OTAY CROSSINGS COMMERCE PARK

APPENDIX L

STORM WATER MANAGEMENT PLAN,
PRELIMINARY HYDROLOGY / DRAINAGE STUDY, AND
HYDROMODIFICATION MANAGEMENT PLAN

to the

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT REPORT

EIR 93-19-006Q, TM 5405RPL[7]
SCH No. 2006041039

Lead Agency:

County of San Diego
Department of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, California 92123
Contact: Robert Hingtgen
(858) 694-3712

MAY 2010

STEVENS · CRESTO ENGINEERING, INC.

Major Stormwater Management Plan (Major SWMP) For *Otay Crossings Commerce Park, TM 5405 RPL7*

Preparation/Revision Date:
April 27, 2010

Prepared for:

Kearny PCCP Otay 311, LLC
655 West Broadway, Suite 1600
San Diego, CA 92101
Telephone: 619-702-8130

Prepared by:

Stevens-Cresto Engineering
Bryan T. Hill, Design Engineer
9665 Chesapeake Dr. Suite 320
San Diego, CA 92129
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The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan have been prepared under the direction of the following Registered Civil Engineer and meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

Mark E. Stevens, RCE #35502

REGISTERED PROFESSIONAL ENGINEER
MARK E. STEVENS
C 35502
EXP. 9/30/11
CIVIL
STATE OF CALIFORNIA

4/27/10
Date

OTAY CROSSINGS COMMERCE PARK (TM 5405 RPL7)
County of San Diego Comments
Responses to County Comments, Dated 04/26/10

1) Page 15, Table 7: Provide additional explanation for selecting each Primary or Secondary pollutant of concern.

   Response: Additional discussion has been provided regarding each pollutant of concern.

2) Page 31, Table 10: Check the appropriate boxes under "Project Specific POCs"

   Response: Appropriate boxes have been checked.

3) Page 39, second paragraph: Revise from "All proposed BMPs" to "The Detention Basins listed in Table 14". Add another sentence to read "The CDS units and Bio-Clean filter inserts listed in Table 14 will be public responsibility".

   Response: Requested revisions have been made.

4) Attachment C-1, Intermediate Post-Construction: extend Airway Road to show the area that forms the 2.15 acres and add a square to show the location of Bio-Clean 'J'.

   Response: Requested revisions have been made.

OWNER'S CERTIFICATION

This project-specific Major Stormwater Management Plan (Major SWMP) has been prepared for Kearny PCCP Otay 311, LLC by Stevens-Cresto Engineering for the project known as Otay Crossings Commerce Park, TM 5405 RPL7, located at the southeast corner of Otay Mesa Road and Alta Road.

This Major SWMP is intended to comply with the requirements of The County of San Diego for Tentative Map 5405 RPL7, which includes the requirement for the preparation and implementation of a project-specific Major SWMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this Major SWMP and will ensure that this Major SWMP is amended as appropriate to reflect up-to-date conditions on the site. Upon completion of each unit of the project, this Major SWMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this Major SWMP. At least one copy of this Major SWMP will be maintained at the project site or project owner's office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this Major SWMP. The undersigned is aware that implementation of this Major SWMP is enforceable under the County of San Diego Watershed Protection Ordinance (Municipal Ordinance No. 9926).

If the undersigned transfers its interest in the subject property/project, the undersigned shall notify the successor in interest in writing of its responsibility to implement this SWMP and maintain post-construction Best Management Practices (BMPs) in perpetuity. The undersigned shall provide the Department of Public Works, Watershed Protection Program with a copy of the signed notification, including the name, address, and contact information of the successor.

"I, the undersigned, certify under penalty of law that the provisions of this Major SWMP have been reviewed and accepted and that the Major SWMP and BMP maintenance requirements will be transferred to future successors in interest."

Owner's Signature

3/29/10
Date

John V. Bragg Jr.
Owner's Printed Name

Senior Vice President
Owner's Title/Position

Kearny PCCP Otay 311, LLC
655 West Broadway, Suite 1600
San Diego, CA 92101
Telephone: 619-702-8130
E-Mail: jbragg@kearny.com

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The Major Stormwater Management Plan (Major SWMP) must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. To determine whether your project is required to submit a Major or Minor SWMP, please reference the County's Stormwater Intake Form for Development Projects.

Project Name:	OTAY CROSSINGS COMMERCE PARK
Project Location:	SE CORNER OF OTAY MESA RD. AND ALTA RD.
Permit Number (Land Development Projects):	TM 5405 RPL7
Work Authorization Number (**CIP only**):	
Applicant:	KEARNY PCCP OTAY 311, LLC
Applicant's Address:	655 WEST BROADWAY, SUITE 1600 SAN DIEGO, CA 92101
Plan Prepared By (*Leave blank if same as applicant*):	STEVENS-CRESTO ENGINEERING INC.
Preparer's Address:	9665 CHESAPEAKE DR., SUITE 320 SAN DIEGO, CA 92123-1352
Date:	04/27/10

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9926) requires all applications for a permit or approval associated with a Land Disturbance Activity to be accompanied by a Storm Water Management Plan (SWMP) (section 67.806.b). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority development project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Review Stage	Does the SWMP need revisions?		If YES, Provide Revision Date
	YES	NO	
Tentative Map 3rd	X		12/21/06, 9/10/07
Tentative Map 4th	X		08/08/08
Tentative Map 5th	X		05/14/09
Tentative Map 6th	X		10/01/09
Tentative Map 7th	X		03/26/10
Tentative Map 8th	X		04/27/10

Instructions for a Major SWMP can be downloaded at
http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html

Completion of the following checklists and attachments will fulfill the requirements of a Major SWMP for the project listed above.

STEP 1

PRIORITY DEVELOPMENT PROJECT DETERMINATION

TABLE 1: IS THE PROJECT IN ANY OF THESE CATEGORIES?

Yes ❑	No ■	**A**	***Housing subdivisions of 10 or more dwelling units.*** Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes ❑	No ■	**B**	***Commercial—greater than one acre.*** Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes ❑	No ■	**C**	***Heavy industry—greater than one acre.*** Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes ❑	No ■	**D**	***Automotive repair shops.*** A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes ❑	No ■	**E**	***Restaurants.*** Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes ❑	No ■	**F**	***Hillside development greater than 5,000 square feet.*** Any development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes ❑	No ■	**G**	***Environmentally Sensitive Areas (ESAs).*** All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
Yes ❑	No ■	**H**	***Parking lots 5,000 square feet or more*** or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes ■	No ❑	**I**	***Street, roads, highways, and freeways.*** Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ❑	No ■	**J**	***Retail Gasoline Outlets (RGOs)*** that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

To use the table, review each definition A through K. If any of the definitions match, the project is a Priority Development Project. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development. Please see special requirements for previously developed sites and project exemptions on page 6 of the County SUSMP.

STEP 2

PROJECT STORMWATER QUALITY DETERMINATION

Total Project Site Area: 311.5 Ac.

Estimated amount of disturbed acreage: 239.8 Ac. (approx 47.1 Ac of the project will be dedicated open space and 24.6 Ac is future Caltrans R/W)
(If >1 acre, you must also provide a WDID number from the SWRCB) WDID: Not applicable for this phase of development; to be provided at final engineering

Complete A through C and the calculations below to determine the amount of impervious surface on your project before and after construction.

A. **Total size of project site:** 311.5 Ac.

B. **Total impervious area (including roof tops) before construction:** 0 Ac.

C. **Total impervious area (including roof tops) after construction:** 19.9 Ac. (Roads only – intermediate post construction)

Calculate percent impervious before construction: (B/A)*100 = 0%
Calculate percent impervious after construction: (C/A)*100 = 6.4% (Roads only – intermediate post construction)

Please provide detailed descriptions regarding the following questions:

TABLE 2: PROJECT SPECIFIC STORMWATER ANALYSIS

1.	Please provide a brief description of the project.

Otay Crossings Commerce Park (OCCP) is a 311.5 acre industrial/commercial subdivision located within the southwest quadrant of the East Otay Mesa Specific Plan Area. The project is located south of Otay Mesa Road and east of Alta Road in the Otay Mesa area within the County of San Diego, California. This report accompanies the Tentative Map for "County of San Diego Tract 5405" (OCCP). The project will consist of fifty-nine (59) lots on 311.5 acres. Lots 57-59, approximately 47.1 acres, will be dedicated as open space. Lots 54 and 55, approximately 24.6 acres, are future Caltrans right-of-way. Lot 56, approximately 59.1 acres, will be the location of a future international border crossing. Lots 54-56 will be rough graded at the same time as the subdivision and temporarily used for parking and storage only (Temp. Pads). Ultimately this land will be acquired by CalTrans for completion of the Highway. The remaining 53 lots range in size from 1.4 acres to 7.5 acres and will be graded for industrial/ commercial use. Otay Crossings Commerce Park proposes only to create rough graded pads and roads/ utilities to service those pads. BMPs at this phase of development will be limited to those BMPs required to treat runoff from the public right of way, and regional detention facilities required per the project Hydromodification Management Plan and CEQA Preliminary Hydrology/ Drainage Study.

Project completion and permanent post construction Best Management Practices (BMPs) will be implemented in two steps. Initially, completion of construction will yield rough graded pads stabilized for erosion and water quality (to be referred to as: Intermediate Post Construction, "IPC"- within the remainder of this report). Ultimately, rough graded pads will be purchased and occupied by industrial/commercial facilities (to be referred to as: Ultimate Development, "UD"- within the remainder of this report). Detention basins and water quality devices are required at UD of each lot. IPC and UD storm runoff collection and conveyance systems for OCCP are designed to limit runoff rates to existing levels. The project Hydromodification Management Plan and CEQA Preliminary Hydrology/ Drainage Study contain detailed calculations for existing and post-construction drainage discharges.

1. At IPC stabilization of rough graded pads will be achieved based upon County of San Diego DPW, Land Development, "Stormwater Management and Requirements on Developer and Single Family Grading Permits - Construction BMPs". Water quality of the stabilized pads will be assured through the use of desiltation basins on each pad. The desiltation basins will serve as detention structures limiting rough graded pad runoff to pre-development rates. Additionally, at IPC public streets and infrastructure storm drain construction will be completed. Streets will be protected from sediment transportation via County erosion protection requirements. As construction of streets will be completed at IPC, water quality devices will be installed for removal of vehicular pollutants (see Attachment C for additional detail). Additionally, a total of six regional detention basins will be completed during this phase of development. The regional facilities will be designed primarily to mitigate for the increase in runoff from the public streets, and will be located within Lots 54 and 56.

Acquisition of Lots 54 and 56 by CalTrans will include acceptance of the responsibility for detention of the project runoff routed to the regional basins. The regional detention basins will remain in place after completion of CalTrans SR-11.

2. At UD industrial/commercial occupants will be required to provide methods to detain runoff to satisfy the project's hydromodification criteria, and assure water quality of stormwater runoff from each lot; as specified within the, "County of San Diego: Stormwater Standards; Ordinance No. 9426 (N.S.)". Detention structures will be installed to limit the UD discharge to the existing runoff rates in accordance with the requirements of the Specific Plan. To accomplish final detention pond creation, the Final Engineering documents will contain minimum required detention volumes for each lot, with parameters for the types of detention facilities to be used. Combined water quality / detention facilities may be used.

2.	Describe the current and proposed zoning and land use designation.

Existing and proposed zoning are S-88, Specific Plan. The Otay Mesa Specific Plan allows for "Mixed Industrial" use within the project boundary.

3.	Describe the pre-project and post-project topography of the project. (Show on Plan)

The 311.3-acre project site, in its existing condition, is undeveloped property consisting of undisturbed natural terrain that is situated within four distinct drainage basins, draining north to south. Runoff passing through the site flows south across the border into Mexico and ultimately to the Tijuana River (Tijuana River Watershed). The proposed project will maintain existing drainage patterns and discharge points to the maximum extent practicable. See the Preliminary Grading Plan in Attachment A for existing and proposed topography.

4.	Describe the soil classification, permeability, erodibility, and depth to groundwater for LID and Treatment BMP consideration. (Show on Plan) If infiltration BMPs are proposed, a Geotechnical Engineer must certify infiltration BMPs in Attachment E.

Per the San Diego County Hydrology Manual, Hydrologic Soil Groups Map, the site is dominated by Hydrologic Soil Group D. Group D soils have very slow infiltration rates when thoroughly wetted. Consisting primarily of clay soils with a high swelling potential, soils with a high permanent water table, soils with clay pan layer at or near the surface, and shallow soils over nearly impervious materials such as rock, Group D soils have a very slow rate of water transmission.

Per a letter prepared by Geocon Incorporated, dated May 15, 2009 and included for reference in Attachment E, top soils at the site consist of, "clayey sand and sandy clay", and formational soils consist of "silty sand, sandy silt, silty clay, and sandy clay". Additionally, Geocon states, "the feasibility of infiltration at the site is very low" and "there is potential for lateral migration to proposed industrial developments and future roadways". As such, infiltration BMPs are not proposed for use at the site.

5.	Describe if contaminated or hazardous soils are within the project area. (Show on Plan)

There appear to be no hazardous or contaminated soils within the project area.

6.	Describe the existing site drainage and natural hydrologic features. (Show on Plan).
Two major drainages pass north-south through the project site. Per the CEQA Preliminary Hydrology/ Drainage Study for Otay Crossings Commerce Park, approximately 37 cfs of off-site run-on is tributary to the westerly drainage during a 100 year design storm. This off-site run-on will be collected within the project storm drain system for conveyance through the site. Approximately 461 cfs of off-site run-on is tributary to the easterly drainage during a 100-year design storm. This off-site run-on will be collected within an unlined channel for conveyance through the site.	
7.	Describe site features and conditions that constrain, or provide opportunities for stormwater control, such as LID features.
The presence of type D silty and clayey soils at the project site constrains options for BMPs. Infiltration BMPs are not feasible and any bio-retention facilities proposed will require underdrains and possibly impervious liners.	
8.	Is this project within the environmentally sensitive areas as defined on the maps in Appendix A of the *County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects?* **(See Figure 1 below)**
Yes	(No)
9.	Is this an emergency project?
Yes	(No)

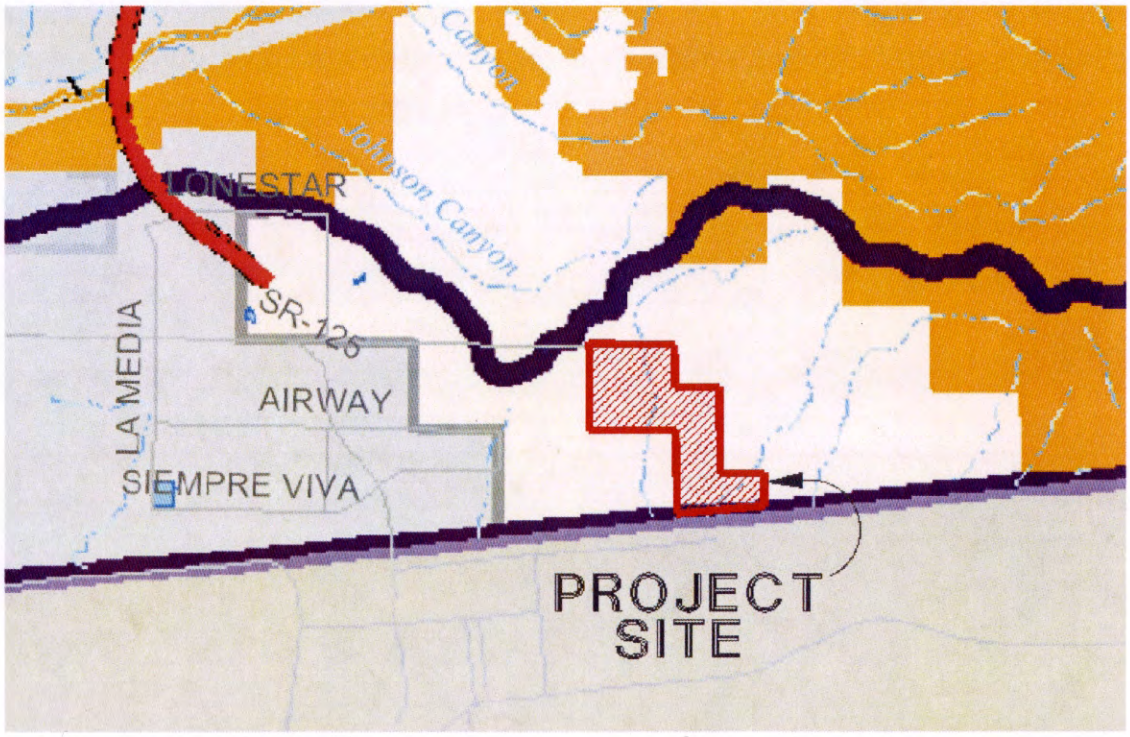


Figure 1
Portion of SUSMP Appendix A – Environmentally Sensitive Areas

CHANNELS & DRAINAGES

Complete the following checklist to determine if the project includes work in channels.

TABLE 3: PROJECT SPECIFIC STORMWATER ANALYSIS

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project include work in channels?	X*			If YES go to 2 If NO go to 13.
2.	Will the project increase velocity or volume of downstream flow?	X			If YES go to 6.
3.	Will the project discharge to unlined channels?			X	If YES go to. 6.
4.	Will the project increase potential sediment load of downstream flow?			X	If YES go to 6.
5.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?			X	If YES go to 8.
6.	Review channel lining materials and design for stream bank erosion.	X			Continue to 7.
7.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	X			Continue to 8.
8.	Include, where appropriate, energy dissipation devices at culverts.	X			Continue to 9.
9.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	X			Continue to 10.
10.	Include, if appropriate, detention facilities to reduce peak discharges.	X			Continue to 11.
11.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.			X	Continue to 12.
12.	Provide other design principles that are comparable and equally effective.		X		Continue to 13.
13.	End				

*No existing channels are present; the project will create a channel.

TEMPORARY CONSTRUCTION BMPS

Please check the construction BMPs that may be implemented during construction of the project. The applicant will be responsible for the placement and maintenance of the BMPs incorporated into the final project design.

- ■ Silt Fence
- ■ Fiber Rolls
- ■ Street Sweeping and Vacuuming
- ■ Storm Drain Inlet Protection
- ■ Stockpile Management
- ■ Solid Waste Management
- ■ Stabilized Construction Entrance/Exit
- ■ Dewatering Operations
- ■ Vehicle and Equipment Maintenance
- ■ Desilting Basin
- ■ Gravel Bag Berm
- ■ Sandbag Barrier
- ■ Material Delivery and Storage
- ■ Spill Prevention and Control
- ■ Concrete Waste Management
- ■ Water Conservation Practices
- ■ Paving and Grinding Operations
- ■ Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

Complete the checklist below to determine if a proposed project will pose an "exceptional threat to water quality," and therefore require Advanced Treatment Best Management Practices during the construction phase.

TABLE 4: EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

No.	CRITERIA	YES	NO	INFORMATION
1.	Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site: http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf		X	If YES, continue to 2. If NO, go to 5.
2.	Will the project disturb more than 5 acres, including all phases of the development?		N/A	If YES, continue to 3. If NO, go to 5.
3.	Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?		N/A	If YES, continue to 4. If NO, go to 5.
4.	Will the project disturb soils with a predominance of USDA-NRCS Erosion factors k_f greater than or equal to 0.4?		N/A	If YES, continue to 6. If NO, go to 5.
5.	Project is not required to use Advanced Treatment BMPs.	X		Document for Project Files by referencing this checklist.
6.	Project poses an "exceptional threat to water quality" and is required to use Advanced Treatment BMPs.		N/A	Advanced Treatment BMPs must be consistent with WPO section 67.811(b)(20)(D) performance criteria

Exemption potentially available for projects that require advanced treatment: Project proponent may perform a Revised Universal Soil Loss Equation, Version 2 (RUSLE 2), Modified Universal Soil Loss Equation (MUSLE), or similar analysis that shows to the County official's satisfaction that advanced treatment is not required

STEP 3

HYDROMODIFICATION DETERMINATION

The following questions provide a guide to collecting information relevant to hydromodification management issues.

TABLE 5: HYDROMODIFICATION DETERMINATION

	QUESTIONS	YES	NO	Information
1.	Will the proposed project disturb 50 or more acres of land? (Including all phases of development)	X		If YES, continue to 2. If NO, go to 6.
2.	Would the project site discharge directly into channels that are concrete-lined or significantly hardened such as with rip-rap, sackcrete, etc, downstream to their outfall into bays or the ocean?		X	If NO, continue to 3. If YES, go to 6.
3.	Would the project site discharge directly into underground storm drains discharging directly to bays or the ocean?		X	If NO, continue to 4. If YES, go to 6.
4.	Would the project site discharge directly to a channel (lined or un-lined) and the combined impervious surfaces downstream from the project site to discharge at the ocean or bay are 70% or greater?		X	If NO, continue to 5. If YES, go to 6.
5.	Project is required to manage hydromodification impacts.	X		Hydromodification Management Required as described in Section 67.812 b(4) of the WPO.
6.	Project is not required to manage hydromodification impacts.		X	Hydromodification Exempt. Keep on file.

An exemption is potentially available for projects that are required (No. 5. in Table 5 above) to manage hydromodification impacts: The project proponent may conduct an independent geomorphic study to determine the project's full hydromodification impact. The study must incorporate sediment transport modeling across the range of geomorphically-significant flows and demonstrate to the County's satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water to qualify for the exemption.

STEP 4

POLLUTANTS OF CONCERN DETERMINATION

WATERSHED

Please check the watershed(s) for the project.

☐ San Juan 901	☐ Santa Margarita 902	☐ San Luis Rey 903	☐ Carlsbad 904
☐ San Dieguito 905	☐ Penasquitos 906	☐ San Diego 907	☐ Sweetwater 909
☐ Otay 910	■ Tijuana 911	☐ Whitewater 719	☐ Clark 720
☐ West Salton 721	☐ Anza Borrego 722	☐ Imperial 723	

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

HYDROLOGIC SUB-AREA NAME AND NUMBER(S)

Number	Name
911.12	WATER TANKS

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

SURFACE WATERS that each project discharge point proposes to discharge to. List the impairments identified in Table 7.

SURFACE WATERS (river, creek, stream, etc.)	Hydrologic Unit Basin Number	Impairment(s) listed [303(d) listed waters or waters with established TMDLs]	Distance to Project
Tijuana River	911.11	Eutrophic, indicator bacteria, low dissolved oxygen, pesticides, solids, synthetic organics, trace elements, trash	~7.5 Miles
Tijuana Estuary	911.11	Eutrophic, indicator bacteria, lead, low dissolved oxygen, nickel, pesticides, thallium, trash, turbidity	~12 Miles
Pacific Ocean Shoreline, Tijuana HU	911.11	Indicator bacteria	~13 Miles

http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r9_06_303d_reqtmdls.pdf

GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE MUN	AGR	IND	PROC	FRSH	GWR
TIJUANA HYDROLOGIC UNIT		**11.00**						
Tijuana Valley	HA	11.10						
Water Tanks	HSA	11.12	O	O	O			

● Existing Beneficial Use

O Potential Beneficial Use

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

+ Excepted from Municipal ● Existing Beneficial Use ○ Potential Beneficial Use

PROJECT ANTICIPATED AND POTENTIAL POLLUTANTS

Using Table 6, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

TABLE 6: ANTICIPATED AND POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE

	General Pollutant Categories								
PDP Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development 1 acre or greater	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

PROJECT POLLUTANTS OF CONCERN SUMMARY TABLE

Please summarize the identified project pollutant of concern by checking the appropriate boxes in the table below and list any surface water impairments identified. Pollutants anticipated to be generated by the project, which are also causing impairment of receiving waters, shall be considered the primary pollutants of concern. For projects where no primary pollutants of concern exist, those pollutants identified as anticipated shall be considered secondary pollutants of concern.

TABLE 7: PROJECT POLLUTANTS OF CONCERN

Pollutant Category	Anticipated (X)	Potential (P)	Surface Water Impairments	
Sediments		X		**Secondary**
Nutrients		X	X (Eutrophic)	**Primary**
Heavy Metals	X		X (Lead, nickel, thallium)	**Primary**
Organic Compounds			X (Synthetic organics)	
Trash & Debris	X		X (Solids, trash)	**Primary**
Oxygen Demanding Substances		X	X (Low dissolved oxygen)	**Primary**
Oil & Grease	X			**Secondary**
Bacteria & Viruses			X (Indicator bacteria)	
Pesticides		X	X (Pesticides)	**Primary**

Primary and secondary pollutants are determined by assessing the anticipated and potential pollutants to be generated by the proposed project, and by comparing those to the impairments in the downstream receiving waters. Pollutants anticipated to be generated by the project, which are also causing impairment of receiving waters, shall be considered the primary pollutants of concern. Pollutants anticipated to be generated by the project, which are not currently causing impairment of receiving waters, shall be considered the secondary pollutants of concern. The Tijuana River and Tijuana Estuary are impaired by eutrophic, an indicator of excessive nutrients and, as a result, nutrients are a primary pollutant of concern. The Tijuana Estuary is impaired by lead, nickel, and thallium, and, as a result, heavy metals are a primary pollutant of concern. The Tijuana River and Tijuana Estuary are impaired by trash, and the river is impaired by solids, and, as a result, trash and debris are primary pollutants of concern. The Tijuana River and Tijuana Estuary are impaired by low dissolved oxygen, an indicator of oxygen demanding substances and, as a result, oxygen demanding substances are a primary pollutant of concern. The Tijuana River and Tijuana Estuary are impaired by pesticides and, as a result, pesticides are a primary pollutant of concern. Additional anticipated pollutants, which the downstream receiving waters are not impacted by, are sediments and oil & grease; these are secondary pollutants of concern. Though downstream receiving waters are impaired by synthetic organics and indicator bacteria, they are not anticipated pollutants at the project and, therefore, are not pollutants of concern.

STEP 5

LID AND SITE DESIGN STRATEGIES

Each numbered item below is a Low Impact Development (LID) requirement of the WPO. Please check the box(s) under each number that best describes the LID BMP(s) and Site Design Strategies selected for this project.

TABLE 8: LID AND SITE DESIGN

1. Conserve natural Areas, Soils, and Vegetation
☐ Preserve well draining soils (Type A or B)
☐ Preserve Significant Trees
☐ Preserve critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions
■ Other. Description: The project will establish an open space easement to preserve natural terrain in the southeastern corner of the site, adjacent to the international border.
2. Minimize Disturbance to Natural Drainages
☐ Set-back development envelope from drainages
■ Restrict heavy construction equipment access to planned green/open space areas
■ Other. Description: The project proposes to convey up-stream watershed flows through the project in an open natural channel in approximately the same location that existing drainage flows. The use of an open channel will allow for a more environmentally sensitive approach for storm water conveyance and water quality treatment of storm water runoff. This channel will become an amenity for each lot and provide an opportunity to create green space throughout the project.
3. Minimize and Disconnect Impervious Surfaces (see 5)
☐ Clustered Lot Design
☐ Items checked in 5?
■ Other. Description: Though the proposed project will employ LID site design principals to the Maximum Extent Practicable (MEP), LID design options are limited at this stage in development since the project will only construct streets and rough graded pads. Ultimate LID site design strategies will be implemented during the development of each lot and will be determined during the Site Plan Review performed prior to the development of each lot, as mandated by the Specific Plan.
4. Minimize Soil Compaction
■ Restrict heavy construction equipment access to planned green/open space areas.
☐ Re-till soils compacted by construction vehicles/equipment
☐ Collect & re-use upper soil layers of development site containing organic Materials
☐ Other. Description:
5. Drain Runoff from Impervious Surfaces to Pervious Areas
LID Street & Road Design

☐ Curb-cuts to landscaping
☐ Rural Swales
☐ Concave Median
☐ Cul-de-sac Landscaping Design
■ Other. Description: Public roadways have been designed to minimum required widths. Runoff generated by the roadways will be treated through the use of structural treatment control BMPs and then routed through unlined extended detention basins.
LID Parking Lot Design
☐ Permeable Pavements
☐ Curb-cuts to landscaping
■ Other. Description: To be determined during the ultimate development of each lot.
LID Driveway, Sidewalk, Bike-path Design
☐ Permeable Pavements
☐ Pitch pavements toward landscaping
■ Other. Description: To be determined during the ultimate development of each lot.
LID Building Design
☐ Cisterns & Rain Barrels
☐ Downspout to swale
☐ Vegetated Roofs
■ Other. Description: To be determined during the ultimate development of each lot.
LID Landscaping Design
☐ Soil Amendments
☐ Reuse of Native Soils
☐ Smart Irrigation Systems
■ Street Trees
☐ Other. Description:
6. Minimize erosion from slopes
■ Disturb existing slopes only when necessary
■ Minimize cut and fill areas to reduce slope lengths
☐ Incorporate retaining walls to reduce steepness of slopes or to shorten slopes
☐ Provide benches or terraces on high cut and fill slopes to reduce concentration of flows
☐ Rounding and shaping slopes to reduce concentrated flow
■ Collect concentrated flows in stabilized drains and channels
☐ Other. Description:

STEP 6

SOURCE CONTROL

Please complete the checklist on the following pages to determine Source Control BMPs. Below are instructions on how to use the checklist. (Also see instructions on page 40 of the *SUSMP)*

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.

2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Source Control Exhibit in Attachment B.

3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Project-Specific SUSMP.

Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

Given that the project will create only rough graded pads with roads and utilities to service those pads, options for source control BMPs are limited at this phase in development. The pads themselves will be stabilized for erosion control, and landscaping will be limited to hydroseeding on steep slopes. Hydroseed mixes contain native, drought tolerant plants that require little maintenance or water, and generally no fertilizers or pesticides. Each lot will contain at least one desiltation basin to remove silt and sediments from project runoff prior to it entering the storm drain system. On-site landscaping and desiltation basins will be maintained by the project owner until a pad is purchased and/or developed. At that time, the new owner will assume responsibility for maintenance. In order to ensure maintenance of the facilities into perpetuity, the current owner of each lot, including the current owner of the entire project, will be required to execute a Storm Water BMP Maintenance Agreement with the County of San Diego.

IPC Source Control BMPs:
Otay Crossings Commerce Park proposes to construct public roads and rough graded pads. The public roads will have curb inlets collecting runoff from the streets. These inlets will all be stamped with, "No Dumping! Flows to Pacific Ocean", or similar. The County of San Diego will be responsible for maintenance of the markings upon completion of the project. Maintenance of landscaping and irrigation within the public right-of-way will initially be the responsibility of the project owner. Ultimately, a landscape maintenance district will be established to assume responsibility into perpetuity.

Use the format in Table 9 below to summarize the project Source Control BMPs. Incorporate all identified Source Control BMPs in your Source Control Exhibit in Attachment B.

TABLE 9: PROJECT SOURCE CONTROL BMPS

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
Storm drain inlets in the public right-of-way.	Inlets will be stamped with, "No Dumping! Flows to Pacific Ocean", or similar.	Storm drain inlets within the public right-of-way will be maintained by the County of San Diego upon completion of the project. CASQA BMP Fact Sheet SC-44, "Drainage System Maintenance" is provided for reference in Attachment B.
Landscape/ Outdoor Pesticide Use (within the public right-of-way)	Approx. 47.1 Ac of the project will be dedicated open space Landscaping will be designed to minimize irrigation and runoff. Hardy and pest-resistant plants will be utilized to reduce the need for fertilizers and pesticides. Landscaping in detention facilities will be designed with plants that are tolerant of saturated soil conditions. Plants will be selected to best suit the project's soils, climate, etc.	The project owner may be required to maintain lanscaping within the public right-of-way for an interim period. Ultimately, a landscape maintenance district will be established to maintain the landscaping into perpetuity. CASQA BMP Fact Sheet SC-41, "Building and Grounds Maintenance" is provided for reference in Attachment B.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	***... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs***		
1 Potential Sources of Runoff Pollutants	***2 Permanent Controls—Show on Source Control Exhibit, Attachment B***	***3 Permanent Controls—List in SUSMP Table and Narrative***	***4 Operational BMPs—Include in SUSMP Table and Narrative***
■ ***A.*** On-site storm drain inlets *Applicable storm drain inlets are located in the public right-of-way. As such, maintenance of inlets will be assured by category 4 maintenance mechanisms.	■ Locations of inlets.	■ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	■ Maintain and periodically repaint or replace inlet markings. ■ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ■ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ❑ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains." (N/A AT THIS PHASE IN DEVELOPMENT)
❑ ***B.*** Interior floor drains and elevator shaft sump pumps		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	***... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs***		
1 Potential Sources of Runoff Pollutants	***2 Permanent Controls—Show on Source Control Exhibit, Attachment B***	***3 Permanent Controls—List in SUSMP Table and Narrative***	***4 Operational BMPs—Include in SUSMP Table and Narrative***
❑ ***C.*** Interior parking garages		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ ***D1.*** Need for future indoor & structural pest control		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	***... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs***		
1 Potential Sources of Runoff Pollutants	***2 Permanent Controls—Show on Source Control Exhibit, Attachment B***	***3 Permanent Controls—List in SUSMP Table and Narrative***	***4 Operational BMPs—Include in SUSMP Table and Narrative***
■ ***D2.*** Landscape/ Outdoor Pesticide Use Note: Should be consistent with project landscape plan (if applicable).	■ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ■ Show stormwater treatment facilities.	State that final landscape plans will accomplish all of the following: ■ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ■ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ■ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ■ Consider using pest-resistant plants, especially adjacent to hardscape. ■ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	■ Maintain landscaping using minimum or no pesticides. ■ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ■ Provide IPM information to new owners, lessees and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on Source Control Exhibit, Attachment B**	3 **Permanent Controls—List in SUSMP Table and Narrative**	4 **Operational BMPs—Include in SUSMP Table and Narrative**
❑ ***E.*** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ ***F.*** Food service	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	❑

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	***... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs***		
1 Potential Sources of Runoff Pollutants	***2 Permanent Controls—Show on Source Control Exhibit, Attachment B***	***3 Permanent Controls—List in SUSMP Table and Narrative***	***4 Operational BMPs—Include in SUSMP Table and Narrative***
❑ ***G.*** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ ***H.*** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	***... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs***		
1 Potential Sources of Runoff Pollutants	***2 Permanent Controls—Show on Source Control Exhibit, Attachment B***	***3 Permanent Controls—List in SUSMP Table and Narrative***	***4 Operational BMPs—Include in SUSMP Table and Narrative***
❑ *I.* Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

❑ *J.* Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

❑ K. Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the SUSMP report, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

❑ L. Fuel Dispensing Areas	❑ Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[1] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

❑ ***M.*** Loading Docks	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer. ❑		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ ***N.*** Fire Sprinkler Test Water		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim.		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	
❑ **P.** Plazas, sidewalks, and parking lots.			❑ Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.

STEP 7

LID AND TREATMENT CONTROL SELECTION

A treatment control BMP and/or LID facility must be selected to treat the project pollutants of concern identified in Table 7 "Project Pollutants of Concern". A treatment control facility with a high or medium pollutant removal efficiency for the project's most significant pollutant of concern shall be selected. It is recommended to use the design procedure in Chapter 4 of the SUSMP to meet NPDES permit LID requirements, treatment requirements, and flow control requirements. If your project does not utilize this approach, the project will need to demonstrate compliance with LID, treatment and flow control requirements. Review Chapter 2 "Selection of Stormwater Treatment Facilities" in the SUSMP to assist in determining the appropriate treatment facility for your project.

Will this project be utilizing the unified LID design procedure as described in Chapter 4 of the Local SUSMP? *(If yes, please document in Attachment D following the steps in Chapter 4 of the County SUSMP)*	
Yes	No (circled)
If this project is not utilizing the unified LID design procedure, please describe how the alternative treatment facilities will comply with applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria.	
Otay Crossings Commerce Park will construct rough graded pads and public roads. Since no use is currently proposed on the pads and, thus, no impervious surfaces are currently proposed on the pads, LID BMPs are not proposed at this time. During the Site Plan review phase mandated by the Specific Plan for the development of each lot, appropriate LID BMPs will proposed and sized, per the current applicable regulations, for the ultimate proposed condition. Treatment of runoff from the public roads will be addressed through the use of TC-BMPs.	

➢ Indicate the project pollutants of concern (POCs) from Table 7 in Column 2 below.

TABLE 10: GROUPING OF POTENTIAL POLLUTANTS of Concern (POCs) by fate during stormwater treatment

Pollutant	Check Project Specific POCs	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	X	
Nutrients	X		X	X
Heavy Metals	X		X	
Organic Compounds			X	
Trash & Debris	X	X		
Oxygen Demanding	X		X	
Bacteria			X	
Oil & Grease	X		X	
Pesticides	X		X	

➢ Indicate the treatment facility(s) chosen for this project in the following table.

TABLE 11: GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	Higher-rate biofilters*	Higher-rate media filters*	Trash Racks & Hydro-dynamic Devices	Vegetated Swales
Coarse Sediment and Trash	High	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low	Medium
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low	Low

➢ Please check the box(s) that best describes the Treatment BMP(s) and/or LID BMP selected for this project.

TABLE 12: PROJECT LID AND TC-BMPS

Bioretention Facilites (LID)
□ Bioretention area
□ Flow-through Planter
□ Cistern with Bioretention Facility
Settling Basins (Dry Ponds)
■ Extended/dry detention basin with grass/vegetated lining
□ Extended/dry detention basin with impervious lining
Infiltration Facilities or Practices (LID)
□ Infiltration basin
□ Dry well
□ Infiltration trench
Wet Ponds and Constructed Wetlands
□ Wet pond/basin (permanent pool)
□ Constructed wetland
Vegetated Swales (LID[1])
□ Vegetated Swale
Media Filters

☐ Austin Sand Filter
☐ Delaware Sand Filter
☐ Multi-Chambered Treatment Train (MCTT)
Higher-rate Biofilters
☐ Tree-pit-style unit
☐ Other_____
Higher-rate Media Filters
☐ Vault-based filtration unit with replaceable cartridges
☐ Other_____
Hydrodynamic Separator Systems
■ Swirl Concentrator
☐ Cyclone Separator
Trash Racks
☐ Catch Basin Insert
■ Catch Basin Insert w/ Hydrocarbon boom
☐ Other_____
Self-Treating or Self-Retaining Areas (LID)
☐ Pervious Pavements
☐ Vegetated Roofs
☐ Other_____

[1] Must be designed per SUSMP "Vegetated Swales" design criteria for LID credit (p. 65).

For design guidelines and calculations refer to Chapter 4 "Low Impact Development Design Guide" in the SUSMP. Please show all calculations and design sheets for all treatment facilities proposed in Attachment D.

➢ Create a Construction Plan SWMP Checklist for your project.

Instructions on how to fill out table

1. Number and list each measure or BMP you have specified in your SWMP in Columns 1 and Maintenance Category in Column 3 of the table. Leave Column 2 blank.

2. When you submit construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 2, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. This table must be shown on the front sheet of the grading and improvement plans.

Stormwater Treatment Control and LID BMP's			
Description / Type	Sheet	Maintenance Category	Revisions
CDS "A"		4	
CDS "B"		4	
CDS "C"		4	
BIO-CLEAN "A"		4	
BIO-CLEAN "B"		4	
BIO-CLEAN "C"		4	
BIO-CLEAN "D"		4	
BIO-CLEAN "E"		4	
BIO-CLEAN "F"		4	
BIO-CLEAN "G"		4	
BIO-CLEAN "H"		4	
BIO-CLEAN "I"		4	
BIO-CLEAN "J"		4	
DETENTION BASIN "A"		3	
DETENTION BASIN "B"		3	
DETENTION BASIN "C"		3	
DETENTION BASIN "D"		3	
DETENTION BASIN "E"		3	
DETENTION BASIN "F"		3	

* BMP's approved as part of Stormwater Management Plan (SWMP) dated xx/xx/xx on file with DPW. Any changes to the above BMP's will require SWMP revision and Plan Change approvals.

address water quality:

A. Water Quality Devices (future on-lot)
B. Detention Basins (future on-lot)
C. Curb Inlet Filter (Bio-Clean) – constructed in IPC
D. Hydrodynamic Separator (CDS unit) – constructed in IPC
E. Regional Detention Basins (DB) – constructed in IPC

Additional details are included in Attachment D. A typical site design layout for a commercial/ industrial facility, using LID BMPs, is provided for reference as Attachment C-3. It is anticipated that facilities similar to this will be constructed at the project in Ultimate Development.

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality treatment volume or flow values for the selected project Treatment BMP(s). Guidelines for design calculations are located in Chapter 4 of the County SUSMP. Label outfalls on the BMP map. The Water Quality peak rate of discharge flow (QWQ) and the Water Quality storage volume (VWQ) is dependent on the type of treatment BMP selected for the project.

TC-BMP SIZING CALCULATIONS SUMMARY (SEE ATTACHMENT C-2 FOR DETAILS)

BMP	Q_{WQ} (Q=CIA) cfs	TREATMENT FLOW RATE cfs	COMMENTS
CDS "A"	0.64	2.0	Off-line Unit
CDS "B"	1.25	2.0	Off-line Unit
CDS "C"	1.51	2.0	Off-line Unit
BIO-CLEAN "A"	0.19	2.1	Bio-Clean
BIO-CLEAN "B"	0.19	2.1	Bio-Clean
BIO-CLEAN "C"	0.20	2.1	Bio-Clean
BIO-CLEAN "D"	0.44	2.1	Bio-Clean
BIO-CLEAN "E"	0.12	2.1	Bio-Clean
BIO-CLEAN "F"	0.12	2.1	Bio-Clean
BIO-CLEAN "G"	0.16	2.1	Bio-Clean
BIO-CLEAN "H"	0.13	2.1	Bio-Clean
BIO-CLEAN "I"	0.09	2.1	Bio-Clean
BIO-CLEAN "J"	0.43	2.1	Bio-Clean

Note: Detention basins are sized per the project Hydromodification Plan and CEQA Preliminary Hydrology/ Drainage Study.

STEP 8

OPERATION AND MAINTENANCE

- Please check the box that best describes the maintenance mechanism(s) for this project.

TABLE 13: PROJECT BMP CATEGORY

CATEGORY	SELECTED		BMP Description
	YES	NO	
First		X	
Second[1]	X		Desiltation Basins
Third[2]	X		Detention Basins
Fourth	X		Curb Inlet Filters, Hydrodynamic Separators

Note:

1. A recorded maintenance agreement will be required.
2. Project will be required to establish or be included in a Stormwater Maintenance Assessment District for the long-term maintenance of treatment BMPs.

- Please list all individual LID and Treatment Control BMPs (TC-BMPs) incorporated into project. Please ensure the "BMP Identifier" is consistent with the legend in Attachment C "LID and/or TC-BMP Exhibit". Please attach the record plan sheets upon completion of project and amend the Major SWMP where appropriate. For each type of LID or TC-BMP provide an inspection sheet in Attachment F "Maintenance Plan".

TABLE 14: PROJECT SPECIFIC LID AND TC-BMPS

BMP Identifier*	LID or TC-BMP Type	BMP Pollutant of Concern Efficiency (H,M,L) – Table 11	Final Construction Date *(to be completed by County inspector)*	Final Construction Inspector Name *(to be completed by County inspector)*
CDS "A"	TC-BMP	H/L		
CDS "B"	TC-BMP	H/L		
CDS "C"	TC-BMP	H/L		
BIO-CLEAN "A"	TC-BMP	H/L		
BIO-CLEAN "B"	TC-BMP	H/L		
BIO-CLEAN "C"	TC-BMP	H/L		
BIO-CLEAN "D"	TC-BMP	H/L		
BIO-CLEAN "E"	TC-BMP	H/L		
BIO-CLEAN "F"	TC-BMP	H/L		
BIO-CLEAN "G"	TC-BMP	H/L		
BIO-CLEAN "H"	TC-BMP	H/L		
BIO-CLEAN "I"	TC-BMP	H/L		
BIO-CLEAN "J"	TC-BMP	H/L		
DETENTION BASIN "A"	TC-BMP	H/L		
DETENTION BASIN "B"	TC-BMP	H/L		
DETENTION BASIN "C"	TC-BMP	H/L		
DETENTION BASIN "D"	TC-BMP	H/L		
DETENTION BASIN "E"	TC-BMP	H/L		
DETENTION BASIN "F"	TC-BMP	H/L		

* For location of BMP's, see approved Record Plan dated _XX/XX/XX_, plan (TYPE) sheet _(#)_. **(To be completed at final engineering)**

➢ Responsible Party for Long-term Maintenance:

Identify the parties responsible for long-term maintenance of the BMPs identified above and Source Controls specified in Attachment B. Include the appropriate written agreement with the entities responsible for O&M in Attachment F. Please see Chapter 5 "Private Ownership and Maintenance" on page 94 of the County SUSMP for appropriate maintenance mechanisms.

The detention basins listed in Table 14 will be maintained by a Maintenance Assessment District. The project owner may be responsible for maintenance for an interim condition until the district is established. The CDS units and Bio-Clean filter inserts listed in Table 14 will be public responsibility. Details will be determined during final engineering.

Name: **To be determined during final engineering**
Phone Number:
Street Address:
City/State/Zip:
Email Address:

➢ Funding Source:

Provide the funding source or sources for long-term operation and maintenance of each BMP identified above. By certifying the Major SWMP the applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners.

FISCAL RESOURCES

SECOND CATEGORY - Maintenance Requirement for Private On-Lot Systems:
As required by the County of San Diego, Stormwater Ordinance No. 924 (N.S.) SEC. 67.819, the proposed project Post-Construction BMPs, per the County Maintenance Plan Guidelines, fall under the second category of maintenance assurance requirements. A Stormwater Facilities Maintenance Agreement, with Easement and Covenants shall be entered into between the owner and the County of San Diego, obliging the owner to maintain the project category two BMPs into perpetuity. An adaptation of the County Maintenance Plan Guidelines follows and details the proposed Maintenance Mechanism and funding.

BMPs covered:

- IPC Desiltation Basins (on-lot)
- UD Water Quality Devices (WQ) (on-lot)
- UD Detention Basins (on-lot)

A. Mechanisms to Assure Maintenance:

1. Stormwater Ordinance (SO) Requirement:
The County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (SO) requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.

2. Public Nuisance Abatement:
Under the SO, failure to maintain BMPs would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Abatement Procedure. This provides an enforcement mechanism in addition to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collection process to be used.

3. Notice to Purchasers:
Section 67.819(e) of the SO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.

4. Conditions in Ongoing Land Use Permits:
For those applications (listed in SO Section 67.804) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance

with the requirements specified in the Stormwater Maintenance Plan. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.

5. Subdivision Public Report:
Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estate to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued.)

6. BMP Maintenance Agreement with Easement and Covenant:
An agreement will be entered into with the County, which will function three ways:

(a) it will commit the land to being used only for purposes of the BMP;

(b) it will include an agreement by the landowner, to maintain the facilities in accordance with the SMP (this obligation would be passed on to future purchasers or successors of the landowner, as a covenant); and

(c) it will include an easement giving the County the right to enter onto the land (and any necessary adjacent land needed for access) to maintain the BMPs.

This would be required of all applications listed in SO Section 67.804. In the case of subdivisions, this easement and covenant would be recorded on or prior to the Final or Parcel Map.

Funding:
Developer will provide the County with SECURITY to back up the maintenance agreement, which shall remain in place for an interim period of 5 years. The amount of the security shall equal the estimated cost of 2 years of maintenance activities. The security can be a Cash Deposit, Letter of Credit or other form acceptable to the County.

THIRD CATEGORY - Maintenance Requirement for Regional Facilities:

As required by the County of San Diego, Stormwater Ordinance No. 924 (N.S.) SEC. 67.819, the proposed regional detention basins that service the public streets, per the County Maintenance Plan Guidelines, fall under the third category of maintenance assurance requirements. A Storm Water Maintenance Zone shall be established to ensure proper maintenance of the proposed BMPs into perpetuity. Initiation of the process to create the zone will occur during the Final Engineering stage of the project. At that time, a County appointed consultant will prepare the documentation necessary to establish the zone. The Civil Engineer working on the project will assist the consultant and the County Department of Public Works as necessary through the process. An adaptation of the County Maintenance Plan Guidelines follows and details the proposed maintenance mechanism and funding.

In the IPC condition, Lots 54-56 (future Caltrans SR-11) will still be under the same ownership as the subdivision. Due to their use as a regional treatment facility these detention basins are classified as a Category 3 BMP. Eventually Caltrans will take over the maintenance of these basins with a mechanism in place to ensure that the region will still have use of the detention basins.

BMPs covered:

- UD Detention Basins (regional)

A. Mechanisms to Assure Maintenance:

1. Dedication of BMP to County:
The developer would be required to dedicate the BMP (and the property on which it is located) to the County. This could be an immediate dedication, or for cases where the County would not want to assume responsibility for the facility for some time (e.g., until after construction is completed), then an IOD could be used instead.

2. County Maintenance Documentation:
Where the County has assumed maintenance responsibility, internal County program documentation would memorialize the required maintenance.

Funding:
The primary funding mechanism will be a special assessment under the authority of the Flood Control District. The assessment will be collected with property tax. Because this primary funding mechanism will require substantial amount of time to establish and collect assessments, a developer fee will be needed to cover the initial maintenance period of 24 months.

FOURTH CATEGORY - Maintenance Requirement for Public Streets:

As required by the County of San Diego, Stormwater Ordinance SEC. 67.819 and the County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Imrpovements (March 2008), the proposed project Post-Construction BMPs for public streets, per the County Maintenance Plan Guidelines, fall under the fourth category of maintenance assurance requirements. An adaptation of the County Maintenance Plan Guidelines follows and details the proposed maintenance mechanism and funding.

BMPs covered:

- Curb Inlet Filter (Bio-Clean)
- Hydrodynamic Separator (CDS unit)

A. Mechanisms to Assure Maintenance:

1. Dedication of BMP to County:
The developer would be required to dedicate the BMP (and the property on which it is located) to the County. This could be an immediate dedication, or for cases where the County would not want to assume responsibility for the facility for some time (e.g., until after construction is completed), then an IOD could be used instead.

2. County Maintenance Documentation:
Where the County has assumed maintenance responsibility, internal County program documentation would memorialize the required maintenance.

Funding:
A permanent source will be implemented; options include gas tax, TransNet, General Fund, or new special taxes or fees.

ATTACHMENTS

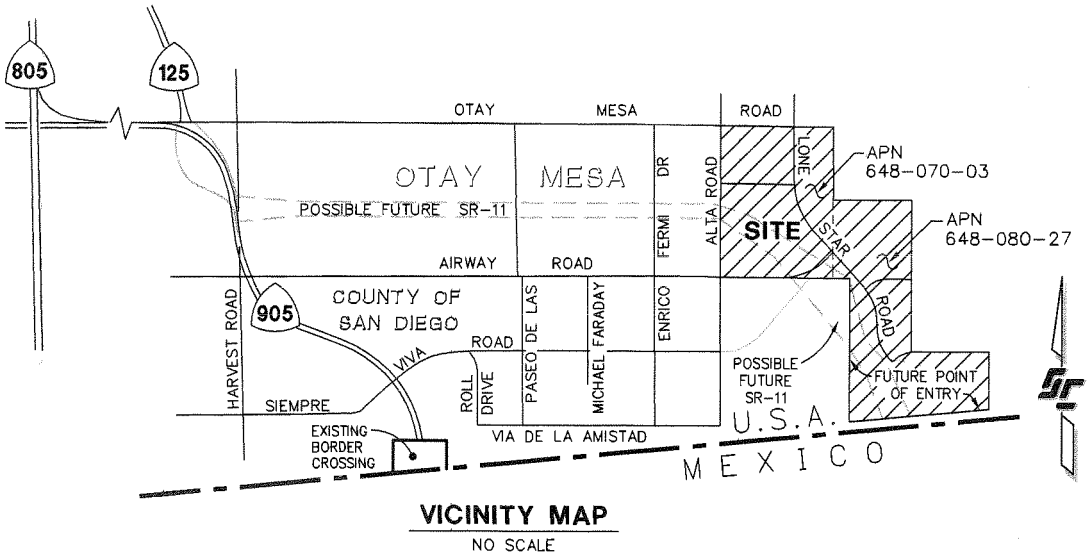
Please include the following attachments.

ATTACHMENT		COMPLETED	N/A
A	Project Location Map	X	
B	Source Control Exhibit	X	
C	LID and/or TC-BMP Exhibit	X	
D	Drainage Management Area (DMA) Maps, Sizing Design Calculations and BMP/IMP Design Details	X	
E	Geotechnical Certification Sheet		X
F	Maintenance Plan	X	
G	Tracking Report		X
H	Addendum		X

Note: Attachments B and C may be combined.

ATTACHMENT A

Project Location Map

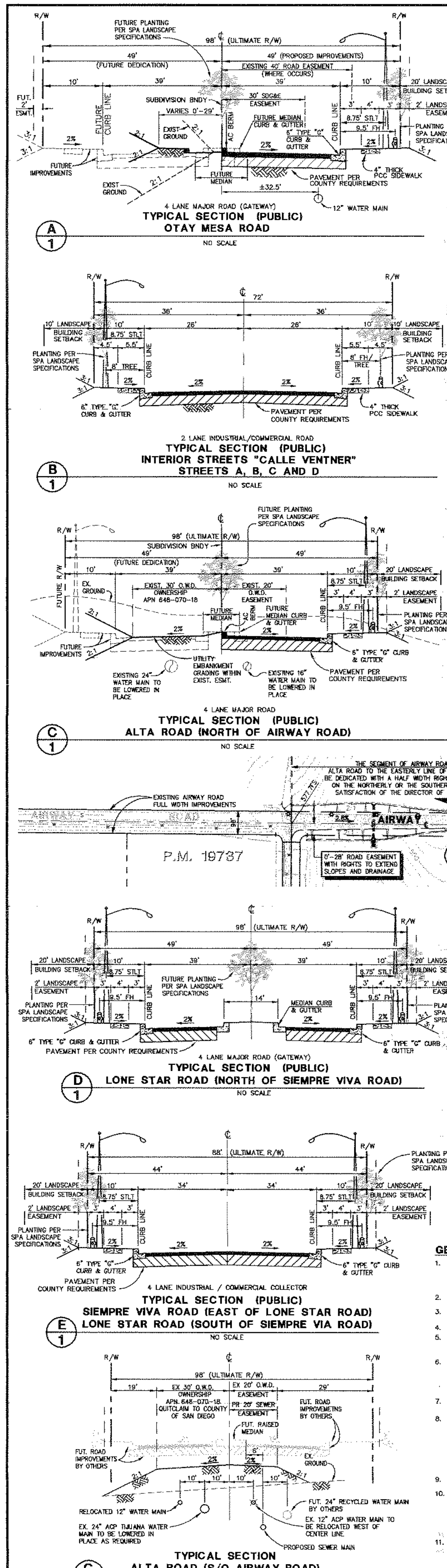


VICINITY MAP

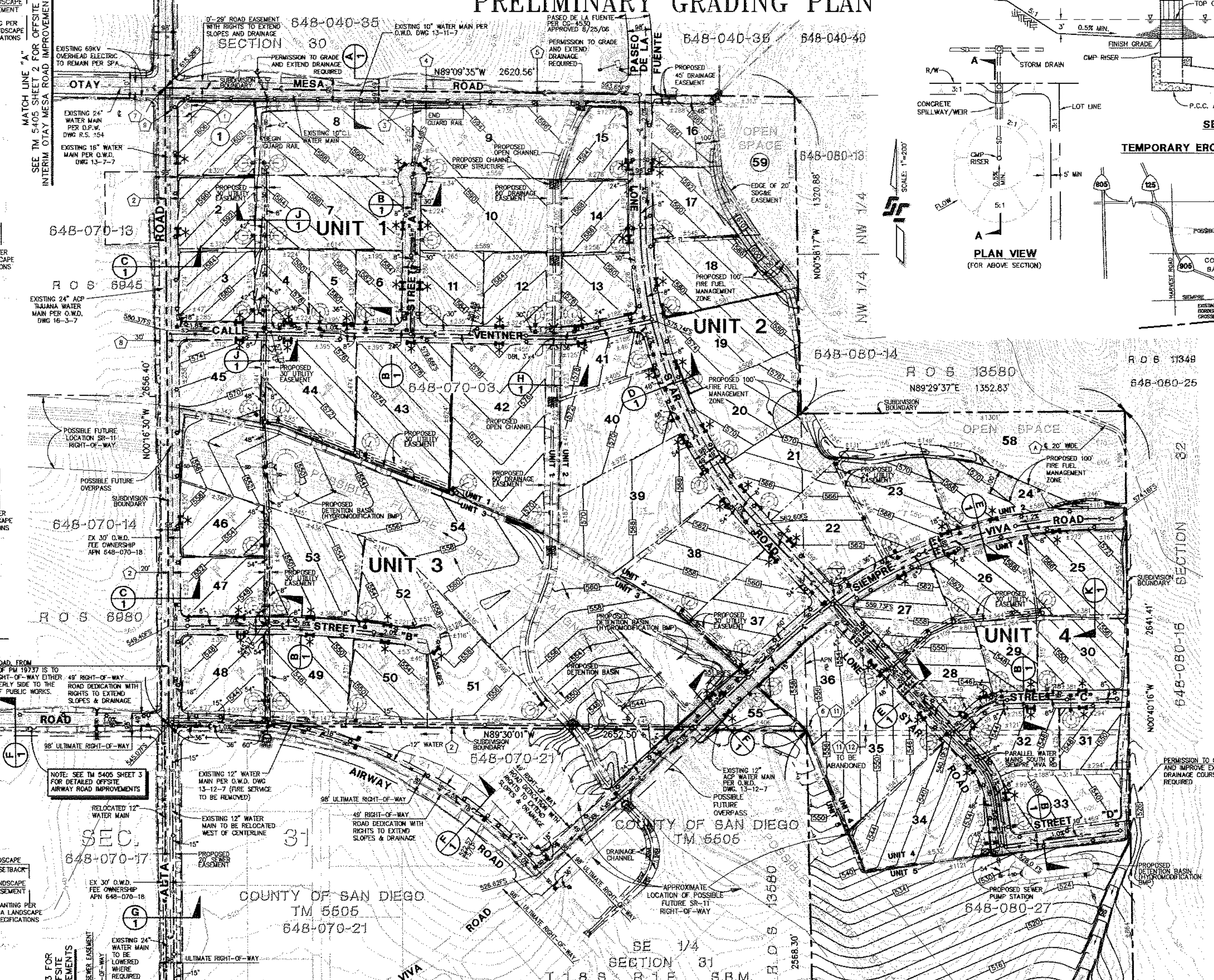
NO SCALE

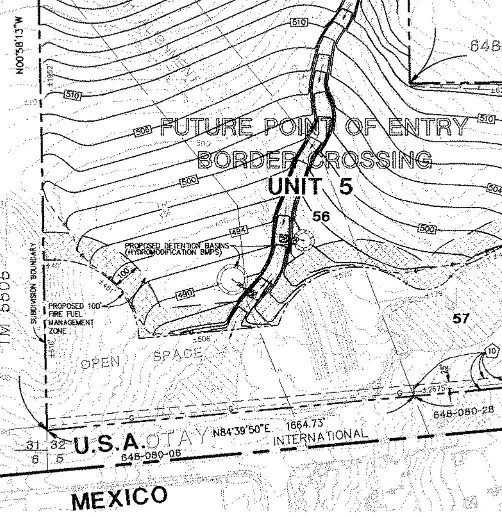
COUNTY OF SAN DIEGO TRACT 5405 RPL7

OTAY CROSSINGS COMMERCE PARK
PRELIMINARY GRADING PLAN

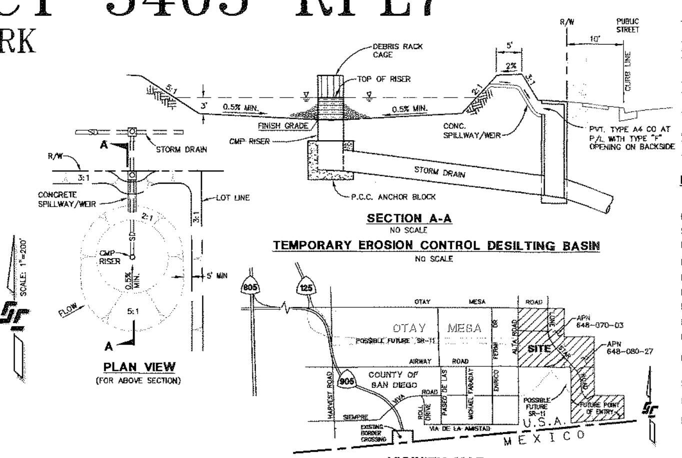


TYPICAL SECTION (PUBLIC) OTAY MESA ROAD — NO SCALE
TYPICAL SECTION (PUBLIC) INTERIOR STREETS "CALLE VENTNER" STREETS A, B, C AND D — NO SCALE
TYPICAL SECTION (PUBLIC) ALTA ROAD (NORTH OF AIRWAY ROAD) — NO SCALE
TYPICAL SECTION (PUBLIC) LONE STAR ROAD (NORTH OF SIEMPRE VIVA ROAD) — NO SCALE
TYPICAL SECTION (PUBLIC) SIEMPRE VIVA ROAD (EAST OF LONE STAR ROAD) LONE STAR ROAD (SOUTH OF SIEMPRE VIA ROAD) — NO SCALE
TYPICAL SECTION ALTA ROAD (S/O AIRWAY ROAD) — NO SCALE

