IN SECTION 108.6, 108.7, AND APPENDIX J TO ENSURE COMPLIANCE OF ALL REQUIREMENTS IN SOILS ENGINEERING REPORT PER (SEC. 3309.5), AND ENGINEERING GEOLOGY REPORT. OBSERVED DEFICIENCIES SHALL BE REPORTED IN WRITING TO THE OWNER'S REPRESENTATIVE, CONTRACTOR AND THE BUILDING OFFICIAL. THE GEOTECHNICAL OBSERVER SHALL SUBMIT TO THE BUILDING OFFICIAL A WRITTEN STATEMENT THAT THE SITE VISITS HAVE BEEN MADE AND IDENTIFYING ANY REPORTED DEFICIENCIES THAT, TO THE BEST OF THE GEOTECHNICAL OBSERVER'S KNOWLEDGE, HAVE BEEN RESOLVED. SEE SOIL'S REPORT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING WRITTEN NOTICE TO THE OFFICE OF THE GEOTECHNICAL ENGINEER WITH AS MUCH NOTICE AS POSSIBLE AND A MINIMUM OF 24 HOURS IN ADVANCE OF THE CONSTRUCTION SCHEDULE IN ORDER TO FACILITATE SCHEDULING OF THE REQUIRED GEOTECHNICAL OBSERVATIONS/TESTING.
- FAILURE TO COMPLETE REQUIRED GEOTECHNICAL OBSERVATION MAY REQUIRE REMOVAL OF ANY FINISHES THAT HAVE BEEN SUBSEQUENTLY INSTALLED, OR DISASSEMBLY OF THE CONSTRUCTION FOR OBSERVATION PURPOSES.
- APPROVAL BY THE CITY BUILDING INSPECTOR DOES NOT PRECLUDE OBSERVATION BY THE GEOTECHNICAL ENGINEER AND ACCEPTANCE OF REVIEW BY THE GEOTECHNICAL ENGINEER DOES NOT PRECLUDE THE INSPECTION PROCESS BY THE CITY BUILDING INSPECTOR AND ANY OTHER CODE REQUIREMENTS FOR INSPECTION.
- REMOVAL AND REPLACEMENT OF ANY MATERIALS AND FINISHES AND/OR DAMAGED BY THE REMOVAL PROCESS, OR AS REQUIRED FOR CORRECTIVE ACTION, SHALL BE AT THE CONTRACTOR'S EXPENSE. NOT THE OWNER, GEOTECHNICAL ENGINEER, GEOTECHNICAL OBSERVER. ANY REVISIONS OF PLANS NEED THE WET STAMP AND WET SIGNATURE OF RESPONSIBLE CIVIL AND GEOTECHNICAL ENGINEERS, AND SUBMIT TWO SETS OF THESE PLANS TO BE BUILDING DEPARTMENT FOR APPROVAL PRIOR TO INSTALLATION.
- OBSERVATION AND/OR TESTING, AND WRITTEN REPORT SUBMITTAL TO THE CITY OF FULLERTON PUBLIC WORKS ENGINEERING DEPARTMENT SHOULD BE PERFORMED BY THE GEOTECHNICAL CONSULTANT OR HIS AUTHORIZED REPRESENTATIVE TO PROVIDE DOCUMENTATION AND CERTIFICATION OF COMPLIANCE TO ALL THE REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE SUBMITTED SOIL'S REPORT AND ANY SUBSEQUENT SOIL REPORT ADDENDA.

