



Public Works Agency

# Ventura County Stormwater Quality Management Program

Ventura County School Facilities Network Meeting

County Biofiltration & Infiltration Projects

By

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Water Quality Engineer

October 15, 2014



# Project Location Selection Criteria

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1. Within urban area of unincorporated County
2. Drains to 303(d) and/or waterbody subject to TMDL
3. No land acquisition or easements required
4. High visibility for public outreach
5. Large tributary drainage area (15+ acres)
6. Adjacent to existing storm drain infrastructure
7. Permeable soils per available soil maps

## Southern Ventura County LID/Green Streets Retrofits

-  Project Sites
-  Ventura County
-  Watersheds
-  Moderate Infiltrating Soils
-  Excellent Infiltrating Soils



Meiners Oaks - Infiltration Testing		
Test Location	Infiltration Rate(in/hr)	
	3 ft Test Depth	14 ft Test Depth
1	< 0.25	< 0.25
2	< 0.25	0.75
3	< 0.25	0.5
4	< 0.25	< 0.25

Government Center - Infiltration Testing		
Test Location	Infiltration Rate(in/hr)	
	3 ft Test Depth	13 ft Test Depth
1	< 0.25	8
2	< 0.25	21
3	< 0.25	32
4	< 0.25	2

Oak Park - Infiltration Testing		
Test Location	Infiltration Rate(in/hr)	
	2 ft Test Depth	15.5 ft Test Depth
1	< 0.25	< 0.25
2	< 0.25	1.53
3	< 0.25	< 0.5
4	< 0.25	< 0.25

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geogra Community

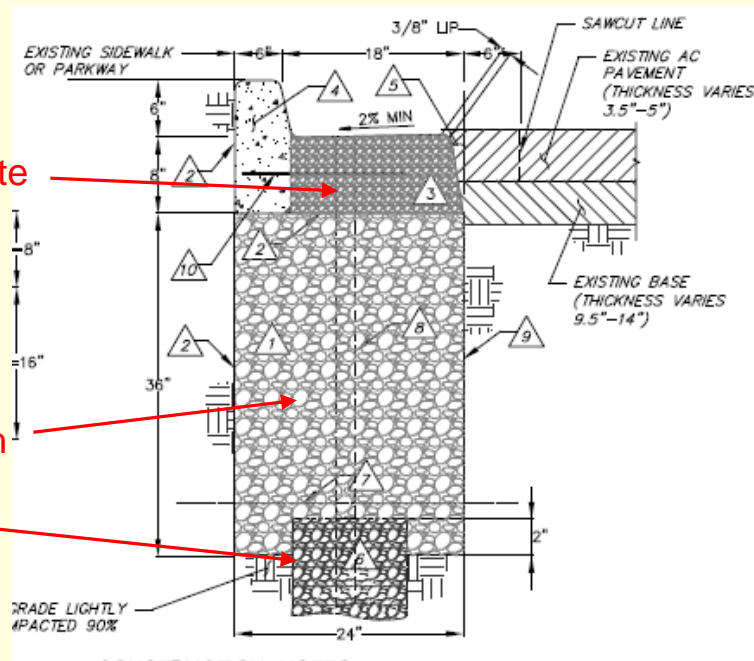


# Project #1 - Government Center

Pervious Concrete

Infiltration Trench

Drywell





# Pervious Gutters at County Government Center

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## DRYWELLS

Drywells are drilled holes filled with coarse gravel that help water soak into the ground increasing groundwater recharge volumes.



## INFILTRATION TRENCH

Water is stored in infiltration trenches that are filled with coarse gravel that have microbes living on them to help break down pollutants like oil and grease, excess nutrients and bacteria.



## INFILTRATION SYSTEM

Stormwater flows through the drywells and infiltration trenches before seeping into the adjacent soil through filter fabrics that line the bottom and sides of the infiltration system.