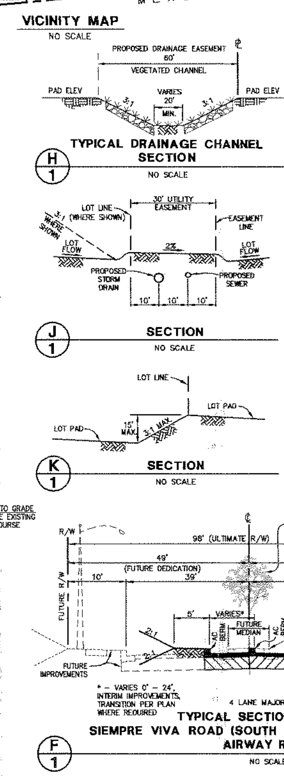




SEE TM 5405 SHEET 4 FOR CONTINUATION OF OFFSITE SEWER FORCE MAIN ALTERNATE



SECTION A-A — TEMPORARY EROSION CONTROL DESILTING BASIN — NO SCALE
PLAN VIEW (FOR ABOVE SECTION)
VICINITY MAP — NO SCALE



TYPICAL DRAINAGE CHANNEL SECTION — NO SCALE
SECTION (J) — NO SCALE
SECTION (K) — NO SCALE
TYPICAL SECTION (PUBLIC) SIEMPRE VIVA ROAD (SOUTH OF PROJECT BOUNDARY) AIRWAY ROAD — NO SCALE

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE COUNTY OF SAN DIEGO.

STANDARD SPECIFICATIONS:

1. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION "GREEN BOOK" (LATEST EDITION), INCLUDING THE REGIONAL AND CITY OF SAN DIEGO SUPPLEMENT AMENDMENT.
2. SAN DIEGO COUNTY GRADING ORDINANCE.
3. CALIFORNIA DEPARTMENT OF TRANSPORTATION, " MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES," (LATEST EDITION).
4. STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS (LATEST EDITION).

STANDARD DRAWINGS:

1. THE CURRENT SAN DIEGO AREA REGIONAL STANDARD DRAWINGS.
2. STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, STANDARD PLAN (LATEST EDITION).

LEGEND

DESCRIPTION	SYMBOL
PROPOSED LOT NUMBER	(1) THRU (59)
SUBDIVISION BOUNDARY	
UNIT BOUNDARY	
PROPOSED LOT LINE	
PROPOSED RIGHT-OF-WAY	
FUTURE ULTIMATE RIGHT-OF-WAY	
EASEMENT LINE	
EXISTING CONTOUR	630
PROPOSED CONTOUR	630
PROPOSED SLOPE 3:1 (2:1 FOR TEMP. SLOPES)	3:1
PROPOSED PAVING	
PROPOSED SEWER MAIN W/MANHOLE	S
PROPOSED SEWER PUMP STATION	
PROPOSED SEWER FUTURE MAIN	SFM
PROPOSED PVC WATER MAIN (12" MINIMUM)	W W
PROPOSED STORM DRAIN	SD
PROPOSED STORM DRAIN INLET/CATCH BASIN	
PROPOSED STORM DRAIN CLEANOUT	
PROPOSED STORM DRAIN INTERIM DESILTING BASIN & RISER, (SHOWN FOR LOCATION ONLY- SEE CEQA PRELIMINARY HYDROLOGY/ DRAINAGE STUDY FOR RELEASE RATE CALCULATIONS AND ULTIMATE DETENTION VOLUME)	2:1
PROPOSED OPEN DRAINAGE CHANNEL	
PROPOSED STORM DRAIN HEADWALL/ENERGY DISSIPATOR	
RUNOFF FLOW DIRECTION	
PROPOSED DRIVEWAY LOCATION	

BENCH MARK

BRASS DISK STAMPED "JM 154 1969" LOCATED 3.09 MILES EAST ALONG OTAY MESA ROAD FROM INTERSECTION OF OTAY VALLEY ROAD, 20.5' SOUTH OF CENTERLINE OF OTAY MESA ROAD AND ABOUT 170' EAST OF CENTERLINE INTERSECTION OF HARVEST ROAD. STEEL FENCEPOST MARKER LIES 1' SOUTH OF DISK. RECORD FROM COUNTY OF SAN DIEGO VERTICAL CONTROL RECORD. ELEVATION: 541.10 DATUM: U.S.C.& G.S., M.S.L.

LEGAL DESCRIPTION

THE NORTHWEST QUARTER OF SECTION 31, TOWNSHIP 18 SOUTH, RANGE 1 EAST, SAN BERNARDINO BASE AND MERIDIAN IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT, TOGETHER WITH THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER, THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER, THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER, AND THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER, ALL IN SECTION 32, TOWNSHIP 18 SOUTH, RANGE 1 EAST, SAN BERNARDINO BASE AND MERIDIAN, IN THE COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.

OTAY SUBREGIONAL PLAN

EXISTING & PROPOSED: SPA 21 (GPA 92-04)
EAST OTAY MESA SPECIFIC PLAN SUBAREA 2

REGIONAL CATEGORY

CUDA/ECA

PARK LAND DEDICATION

NOT REQUIRED IN INDUSTRIAL ZONE

GRADING QUANTITIES

CUT: 1,882,000 CUBIC YARDS
FILL: 1,882,000 CUBIC YARDS
EXPORT: 0

APN'S

648-070-03 AND 648-080-27

GENERAL NOTES (PRELIMINARY GRADING)

1. THIS "PRELIMINARY GRADING PLAN" DOES NOT CONSTITUTE A CONSTRUCTION DOCUMENT. A FINAL GRADING PLAN, PREPARED (TO THE SATISFACTION OF THE DIRECTOR OF PUBLIC WORKS) IN ACCORDANCE WITH COUNTY GRADING ORDINANCE SHALL BE SUBMITTED TO THE DEPARTMENT OF PUBLIC WORKS. APPROVAL OF THE FINAL GRADING PLAN SHALL BE REQUIRED AND GRADING PERMIT ISSUED PRIOR TO ANY WORK IN THE FIELD.
2. A CONSTRUCTION, EXCAVATION OR ENCROACHMENT PERMIT FROM THE DIRECTOR OF PUBLIC WORKS WILL BE REQUIRED FOR ANY WORK IN THE COUNTY RIGHT-OF-WAY.
3. ALL SLOPES OVER 3 FEET IN HEIGHT SHALL BE PLANTED IN ACCORDANCE WITH SAN DIEGO COUNTY SPECIFICATIONS.
4. A SOILS REPORT SHALL BE REQUIRED PRIOR TO THE ISSUANCE OF A GRADING AND/OR BUILDING PERMIT.
5. APPROVAL OF THESE PLANS BY THE DIRECTOR OF PUBLIC WORKS DOES NOT AUTHORIZE ANY WORK OR GRADING TO BE PERFORMED UNTIL THE PROPERTY OWNER'S PERMISSION HAS BEEN OBTAINED AND A VALID GRADING PERMIT HAS BEEN ISSUED.
6. THE DIRECTOR OF PUBLIC WORKS APPROVAL OF THESE PLANS DOES NOT CONSTITUTE COUNTY BUILDING OFFICIAL APPROVAL OF ANY FOUNDATIONS FOR STRUCTURES TO BE PLACED ON THE AREA COVERED BY THESE PLANS. NO WAIVER OF THE GRADING ORDINANCE REQUIREMENTS CONCERNING MINIMUM COVER OVER EXPANSIVE SOILS IS MADE OR IMPLIED (SECTIONS 87.403 & 87.410). ANY SUCH WAIVER MUST BE OBTAINED FROM THE DIRECTOR OF DPLU.
7. ALL SLOPES SHALL BE ROUNDED INTO EXISTING TERRAIN TO PRODUCE A CONTOURED TRANSITION FROM CUT OR FILL FACES TO NATURAL GROUND AND ABUTTING CUT OR FILL SURFACES.
8. NOTWITHSTANDING THE MINIMUM STANDARDS SET FORTH IN THE GRADING ORDINANCE AND NOTWITHSTANDING THE APPROVAL OF THESE PRELIMINARY GRADING PLANS, THE PERMITTEE IS RESPONSIBLE FOR THE PREVENTION OF DAMAGE TO THE ADJACENT PROPERTY. NO PERSON SHALL EXCAVATE ON LAND SO CLOSE TO THE PROPERTY LINE AS TO ENDANGER ANY ADJOINING PUBLIC STREET, SIDEWALK, ALLEY, FUNCTION OF ANY SEWAGE DISPOSAL SYSTEM, OR ANY OTHER PUBLIC OR PRIVATE PROPERTY, WITHOUT SUPPORTING AND PROTECTING SUCH PROPERTY FROM SETTLING, CRACKING, EROSION, SILTING, SCOUR OR OTHER DAMAGE WHICH MIGHT RESULT FROM THE GRADING DESCRIBED ON THIS PLAN. THE COUNTY WILL HOLD THE PERMITTEE RESPONSIBLE FOR CORRECTION OF NON-DEDICATED IMPROVEMENTS WHICH DAMAGE ADJACENT PROPERTY.
9. ALL GRADING DETAILS WILL BE IN ACCORDANCE WITH SAN DIEGO COUNTY STANDARD DRAWINGS DS-8, DS-10, DS-11, D-75 UNLESS SHOWN OTHERWISE ON THESE PLANS.
10. SLOPE RATIOS:
    CUT - 3:1
    FILL - 3:1
    DEVIATING FROM THE ABOVE RATIO WILL REQUIRE APPROVAL OF THE DIRECTOR OF PUBLIC WORKS AFTER REVIEW OF A REPORT FROM A SOILS ENGINEER.
11. EARTHWORK QUANTITIES:
    CUT: 1,882,000± CY
    FILL: 1,882,000± CY
    IMPORT/EXPORT: 0 C.Y.
    A SEPARATE PERMIT MUST BE OBTAINED FOR WASTE OR IMPORT AREA.
    GRADING QUANTITIES ARE APPROXIMATE AND ARE PROVIDED HEREON FOR PERMIT PURPOSES ONLY. QUANTITIES ARE BASED ON THE DIFFERENCE BETWEEN THE EXISTING SURFACES AND PROPOSED PAD/SUBGRADE SURFACES. VARIATIONS DUE TO LOSS FROM CLEARING AND GRUBBING, STRIPPING, SHRINKAGE, SWELL, UNSUITABLE MATERIAL & REMEDIAL GRADING ARE NOT CONSIDERED NOR FACTORED INTO THESE QUANTITIES. CONTRACTOR SHALL VERIFY QUANTITIES WITH THEIR OWN VOLUME CALCULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THEIR OWN INDEPENDENT QUANTITY AND MATERIAL TAKE OFFS AND CONSTRUCT THE DESIGN INDICATED ON THESE DRAWINGS, PROJECT TO BE BID BASED ON CONTRACTOR'S OWN ESTIMATES.
12. SPECIAL CONDITION: IF ANY ARCHAEOLOGICAL RESOURCES ARE DISCOVERED ON THE SITE OF THIS GRADING DURING GRADING OPERATIONS, SUCH OPERATIONS WILL CEASE IMMEDIATELY, AND THE PERMITTEE WILL NOTIFY THE DIRECTOR OF PUBLIC WORKS OF THE DISCOVERY. GRADING OPERATIONS WILL NOT RECOMMENCE UNTIL THE PERMITTEE HAS RECEIVED WRITTEN AUTHORITY FROM THE DIRECTOR OF PUBLIC WORKS TO DO SO.

ADVISORY NOTE ON STORMWATER OBLIGATIONS:

1. THE ACTIVITIES SHOWN ON THE PLANS ARE SUBJECT TO ENFORCEMENT UNDER PERMITS FROM THE SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD AND MUST ALSO COMPLY WITH THE REQUIREMENTS OF THE SAN DIEGO COUNTY MUNICIPAL STORM WATER PERMIT. THIS INCLUDES REQUIREMENTS FOR MATERIALS AND WASTES CONTROL, EROSION CONTROL, AND SEDIMENT CONTROL ON PROJECT CONSTRUCTION SITES. THE PERMITTEES OF OPERATIONS SHOWN ON THESE PLANS ARE OBLIGATED TO INSURE COMPLIANCE WITH ALL APPLICABLE STORM WATER REGULATIONS AT ALL TIMES. THE PERMITTEE SHALL ALSO KEEP A COPY OF THE SWPPP (STORM WATER POLLUTION PREVENTION PLAN) ON SITE AND AVAILABLE FOR REVIEW BY COUNTY.
2. DURING THE RAINY SEASON THE AMOUNT OF EXPOSED SOIL ALLOWED AT ONE TIME SHALL NOT EXCEED THAT WHICH CAN BE ADEQUATELY PROTECTED BY THE PROPERTY OWNER OR AUTHORIZED AGENT IN THE EVENT OF A RAINSTORM. 125% OF ALL SUPPLIES NEEDED FOR BMP MEASURES SHALL BE RETAINED ON THE JOB SITE IN A MANNER THAT ALLOWS FULL DEPLOYMENT AND COMPLETE INSTALLATION IN 48 HOURS OR LESS OF A FORECAST RAIN.
3. NO AREA BEING DISTURBED SHALL EXCEED 50 ACRES AT ANY GIVEN TIME WITHOUT DEMONSTRATING TO THE SAN DIEGO COUNTY DPW DIRECTOR'S SATISFACTION THAT ADEQUATE EROSION AND SEDIMENT CONTROL CAN BE MAINTAINED. ANY DISTURBED AREA THAT IS NOT ACTIVELY GRADED FOR 10 DAYS MUST BE FULLY PROTECTED FROM EROSION. UNTIL ADEQUATE LONG-TERM PROTECTIONS ARE INSTALLED, THE DISTURBED AREA SHALL BE INCLUDED WHEN CALCULATING THE ACTIVE DISTURBANCE AREA. ALL EROSION CONTROL MEASURES SHALL REMAIN INSTALLED AND MAINTAINED DURING ANY INACTIVE PERIOD.

EROSION AND SEDIMENT CONTROL MEASURES NOTES:

1. ALL UTILITY TRENCHES SHALL BE BLOCKED AT THE PRESCRIBED INTERVALS WITH A DOUBLE ROW OF GRAVEL BAGS WITH A TOP ELEVATION. TWO GRAVEL BAGS BELOW THE GRADED SURFACE OF THE STREET. GRAVEL BAGS ARE TO BE PLACED WITH LAPPED COURSES.
2. AFTER UTILITY TRENCHES ARE BACK FILLED AND COMPACTED, THE SURFACES OVER SUCH TRENCHES SHALL BE MOUNDED SLIGHT TO PREVENT CHANNELING OF WATER IN THE TRENCH AREA. CARE SHOULD BE EXERCISED TO PROVIDE FOR CROSS FLOW AT FREQUENT INTER INTERVALS WHERE TRENCHES ARE NOT ON THE CENTERLINE OF A CROWNED STREET.
3. ALL BUILDING PADS SHOULD BE SLOPED TOWARDS THE DRIVEWAYS AND VELOCITY CHECK DAMS PROVIDED AT THE END OF THE DRIVEWAY APRON OF ALL DRIVEWAYS DRAINING INTO THE STREET.
4. PROVIDE VELOCITY CHECK DAMS IN ALL UNPAVED GRADED CHANNELS.
5. PROVIDE VELOCITY CHECK DAMS IN ALL STREET AREAS. VELOCITY CHECK DAMS MAY BE CONSTRUCTED OF GRAVEL BAGS, TIMBER, OR OTHER EROSION RESISTANT MATERIAL APPROVED BY THE COUNTY ENGINEER, AND SHALL EXTEND COMPLETELY ACROSS THE STREET OR CHANNEL AT RIGHT ANGLES TO THE CENTERLINE. VELOCITY CHECK DAMS MAY ALSO SERVE AS SEDIMENT TRAPS.
6. GRAVEL BAGS AND FILL MATERIAL SHALL BE STOCKPILED AT INTERVALS, READY FOR USE WHEN REQUIRED.
7. ALL EROSION CONTROL DEVICES WITHIN THE DEVELOPMENT SHOULD BE MAINTAINED DURING AND AFTER EVERY RUNOFF PRODUCING STORM. IF POSSIBLE, MAINTENANCE CREWS WOULD BE REQUIRED TO HAVE ACCESS TO ALL AREAS.
8. ANY PROPOSED ALTERNATE CONTROL MEASURES MUST BE APPROVED IN ADVANCE BY ALL RESPONSIBLE AGENCIES; I.E., COUNTY ENGINEER, DEPARTMENT OF SANITATION AND FLOOD CONTROL, OFFICE OF ENVIRONMENTAL MANAGEMENT, ETC.
9. PHYSICAL STABILIZATION THROUGH USE OF GEOTEXTILES, MATS, FIBER ROLLS (SS-7 OR ESC20), BONDED FIBER MATRIX OR OTHER MATERIAL APPROVED BY THE COUNTY FOR STABILIZING SLOPES.
10. VEGETATION STABILIZING USING HYDROSEED (SS-4 OR ESC10) OR ACCEPTABLE LANDSCAPING MAY BE USED ONLY MAY 1 TO AUGUST 15. VEGETATION PROPOSED TO STABILIZE SLOPES MUST BE INSTALLED BY AUGUST 15, WATERED AND ESTABLISHED PRIOR TO OCTOBER 1. THE PROPERTY OWNER OR AUTHORIZED AGENT SHALL SHOW ON THE PLAN A CONTINGENCY PHYSICAL BMP TO BE INSTALLED BY OCTOBER 1 IF HYDROSEED ESTABLISHMENT DOES NOT OCCUR BY THAT DATE. IF LANDSCAPING IS PROPOSED, EROSION CONTROL MEASURES MUST ALSO BE USED WHILE LANDSCAPING IS BEING ESTABLISHED. ESTABLISHED VEGETATION SHALL HAVE A SUBSURFACE MAT OF INTERTWINED MATURE ROOTS WITH A UNIFORM VEGETATIVE COVERAGE OF 70 PERCENT OF THE NATURAL VEGETATIVE COVERAGE OR MORE ON ALL DISTURBED AREAS.
11. ALL MANUFACTURED SLOPES AND CLEARED SLOPES OF 3 TO 1 (HORIZONTAL TO VERTICAL) AND STEEPER ARE TO BE PROTECTED WITH A BMP APPROVED BY THE COUNTY OF SAN DIEGO. CLEARED SLOPES FLATTER THAN 3 TO 1 MUST STILL BE PROTECTED FROM EROSION USING EITHER AN APPROVED BMP OR BY USING HYDROMULCH WITH A GUAR BINDER. FLAT AREAS OF LESS THAN 5% (LIKE BUILDING PADS, PARKING AREAS, LEACH FIELDS) SHALL HAVE 100% PROTECTION USING GEOTEXTILES, MATS (SS-7 OR ESC20), OR OTHER MATERIAL APPROVED BY THE COUNTY FOR STABILIZING SLOPES, OR USING TRACKING AND SOIL STABILIZERS/BINDERS (SS-5), TEMPORARY SEEDING (SS-4), MULCH/WOOD CHIPS (SS-3, SS-6, SS-8), OR JUTE MATTING (SS-7). THE COUNTY MAY REDUCE THIS REQUIREMENT FOR FLAT AREAS AND THE BELOW REQUIREMENT, PROVIDED FULL SEDIMENT CONTROL IS PROVIDED THROUGH CONSTRUCTED AND MAINTAINED DESILTATION BASINS (SC-2) AT ALL PROJECT DISCHARGE POINTS.
12. AREAS OF GRADED PADS THAT HAVE ACTIVE STRUCTURE CONSTRUCTION UNDERWAY MAY BE PROTECTED BY ROLLED PLASTIC AS PART OF A WEATHER-TRIGGERED ACTION PLAN UNTIL THE STRUCTURE'S ROOF HAS BEEN COMPLETED. THE REMAINDER OF THE PAD AREA MUST CONTINUE TO BE PROTECTED USING EROSION CONTROL MEASURES IDENTIFIED ABOVE.
13. UNPAVED ROADS ARE EXEMPT FROM THE 100% PROTECTION REQUIREMENTS BUT SHALL HAVE APPROPRIATE BMP'S INSTALLED SUCH AS GRAVEL BAG CHEVRONS.

EXISTING EASEMENT TABLE

1	HIGHWAY EMBANKMENT, SLOPES, ELECTRICAL AND COMMUNICATIONS FACILITIES EASEMENT TO COUNTY OF SAN DIEGO RECORDED 11/5/1987 AS FILE NO. 87-624337, O.R. AND EXTENSION AGREEMENT WITH SAN DIEGO GAS & ELECTRIC COMPANY RECORDED 6/20/1989 AS FILE NO. 89-382889, O.R.
2	20' WIDE EASEMENT TO OTAY MUNICIPAL WATER DISTRICT RECORDED 2/8/1967 AS FILE NO. 17469, O.R.
3	LINE EASEMENT TO SAN DIEGO GAS AND ELECTRIC CO. RECORDED 10/19/1948 IN BOOK 2985, PAGE 183, O.R.
4	40' WIDE EASEMENT FOR COUNTY HIGHWAY (ROAD SURVEY 793) RECORDED 1/31/1939 IN BOOK 869, PAGE 177, O.R.
5	30' WIDE EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY (OR WIDER IF REQUIRED BY NECESSARY CUTS AND FILLS) RECORDED 1/4/1983 AS FILE NO. 83-002642, O.R. AND RE-RECORDED 2/4/1983 AS FILE NO. 83-037564, O.R.
6	20' WIDE EASEMENT TO OTAY MUNICIPAL WATER DISTRICT RECORDED 2/8/1967 AS FILE NO. 17470, O.R.
7	EASEMENT FOR PUBLIC ROAD AND INCIDENTAL PURPOSES, RECORDED 3/8/1900 IN BOOK 257, PAGE 500 OF DEEDS.
8	EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES IN FAVOR OF SAN DIEGO GAS & ELECTRIC, RECORDED 12/7/1987 AS INSTRUMENT NO. 87-673753 OF O.R.
9	EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES IN FAVOR OF PACIFIC BELL, RECORDED 12/10/1987 AS INSTRUMENT NO. 87-682036 OF O.R.
10	EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES IN FAVOR OF SAN DIEGO GAS & ELECTRIC, RECORDED 6/4/1999 AS INSTRUMENT NO. 1999-0392159 OF O.R.
11	20' WIDE EASEMENT TO OTAY MUNICIPAL WATER DISTRICT RECORDED 2/15/1967 AS FILE NO. 20418, O.R.
12	20' WIDE EASEMENT TO OTAY MUNICIPAL WATER DISTRICT RECORDED 2/8/1967 AS FILE NO. 17468, O.R.
A	20' WIDE EASEMENT TO SAN DIEGO GAS AND ELECTRIC COMPANY, RECORDED 9/24/1985 AS FILE NO. 85-352966, O.R.