ADDITIONAL GENERAL NOTES

- ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH CURRENT CITY OF FULLERTON AND SPWW STANDARDS. WORK SHALL ALSO CONFORM TO APPLICABLE BUILDING CODES (CA BUILDING CODE, CA PLUMBING CODE, ETC.) AS INTERPRETED BY THE CITY OF FULLERTON.
- ALL CONTRACTORS PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE THEMSELVES WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM THEIR OPERATIONS, WHETHER OR NOT SHOWN ON THESE PLANS.
- EXISTING UNDERGROUND UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORDS. OTHER UTILITIES MAY EXIST THAT ARE NOT PLOTTED HEREON.
- EXISTING UNDERGROUND UTILITIES ARE TO BE RELOCATED AS REQUIRED TO AVOID CONFLICT WITH PROPOSED STRUCTURES.
- EXISTING PUBLIC UTILITY EASEMENTS IN CONFLICT WITH PROPOSED STRUCTURES ARE TO BE QUITCLAIMED WITH THE APPROVAL OF THE UTILITY COMPANY. NEW EASEMENTS ARE TO BE GRANTED AT THE PROPOSED UTILITY LOCATIONS.
- THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED.
- REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL DIMENSIONS, CONCRETE COLOR, STRIPING, RAMPS, HANDRAILS, SIGNAGE, TRUNCATED DOMES, ETC.
- THIS PLAN IS BASED ON THE ARCHITECTURAL SITE PLAN RECEIVED ON 12/22/15.
- OBTAIN PERMIT FROM CAL/OSHA FOR EXCAVATIONS OVER 5'-0" DEEP.
- A PERFORMANCE BOND IS REQUIRED IN THE AMOUNT OF \$2.0 X 2,140 C.Y. = \$4,280. BOND MUST BE WITH SIGNED "AGREEMENT FOR GRADING, SOILS PLANTING AND EROSION CONTROL" FORM. (NOTE: BOND IS BASED ON ANY ONE OF THE LARGEST QUANTITIES OF CUT, FILL, IMPORT, EXPORT; OR THE SUM OF EXCAVATION AND OVER-EXCAVATION.
- A LIABILITY BOND IS REQUIRED IN THE AMOUNT OF \$500,000. IN LIEU OF A LIABILITY BOND, EVIDENCE OF LIABILITY INSURANCE IN THAT AMOUNT MAY BE SUBMITTED SHOWING THE CITY OF FULLERTON AS INSURED.
- THESE GRADING PLANS WERE REVIEWED AND APPROVED, AND THEY COMPLY WITH ALL THE REQUIREMENTS AND RECOMMENDATIONS OF THE GEOTECHNICAL/SOILS REPT DONE BY PROFESSIONAL SERVICE INDUSTRIES, INC., PROJECT NO. 05591624, DATED NOVEMBER 19, 2015 AND GEOTECHNICAL/SOILS ENGINEER.
- UPPER SOILS ARE SENSITIVE TO DISTURBANCES CAUSED BY CONSTRUCTION TRAFFIC AND TO CHANGES IN MOISTURE CONTENT. DURING WET WEATHER PERIODS, INCREASES IN THE MOISTURE CONTENT OF THE SOIL CAN CAUSE SIGNIFICANT REDUCTION IN THE SOIL STRENGTH AND SUPPORT CAPABILITIES. FURTHERMORE, PERCHED GROUNDWATER CONDITIONS CAN DEVELOP DURING PERIODS OF HEAVY RAINFALL AS A RESULT OF LESS PERMEABLE LAYERS IMPENDING INFILTRATION. IN THESE INSTANCES, OVERLAYING SUBGRADE SOILS MAY BECOME UNSTABLE AND REQUIRE REMEDIAL MEASURES. IT WILL, THEREFORE, BE ADVANTAGEOUS TO PERFORM EARTHWORK AND FOUNDATIONS CONSTRUCTION ACTIVITIES DURING DRY WEATHER.



PLAN INDEX

- C-1 TITLE SHEET
- C-2 SITE MAP
- C-3 CONCEPTUAL GRADING PLAN
- C-4 CONCEPTUAL STORM DRAIN PLAN
- C-5 CONCEPTUAL UTILITY PLAN
- * 1 TENTATIVE PARCEL MAP (TITLE SHEET)
- * 2 TENTATIVE PARCEL MAP (BOUNDARY)
- * FOR REFERENCE ONLY

BENCHMARK

CITY OF FULLERTON BENCHMARK NO. 3-7A
ELEVATION = 145.14 FEET
P.K. NAIL IN LEAD, SOUTHEAST CORNER OF ORANGETHORPE AND HARBOR, SOUTH CURB OF ORANGETHORPE, 1' EAST OF E.C.R.

BASIS OF BEARINGS

THE BEARING OF NORTH 89° 30' 58" WEST AS THE CENTERLINE OF EAST ORANGETHORPE AVENUE AS SHOWN ON PARCEL MAP NO. 84-453 FILED IN BOOK 198, PAGES 22-24 OF PARCEL MAPS, RECORDS OF ORANGE COUNTY, CALIFORNIA WAS USED AS THE BASIS OF BEARINGS FOR THIS SURVEY.

FLOOD_ZONE

COMMUNITY NUMBER: 060219 0131x, EFFECTIVE DATE: 12/3/2009

ZONE _SH_X_
AREAS OF 0.2% ANNUAL CHANCE OF FLOOD; AREAS OF 1% ANNUAL CHANCE OF FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM THE 1% ANNUAL CHANCE OF FLOODING. FLOOD INSURANCE IS AVAILABLE, BUT NOT REQUIRED.