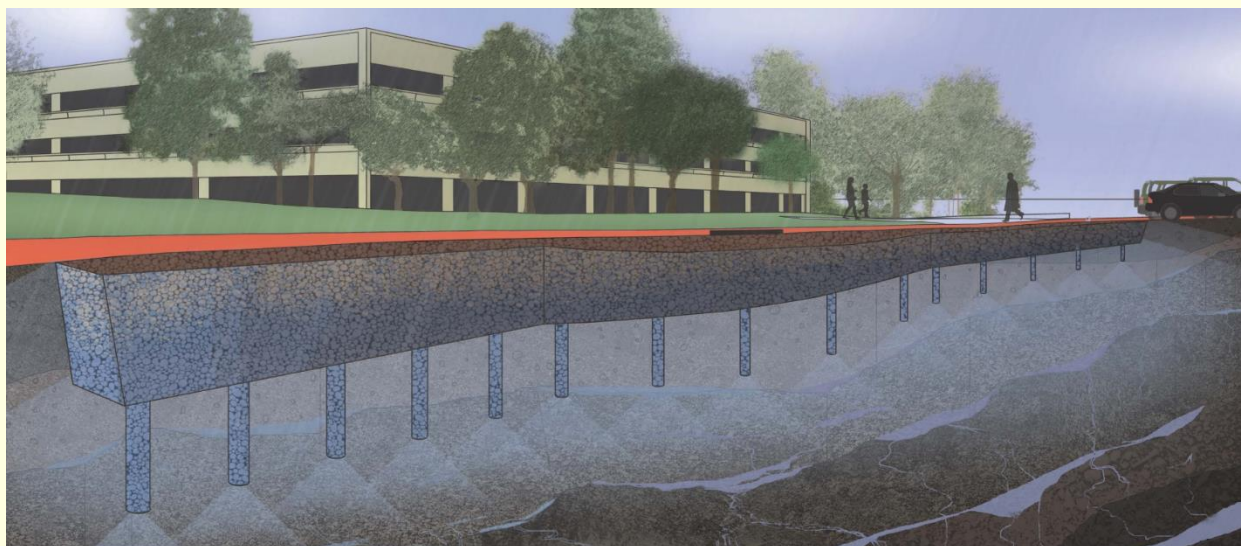
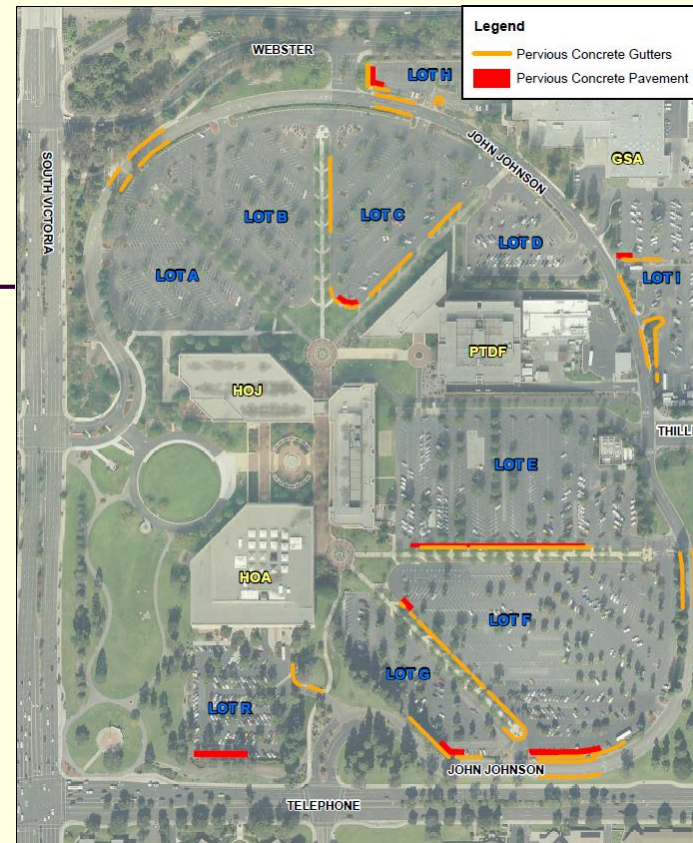
## PERVIOUS CONCRETE

Pervious Concrete contains small spaces that allow water to pass through to the infiltration trench and drywells below.