***APPROX. LOCATION 30' COMMERCIAL D/W**

NOTE: MINIMUM C/L SEPARATION FOR COMMERCIAL DRIVEWAYS;
200' SEPARATION ON NON-CIRCULATION ELEMENT ROADWAYS
300' SEPARATION ON CIRCULATION ELEMENT ROADWAYS

KEARNY Real Estate Company

OWNER/SUBDIVIDER

KEARNY REAL ESTATE COMPANY
655 WEST BROADWAY, SUITE 1600
SAN DIEGO, CA 92101
PHONE: 619-702-8130
FAX: 619-702-7812

ENGINEER OF WORK

STEVENS CRESTO ENGINEERING, INC.
9665 CHESAPEAKE DRIVE, SUITE 320
SAN DIEGO, CA 92123-1352
PHONE: (858) 694-5660
FAX: (858) 694-5661

MARK E. STEVENS
R.C.E. 35502
DATE

REGISTERED PROFESSIONAL ENGINEER MARK E. STEVENS No. 35502 Exp. 9-30-11 CIVIL STATE OF CALIFORNIA

STEVENS-CRESTO ENGINEERING, INC.
CIVIL ENGINEERS / LAND PLANNERS / SURVEYORS

SCALE: 1" = 200'

ATTACHMENT B

Source Control Exhibit

LEGEND

PROPOSED LOT NUMBER — (1) THRU (59)

SUBDIVISION BOUNDARY

PROPOSED LOT LINE

PROPOSED RIGHT-OF-WAY

PROPOSED CONTOUR — 630

PROPOSED STORM DRAIN — SD

PROPOSED STORM DRAIN INLET/ CATCH BASIN

PROPOSED STORM DRAIN CLEANOUT

PROPOSED STORM DRAIN HEADWALL/ ENERGY DISSIPATOR

RUNOFF FLOW DIRECTION

DESILTATION BASIN

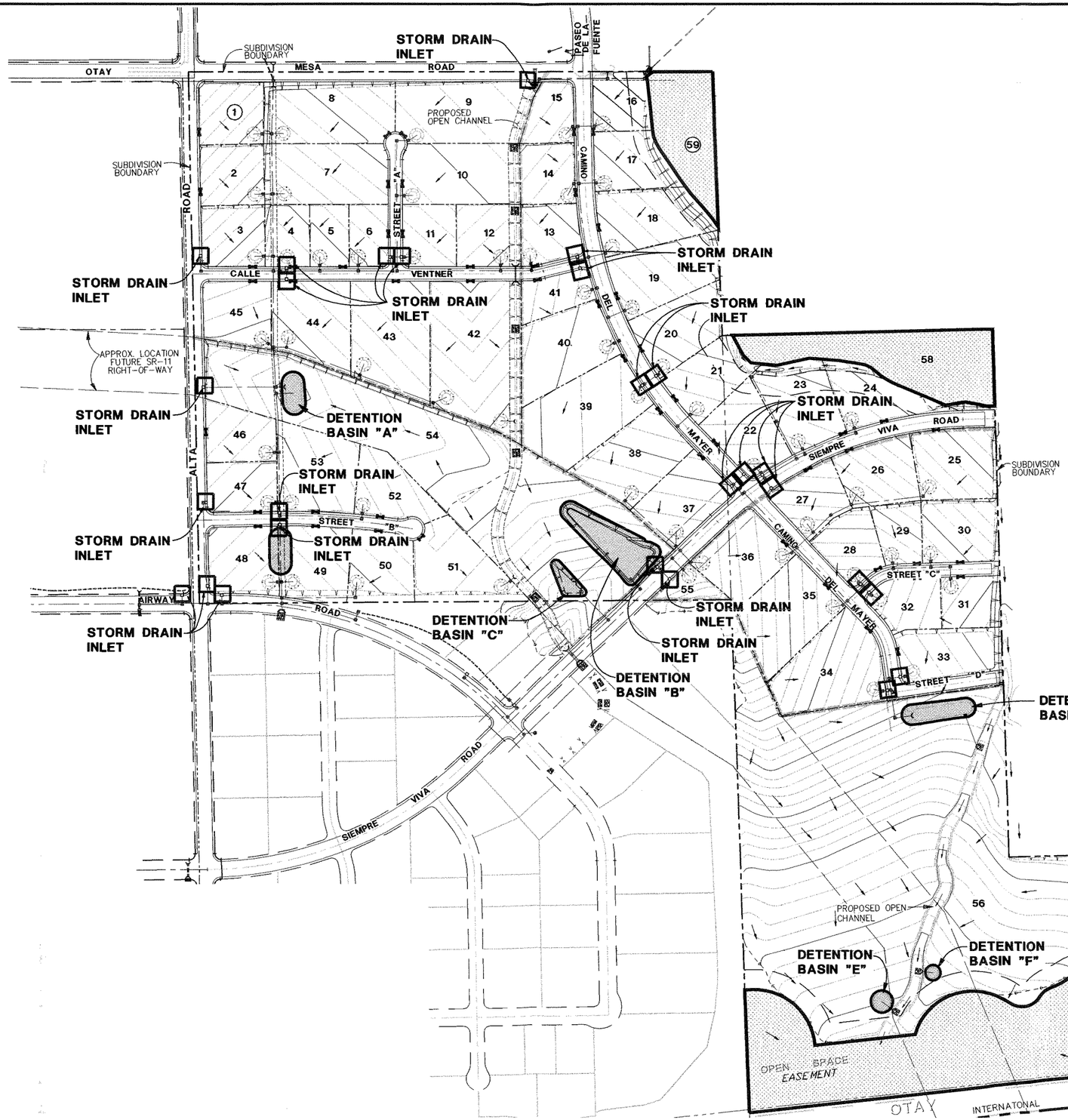
SOURCE CONTROL BMPS

STORM DRAIN INLET
(EACH INLET WILL BE MARKED WITH, "NO DUMPING! FLOWS TO OCEAN", OR SIMILAR)

VEGETATED STORM WATER DETENTION FACILITY
(DETENTION FACILITIES WILL CONTAIN PLANTS TOLERANT OF SATURATED SOIL CONDITIONS)

DEDICATED OPEN SPACE
(NATIVE SHRUBS AND GROUND COVER TO REMAIN UNDISTURBED)

VEGETATED SLOPES
(WILL BE HYDROSEEDED WITH NATIVE / DROUGHT TOLERANT PLANTS. PESTICIDES/ FERTILIZERS WILL BE USED AT A MINIMUM AND ONLY ON AN AS-NEEDED BASIS)



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CIVIL ENGINEERS · PLANNERS · LAND SURVEYORS
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PHONE: 858.694.2640
FAX: 858.694.2641
www.scenginc.com

OTAY CROSSINGS COMMERCE PARK

OTAY MESA, CALIFORNIA

ATTACHMENT "B"
STORM WATER MANAGEMENT PLAN
SOURCE CONTROL EXHIBIT (IPC)

DATE: 03/26/10

SCE NO. 03043.03

SHEET B

1 OF 1 SHEET

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Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

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- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

ATTACHMENT C

LID and/or TC-BMP Exhibit

LEGEND

- PROPOSED LOT NUMBER — 1 THRU 59
- SUBDIVISION BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT-OF-WAY
- EXISTING CONTOUR — 630
- PROPOSED CONTOUR — 630
- PROPOSED STORM DRAIN — SD
- PROPOSED STORM DRAIN INLET/ CATCH BASIN
- PROPOSED STORM DRAIN CLEANOUT
- PROPOSED STORM DRAIN HEADWALL/ ENERGY DISSIPATOR
- RUNOFF FLOW DIRECTION
- DESILTATION/ DETENTION BASINS
- DRAINAGE MANAGEMENT AREA BOUNDARY AND LABEL — STREETS 13, 2.150 ACRES

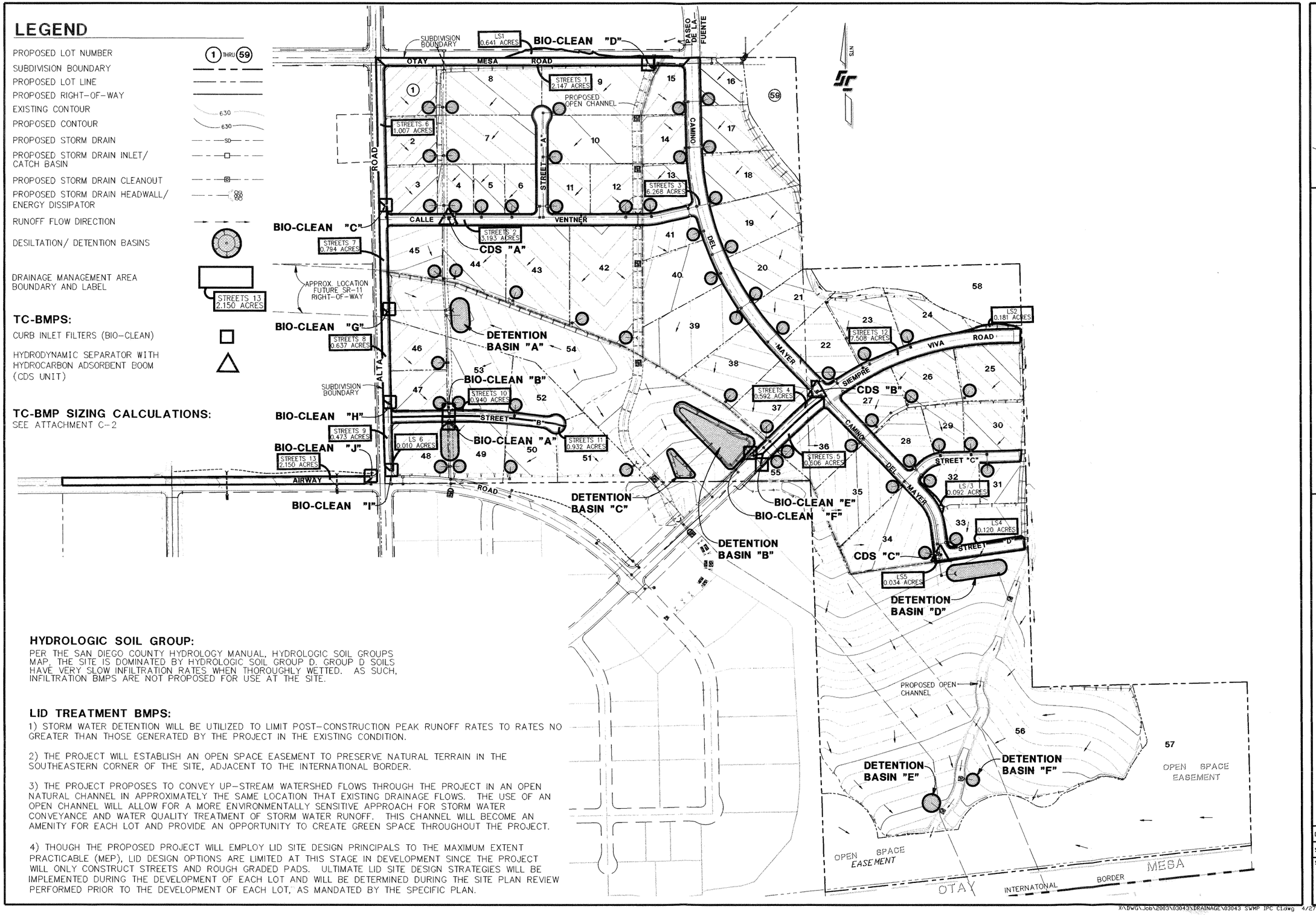
TC-BMPS:

CURB INLET FILTERS (BIO-CLEAN)

HYDRODYNAMIC SEPARATOR WITH HYDROCARBON ADSORBENT BOOM (CDS UNIT)

TC-BMP SIZING CALCULATIONS:

SEE ATTACHMENT C-2



HYDROLOGIC SOIL GROUP:

PER THE SAN DIEGO COUNTY HYDROLOGY MANUAL, HYDROLOGIC SOIL GROUPS MAP, THE SITE IS DOMINATED BY HYDROLOGIC SOIL GROUP D. GROUP D SOILS HAVE VERY SLOW INFILTRATION RATES WHEN THOROUGHLY WETTED. AS SUCH, INFILTRATION BMPS ARE NOT PROPOSED FOR USE AT THE SITE.

LID TREATMENT BMPS:

1) STORM WATER DETENTION WILL BE UTILIZED TO LIMIT POST-CONSTRUCTION PEAK RUNOFF RATES TO RATES NO GREATER THAN THOSE GENERATED BY THE PROJECT IN THE EXISTING CONDITION.

2) THE PROJECT WILL ESTABLISH AN OPEN SPACE EASEMENT TO PRESERVE NATURAL TERRAIN IN THE SOUTHEASTERN CORNER OF THE SITE, ADJACENT TO THE INTERNATIONAL BORDER.

3) THE PROJECT PROPOSES TO CONVEY UP-STREAM WATERSHED FLOWS THROUGH THE PROJECT IN AN OPEN NATURAL CHANNEL IN APPROXIMATELY THE SAME LOCATION THAT EXISTING DRAINAGE FLOWS. THE USE OF AN OPEN CHANNEL WILL ALLOW FOR A MORE ENVIRONMENTALLY SENSITIVE APPROACH FOR STORM WATER CONVEYANCE AND WATER QUALITY TREATMENT OF STORM WATER RUNOFF. THIS CHANNEL WILL BECOME AN AMENITY FOR EACH LOT AND PROVIDE AN OPPORTUNITY TO CREATE GREEN SPACE THROUGHOUT THE PROJECT.

4) THOUGH THE PROPOSED PROJECT WILL EMPLOY LID SITE DESIGN PRINCIPALS TO THE MAXIMUM EXTENT PRACTICABLE (MEP), LID DESIGN OPTIONS ARE LIMITED AT THIS STAGE IN DEVELOPMENT SINCE THE PROJECT WILL ONLY CONSTRUCT STREETS AND ROUGH GRADED PADS. ULTIMATE LID SITE DESIGN STRATEGIES WILL BE IMPLEMENTED DURING THE DEVELOPMENT OF EACH LOT AND WILL BE DETERMINED DURING THE SITE PLAN REVIEW PERFORMED PRIOR TO THE DEVELOPMENT OF EACH LOT, AS MANDATED BY THE SPECIFIC PLAN.

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OTAY CROSSINGS COMMERCE PARK

OTAY MESA, CALIFORNIA

ATTACHMENT "C-1"
STORM WATER MANAGEMENT PLAN
INTERMEDIATE POST CONSTRUCTION

DATE: 04/27/10

SCE NO. 03043.03

SHEET C-1

1 OF 1 SHEET

TC-BMP SIZING CALCULATIONS:

BMP Name: CDS "A"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 2	AC Pavement	1.0	3.19	3.19			
Total (AC)				3.19	0.20	0.64	2.0

BMP Name: CDS "B"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 3	AC Pavement	1.0	6.27	6.27			
Total (AC)				6.27	0.20	1.25	2.0

BMP Name: CDS "C"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 12	AC Pavement	1.0	7.51	7.51			
LS 2	Landscaping	0.1	0.18	0.02			
LS 3	Landscaping	0.1	0.09	0.01			
LS 4	Landscaping	0.1	0.12	0.01			
LS 5	Landscaping	0.1	0.03	0.00			
Total (AC)				7.55	0.20	1.51	2.0

BMP Name: BIO-CLEAN "A"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 11	AC Pavement	1.0	0.93	0.93			
Total (AC)				0.93	0.20	0.19	2.1

BMP Name: BIO-CLEAN "B"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 10	AC Pavement	1.0	0.94	0.94			
Total (AC)				0.94	0.20	0.19	2.1

BMP Name: BIO-CLEAN "C"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 6	AC Pavement	1.0	1.01	1.01			
Total (AC)				1.01	0.20	0.20	2.1

BMP Name: BIO-CLEAN "D"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 1	AC Pavement	1.0	2.15	2.15			
LS 1	Landscaping	0.1	0.64	0.06			
Total (AC)				2.21	0.20	0.44	2.1

BMP Name: BIO-CLEAN "E"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 5	AC Pavement	1.0	0.61	0.61			
Total (AC)				0.61	0.20	0.12	2.1

BMP Name: BIO-CLEAN "F"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 4	AC Pavement	1.0	0.59	0.59			
Total (AC)				0.59	0.20	0.12	2.1

BMP Name: BIO-CLEAN "G"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 7	AC Pavement	1.0	0.79	0.79			
Total (AC)				0.79	0.20	0.16	2.1

BMP Name: BIO-CLEAN "H"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 8	AC Pavement	1.0	0.64	0.64			
Total (AC)				0.64	0.20	0.13	2.1

BMP Name: BIO-CLEAN "I"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 9	AC Pavement	1.0	0.47	0.47			
LS 6	Landscaping	0.1	0.01	0.00			
Total (AC)				0.47	0.20	0.09	2.1

BMP Name: BIO-CLEAN "J"		Soil Type: D					
Tributary DMAs							
DMA Name	Post-Project Surface Type	Runoff Factor	Area (AC)	Adjusted Area (AC)	Intensity (In/Hr)	Q_{WQ} (CFS)	BMP TREATMENT FLOW RATE (CFS)
STREETS 13	AC Pavement	1.0	2.15	2.15			
Total (AC)				2.15	0.20	0.43	2.1

NOTES:

1) LOT RUN-OFF TRIBUTARY TO THE CDS UNITS HAS NOT BEEN INCLUDED IN THE SIZING CALCULATIONS FOR THOSE UNITS SINCE, DUE TO THE USE OF ON-LOT LID BMPS AND HYDROMODIFICATION BMPS, RUNOFF FROM ROADWAY BASINS WILL PEAK WELL BEFORE LOT RUN-OFF ENTERS THE SYSTEM.

2) A TREATMENT FLOW RATE OF 2.0 CFS FOR A CDS UNIT IS TAKEN FROM THE MANUFACTURER'S SPECIFICATIONS FOR THE SMALLEST OFF-LINE UNIT (PSWC30_20. A TREATMENT FLOW RATE OF 2.1 CFS FOR A BIO-CLEAN FILTER IS TAKEN FROM THE MANUFACTURER'S SPECIFICATIONS FOR THE FINE BOTTOM SCREEN OF A BIO-CLEAN HIGH CAPACITY ROUND GRATE INLET SKIMMER BOX SYSTEM.

3) DETENTION BASINS WILL BE SIZED PER THE CALCULATIONS IN THE PROJECT HYDROMODIFICATION MANAGEMENT PLAN AND CEQA PRELIMINARY HYDROLOGY/ DRAINAGE STUDY

LID TREATMENT BMPS:

1) STORM WATER DETENTION WILL BE UTILIZED TO LIMIT POST-CONSTRUCTION PEAK RUNOFF RATES TO RATES NO GREATER THAN THOSE GENERATED BY THE PROJECT IN THE EXISTING CONDITION.

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HYDROLOGIC SOIL GROUP:

PER THE SAN DIEGO COUNTY HYDROLOGY MANUAL, HYDROLOGIC SOIL GROUPS MAP, THE SITE IS DOMINATED BY HYDROLOGIC SOIL GROUP D. GROUP D SOILS HAVE VERY SLOW INFILTRATION RATES WHEN THOROUGHLY WETTED. AS SUCH, INFILTRATION BMPS ARE NOT PROPOSED FOR USE AT THE SITE.

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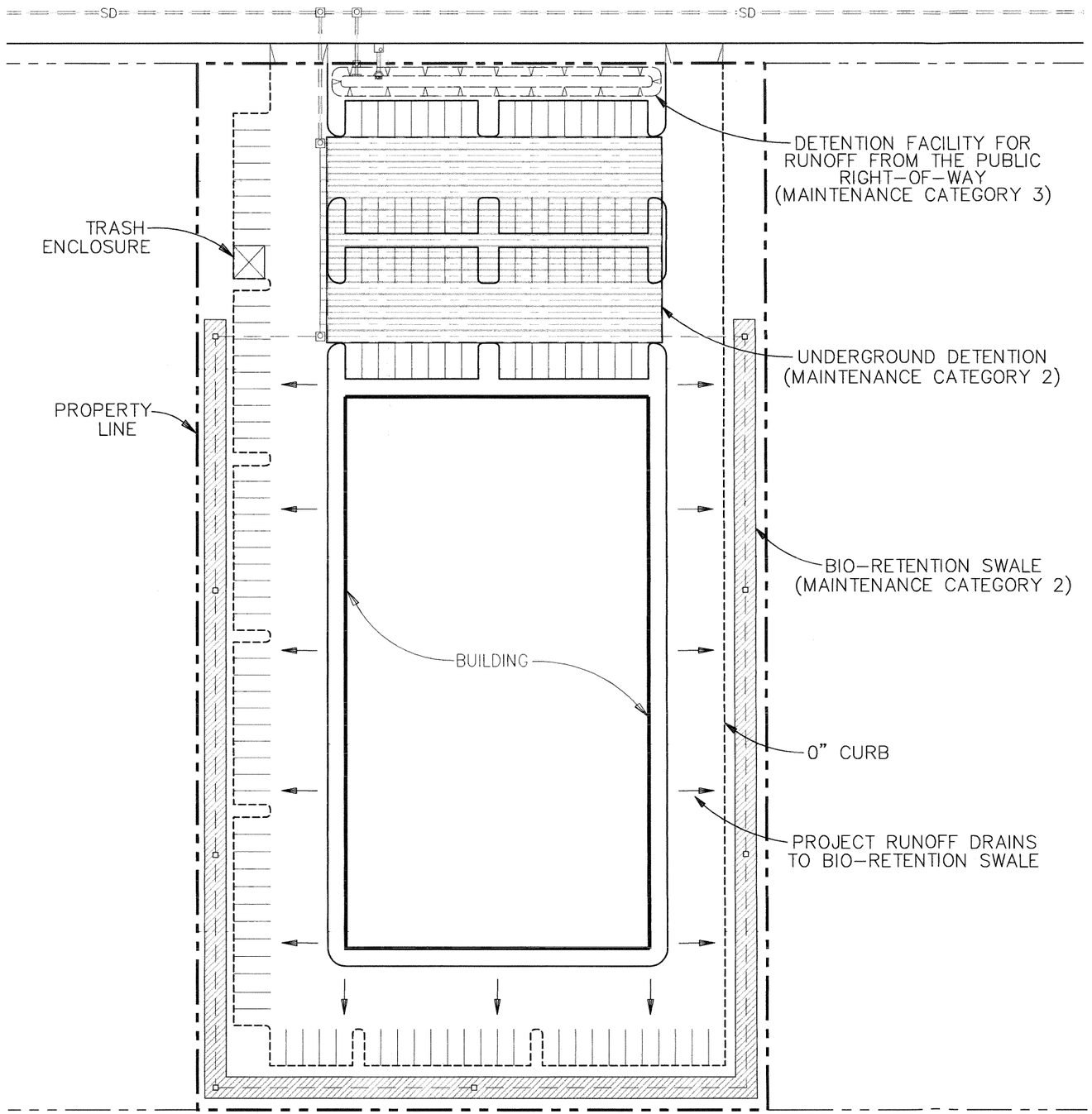
OTAY CROSSINGS COMMERCE PARK

ATTACHMENT "C-2"
STORM WATER MANAGEMENT PLAN
INTERMEDIATE POST CONSTRUCTION

OTAY MESA, CALIFORNIA

DATE: 03/29/10
SCE NO. 03043.03
SHEET
C-2
1 OF 1 SHEET

TYPICAL ON-LOT LID BMPS
(NOT A PROPOSED LAYOUT - IT IS ANTICIPATED THAT FACILITIES SIMILAR TO THIS WILL BE CONSTRUCTED IN ULTIMATE DEVELOPMENT)



TYPICAL ON-LOT LID BMPS*:

1) MINIMIZE AND DISCONNECT IMPERVIOUS SURFACES
   - IT IS ANTICIPATED THAT THE FUTURE ON-LOT DEVELOPMENTS WILL BE APPROXIMATELY 75% IMPERVIOUS; 5-15% LESS THAN TYPICAL COMMERCIAL/ INDUSTRIAL DEVELOPMENTS.
   - IMPERVIOUS SURFACES WILL DRAIN TO LANDSCAPED AREAS.
2) DRAIN RUNOFF FROM IMPERVIOUS SURFACES TO PERVIOUS AREAS.
   - RUNOFF FROM PARKING LOTS, DRIVE LANES AND BUILDING ROOFTOPS WILL DRAIN TO BIO-RETENTIONS SWALES AROUND THE PROJECT PERIMETER.
   - RUNOFF FROM ADJACENT PUBLIC RIGHT-OF-WAYS MAY BE COLLECTED IN DETENTION FACILITIES CONSTRUCTED WITH THE PROJECT.
3) LID LANDSCAPING DESIGN
   - SOIL AMENDMENTS
   - REUSE OF NATIVE SOILS
   - STREET TREES

*BMPS LISTED ARE TYPICAL ON-LOT BMPS ANTICIPATED FOR USE AT THE PROJECT. ACTUAL BMPS MAY VARY AND WILL BE SPECIFIED DURING THE SITE PLAN REVIEW PERFORMED PRIOR TO THE DEVELOPMENT OF EACH LOT, AS MANDATED BY THE SPECIFIC PLAN.

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OTAY CROSSINGS COMMERCE PARK
OTAY MESA, CALIFORNIA

ATTACHMENT "C-3"
TYPICAL ON-LOT LID BMPS
(ULTIMATE DEVELOPMENT)

DATE: 03/29/10
SCE NO. 03043.03
SHEET C-3
1 OF 1 SHEET

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ATTACHMENT D

Drainage Management Area (DMA) Maps, Sizing Design Calculations and TC-BMP/LID Design Details

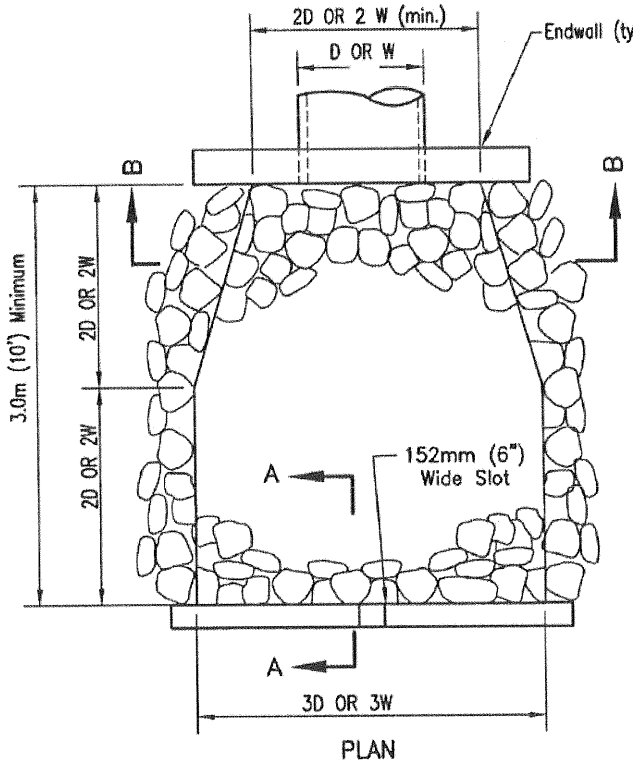
For Drainage Management Area (DMA) Maps and Sizing Design Calculations, see Attachments C-1 and C-2

Treatment Control BMPs – Intermediate Post-Construction

Otay Crossings Commerce Park proposes to construct public roads and rough graded pads. The rough graded pads will be stabilized for erosion control, and each pad will contain at least one desiltation basin to remove silt and sediments from project runoff prior to it entering the storm drain system. Additionally, desiltation basins, by design, detain flows and reduce post construction runoff rate increases. Also, riprap type energy dissipaters will be placed at storm drain outfalls to reduce velocities and spread concentrated runoff.

Riprap-type Energy Dissipator is composed of rock placed at the outlet of a pipe to prevent scour of the soil caused by concentrated, high velocity flows. The use of riprap helps protect the outlet of a pipe from developing small eroded pools (plange pools). Riprap will be installed at the outlet of storm drain pipes discharging into open space and open channels.

Factors Affecting Preliminary Design: Apron length and rock size gradation will be determined at final engineering based on the discharge pipe diameter and estimated discharge rate. Initial estimate for sizing is 10' x 10' riprap pad utilizing ¼ ton rock and filter fabric. General guidelines of riprap design are included as Figure A for reference. The design criteria presented are considered to be minimums.



Design Velocity m/sec (ft/sec)*	Rock Classification	T (min)
1.8–3 (6–10)	No. 2 Backing	320mm (1.1ft)
3–3.7 (10–12)	220 kg (1/4 ton)	823mm (2.7ft)
3.7–4.3 (12–14)	450 kg (1/2 ton)	1.1m (3.5ft)
4.3–4.9 (14–16)	900 kg (1 ton)	1.3m (4.4ft)
4.9–5.5 (16–18)	1.8 tonne (2 ton)	1.6m (5.4ft)

*over 5.5 mps (18 fps) requires special design

D = Pipe Diameter
W = Bottom Width of Channel

Figure A
Schematic of Riprap Energy Dissipator
(San Diego Regional Standard Drawing D-40)

The following TC-BMPs will be implemented to address water quality and to mitigate the increase in storm water runoff generated by the proposed development:

A. Desiltation Basins (DSBs)
B. Curb Inlet Filter (Bio-Clean)
C. Hydrodynamic Separator (CDS unit)
D. Regional Detention Basins (DB)

A. Desiltation Basins (DSB)

A DSB is a controlled stormwater release structure formed by excavation at the low point in each developed lot. The DSB collects all stormwater runoff on each lot. Desiltation occurs prior to release to the public storm drain system. Its purpose is to collect and store sediment from the constructed stabilized pads for extended periods of time before UD. DSB shall be maintained and cleaned to design contours when sediment accumulation exceeds 18" in depth or 10% of the storage volume (which ever is less). The DSB is an IPC measure and is to be maintained until the UD.

DSB are impoundments where the runoff is detained under quiescent conditions, allowing sediment and particulates to settle out via, "...an outlet structure that will cause the runoff from most storms to pond in the basin." A conceptual schematic of a DSB is shown in Figure B and outlet structure schematic is shown in Figure C.

Appropriate Applications and Sighting Constraints: DSB will be installed on each lot. One important sighting requirement is that sufficient head is available so that water stored in the device does not cause a backwater condition in the storm drain system, which would limit its capacity. A second sighting requirement is that seasonally high groundwater is no higher than the bottom elevation of the device for reasons described below.

Factors Affecting Preliminary Design: A DSB shall have a means for dewatering within 4-calendar days following a storm event. DSB may be fenced if safety (worker or public) is a concern. Sizing of Desiltation basins will be done at final engineering however, general guidelines follow for reference.

Option 1
Desiltation basin(s), as measured from the bottom of the basin to the principal outlet, shall have at least a capacity equivalent to 3,600 cubic feet of storage per acre draining into the desiltation basin. The length of the basin shall be more than twice the width of the basin. The length is determined by measuring the distance between the inlet and the outlet; and the depth must not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency.

Option 2
Desiltation basin(s) shall be designed using the standard equation:

$$As = 1.2Q/Vs$$

Where: As is the minimum surface area for trapping soil particles of a certain size; Vs is the settling velocity of the design particle size chosen; and Q=C x I x A where Q is the discharge rate measured in cubic feet per second; C is the runoff coefficient; I is the precipitation intensity for the 10-year, 6-hour rain event and A is the area draining into the desiltation basin in acres. The design particle size shall be the smallest soil grain size determined by wet sieve analysis, or the fine silt sized (0.01mm) particle, and the Vs used shall be 100 percent of the calculated settling velocity.

The length is determined by measuring the distance between the inlet and the outlet; the length shall be more than twice the dimension as the width; the depth shall not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency (two feet of storage, two feet of capacity). The basin(s) shall be located on the site where it can be maintained on a year-round basis and shall be maintained on a schedule to retain the two feet of capacity.

Option 3

The use of an equivalent surface area design or equation, provided that the design efficiency is as protective or more protective of water quality than Option 2.