INFORMATION OBTAINED FROM CERTIFIED FLOOD SYSTEMS, INC. ON 11/25/2015

LEGEND

AB = AGGREGATE BASE	TRW = TOP OF RETAINING WALL
AC = ASPHALT CONCRETE	TW = TOP OF WALL
BLK = CONCRETE BLOCK	UG = UNDERGROUND
BS = BACK OF SIDEWALK	UP = UTILITY POLE
CB = CATCH BASIN	VAR = VARIABLE
CF = CURB FACE	W = WASHER
CL = CENTERLINE	WDF = WOOD FENCE
CLF = CHAIN LINK FENCE	WM = WATER METER
CO = CLEANOUT	WV = WATER VALVE
DCV = DETECTOR CHECK VALVE	N. = NORTH
DS = ROOF DOWNSPOUT	S. = SOUTH
EG = EDGE OF GUTTER	E. = EAST
EP = EDGE OF PAVEMENT	W. = WEST
FD = FOUND	NLY = NORTHERLY
FDC = FIRE DEPT. CONNECTION	SLY = SOUTHERLY
FF = FINISHED FLOOR	ELY = EASTERLY
FG = FINISHED GRADE	WLY = WESTERLY
FH = FIRE HYDRANT	N/O = NORTH OF
FL = FLOW LINE	S/O = SOUTH OF
FS = FINISHED SURFACE	E/O = EAST OF
GB = GRADE BREAK	W/O = WEST OF
GM = GAS METER	P. = PROPERTY LINE
GR = TOP OF GRATE	C. = CENTERLINE
GV = GAS VALVE	R/W = RIGHT OF WAY
HP = HIGH POINT	Δ OR Δ = DELTA
HT = HEIGHT	R = RADIUS
ICV = IRRIGATION CONTROL VALVE	L = LENGTH
IP = IRON PIPE	T = TANGENT
LS = LIGHT STANDARD	M = MEASURED DATA
L&T = LEAD & TAG	C = CALCULATED DATA
MH = MANHOLE	(RAD) = RADIAL BEARING
NG = NATURAL GROUND	PRO = PROPORTIONATE MEASUREMENT
N&T = NAIL & TAG	(210.00' R) = RECORD DATA
OHW = OVERHEAD WIRE	(210.00' M. = MEASURED DATA
PB = PULL BOX	(210.00' PRO. = PROKATED DATA
PCC = CONCRETE	(210.00' C. = CALCULATED DATA
PIV = POST INDICATOR VALVE	(427.00) TC = EXISTING ELEVATION
PL = PROPERTY LINE	427.00 TC = DESIGN ELEVATION
PR = ROOF DRAIN	— CATV — = CABLE TV LINE
RWH = REDWOOD HEADER	— E — = ELECTRICAL LINE
SCB = SIGNAL CONTROL BOX	— G — = GAS LINE
SMH = SEWER MANHOLE	— GB — GB — = GRADE BREAK LINE
SPK = SPIKE	— R — R — = RIDGE LINE
SW = SIDEWALK	— S — = SEWER LINE
TC = TOP OF CURB	— SD — = STORM DRAIN LINE
TE = TRASH ENCLOSURE	— T — = TELEPHONE LINE
TP = TELEPHONE POLE	— OHW — = OVERHEAD WIRES
TRAN = TRANSITION	— W — = WATER LINE
TRANS = TRANSFORMER	

SYMBOLS

⊙	FIRE HYDRANT	⊕	MANHOLE
⊙	STREET LIGHT	⊕	SEWER CLEANOUT
⊙	TRAFFIC SIGNAL	⊕	MONITORING WELL
⊙	TRAFFIC SIGNAL ARM & POLE	⊕	HANDICAP PARKING STALL
⊙	LIGHT STANDARD	⊕	LANDSCAPED AREA
⊙	UTILITY POLE	⊕	PROTECT IN PLACE
⊙	GUY WIRE & ANCHOR	⊕	REMOVE AND DISPOSE OFFSITE
⊕	WATER METER	⊕	RELOCATE
⊕	GAS METER	⊕	PLOTTABLE EASEMENT ITEM
⊕	WATER VALVE	⊕	No. PER TITLE REPORT
⊕	GAS VALVE	— (427.0) —	EXIST. CONTOUR
⊕	PULL BOX	— 427.0 —	DESIGN CONTOUR
⊕	GRATE INLET		
⊕	SIGN		
⊕	VENT		
⊕	SEWER MANHOLE		
⊕	STORM DRAIN MANHOLE		
⊕	TELEPHONE MANHOLE		