# Retrofit

- Proposition 84 Grant award in April 2013
- Infiltration of first flush from 39 acres
- Construction completed in September 2014





# Water Quality Monitoring

- Stormwater and dry-weather runoff
- Baseline (2013-2014) & Post-construction (2014-2015)





# Pervious Concrete Demonstration

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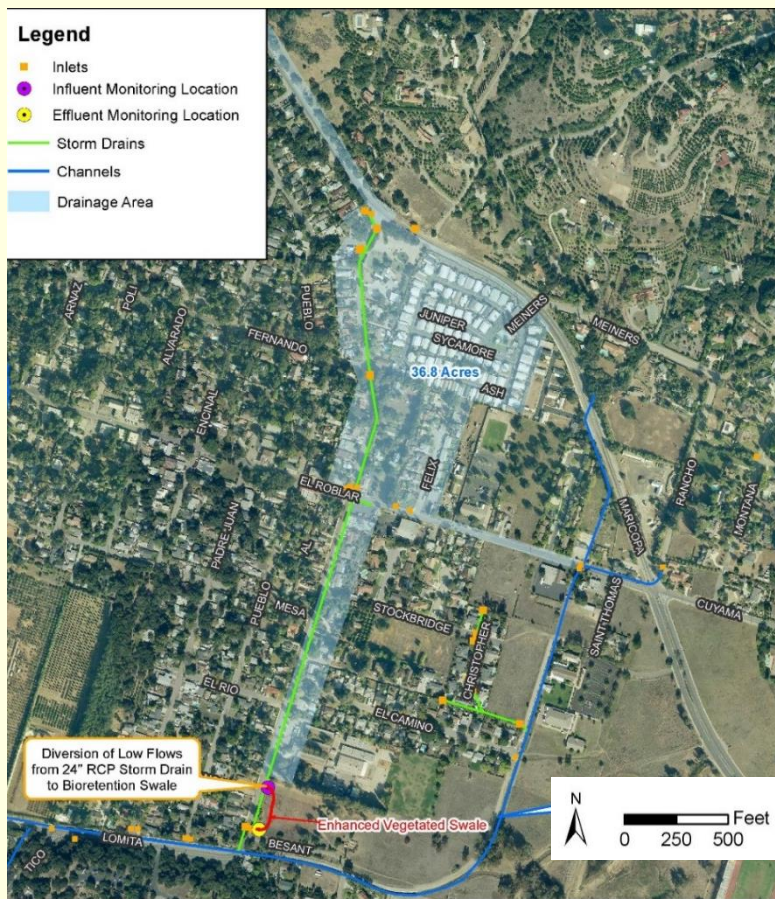