(Figures B & C follow on next page)

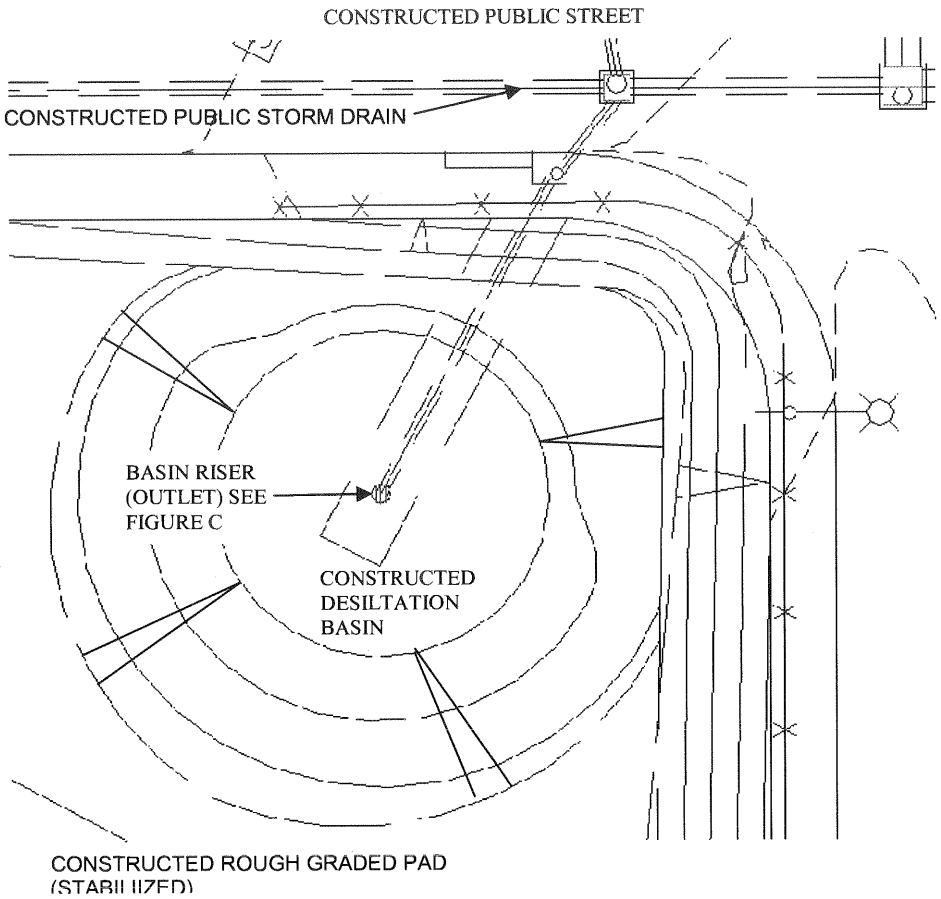


Figure B
Schematic Example of Desiltation Basin (DSB)
(Not a Standard Plan)

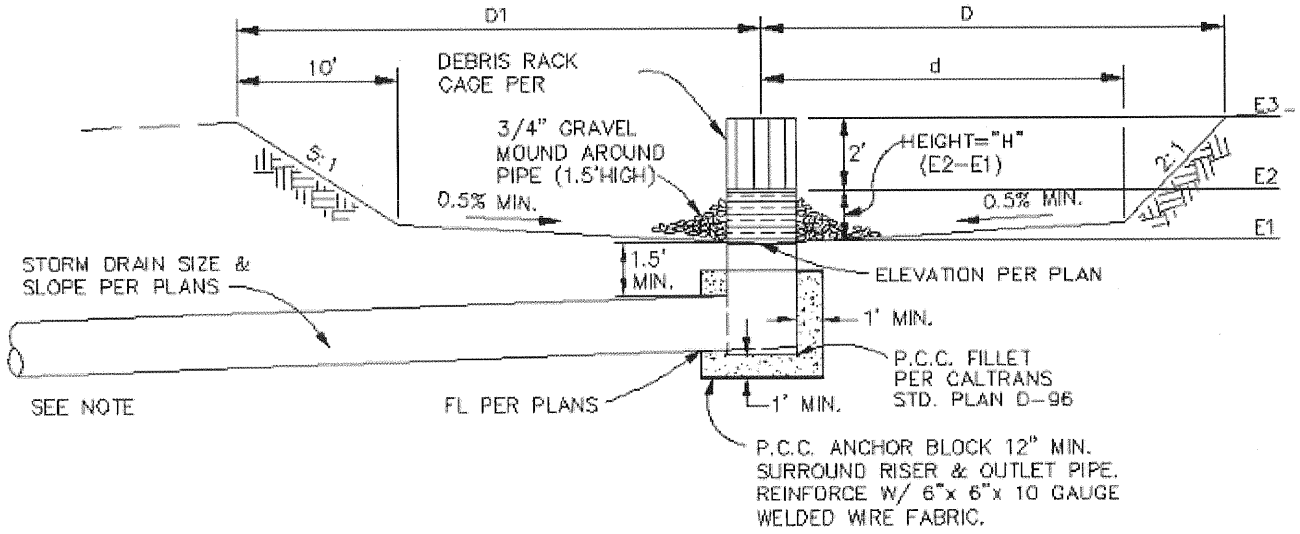


Figure C
Desiltation Basin Outlet Structure Schematic
(Not a Standard Plan)

B. Curb Inlet Filter (Bio-Clean)

Storm drain inserts are a cost effective solution for treating storm water runoff prior to release to the public storm drain system. Although Table 11 - Groups of Pollutants and Relative Effectiveness of Treatment Facilities indicates that storm drain inserts provide low levels of pollutant removal for all pollutants except "coarse sediment and trash", current Best Available Technology (BAT) in catch basin inserts, utilizing Suntree Technologies' (Bio-Clean) "Grate Inlet Skimmer Box" with "Bio-Sorb" hydrocarbon adsorbing booms, have been shown to be effective in removing a wide range of pollutants. A study prepared by Creech Engineers, Inc. titled, "Pollutant Removal Testing for a Suntree Technologies Grate Inlet Skimmer Box", dated November 2001, found that the Grate Inlet Skimmer Box has a removal efficiency of 79.3% for grass clippings, and 73.3% for sediment. Grass clippings are likely to be the most common oxygen demanding substance, and source of nutrients and pesticides, found at the project. An additional study, prepared by the City of El Monte, dated November 2002, found Bio-Clean filters to be effective in removing heavy metals and oil & grease. The study was a real-world analysis of a storm drain inlet fitted with a Bio-Clean filter. The study analyzed a sample of storm water runoff at the storm drain inlet prior to the installation of the filter, and then analyzed effluent water samples after one week, three weeks, and five weeks of having the Bio-Clean filter installed. Heavy metals and oil & grease concentrations were reduced by up to 95% by the Bio-Clean filter. Another study, prepared by the University of Hawaii, titled, "The Efficiency of Storm Drain Filters in Removing Pollutants from Urban Road Runoff", dated March 2004, analyzed the effectiveness of four of the most popular storm drain inlet filters, including the Bio-Clean Grate Inlet Skimmer Box, and found the Bio-Clean filter to be the most promising for wide spread use in Honolulu. They came to this conclusion after performing a multi-year, three phase study of the inlet filters, and taking into account several factors, including cost and ease of maintenance. The Creech Engineers, Inc. and City of El Monte studies, and an excerpt from the University of Hawaii study, are included at the end of this section.

Structural treatment BMPs to be implemented by OCCP as a means to reduce pollution of storm water runoff due to the proposed development are:

> Storm Drain inserts: Inserts will be located within curb inlets collecting runoff generated from public roadways.
>
> Inserts treat "first flush" (Qff) minor storms and allow bypass of the filter for large storm events. Additionally, inserts remove hydrocarbons, oil, and petroleum products and assist in further removal of heavy metals which may escape non-structural good housekeeping practices, thus removing pollutants from public roadway runoff prior to release into the Municipal Storm Drain to the MEP.

- Design Criteria:
  a) Manufacturer's Specifications for the curb inlet inserts show a filtration capacity of 2.1 cfs for the fine mesh screen on the bottom of the High Capacity Basket.
  b) Based upon County of San Diego, Storm Water Standards, flow based BMPs are required to treat runoff from a storm with an intensity of 0.2 in/hr. Therefore these inserts can treat flows from tributary areas up to 11.1 acres (Qff= 2.1 cfs/(0.2in/hr)(0.95) = 11.1 Acres).
  c) Given that the maximum area tributary to a proposed curb inlet insert at OCCP is approximately 3.0 acres, the project will have the ability to treat all public roadway runoff with excess capacity.

Manufacturer's Specifications are presented at the end of this section.

C. Hydrodynamic Separator (CDS unit)

Based on current Best Available Technology (BAT), and per recommendations from County of San Diego staff, hydrodynamic separators, utilizing Continuous Deflection Separation (CDS) Technology, will be used to treat runoff from public right-of-ways. Storm water runoff entering a CDS unit passes by an internal diversion weir and is directed along a separation screen in the center of the unit. Storm water passes through the screen, flows under an oil baffle, and exits the unit. Trash, debris and sediments are trapped by the separation screen and fall into a storage sump at the bottom of the unit. The CDS unit utilizes swirl concentration and screen separation to remove 100% of floatables, sediments, and all other materials greater in size than the screen aperture. Oil and grease are removed by the oil baffle at the outlet of the unit. Although laboratory testing has found that the oil baffle alone can remove up to 70% of free oil and grease from storm water, oil sorbents will be placed in the separation chamber to increase removal rates to 80% or 90%. CDS units are designed to treat "first flush" 85th percentile flows and allow for the bypass of higher flow rates. The CDS units will remove pollutants to the MEP. Refer to the end of this section for product specifications.

- Design Criteria: Although the CDS units will be utilized specifically for the removal of pollutants in runoff from the public roadways, each unit will be sized to also receive runoff from the developed lots. The CDS units will not be relied upon for treatment of on-lot runoff, however, as water quality treatment will be provided on each lot, in conformance with LID standards implemented at the UD grading or Building Permit stage. See Attachment C-1 for locations of the proposed CDS units.

a) CDS units are available in several sizes and treatment configurations. Inline units are capable of treating up to 6 cfs, and offline units are capable of treating up to 64 cfs. Manufacturer's specifications are presented at the end of this section documenting removal levels and specific water control device information.

b) Based upon County of San Diego, Storm Water Standards, flow based BMPs are required to treat runoff produced from a rainfall intensity of 0.2in/hr. Therefore, the water quality treatment flow rate from the largest basin tributary to a CDS unit is approximately 1.51 cfs (See calculations on attachment C-2). Given that CDS units are capable of treating up to 64 cfs, they have the ability to treat all project runoff with excess capacity.

Vector Control: Measures will be taken to minimize the potential for vector habitation within the CDS units. Vector restricting manhole covers will be utilized on all units, and mosquito netting will be installed as necessary. Should a persistent vector problem occur, the manufacturer will be contacted and recommendations adopted

Treatment Control BMPs – Ultimate Development

At UD industrial/commercial occupants will be required to provide structural methods to assure water quality of storm water runoff from each lot, as necessary for the intended land use.

The following treatment control BMPs will be implemented to address water quality:

A. Water Quality Devices (future on-lot)
B. Detention Basins (future on-lot)
C. Curb Inlet Filter (Bio-Clean) – constructed in IPC (See discussion earlier in this section)
D. Hydrodynamic Separator (CDS unit) – constructed in IPC (See discussion earlier in this section)
E. Regional Detention Basins (DB) – constructed in IPC (See discussion earlier in this section)

A. Water Quality Devices (WQ) (future on-lot)

If the proposed land use generates regulated pollutants and site design or source control will not control pollutants, WQ devices will be required within each development/lot to assure water quality for the proposed site. WQ devices serve to clarify storm water runoff prior to entry into the detention basin.

The industrial/commercial land use will significantly increase the impervious surface limiting the natural ground's ability to remove water quality impairments from storm runoff. The purpose of the WQ device is to separate debris, grit, petroleum products and heavy metals out of runoff from developed sites. Parking areas, driveways, and building rooftops will comprise a large percentage of the impervious surface on each lot. Table 7: Project Pollutants of Concern identifies target pollutants anticipated for filtration.

Many structural water quality treatment devices are available and the appropriate BMP will be chosen at final engineering for each lot, based upon the anticipated pollutants generated from the proposed land use. Combined water quality / detention facilities may be utilized. A typical site design layout for a commercial/ industrial facility, using LID BMPs, is provided for reference as Attachment C-3. It is anticipated that facilities similar to this will be constructed at the project in Ultimate Development.

B. Detention Basins / Structures (DB) (future on-lot)

As required by the City of San Diego, "Drainage Requirements for Developments in Otay Mesa" (Memo dated: 08/07/1987), "...Each property owner shall provide storm water detention...so that the rate of runoff will not be greater after development than it was before development...." For Otay Crossings Commerce Park (OCCP), detention will be provided. Detention, in itself, is a method to assure water quality by eliminating

down stream impacts of increased runoff due to development. Combined water quality / detention facilities are recommended.

DB devices will replace the desiltation basins (DSB) constructed at IPD. DB devices detain all storm runoff that exceeds the allowable flow rate and release the flow at a controlled rate to reduce peak flow on each lot. This effort attenuates increased runoff due to development and assures overall project release rates meet exiting levels.

Conventional DB require a large area of the site, which can make them economically unfeasible. A conceptual schematic of a conventional above ground detention basin is shown in Figure D with a typical outlet structure shown in Figure E. Alternatively, Parking Lot Detention may be utilized; Figures F and G depict a conceptual schematic of above ground parking lot detention. An additional alternative is to place detention below ground. Sub-surface devices for detention will allow utilization of the above ground area over footprint of the structure for driveway, parking, and landscape uses. Figure H depicts a conceptual schematic of below ground detention, typically located under parking lots.

Subsurface and Parking Lot surface detention will require pre-filtering for removal of petroleum/hydrocarbons as well as heavy metal removals. Catch basin inserts within parking/drive lane catch basins/inlets shall be required; alternatively, BAT may be utilized combining pre-filtering with detention at the time of construction subject to approval by the County of San Diego Department of Public Works

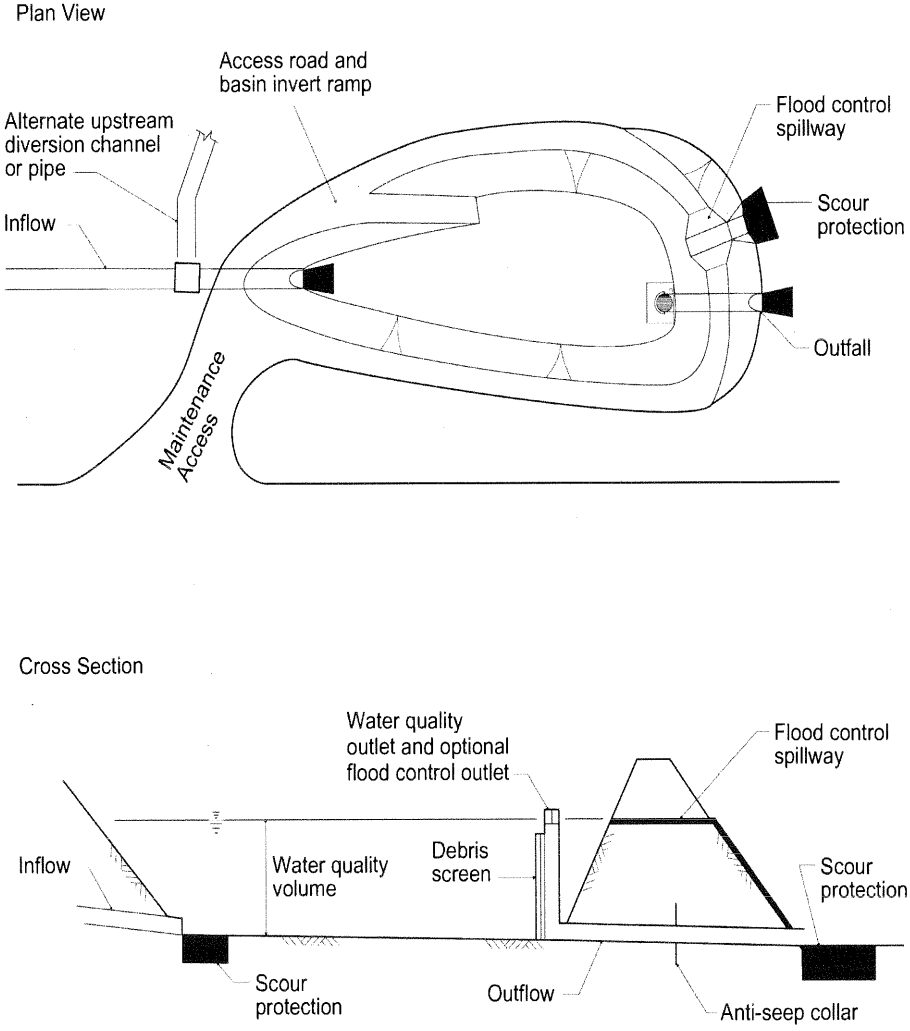


Figure D.
Schematic of Detention Basin
(Not a Standard Plan)

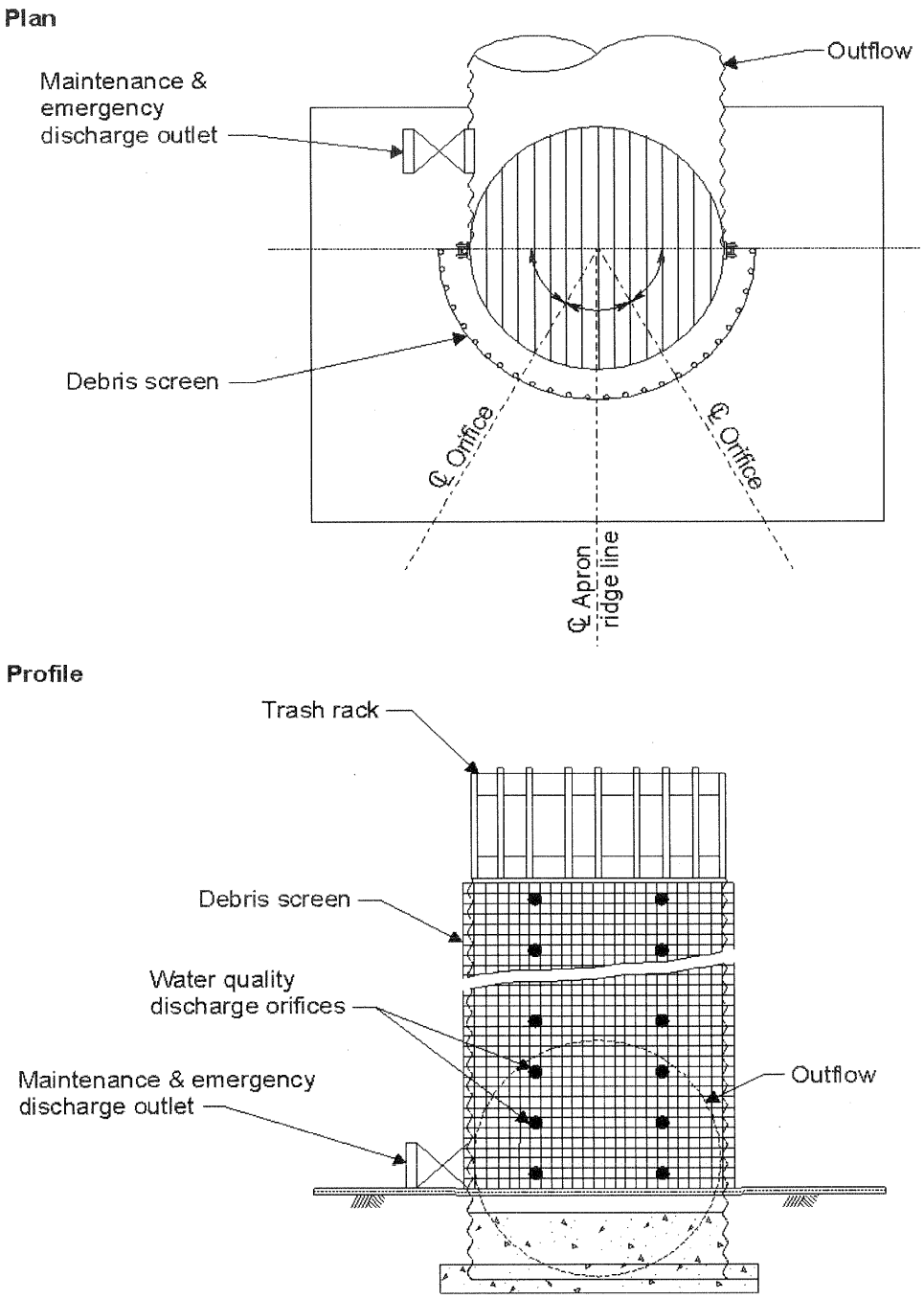


Figure E.
Detention Basin Outlet Structure Schematic
(Not a Standard Plan)

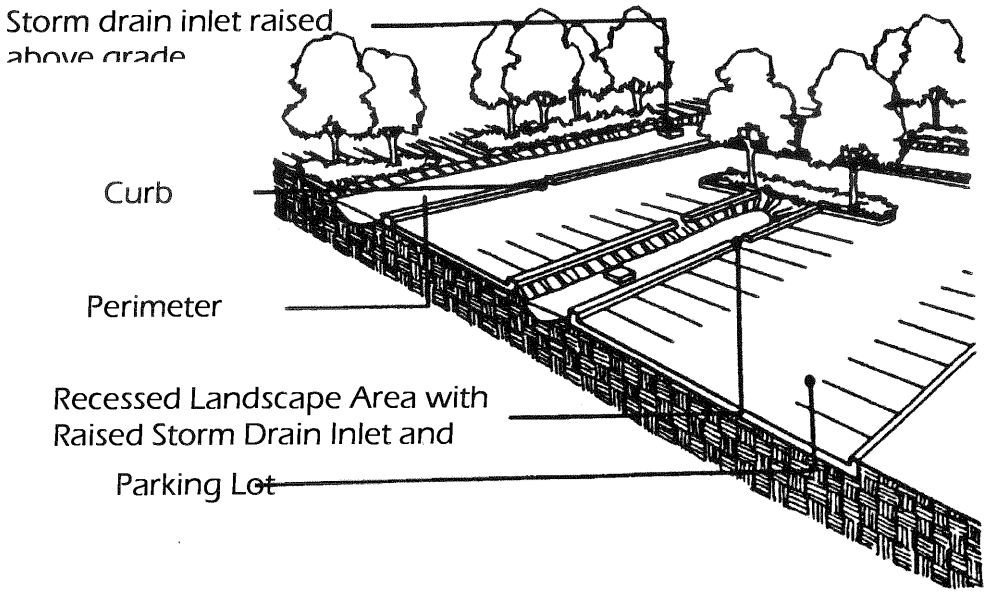


Figure F.
Parking Lot Detention Schematic
(Not a Standard Plan)

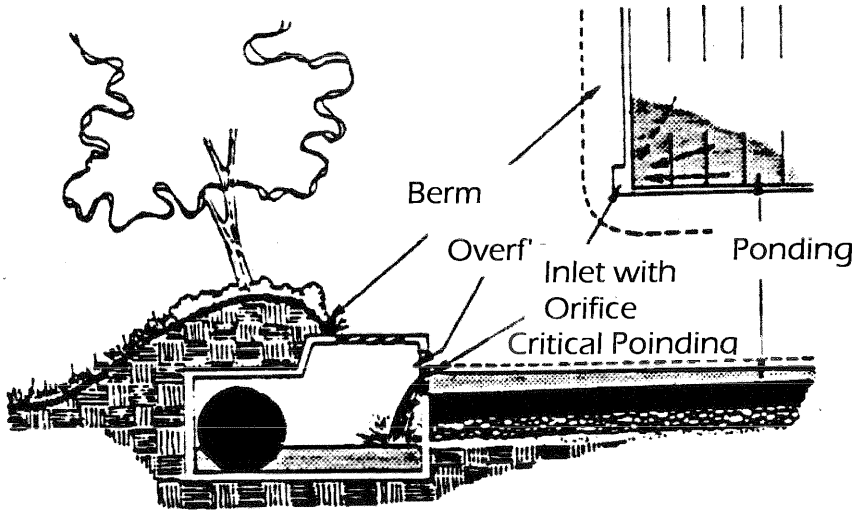
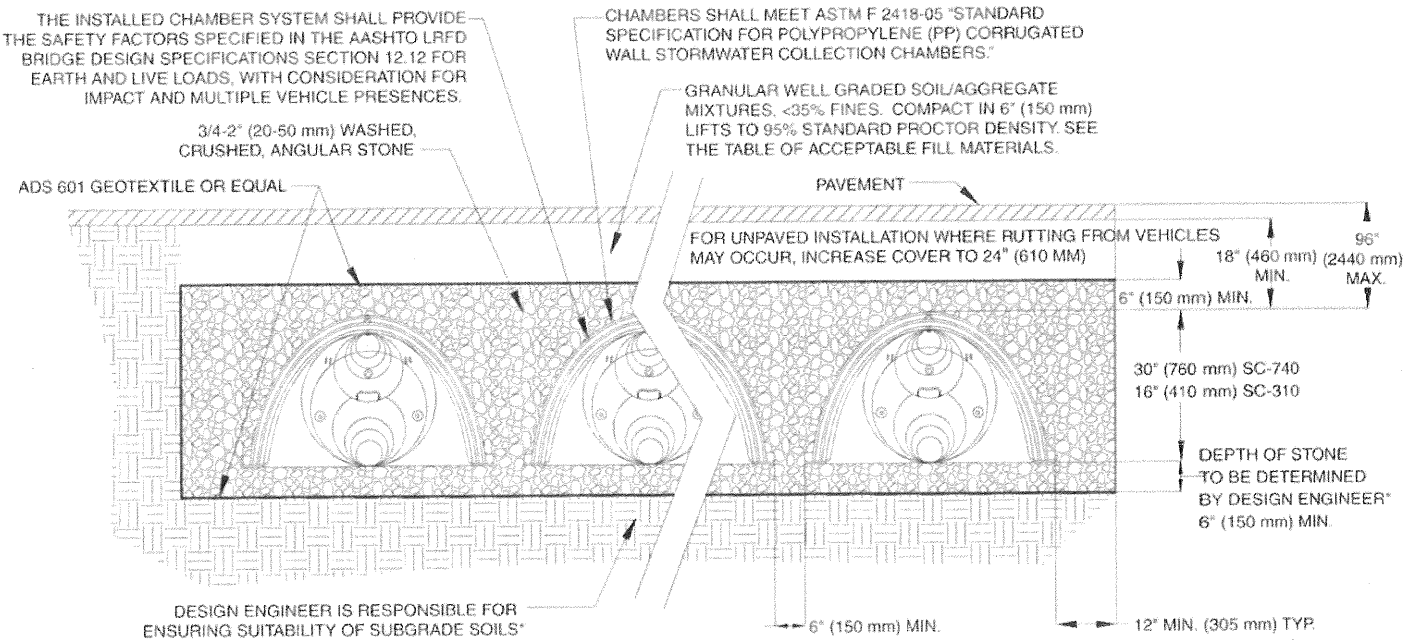


Figure G.
Section through Parking Lot Storage Area (Schematic)
(Not a Standard Plan)



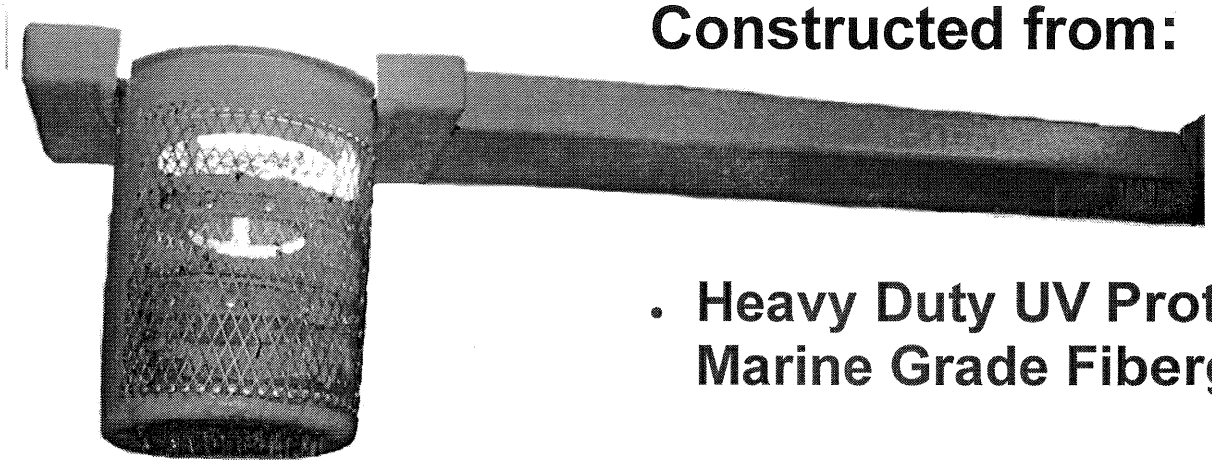
THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE SAFETY FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

Figure H.
Schematic of Sub-Surface Detention Basin
(Not a Standard Plan)

TREATMENT BMP MANUFACTURER'S SPECIFICATIONS

High Capacity Basket

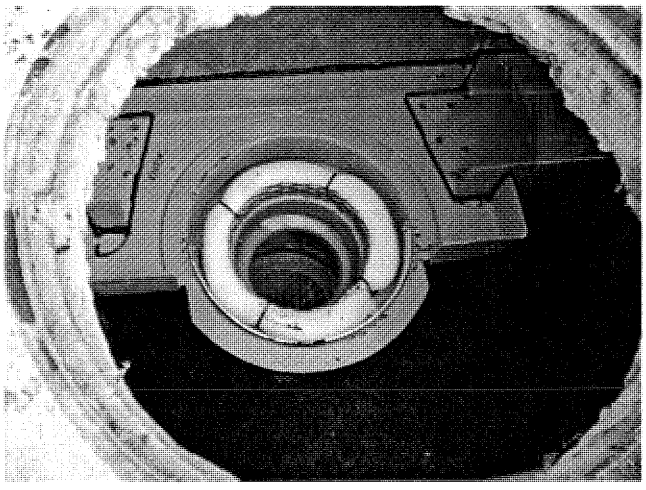
w/ Easy Maintenance Shelf System



Extreme Durability—
Constructed from:

- Heavy Duty UV Protected Marine Grade Fiberglass
- High Grade Stainless Steel Hardware and Screens

5 Year
Unlimited Warranty on Construction



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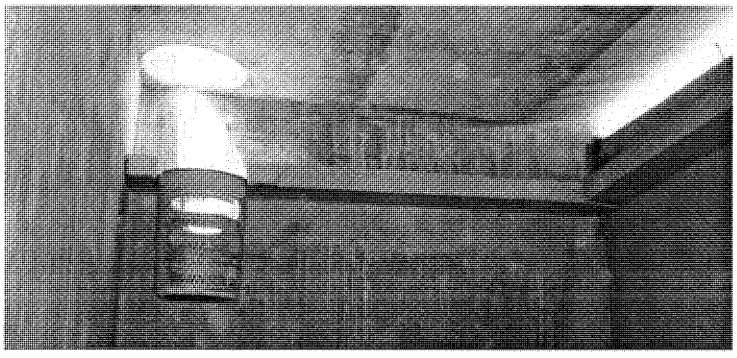

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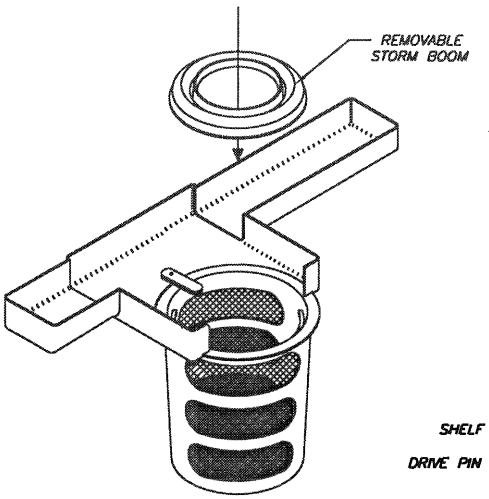
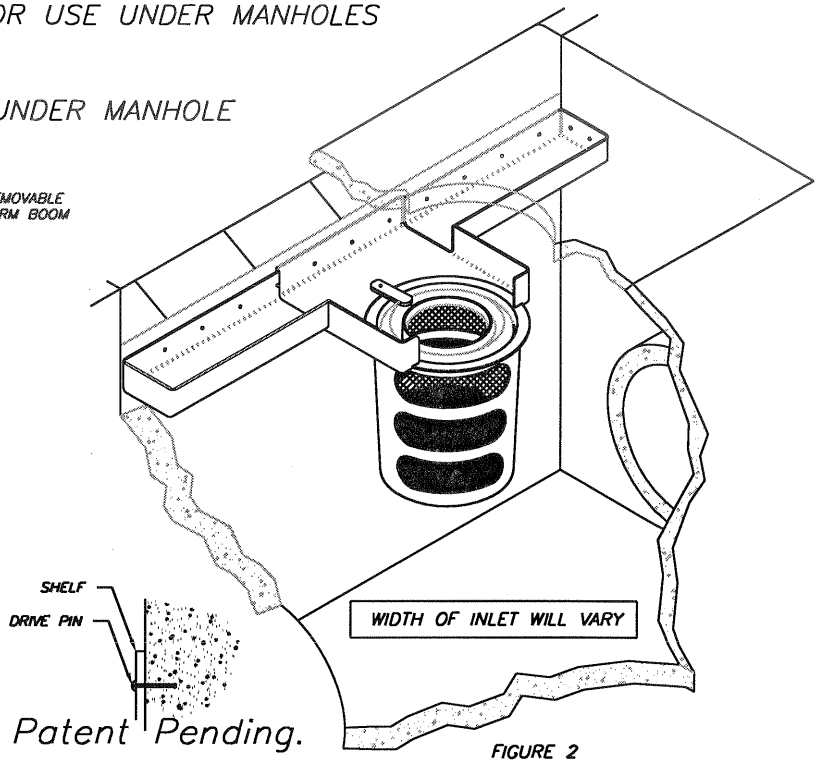
ENVIRO-SAFE HIGH CAPACITY ROUND GRATE INLET SKIMMER BOX SYSTEM FOR USE UNDER MANHOLES

ROUND GISB FOR MOUNTING UNDER MANHOLE



DETAIL OF PARTS
FIGURE 1



Patent Pending.

FIGURE 2
DETAIL OF INSTALLATION

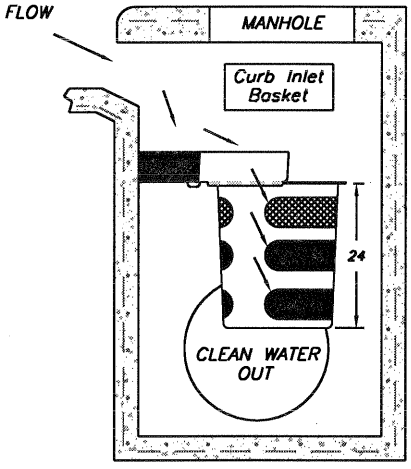


FIGURE 3
DETAIL OF PROCESS

FLOW RATES per Basket				
$Q=SO*c_d*A\sqrt{2*g*h}$		c_d = Coefficient of Discharge = .67		
	SO	$A(ft^2)$	h (ft)	$Q\ (\frac{ft^3}{s})$
TOP SIDE	1	135.22	5.50	3.42
CENTER SIDE	.62	130.36	11.5	2.95
BOTTOM SIDE	.56	125.50	17.50	3.17
BOTTOM	.68	63.14	20.81	2.11
TOTAL				11.65

NOTES:

1. SHELF SYSTEM PROVIDES FOR ENTIRE COVERAGE OF INLET OPENING SO TO DIVERT ALL FLOW TO BASKET.
2. SHELF SYSTEM MANUFACTURED FROM MARINE GRADE FIBERGLASS,GEL COATED FOR UV PROTECTION.
3. SHELF SYSTEM ATTACHED TO THE CATCH BASIN WITH NON-CORROSIVE HARDWARE.
4. FILTRATION BASKET STRUCTURE MANUFACTURED OF MARINE GRADE FIBERGLASS,GEL COATED FOR UV PROTECTION.
5. FILTRATION BASKET FINE SCREEN AND COARSE CONTAINMENT SCREEN MANUFACTURED FROM STAINLESS STEEL.
6. FILTRATION BASKET HOLDS BOOM OF ABSORBENT MEDIA TO CAPTURE HYDROCARBONS. BOOM IS EASILY REPLACED WITHOUT REMOVING MOUNTING HARDWARE.
7. FILTRATION BASKET LOCATION IS DIRECTLY UNDER MANHOLE FOR EASY MAINTENANCE.

REMOVABLE BASKET CATCHES EVERYTHING AND MAY BE REMOVED THROUGH MANHOLE WITHOUT ENTRY.

5 YEAR MANUFACTURERS WARRANTY

PATENTED

ALL FILTER SCREENS ARE STAINLESS STEEL

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TEL. 321-637-7552 FAX 321-637-7554

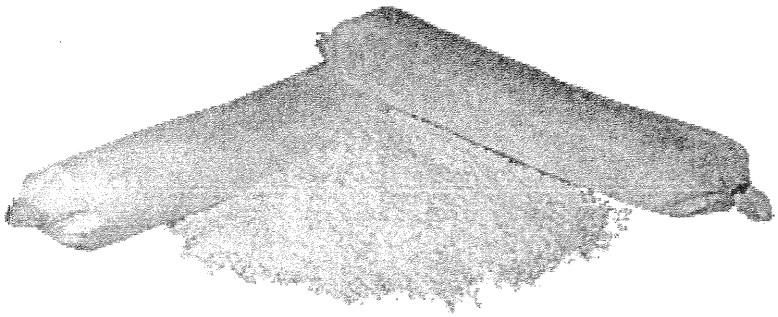
CURB INLET BASKET SYSTEM

DATE: 04/12/04 | SCALE:SF = 15

DRAFTER: N.R.B. | UNITS =INCHES

PROJECT:	
REVISIONS:	DATE:
REVISIONS:	DATE:
REVISIONS:	DATE:
REVISIONS:	DATE:
REVISIONS:	DATE:

Bio-Sorb



Oil Absorbing Polymers

Our Bio-Sorb oil absorbing polymers are uniquely formulated to clean up...

- Spills
- Chemical Spills
- Fuel Oil Spills
- Diesel Oil Spills

Control and absorb oil and hydrocarbons on any surface – including water

- Control oil spills and slicks in harbor and dock areas
- Control oil contamination in municipal run-off
- Remove oil contamination from plant process water
- Clean-up fuel spills on highways
- Absorb hydrocarbon vapors and fumes

	TIME (seconds)	% Uptake	C
0	0.00	0.0000	
1	30.0	104.00	
2	60.0	107.00	
3	120	128.00	
4	180	155.00	
5	240	164.00	
6	300	188.00	

How Are Bio-Sorb Oil Absorbing Polymers Unique?

Bio-Sorb oil absorbing polymers function by first attracting hydrocarbons to the surface of the polymer to adsorb the liquid, followed immediately by internally absorbing the media into its structure. Bio-Sorb oil absorbing polymers will not absorb water, which lends the material a unique usefulness for separating and collecting hydrocarbons from water mixtures. Most notably, the polymer can commonly absorb from 20% to 200% or more of its own weight of chemical or petroleum derived liquids. Furthermore, because of the unique absorption characteristic of the material, Bio-Sorb becomes dry to the touch shortly after sorption.

For What Applications May Biosorb Oil Absorbing Polymers be Useful?

Potential applications for Bio-Sorb hydrocarbon absorbing materials are numerous as a result of their unique nature. One can imagine applications for commercial, industrial, defense and ecological markets.

- Stormwater Filters
- Concentrate Carrier Material for Liquid Additives
- Removing Oil or Chemicals from Contaminated Water Streams or Water/Soil Slurries
- Industrial Work Area Collection Mats
- Spill Containment and Collection
- Odor Barrier/Collector for Flavor Oils and Fragrances
- Collection of Volatile Organic Compounds (VOC's)
- Many Others

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Grate Inlet Skimmer Box - Removal Efficiencies

Numeric Reductions (mg/L)

	Total Suspended Solids mg/L			Total Phosphorus mg/L			Total Nitrogen mg/L		
Location	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency
Site Evaluation - Reedy Creek			74%			57%	24.3	10.4	57%
Creech Engineering Report			73%			79%			79%
Witman's Pond	978	329	66%	18.6	0.452	98%	48.08	9.86	79%
UC Irvine			63%						

	Zinc mg/L			Lead mg/L			Copper mg/L		
Location	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency
UC Irvine			11%			99%			
Longo Toyota	13.7	0.73	95%	1.5	0.2	87%	1.9	0.1	95%

	Ammonia, Salicylate mg/L			Fecal Coliform CFU/100 mL			Cadmium		
Location	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency
Site Evaluation - Reedy Creek	0.38	0.23	39%						
UC Irvine						33%			94%

	Hydrocarbons mg/L			COD (mg/L)		
Location	Inlet	Outlet	Removal Efficiency	Inlet	Outlet	Removal Efficiency
Site Evaluation - Reedy Creek			54%	2670	1490	44%
Witman's Pond	110	50	55%			
UC Irvine			90%			
Longo Toyota	199	10.43	95%			

Reedy Creek - Site Evaluation of a Grate Inlet Skimmer Box for Debris, Sediment, and Oil & Grease Removal - 1999 - Independent Test
Creech Engineering Report - Pollutant Removal Testing for a Grate Inlet Skimmer Box - 2001
Witman's Pond - Restoration Project - Massachusetts Dept of Environmental Management - 1998 - Independent Test
UC Irvine - Optimization of Stormwater Filtration at the Urban/Watershed Interface - Dept of Environmental Health - 2005 - Independent Test
Longo Toyota - Field Test - City of El Monte - 2002 - Independent Test

POLLUTANT REMOVAL TESTING FOR A SUNTREE TECHNOLOGIES GRATE INLET SKIMMER BOX

Prepared for

Suntree Technologies, Inc.

November 2001

CEI Project #21121.00

Prepared By:

11-13-01

CREECH ENGINEERS, INC.
CIVILIZATION ENGINEERED

4450 W. Eau Gallie Blvd., Ste. 232
Melbourne, FL 32934
(321) 255-5434

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Pollutant Removal Testing for a Suntree Technologies Grate Inlet Skimmer Box

by
Creech Engineers, Inc.

November 2001

With special thanks to Joanie Regan of the Cocoa Beach Stormwater Utility

Background:

Over the last several years, a number of BMPs have been developed to provide stormwater treatment by trapping pollutants and debris in inlets. Inlet trap BMPs are quasi source controls, being inexpensive, requiring no roadway construction or utility relocation, and keeping pollutants out of the water bodies, rather than trying to remove the pollutants from the water once it is contaminated. Suntree Technologies, of Cape Canaveral, Florida commissioned Creech Engineers, Inc. and Universal Engineering to perform testing on a Grate Inlet Skimmer Box (GISB) to determine its pollutant removal effectiveness for sediment and grass clippings. The testing was performed on September 26, 2001. Attached are photographs from the test and the accompanying report by Universal Engineering Sciences.

The GISB is designed to trap sediment, grass, leaves, organic debris, floating trash, and hydrocarbons as they enter a grated inlet, thereby preventing these pollutants from entering the stormdrain system where they would cause detrimental impacts on downstream waterbodies. The GISB is a 3/16" thick fiberglass device custom made to fit most types of grated inlets. The overflow capacity of the GISB is designed to be greater than the curb grate capacity, thereby insuring that there will be no loss of hydraulic capacity due to the device being inside the inlet. The bottom of the GISB is designed to be above any pipes entering or leaving the inlet so that flow through the inlet is not blocked.

Water flowing through the grate first encounters a hydrocarbon absorbing cellulose. This boom also serves to trap large debris between the boom and the body of the GISB. At the bottom of the trap are a series of stainless steel filter screens covering 3.5 inch wide cutouts in the fiberglass body. These screens trap debris while allowing water to pass through the bottom of the body and out to the storm drain system. The screens in the floor and first vertical row of the GISB are fine mesh. The second vertical row of screens are medium mesh and the highest row are coarse mesh. On the outside of the cutouts the screens are backed by stainless diamond plate to provide support to the screens since heavy loads of debris build up in the box. If the flow rate through the inlet exceeds the capacity of the filter screens there is another row of overflow holes cut out with no screens. These overflow holes allow water to pass through the GISB even if it becomes full of debris. The level of the holes is above the bottom of the top tray, enabling the tray to act as a skimmer to prevent floating trash from escaping through the overflow holes.

About halfway down the box is a diffuser plate to minimize resuspension of trapped sediment.

Inlet traps such as these are generally designed to capture hydrocarbons, sediment, and floating debris. There is generally a large build up of grass, leaves, and yard debris in the GISBs; which represent a source of nutrients, which do not enter the waterbodies. Royal and England, 1999, determined that leaves and grass leach most of their nutrients into the water within 24-72 hours after being submerged in water. GISBs are designed to keep captured debris in a dry state, off the bottom of the inlet, thus preventing phosphates and nitrates from leaching into the stormdrain system, where much more expensive BMPs would be required to remove the dissolved nutrients.

Methodology:

A test was designed to simulate a rainfall event and measure the ability of a GISB to remove sediment and grass leaves from a typical grated inlet at 600 South Brevard Ave., Cocoa Beach, Florida. Joanie Regan of the Cocoa Beach Stormwater Utility provided this location for the test, as well as a water truck to flush the curbs. Universal Engineering Sciences performed the testing, measurements, and sediment sampling. Creech Engineering, Inc. observed the testing.

The City has installed a number of these devices and Joanie indicated this location was typical of a normal installation. The grate, curb, and gutter around and upstream of the inlet were brushed and washed clean. A new, clean GISB was placed inside the inlet. A water truck with a pump discharged reuse water into the gutter upstream of the inlet at a rate of 500 gpm (1.1 cfs). Dry, green St. Augustine grass clippings from a yard that had been recently fertilized were slowly fed into the gutter and flushed into the inlet. It was observed that the cast iron grate trapped a significant amount of grass around the edges of the grate. The grate was removed for all tests to enable all of the grass and sediment to enter the box. After all of a measured sample of grass had been washed into the inlet, the grass was removed from the inlet, dried, and weighed. Samples of grass before and after the test were sent to PC&B Laboratories in Oviedo, Florida. Laboratory analysis was performed to determine the Total Phosphorus and TKN content of the grass.

Next, a sediment sample was washed through the GISB using the same methodology. Universal Engineering ran a sieve size analysis, using ASTM D 422 procedures, before and after the test. The sediment was classified as a poorly graded gravely sand. The sediment was removed from the GISB, dried, and weighed.

Results:

During both of the tests, all water leaving the GISB passed through the filter screens. The water levels in the box only rose a few inches, with no water passing through the overflow holes or coarse screens, even though the bottom screens were completely covered with grass or sediment. There was a small amount of grass and sediment that passed between the box and the concrete walls of the inlet because of the uneven edges of

the inlet. This situation is fairly common in most inlets due to loose tolerances in construction techniques.

In the grass test, 6.58 lbs. of grass were washed into the inlet and 5.22 lbs. were captured, resulting in 1.36 lbs. of grass passing through the GISB. This represents a removal efficiency of 79.3%. The pretest grass sample had a Total Phosphorus content of 950 mg/kg and a TKN content of 510 mg/kg. The grass sample removed from the GISB had a Total Phosphorus content of 2,270 mg/kg and TKN content of 905 mg/kg.

The sediment test was a little more complex. The initial results showed that of the 57.87 lbs. of sediment introduced to the GISB, 42.41 lbs. were captured, giving a total mass removal efficiency of 73.3%. Universal Engineering indicates that the Pretest sample had 10.7 % gravel, 88.0% sand, and 1.4% clay. The Post test sample had 25.9% gravel, 14.7% sand, and 1.7% clay. Gravel is considered to be particles No.4 and larger. Silt and clay is defined as particles passing the No. 200 sieve.

Table 1
Sediment Sieve Analysis

Sieve Size	3/8"	No. 4	No. 10	No. 40	No. 60	No. 100	No. 200
PreTest % Passing	94.3	89.3	81.8	64.8	50.3	25.5	1.4
Post Test % Passing	88.8	74.1	62.6	44.2	31.8	14.7	1.7
Difference	5.5	15.2	19.2	20.6	18.5	10.8	-0.3

Conclusions:

At the flow rate tested, the GISB removed 79.3% of the grass clippings washed into it. The ability of the GISB to remove grass during large flows when water passes through the bypass holes was not tested. In Florida, 90% of the storms are low rainfall events of 1" or less, resulting in low flows similar to the test conditions. This makes the GISB a very effective BMP for Low flow events. It is unknown how effectively the GISB works in large storm events.

By keeping grass and other trapped organic debris in a dry state, the nutrients in the debris do not leach out and become dissolved nitrates and phosphates. The GISB is a very effective BMP for preventing nutrients from organic debris from entering waterbodies. The significant increase in nutrient concentration after the test is probably attributed to the use of wastewater reuse water during the test. The grass matted several inches thick in the bottom of the box. This thick layer could have acted as a filter to remove nutrients from the water source.

At the flow rate of 1.1 cfs, the GISB had a sediment removal efficiency of 73.3%. As would be expected, most of the trapped sediment was gravel and sand, with little fine material collected. The GISB has sediment removal capabilities rivaling those found in many structural BMPs, at a fraction of the cost, and without disruptive construction.

Environmental Laboratories, Inc.

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02 DEC 2 PM 2:30

Client: CITY OF EL MONTE
PUBLIC WORKS/ENGINEERING DEPARTMENT
11333 Valley Boulevard
El Monte, CA 91731-3293

Report based on Analyses Results:

The city of El Monte provided ABN Environmental Laboratories, Inc. with four runoff samples which were collected from Longo Toyota. Only one sample was collected before filtration and three samples were collected after filtration. Three samples (after filtration) were collected on three separate dates. All four samples were tested for metals, oil & grease, and MBAS (soap)

Based on the analyses results, the following can be deduced:

The filtration is efficient in retaining the tested metals as well as oil & grease. However, filtration is unable to retain MBAS (soap) as indicated by the test results. This report is prepared based on limited runoff samples.

Respectfully submitted,

Fredrick Bet-Pera, Ph. D.
Laboratory Director

Jacob (Hacop) Nercessian
Technical Director

LAB TEST RESULTS-RUNOFF WATER SAMPLES
COLLECTED AT LONGO TOYOTA
BETWEEN 09/23/02 AND 11/07/02
(BIO CLEAN FILTERS)
TESTING BY ABN ENV. LABS., SOUTH EL MONTE, CA

No.	POLLUTANT	DETECTION LIMIT	TEST 1 NO FILTER	TEST 2 AFTER 1 WEEK W/FILTER	TEST 3 AFTER 3 WEEKS W/FILTER	TEST 4 AFTER 5 WEEKS W/FILTER
		mg/l	mg/l	mg/l	mg/l	mg/l
1	OIL & GREASE	2.70	199.00	< 2.7	20.00	8.60
2	SOAP	17.00	102.00	166.00	161.00	106.00
3	CHROMIUM	0.05	0.47	< 0.05	< 0.05	< 0.05
4	LEAD	0.10	1.50	0.40	< 0.10	< 0.10
5	COPPER	0.05	1.90	0.13	0.06	0.11
6	IRON	0.05	218.00	3.70	1.83	1.25
7	ALUMINUM	0.20	103.00	1.99	1.20	0.80
8	ZINC	0.10	13.70	1.10	0.84	0.76
9	NICKEL	0.10	0.79	0.30	< 0.10	0.15

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The Efficiency of Storm Drain Filters in Removing Pollutants from Urban Road Runoff

Phase 3 and Final Report

March 2004

Prepared for:
The City and County of Honolulu
Department of Environmental Services
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Honolulu, Hawaii 96813

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In consultation with
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Overall Summary and Performance Evaluation Matrix

As part of the overall study, four neighborhoods with different land use within urban Honolulu were evaluated with respect to the conditions of streets and roadways with emphasis on material that might enter the storm drain system during storm and/or "nuisance" runoff. The quantity and quality of RDS, the abundance of oil and grease on the pavement and of gross litter near and adjoining storm drain inlets/catch basins were determined through a series of surveys. Conditions on land adjoining the surveyed storm drain inlets as well as traffic density were also examined. Not surprisingly, it was found that the quality of RDS deteriorates from neighborhoods that are comprised primarily of single-family homes with yards (e.g., upper Manoa) through high-density multi-family areas (e.g., Makiki) to commercial/light industrial (e.g., Kakaako). On average RDS from Kakaako displayed the highest heavy metal concentrations. The abundance of RDS, however, does not seem to depend on land use, as RDS was found to be abundant near almost all the storm drain inlets examined throughout the four neighborhoods. This finding is consistent with observations by the C&CH Roads Division who, according to DES staff, state that street sweepers always come back full, regardless of how long it has been between episodes of street sweeping. Clearly street sweeping is a beneficial practice, as it removes RDS that is most readily transported into the storm drain system and can contribute to heavy metal pollution in sediments of receiving waters. Street sweeping also targets other materials such as vegetative debris that can also contribute to degraded water quality (i.e., high BOD) in receiving waters, not to mention potentially clog the storm drain system.

Vegetative debris was generally found to be more abundant in residential neighborhoods than in commercial/light industrial areas. Certain streets, however, are particularly prone to the accumulation of vegetative debris, largely as a function of the abundance of trees lining the particular city streets.

Abundances of gross litter and rubbish vary considerably within any given neighborhood. There does not seem to be a strong correlation between land use and the abundance of gross rubbish, although greater amounts of rubbish are often observed in the immediate proximity of small businesses, particularly fast-food establishments, "mini-marts" or convenience stores.

This study also researched the commercially available DII devices that can readily be retrofitted into existing catch basins. Many systems exist, although many challenges exist

including but not limited to costs (both initial and maintenance), the need for modifications to the catch basin, and size constraints, which limit the pool of devices that are potentially suitable for large-scale implementation. A variety of large systems that require specific construction were also identified but not deemed appropriate for this study. Four DII systems were subsequently selected from those deemed potentially suitable for large-scale retrofit installations and their performance was evaluated through short- and long-term field studies.

The performance of the four DII systems that were field-tested varied considerably. Each system has characteristics that provide advantages in terms of target pollutants. Each system also exhibits considerable differences in terms of initial costs of the DII installation as well as maintenance/servicing costs. The latter typically depend on replacement costs of filter media (e.g., Kristar, Bioclean, and Hydrocompliance systems) or entire devices (e.g., Abtech system) as well as the cost of manpower required for maintenance/servicing. Because there are about 21,000 catch basins within Honolulu, the overall efficiency of any given system in pollutant removal may not necessarily be the most important evaluation criterion. Additionally, of the 21,000 catch basins in Honolulu, possibly 30-50% are Type B catch basins. The Type B catch basins pose different challenges to DII installation as well as maintenance. Only the Bioclean and Kristar systems appear to be readily suitable for use in Type B catch basins.

Examination of total RDS and PAH removal data shows that the Hydrocompliance and Kristar systems performed best in the long term experiments; the Abtech and Bioclean systems, however, performed best for oil and grease. With respect to gross litter (rubbish), the size of the baskets or compartments of the DII largely dictates their efficacy. Therefore, the Bioclean and Kristar DII systems appeared better than either the Abtech or Hydrocompliance systems in this category. Finally, when including cost factors, the Bioclean and the Kristar DII systems appear to perform best in the long-term evaluations.

All the above factors must be considered before any final decision as to what system to utilize for BMP implementation can be made. With hopes of facilitating such a decision, a matrix was constructed to evaluate each system with the tested DII assigned a ranking in various categories. Ranking were then normalized to a value of 10. Because of the importance of fiscal constraints in any potential large-scale BMP implementation, the categories for initial cost and filter media (or device) replacement costs were scaled to 20. Similarly, because of personnel/costs constraints, the "service requirements" category was assigned a maximum score

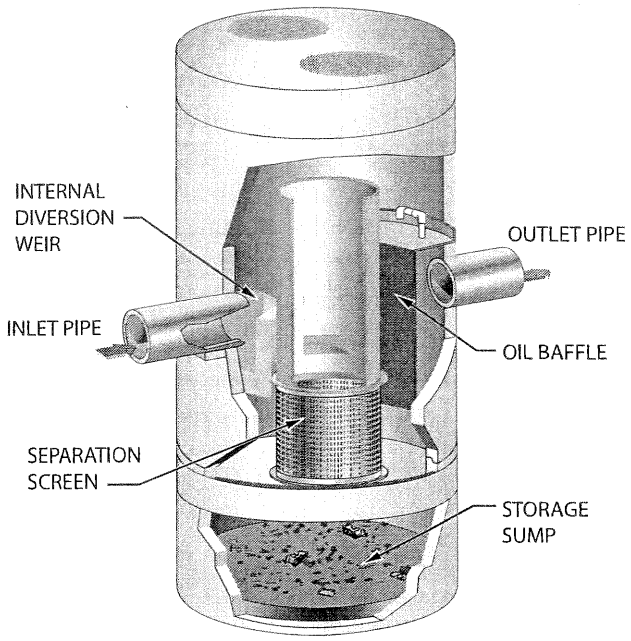
of 25 points. The maximum possible score for each DII system using the above matrix evaluation was 185 points. The matrix, which is somewhat subjective with respect to the importance placed on the various parameters, is provided below. Scores for the Bioclean (142) and Kristar (127.5) systems are relatively similar but substantially higher than those for the Abtech (110.5) and Hydrocompliance (91.5) systems.

Performance matrix for field tested DII systems				
Parameter	**AbTech**	**Hydrocompliance**	**KriStar**	**Bioclean**
Initial device cost (10 ft drain inlet)	10	5	15	20
Initial installation requirements	10	2.5	7.5	5
Flow capacity	5	10	2.5	7.5
Turbidity during short term test	5	10	7.5	2.5
Short term RDS retention	10	5	7.5	2.5
Short term organics retention	10	2.5	7.5	5
Long term RDS retention	2.5	10	7.5	5
Long term PAH retention (mg)	5	10	7.5	5
Long term O/G retained (mg)	10	5	2.5	7.5
Long term overall rubbish retention	5	5	10	10
Suitability for Vector Control	5	2.5	7.5	10
Unit durability	7.5	2.5	7.5	10
Media replacement Costs	5	10	15	20
Suitability for Type B basin	2.5	2.5	7.5	10
Servicing Requirements	18	9	15	22
TOTAL SCORE	**110.5**	**91.5**	**127.5**	**142**

Performance of DII is ranked from one to four, with increasing scores assigned to increasing performance of the device. Ranks for each category are scaled to 10 except initial costs and media replacement costs which are scaled to 20. Servicing requirements are based on a score of 25 as determined in Appendix A. Maximum total possible score is 185.

Patented continuous deflection separation (CDS) technology

Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Available precast or cast-in-place, offline units can treat flows from 1 to 300 cfs. Inline units can treat up to 6 cfs, and internally bypass flows in excess of 50 cfs. The pollutant removal capability of the CDS system has been proven in the lab and field.