Joseph C. Truxaw and Associates, Inc
Civil Engineers and Land Surveyors
1915 Orangewood Ave., Suite 101
Orange, California 92868
(714) 935-0265
(714) 935-0106 FAX

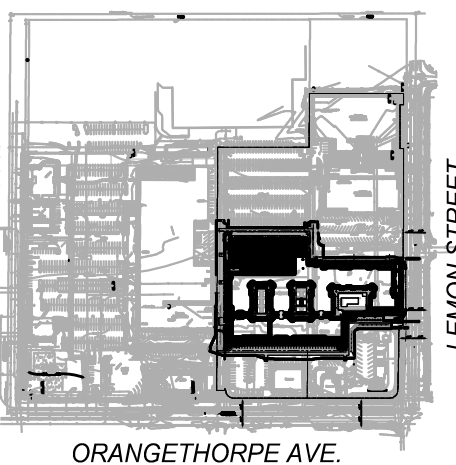
DESIGN CONSULTANT

AUTHORIZATION

PROJECT TITLE

FULLERTON
FULLERTON, CA

Key Plan



DRAWING ISSUES AND REVISIONS

No.	Date	Description

DRAWING NUMBER AND TITLE

TITLE

1"=30'

DRAWING NUMBER AND TITLE

C-1

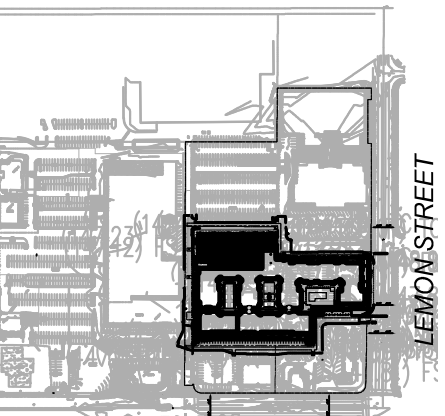
THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

IMPORTANT NOTICE
Section 4216 of the Government Code requires a Dig Alert Identification Number be issued before a "Permit to Excavate" will be valid. For your Dig Alert I.D. Number call Underground Service Alert Call 811 Two working days before you dig.

THIS PLAN IS:
PRELIMINARY
(NOT FOR CONSTRUCTION)

FULLERTON
FULLERTON, CA

Key Plan



RANGETHORPE AVE.

DRAWING ISSUES AND REVISIONS

[illegible]

DRAWING NUMBER AND TITLE

CONCEPTUAL SITE PLAN

1"=40'

DRAWING NUMBER AND TITLE

C-2

NOTICE TO CONTRACTOR

THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION AND SIZE OF ALL UTILITIES, PIPES, AND/OR STRUCTURES AND SHALL BE RESPONSIBLE FOR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