# Project #2 - Urban LID Retrofit Project at Meiners Oaks, CA - Location

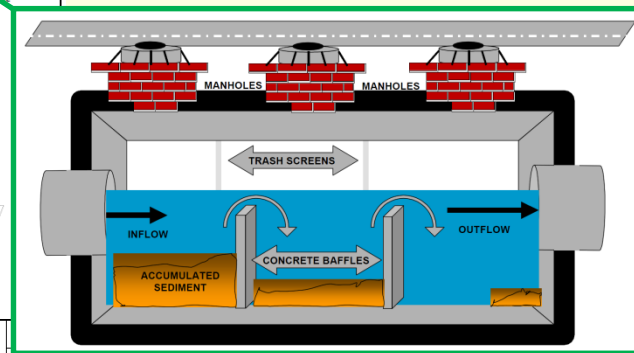
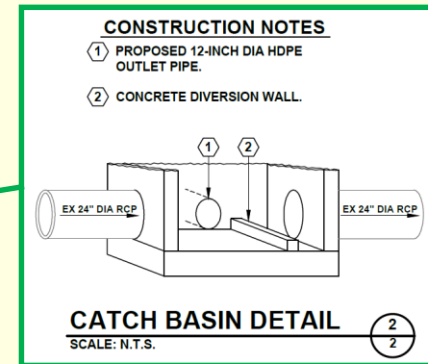
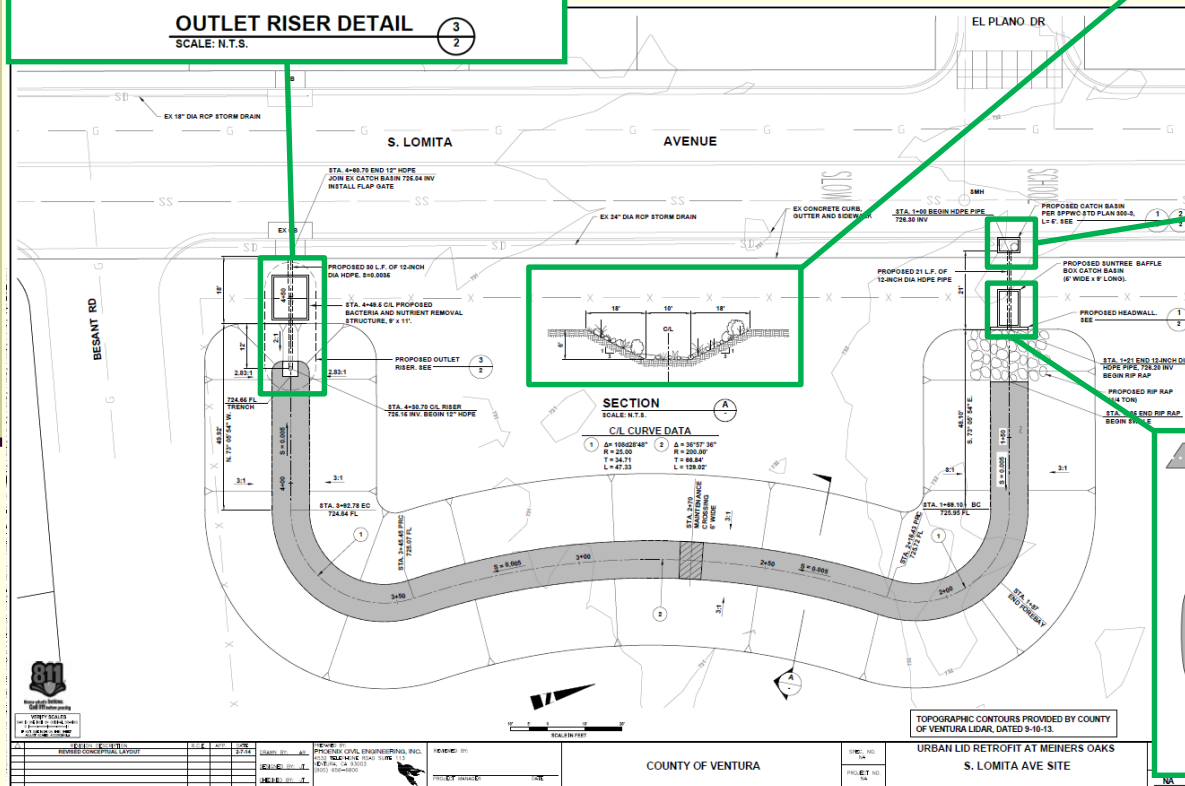
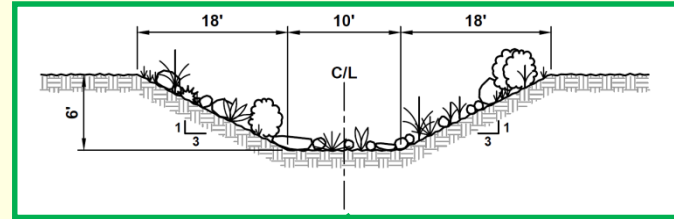
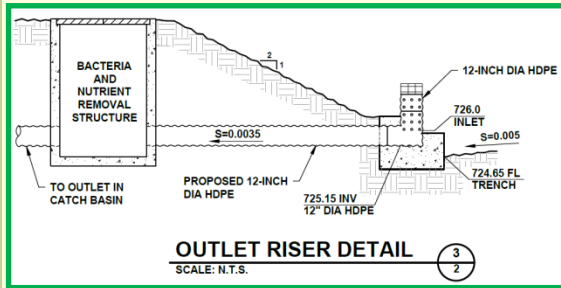
- Ojai Valley Land Conservancy's Ojai Meadows Preserve
- Treats runoff from about 40% (36.8 acres) of the Meiners Oaks urban area
- Treatment of 1,660,000 cubic feet of runoff annually