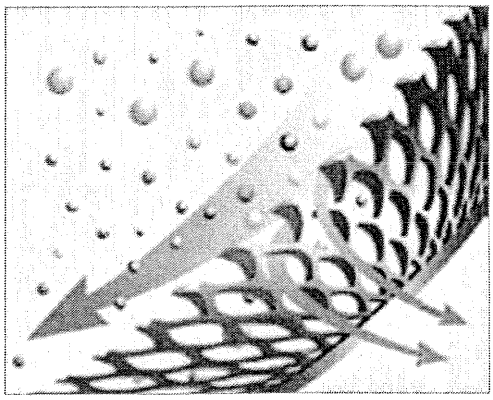
How does it work?

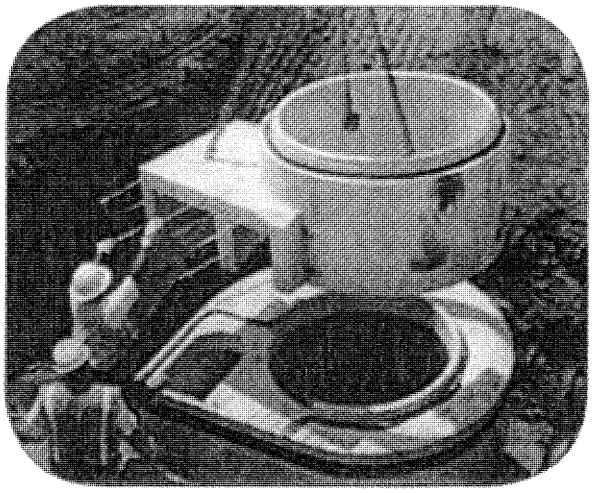
Stormwater enters the CDS unit's diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed. All flows up to the system's treatment design capacity enter the separation chamber.

Swirl concentration and screen deflection forces floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During flow events exceeding the design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants will not wash out.





CDS

- Removes sediment, trash, and free oil and grease
- Patented screening technology captures and retains 100% of floatables, including neutrally buoyant and all other material greater than the screen aperture
- Operation independent of flow
- Performance verified through lab and field testing
- Unobstructed maintenance access
- Customizable/flexible design and multiple configurations available
- Separates and confines pollutants from outlet flow
- Grate inlet available
- Multiple screen aperture sizes available

Available Models

Refer to the following tables for our standard models, sizes, and treatment capacities. Drawings and specifications are available at contechstormwater.com.

We encourage you to contact your local stormwater consultant for site-specific design assistance. In many cases our products can be customized to fit your particular project's needs.

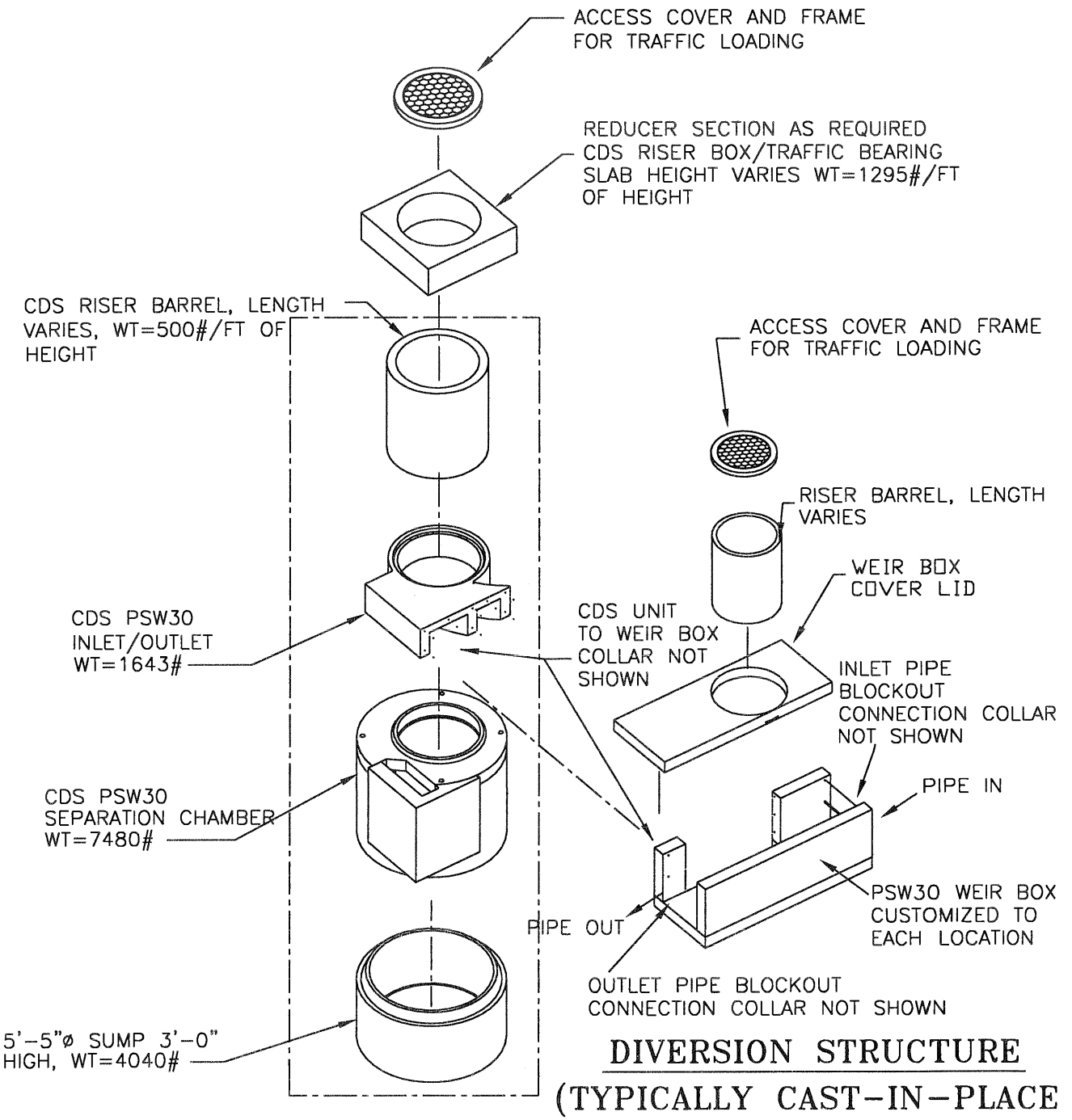
Local regulations may impact design requirements.

	CDS Model	Structure Diameter[1] ft	m	Typical Depth Below Invert ft	m	Water Quality Flow[2] 125 µm cfs	L/s	Screen Diameter/Height ft	m	Sump Storage yd³	m³
Inline	PMIU20_15	4	1.2	3.7	1.1	0.7	19.8	2.0/1.5	0.6/0.5	0.5	0.4
	PMIU20_15_4	4	1.2	3.5	1.1	0.7	19.8	2.0/1.5	0.6/0.5	0.5	0.4
	PMSU20_15	5	1.5	4.4	1.3	0.7	19.8	2.0/1.5	0.6/0.5	1.1	0.8
	PMSU20_20	5	1.5	5.0	1.5	1.1	31.1	2.0/2.0	0.6/0.6	1.1	0.8
	PMSU20_25	5	1.5	5.3	1.6	1.6	45.3	2.0/2.5	0.6/0.8	1.1	0.8
	PMSU30_20	6	1.8	5.5	1.7	2.0	56.6	3.0/2.0	0.9/0.6	2.1	1.6
	PMSU30_30	6	1.8	6.5	2.0	3.0	85.0	3.0/3.0	0.9/0.9	2.1	1.6
	PMSU40_30	8	2.4	7.8	2.4	4.5	127.4	4.0/3.0	1.2/0.9	5.6	4.3
	PMSU40_40	8	2.4	8.8	2.7	6.0	169.9	4.0/4.0	1.2/1.2	5.6	4.3
Offline	PSWC30_20	6	1.8	5.3	1.6	2.0	56.6	3.0/2.0	0.9/0.6	1.9	1.5
	PSW30_30	varies	varies	6.3	1.9	3.0	85.0	3.0/3.0	0.9/0.9	5.8	4.4
	PSWC30_30	6	1.8	6.3	1.9	3.0	85.0	3.0/3.0	0.9/0.9	2.1	1.6
	PSWC40_30	7	2.1	7.7	2.3	4.5	127.4	4.0/3.0	1.2/0.9	1.9	1.5
	PSWC40_40	7	2.1	8.8	2.7	6.0	169.9	4.0/4.0	1.2/1.2	1.9	1.5
	PSW50_42	varies	varies	8.8	2.7	9.0	254.9	5.0/4.2	1.5/1.3	1.9	1.5
	PSWC56_40	8	2.4	8.8	2.7	9.0	254.9	5.6/4.0	1.7/1.2	1.9	1.5
	PSW50_50	varies	varies	9.5	2.9	11.0	311.5	5.0/5.0	1.5/1.5	1.9	1.5
	PSWC56_53	8	2.4	10.1	3.1	14.0	396.4	5.6/5.3	1.7/1.6	1.9	1.5
	PSWC56_68	8	2.4	11.8	3.6	19.0	538.0	5.6/6.8	1.7/2.1	1.9	1.5
	PSWC56_78	8	2.4	12.8	3.9	25.0	707.9	5.6/7.8	1.7/2.4	1.9	1.5
	PSW70_70	varies	varies	13.0	4.0	26.0	736.2	7.0/7.0	2.1/2.1	3.9	3.0
	PSW100_60	varies	varies	11.0	3.4	30.0	849.5	10.0/6.0	3.0/1.8	6.9	5.3
	PSW100_80	varies	varies	13.0	4.0	50.0	1415.8	10.0/8.0	3.0/2.4	6.9	5.3
	PSW100_100	varies	varies	15.0	4.6	64.0	1812.3	10.0/10.0	3.0/3.0	6.9	5.3

1. Structure diameter represents the standard inside dimension of the concrete structure. Offline systems will require additional concrete diversion components.
2. Water Quality Flow is based on 80% removal of a particle size distribution with an average particle size of 125 microns. This flow also represents the maximum flow prior to which bypass occurs. Test results are based on use of a 2400 micron screen.

Cast-in-place system are available to treat higher flows. Check with your local representatives for specifications.

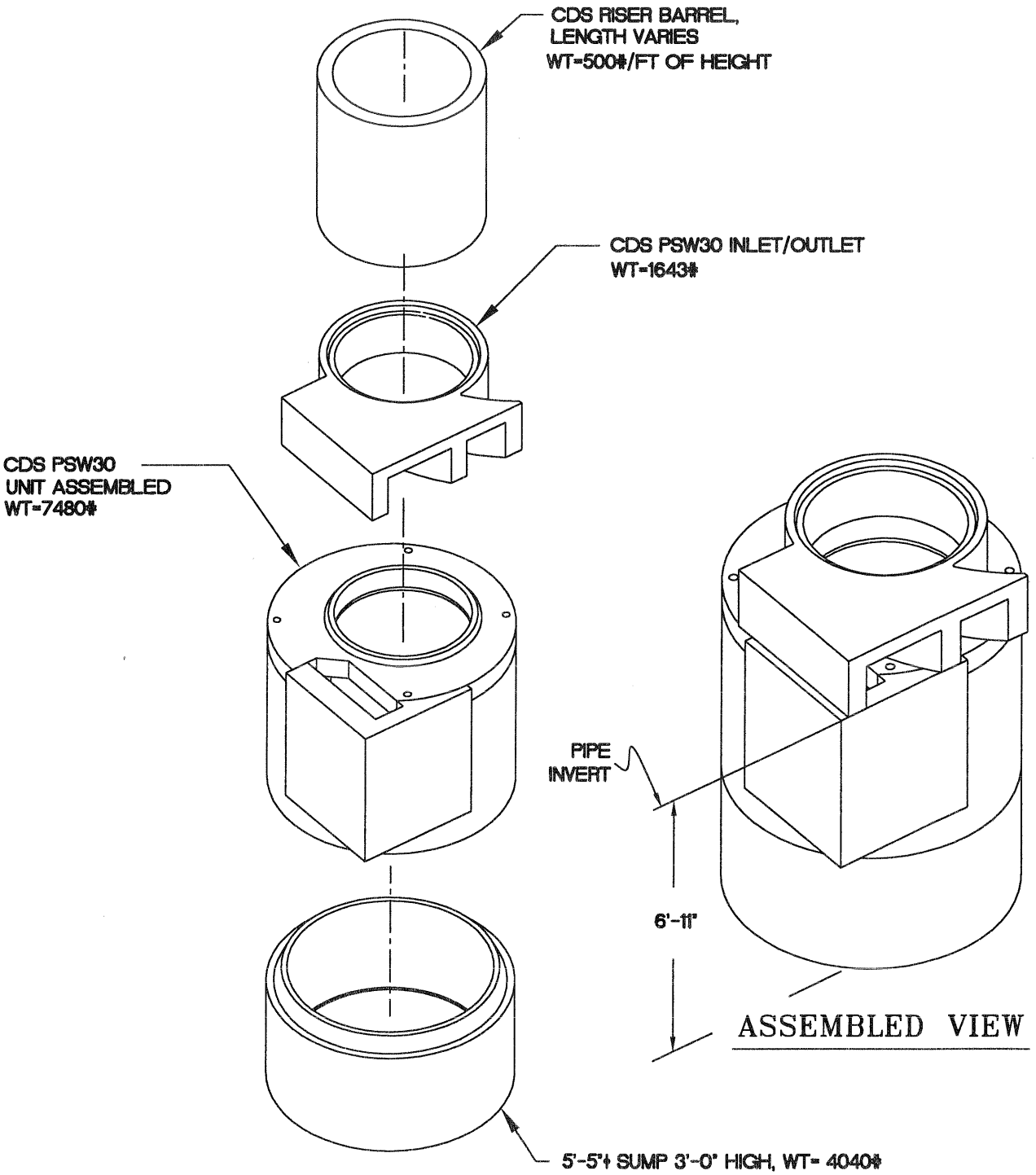
Notes:
- Systems can be sized based on a water quality flow (e.g. 1 inch storm) or on a net annual basis depending on the local regulatory requirement.
- When sizing based on a water quality storm, the required flow to be treated should be equal to or less than the listed water quality flow for the selected system. Systems sized based on a water quality storm are generally more conservatively sized.
- Additional particle size distributions are available for sizing purposes upon request.
- Depth below invert is measured to the inside bottom of the system. This depth can be adjusted to meet specific storage or maintenance requirements.
- Contact our support staff for the most cost effective sizing for your area.



DIVERSION STRUCTURE
(TYPICALLY CAST-IN-PLACE IN SOUTHERN CALIFORNIA)

PSW30_30 ASSEMBLY

CDS TECHNOLOGIES PATENTED	CDS PSW30 ASSEMBLY AND DIVERSION STRUCTURE	DATE 01/23/02	SCALE N.T.S.
		DRAWN W.H.S.	SHEET 1
		APPROV. R. HOWARD	



EXPLODED VIEW

ASSEMBLED VIEW

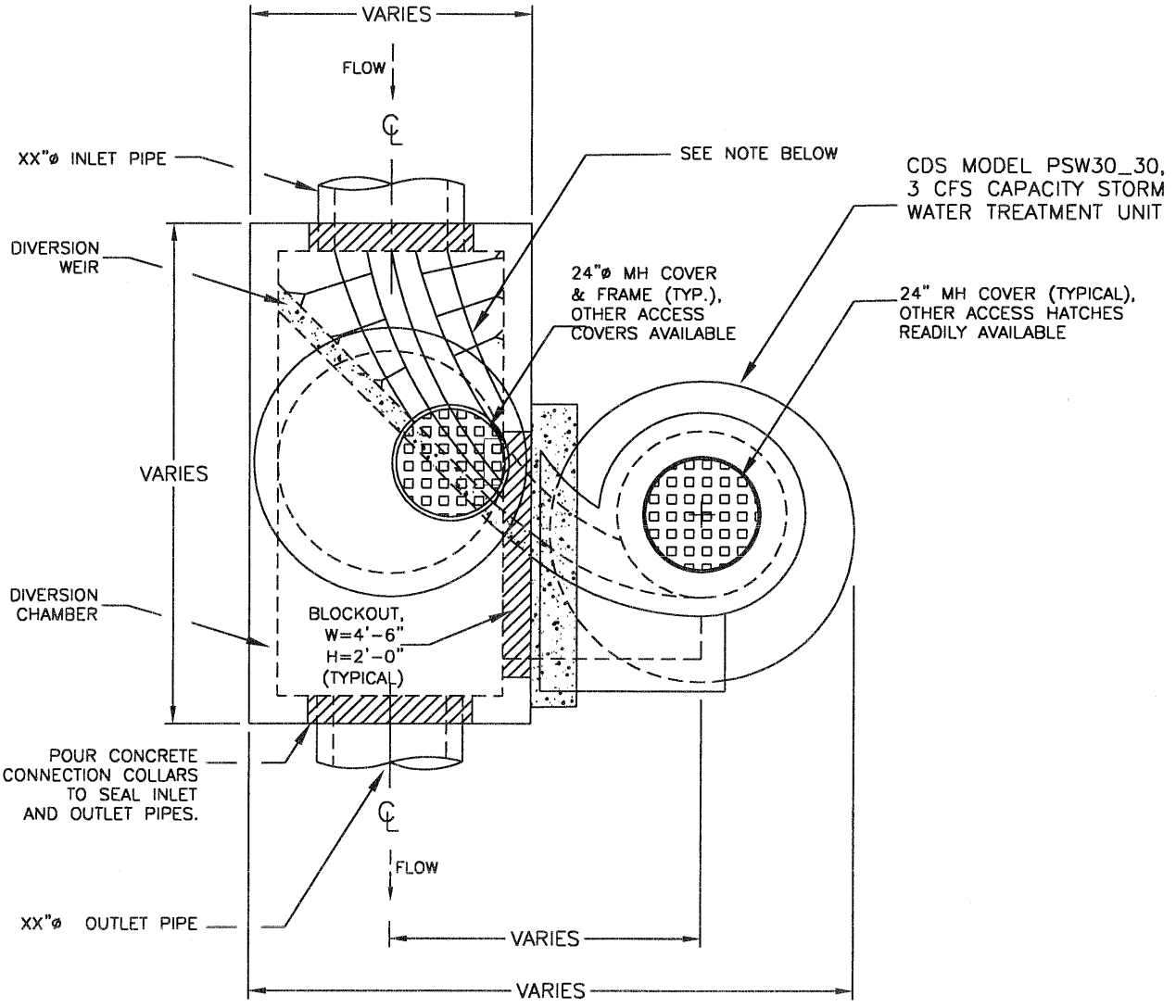
DIVERSION CHAMBER NOT SHOWN

CDS™ TECHNOLOGIES
PATENTED

CDS PSW30

DATE 01/23/02		SCALE N.T.S.
DRAWN W.H.S.		SHEET 2
APPROV. R. HOWARD		

GENERIC / TYPICAL INSTALLATION
LEFT HANDED CONFIGURATION SHOWN HERE



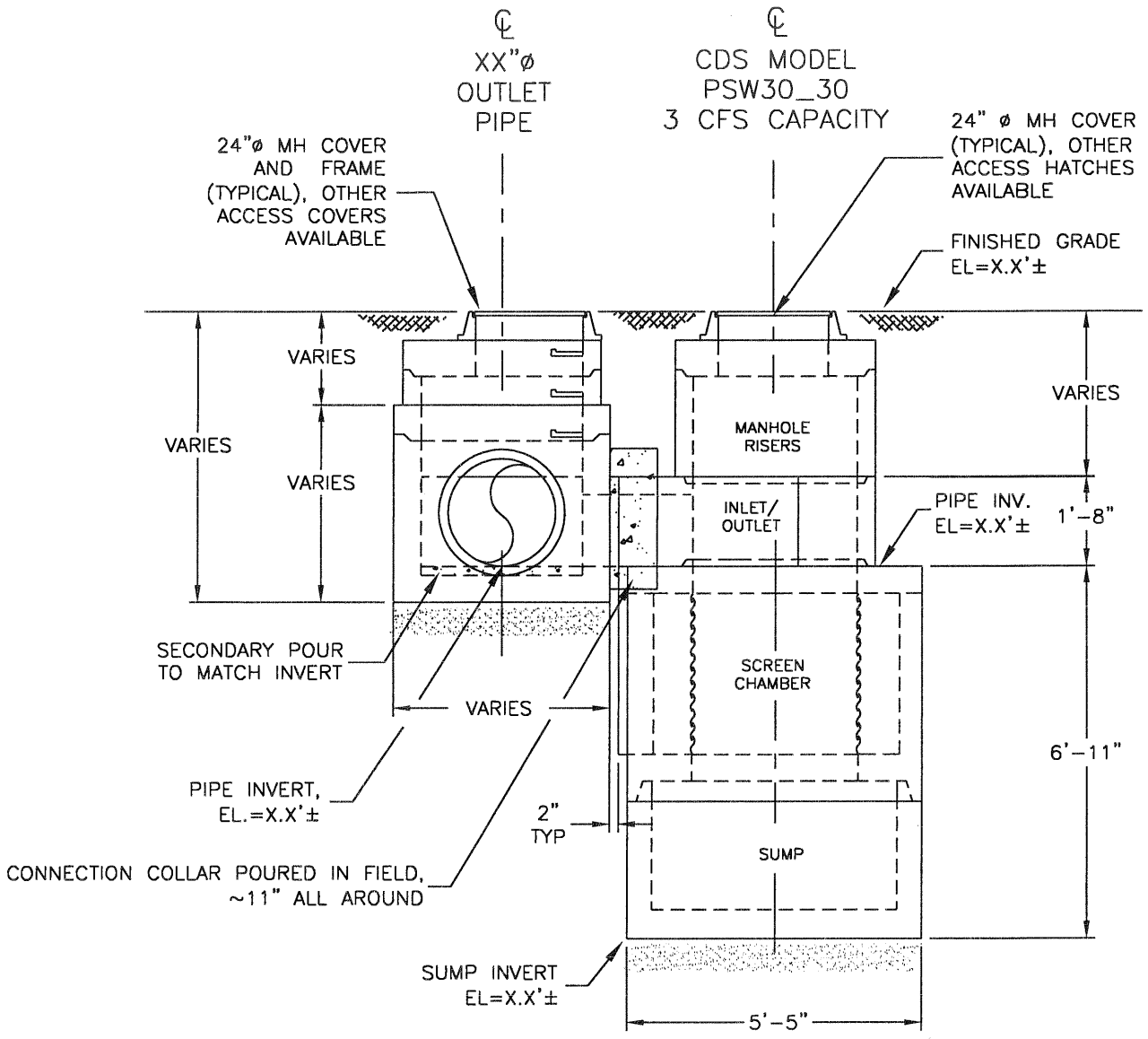
PLAN VIEW
CDS MODEL PSW30_30
3 CFS CAPACITY
STORM WATER TREATMENT UNIT

NOTE(S):

CREATE SMOOTH SWALE TRANSITION THRU DIVERSION BOX W/ SECONDARY CONCRETE POUR IN FIELD.

CDS TECHNOLOGIES PATENTED	PROJECT/ DEVELOPMENT NAME CITY & STATE	DATE 01/23/02	SCALE 1"=3'
		DRAWN J.S.F.	SHEET 3
		APPROV.	

GENERIC / TYPICAL INSTALLATION
LEFT HANDED CONFIGURATION SHOWN HERE



ELEVATION VIEW
CDS MODEL PSW30_30
3 CFS CAPACITY
STORM WATER TREATMENT UNIT

CDS™ TECHNOLOGIES PATENTED	PROJECT/ DEVELOPMENT NAME CITY & STATE	DATE 1/23/02 DRAWN J.S.F. APPROV.	SCALE 1"=3' SHEET 4

OPERATIONS AND MAINTENANCE GUIDELINES

CDS Stormwater Treatment Unit

INTRODUCTION

The CDS unit is an important and effective component of your storm water management program and proper operation and maintenance of the unit are essential to demonstrate your compliance with local, state and federal water pollution control requirements.

The CDS technology features a patented non-blocking, indirect screening technique developed in Australia to treat water runoff. The unit is highly effective in the capture of suspended solids, fine sands and larger particles. Because of its non-blocking screening capacity, the CDS unit is un-matched in its ability to capture and retain gross pollutants such as trash and debris. In short, CDS units capture a very wide range of organic and in-organic solids and pollutants that typically result in tons of captured solids each year such as: Total suspended solids (TSS) and other sedimentitious materials, oil and greases, trash, and other debris (including floatables, neutrally buoyant, and negatively buoyant debris). These pollutants will be captured even under very high flow rate conditions.

CDS units are equipped with conventional oil baffles to capture and retain oil and grease. Laboratory evaluations show that the CDS units are capable of capturing up to 70% of the free oil and grease from storm water. CDS units can also accommodate the addition of oil sorbents within their separation chambers. The addition of the oil sorbents can ensure the permanent removal of 80% to 90% of the free oil and grease from the storm water runoff.

OPERATIONS

The CDS unit is a non-mechanical self-operating system and will function any time there is flow in the storm drainage system. The unit will continue to effectively capture pollutants in flows up to the design capacity even during extreme rainfall events when the design capacity may be exceeded. Pollutants captured in the CDS unit's separation chamber and sump will be retained even when the units design capacity is exceeded.

CDS UNIT INSPECTION

Access to the CDS unit is typically achieved through two manhole access covers – one allows inspection (and cleanout) of the separation chamber (screen/cylinder) & sump and another allows inspection (and cleanout) of sediment captured and retained behind the screen.

The unit should be periodically inspected to determine the amount of accumulated pollutants and to ensure that the cleanout frequency is adequate to handle the predicted pollutant load being processed by the CDS unit. The unit should be periodically inspected for indications of vector infestation, as well. The recommended cleanout of

solids within the CDS unit's sump should occur at 75% to 85% of the sump capacity. However, the sump may be completely full with no impact to the CDS unit's performance.

CONTECH Stormwater Solutions (previously CDS Technologies) recommends the following inspection guidelines: For new initial operation, check the condition of the unit after every runoff event for the first 30 days. For ongoing operations, the unit should be inspected after the first six inches of rainfall at the beginning of the rainfall season and at approximately 30-day intervals. The visual inspection should ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen), evidence of vector infestation, and to measure the amount of solid materials that have accumulated in the sump, fine sediment accumulated behind the screen, and floating trash and debris in the separation chamber. This can be done with a calibrated dipstick, tape measure or other measuring instrument so that the depth of deposition in the sump can be tracked.

CDS UNIT CLEANOUT

The frequency of cleaning the CDS unit will depend upon the generation of trash and debris and sediments in your application. Cleanout and preventive maintenance schedules will be determined based on operating experience unless precise pollutant loadings have been determined.

Access to the CDS unit is typically achieved through two manhole access covers – one allows cleanout of the separation chamber (screen/cylinder) & sump and another allows cleanout of sediment captured and retained behind the screen. For units possessing a sizable depth below grade (depth to pipe), a single manhole access point would allow both sump cleanout and access behind the screen.

CONTECH Stormwater Solutions Recommends The Following:

NEW INSTALLATIONS: Check the condition of the unit after every runoff event for the first 30 days. The visual inspection should ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen), measuring the amount of solid materials that have accumulated in the sump, the amount of fine sediment accumulated behind the screen, and determining the amount of floating trash and debris in the separation chamber. This can be done with a calibrated "dip stick" so that the depth of deposition can be tracked. Refer to the "Cleanout Schematic" **(Appendix B)** for allowable deposition depths and critical distances. Schedules for inspections and cleanout should be based on storm events and pollutant accumulation.

ONGOING OPERATION: During the rainfall season, the unit should be inspected at least once every 30 days. The floatables should be removed and the sump cleaned when the sump is 75-85% full. If floatables accumulate more rapidly than the settleable solids, the floatables should be removed using a vactor truck or dip net before the layer thickness exceeds approximately one foot.

Cleanout of the CDS unit at the end of a rainfall season is recommended because of the nature of pollutants collected and the potential for odor generation

from the decomposition of material collected and retained. This end of season cleanout will assist in preventing the discharge of pore water from the CDS® unit during summer months.

USE OF SORBENTS –The addition of sorbents is **not a requirement** for CDS units to effectively control oil and grease from storm water. The conventional oil baffle within a unit assures satisfactory oil and grease removal. However, the addition of sorbents is a unique enhancement capability unique to CDS units, enabling increased oil and grease capture efficiencies beyond that obtainable by conventional oil baffle systems.

Under normal operations, CDS units will provide effluent concentrations of oil and grease that are less than 15 parts per million (ppm) for all dry weather spills where the volume is less than or equal to the spill capture volume of the CDS unit. During wet weather flows, the oil baffle system can be expected to remove between 40 and 70% of the free oil and grease from the storm water runoff.

CONTECH Stormwater Solutions only recommends the addition of sorbents to the separation chamber if there are specific land use activities in the catchment watershed that could produce exceptionally large concentrations of oil and grease in the runoff, concentration levels well above typical amounts. If site evaluations merit an increased control of free oil and grease then oil sorbents can be added to the CDS unit to thoroughly address these particular pollutants of concern.

Recommended Oil Sorbents

Rubberizer® Particulate 8-4 mesh or OARS™ Particulate for Filtration, HPT4100 or equal. Rubberizer® is supplied by Haz-Mat Response Technologies, Inc. 4626 Santa Fe Street, San Diego, CA 92109 (800) 542-3036. OARS™ is supplied by AbTech Industries, 4110 N. Scottsdale Road, Suite 235, Scottsdale, AZ 85251 (800) 545-8999.