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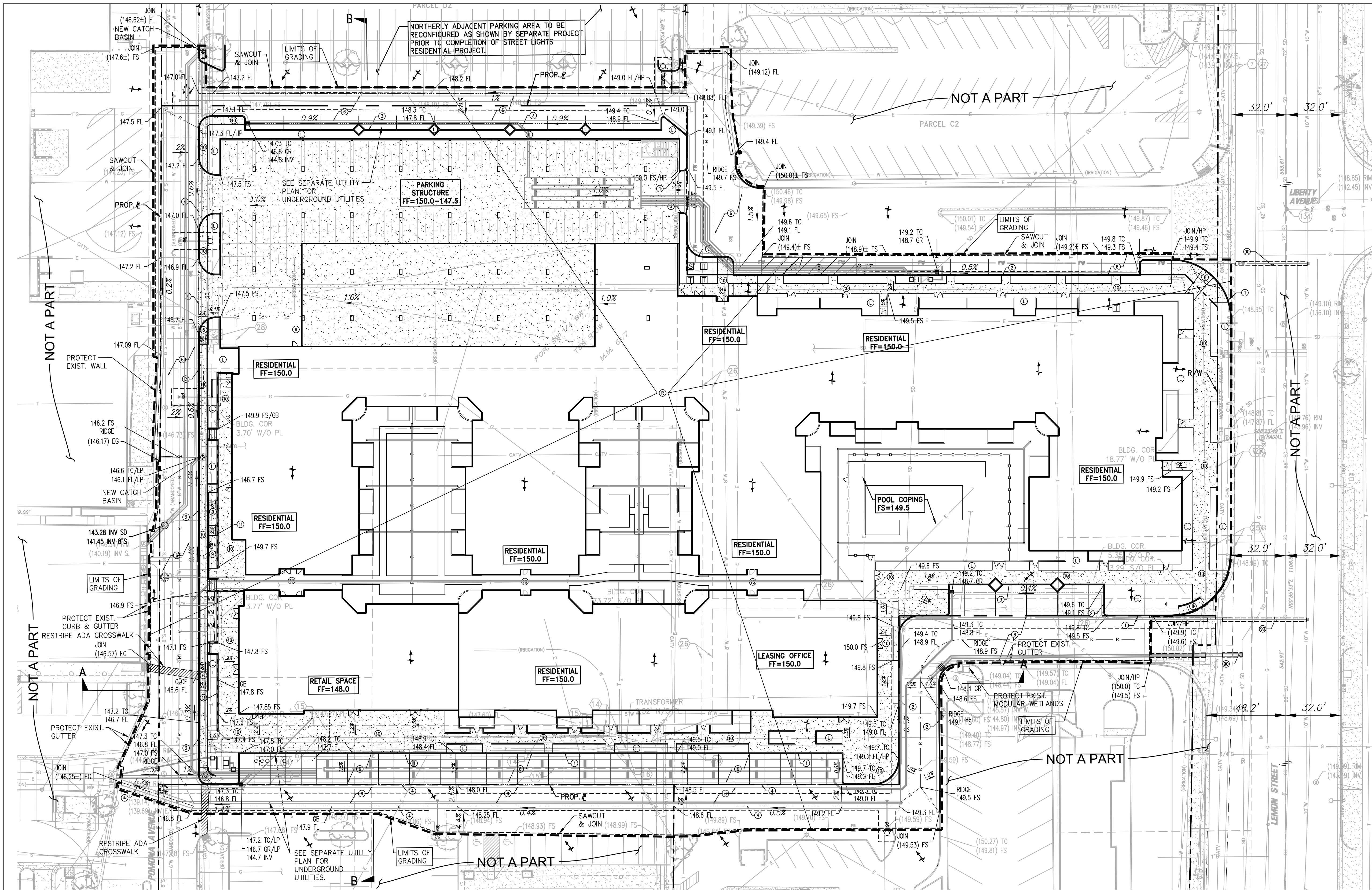
PLAN PREPARED FOR

STREET LIGHTS

STREET LIGHTS
RESIDENTIAL
4180 LA JOLLA VILLAGE DRIVE, STE. 125
LA JOLLA, CA 92037

40 80 120

SCALE: 1"=40'



- CONSTRUCTION NOTES (ON-SITE)**
- PCC CURB, 6-INCH CF UNLESS OTHERWISE NOTED.
 - PCC CURB AND GUTTER 6-INCH CF AND 18-INCH WIDE UNLESS OTHERWISE NOTED
 - PCC CURB AND MODIFIED GUTTER, 6-INCH CURB FACE UNLESS OTHERWISE NOTED
 - PCC V-GUTTER, GUTTER WIDTH = 36-INCH
 - DRIVE AISLE PAVING ---INCH PCC OVER ---INCH BASE OVER COMPACTED SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS, FINISH AND JOINTS PER ARCHITECTURAL PLANS
 - DRIVE AILE PAVING ---INCH AC OVER ---INCH BASE OVER COMPACTED SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS
 - PARKING AREA PAVING ---INCH AC OVER ---INCH BASE OVER COMPACTED SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS
 - CURB RAMP CONFORMING TO SECTION 11B OF CBC
 - RAMP WITH HANDRAIL CONFORMING TO SECTION 11B OF CBC SEE ARCHITECTURAL DETAILS
 - INCH PCC SIDEWALK OVER ---INCH BASE OVER PER GEOTECHNICAL RECOMMENDATIONS, FINISH AND JOINTS PER ARCHITECTURAL PLANS
 - RETAINING WALL
 - LANDSCAPE AREA PER LANDSCAPE PLANS
 - SAWCUT AND REMOVE EXISTING AC PAVING, CONCRETE CURB, BUILDINGS AND FOUNDATIONS, ETC. TO THE EXTENTS SHOWN.
- CONSTRUCTION NOTES (OFF-SITE)**
- TRENCH AND BACKFILL PER CITY OF FULLERTON STD. NO. 312 & 313.