# Meiners Oaks Enhanced Vegetated Swale

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PROJECT NO. 13-001	DATE 12/13	SCALE 1" = 40'	PROJECT NAME URBAN LID RETROFIT AT MEINERS OAKS
DESIGNED BY J. L. HARRIS	CHECKED BY J. L. HARRIS	DATE 12/13	SHEET NO. 1
DRAWN BY J. L. HARRIS	PROJECT NO. 13-001	DATE 12/13	TITLE SHEET
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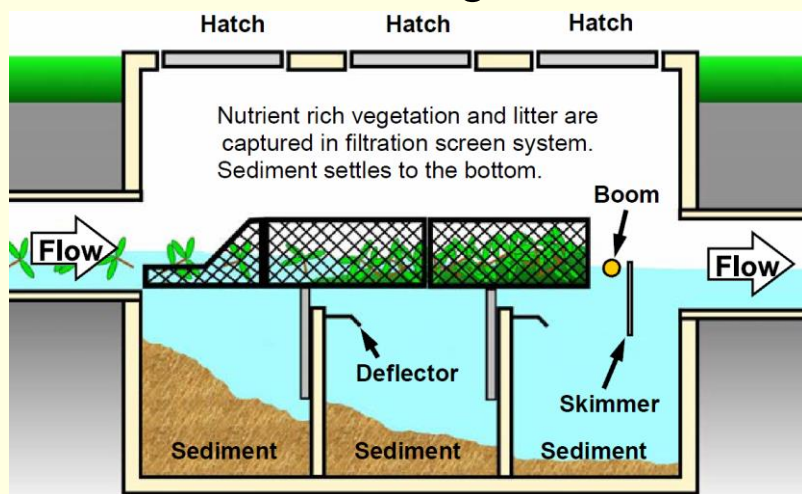


# Meiners Oaks Proprietary Treatment Devices

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## Suntree Baffle Box

Sediment/Trash/Organic Removal



## Abtech Smart Sponge Vault Bacteria/Nutrient Removal

**Containment Cage**  
Containment cage made of 304 stainless steel is utilized to contain the Smart Sponge® media.

**Concrete Construction**  
The use of concrete allows this to be a flexible design for new or retrofitted applications.

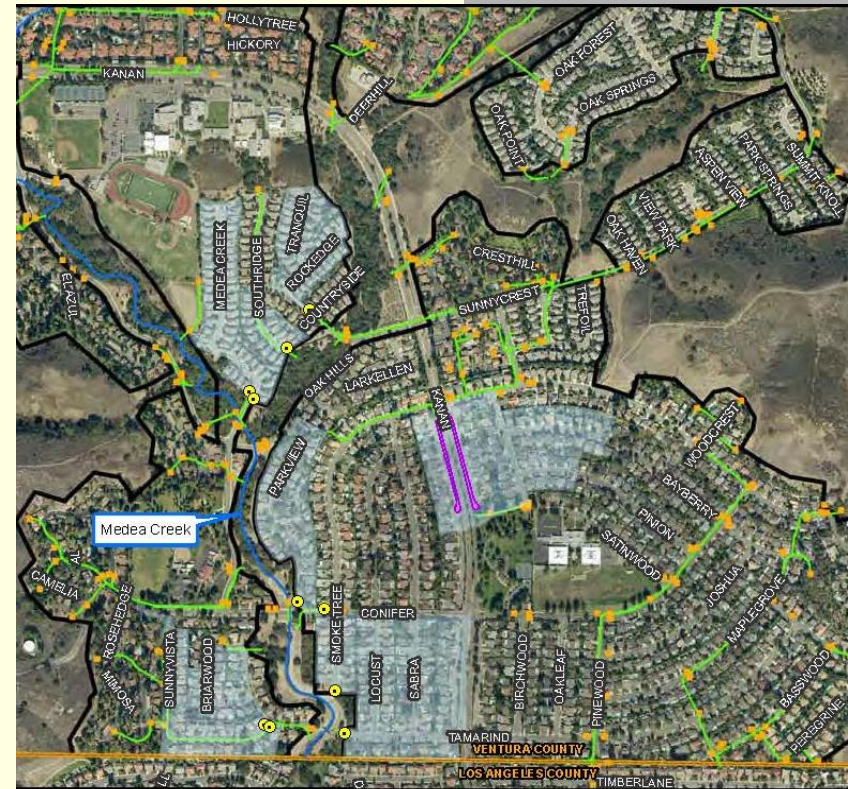
**Smart Sponge® Compact Vault**  
Effective on Hydrocarbon Removal and Bacteria Reduction.