The amount of sorbent to be added to the CDS separation chamber can be determined if sufficient information is known about the concentration of oil and grease in the runoff. Frequently the actual concentrations of oil and grease are too variable and the amount to be added and frequency of cleaning will be determined by periodic observation of the sorbent. As an initial application, CDS recommends that approximately 4 to 8 pounds of sorbent material be added to the separation chamber of the CDS units per acre of parking lot or road surface per year. Typically this amount of sorbent results in a ½ inch to one (1") inch depth of sorbent material on the liquid surface of the separation chamber. The oil and grease loading of the sorbent material should be observed after major storm events. Oil Sorbent material may also be furnished in pillow or boom configurations.

The sorbent material should be replaced when it is fully discolored by skimming the sorbent from the surface. The sorbent may require disposal as a special or hazardous waste, but will depend on local and state regulatory requirements.

CLEANOUT AND DISPOSAL

A vactor truck is recommended for cleanout of the CDS unit and can be easily accomplished in less than 30-40 minutes for most installations. Standard vactor operations should be employed in the cleanout of the CDS unit. Disposal of material from the CDS unit should be in accordance with the local municipality's requirements. Disposal of the decant material to a POTW is recommended. Field decanting to the storm drainage system is not recommended. Solids can be disposed of in a similar fashion as those materials collected from street sweeping operations and catch-basin cleanouts.

MAINTENANCE

The CDS unit should be pumped down at least once a year and a thorough inspection of the separation chamber (inlet/cylinder and separation screen) and oil baffle performed. The unit's internal components should not show any signs of damage or any loosening of the bolts used to fasten the various components to the manhole structure and to each other. Ideally, the screen should be power washed for the inspection. If any of the internal components is damaged or if any fasteners appear to be damaged or missing, please contact CONTECH Stormwater Solutions to make arrangements to have the damaged items repaired or replaced:

CONTECH Stormwater Solutions
16360 Monterey Road, Suite 250
Morgan Hill, CA 95037-5406

Phone, Toll Free: (888) 535-7559
Fax: (408) 782-0721

The screen assembly is fabricated from Type 316 stainless steel and fastened with Type 316 stainless steel fasteners that are easily removed and/or replaced with conventional hand tools. The damaged screen assembly should be replaced with the new screen assembly placed in the same orientation as the one that was removed.

CONFINED SPACE

The CDS unit is a confined space environment and only properly trained personnel possessing the necessary safety equipment should enter the unit to perform particular maintenance and/or inspection activities beyond normal procedure. Inspections of the internal components can, in most cases, be accomplished by observations from the ground surface.

VECTOR CONTROL

Most CDS units do not readily facilitate vector infestation. However, for CDS units that may experience extended periods of non-operation (stagnant flow conditions for more than approximately one week) there may be the potential for vector infestation. In the event that these conditions exist, the CDS unit may be designed to minimize potential vector habitation through the use of physical barriers (such as seals, plugs and/or netting) to seal out potential vectors. The CDS unit may also be configured to allow drain-down under favorable soil conditions where infiltration of storm water runoff is permissible. For standard CDS units that show evidence of mosquito infestation, the

application of larvicide is one control strategy that is recommended. Typical larvicide applications are as follows:

SOLID B.t.i. LARVICIDE: ½ to 1 briquet (typically treats 50-100 sq. ft.) one time per month (30-days) or as directed by manufacturer.

SOLID METHOPRENE LARVICIDE (not recommended for some locations): ½ to 1 briquet (typically treats 50-100 sq. ft.) one time per month (30-days) to once every 4-½ to 5-months (150-days) or as directed by manufacturer.

RECORDS OF OPERATION AND MAINTENANCE

CONTECH Stormwater Solutions recommends that the owner maintain annual records of the operation and maintenance of the CDS unit to document the effective maintenance of this important component of your storm water management program. The attached **Annual Record of Operations and Maintenance** form (see **Appendix A**) is suggested and should be retained for a minimum period of three years.

APPENDIX A

ANNUAL RECORDS OF OPERATIONS & MAINTENANCE AND INSPECTION CHECKLISTS

ANNUAL RECORD OF
OPERATION AND MAINTENANCE

OWNER _____
ADDRESS _____
OWNER REPRESENTATIVE _____ **PHONE** _____

INSTALLATION:
MODEL DESIGNATION _____ DATE _____
SITE LOCATION _____

INSPECTIONS:

DATE/ INSPECTOR	SCREEN/INLET INTEGRITY	FLOATABLES DEPTH	DEPTH TO SEDIMENT (inches)	SEDIMENT VOLUME* (CUYDS)	SORBENT DISCOLORATION

DEPTH FROM COVER TO BOTTOM OF SUMP (SUMP INVERT) _____

DEPTH FROM COVER TO SUMP @ 75% FULL _____

VOLUME OF SUMP @ 75% FULL = _____ CUYD

VOLUME/INCH DEPTH _____ CUFT/IN OF SUMP

VOLUME/FOOT DEPTH _____ CUYD/FT OF SUMP

***Calculate Sediment Volume = (Depth to Sump Invert – Depth to Sediment)*(Volume/inch)**

OBSERVATIONS OF FUNCTION: _____
_____
_____

CLEANOUT:

DATE	VOLUME FLOATABLES	VOLUME SEDIMENTS	METHOD OF DISPOSAL OF FLOATABLES, SEDIMENTS, DECANT AND SORBENTS

OBSERVATIONS:
_____
_____
_____
_____

SCREEN MAINTENANCE:
DATE OF POWER WASHING, INSPECTION AND OBSERVATIONS:
_____
_____

CERTIFICATION: _____ **TITLE:** _____ **DATE:** _____

INSPECTION CHECKLIST

1. During the rainfall season, inspect and check condition of unit at east once every 30 days ☐
2. Ascertain that the unit is functioning properly (no blockages or obstructions to inlet and/or separation screen) ☐
3. Measure amount of solid materials that have accumulated in the sump (Unit should be cleaned when the sump is 75-85% full) ☐
4. Measure amount of fine sediment accumulated behind the screen ☐
5. Measure amount of floating trash and debris in the separation chamber ☐

MAINTENANCE CHECKLIST

1. Cleanout unit at the end and beginning of the rainfall season ☐
2. Pump down unit (at least once a year) and thoroughly inspect separation chamber, separation screen and oil baffle ☐
3. No visible signs of damage or loosening of bolts to internal components observed * ☐

*** If there is any damage to the internal components or any fasteners are damaged or missing please contact CONTECH Stormwater Solutions (888 535-7559).**

ATTACHMENT E

Geotechnical Certification Sheet

The design of stormwater treatment and other control measures proposed in this plan requiring specific soil infiltration characteristics and/or geological conditions has been reviewed and approved by a registered Civil Engineer, Geotechnical Engineer, or Geologist in the State of California.

_____ _____

Name Date

N/A – no infiltration BMPs proposed. See letter from Geocon Inc. that follows.

Project No. 07149-22-01A
May 15, 2009

The Judd Company
500 Stevens Avenue, Suite 208
Solana Beach, California 92075

Attention: Mr. Judd Halenza

Subject: OTAY CROSSING COMMERCIAL PARK
(310-ACRE PROPERTY)
SAN DIEGO COUNTY, CALIFORNIA
TRANSMITTAL

Dear Mr. Halenza:

In accordance with the request of Mr. Brian Hill with Stevens Cresto Engineering Incorporated, we have provided additional geotechnical engineering services on the subject project. The purpose of our work was to prepare this transmittal letter regarding our opinion for *Geotechnical Input for Hydromodification Management Studies* as requested by the County of San Diego with the outline indicated below.

- **Description of site soils.** Topsoils consist of clayey sand and sandy clay. The natural formational soils at the site consist of silty sand, sandy silt, silty clay, and sandy clay.

- **Discussion of the feasibility of infiltration of the site.** The soils at the site have a considerable clay and silt content and exhibit low permeability and low infiltration properties. Therefore, in our opinion, the feasibility of infiltration at the site is very low.

- **Recommendations of areas where on-site infiltration may be feasible, considering expected depth to groundwater, potential for lateral migration, and proximity of existing and proposed slopes, structures, roadways, walls, or other sensitive features.** Permanent groundwater level is expected to be greater than 100 feet. However, the site is not feasible for infiltration due to the low infiltration characteristics of *in situ* soils. In addition, there is a potential for lateral migration to proposed industrial developments and future roadways. Lateral migration of water could result in seepage on proposed cut slopes. Wetting of proposed fill slopes could create slope stability issues.

- **Preliminary infiltration rates for areas where on-site infiltration may be feasible.** Based on our experience in the area with similar soils conditions and the Soil Conservation Service *SCS Engineering Field Handbook,* Chapter 2, which has an infiltration rate of 0.05 to 0.15 inches/hour, we are of the opinion that *in situ* soils are similar to the Group C.

If you have any questions regarding this transmittal letter, please contact the undersigned.

Very truly yours,

GEOCON INCORPORATED

Raul R. Garcia
RCE 42132

RRG:dmc

(1) Addressee
(2) Stevens Cresto Engineering Inc.
Attention: Mr. Brian Hill

ATTACHMENT F

Maintenance Plan

(Use Chapter 5 of the SUSMP as guidance in developing your Maintenance Plan)

Otay Crossings Commerce Park proposes to construct public roads and rough graded pads. The rough graded pads will be stabilized for erosion control, and each pad will contain at least one desiltation basin to remove silt and sediments from project runoff prior to it entering the storm drain system. The desiltations basins will be maintained per Category 2 maintenance criteria until the pads are developed and the desiltation basins are replaced by permanent BMPs. A Storm Water Maintenance Agreement with Easements and Covenants will be entered into by the owner and the County of San Diego, obliging the owner to maintain the facilities into perpetuity. Resposibility for maintenance of the facilities will transfer with ownership of the lots.

TC-BMPs constructed within the public right-of-way (curb inlet filters, hydrodynamic separators, and extended detention basins) will ultimately be maintained per Category 3 and 4 maintenance criteria. The County of San Diego will assume responsibility for maintenance of the curb inlet filters and hydrodynamic separators, and a Storm Water Maintenance Assessment District will be established to maintain the extended detention basins. The public entities may not be able to assume maintenance responsibility immediately following completion of construction, however, and the project owner may be require to assume maintenance responsibility for an interim period.

Specifics regarding maintenance requirements and maintenance responsibility will be detailed in Maintenance Plans that will be generated during final engineering of each project unit. The project will be developed in up to 5 unit and, as such, the specific BMPs proposed to be constructed in each Unit will be identified and discussed in detail in each Maintenance Plan generated for the project. General maintenance guidelines are included within this section and may be used for reference in developing the Maintenance Plans.

<u>The following is a general outline for to create your project specific Maintenance Plan.</u>

I. Inspection, Maintenance Log and Self-Verification Forms (Examples are provided in Appendix F of the San Diego County SUSMP)

II. Updates, Revisions and Errata

III. Introduction

   A. Narrative overview describing the site; drainage areas, routing, and discharge points; and treatment facilities.

IV. Responsibility for Maintenance

A. General

(1) Name and contact information for responsible individual(s).

(2) Organization chart or charts showing organization of the maintenance function and location within the overall organization.

(3) Reference to Operation and Maintenance Agreement (if any). A copy of the agreement should be attached.

(4) Maintenance Funding

(1) Sources of funds for maintenance

(2) Budget category or line item

(3) Description of procedure and process for ensuring adequate funding for maintenance

B. Staff Training Program

C. Records

D. Safety

V. Summary of Drainage Areas and Stormwater Facilities

A. Drainage Areas

(1) Drawings showing pervious and impervious areas (copied or adapted from initial SWMP).

(2) Designation and description of each drainage area and how flow is routed to the corresponding facility.

B. Treatment and Flow-Control Facilities

(1) Drawings showing location and type of each facility

(2) General description of each facility (Consider a table if more than two facilities)

(1) Area drained and routing of discharge.

(2) Facility type and size

VI. Facility Documentation

A. "As-built" drawings of each facility (design drawings in the draft Plan)

B. Manufacturer's data, manuals, and maintenance requirements for pumps, mechanical or electrical equipment, and proprietary facilities (include a "placeholder" in the draft plan for information not yet available).

C. Specific operation and maintenance concerns and troubleshooting

VII. Maintenance Schedule or Matrix

A. Maintenance Schedule for each facility with specific requirements for:

(1) Routine inspection and maintenance

(2) Annual inspection and maintenance

(3) Inspection and maintenance after major storms

B. Service Agreement Information

Assemble and make copies of your maintenance plan. One copy must be submitted to the County, and at least one copy kept on-site. Here are some suggestions for formatting the maintenance plan:

- Format plans to 8½" x 11" to facilitate duplication, filing, and handling.
- Include the revision date in the footer on each page.
- Scan graphics and incorporate with text into a single electronic file. Keep the electronic file backed-up so that copies of the maintenance plan can be made if the hard copy is lost or damaged.

GENERAL MAINTENANCE GUIDELINES

A. DESILTATION BASIN (DSB) AND ABOVE GROUND DETENTION BASIN (DB)

DSBs and above ground DBs have similar maintenance requirements and are as follows:

Sediment shall be removed whenever sediment accumulation exceeds 18" in depth or 10% of the storage volume (which ever is less). Sediment shall be disposed of in such a manner that will prevent its return to the basin or movement into downstream areas during subsequent runoff. The desilting basins and on-lot detention basins are private facilities, and the County will not be responsible for their maintenance.

The operational and maintenance needs of a DB are:

- Dispersion of alluvial sediment deposition at inlet structures thus limiting the localized ponding of water
- Periodic sediment removal when sediment accumulation exceeds 18" in depth or 10% of the storage volume (which ever is less).
- Monitoring of the basin to ensure it is completely and properly drained. Basins should be designed to drain within 72 hours of a storm event.
- Outlet riser cleaning. Vegetation management to prevent marsh vegetation from taking hold, and to limit habitat for disease-carrying fauna.
- Removal of graffiti, grass trimmings, weeds, tree pruning, leaves, litter, and debris.
- Preventative maintenance on monitoring equipment.
- Vegetative stabilization of eroding banks and basal areas.

Inspection Frequency

The facility will be inspected and inspection visits will be completely documented:

- Quarterly
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Aesthetic and Functional Maintenance

Functional maintenance is important for performance and safety reasons. Aesthetic maintenance is important for public acceptance of stormwater facilities.

Aesthetic Maintenance

The following activities will be included in the aesthetic maintenance program:

- Graffiti Removal. Graffiti will be removed in a timely manner to improve the appearance of a DB, and to discourage additional graffiti or other acts of vandalism.

- Grass Trimming. Trimming of grass will be done around fences, the basin, outlet structures, and sampling structures.
- Weed Control. Weeds will be removed through mechanical means.

Functional Maintenance
Functional maintenance has two components:

- Preventive maintenance.
- Corrective maintenance.

Preventive Maintenance

Preventive maintenance will be performed regularly and on an as-needed basis. Preventive maintenance activities to be instituted at a DB are:

- Mowing. Vegetation in the DB will be kept at the average maximum height of 18 inches to prevent the establishment of marsh vegetation, the stagnation of water, and the development of faunal habitats.
- Trash and Debris. During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.
- Sediment Management. Alluvial deposits at the inlet structures may create zones of ponded water. Upon these occurrences these deposits will be graded within the DB in an effort to maintain the functionality of the BMP. Sediment grading will be accomplished by manually raking the deposits.
- Sediment Removal. Surface sediments will be removed when sediment accumulation exceeds 18" in depth or 10% of the storage volume (which ever is less). Vegetation removed with any surface sediment excavation activities will be replaced through reseeding. Disposal of sediments will comply with applicable local, county, state, or federal requirements.
- Mechanical Components. Regularly scheduled maintenance will be performed on valves, fence gates, locks, and access hatches in accordance with the manufacturers' recommendations. Mechanical components will be operated during each maintenance inspection to assure continued performance.
- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a DB. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which threaten the ability of a DB to store or convey water, will be removed immediately and properly disposed of.
- Structural Repairs. Repairs to any structural component of a DB will be made promptly (e.g., within 10 working days). Designers and contractors will conduct repairs where structural damage has occurred.
- Embankment and Slope Repairs. Damage to the embankments and slopes will be repaired quickly (e.g., within 10 working days).
- Erosion Repair. Where a reseeding program has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance of a DB. There are a number of corrective actions than can be taken. These include erosion control blankets, riprap, sodding, or reduced flow through the area. Design engineers will be consulted to address erosion problems if the solution is not evident.
- Fence Repair. Timely repair of fences (e.g., within 10 working days) will be performed to maintain the security of the site.
- Elimination of Trees and Woody Vegetation. Woody vegetation will be removed from embankments.
- Elimination of Animal Burrows. Animal burrows will be filled and steps taken to remove the animals if burrowing problems continue to occur (filling and compacting). If the problem persists, vector control specialists will be consulted regarding removal steps. This consulting is necessary as the threat of rabies in some areas may necessitate the animals being destroyed rather than relocated.
- General Facility Maintenance. In addition to the above elements of corrective maintenance, general corrective maintenance will address the overall facility and its associated components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

B. SUB-SURFACE DETENTION STRUCTURES (DB), (FUTURE ON-LOT)

Sediment shall be removed whenever storage capacity has been achieved. Sediment shall be disposed of in such a manner that will prevent its return to the detention basin or movement into downstream areas during subsequent runoff. On-lot detention basins are private facilities, and the County will not be responsible for their maintenance.

The operational and maintenance needs of a DB are:

- Periodic sediment removal in accordance with the manufactures specifications.
- Monitoring of the basin to ensure it is completely and properly drained. Facilities should be designed to drain within 72 hours of a storm event.
- Outlet cleaning to limit habitat for disease-carrying fauna.
- Preventative maintenance on monitoring equipment.

Inspection Frequency
The facility will be inspected and inspection visits will be completely documented:

- Quarterly.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Functional Maintenance
Functional maintenance is important for performance and safety reasons and has the following components:

- Preventive maintenance.
- Corrective maintenance.

Preventive Maintenance

Preventive maintenance will be performed regularly and on an as-needed basis. Preventive maintenance activities to be instituted at a DB are:

- Trash and Debris. During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.
- Sediment Management. Alluvial deposits at the inlet structures may create zones of ponded water. Upon these occurrences these deposits will be graded within the DB in an effort to maintain the functionality of the BMP. Sediment grading will be accomplished by manually raking the deposits.
- Sediment Removal. Surface sediments will be removed when sediment accumulation is 10 percent of the basin volume. Vegetation removed with any surface sediment excavation activities will be replaced through reseeding. Disposal of sediments will comply with applicable local, county, state, or federal requirements.
- Mechanical Components. Regularly scheduled maintenance will be performed on valves, fence gates, locks, and access hatches in accordance with the manufacturers' recommendations. Mechanical components will be operated during each maintenance inspection to assure continued performance.
- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a DB. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which threaten the ability of a DB to store or convey water, will be removed immediately and properly disposed of.
- Structural Repairs. Repairs to any structural component of a DB will be made promptly (e.g., within 10 working days). Designers and contractors will conduct repairs where structural damage has occurred.
- General Facility Maintenance. In addition to the above elements of corrective maintenance, general corrective maintenance will address the overall facility and its associated components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

Debris and Sediment Disposal

The OTAY CROSSINGS COMMERCE PARK Subdivision is responsible for any hazardous waste generated at a DB since they are responsible for maintenance. All construction waste shall be disposed of offsite in accordance with local, State and Federal regulations.

The following is a list of approved disposal sites:

Non-Hazardous Waste
Miramar Landfill 619-573-1418
5180 Convoy Street
San Diego, CA

Hazardous Waste (i.e., Gas, Oil, Chemicals, etc.)
Appropriate technologies II/B.K.K. (619) 421-1175
1700 Maxwell Road
Chula Vista, CA 91911

No transport vehicle may carry more than five gallons or 50 pounds of hazardous waste at one time. An Environmental Protection Agency identification number must be obtained prior to transporting material. The above site will not accept waste without this number. The contractor shall contact The Department of Health Services at (916) 324-1781 to obtain a temporary EPA ID number. Hazardous wastes may be hauled in larger quantities by licensed hazardous waste transporters. For a complete list of County of San Diego Hazardous Waste Requirements and waste transporters see Section 18 within the project SWPPP, References. Any additional questions regarding the disposal of hazardous waste shall be directed to County of San Diego Hazardous Materials Management Division at (619) 338-2222.

Hazardous Wastes

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous materials generated on site will be handled and disposed of according to local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria listed in the California Code of Federal Regulations, Title 22, Article 11 (State of California, 1985).

C. CURB INLET FILTER (BIO-CLEAN)

The operational and maintenance needs of a Bio-Clean Curb Inlet Filter are:

- Removal of accumulated materials with a vacuum truck
- Replacement of adsorbent boom
- Inspection of the unit to ensure that it is functioning properly

Inspection Frequency
Each unit will be inspected and inspection visits will be completely documented:

- After every runoff event for the first 90 days
- Once every 60 days during the rainfall season
- At the end of the rainfall season

After the first year, inspection frequencies may be modified based on pollutant accumulation and the specific maintenance needs of each unit. The manufacture will provide inspection criteria during installation. A typical inspection program is identified below.

Functional Maintenance
Functional maintenance has two components:

1. Preventive maintenance
2. Corrective maintenance

Maintenance requirements are specific to the manufacturer. The manufacture will provide maintenance criteria during installation. A typical maintenance program is identified below.

Preventive Maintenance
Preventive maintenance activities to be instituted for debris separation are:

- **Trash and Debris Removal.** Trash and Debris accumulation, as part of the operation and maintenance program of the Bio-Clean filter, will be monitored after every large storm event, and cleaned out at least twice per year.
- **Sediment Removal.** Sediment accumulation, as part of the operation and maintenance program of the Bio-Clean filter, will be monitored after every large storm event, and cleaned out at least twice per year.
- **Hydrocarbon Boom Replacement.** Replace hydrocarbon boom per manufacturer's criteria.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a Bio-Clean filter. Corrective maintenance activities include:

- **Removal of Debris and Sediment.** Sediment, debris, and trash, which impede the functioning of a Bio-Clean filter will be removed and properly disposed.
- **Replacement.** Once deemed necessary. Qualified individuals (i.e., the manufacturer representatives) will conduct replacement if damage has occurred.

Maintenance Frequency

Maintenance frequency is site dependant and at final engineering the manufacturer should be contacted for initial schedule and details. Maintenance activities will be performed per the manufacturer's requirements attached at the end of this section. Contact: BIO CLEAN ENVIRONMENTAL SERVICES, Incorporated at 760-433-7640.

Debris and Sediment Disposal

Any debris or sediment found in a Bio-Clean filter shall be disposed of offsite in accordance with local, State and Federal regulations.

The following is a list of approved disposal sites:

Non-Hazardous Waste
Miramar Landfill 619-573-1418
5180 Convoy Street
San Diego, CA

Hazardous Waste (i.e., Gas, Oil, Chemicals, etc.)
Appropriate technologies II/B.K.K. (619) 421-1175
1700 Maxwell Road
Chula Vista, CA 91911

No transport vehicle may carry more than five gallons or 50 pounds of hazardous waste at one time. An Environmental Protection Agency identification number must be obtained prior to transporting material. The above site will not accept waste without this number. The contractor shall contact The Department of Health Services at (916) 324-1781 to obtain a temporary EPA ID number. Hazardous wastes may be hauled in larger quantities by licensed hazardous waste transporters. Any additional questions regarding the disposal of hazardous waste shall be directed to County of San Diego Hazardous Materials Management Division at (619) 338-2222.

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state,

and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria list in the CCR, Title 22, Article 11.

D. HYDRODYNAMIC SEPARATOR (CDS UNIT)

The operational and maintenance needs of CDS units are:

- Removal of accumulated materials with a vacuum truck
- Replacement of adsorbent boom
- Inspection of the unit to ensure that it is functioning properly

Inspection Frequency
Each unit will be inspected and inspection visits will be completely documented:

- Twice yearly: In October and April
- Once every 30 days during the rainfall season

After the first year, inspection frequencies may be modified based on pollutant accumulation and the specific maintenance needs of each filtration unit. The manufacture will provide inspection criteria during installation. A typical inspection program is identified below.

Functional Maintenance
Functional maintenance has two components:

1. Preventive maintenance
2. Corrective maintenance

Maintenance requirements are specific to the manufacturer. The manufacturer will provide maintenance criteria during installation. A typical maintenance program is identified below.

Preventive Maintenance
Preventive maintenance activities to be instituted for debris separation are:

- **Trash and Debris Removal.** Trash and debris accumulation, as part of the operation and maintenance program of the CDS unit, will be monitored during every inspection, and cleaned out when the sump is 75% to 85% full. At a minimum, trash and debris will be removed once a year, at the end of the rainy season.
- **Sediment Removal.** Sediment accumulation, as part of the operation and maintenance program of the CDS unit, will be monitored during every inspection, and cleaned out when the sump is 75% to 85% full. At a minimum, sediment should be removed once a year, at the end of the rainy season.
- **Adsorbent Boom Replacement.** Replace disposable items at least once a year.

Vector Control

During every inspection or maintenance visit, each CDS unit will be thoroughly examined to ensure that no vectors have infested the unit. Additionally, mosquito netting and manhole seals will be inspected to ensure that they have not been damaged. Any damaged netting or seals will be replaced immediately. Should any cracks or holes be found in the unit, they will be plugged immediately. If an infestation occurs and these measures do not remedy the situation, the manufacturer will be contacted and their recommendations adopted. A persistent infestation could require that larvicide be added into the treatment chamber.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a CDS unit. Corrective maintenance activities include:

- **Removal of Debris and Sediment.** Sediment, debris, and trash, which impede the functioning of a CDS unit, will be removed and properly disposed.
- **Replacement.** Once deemed necessary. Qualified individuals (i.e., the manufacturer representatives) will conduct replacement if damage has occurred.

Maintenance Frequency

Maintenance frequency is site dependant and at Final Engineering the manufacturer should be contacted for initial schedule and details. Contact: CONTECH STORMWATER SOLUTIONS at 800-925-5240.

Debris and Sediment Disposal

See Section B Sub-surface Detention Structures (SSDS) Debris and Sediment Disposal specifications

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria list in the CCR, Title 22, Article 11.

E. RIPRAP ENERGY DISSIPATER (RIPRAP)

Sediment shall be removed whenever the effectiveness of the riprap is being impaired. Sediment shall be disposed of in such a manner that will prevent its return to the basin or movement into downstream areas during subsequent runoff.

The operational and maintenance needs of riprap are:

- Removal of alluvial sediment deposits in the riprap to increase its ability to dissipate energy.
- Inspection and repair of riprap components (rock and filter fabric).

- Vegetation management to prevent marsh vegetation from taking hold, and to limit habitat for disease-carrying fauna.
- Removal of graffiti, grass trimmings, weeds, tree pruning, leaves, litter, and debris.

Inspection Frequency
The facility will be inspected and inspection visits will be completely documented:

- Quarterly.
- After every large storm (after every storm monitored or those storms with more than 0.50 inch of precipitation).
- On a weekly basis during extended periods of wet weather.

Aesthetic and Functional Maintenance
Functional maintenance is important for performance and safety reasons. Aesthetic maintenance is important for public acceptance of stormwater facilities.

Aesthetic Maintenance
The following activities will be included in the aesthetic maintenance program:

- Graffiti Removal. Graffiti will be removed in a timely manner to improve the appearance of the riprap, and to discourage additional graffiti or other acts of vandalism.
- Grass Trimming. Trimming of grass will be done around the structures.
- Weed Control. Weeds will be removed through mechanical means.

Functional Maintenance
Functional maintenance has two components:

- Preventive maintenance.
- Corrective maintenance.

Preventive Maintenance

Preventive maintenance will be performed on a regular basis. Preventive maintenance activities to be instituted at the riprap are:

- Trash and Debris. During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for outlet structures and other components from becoming clogged and inoperable during storm events.
- Sediment Removal. Alluvial deposits at the outlet structures may inhibit the effectiveness of the riprap. Upon these occurrences these deposits will be removed in an effort to maintain the functionality of the BMP. Sediment removal may require the removal and replacement of the riprap. Disposal of sediments will comply with applicable local, county, state, or federal requirements.

- Inspection. Regularly scheduled maintenance will be performed to inspect the riprap for displacement and the underlying fabric for damage. Displaced riprap will be replaced and damaged fabric will be repaired or replaced.
- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of the riprap. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which threaten the ability of the riprap to convey water, will be removed immediately and properly disposed of.
- Repairs. Repairs to any component of the riprap will be made promptly (e.g., within 10 working days).
- Erosion Repair. Where riprap has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance of the riprap. There are a number of corrective actions than can be taken. These include using larger diameter rocks or extending the length of the apron. Design engineers shall be consulted to address erosion problems if the solution is not evident.
- Elimination of Trees and Woody Vegetation. Woody vegetation will be removed from in and around the riprap.
- General Facility Maintenance. In addition to the above elements of corrective maintenance, general corrective maintenance will address the overall facility and its associated components. If corrective maintenance is being done to one component, other components will be inspected to see if maintenance is needed.

ATTACHMENT G

Tracking Report

ATTACHMENT H

Addendum