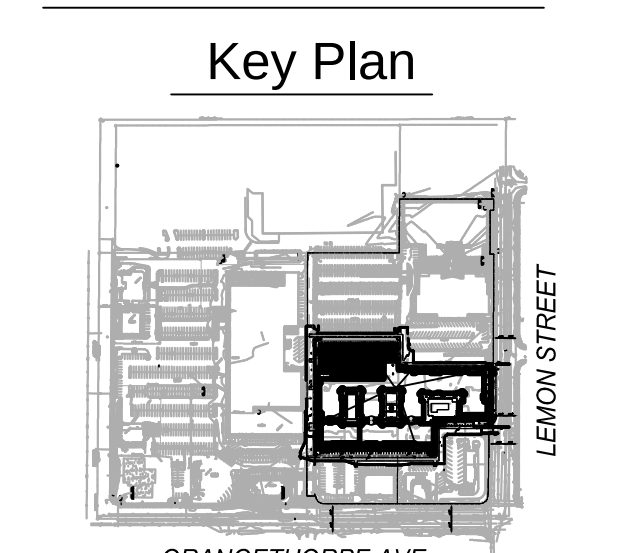
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DESIGN CONSULTANT

AUTHORIZATION

PROJECT TITLE

FULLERTON
FULLERTON, CA



ORANGETHORPE AVE.

DRAWING ISSUES AND REVISIONS		
No.	Date	Description

DRAWING NUMBER AND TITLE
CONCEPTUAL GRADING PLAN

1"=30'