**Smart Sponge® Filtration Units SMPK**  
Utilizes the patented technology of Abtech's Smart Sponge or Smart Sponge Plus filtration media



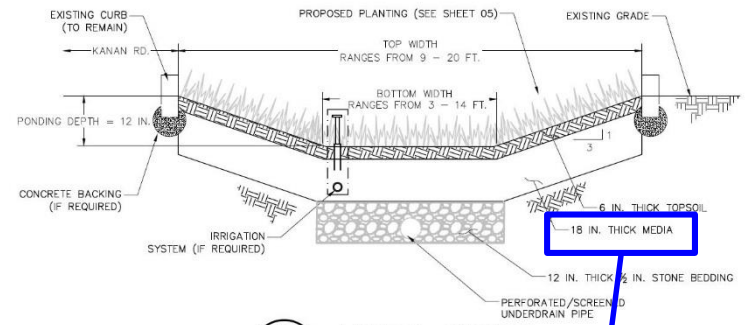
# Project #3 - Oak Park Green Streets Urban Retrofit

- Biofiltration and distributed modular wetlands
- Treatment of 83 acres of urban area
- Treatment of 1,700,000 cubic feet of runoff annually





# Oak Park Biofilters

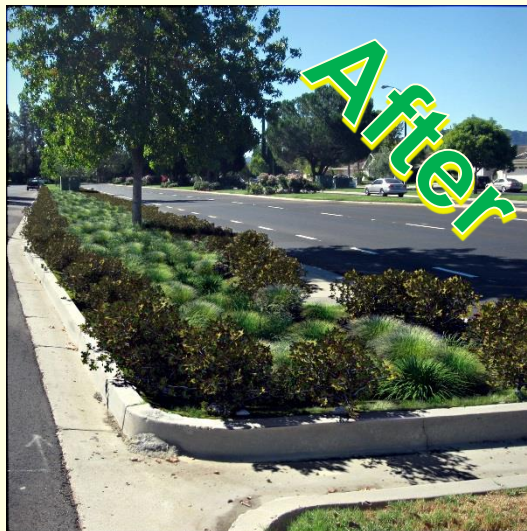


**A**  
**03** TYPICAL SECTION  
ROADSIDE BIOFILTER  
SCALE: N.T.S.

Custom Media Mix:

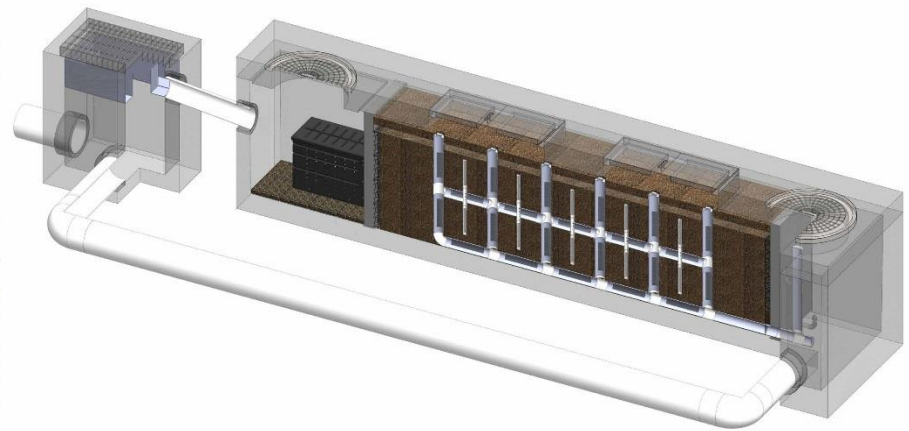
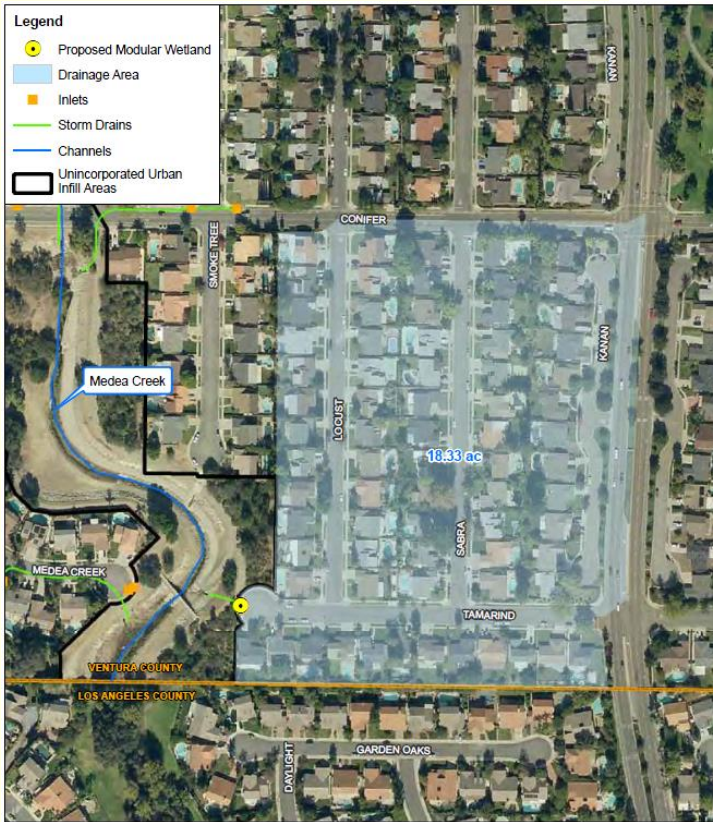
- 60% Sand
- 20% Zeolite
- 20% Biochar

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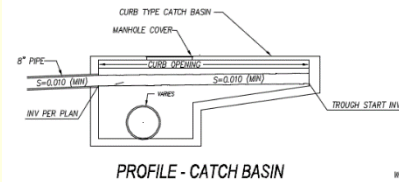




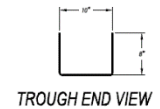
# Oak Park Modular Wetlands



## DVERT™ MODULAR WATER QUALITY DIVERSION WEIR SYSTEM

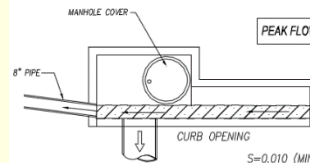


PROFILE - CATCH BASIN

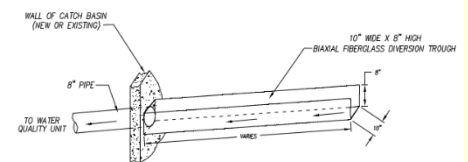


TROUGH END VIEW

TROUGH/PIPE FLOW RATE	
PIPE SIZE DIA. (Inches)	#
55000 HEAD (Inches)	8
SAFETY FACTOR	2
FLOW RATE (GPD)	174



TOP VIEW - CATCH BASIN



TROUGH ISOMETRIC VIEW

DRAWINGS NOT TO SCALE

PATENT PENDING