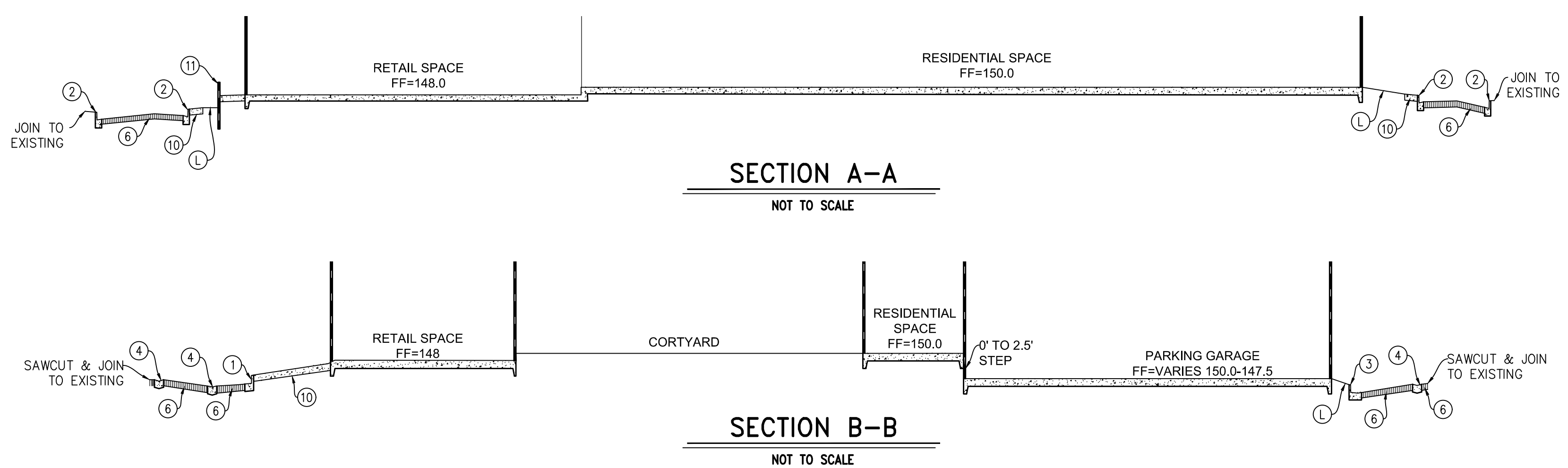
DRAWING NUMBER AND TITLE

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IMPORTANT NOTICE

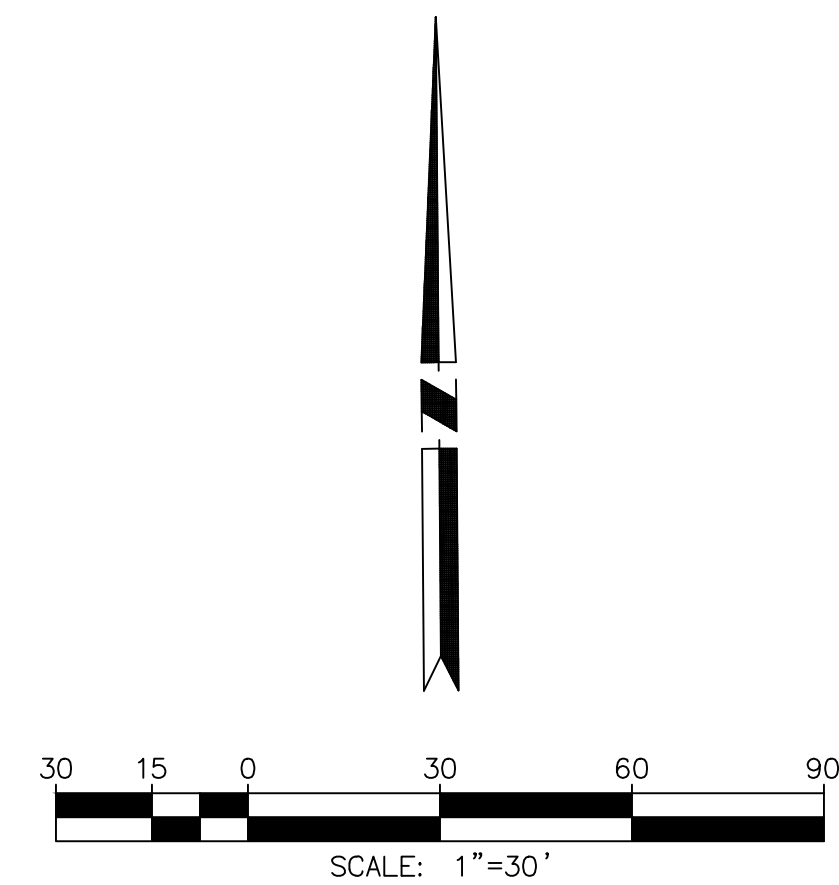
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PRELIMINARY
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PLAN PREPARED FOR
**STREET LIGHTS
RESIDENTIAL**
4180 LA JOLLA VILLAGE DRIVE, STE. 125
LA JOLLA, CA 92037

C-3



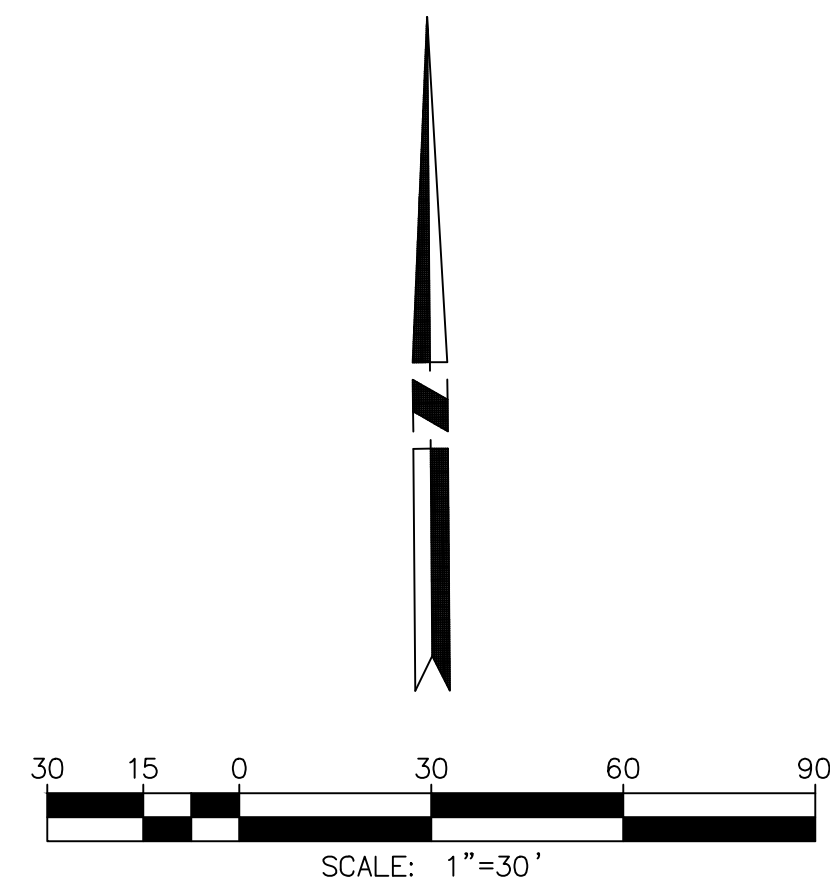
FULLERTON
FULLERTON, CA

DRAWING NUMBER AND TITLE

C-4

**STREET LIGHTS
RESIDENTIAL**
4180 LA JOLLA VILLAGE DRIVE, STE. 125
LA JOLLA, CA 92037

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CALL 811
Two working days before you dig.



FULLERTON
FULLERTON, CA

C-5

PLAN PREPARED FOR
STREET LIGHTS
RESIDENTIAL
4180 LA JOLLA VILLAGE DRIVE, STE. 125
LA JOLLA, CA 92037

- (80) POTHOLE AND VERIFY THE EXISTENCE, LOCATION, DEPTH, MATERIAL, SIZE AND CONDITION OF EXISTING 8-INCH WATER MAIN. REPORT FINDINGS TRUXAW & ASSOCIATES PRIOR TO CONSTRUCTION.
- (81) CONNECT TO EXISTING 8-INCH WATER MAIN PER CITY OF FULLERTON STANDARDS.
- (82) CONSTRUCT CONCRETE THRUST BLOCK.
- (83) INSTALL DOUBLE DETECTOR CHECK PER CITY OF FULLERTON STD. _____
- (84) PLACE _____INCH PVC (C-900) WATER LINE. PIPE BEDDING AND BACKFILL TO CONFORM TO THE RECOMMENDATIONS OF THE SOILS ENGINEER AND THE CITY OF FULLERTON.
- (85) INSTALL FIRE HYDRANT PER CITY OF FULLERTON STD. 610.
- (86) INSTALL GATE VALVE PER CITY OF FULLERTON STD. 650.
- (87) CONNECT TO EXISTING 10-INCH WATER MAIN PER CITY OF FULLERTON STANDARDS.

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Attachment D

Notice of Transfer of Responsibility

Water Quality Management Plan Notice of Transfer of Responsibility

Tracking No. Assigned by the City of Fullerton: _____

Submission of this Notice of Transfer of Responsibility constitutes notice to the City of Fullerton that responsibility for the Water Quality Management Plan ("WQMP") for the subject property identified below, and implementation of that plan, is being transferred from the Previous Owner (and his/her agent) of the site (or a portion thereof) to the New Owner, as further discussed.

I. Previous Owner/Previous Responsible Party Information

Company/Individual Name:		Contact Person:	
Title:			
Street Address:			
City:	State:	Zip:	Phone:

II. Information about Site Transferred

Name of Project (if applicable):		Contact Person:	
Title of WQMP applicable to Site:			
Planning Area (PA) and/or Tract Number(s) for Site Lot Numbers (if Site is a portion of a tract):			
Date WQMP Prepared (and revised if applicable):			
Street Address of Site:			
City:	State:	Zip:	Phone:

III. New Owner/New Responsible Party Information

Company/Individual Name:		Contact Person:	
Title:			
Street Address:			
City:	State:	Zip:	Phone:

IV. Ownership Transfer Information

General Description of Site Transferred to New Owner:	General Description of Portion of Project/Parcel Subject to WQMP Retained by Owner (if any):
Lot/Tract Numbers of Site Transferred to New Owner:	
Remaining Lot/Tract Numbers Subject to WQMP Still Held by Owner (if any):	
Date of Ownership Transfer:	

Preliminary Water Quality Management Plan (WQMP)
Fullerton Shops at Fullerton Town Center

Note: When the Previous Owner is transferring a site that is a portion of a larger project/parcel addressed by the WQMP, as opposed to the entire project/parcel addressed by the WQMP, the General Description of the Site transferred and the remainder of the project/parcel not transferred shall be set forth as maps attached to this notice. These maps shall show those portions of a project/parcel addressed by the WQMP that are transferred to the New Owner (the Transferred Site), those portions retained by the Previous Owner, and those portions previously transferred by Previous Owner. Those portions retained by Previous Owner shall be labeled "Previous Owner," and those portions previously transferred by Previous Owner shall be labeled as "Previously Transferred."

V. Purpose of Transfer

The purpose of this Notice of Transfer of Responsibility are: 1) to track transfer of responsibility for implementation and amendment of the WQMP when property to which the WQMP is transferred from the Previous Owner to the New Owner, and 2) to facilitate notification to a transferee of property subject to a WQMP that such New Owner is now the Responsible Party of record for the WQMP for those portions of the site that it owns.

VI. Certifications

A. Previous Owner

I Certify under penalty of law that I am no longer the owner of the Transferred Site as described in Section II above. I have provided the New Owner with a copy of the WQMP applicable to the Transferred Site that the New Owner is acquiring from the Previous Owner.

Printed Name of Previous Owner Representative:	Title:
Signature of Previous Owner Representative:	Date:

B. New Owner

I Certify under penalty of law that I am the owner of the Transferred Site, as described in Section II above, that I have been provided a copy of the WQMP, and that I have informed myself and understand the New Owner's responsibilities related to the WQMP, its implementation, and Best Management Practices associated with it. I understand that by signing this notice, the New Owner is accepting all ongoing responsibilities for implementation and amendment of the WQMP for the Transferred Site, which the New Owner has acquired from the Previous Owner.

Printed Name of New Owner Representative:	Title:
Signature of New Owner Representative:	Date: