

Appendix F

Hydrology

HYDROLOGY STUDY FOR

**Tract No. 73661
Covina, CA**

Prepared For:

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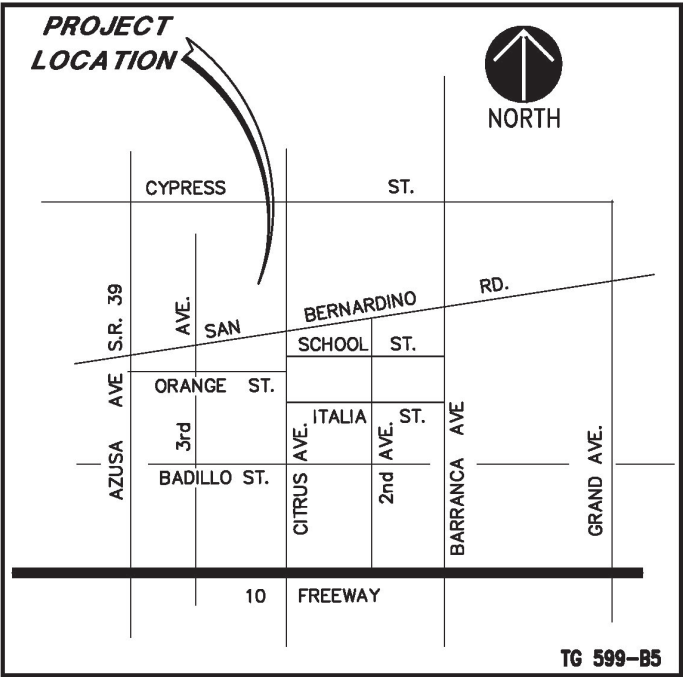
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October 2017

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I. VICINITY MAP



VICINITY MAP
N.T.S.

II. SOILS AND RAIN FALL INTENSITY MAPS

From Los Angeles County Hydrology Manual edition 2006

County Hydrology Map: Page 1-H21

50-year 24-hour rainfall: 7.1 inches

85th percentile rainfall: 1.0"

Soil Identification: 006

III. DISCUSSION

III. DISCUSSION

Introduction

The purpose of the attached analysis is to determine the existing and proposed storm water discharge flow for the project. Tentative Tract 73661 is located at 137 San Bernardino Place and 141 W Geneva Road in the City of Covina, California. The project is bound by 3rd Avenue on the west and San Bernardino Road on the south with residential lots to the north.

The project site is 5.43 acres and currently consists of a commercial lot with various commercial buildings.

This hydrology report will calculate the 2, 10, 25, and 50-year storm water runoff for this location.

Existing Conditions

The existing site is currently a large commercial lot with various commercial buildings. The site drains south west toward 3rd Avenue and San Bernardino Rd at a gradient of 1.5%.

Project Description

The proposed project consists of the construction of 8 new condominium buildings and 1 podium building with private streets.

Roof runoff will drain to landscape areas and enter an area drainage system which will drain into the storm drain system. Street drainage will drain into catch basins which will lead to the storm drains. Excess flow will also drain into the storm drain system. The storm drains will connect into underground infiltration chambers and then tie into the 48" storm drain on San Bernardino Road.

Hydrology and Calculation Methodology

The hydrology study was performed utilizing Los Angeles County Department of Public Works (LACDPW) Modified Rational Methodology (MODRAT) and in accordance with the requirements of the Los Angeles County Hydrology Manual 2006 version. The 50-year storm event was used in the study. The 50-year, 24-hour rainfall for this site is 7.1 inches per Los Angeles County Hydrological Map 1-H21.

Conclusion

The proposed project consists of 8 condominium buildings and 1 podium building. Roof drainage will be diverted to landscape areas. The drainage from the landscape and hardscape will be collected in area drains and diverted to the curb and gutter system in the street. Street drainage will drain into catch basins which will lead to the storm drains. Excess flow will also drain into the storm drain system. The storm drains will connect into underground infiltration chambers and then tie into the 48" storm drain on San Bernardino Road.

A table of pre- and post-construction flows can be seen in the table below:

Condition	2-YR Flow (cfs)	10-YR Flow (cfs)	25-YR Flow (cfs)	50-YR Flow (cfs)	85 th % vol. (cu-ft)
Pre-Developed Condition	4.835	11.1119	14.50	17.63	1.21
Post-Developed Condition	4.60	10.88	14.32	17.52	1.017
Percent Change	-4.8%	-2.1%	-1.2%	-0.6%	-16.0%

IV. 2, 10, 25, & 50-YEAR HYDROLOGY CALCULATIONS – UN-DEVELOPED EXISTING CONDITION

V. 2, 10, 25, & 50-YEAR HYDROLOGY CALCULATIONS – DEVELOPED CONDITION

Peak Flow Hydrologic Analysis

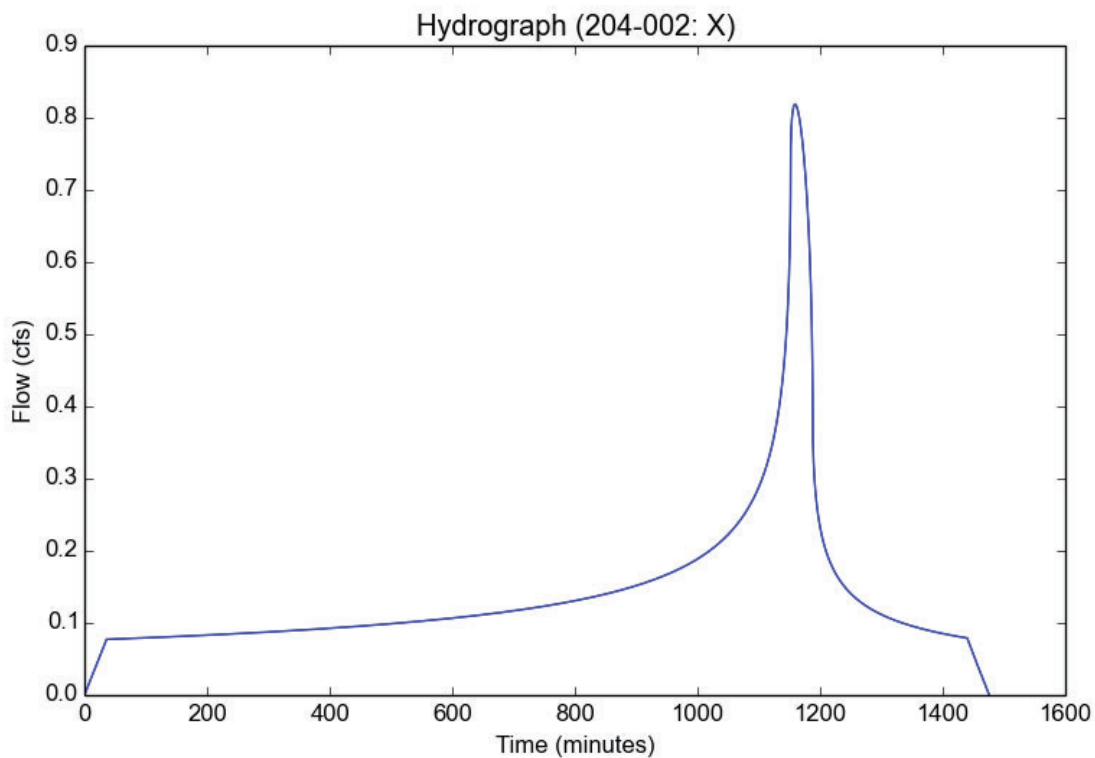
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Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1769
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.852
Time of Concentration (min)	36.0
Clear Peak Flow Rate (cfs)	0.8186
Burned Peak Flow Rate (cfs)	0.8186
24-Hr Clear Runoff Volume (ac-ft)	0.2868
24-Hr Clear Runoff Volume (cu-ft)	12491.3793



Peak Flow Hydrologic Analysis

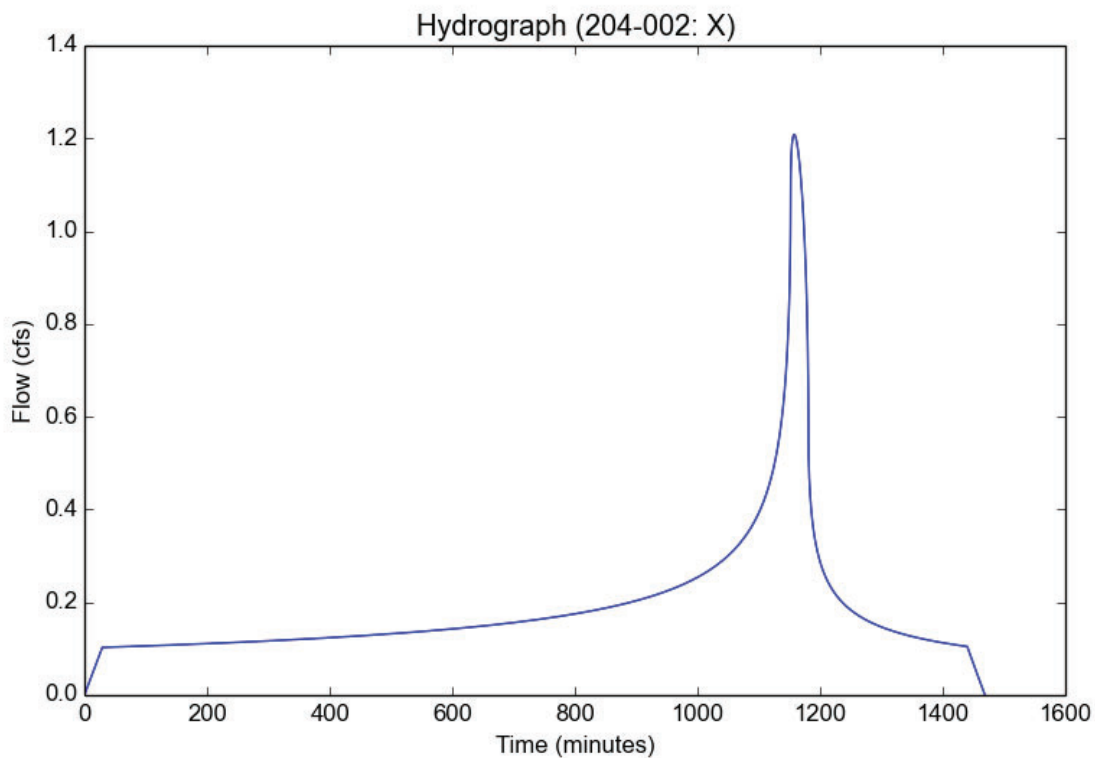
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Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.2612
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.852
Time of Concentration (min)	29.0
Clear Peak Flow Rate (cfs)	1.2082
Burned Peak Flow Rate (cfs)	1.2082
24-Hr Clear Runoff Volume (ac-ft)	0.3823
24-Hr Clear Runoff Volume (cu-ft)	16655.0746



Peak Flow Hydrologic Analysis

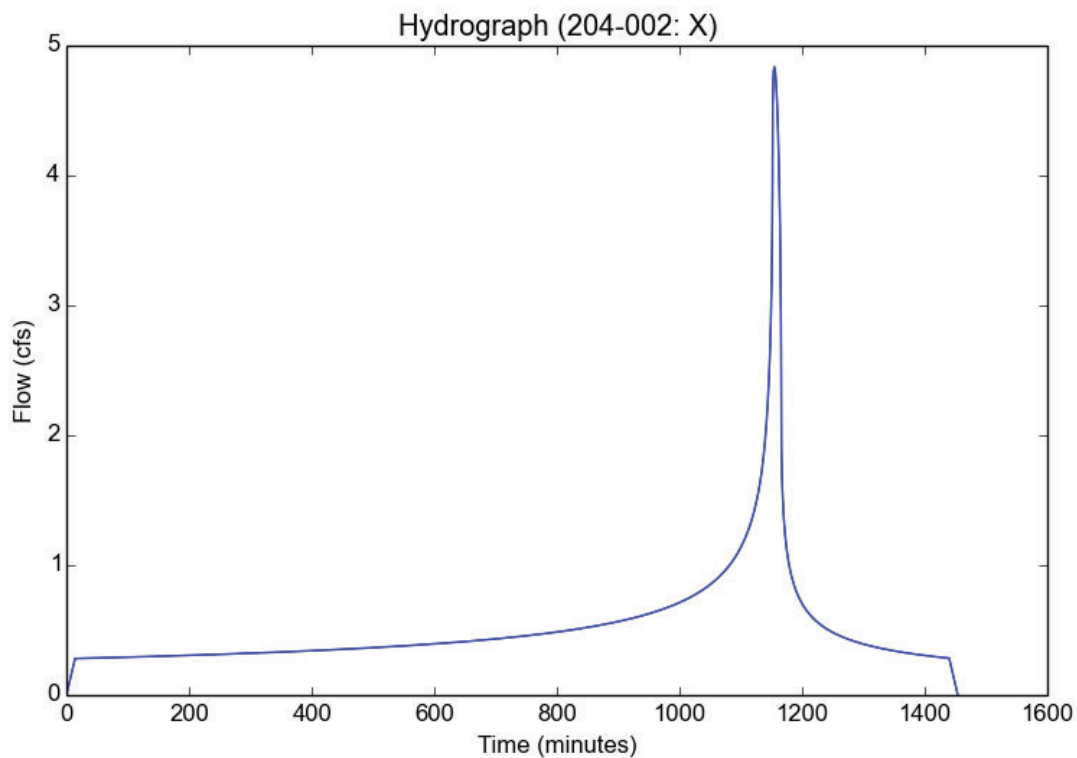
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Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.7477
Peak Intensity (in/hr)	1.0104
Undeveloped Runoff Coefficient (Cu)	0.5871
Developed Runoff Coefficient (Cd)	0.8812
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	4.835
Burned Peak Flow Rate (cfs)	4.835
24-Hr Clear Runoff Volume (ac-ft)	1.054
24-Hr Clear Runoff Volume (cu-ft)	45910.5775



Peak Flow Hydrologic Analysis

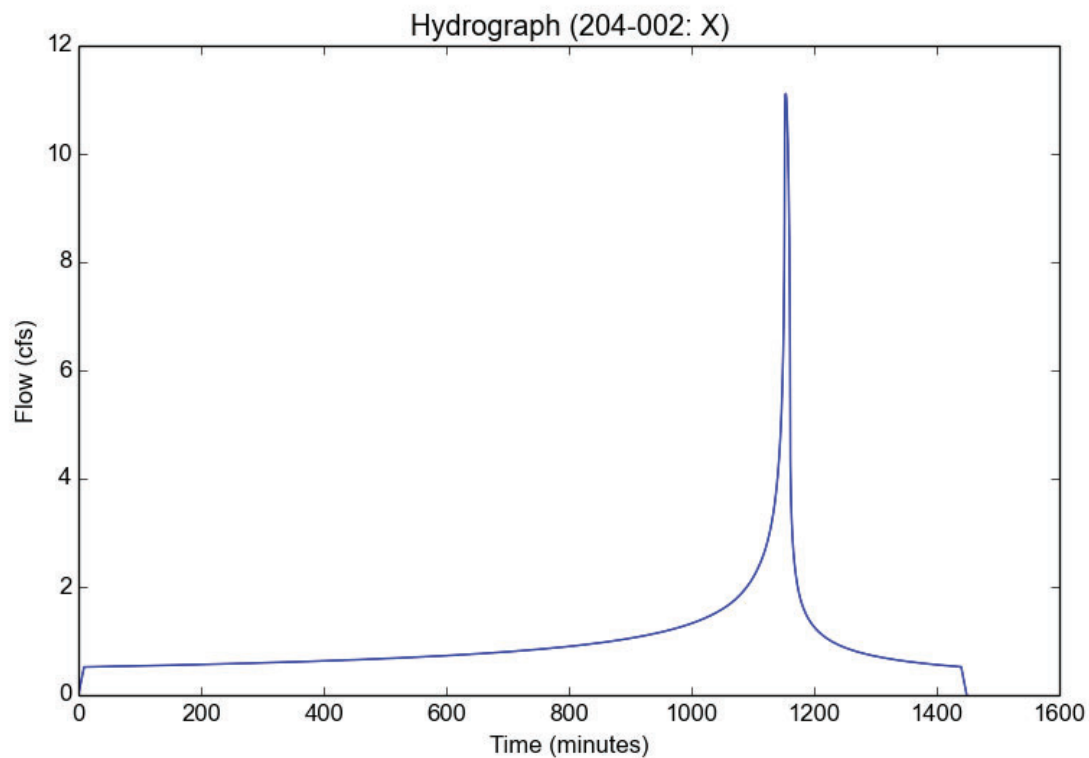
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Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.0694
Peak Intensity (in/hr)	2.2945
Undeveloped Runoff Coefficient (Cu)	0.7646
Developed Runoff Coefficient (Cd)	0.8919
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	11.1119
Burned Peak Flow Rate (cfs)	11.1119
24-Hr Clear Runoff Volume (ac-ft)	1.9512
24-Hr Clear Runoff Volume (cu-ft)	84993.7142



Peak Flow Hydrologic Analysis

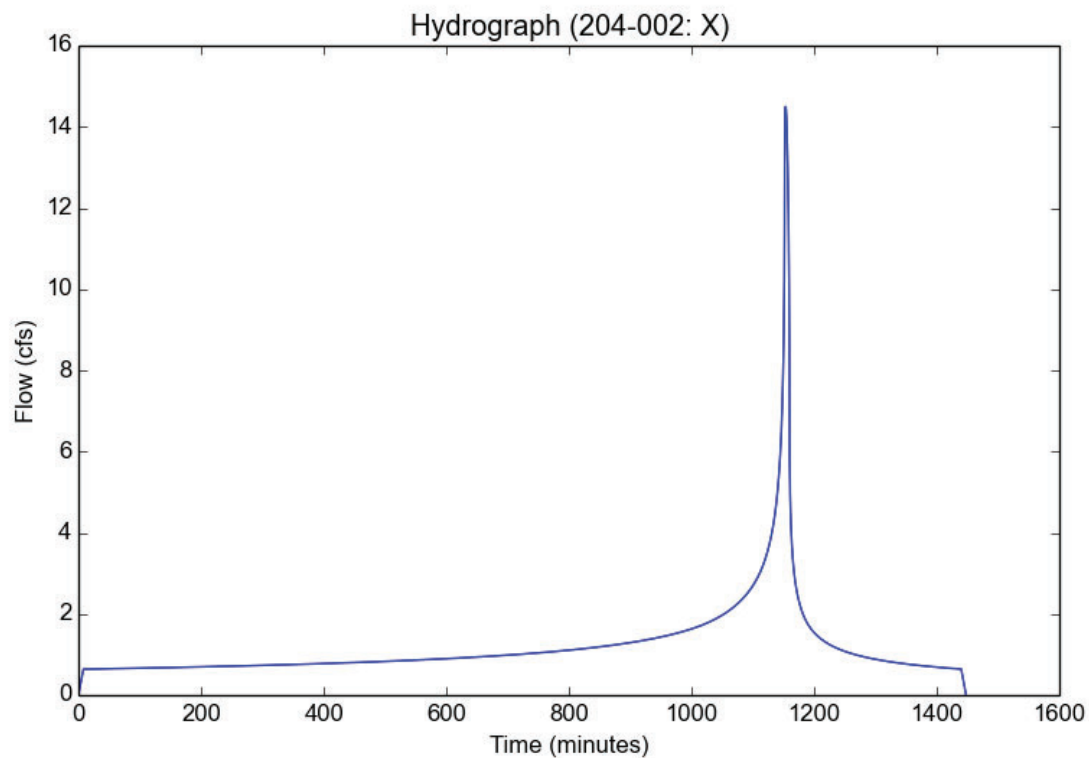
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Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.2338
Peak Intensity (in/hr)	2.9821
Undeveloped Runoff Coefficient (Cu)	0.821
Developed Runoff Coefficient (Cd)	0.8953
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	14.4967
Burned Peak Flow Rate (cfs)	14.4967
24-Hr Clear Runoff Volume (ac-ft)	2.4038
24-Hr Clear Runoff Volume (cu-ft)	104708.1209



Peak Flow Hydrologic Analysis

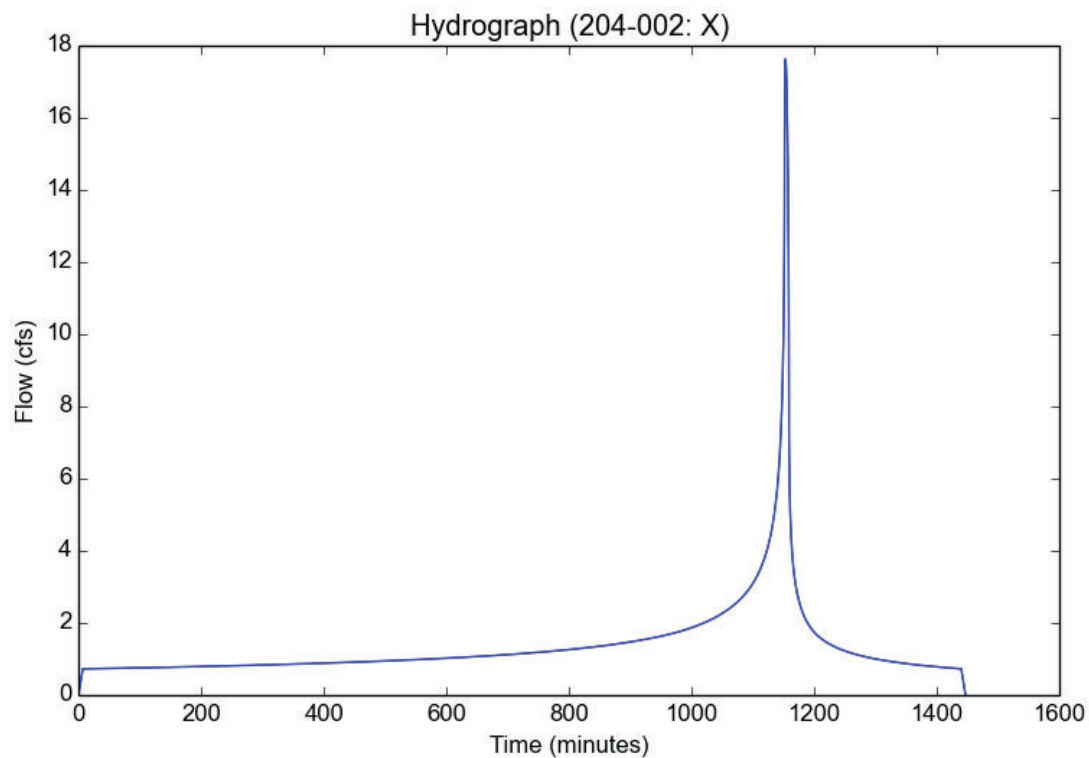
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Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	7.1
Peak Intensity (in/hr)	3.6164
Undeveloped Runoff Coefficient (Cu)	0.8618
Developed Runoff Coefficient (Cd)	0.8977
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	17.6286
Burned Peak Flow Rate (cfs)	17.6286
24-Hr Clear Runoff Volume (ac-ft)	2.7416
24-Hr Clear Runoff Volume (cu-ft)	119424.4315



VI. WSPG, PIPE SIZING, AND CATCH BASIN SIZING CALCULATIONS

Peak Flow Hydrologic Analysis

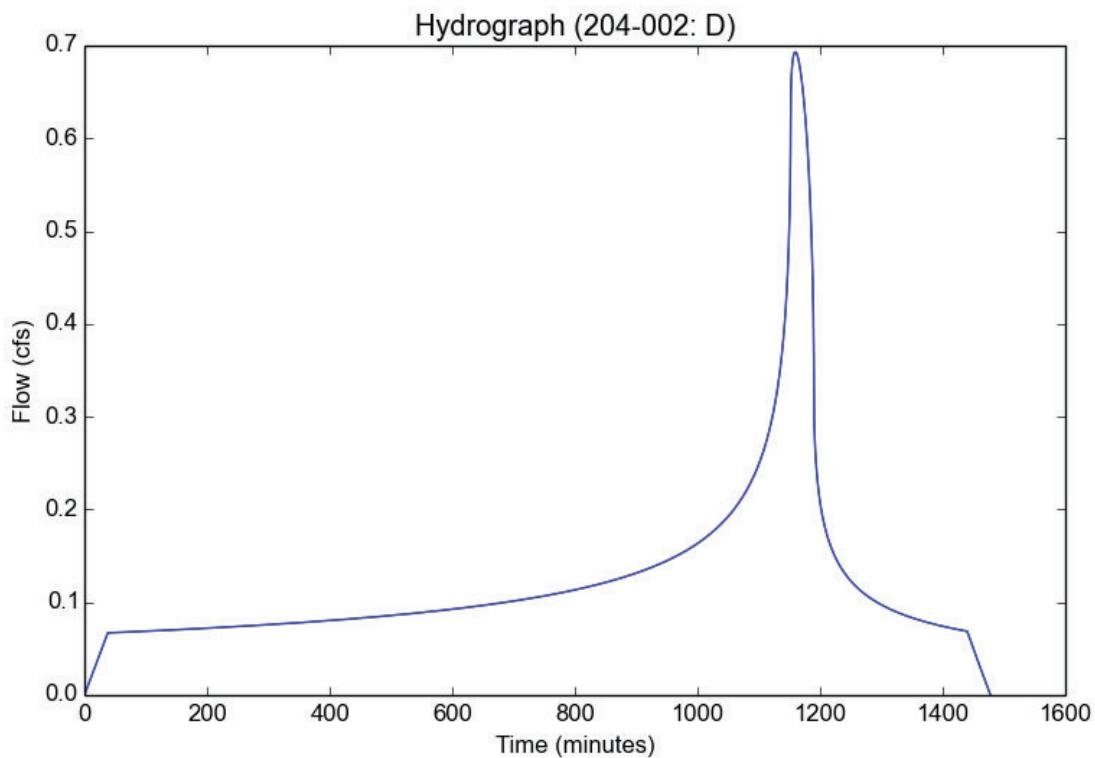
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1725
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.74
Time of Concentration (min)	38.0
Clear Peak Flow Rate (cfs)	0.6931
Burned Peak Flow Rate (cfs)	0.6931
24-Hr Clear Runoff Volume (ac-ft)	0.2491
24-Hr Clear Runoff Volume (cu-ft)	10849.3409



Peak Flow Hydrologic Analysis

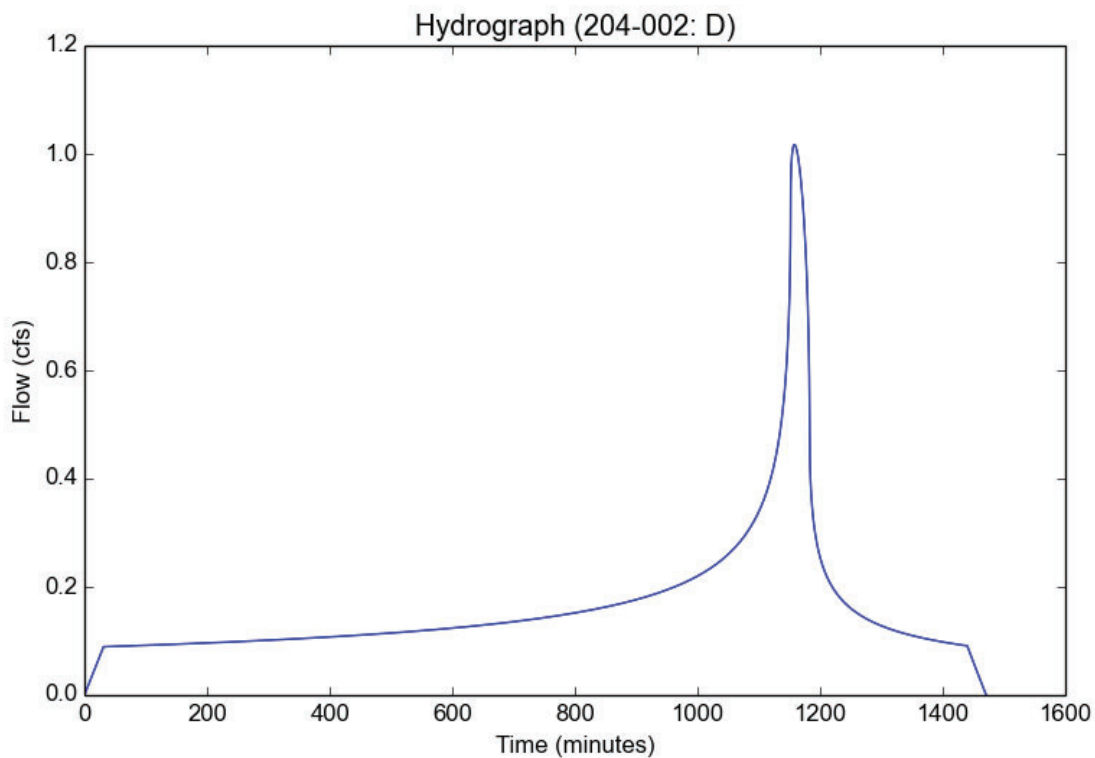
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.2531
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.74
Time of Concentration (min)	31.0
Clear Peak Flow Rate (cfs)	1.017
Burned Peak Flow Rate (cfs)	1.017
24-Hr Clear Runoff Volume (ac-ft)	0.3321
24-Hr Clear Runoff Volume (cu-ft)	14465.6975



Peak Flow Hydrologic Analysis

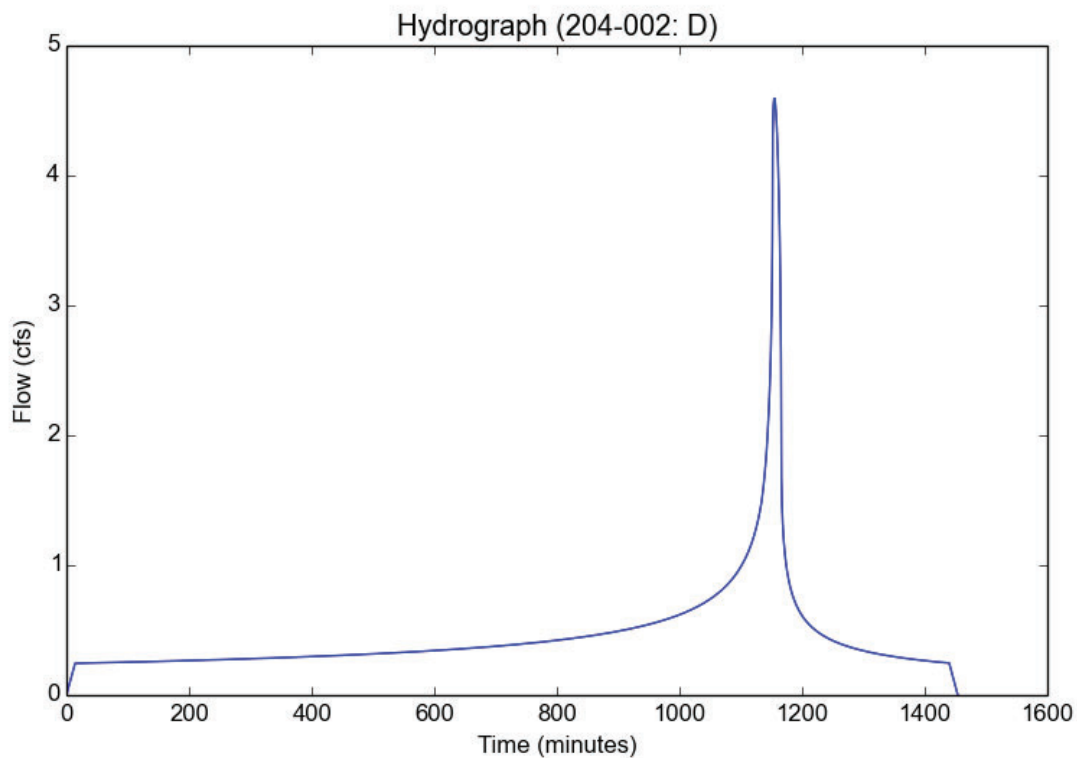
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	2-yr
Fire Factor	0
LID	False

Output Results

Modeled (2-yr) Rainfall Depth (in)	2.7477
Peak Intensity (in/hr)	1.0104
Undeveloped Runoff Coefficient (Cu)	0.5871
Developed Runoff Coefficient (Cd)	0.8374
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	4.5947
Burned Peak Flow Rate (cfs)	4.5947
24-Hr Clear Runoff Volume (ac-ft)	0.9238
24-Hr Clear Runoff Volume (cu-ft)	40239.6959



Peak Flow Hydrologic Analysis

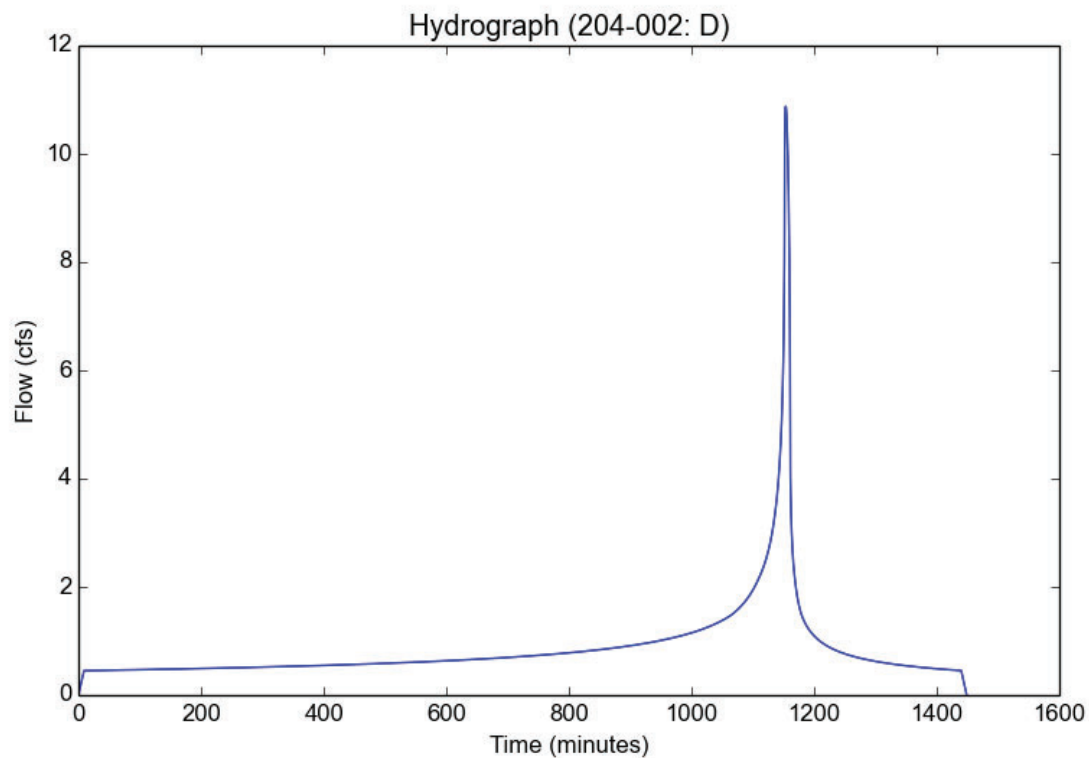
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.0694
Peak Intensity (in/hr)	2.2945
Undeveloped Runoff Coefficient (Cu)	0.7646
Developed Runoff Coefficient (Cd)	0.8729
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	10.8757
Burned Peak Flow Rate (cfs)	10.8757
24-Hr Clear Runoff Volume (ac-ft)	1.7266
24-Hr Clear Runoff Volume (cu-ft)	75209.2432



Peak Flow Hydrologic Analysis

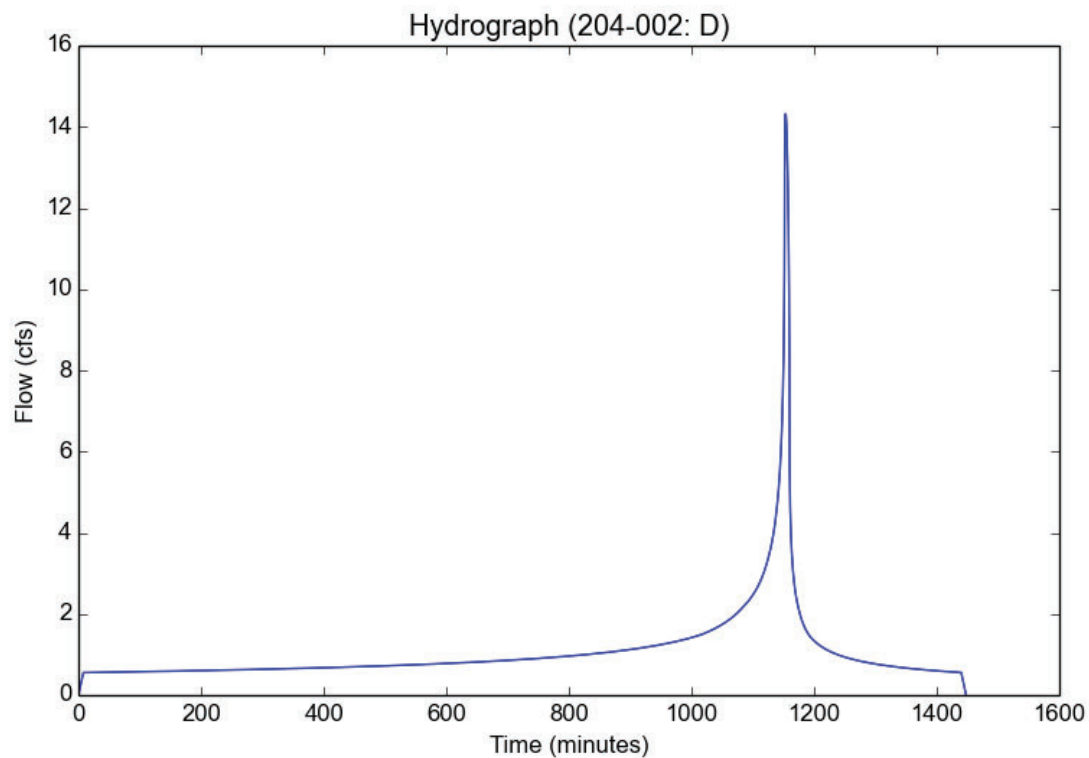
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	6.2338
Peak Intensity (in/hr)	2.9821
Undeveloped Runoff Coefficient (Cu)	0.821
Developed Runoff Coefficient (Cd)	0.8842
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	14.3177
Burned Peak Flow Rate (cfs)	14.3177
24-Hr Clear Runoff Volume (ac-ft)	2.1378
24-Hr Clear Runoff Volume (cu-ft)	93124.3866



Peak Flow Hydrologic Analysis

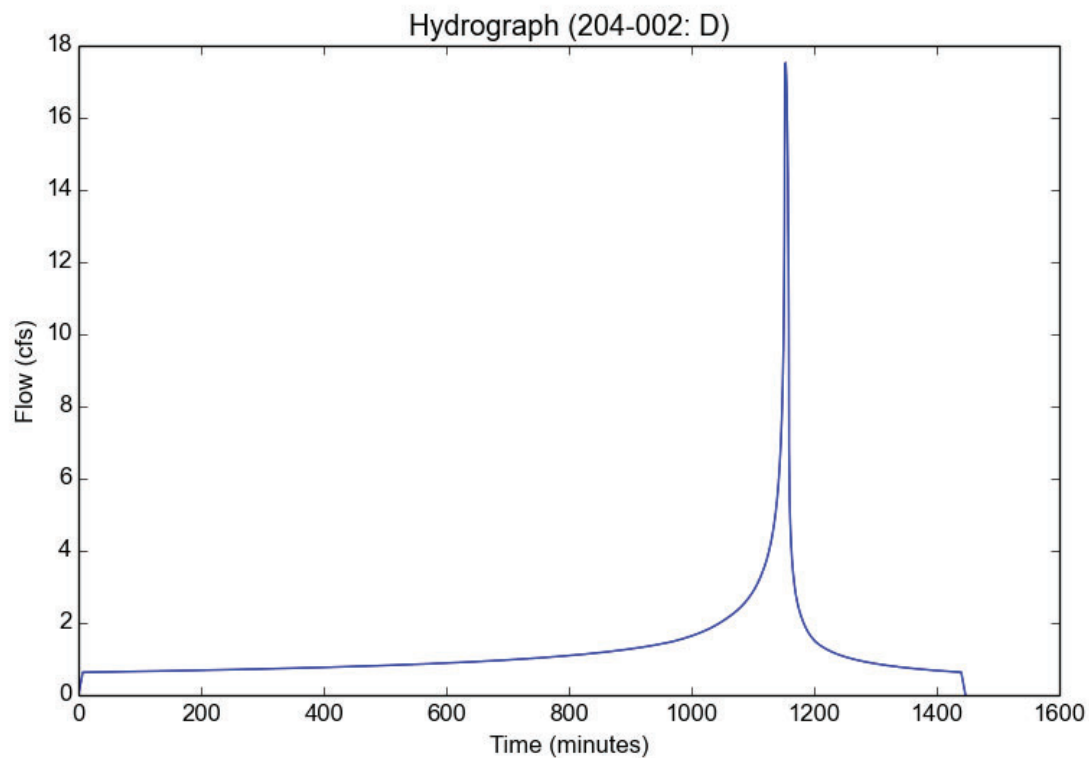
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
50-yr Rainfall Depth (in)	7.1
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
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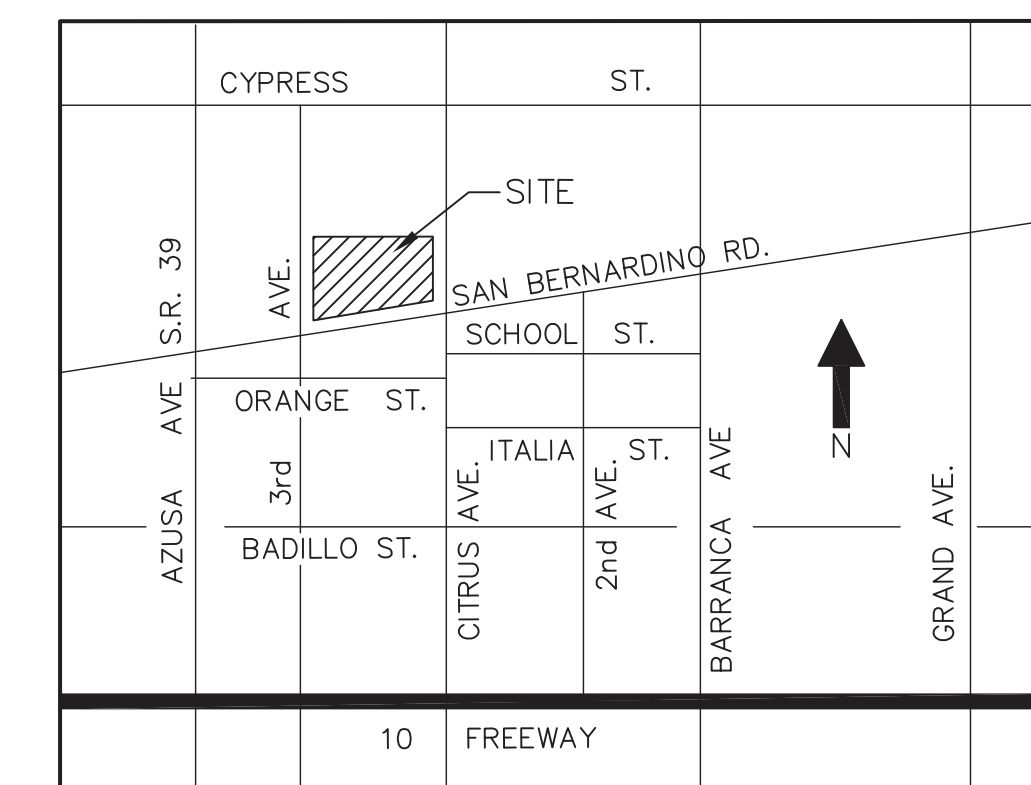
Output Results

Modeled (50-yr) Rainfall Depth (in)	7.1
Peak Intensity (in/hr)	3.6164
Undeveloped Runoff Coefficient (Cu)	0.8618
Developed Runoff Coefficient (Cd)	0.8924
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	17.5237
Burned Peak Flow Rate (cfs)	17.5237
24-Hr Clear Runoff Volume (ac-ft)	2.4477
24-Hr Clear Runoff Volume (cu-ft)	106620.579



VII. HYDROLOGY MAP-EXISTING AND DEVELOPED CONDITIONS

HYDROLOGY STUDY FOR TRACT 73661 (EXISTING CONDITIONS)

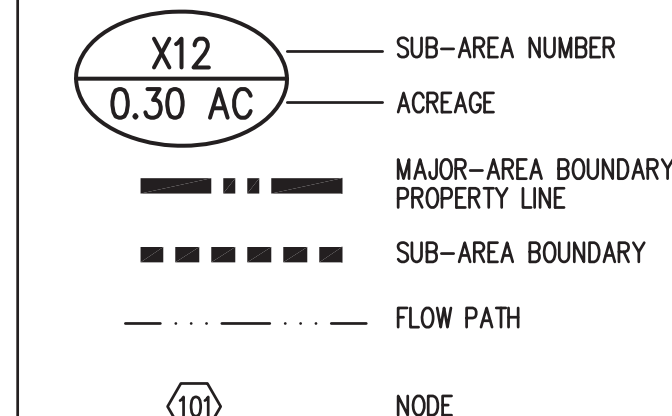


THOMAS BROTHERS GUIDE PAGE 599 GRID B5

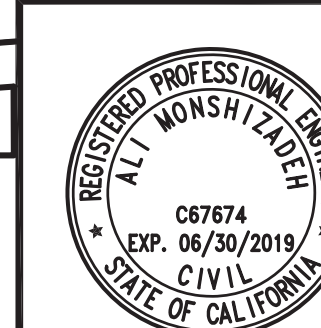
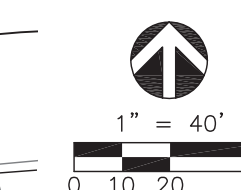
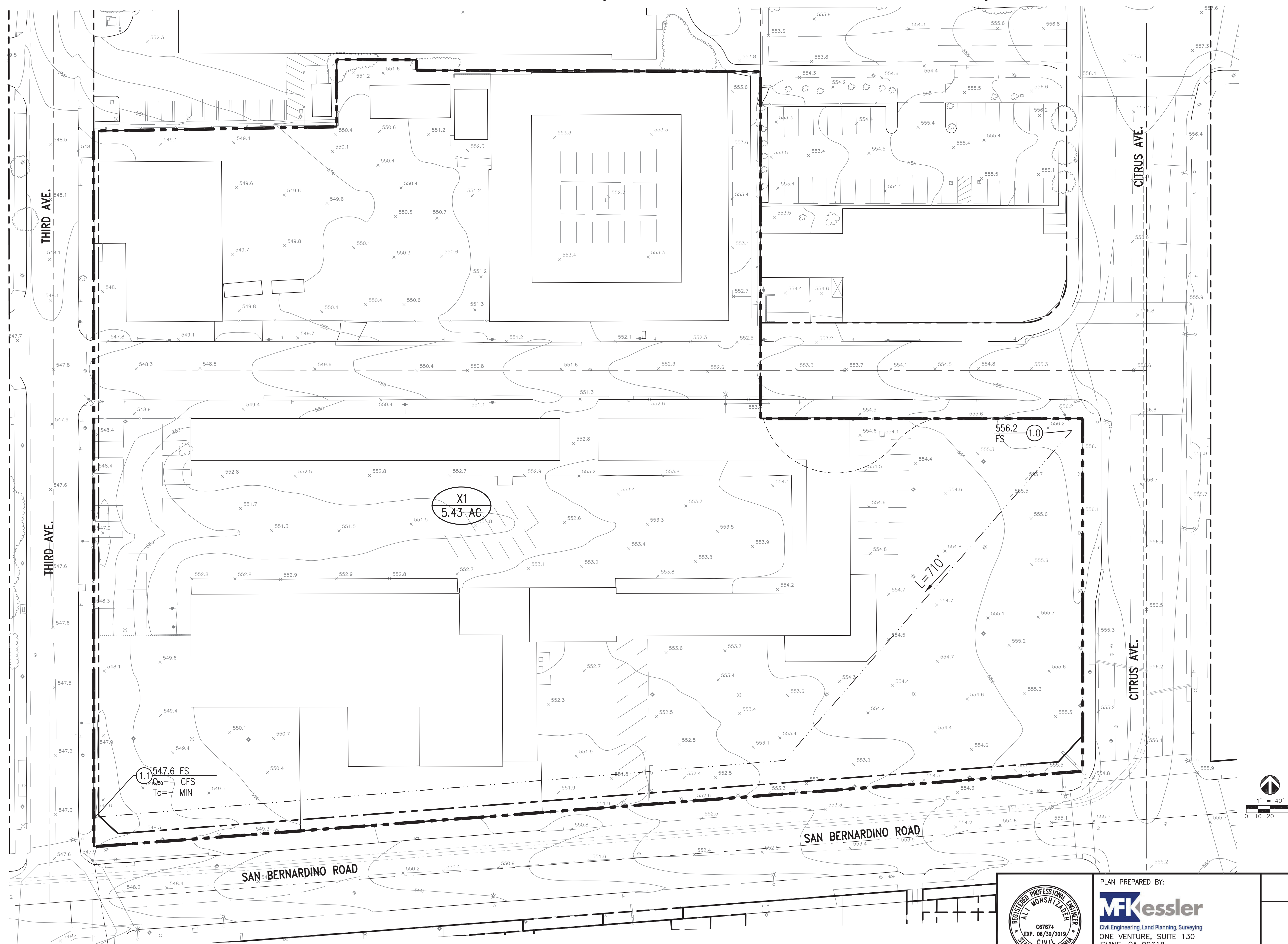
VICINITY MAP
N.T.S.

SOIL TYPE:	006
50 YR-24 HR RAINFALL:	7.1 IN.
85TH PERCENTILE RAINFALL:	1.0 IN.
<u>PRE DEVELOPMENT:</u>	
PERVIOUS AREA	= 1.03 AC. (19%)
IMPERVIOUS AREA	= 4.40 AC. (81%)
Q _{25R-24R}	= 4.84
Q _{10R-24R}	= 11.11
Q _{25R-24R}	= 14.50
Q _{50R-24R}	= 17.63
V _{60R-24R}	= 16655
V _{60R-24R}	= 12492

LEGEND:



OFFSITE FLOW NOTE:
THERE ARE NO OFFSITE FLOWS DISCHARGING
THROUGH THE SITE IN EXISTING OR PROPOSED
CONDITIONS.



PLAN PREPARED BY:



Civil Engineering, Land Planning, Surveying
ONE VENTURE, SUITE 130
IRVINE, CA 92618
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MFKESSLER.COM

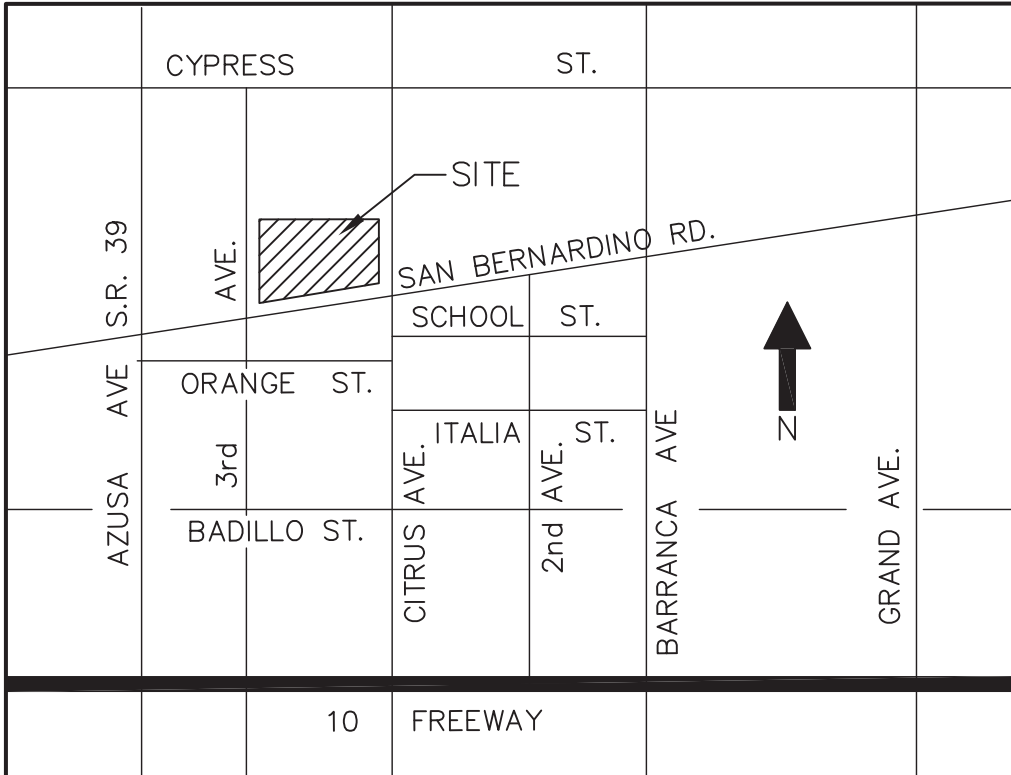
CITY OF COVINA

HYDROLOGY MAP
EXISTING (PRE DEVELOPED) CONDITIONS
TRACT 73661
3RD AVE. AND SAN BERNARDINO ROAD

SHEET

1 OF 1

HYDROLOGY STUDY FOR TRACT 73661 (DEVELOPED CONDITIONS)

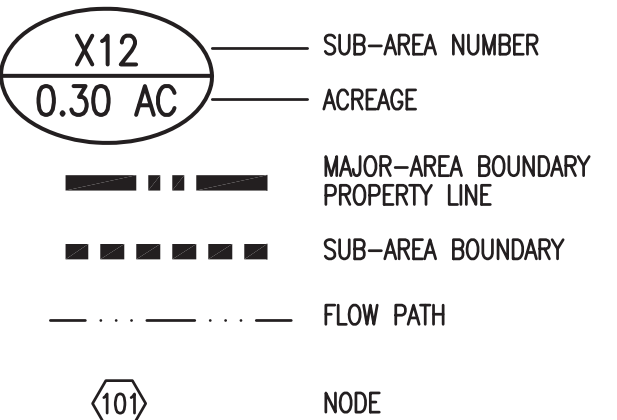


THOMAS BROTHERS GUIDE PAGE 599 GRID B5

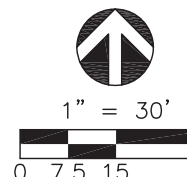
VICINITY MAP
N.T.S.

SOIL TYPE:		006	
50 YR-24 HR RAINFALL:		7.1 IN.	
85TH PERCENTILE RAINFALL:		1.0 IN.	
<u>POST DEVELOPMENT:</u>			
PERVIOUS AREA	=	0.33 AC. (6%)	
IMPERVIOUS AREA	=	5.10 AC. (94%)	
Q ₂₀₀ -24HR	=	4.59	CFS
Q ₁₀₀ -24HR	=	10.88	CFS
Q ₂₅₀ -24HR	=	14.32	CFS
Q ₅₀₀ -24HR	=	17.52	CFS
V _{85H} 1	=	14466	CF
V _{0.75}	=	10850	CF

LEGEND:



OFFSITE FLOW NOTE:
THERE ARE NO OFFSITE FLOWS DISCHARGING
THROUGH THE SITE IN EXISTING OR PROPOSED
CONDITIONS.



PLAN PREPARED BY



CITY OF COVINA

HYDROLOGY MAP
PROPOSED (POST DEVELOPED) CONDITIONS
TRACT 73661
3RD AVE. AND SAN BERNARDINO ROAD

SHIFT

1 OF 1

Low Impact Development (LID) Mitigation Plan

Bently Real Estate, LLC
100 N. Barranca Suite 900
West Covina, CA 91791
Contact: Tarif Alhassen
Tel: (626) 616-3605

Property Address:
137 San Bernardino Road
141 W Geneva Place
COVINA, CA 91723

Prepared by:
MFKessler, Inc.
One Venture Ste 130
Irvine, CA 92618
(949) 339-5330
Contact: Ali Monshizadeh P.E.

LID Preparation Date:
October 2017

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**Owner/Developer
Approval and Certification
Of the
Low Impact Development (LID) Mitigation Plan**

Project Name: **TTM 73661**

Project Number:

Project Address: **137 San Bernardino Road & 141 W Geneva Place**
Covina, California

This Low Impact Development (LID) Mitigation Plan for the "TTM73661" development has been prepared for Bentley Real Estate, LLC; a California limited partnership by MFKessler, Inc. It is intended to comply with the requirements of the City of Covina's Conditions of Approval for development of the subject site.

The undersigned is authorized to approve implementation of provisions of this plan as appropriate, and will strive to have the plan carried out by successors consistent with the County of Los Angeles LID requirements and the intent of the NPDES storm water requirements.

"I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathered information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Owner/Developer Signature

Date

Owner/Developer's Name and Title

Telephone Number

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A. Contact Information/List of Responsible Parties

The property contact information is:

Bently Real Estate, LLC
100 N. Barranca Suite 900
West Covina, CA 91791
Contact: Tarif Alhassen
Tel: (626) 616-3605

The property owner shall have primary responsibility and significant authority for the implementation, maintenance, and inspection of the property BMPs. Duties of the Owner include but are not limited to:

- Implementing all elements of the LID, including but not limited to:
 - Implementation of prompt and effective erosion and sediment control measures
 - Implementing all non-storm water management, and materials and waste management activities, such as: monitoring, discharges, general site clean-up; vehicle and equipment cleaning, spill control; ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems, etc.
- Pre-storm inspections
- Storm event inspections
- Post-storm inspections
- Routine inspections as described in the LID
- Ensuring elimination of all unauthorized discharges
- The Owner shall be assigned authority to mobilize crews in order to make immediate repairs to the control measures.
- Coordinate all of the necessary corrections/repairs are made immediately, and that the project complies with the LID at all times.
- Managing and report any Illicit Connections or Illegal Discharges.

Ownership Note: After final construction an HOA will be formed and will assume all responsibility for maintenance and implementation of this document.

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A. References

The following documents are made a part of this LID by reference:

- Project plans and specifications for Grading and Utilities, prepared by MFKessler Inc., One Venture Ste 130, Irvine, CA 91618
- MS4 Permit within Los Angeles County (CAS00401, Order No. R42012-0175)
- California Stormwater BMP Handbook – Construction, January 2003
- California Stormwater BMP Handbook – New Development and Redevelopment, January 2003
- County of Los Angeles Department of Public Works Low Impact Development Standards Manual, February 2014

Section 400 – Body of LID

A. Objectives

Low Impact Development (LID) Mitigation Plan has four main objectives:

- 1) Identify all pollutant sources, including sources of sediment that may affect the quality of storm water discharges associated with daily use / activity (storm water discharges) from the property site.
- 2) Identify non-storm water discharges.
- 3) Identify, construct, implement and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the property site.
- 4) Develop a maintenance schedule for BMPs designed to reduce or eliminate pollutants.
- 5) HOA will be formed for the subject site, after development is completed the HOA will be responsible for implementation and maintenance of BMP's

B. Project Background and Description

The project site is currently a commercial lot with various commercial buildings as TTM 73661.

The proposed project (5.43 AC) will include 8 condominium buildings and 1 podium building. The subject site will include residential for sale units, private streets, open space and landscape throughout the development.

The existing site currently resides as an old car dealership. The exiting site surface flows to the south and west. Currently the existing site is 6% pervious. The proposed development is proposed as 20% pervious and include required vehicular pavement and open space, and parking as required by planning for the subject development. Existing flow enters the right of way and flows into existing catch basins south along Camino De Teodoro (LA County Storm Drain). No current water quality BMP are in place and utilized on the current site.

The current soils condition do not allow for infiltration in accordance to field testing and the projects geotechnical report included herein. In lieu of infiltration the proposed project will install a proprietary filter to simulate the natural bio-filtration process. The proposed filter treats storm water on a flow based value by allows flow to base through the bio-media.

The proposed development will drain roof runoff to landscape areas where they will enter an area drain system which will drain into the storm drain system. The streets of the proposed development will drain into catch basins which will drain into storm drains which will drain to underground infiltration chambers. Excess flow will also flow into the

storm drain system. The storm drain system ties into the 48" storm drain on San Bernardino Rd.

The storm drain system in around the subject project is owned and maintained publically by LA COUNTY Flood Control until it flows into the Walnut Creek Wash to the San Gabriel River which outlets in the Pacific Ocean, All reaches are listed as a 303(d) water body. Various 303(d) contaminates of concern are shown in Figure 3.

Abbreviation Note

The property is to be developed by The Olson Company that are also the ultimate owners. The property owner will be responsible for the maintenance of the project until an HOA is formed.

C. Vicinity Map

The subject project is located in the City of Covina, County of Los Angeles.

The area surrounding the project would be considered residential use on the north, east and northwest sides and industrial to the south and southwest.

Please refer to Figure 1 & 2 for Vicinity and Location maps.

D. Existing Site Drainage Condition

The existing site currently surface flows directly into 3rd Avenue and San Bernardino Road at a gradient of 1.5%.

E. LID Project Types, Characteristics, & Activities

This proposed development is subject to the Los Angeles County Department of Public Works' (LACDPW) requirement for the LID under the "development projects equal to one acre or greater of disturbed area and adding more than 10,000 square feet of pervious area" and "parking lots with 5,000 square feet or more of impervious area, or with 25 or more parking space and also defined as redevelopment per LID manual section 2-1 which are "development that result in creation or addition or replacement of either (1) 5000 square feet or more of impervious surface that was previously development." According to the LID Manual, "redevelopment" does not include the routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety. Impervious surface replacement such as reconstruction of parking lots and roadways, which does not disturb additional area and maintains the original grade and alignment in considered routine maintenance activity. Redevelopment does not include repaving of existing roads to maintain original line and grade. Per the Los Angeles County LID Manual the subject project is considered a "designated project."

F. Source Control BMPs

Project proponents shall implement Site Design concepts that achieve each of the following:

- Minimize Urban Runoff
- Minimize Impervious Footprint
- Conserve Natural Areas
- Minimize Directly Connected Impervious Areas (DCIAs)

The following tables identify the source control and treatment BMPs and how each implemented to achieve each Site Design concept.

Table-1: Design BMPs

BMP	TECHNIQUE	INCLUDED?		BRIEF DESCRIPTION OF METHOD
		YES	NO	
	Site Planning	X		All streets and pavement sections are to be constructed at minimum width as required by City planning staff and fire requirements.
	Protection of Natural Areas		X	The project site does not have any natural areas to protect.
	Minimization of land Disturbance and Minimize Impervious cover	X		Project area include required open space, private open space and require parking. Project proposes to construct the required parking stall and number of stalls as required by planning comission

Table-2: Treatment BMPs

BMP	NAME	INCLUDED?		IF NOT APPLICABLE, STATE BRIEF REASON
		YES	NO	
TC-31	Vegetated (Grass) Strips		X	Not part of the site plan
TC-30	Vegetated (Grass) Swales		X	Not part of the site plan

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BMP	NAME	INCLUDED?		IF NOT APPLICABLE, STATE BRIEF REASON
		YES	NO	
MP-52	Drain Inserts	X		Drain inserts are proposed in both catch basin
TC-22	Dry Detention Basin (Extended Detention Basin)		X	The project does not utilize this BMP for treatment
TC-20	Wet Detention Basin		X	The project does not utilize this BMP for treatment
TC-21	Constructed Wetland		X	This is not a wetland area/ development.
TC-10	Detention Basin/Sand Filter		X	The project does not utilize this BMP for treatment
TC-12	Porous Pavement Detention		X	The projects underlying soils is not suitable for infiltration.
TC-11	Infiltration Basin		X	The projects underlying soils is not suitable for infiltration.
TC-10	Infiltration Trench	X		Storm drains will drain to underground infiltration chambers
TC-40	Bio Media Chamber		X	The proposed bio-filter is located upon exit of all storm drain water leaving the project site

Table-3: Source Control BMPs

BMP	BMP DESCRIPTION	CHECK ONE		IF NOT APPLICABLE, STATE BRIEF REASON
		INCLUDED?	NOT APPLICABLE	
	Non-Structural Source Control BMPs:			
	Education for Leasers, Operators, Occupants, or Employees	X		
	Activity Restrictions (CC&Rs)	X		

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BMP	BMP DESCRIPTION	CHECK ONE		IF APPLICABLE, STATE REASON
		INCLUDED?	NOT APPLICABLE	
SD-12	Efficient Irrigation System and Landscape Maintenance	X		
SD-32	Common Area Litter Control	X		
SE-7	Street Sweeping Private Streets and Parking Lots	X		
	Drainage Facility Inspection and Maintenance	X		
	Structural Source Control BMPs:			
SD-13	MS4 Stenciling and Signage	X		
SD-12	Landscape and Irrigation System Design	X		
SD-10	Protect Slopes and Channels		X	No slopes to protect on the subject site
SD-30	Provide Community Car Wash Racks		X	Car Wash Racks are not permitted within the proposed development – Not Applicable.
	Proper Site Design:			
SD-30	Fueling Areas		X	Not Applicable
SD-33	Air/Water Supply Area Drainage		X	Not Applicable

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BMP	BMP DESCRIPTION	CHECK ONE		IF APPLICABLE, STATE REASON
		INCLUDED?	NOT APPLICABLE	
SD-32	Trash Storage Areas		X	No Common trash storage areas are proposed for the subject project.
SD-31	Loading Docks		X	Not Applicable
SD-31	Maintenance Bays		X	Not Applicable
SD-33	Vehicle and Equipment Wash Areas		X	Not Applicable
SD-35	Outdoor Material Storage Areas		X	Not Applicable
SD-36	Outdoor Work Areas or Processing Areas		X	Not Applicable
	Provide Wash Water Controls for Food Preparation Areas		X	Not Applicable

Non-Structural Measures

Non-structural BMPs are generally managerial, educational, inspection and/ or maintenance oriented. These items consist of educating employees and occupants, developing and implementing Owner guidelines, implementing BMPs and enforcing Code requirements. Non-structural BMPs used for this project are summarized below:

Education for Employees and Occupants

Practical informational materials will be provided to owners, occupants and employees on general good housekeeping practices that contribute to protection of storm water quality. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of specified wastes via hosing or other direct discharge to gutters, catch basins and storm drains.

The property owner will provide these materials. Thereafter, such materials will be available through the property owner education program.

This program must be maintained, enforced, and updated periodically by the property owner. Educational materials including, but not limited to, the materials included in the TTM 73661

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Appendix section of this plan will be made available to the employees and contractors of the property owner.

Activity Restrictions

Conditions, covenants and restrictions (CC&Rs) must be prepared by the developer for the appointed HOA for the purpose of surface water quality protection. The CC&R shall incorporate the restrictions based on the Project LID. Activities including outdoor material storage and car washing will not be permitted.

Common Area Landscape Management

Management programs will be designed and established by the property owner, who will maintain the common areas within the project site. These programs will include how to mitigate the potential dangers of fertilizer and pesticide usage (refer to the Maintenance and Frequency Table).

Ongoing maintenance will be consistent with the State of California Model Water-Efficient Landscape Ordinance.

Fertilizer and pesticide usage shall be consistent with County Management Guidelines for use of Fertilizers and Pesticides.

BMP Maintenance

The property owner(s) will be responsible for implementing each of the BMPs detailed in this plan. The property owner will also be responsible for cleaning and maintaining the BMPs on a regular basis. Maintenance operations should be logged in Appendix G.

Uniform Fire Code Implementation

The property owner will comply with this Code.

Common Area Litter Control

The property owners through the HOA and the contracted maintenance company will perform required common area litter control

Employee Training

A training program will be established as it would apply to future employees, contractors, and leasers of the property owner to inform and train in maintenance activities regarding the impact of dumping oil, paints, solvents, or other potentially harmful chemicals into storm drains; the proper use of fertilizers and pesticides in landscaping maintenance practices; and the impacts of littering and improper water disposal.

Catch Basin Inspection

The property owner will maintain the drainage systems, including catch basins and culverts. The property owner is required to have catch basins inspected and, if necessary, cleaned prior to the storm season, no later than October 15th each year

prior to the "first flush" storm. These duties may be contracted out to the landscape maintenance firm hired by the property owner. Please see Appendix E for maintenance program. Maintenance operations should be logged in Appendix G.

Street Sweeping Private Streets and Parking Lots

The property owner shall clean the surface of pavement surfaces by mechanized methods one time a month.

G. Structural BMPs

Structural BMPs shall be installed by the developer/ owner, through the construction and development of the project, for instance; slope planting and irrigation systems shall be designed by licensed landscape architects and installed by qualified contractors to specifications and standards of Los Angeles County. The structural BMPs used for this project are summarized below:

With this project we anticipate on-site trash, and the potential of on-site automobile oil. To mitigate these pollutants we propose the structural best management practices listed.

Efficient Irrigation

As part of the design of all common area landscape irrigation shall employ water conservation principals, including, but not limited to, such provisions as water sensors, programmable irrigation times (for short cycles), etc., will be used. Such common areas will be maintained by the property owner.

Runoff-Minimizing Landscape Design

As part of the design of all common area landscape areas, similar planting material with similar water requirements will be used in order to reduce excess irrigation runoff and promote surface filtration. Such common areas will be maintained by the property owner/HOA.

Car Wash Racks

No car wash rack or area will be provided, therefore, washing of vehicles by employees on the property will not be allowed.

Trash Container (Dumpster) Areas

Community trash container areas are not provided as part of this project.

Self Contained Washing

Self-contained washing of vehicles by employees or clients on the property will not be allowed.

Outdoor Material Storage Areas

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity

for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Outdoor Storage by home owners on the property will not be allowed.

Catch Basin Stenciling

Phrase "No Dumping – Drains to Ocean" or equally effective phrase to be stenciled on catch basins to alert the public to the destination of pollutants discharged into storm water. This stenciling will be inspected and re-stenciled on a periodic basis by the property owner. Please see Figure five (5) for maintenance frequency.

Inlet trash Racks

Trash racks will be installed within the on site catch basin. The development will be swept regularly to minimize the amount of trash and debris on-site. Debris shall be monitored throughout the year and shall be cleaned out once a month and prior to any rain event.

Bio-Media Filter

A Bio-media filter will be installed upon outfall into the County storm drain system. The filter will be required to be maintained in accordance with manufactures recommendations. Debris shall be monitored throughout the year and shall be cleaned out once a month and prior to any rain event.

H. BMP Maintenance, Inspection, and Repair

Inspections will be conducted as follows:

- Annually prior to the start of the rainy season
- Every (1) month during rainy season
- At any other time(s) or intervals of time specified in the contract documents

An inspection form shall be completed at least once per year prior to the start of the rainy season. This inspection check-sheet (see Appendix G) shall be included in this report and kept onsite at all times. The check-sheet should be filled out completely and clearly indicate any BMPs that are in need of repair or maintenance. These repairs and/or maintenance procedures shall be carried out at the soonest possible time.

A legible log shall be kept on site to record the inspection of the stormwater pollution abatement control measures. The record must contain the following information: (i) type of maintenance activities or source-control practices; (ii) date the activities are completed; and (iii) the name of the operator performing the activities. During transfer of ownership/operation of the facility, the current owner must notify the new owner/operator of the BMPs and the associated maintenance activities that also transfer to the new owner/operator of the property. See Appendix G.

I. Inspection, Maintenance, and Responsibility for BMPs

The following tables show the lists of the post-construction BMPs (routine non-structural and structural), the required ongoing maintenance, the inspection and maintenance frequency, the inspection criteria, and the entity or party responsible for implementation, maintenance, and/or inspection.

Table-4: Non-Structural BMP Maintenance Responsibility/Frequency Matrix

BMP	RESPONSIBILITY	FREQUENCY
Leaser/ Occupant Education, Activity Restrictions	The property owner will provide educational materials.	Continuous. Maintenance/ Educational materials to be provided to leasers/ occupants at the time they lease the apartment and updates provided by the property owner as they occur.
Common Area Landscape Management	The property owner through it's landscape maintenance contractor	Monthly during regular maintenance and use with management guidelines for use of fertilizers and pesticides.
Parking Areas and Drives Management	The property owner through it's landscape maintenance contractor	The Parking Areas and Drives are to be swept on a routine scheduled basis to facilitate the pickup of trash and debris (plant or otherwise) and to remove excessive oil, grease and build-up. During sweeping, debris is to be removed from the parking areas and drives and then scrubbed and rinsed. This sweeping schedule will be at a minimum occurrence of once a month and as necessary to rid / reduce active pollutants from the pavement areas. This maintenance requirement will be listed in the Maintenance Contract for this project.
Litter Control by Sweeping	The property owner through its landscape maintenance contractor.	Daily inspection of trash receptacles to ensure that lids are closed and pick up any excess trash on the ground, noting trash disposal violations to the property owner for remediation.

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BMP	RESPONSIBILITY	FREQUENCY
Employee Training	The property owner will train the landscape contractors after construction.	Monthly for maintenance personnel and employees to include the educational materials contained in the approved LID.
Common Area Catch Basin Inspection & Cleaning	The property owner through it's landscape maintenance contractor for common areas and storm drain facilities	Inspect basins once a month. Clean debris and silt in bottom of catch basins as needed. Intensified on or about October 1 of each year, prior to "first flush" storm. See Appendix "G"

Table-5: Structural BMP Maintenance Responsibility/Frequency Matrix

BMP	RESPONSIBILITY	FREQUENCY
Filtration Units	The property owner after construction	Filters will need to be maintained once a year one month prior to the rainy season and per Manufacturers recommendations.
Common Area Efficient Irrigation	The property owner through it's landscape contractors after construction	Once a week, in conjunction with maintenance activities. Verify that runoff minimizing landscape design continues to function by checking that water sensors are functioning properly, that irrigation heads are adjusted properly to eliminate overspray to hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather and day or night time temperatures.
Common Area Runoff Efficient Landscape Design	The property owner through it's landscaping contractors	Once a week in conjunction with maintenance activities and prior to finalizing any replanting schemes. Verify that plants continue to be grouped according to similar water requirements in order to reduce excess irrigation runoff.
Catch Basin Stenciling	The property owner providing maintenance	A warning stencil will be painted on top and in view with the words: "No-Dumping – Drains to Ocean" At all catch basin, drain inlets draining to the street or storm drain system. See Appendix "F" (example). Once every 6 months, inspect for re-stenciling needs. Re-stencil as needed immediately.

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BMP	RESPONSIBILITY	FREQUENCY
Brentwood Infiltration Trench	The property owner providing maintenance	Inspections every 6 months and as recommended by manufacturer.

J. Operation/Maintenance Funding after Project Completion

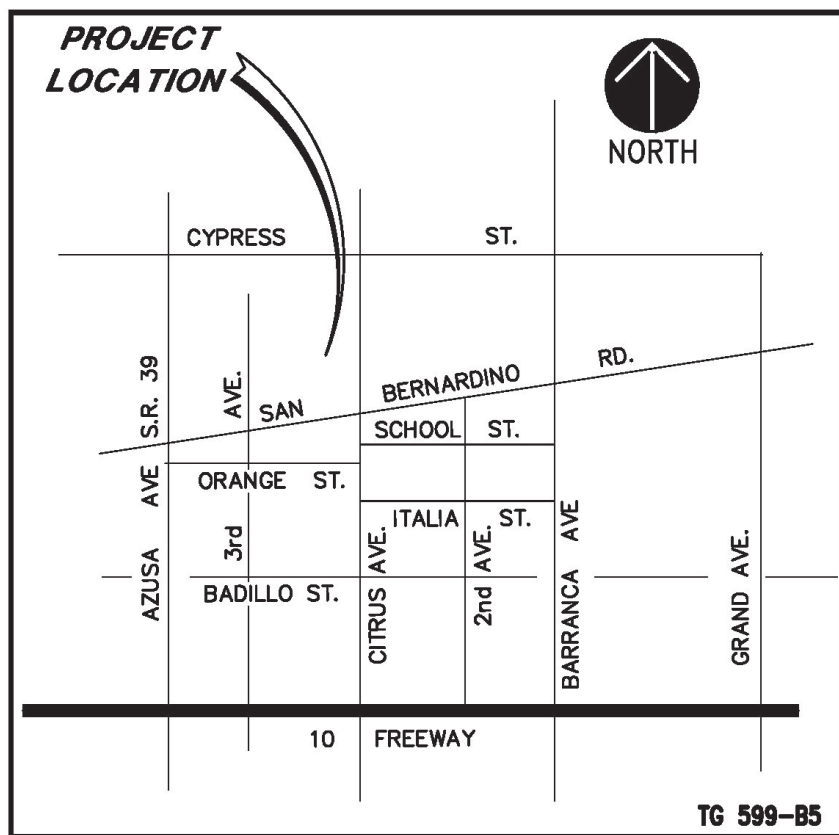
The post-construction BMPs as described above will be funded and maintained by:

Bently Real Estate, LLC
100 N. Barranca Suite 900
West Covina, CA 91791
Contact: Tarif Alhassen
Tel: (626) 616-3605

- Maintenance requirements and responsibilities for the property will be listed in the Maintenance Contract for this project and will be the responsibility of the property owner at all times.

Figure
Project Vicinity Map

-1:

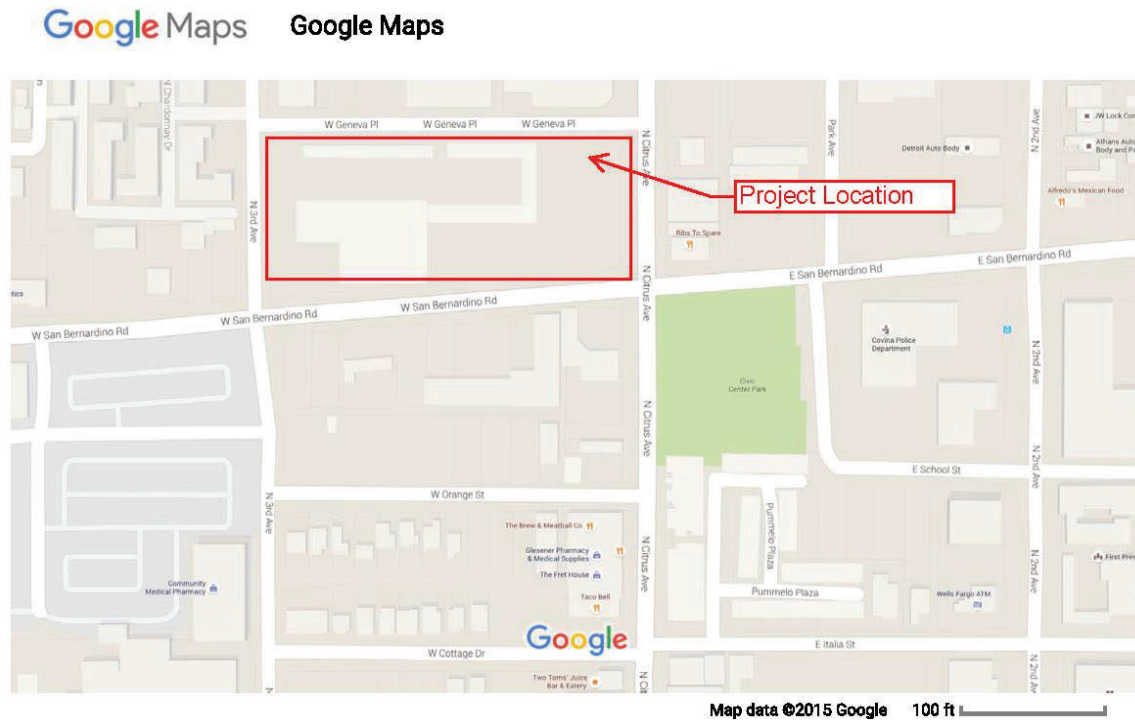


VICINITY MAP
N.T.S.

Figure
Project Location Map

-2:

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Low Impact Development (LID) Mitigation Plan
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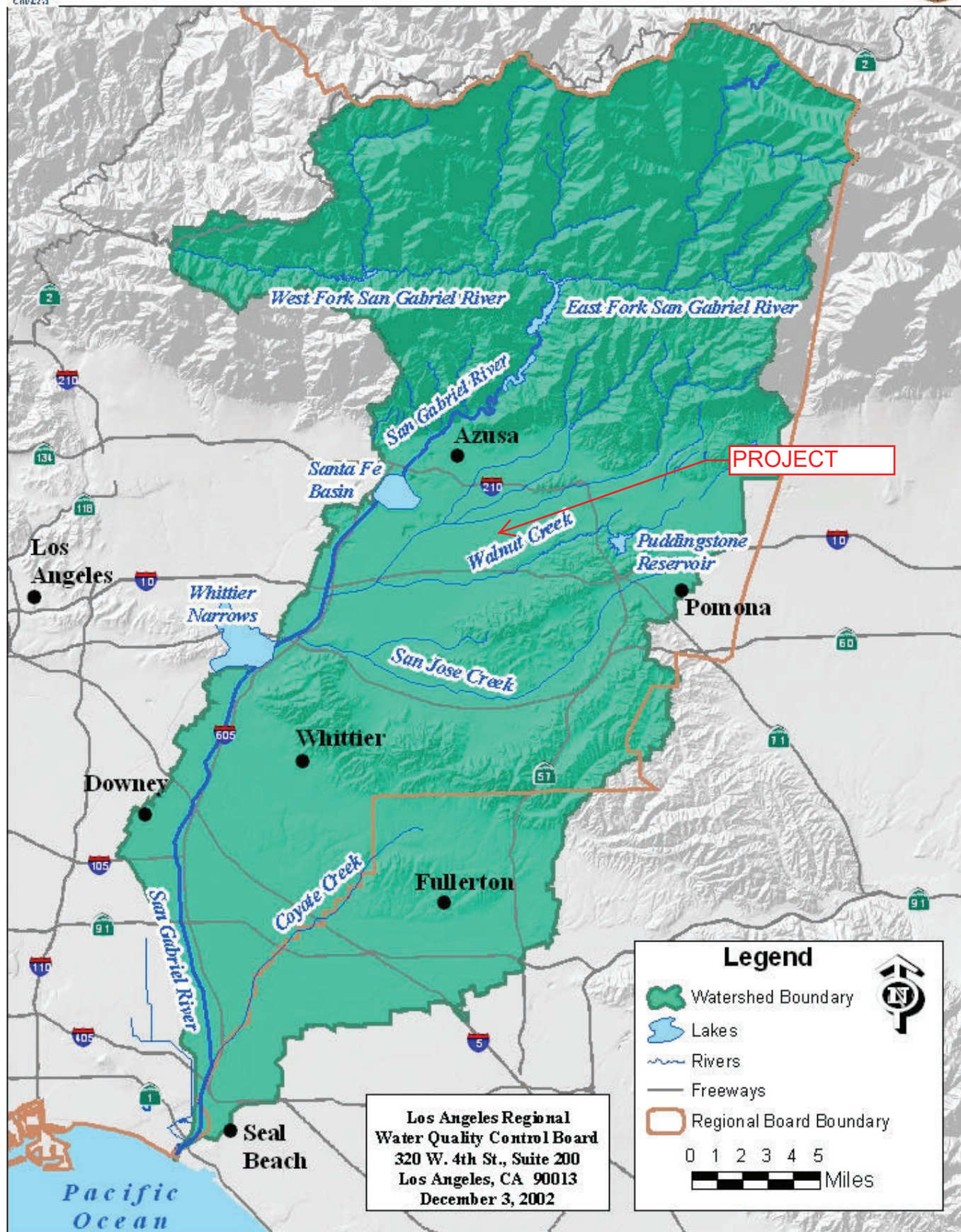
Figure
Impaired Waters

-3:

Water Body	303(d) contaminants list:
(1) Walnut Creek Wash	Benthic-Macroinvertebrate Bioassessments, Indicator Bacteria, pH
(2) San Gabriel River Reach 3	Indicator Bacteria,
(3) San Gabriel River Reach 2	Coliform Bacteria, Cyanide, Lead,
(4) San Gabriel River Reach 1	Coliform Bacteria, pH
(5) San Gabriel River Estuary	Copper, Dioxin, Nickel, DO
(6) San Pedro Bay	Chlordane, DDT, PCBs, Sediment Toxicity,



San Gabriel River Watershed



Appendix
Volume and Flow Rate Calculations

A:

Peak Flow Hydrologic Analysis

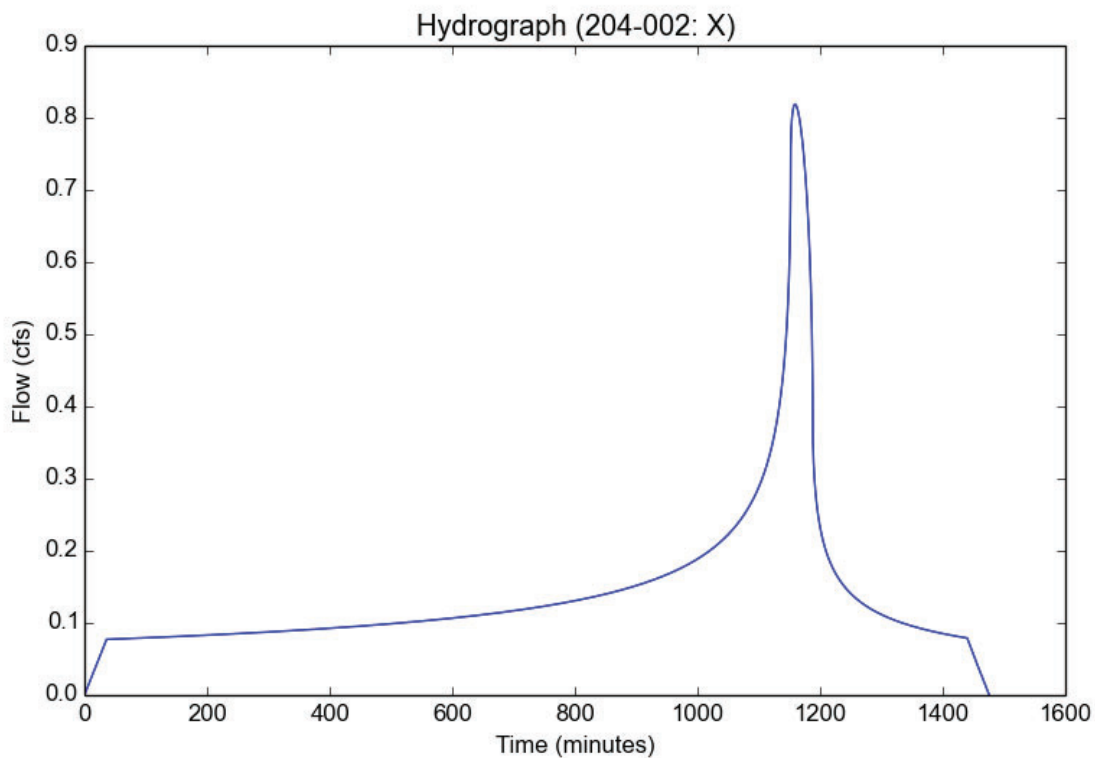
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1769
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.852
Time of Concentration (min)	36.0
Clear Peak Flow Rate (cfs)	0.8186
Burned Peak Flow Rate (cfs)	0.8186
24-Hr Clear Runoff Volume (ac-ft)	0.2868
24-Hr Clear Runoff Volume (cu-ft)	12491.3793



Peak Flow Hydrologic Analysis

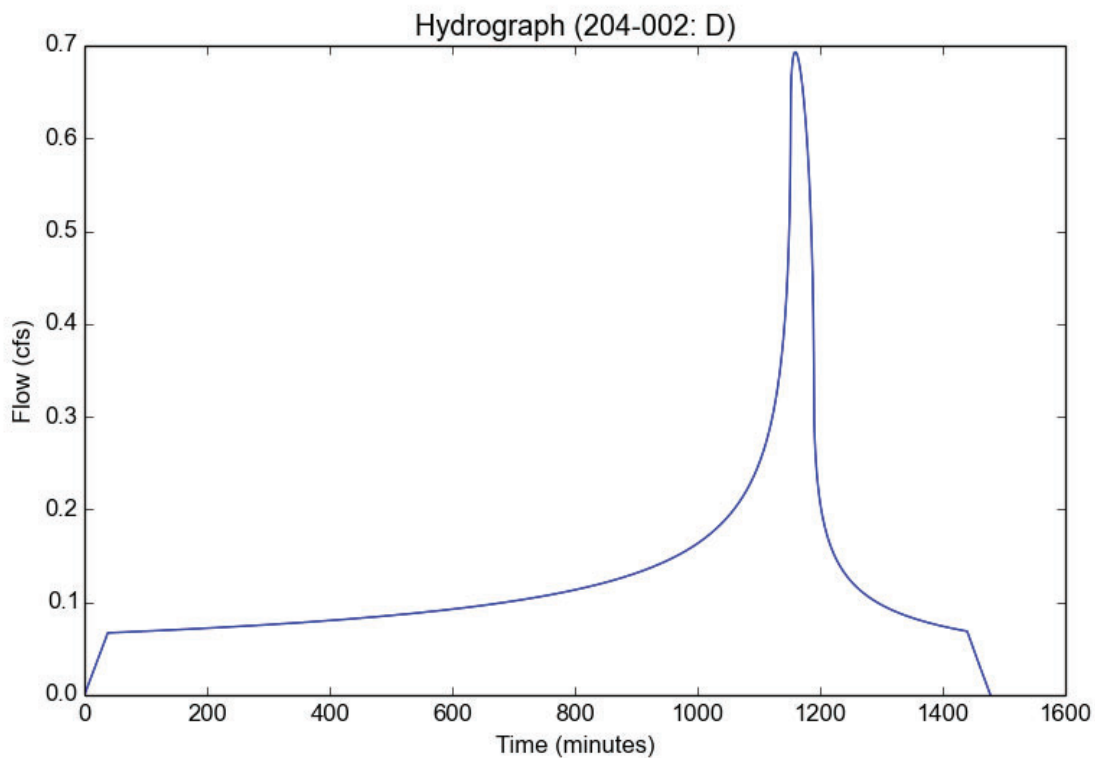
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Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
0.75-inch Rainfall Depth (in)	0.75
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	0.75 inch storm
Fire Factor	0
LID	True

Output Results

Modeled (0.75 inch storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1725
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.74
Time of Concentration (min)	38.0
Clear Peak Flow Rate (cfs)	0.6931
Burned Peak Flow Rate (cfs)	0.6931
24-Hr Clear Runoff Volume (ac-ft)	0.2491
24-Hr Clear Runoff Volume (cu-ft)	10849.3409



Peak Flow Hydrologic Analysis

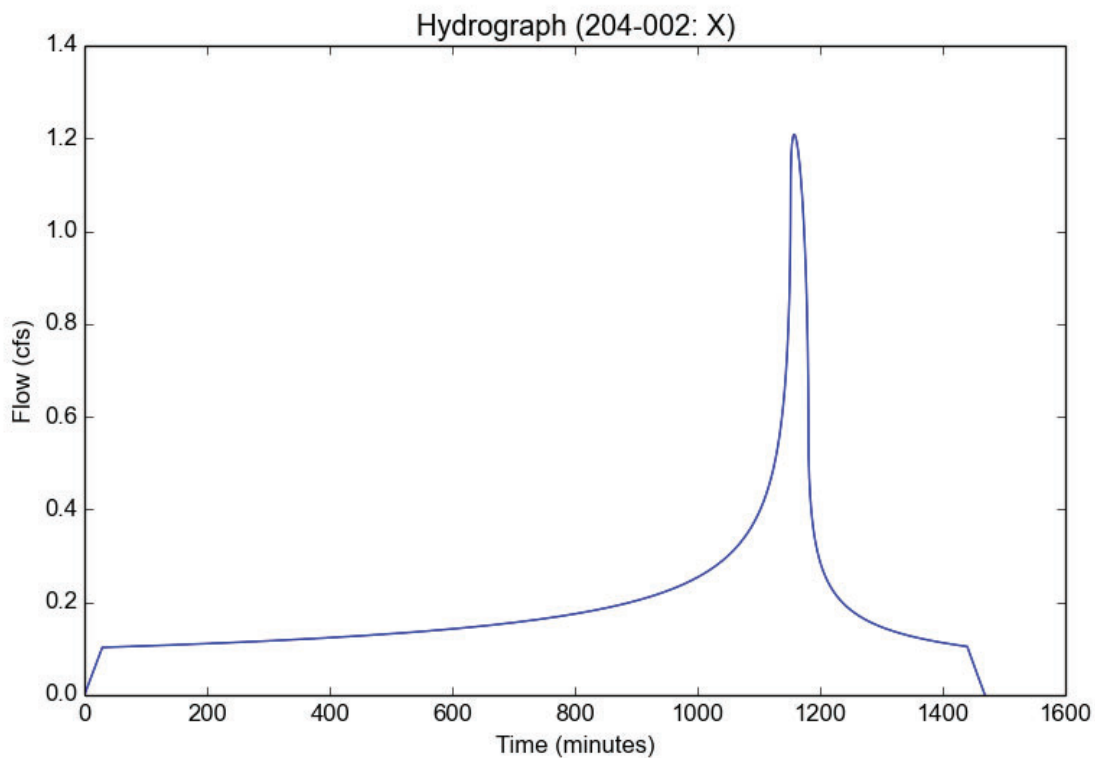
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	204-002
Subarea ID	X
Area (ac)	5.43
Flow Path Length (ft)	710.0
Flow Path Slope (vft/hft)	0.012
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.94
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.2612
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.852
Time of Concentration (min)	29.0
Clear Peak Flow Rate (cfs)	1.2082
Burned Peak Flow Rate (cfs)	1.2082
24-Hr Clear Runoff Volume (ac-ft)	0.3823
24-Hr Clear Runoff Volume (cu-ft)	16655.0746



Peak Flow Hydrologic Analysis

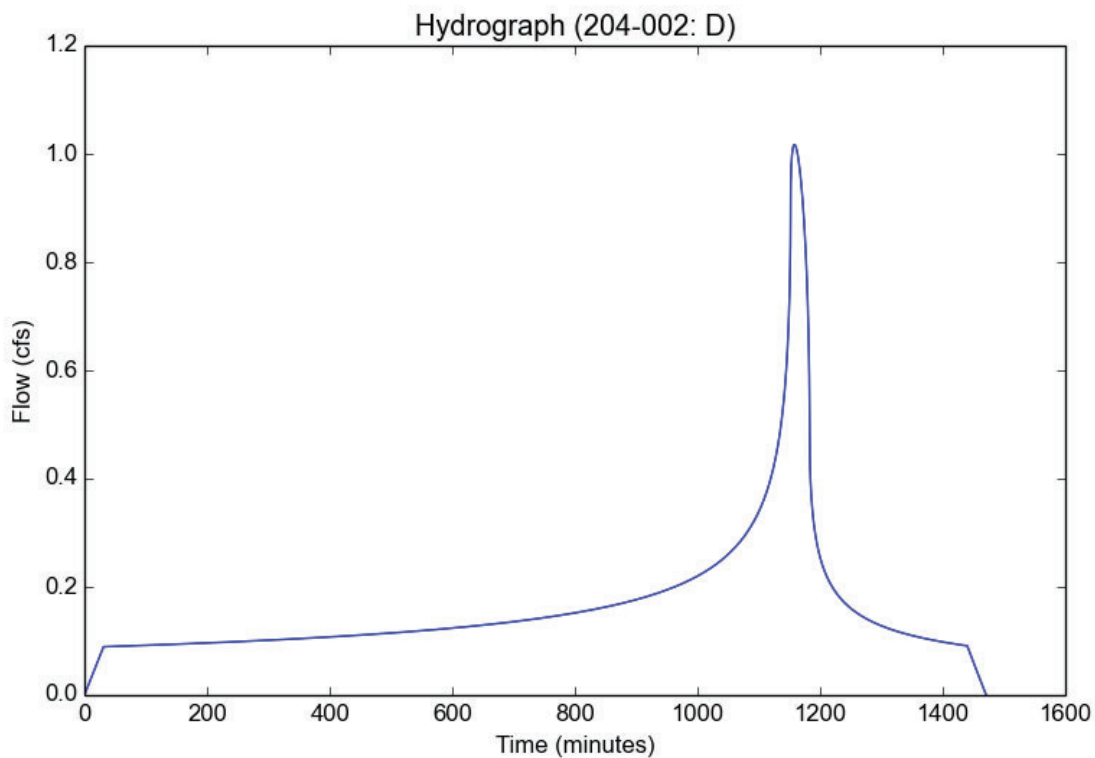
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Version: HydroCalc 1.0.2

Input Parameters

Project Name	204-002
Subarea ID	D
Area (ac)	5.43
Flow Path Length (ft)	695.0
Flow Path Slope (vft/hft)	0.014
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.2531
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.74
Time of Concentration (min)	31.0
Clear Peak Flow Rate (cfs)	1.017
Burned Peak Flow Rate (cfs)	1.017
24-Hr Clear Runoff Volume (ac-ft)	0.3321
24-Hr Clear Runoff Volume (cu-ft)	14465.6975



Appendix
Site BMPs

B:

Site Design & Landscape Planning SD-10



Design Objectives

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

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.



SD-10 Site Design & Landscape Planning

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

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regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

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

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Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

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

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

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

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

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



Rain Garden

Design Objectives

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

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain



barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say 1/4 to 1/2 inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylight some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

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

Supplemental Information

Examples

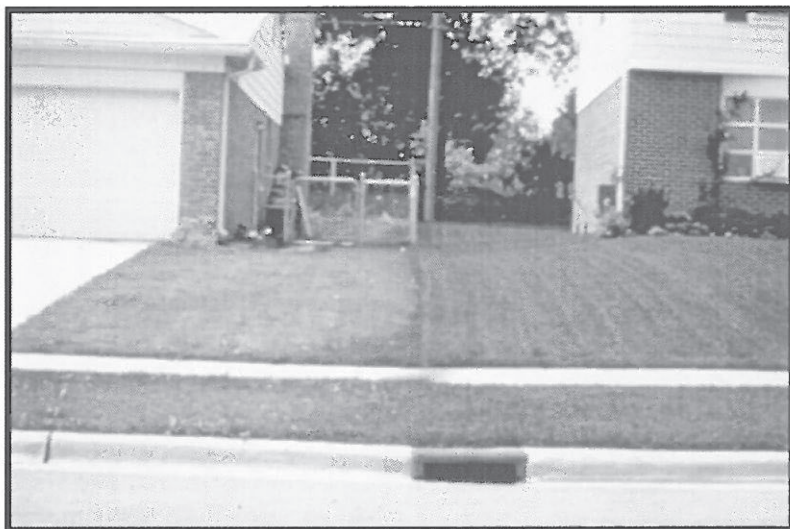
- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, “Low-Impact Development”, January/February 2003.
www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD.
www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition



Design Objectives

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

Description

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

Approach

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

Suitable Applications

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

Design Considerations

Designing New Installations

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

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



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

Redeveloping Existing Installations

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

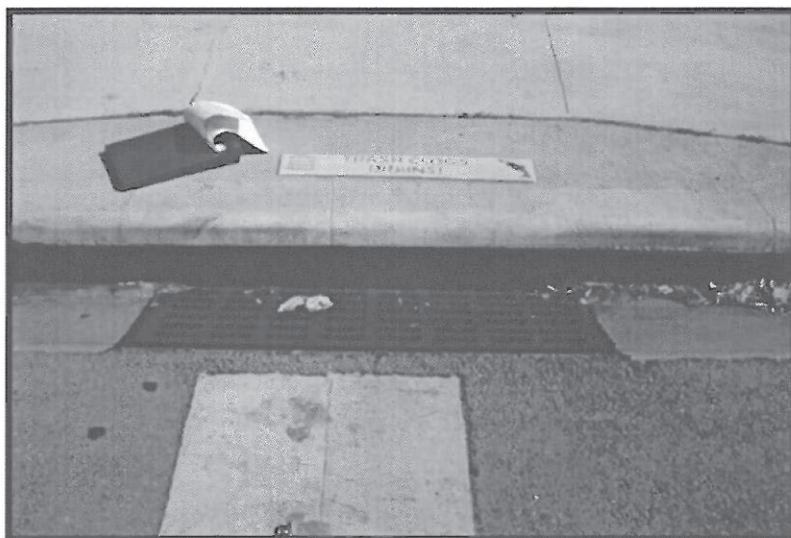
Other Resources

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Design Objectives

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

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING



– DRAINS TO OCEAN” and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of “redevelopment”, then the requirements stated under “designing new installations” above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner’s association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.
- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

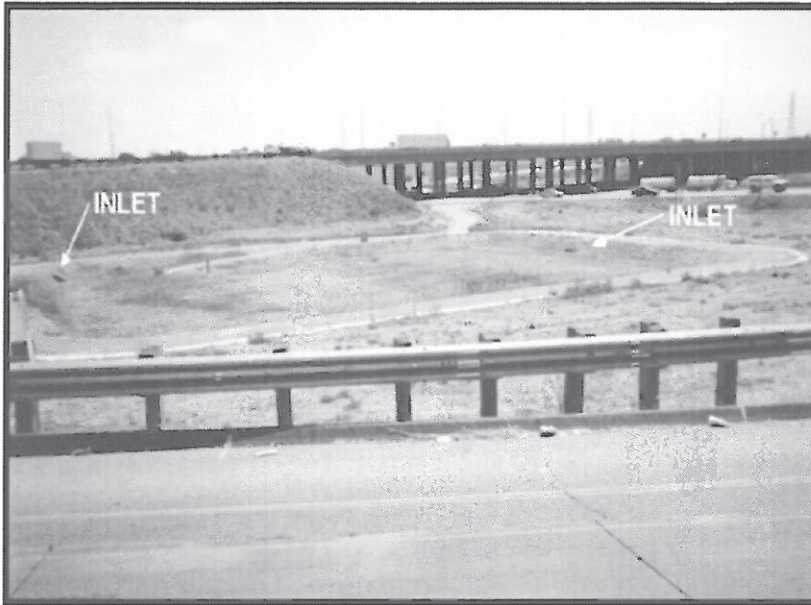
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Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.
- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

<input checked="" type="checkbox"/>	Sediment	■
<input checked="" type="checkbox"/>	Nutrients	■
<input checked="" type="checkbox"/>	Trash	■
<input checked="" type="checkbox"/>	Metals	■
<input checked="" type="checkbox"/>	Bacteria	■
<input checked="" type="checkbox"/>	Oil and Grease	■
<input checked="" type="checkbox"/>	Organics	■

Legend (Removal Effectiveness)

- Low
- High
- ▲ Medium



significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabilized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.
- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.
- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.
- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.
- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.
- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.
- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

- (1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.
- (2) Provide pretreatment if sediment loading is a maintenance concern for the basin.
- (3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.
- (4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m²)

WQV = water quality volume (m³)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

- (5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about \$2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about \$18/ft³ for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

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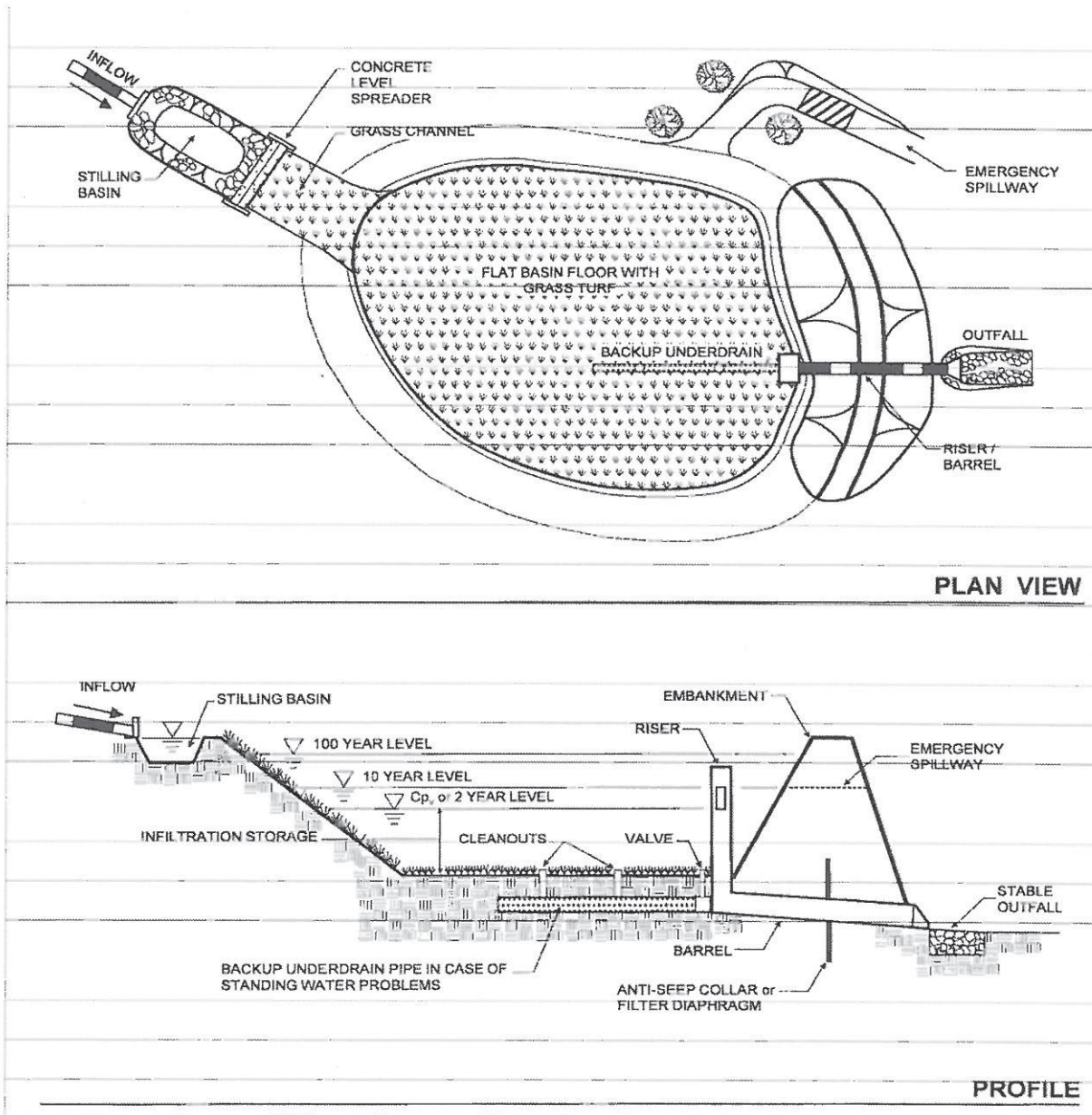
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Information Resources

Center for Watershed Protection (CWP). 1997. *Stormwater BMP Design Supplement for Cold Climates*. Prepared for U.S. Environmental Protection Agency Office of Wetlands, Oceans and Watersheds. Washington, DC.

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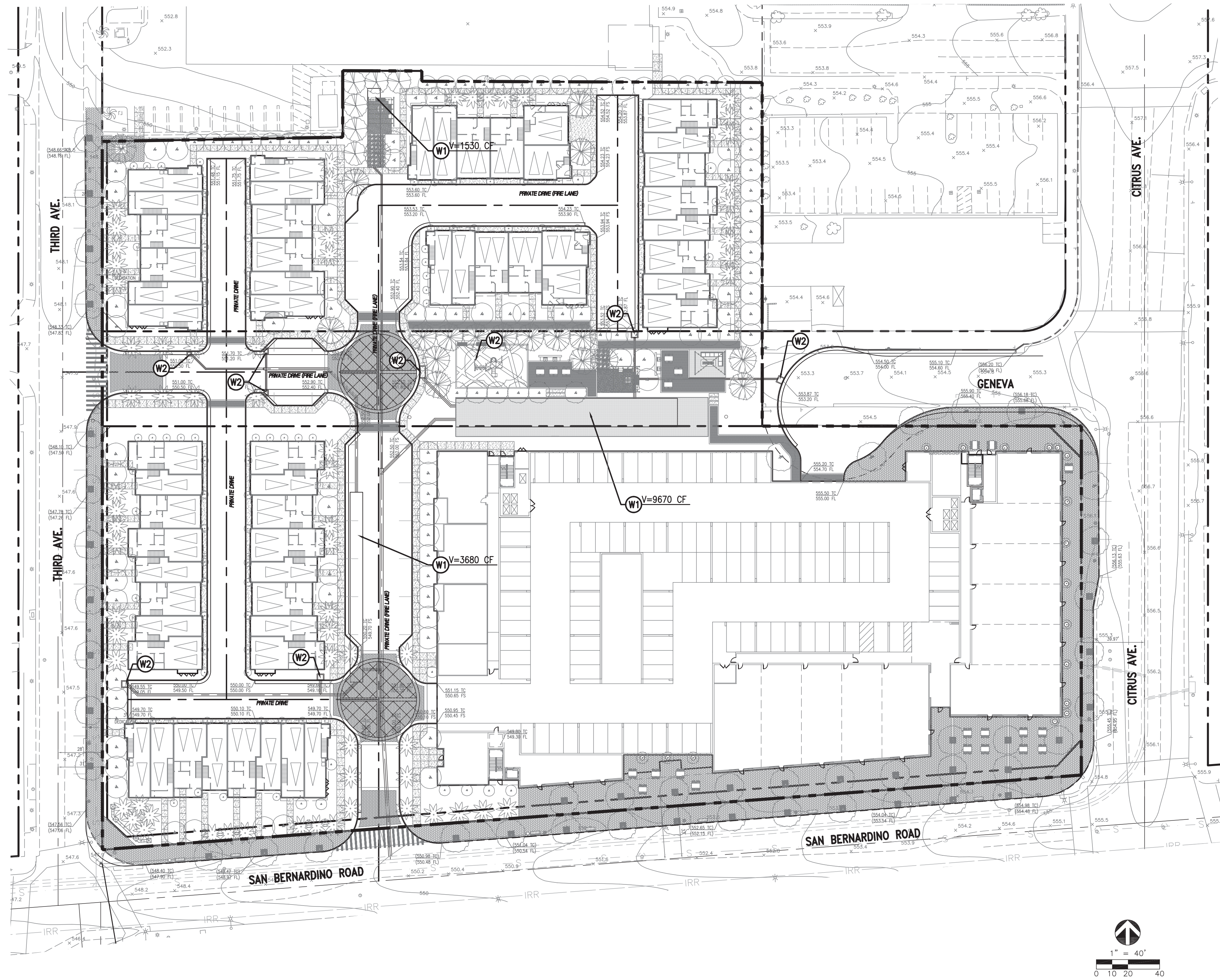
USEPA. 1993. *Guidance to Specify Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. EPA-840-B-92-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.



Appendix
BMP Exhibit

C:

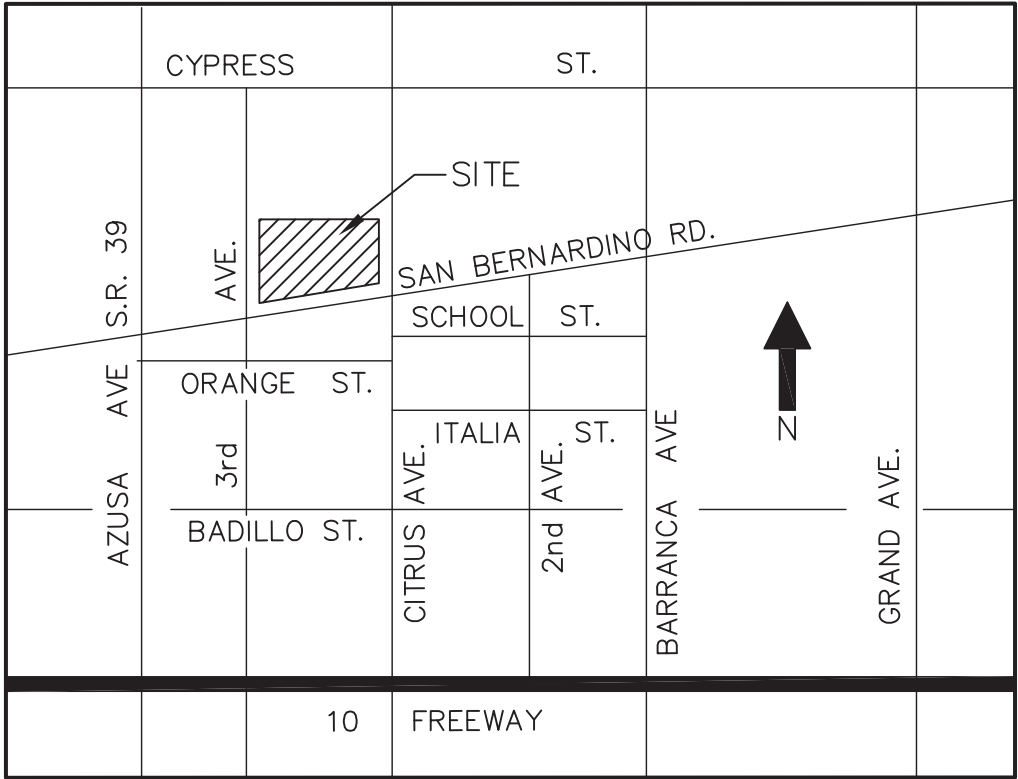
LID EXHIBIT
TRACT 73661



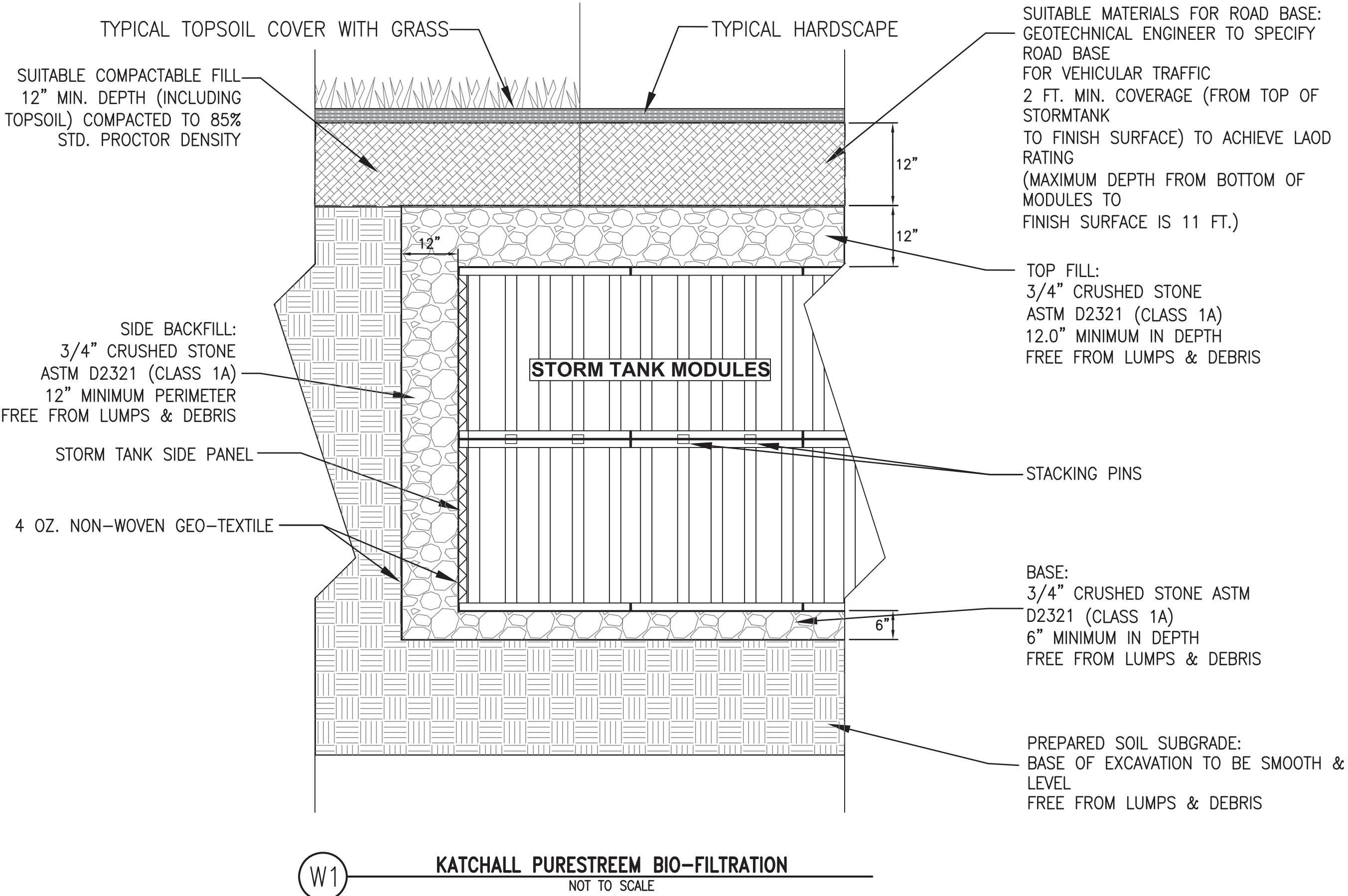
SOIL TYPE:	006
50 YR-24 HR RAINFALL:	7.1 IN.
85TH PERCENTILE RAINFALL:	1.0 IN.
POST DEVELOPMENT:	
PERVIOUS AREA	= 0.33 AC. (6%)
IMPERVIOUS AREA	= 5.10 AC. (94%)
Q _{25YEAR}	= 4.59 CFS
Q _{10YEAR}	= 10.88 CFS
Q _{5YEAR}	= 14.32 CFS
Q _{2YEAR}	= 17.52 CFS
V _{25HR}	= 14468 CF
V _{10HR}	= 10850 CF

BEST MANAGEMENT PRACTICES NOTES:

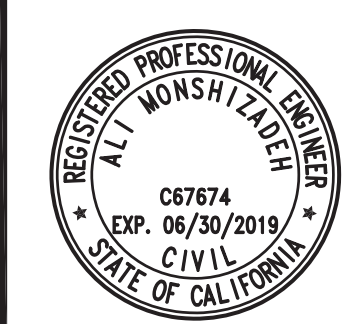
- (W1) — BRENTWOOD INDUSTRIES STORAGE AND INFILTRATION SYSTEM
(W2) — INSTALL KRISTAR FLOGARD PLUS CATCH BASIN FILTER INSERT OR APPROVED EQUAL.



THOMAS BROTHERS GUIDE PAGE 599 GRID B5
VICINITY MAP
N.T.S.



(W1) — **KATCHALL PURESTREAM BIO-FILTRATION**
NOT TO SCALE



PLAN PREPARED BY:
MFKessler
Civil Engineering, Land Planning, Surveying
ONE VENTURE, SUITE 130
IRVINE, CA 92618
(949) 339-5330
MFKESSLER.COM

CITY OF COVINA
LID EXHIBIT
TRACT 73661
3RD AVE. AND SAN BERNARDINO ROAD

SHEET
1 OF 1

Appendix

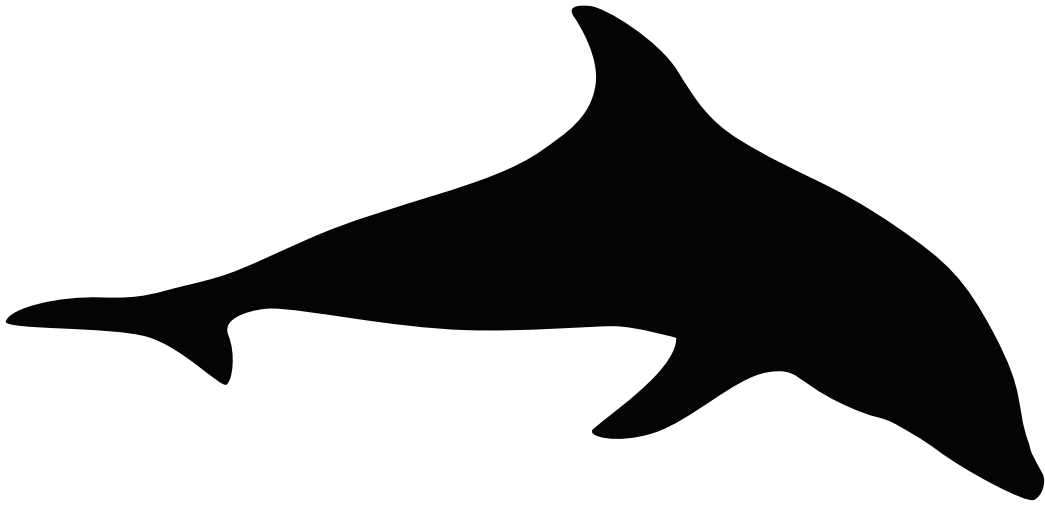
D:

"NO DUMPING – DRAINS TO OCEAN" Stencil Example



Sample Stencil 1

NO DUMPING

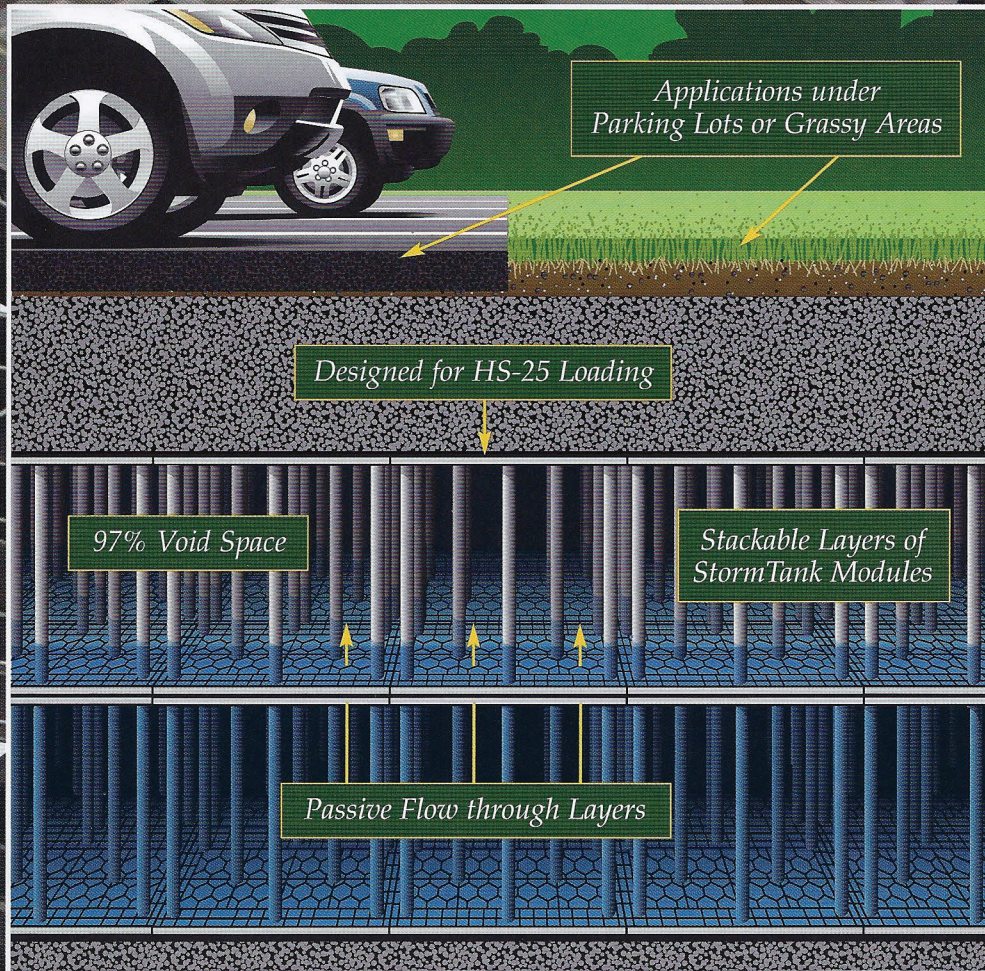


**DRAINS TO
OCEAN**

Appendix
Filter Unit

E:

STORMTANK™ STORMWATER STORAGE MODULES

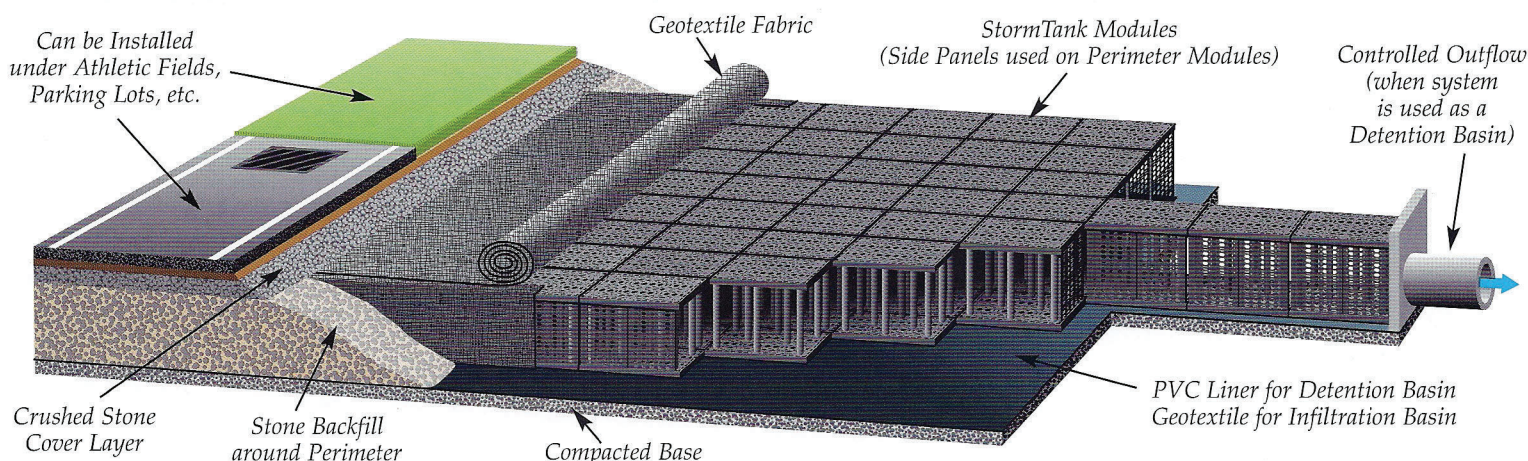


StormTank™

Stormwater Storage Modules are a high-void, strong, affordable alternative to crushed stone, concrete structures, or pipe chambers for sub-surface stormwater detention or infiltration basins.

 **BRENTWOOD**
INDUSTRIES

STORMTANK™ STORMWATER STORAGE SYSTEM



Brentwood's StormTank™ Stormwater Storage System is a high-void, strong, affordable alternative to crushed stone, concrete structures, or pipe chambers for sub-surface stormwater detention or infiltration basins.

HIGH VOID, HIGH STRENGTH Our modules offer the largest void space of any underground stormwater storage units currently on the market (97%), and are load-rated for use under parking lots, athletic fields, parks, etc. (Designed to exceed HS-25 loading criteria)!

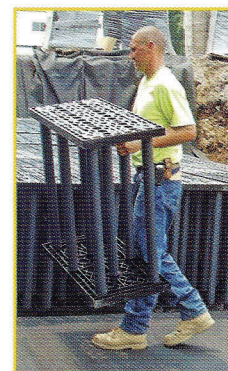
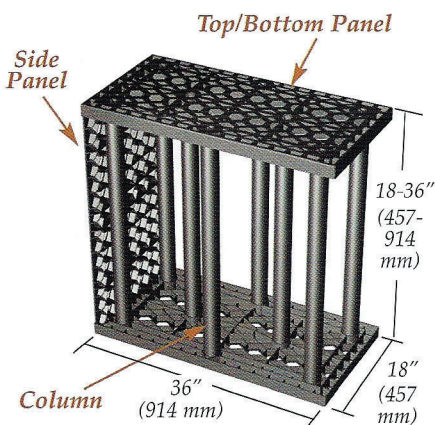
EASY TO INSTALL The entire StormTank Storage System is built on-site from Top/Bottom Panels and Side Panels made of rugged, lightweight polypropylene and 2-3/8" (60.3 mm) diameter PVC columns. Combinations of these three components create all the module configurations needed for a fully-functioning underground system (see example at top).

To minimize shipping costs, the StormTank components are delivered unassembled, but on-site assembly is a snap! No special equipment, tools, or bonding agents are needed to assemble or install the modules. All components easily attach with a secure concentric pressure fit.

EASY TO CLEAN The open tops/bottoms and sides of the modules makes flushing and cleaning easy ... a great advantage over storage systems where access is limited.

SAVES SPACE AND MONEY Because of its 97% void space, stackability, and HS-25 strength, a StormTank system offers significant space and cost savings when compared to conventional stormwater storage solutions. For example:

- A StormTank installation requires a much smaller footprint than a crushed rock system with the same amount of stormwater storage capacity. And less space used also means less expense for excavation, geotextile, liner, installation, and backfill.
- Because a StormTank system is installed underground, it frees up surface space for uses that would be otherwise unavailable with a typical detention pond.
- StormTank's stackability and variable column height can maximize the use of a site with limited surface area.



StormTank installation is quick & easy ... and requires no special tools or equipment!



BRENTWOOD INDUSTRIES

Brentwood Industries, Inc.

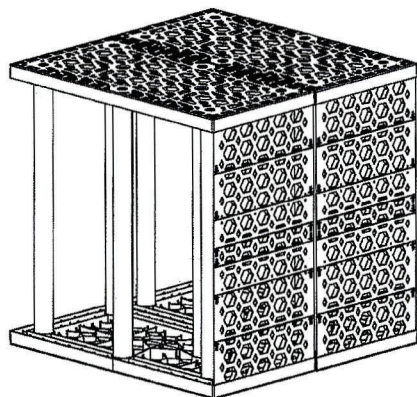
Mailing Address P.O. Box 605, Reading, PA 19603, USA

Shipping Address 610 Morgantown Rd., Reading, PA 19611

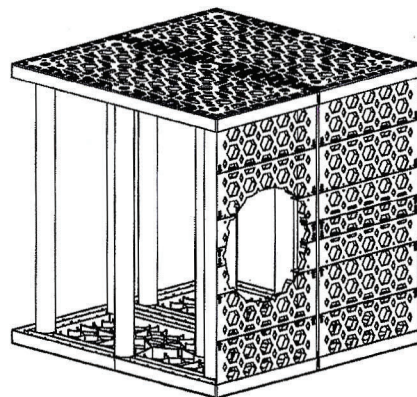
Phone 610.236.1100 Fax 610.736.1280

Email wwsales@brentw.com

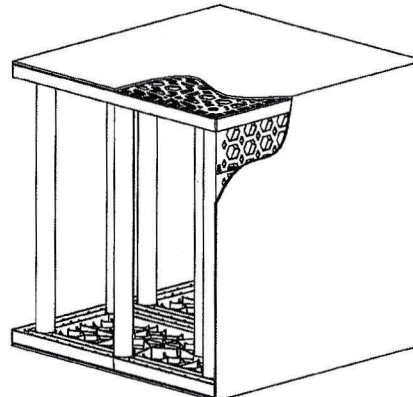
Website www.BrentwoodProcess.com



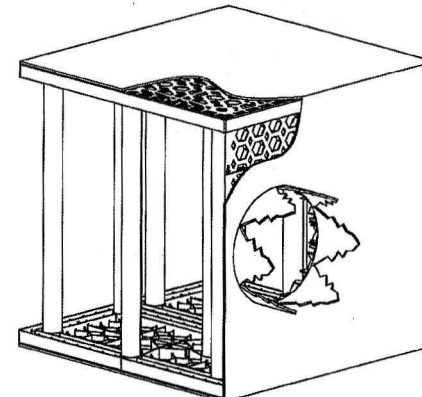
Installed StormTank Modules



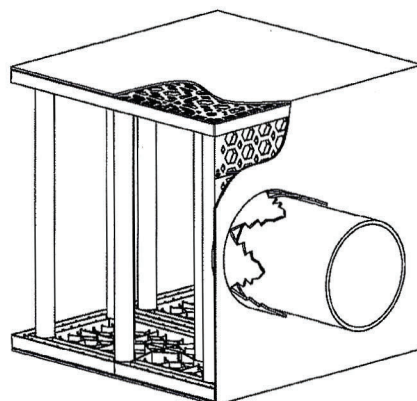
Hole cut into side panel for pipe.
Diameter not to exceed 14.0" OD.



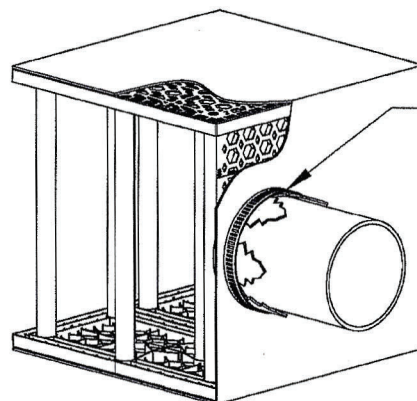
Geo Textile Wrapped around
entire Installation of StormTank Modules.




Hole Cut into Geo-Textile fabric
and edges peeled out.



Pipe inserted through hole in
side panel and Geo-Textile:
**Note: Geo-Textile fabric edges
are on outside of pipe.**



Pipe is sealed with banding
or water resistant tape.

 BRENTWOOD INDUSTRIES P.O. Box 605 610 Morgantown Road Reading, PA 19603 U.S.A. (610) 236-1100 / (610) 736-1280 (Fax) www.brentwoodprocess.com		Project Name		B
		StormTank Pipe Connections		
		Title		
		Typical Influent Pipe Connection		
TOLERANCES		Drawn By	Date	
HEIGHT	±1/2"	DMB	7-15-08	
LENGTH	±1/2"	Drawing No.	SCALE	
WIDTH	±1/2"	DRAWING_NO.	N.T.S.	
Rev. No.	Date	Record of Changes	By	Approv.

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INSTALLATION GUIDE



STORM TANK[®] *Module*

SITE PREPARATION & INSTALLATION INSTRUCTIONS

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General Conditions

- Review installation procedures and coordinate the installation with other construction activities, such as grading, excavation, utilities, construction access, erosion control, etc.
- Engineered Drawings supersede all provided documentation, as the information furnished in this document is based on a typical installation.
- When installed based on Brentwood’s Site Preparation and Installation Instructions or similar, a StormTank® system can support an HS-25 load.
- Coordinate the installation with manufacturer’s representative/distributor to be on-site to review start up procedures and installation instructions.
- Components shall be unloaded, handled and stored in an area protected from traffic and in a manner to prevent damage.
- Assembled modules may be walked on, but vehicular traffic is prohibited until backfilled per Manufacturer’s requirements. Protect the installation against damage with highly visible construction tape, fencing, or other means until construction is complete.
- Ensure all construction occurs in accordance with Federal, State and Local Laws, Ordinances, Regulations and Safety Requirements.
- Extra care and caution should be taken when temperatures are at or below 40° F (4.4° C).

1.0 StormTank® Assembly

StormTank® Modules:

StormTank® modules are delivered to the site as palletized components requiring simple assembly. No special equipment, tools or bonding agents are required; only a rubber mallet. A single worker can typically assemble a module in two minutes.

General Notes:

- Remove packaging material and check for any damage. Report any damaged components to a StormTank® Distributor or Brentwood personnel.
- StormTank® components are backed by a one year warranty, when installed per manufacturer's recommendations.

Step 1



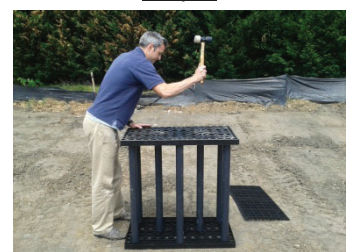
Place a platen on a firm level surface and insert the eight (8) columns into the platen receiver cups. Firmly tap each column with a rubber mallet to ensure the column is seated.

Step 2



Place a second platen on a firm level surface. Flip the previously assembled components upside down onto the second platen, aligning the columns into the platen receiver cups.

Step 3



Once aligned, seat the top assembly by alternating taps, with a rubber mallet at each structural column until all columns are firmly seated.

Step 4



If side panels are required, firmly tap the top platen upward to raise the top platen. Insert the side panel into the bottom platen.

Step 5



Align the top of the side panel with the top platen and firmly seat the top platen utilizing a rubber mallet.

Completed Module



A complete module can support up to HS-25 Loading when installed per manufacturer's recommendations.

2.0 Basin Excavation

1. Stake out and excavate to elevations per approved plans.

Excavation Requirements:

- a. Sub-grade excavation must be a minimum of 6" (152 mm) below designed StormTank® Module invert.
- b. The excavation should extend a minimum of 12" (305 mm) beyond the StormTank® dimensions in each length and width (an additional 24" [610 mm] in total length and total width) to allow for adequate placement of side backfill material.
- c. Remove objectionable material encountered within the excavation, including protruding material from the walls.
- d. Furnish, install, monitor and maintain excavation support (e.g., shoring, bracing, trench boxes, etc.) as required by Federal, State and Local Laws, Ordinances, Regulations and Safety Requirements.



3.0 Sub-Grade Requirements

1. Sub-grade shall be unfrozen, level (plus or minus 1%), and free of lumps or debris with no standing water, mud or muck. Do not use materials nor mix with materials that are frozen and/or coated with ice or frost.
2. Unstable, unsuitable and/or compromised areas should be brought to the Engineer's attention and mitigating efforts determined prior to compacting the sub-grade.
3. Sub-grade must be compacted to 95% Standard Proctor Density or as approved by the Engineer of Record. If code requirements restrict subgrade compaction, it is the requirement of the geotechnical Engineer to verify that the bearing capacity and settlement criteria for support of the system are met. *



** The Engineer of Record shall reference Brentwood document Appendix A for minimum soil bearing capacity required based on Load Rating and top cover depth. Minimum soil bearing capacity is required so that settlements are less than 1" through the entire sub-grade and do not exceed long-term 1/2" differential settlement between any two adjacent units within the system. Sub-grade must be designed to ensure soil bearing capacity is maintained throughout all soil saturation levels.*

4.0 Leveling Bed Installation

1. Install geotextile fabric and/or liner material, as specified.
 - a. Geotextile fabric shall be placed per manufacturer's recommendations.
 - b. Additional material to be utilized for wrapping above the system must be protected from damage until use.
2. After the geotextile is secured, place a minimum 6" (152 mm) Leveling Bed.
 - a. Material should be a 3/4" (19 mm) angular stone meeting Appendix B – Acceptable Fill Material.
 - b. Material should be raked free of voids, lumps, debris, sharp objects and plate vibrated to a level with a maximum 1% slope.
3. Correct any unsatisfactory conditions.

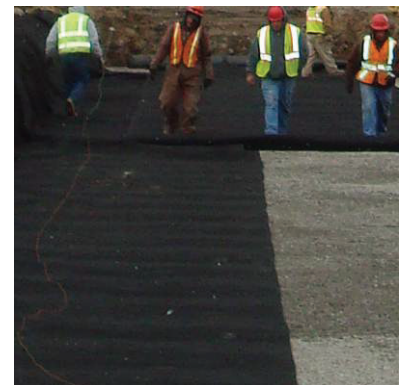


*Leveling Bed preparation is critical to proper installation and operation of the StormTank® system. **DO NOT PROCEED UNTIL THE LEVELING BED IS PROPERLY PREPARED.***



5.0 StormTank® Module Placement

1. Install geotextile fabric and/or liner material, as specified.
 - a. Geotextile fabric shall be placed per manufacturer's recommendations.
 - b. Additional material to be utilized for wrapping above the system must be protected from damage until use.
2. Mark the footprint of the modules for placement.
 - a. Ensure module perimeter outline is square or similar prior to Module placement.
 - b. Care should be taken to note any connections, ports or other irregular units to be placed.

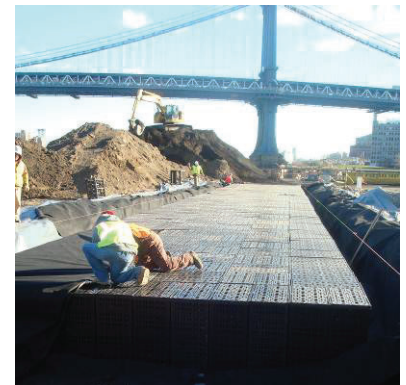


5.0 StormTank® Module Placement (Continued)

3. Install the individual modules by hand, as detailed below.
 - a. The modules should be installed as shown in the StormTank® submittal drawings with the short side of perimeter modules facing outward, except as otherwise required.
 - b. Make sure the top/bottom platens are in alignment in all directions to within a maximum 1/4" (6.4 mm).
 - c. For double stack configurations:
 - i. Install the bottom module first. **DO NOT INTERMIX VARIOUS MODULE HEIGHTS ACROSS LAYERS.** Backfilling prior to proceeding to second layer is optional.
 - ii. Insert stacking pins (2 per module) into the top platen of the bottom module.
 - iii. Place the upper module directly on top of the bottom module in the same direction, making sure to engage the pins.
4. Install the modules to completion, taking care to avoid damage to the geotextile and/or liner material.
5. Locate any ports or other penetration of the StormTank®.
 - a. Install ports/penetrations in accordance with the approved submittals, contract documents and manufacturer's recommendations.
6. Upon completion of module installation, wrap the modules in geotextile fabric and/or liner.
 - a. Geotextile fabric shall be wrapped and secured per manufacturer's recommendations.
 - b. Seal any ports/penetrations per Manufacturer's requirements

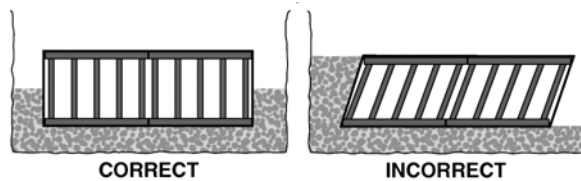
Notes:

- *If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacturer's recommendations.*



6.0 Side Backfill

1. Inspect all geotextile, ensuring that no voids or damage exists; which will allow sediment into the StormTank® system.
2. Adjust the stone/soil interface geotextile along the side of the native soil to ensure the geotextile is taught to the native soil.
3. Once the geotextile is secured, begin to place the Side Backfill.
 - a. Material should be a 3/4" (19 mm) angular stone meeting Appendix B – Acceptable Fill Material.
 - b. Backfill sides “evenly” around the perimeter without exceeding single 12" (305 mm) lifts.



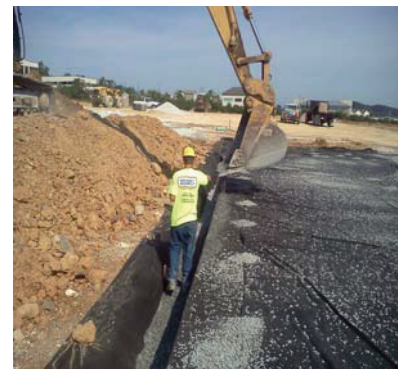
- c. Place material utilizing an excavator, dozer or conveyor boom.
- d. Utilize a plate vibrator to settle the stone and provide a uniform distribution.



Complete the Side Backfill evenly to the top of the StormTank® Modules prior to proceeding to the next step (Top Backfill).

Notes:

- Do not apply vehicular load to the modules during placement of side backfill. All material placement should occur with equipment located on the native soil surrounding the system.
- If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacturer's recommendations.



7.0 Top Backfill (Stone)

1. Begin to place the Top Backfill.
 - a. Material should be a 3/4" (19 mm) angular stone meeting Appendix B – Acceptable Fill Material.
 - b. Place material utilizing an excavator, dozer or conveyor boom (Appendix C – Material Placement) and use a walk-behind plate vibrator to settle the stone and provide an even distribution.

DO NOT DRIVE ON THE MODULES WITHOUT A MINIMUM 12" (305 mm) COVER.

2. Upon completion of Top Backfilling, wrap the system in geotextile fabric and/or liner per manufacturer's recommendations.
3. Install metallic tape around the perimeter of the system to mark the area for future utility detection.



Driving on the Modules and stone backfill with equipment heavier than a low ground pressure, track type equipment (Max. gross operating load of 6,000 lbs. [2,721 kg] or less) is prohibited until a full 24" (610 mm) of material has been placed.

Notes:

- *If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacturer's recommendations.*



8.0 Suitable Compactable Fill

Following Top Backfill placement and geotextile fabric wrapping; complete the installation as noted below.

Vegetated Area

1. Place fill onto the geotextile.
 - a. Maximum 12" (305 mm) lifts, compacted with a vibratory plate or walk behind roller to a minimum of 90% Standard Proctor Density.
 - b. The minimum top cover to finished grade should not be less than 24" (610 mm) and the maximum depth from final grade to the bottom of the lowest module should not exceed 11' (3.35 m).
2. Finish to the surface and complete with vegetative cover.

Impervious Area

1. Place fill onto the geotextile.
 - a. Maximum 12" (305 mm) lifts compacted with a vibratory plate or walk behind roller to a minimum 90% Standard Proctor Density or to meet the Engineer of Record's specification.
 - b. Sub-base materials should be referenced by the approved Engineering Drawings.
 - c. The minimum top cover to finished grade should not be less than 24" (610 mm) and the maximum depth from final grade to the bottom of the lowest module should not exceed 11' (3.35 m).
2. Finish to the surface and complete with asphalt, concrete, etc.

Notes:

- *A vibratory roller may only be utilized after a minimum 24" (610 mm) of compacted material has been installed or for the installation of the asphalt wearing course.*
- *If damage occurs to the geotextile fabric, repair the material in accordance with the geotextile Manufacturer's recommendations.*



Appendix A - Bearing Capacity Tables

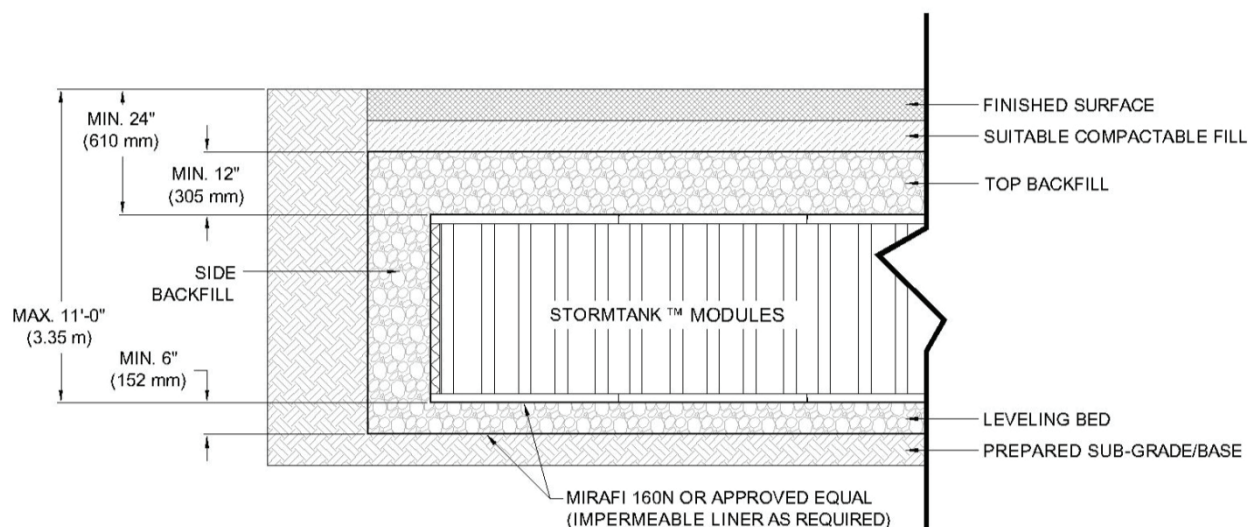
Cover		HS-25 (Unfactored)		HS-25 (Factored)			Cover		HS-25 (Unfactored)		HS-25 (Factored)	
English (in.)	Metric (mm)	English (ksf)	Metric (kPa)	English (ksf)	Metric (kPa)		English (in.)	Metric (mm)	English (ksf)	Metric (kPa)	English (ksf)	Metric (kPa)
24	610	1.89	90.45	4.75	227.43		67	1,702	1.12	53.75	2.07	99.11
25	635	1.82	86.96	4.53	216.90		68	1,727	1.13	53.91	2.07	99.11
26	660	1.75	83.78	4.34	207.80		69	1,753	1.13	54.08	2.06	98.63
27	686	1.69	80.88	4.16	199.18		70	1,778	1.13	54.26	2.06	98.63
28	711	1.63	78.24	3.99	191.04		71	1,803	1.14	54.46	2.06	98.63
29	737	1.58	75.82	3.84	183.86		72	1,829	1.14	54.67	2.06	98.63
30	762	1.54	73.62	3.70	177.16		73	1,854	1.15	54.90	2.06	98.63
31	787	1.50	71.60	3.57	170.93		74	1,880	1.15	55.13	2.06	98.63
32	813	1.46	69.75	3.45	165.19		75	1,905	1.16	55.38	2.06	98.63
33	838	1.42	68.06	3.34	159.92		76	1,930	1.16	55.64	2.06	98.63
34	864	1.39	66.51	3.24	155.13		77	1,956	1.17	55.90	2.06	98.63
35	889	1.36	65.10	3.14	150.34		78	1,981	1.17	56.18	2.06	98.63
36	914	1.33	63.80	3.05	146.03		79	2,007	1.18	56.46	2.07	99.11
37	940	1.31	62.62	2.97	142.20		80	2,032	1.19	56.76	2.07	99.11
38	965	1.29	61.54	2.90	138.85		81	2,057	1.19	57.06	2.07	99.11
39	991	1.26	60.55	2.83	135.50		82	2,083	1.20	57.37	2.08	99.59
40	1,016	1.25	59.65	2.76	132.15		83	2,108	1.20	57.69	2.08	99.59
41	1,041	1.23	58.84	2.70	129.28		84	2,134	1.21	58.02	2.09	100.07
42	1,067	1.21	58.09	2.67	127.84		85	2,159	1.22	58.35	2.09	100.07
43	1,092	1.20	57.42	2.60	124.49		86	2,184	1.23	58.69	2.10	100.55
44	1,118	1.19	56.81	2.55	122.09		87	2,210	1.23	59.04	2.11	101.03
45	1,143	1.18	56.26	2.50	119.70		88	2,235	1.24	59.39	2.11	101.03
46	1,168	1.16	55.77	2.46	117.79		89	2,261	1.25	59.75	2.12	101.51
47	1,194	1.16	55.33	2.42	115.87		90	2,286	1.26	60.11	2.13	101.98
48	1,219	1.15	54.94	2.39	114.43		91	2,311	1.26	60.48	2.13	101.98
49	1,245	1.14	54.59	2.36	113.00		92	2,337	1.27	60.86	2.14	102.46
50	1,270	1.13	54.29	2.33	111.56		93	2,362	1.28	61.24	2.15	102.94
51	1,295	1.13	54.03	2.30	110.12		94	2,388	1.29	61.62	2.16	103.42
52	1,321	1.12	53.80	2.27	108.69		95	2,413	1.30	62.01	2.17	103.90
53	1,346	1.12	53.62	2.25	107.73		96	2,438	1.30	62.41	2.18	104.38
54	1,372	1.12	53.46	2.23	106.77		97	2,464	1.31	62.81	2.19	104.86
55	1,397	1.11	53.34	2.21	105.82		98	2,489	1.32	63.21	2.20	105.34
56	1,422	1.11	53.24	2.19	104.86		99	2,515	1.33	63.62	2.21	105.82
57	1,448	1.11	53.18	2.17	103.90		100	2,540	1.34	64.03	2.22	106.29
58	1,473	1.11	53.14	2.16	103.42		101	2,565	1.35	64.45	2.23	106.77
59	1,499	1.11	53.12	2.14	102.46		102	2,591	1.35	64.87	2.24	107.25
60	1,524	1.11	53.13	2.13	101.98		103	2,616	1.36	65.29	2.25	107.73
61	1,549	1.11	53.16	2.12	101.51		104	2,642	1.37	65.72	2.27	108.69
62	1,575	1.11	53.21	2.11	101.03		105	2,667	1.38	66.15	2.28	109.17
63	1,600	1.11	53.28	2.10	100.55		106	2,692	1.39	66.58	2.29	109.65
64	1,626	1.11	53.37	2.09	100.07		107	2,718	1.40	67.02	2.30	110.12
65	1,651	1.12	53.48	2.08	99.59		108	2,743	1.41	67.45	2.31	110.60
66	1,676	1.12	53.61	2.08	99.59		109	2,769	1.42	67.90	2.33	111.56
67	1,702	1.12	53.75	2.07	99.11		110	2,794	1.43	68.34	2.34	112.04
68	1,727	1.13	53.91	2.07	99.11		111	2,819	1.44	68.79	2.35	112.52
69	1,753	1.13	54.08	2.06	98.63		112	2,845	1.45	69.24	2.36	113.00
70	1,778	1.13	54.26	2.06	98.63		113	2,870	1.46	69.69	2.38	113.96
71	1,803	1.14	54.46	2.06	98.63		114	2,896	1.47	70.15	2.39	114.43

Notes:

1. Additional load ratings and associated bearing capacities may be applicable on a case by case basis. Please contact your local Brentwood Representative.

Appendix B - Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation	ASTM D2321 Class	Compaction/Density
Finished Surface	Topsoil, hardscape, stone, concrete or asphalt per engineer of record.	N/A	N/A	Prepare per engineered plans.
Suitable Compactable Fill	Granular well graded soil/aggregate, typically road base or earthen fill, maximum 4" particle size.	56, 57, 6, 67, 68 Earth	I & II III (Earth Only)	Place in max. 12" lifts to a min. 90% standard proctor density.
Top Backfill	Crushed angular stone placed between modules and road base or earthen fill.	56, 57, 6, 67, 68	I & II	Plate compacted to provide evenly distributed layers.
Side Backfill	Crushed angular stone placed between earthen wall and modules.	56, 57, 6, 67, 68	I & II	Place in uniform 12" lifts around the system
Leveling Bed	Crushed angular stone placed to provide level surface for installation of modules.	56, 57, 6, 67, 68	I & II	Plate vibrated to achieve level surface.
* See Appendix C - Material Placement for limitations				



Notes:

- All stone must be angular stone meeting ASTM D2321. Recycled concrete may be utilized when meeting acceptable gradation and ASTM standards.
- The sub-grade is to be prepared to meet bearing and compaction requirements. Please see engineer of record's design.
- Storage of materials such as construction materials, equipment, soils, etc. over the StormTank® system is strictly **prohibited**.
- Please contact a Geotechnical Engineer and the Brentwood representative prior to utilization of any material not listed above.

Appendix C - Material Placement Guidelines

Material Location	Placement Methods	Tired Equipment Limitations	Tracked Equipment Limitations	Roller Limitations
Finished Surface	Numerous methods may be utilized. Material dumping onto system should be limited unless otherwise noted.	Asphalt can be dumped into pavers.		Vibratory rollers may only be utilized if compacted cover exceeds 24" (610 mm) or for pavement installation.
Suitable Compactable Fill	Utilize an excavator, skid loader or dozer to place material. (Max. gross operating load of 6,000 lbs. [2,721 kg] or less).	No DUMPING by dump trucks. No wheel loads until approved by Engineer of Record.	SMALL DOZERS ONLY (Max. gross operating load of 6,000 lbs. [2,721 kg] or less).	Static rollers ONLY are permitted until compacted cover exceeds 24" (610 mm).
Top Backfill	Utilize excavator bucket or stone conveyor, positioned off of system, to uniformly backfill on top of the modules. No DUMPING directly onto modules by dump trucks.	No DUMPING by dump trucks. No wheel loads until approved by Engineer of Record.	Utilize an excavator or skid loader (Max. gross operating load of 6,000 lbs. [2,721 kg] once a min. 12" (305 mm) has been placed and compacted.	No rollers allowed at this time.
Side Backfill	Utilize excavator bucket or stone conveyor, positioned off of system, to uniformly backfill around modules. Stone to be placed in max. 12" (305 mm) lifts until stone reaches top of modules.	No equipment is permitted on the modules during the side backfilling process.		
Leveling Bed	No limitations			

Notes:

1. Storage of materials such as construction materials, equipment, soils, etc. over the StormTank® system is strictly **prohibited**.
2. Please contact a Brentwood representative/distributor prior to utilization of any equipment not listed above.
3. During paving operations it may be necessary to utilize dump operations for paving equipment. Additional precautions should be utilized to limit the dump distance and prevent rutting of the road base.
4. It is recommended that all backfilling operations be completed with low ground pressure vehicles such as mini excavators, skid steers, etc. **All** equipment is to access system by a level approach to the system.

Appendix D - Standard Limited Warranty

Brentwood Stormwater StormTank® Module Product One (1) Year Limited Express Warranty

WARRANTY ("Warranty"): Unless agreed otherwise, in writing, between Brentwood Industries, Inc. ("Brentwood") and Purchaser, Brentwood warrants its **Stormwater StormTank Module Product** against defects in materials and workmanship that affect the performance for which it was intended upon meeting the subsequent terms and conditions. This Warranty applies solely to the **StormTank Module Product (including the platens, columns, and side panels, and hereinafter collectively referred to as the "Product")**. Warranty coverage is contingent upon proper installation, in strict accordance with Brentwood's written installation instructions, proper Product Warranty registration upon completion of installation (form to be returned to Brentwood is included in installation instructions), and compliance with all applicable local, state and federal codes/regulations. This Warranty is further contingent upon proper use and maintenance under ordinary conditions, consistent with the approved design criteria and good industry standards, as well as compliance with Brentwood's Warranty claim procedure. The Warranty period shall be limited to twelve (12) months from the Product purchase date. The terms of this Warranty shall be modified only through written agreement by an authorized Brentwood employee. This Warranty applies to the Purchaser of the Product and is non-transferable.

REMEDY AND EXCLUSIONS: The sole remedy for a covered defect during the Warranty period shall be limited to Product replacement, including shipping costs, or refund of the original purchase price. The remedy excludes costs of labor, removal of non-conforming Product, and expenses related to de-installation and re-installation of the Product. In no event will Brentwood be obligated to pay costs, damages or other amounts, in total, exceeding the original price paid to Brentwood for the Product to Purchaser or any third party. Additionally, Brentwood shall not warrant Product nor be liable to Purchaser or any third party for any Product liability claims or damages caused by non-compliance with any of the foregoing conditions or, without limitation, any of the following:

- i) Alteration, accident, abuse, misuse or neglect;
- ii) Acts of god or otherwise outside the control of Brentwood;
- iii) Normal wear and tear;
- iv) Abnormal contaminants detrimental to the Product or damage due to pollutants, solvents or hazardous substances;
- v) Improper handling during installation, improper installation, and improper or unintended use;
- vi) Subjecting Product to vehicle traffic, adjacent excavation and any other conditions excluded by Brentwood's specifications and written installation instructions;
- vii) Failure to maintain the minimum ground covers set forth in the installation instructions;
- viii) Placement of improper materials into or onto the Product;
- ix) Failure due to improper siting or sizing; and
- x) Damage during shipping.

THE TERMS OF THIS WARRANTY ARE THE SOLE AND EXCLUSIVE OBLIGATION OF BRENTWOOD TO PURCHASER. UNDER NO CIRCUMSTANCE SHALL BRENTWOOD BE LIABLE TO ANY PERSON OR ENTITY FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES OR ANY OTHER LOSS, COST OR EXPENSE OTHER THAN SPECIFICALLY STATED IN THIS WARRANTY. OTHER THAN THE EXPRESS LIMITED WARRANTIES MADE HEREIN, BRENTWOOD EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED BY LAW, WITH RESPECT TO ANY SERVICE OR DELIVERABLE, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AS WELL AS ANY WARRANTIES WHICH MAY ARISE FROM PRIOR COURSE OF DEALING, CUSTOM, TRADE USAGE, PROVISION OF SAMPLES, PRODUCT LITERATURE OR WEBSITE CONTENT.

CLAIM PROCEDURE:

- 1) Notification: Warranty claims must be submitted to Brentwood within fifteen (15) days of discovering the defective material and must be accompanied by a copy of the already-filed Product Warranty Registration and proof of purchase, a detailed explanation of the claim and alleged defect/damages, any relevant work logs/repair orders, and pictorial documentation of the defect. Brentwood reserves the right to investigate all claims and request additional information. Claims shall be emailed to stormtank@brentwoodindustries.com or mailed to: Brentwood Industries, Inc., Attn: Stormwater Warranty Claims, 610 Morgantown Road, Reading, PA 19611.
- 2) Dispute Resolution: Brentwood shall, in its sole opinion, have the authority to judge the existence and extent of any alleged defect. In the event Brentwood denies a Warranty claim, the claimant has ten (10) days to supply additional data in support of its claim. If a second denial is made by Brentwood, or a resolution cannot otherwise be reached amongst the parties, both Brentwood and Purchaser agree upon and preserve the right to pursue impartial mediation/arbitration under the Pennsylvania Uniform Arbitration Act, Pa. Stat. §7301-7320, subchapter A, as the means of dispute resolution. Mediation/arbitration shall take place in Reading, Berks County, in the Commonwealth of Pennsylvania. Costs of mediation/arbitration (excluding attorneys' fees and travel/individual related expenses which shall be borne by the party incurring the costs/expenses) shall be divided equally between Brentwood and Purchaser.

COMPLETE AGREEMENT: This Warranty incorporates and shall be interpreted along with Brentwood's Standard Terms and Conditions, in their entirety; however, in the event of conflict between the two, the terms of this Warranty shall supersede the Standard Terms and Conditions. Brentwood reserves the right to modify or discontinue offering this Warranty at any time.

Appendix E - StormTank® Module Project Registration

Please complete and mail / email to the addressee at the bottom within 30 days of installation of the product.

Owner's Information:

Name: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Phone: _____ Email: _____

Installation Contractor Information:

Name: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Phone: _____ Email: _____

Project Information:

Name: _____ Installation Date: _____
Location: _____
City: _____ State: _____ Zip Code: _____
Storage Capacity: _____ ☐ ft³ ☐ m³
Engineer of Record: _____ Distributor / Supplier: _____

Product Information:

Application (Select One):

☐ Detention ☐ Infiltration ☐ Capture / Reuse
☐ Other: _____

Cover (Select One):

☐ Impervious ☐ Pervious
☐ Vegetated ☐ Hardscape

Module Height (Select Applicable):

☐ 18" (457.2 mm) ☐ 24" (609.6 mm) ☐ 30" (762.0 mm) ☐ 33" (838.2 mm) ☐ 36" (914.4 mm)

Stacking (Select One):

☐ Single ☐ Double

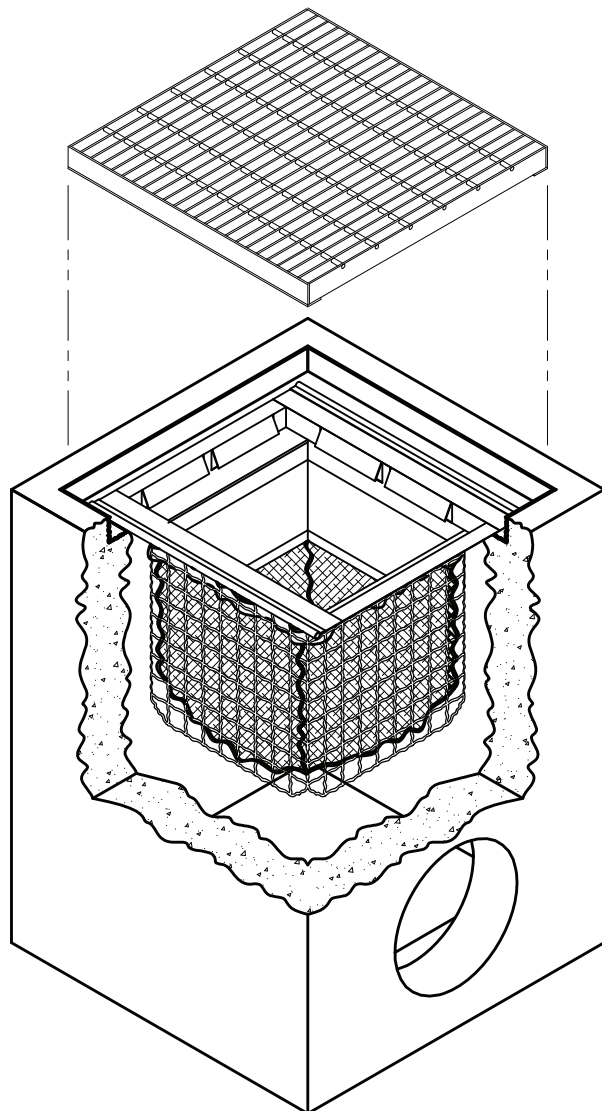
By completing and signing this document, the Owner, Engineer of Record and Contractor acknowledge they have reviewed the Brentwood Industries StormTank Module Site Preparation and Installation Instruction document. Additionally, the distributor hereby indicates that they have provided installation documentation and explanation relating to the product and this project.

Owner / Engineer of Record Signature

Date: _____

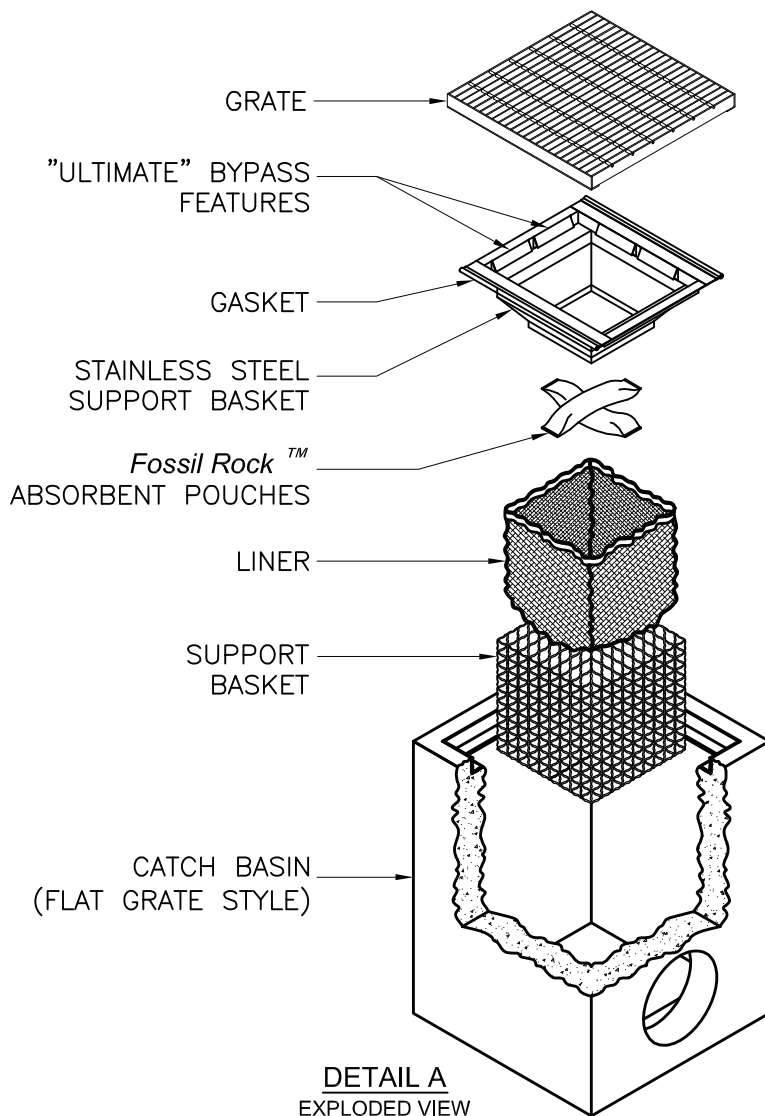
Distributor Signature

Date: _____



FLOGARD+PLUS® FILTER
-INSTALLED INTO CATCH BASIN-

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



NOTES:

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

TITLE

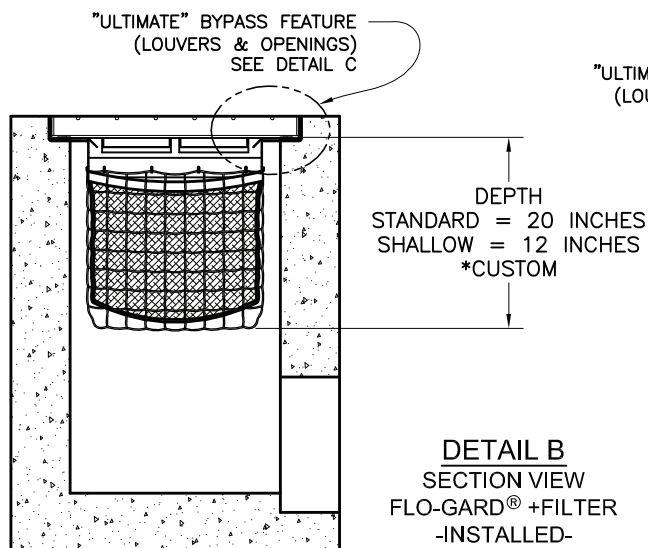
FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Flat Grated Inlet Style)



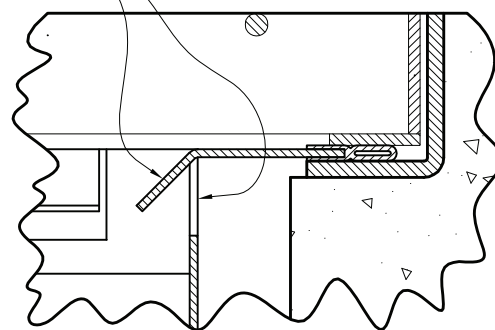
KriStar Enterprises, Inc.

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

DRAWING NO.	REV	ECO	DATE	
FGP-0001	D	0059 JPR	12/30/08	JPR 11/3/06
				SHEET 1 OF 2



"ULTIMATE" BYPASS FEATURE
(LOUVERS & OPENINGS)



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

SPECIFIER CHART

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

TITLE

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



KriStar Enterprises, Inc.

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

DRAWING NO. FGP-0001	REV D	ECO 0059 JPR 12/30/08	DATE JPR 11/3/06	SHEET 2 OF 2
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Appendix
General Education Materials

F:

Storm Drains are for Rain...

More than 50% of the automotive oil sold to do-it-



yourself oil changers is not recycled. There are more than 600 State-certified used oil collection centers within Los Angeles County.

Never dispose of automotive fluids in the street or gutter. Take them to your local auto parts store, gas station or repair shop, or a household hazardous waste Roundup for recycling.

...not automotive fluids.



1(888)CLEAN LA
www.888CleanLA.com

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1(888)CLEAN LA
www.888CleanLA.com

Car Care Tips:

You can keep your car running smoothly and efficiently, and at the same time help prevent stormwater pollution by taking these easy steps...

- When changing vehicle fluids — motor oil, transmission, brake and radiator fluids — drain them into separate drip pans to avoid spills. Do not combine these fluids. Do not dispose of these fluids in the street, gutter or garbage. It is illegal.
- If a spill occurs, use kitty litter, sawdust or cornmeal for cleanup. Do not hose or rinse with water.
- Regularly check and maintain your car to keep it running safely and efficiently. Water runoff from streets, parking lots and driveways picks up oil and grease drippings, asbestos from brake linings, zinc from tires and organic compounds and metals from spilled fuels and carries them to the ocean.
- Recycle all used vehicle fluids. Call 1(888)CLEAN LA or visit www.888CleanLA.com for the location of an auto parts store or gas station that recycles these fluids, or for the location of a local household hazardous waste Roundup.



Printed on recycled paper

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Printed on recycled paper

What is Smart Gardening?

Smart Gardening is an easy way to get a great looking yard while conserving water, energy and resources. You will also save time and money, all while doing something that helps make Malibu a nicer place to live.

How can I be a Smart Gardener?

- 🔧 **Bag, compost or recycle grass, tree limbs, leaves and other yard waste.** Soggy yard waste is a major contributor to clogged storm drains, street and neighborhood flooding.
- 🔧 **Make sure you “grasscycle.”** Grasscycling is a helpful waste prevention activity in which grass clippings are left on the lawn after mowing, enabling the nutrients to return into the soil. Nearly 20 percent of the waste buried in landfills is from our yards – like grass and tree trimmings.
- 🔧 **Don't overwater your lawn.** Excess water will carries contaminants through the stormdrain system to the ocean, untreated.
- 🔧 **Be smart when you apply pesticides or fertilizers.** Do not apply pesticides or fertilizers before it rains. Not only will you lose most of the chemicals but you will also harm the environment.
- 🔧 **Use native plants.** Native plants benefit the environment because they are naturally drought-resistant, more resistant to natural pests and diseases, and are better suited to provide natural cover and habitat for native wildlife.

Share these tips with your landscaper!

For more Smart Gardening tips, log on to www.888CleanLA.com or visit your local Smart Gardening demonstration center at:

**Gates Canyon Park
25801 Thousand Oaks Boulevard
Calabasas**

NON-TOXIC PESTICIDE RECIPES:

Here are a couple of recipes for non-toxic sprays that are sure to keep the bugs away!

Hot Pepper Spray

1. Boil 2 or 3 very hot peppers, 1/2 onion and 1 clove garlic in water.
2. Steep for two days and strain.
(This spray will not damage indoor or outdoor plants and can be frozen for future use.)

Soap Sprays

- Liquid soaps: Mix 2 tbsp. of soap per quart of water.
- Dry soaps: Mix 4 tbsp. per quart of water. (Use only pure soap, as detergents will damage your plants.)

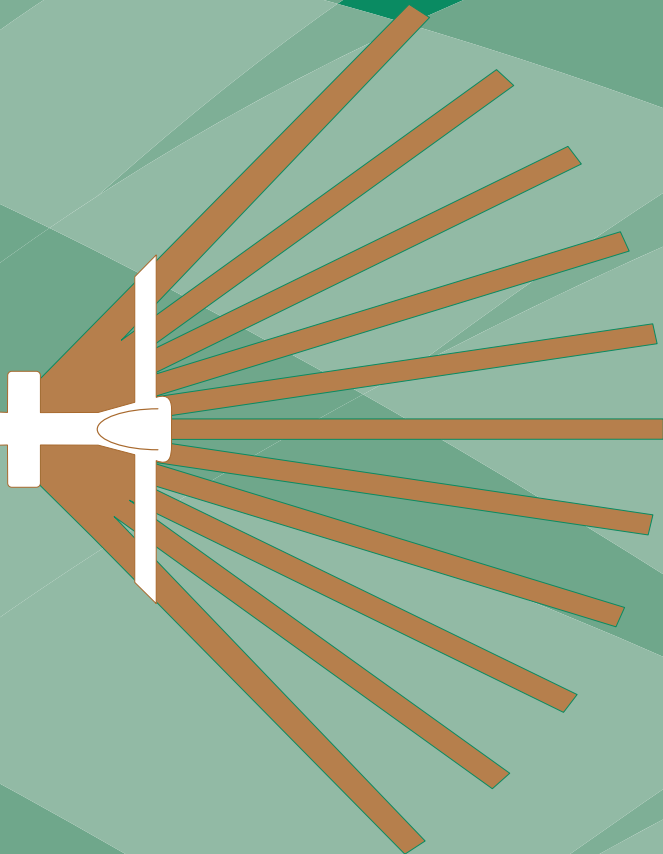
Be sure to rinse the plants with fresh water after pests have been controlled!





PROJECT
Pollution
PREVENTION

City of Malibu
Clean Water Program
23815 Stuart Ranch Rd.
Malibu, CA 90265
www.ci.malibu.ca.us



Get Smart...

...about Gardening

Storm Drains are for Rain...

More than 50% of the automotive oil sold to do-it-



yourself oil changers is not recycled. There are more than 600 State-certified used oil collection centers within Los Angeles County.

Never dispose of automotive fluids, recyclable products, or household hazardous wastes into the street or gutter. Take them to your local auto repair station, recycling center or a household hazardous waste roundup.

...they're not recycling centers.



1(888)CLEAN LA
www.888CleanLA.com

Recycling Tips:

You can help keep your community clean, protect our area waterways and make the beaches safe for ocean swimmers by putting recyclable materials where they belong — at a recycling center or household hazardous waste roundup. Never throw or pour anything into the streets or gutters...

- When changing vehicle fluids – transmission, hydraulic and motor oil, brake and radiator fluid – drain them into a drip pan to avoid spills. Do not combine these fluids. Do not dispose of them in the street, gutter or in the garbage. It is illegal.
- Recycle all used vehicle fluids. Call 1(888)CLEAN LA or visit www.888CleanLA.com for the location of a center that recycles these fluids, or for the location of a local household hazardous waste Roundup.
- Other materials that should be taken to a household hazardous waste Roundup are: paint and paint-related materials, household cleaners, batteries, pesticides and fertilizers, pool chemicals, and aerosol products.
- Aluminum, glass, plastic and newspapers should be placed in your curbside recycling bin or taken to a local recycling center.



Printed on recycled paper

PROJECT
Pollution
PREVENTION

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Printed on recycled paper

PROJECT
Pollution
PREVENTION

Storm Drains are for Rain...

More than 200,000 times each month,



lawns and gardens throughout LA County are sprayed with pesticides. Overwatering or rain causes pesticides on leaves and grass to flow into the storm drain and to the ocean — untreated.

Please use pesticides wisely, not before a rain, and water carefully.

...not pesticides.



1(888)CLEAN LA
www.888CleanLA.com

Pesticide Tips:

You can keep your lawn and garden green and at the same time solve the pollution problem by taking these easy steps...

- Never dispose of lawn or garden chemicals in storm drains. This is called illegal dumping. Take them to a household hazardous waste roundup. Call 1(888)CLEAN LA or visit www.888CleanLA.com to locate a roundup or collection facility near you.
- More is not better. Use pesticides sparingly. "Spot" apply, rather than "blanket" apply.
- Read labels! Use only as directed.
- Use non-toxic products for your garden and lawn whenever possible.
- If you must store pesticides, make sure they are in a sealed, water-proof container that cannot leak.
- When watering your lawn, use the least amount of water possible so it doesn't run into the street and carry pesticide chemicals with it. Don't use pesticides before a rain storm. You will not only lose the pesticide, but also will be harming the environment.



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Storm Drains are for Rain...

More than 200,000 times each month,



lawns and gardens throughout LA County are sprayed with pesticides. Overwatering or rain causes pesticides on leaves and grass to flow into the storm drain and to the ocean — untreated.

Please use pesticides wisely, not before a rain, and water carefully.

...not pesticides.



1(888)CLEAN LA
www.888CleanLA.com

Pesticide Tips:

You can keep your lawn and garden green and at the same time solve the pollution problem by taking these easy steps...

- Never dispose of lawn or garden chemicals in storm drains. This is called illegal dumping. Take them to a household hazardous waste roundup. Call 1(888)CLEAN LA or visit www.888CleanLA.com to locate a roundup or collection facility near you.
- More is not better. Use pesticides sparingly. "Spot" apply, rather than "blanket" apply.
- Read labels! Use only as directed.
- Use non-toxic products for your garden and lawn whenever possible.
- If you must store pesticides, make sure they are in a sealed, water-proof container that cannot leak.
- When watering your lawn, use the least amount of water possible so it doesn't run into the street and carry pesticide chemicals with it. Don't use pesticides before a rain storm. You will not only lose the pesticide, but also will be harming the environment.



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Storm Drains are for Rain...

More than 130,000 times each month,

L.A. County residents wash their dirty paint brushes under an outdoor faucet.

This dirty rinse water flows into the street, down the storm drain and to the ocean, untreated.

- Wash water-based paint brushes in the sink and take old paint and paint-related products to a household hazardous waste Roundup.

...not paint.



1 (888)CLEAN LA
www.888CleanLA.com

Painting Tips:

All paints and solvents contain toxic chemicals that can be dangerous to people and harmful to the environment. Please handle these products carefully by taking these easy steps.

- Never dispose of paint or paint-related products in the gutters or storm drains. This is called illegal dumping. Take them to a household hazardous waste Roundup. Call 1(888)CLEAN LA or visit www.888CleanLA.com to locate a Roundup near you.
- Buy only what you need. Reuse leftover paint for touch-ups or donate it to a local graffiti paint-out program. Recycle or use up excess paint.
- Clean water-based paint brushes in the sink.

- Oil-based paints should be cleaned with thinner that can be reused. Set the used thinner aside in a closed jar to settle-out paint particles.
- Store paints and paint-related products in rigid, durable and watertight containers with tight-fitting covers.



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Do you have "leaky" car syndrome? Cure It! You are contributing to storm water pollution!

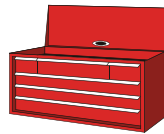


Cars with oil, radiator, transmission, brake, power steering or gear oil leaks are a hazard to our water resources. These toxins drip onto the ground and are washed into storm drains with any source of water. These toxic fluids contaminate our ocean, lakes and ground water.

If your car is experiencing leaky car syndrome, please cure it as soon as possible. Not only will your car appreciate it, but it will prevent your contribution to our storm water pollution problem.



You have the tools for success. Simply keep your vehicles in good running order to prevent leaks. Not only will your car run better but you'll be doing yourself, your neighborhood and your city - a great service.



RECYCLE YOUR USED OIL

When changing your own oil - Be Cautious! Used oil is one of the largest sources of storm water pollution we have! Make a difference - Recycle your oil at one of our used oil collection centers. Call **1 (888) CLEAN-UP** for used oil collection center locations.

If your oil has anything else in it, such as radiator fluid or carburetor cleaner, it is contaminated. Call **1 (888) CLEAN-UP** for the location of a Household Hazardous Waste Facility.

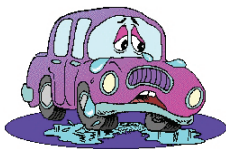


RECICLE SU ACEITE USADO

Tenga mucho cuidado cuando cambia el aceite de su auto! El aceite usado es uno de los principales contribuyentes de la contaminación del agua pluvial. Haga la diferencia- Recicle su aceite usado en uno de nuestros centros de colección. Llame al 1 (888) CLEAN-UP para un centro de aceite usado.

Su aceite usado esta contaminado si contiene anticongelante, limpiador de carburador u otros químicos. Llame al 1 (888) CLEAN-UP para encontrar un local que acepte desperdicios peligrosos de domicilio.

Do you have "leaky" car syndrome? Cure It! You are contributing to storm water pollution!

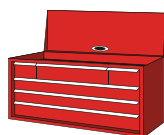


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Tiene su carro problema de goteras? Arreglélo!

Si no, usted esta contrbuyendo a la contaminación de agua pluvial!

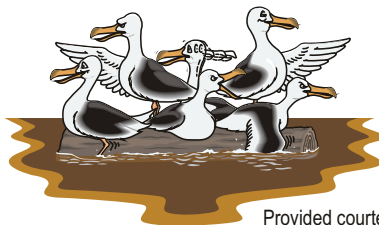
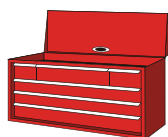


Carros que gotean aceite de motor, o líquidos del radiador y transmisión, frenos, y volante hidráulico pueden dañar a nuestros recursos de agua. Estos tóxicos caen al al suelo y son desechados a los desagües pluviales. Estos tóxicos contaminan nuestro oceano, lagos y agua subterránea.

Si su automóvil está goteando, por favor arreglélo lo más pronto posible. Su carro no solo se lo va a agradecer, pero también usted estaría impidiendo su contribución a la contaminación de agua pluvial.



Usted tiene la capacidad para salir adelante. Simplemente mantenga su vehículo en buenas condiciones para prevenir goteras de líquidos tóxicos. Con mantenimiento regular su carro corera mejor y le estaria haciendo un favor a su vecindad y su ciudad.



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Provided courtesy of Hunter-Kennedy & Associates Inc.

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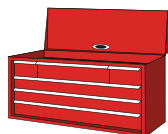


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Provided courtesy of Hunter-Kennedy & Associates Inc.

Simple. Smart.Steps.

Know Your HHW.

Household **H**azardous **W**aste (**HHW**) is any product labeled: toxic, poison, corrosive, flammable, combustible or irritant that is disposed of.

Buy Smart.

Purchase non-toxic/less hazardous products and only what you need.

Store Properly.

Keep products out of reach of children and pets. Toxic products are poisonous — don't put your family's health and safety at risk!

Use It Up.

Finish all unused products and recycle the containers or donate leftover products to a neighbor or community group.

Dispose Properly.

Dispose of HHW properly at a FREE Los Angeles County Roundup near you!

Protect Our Communities.

NEVER throw HHW into your household garbage, toilets or sinks; never dump on the ground or pour down the storm drains — it's illegal — and HHW can seep into the groundwater, waterways and oceans, causing contamination of our drinking water, causing beach closures and posing health hazards to swimmers.

Help keep Los Angeles County healthy and clean!

Find out how to reduce household hazardous waste and what alternative products are available on the reverse side of this flyer.

Toxic.Free.Home.

Call or log on to find an HHW collection event near you!



1-888-CLEAN-LA
www.888CLEANLA.com

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How to Reduce Use of Hazardous Products:

One way to reduce the potential concerns associated with **household hazardous waste** is to use nonhazardous or less hazardous products, and when it is necessary to use a hazardous product, always be safe and smart. Protect the health of your family, neighbors and the environment.

What You Can Do to Reduce Household Hazardous Waste

As you make your choices about the use of hazardous and nonhazardous products, remember that the decisions consumers make affect the way manufacturers design products.

- Use products containing hazardous materials sparingly or use a non hazardous/less hazardous alternative.
- Before purchasing a product, read the label carefully to make sure it will do what you want it to do. Once you buy something you are also legally responsible for disposing of it properly.
- Buy just what you need to do the job. Use it up. Give leftovers to a friend, neighbor, business or charity that can use them up. Excess pesticide might be offered to a greenhouse or garden center.
- Select water-based products over solvent-based products when available (e.g., paint, glue, shoe polish).
- Avoid aerosol sprays. Choose the pump spray or other alternatives.
- Be smart when you apply pesticides or fertilizers. Do not apply before a rain. Not only will you lose most of the pesticides or fertilizer through runoff, but you also will be harming the environment. Do not overwater after application. Read the label. Do not apply more than is recommended.
- Have a professional change your motor oil. For a few dollars more, you not only save yourself time and energy, but it's more likely that the used motor oil collected is recycled.
- Dispose of household hazardous wastes according to the directions on the container, or at a household hazardous waste collection event (Countywide Roundup or a local collection event), a used motor oil recycling center, auto parts store or service station. Call 1-888-CLEAN-LA or check the Internet at www.888CLEANLA.com for the location of an event or facility near you.

Consumer Choices

We can easily reduce the amount and toxicity of waste in and around our homes, and at the same time save money.

- Careful planning can help avoid the need for many potentially toxic products;
- Careful shopping will allow us to find products that can be recycled, reused or be disposed of safely.

Many sources of household hazardous waste can be replaced with other products that are safer, cheaper and equally effective.

Careful planning and shopping lend themselves to source reduction – meaning reducing the amount of hazardous wastes entering the household as well as reducing the toxicity of that waste. The less waste that comes in, the less that goes out. We can do this by shopping thoughtfully, reading labels and looking for non-hazardous or less hazardous products.

What are Alternative Products?

Alternative Cleaning Products

Try these easy alternatives to minimize household hazardous products. Most of these products are very common and are found in most household cabinets:

KITCHEN

Spray Disinfectant Cleaner

- 1 teaspoon sodium lauryl sulfate
- 1 teaspoon borax
- 2 tablespoons white vinegar
- 2 cups hot water
- ¼ teaspoon eucalyptus essential oil
- ¼ teaspoon lavender essential oil
- 3 drops tea tree essential oil

Mix all ingredients together and stir until dry ingredients dissolve. Pour into spray bottle for use. Do not use on glass.

Dish Detergent

- ½ cup clay powder
 - 2 tablespoons lime essential oil
 - 24 cups sodium lauryl sulfate
 - 6 cups baking soda
- Mix clay powder and essential oil. Then, in a two-gallon pail or container, combine with the baking soda and sodium lauryl sulfate. Mix well. For liquid soap: add 18 cups boiling water and stir until powder is dissolved.

Abrasive Cleaner

- 1 cup fine-grade pumice
 - ½ cup clay powder
 - 2 tablespoons grapefruit essential oil
 - ¼ cup baking soda
 - ½ cup sodium lauryl sulfate
 - ½ cup boiling water
- Mix all ingredients. Apply with a damp sponge or cloth and scrub.

Brass/Copper Tarnish Remover

- Salt, flour and white vinegar
- Mix together equal parts salt and flour, then add white vinegar to make a paste. Rub into the stain. Repeat if necessary.

Window Wash

- Juice from one fresh lemon
 - 2 cups water or club soda
 - ½ teaspoon peppermint essential oil
 - 1 teaspoon cornstarch
- Mix all ingredients and pour into plastic spray bottle. Shake well.

BATHROOM

Bathtub/Sink Stains

Scrub with paste made from cream of tartar and hydrogen peroxide.

Soap Film on Fiberglass Surface

Apply baking soda with damp cloth, rub and rinse off residue well.

Soap Film/Mildew on Shower Curtains

Pour full-strength vinegar on the shower curtain to remove soap film and mildew.

Shower-Door Track Cleaning

Pour full-strength vinegar into the track, let soak for a few minutes, rinse.

Toilet Lime Deposit Removal

Pour full strength white vinegar in the bowl, let sit for several hours. Scrub with sturdy brush.

Toilet Bowl Cleaner

- ½ teaspoon sodium lauryl sulfate
 - 2 tablespoons baking soda
 - 2 tablespoons vinegar
 - 1 teaspoon orange essential oil
 - 1 teaspoon grapefruit essential oil
 - 2 cups water
- Mix all ingredients. Vinegar and baking soda will foam when mixed. Let mixture stand for 10 minutes before pouring into a spray bottle.

Visit www.888cleanla.com for more alternative product recipes.

HOUSEHOLD HAZARDOUS WASTE FACT SHEETS

The following fact sheets provide detailed information on Household Hazardous Waste and related issues – how to define it, potential health and environmental risks, proper disposal methods, the use of nontoxic, alternative products...and more.

Please use this information as:

- **A quick reference source** to enhance the HHW efforts already ongoing in your city
- **Materials for community outreach and media relations** – they can be reproduced and distributed through your existing community and media outreach channels by accompanying news releases, PSAs, op-eds and letters to the editor. They may also be disseminated to local community-based organizations for insertion in their newsletters or used as information sheets at local community events. And don't forget to include them in your own city bulletins!

How to use these fact sheets:

- These fact sheets are designed to be used independently – each fact sheet has a slightly different focus, yet they all contain core information – such as how to find a Roundup by calling 888-CLEAN-LA or visiting www.888CLEANLA.com.
- Feel free to incorporate your city logo and/or the Project Pollution logo (included in this manual) and use these fact sheets in their current format.
- These materials will also be available shortly on www.888CLEANLA.com. We will notify you when these materials are up on the site for you to download.

Fact sheets provided include:

- What is household hazardous waste?
- Toxic products – dangers of improper storage, management and disposal
- How to dispose of HHW properly
- Make your home a Toxic Free Home – source reduction tips and recipes for nontoxic alternatives to hazardous household products
- Helpful activity-specific tips about safe storage/disposal, source reduction and alternative products and practices
- The stormwater pollution and household hazardous waste connection
- What children should know about household hazardous waste
- Home hazardous product survey for parents and children
- Household hazardous waste and the dangers of inhalant abuse

What is Household Hazardous Waste?

Many people are surprised to learn that Household Hazardous Waste (HHW) extends beyond the more “obvious” items – used motor oil and paint – and includes such daily household products as window cleaners, glue and nail polish. HHW is any toxic product located within the home that poses a threat to public health and environmental safety when handled, stored and/or disposed of improperly. While safe for you to use properly, we must remember that these same products are considered *Hazardous Waste* when we’re ready to dispose of the leftover products.

Unusable or unwanted household chemicals that are considered Household Hazardous Waste can easily be identified by carefully reading product labels and checking for any of these key words:

- Caution, Warning or Danger – try to buy products labeled “caution” whenever possible
- Toxic – poisonous or lethal when ingested, touched and or inhaled, even in small quantities
- Corrosive – acids or bases which deteriorate the surface of other materials and/or living tissues by chemical reaction
- Flammable – chemicals that ignite easily

Examples of Household Hazardous Products include:

Paint & Paint-Related Products Turpentine paint stripper Latex/water-based paint Oil-based paint Rust remover Paint thinner Varnish	Lawn/Garden-Care Products Pesticide/insecticide Weed killer Snail killer Bug spray Fungicide Herbicide Fertilizer	Beauty Products & Medicines Products in aerosol cans Alcohol-based lotions Nail polish remover Isopropyl alcohol Expired medicine Hair relaxers Depilatories Deodorizers Nail polish
Household Cleaners Ammonia-based cleaners Tub & tile cleaners Toilet bowl cleaners Floor care products Aluminum cleaners Window cleaners Aerosol cleaners Copper cleaners Furniture polish Metal polishes Oven cleaners Drain cleaners	Automotive Fluids & Batteries Windshield washer solution Auto body repair products Metal polish with solvent Fuel oil and other oils Lead acid batteries Transmission fluid Brake fluid Antifreeze Diesel fuel Motor oil Kerosene Gasoline Car wax	Miscellaneous Cell phone rechargeable batteries Swimming pool chemicals Photographic chemicals Mercury thermometers Dry cleaning solvents Mercury vapor lights Mercury batteries Fluorescent lights Fiberglass epoxy Lighter fluid Shoe polish Moth balls Glue

Toxic Products -- Dangers of Improper Storage, Management and Disposal

If you're like most people, you've stored your leftover paint, motor oil, household cleaners and pesticides in a corner or on a shelf in your garage, neglecting it for months -- even years -- at a time. But what you may not know is that these leftover products are potentially dangerous to your family, neighbors, garden and even your pets!

Protect your family:

Each year, a staggering one out of ten children is injured at home from household hazardous chemicals – through inhalation, absorption or contact with the eyes or skin. Handle toxic products with care by following these helpful tips:

DO:

- Follow directions carefully and use only recommended portions
- Store in tightly sealed containers in cool, dry locations
- Store in original container
- Store out of reach of children in locked cupboard

DO NOT:

- Do not repackage chemical products in containers normally used for food products or soft drinks – *Children have died from drinking chemicals stored in soft drink and juice bottles*
- Do not store corrosives, flammables and poisons together – separate these containers
- Do not mix chemical products or wastes – *dangerous reactions can occur*

Do NOT dispose of Household Hazardous Waste the WRONG WAY...

➤ Do NOT Throw in the Household Garbage:

Dumping household hazardous waste into garbage bins is dangerous -- *and illegal*. When thrown in with regular trash, household chemicals can cause fires or explosions, injuring sanitation workers and go into landfills not permitted or intended for hazardous waste – where the toxic chemicals could seep into the groundwater -- contaminating our environment.

➤ Do NOT Dump in Household Toilets, Sinks & Drains:

When flushed down a toilet, sink or drain, household hazardous waste goes through the sewage system to treatment plants not equipped to handle hazardous waste. At treatment plants, hazardous waste interferes with the treatment process by killing bacteria and contaminating the effluent that runs into the ocean and the sludge which is reused as fertilizer.

➤ Do NOT Pour in Storm Drains:

Household hazardous waste illegally dumped into storm drains contaminates our waterways and ocean, significantly affecting our quality of life in Los Angeles County. Many people don't realize that whenever litter, debris, motor oil, paints, fertilizers, pesticides and animal droppings end up in the storm drain system, these contaminants mix with millions of gallons of rainwater and flow untreated into LA County's lakes, rivers and the Pacific Ocean -- causing beach closures, disruption of aquatic life and health hazards for swimmers.

DO Dispose of Your Household Hazardous Waste the RIGHT WAY...

- Household Hazardous Waste Collection Events
Collection events are held at various sites throughout Los Angeles County and provide residents the opportunity to dispose of their unused toxic products quickly, conveniently and free of charge. They are open to all residents and are usually held on a Saturday from 9am to 3pm.
- Call 1-888-CLEAN-LA or visit www.888CLEANLA.com to find the date and location of a free HHW collection event near you.
- Additionally, some cities provide permanent HHW collection sites that accept unused toxic products from residents of that specific city during defined hours of operations. Call your city for more information about permanent HHW collection facilities.

How to Prepare

- Bring any unused chemicals that may be hazardous
- Keep the waste in its original container
- Make sure the container is not leaking
- Bring the items in a sturdy box that can be left behind
- Do not bring explosives, ammunition, tires, bio-medical waste or radioactive material
- There is a limit of 15 gallons or 125 pounds per vehicle

How to Dispose of Household Hazardous Waste Properly...

❖ Household Hazardous Waste Roundups

HHW collection events are held at various sites throughout Los Angeles County and provide residents the opportunity to dispose of their unused toxic products quickly, conveniently and free of charge. They are open to all residents and are usually held on a Saturday from 9am to 3pm. Additionally, some cities provide permanent HHW collection sites that accept unused toxic products from residents of that specific city during defined hours of operations.

❖ How to prepare:

- Bring any unused chemicals that may be hazardous (latex/oil-based paint, used motor oil, leftover fertilizer, etc.) in a sturdy box
- Make sure the container is not leaking
- Do not mix products together – *dangerous reactions can occur*
- Do not bring explosives, ammunition, tires or radioactive materials

- Call 1-888-CLEAN-LA or visit www.888CLEANLA.com for the location and date of a Household Hazardous Waste Roundup near you or call your city for more information about permanent HHW collection facilities.

Dangers of Improper -- *and illegal* -- Disposal...

❖ Household Garbage

Dumping household hazardous waste into garbage bins is dangerous -- *and illegal*. When thrown in with regular trash, household chemicals can cause fires or explosions, injuring sanitation workers and go into landfills not permitted or intended for hazardous waste – where the toxic chemicals could seep into the groundwater -- contaminating our environment.

❖ Household Toilets, Sinks & Drains

When flushed down a toilet, sink or drain, household hazardous waste goes through the sewage system to treatment plants not equipped to handle hazardous waste. At treatment plants, hazardous waste interferes with the treatment process by killing bacteria and contaminating the effluent that runs into the ocean and the sludge which is reused as

❖ Storm Drains

Household hazardous waste illegally dumped into storm drains contaminates our waterways and ocean, significantly affecting our quality of life in Los Angeles County. Many people don't realize that whenever litter, debris, motor oil, paints, fertilizers, pesticides and animal droppings end up in the storm drain system, these contaminants mix with millions of gallons of rainwater and flow untreated into LA County's lakes, rivers and the Pacific Ocean -- causing beach closures, disruption of aquatic life and health hazards for swimmers.

Make Your Home a Toxic.Free.Home.

Take these easy steps to reduce hazardous products in your homes...

- Make an effort to buy products that are water-based, less hazardous and non-toxic
- Buy only the amount you need to do the job
- Avoid aerosol sprays -- choose the pump spray or other alternatives
- USE IT UP -- or give leftovers to a neighbor, business or charity that can use them up
- Be smart when you apply pesticides or fertilizers. Do not apply before a rain -- not only will you lose most of the pesticides or fertilizer through runoff, but you'll also be harming the environment. Also, do not overwater after application. Read the label -- do not apply more than is recommended

Dispose of Your Household Hazardous Waste the RIGHT WAY...

- Household Hazardous Waste Collection Events
HHW collection events are held at various sites throughout Los Angeles County and provide residents the opportunity to dispose of their unused toxic products quickly, conveniently and free of charge. They are open to all residents and are usually held on a Saturday from 9am to 3pm. Additionally, some cities provide permanent HHW collection sites that accept unused toxic products from residents of that specific city during defined hours of operations.
- Call 1-888-CLEAN-LA or visit www.888CLEANLA.com for the location and date of an upcoming Roundup or call your city for more information about permanent HHW collection facilities.

How to Prepare

- Bring any unused materials that may be hazardous
- Keep the waste in its original container
- Make sure the container is not leaking
- Bring the items in a sturdy box that can be left behind
- Do not bring explosives, ammunition, tires, bio-medical waste or radioactive material
- There is a limit of 15 gallons or 125 pounds per vehicle

Try these easy and less-toxic alternatives
to minimize household hazardous waste...

KITCHEN

Spray Disinfectant Cleaner

1 teaspoon sodium lauryl sulfate

1 teaspoon borax

2 tablespoons white vinegar

2 cups hot water

¼ teaspoon eucalyptus essential oil

¼ teaspoon lavender essential oil

3 drops tea tree essential oil

Mix all ingredients together and stir until dry ingredients dissolve. Pour into spray bottle for use. Do not use on glass.

Brass/Copper Tarnish Remover

Salt

Flour

White vinegar

Mix together equal parts salt and flour, then add white vinegar to make a paste. Rub into the stain. Repeat if necessary.

Window Wash

Juice from one fresh lemon

2 cups water or club soda

½ teaspoon peppermint essential oil

1 teaspoon cornstarch

Mix all ingredients and pour into plastic spray bottle. Shake well.

Metal Cleaner

Fresh squeezed juice of 2 lemons

1/3 cup baking soda

1 teaspoon fine salt

6 tablespoons clay powder

Mix all ingredients together until pasty. Add water or more clay if needed. Rub paste onto metal with extremely fine steel wool and allow to sit for fifteen minutes. Wash off with a sponge and clear water. Polish metal with a soft cloth. Do not use on aluminum.

Dish Detergent

½ cup clay powder

2 tablespoons lime essential oil

24 cups sodium lauryl sulfate

6 cups baking soda

Mix clay powder and essential oil. Then, in a two-gallon pail or container, combine with the baking soda and sodium lauryl sulfate. Mix well. For liquid soap: add 18 cups boiling water and stir until powder is dissolved.

Abrasive Cleaner

1 cup fine-grade pumice

½ cup clay powder

2 tablespoons grapefruit essential oil

¼ cup baking soda

1/3 cup sodium lauryl sulfate

½ cup boiling water

Mix all ingredients. Apply with a damp sponge or cloth and scrub.

Glassware/Crystal Spot Removal

Dip spotted glassware into water to which a splash of vinegar has been added, dry with lint-free dishcloth.

Silver Polish

Rub with paste of baking soda and water.

Stainless Steel Water Spots

Rub area with clean soft cloth dampened with white vinegar. Wipe dry to avoid spots.

BATHROOM

Bathtub/Sink Stains

Scrub with paste made from cream of tartar and hydrogen peroxide.

Soap Film on Fiberglass Surface

Apply baking soda with damp cloth, rub and rinse off residue well.

Soap Film/Mildew on Shower Curtains

Pour full-strength vinegar on the shower curtain to remove soap film and mildew.

Shower-Door Track Cleaning

Pour full-strength vinegar into the track, let soak for a few minutes, rinse.

Toilet Lime Deposit Removal

Pour full strength white vinegar in the bowl, let sit for several hours. Scrub with sturdy brush.

Toilet Bowl Cleaner

½ teaspoon sodium lauryl sulfate

2 tablespoons baking soda

2 tablespoons vinegar

1 teaspoon orange essential oil

1 teaspoon grapefruit essential oil

2 cups water

Mix all ingredients. Vinegar and baking soda will foam when mixed. Let mixture stand for 10 minutes before pouring into a spray bottle.

PETS

Dog House Flea Repellant

Wash dog houses with salt water. Scatter fresh pine needles or cedar shavings under your pet's sleeping pad. Keep bedding clean.

Pet Stains

Soak stained area in warm soapy water. Sponge with equal parts of water and white vinegar. Blot dry.

Flea Collar

2 tablespoons peppermint essential oil

½ cup plus 2 tablespoons rosemary essential oil

2 tablespoons white cedar essential oil

¼ cup citronella essential oil

2 tablespoons eucalyptus essential oil

Soak a natural fiber rope in mixture and let dry for several hours. Tie around pet's neck.

Flea Shampoo

2 cups boiling water

½ cup sodium lauryl sulfate

¼ cup white vinegar

2 tablespoons peppermint essential oil

½ cup plus 2 tablespoons rosemary essential oil

2 tablespoons white cedar essential oil

¼ cup citronella essential oil

2 tablespoons eucalyptus essential oil

Mix water and sodium lauryl sulfate together until completely dissolved. Cool. Mix vinegar and remaining ingredients and add to sodium lauryl sulfate mixture.

PEST REPELLANT

Mice Repellant

Stuff all cracks around gas and water pipes with steel wool to keep mice out.

Ant Repellant

Sprinkle cucumber peelings near ant infestations.

Anti-Insect Air Spritzer

2 cups vodka

1 tablespoon citronella essential oil

1 tablespoon eucalyptus essential oil

1 teaspoon geranium essential oil

1 teaspoon rosemary essential oil

1 teaspoon orange essential oil

1 teaspoon lemon essential oil

Mix all ingredients and shake well. Mist into air to keep bugs away.

Body Bug Repellant

2 tablespoons citronella essential oil

2 tablespoons rosemary essential oil

2 tablespoons geranium essential oil

2 tablespoons eucalyptus essential oil

½ cup olive oil

Mix all oils together. Dab on clothing and skin. Avoid eyes and mouth.

SPOT REMOVERS

Club Soda

Pour on fresh spots and stains to remove wine and foods from clothing, carpets and linens.

Double Duty Spot Cleaner

1 tablespoon tangerine essential oil (or other citrus oil)

4 tablespoons glycerin

2 tablespoons borax

1 teaspoon sodium lauryl sulfate

Mix essential oil with glycerin; add remaining ingredients.

FURNITURE POLISH

Lemon Scented Polish

1 teaspoon lemon oil

2 cups mineral oil

Mix and apply with soft cloth.

Dark Wood Polish

1 teaspoon olive oil

Juice of one lemon

1 teaspoon brandy or whiskey

1 teaspoon water

Mix and apply with soft cloth. Must be made fresh each time.

Unscented Polish

3 parts olive oil

1 part vinegar

Mix and apply with soft cloth.

Oak Furniture Polish

1 quart of beer

1 tablespoon sugar

2 tablespoons beeswax

Boil beer with sugar and beeswax. When cool, wipe mixture on wood, allow to dry and polish with a soft cloth.

Heat Blemish/Scratch Remover

Rub in mayonnaise and wipe off. Buff with clean cloth.

Water Spot Treatment Polish

Toothpaste (not gel)

Baking soda

Pecan

Apply equal parts toothpaste and baking soda with a soft, damp cloth. Rinse out the cloth and wipe off any residue. When the finish is smooth, buff with a clean soft cloth. Restore color and shine by rubbing the spot with the meat of half a pecan, then buff.

BEAUTY PRODUCTS

Hair Dye Alternatives

Lighten hair:

1 tablespoon lemon juice

1 gallon warm water

Rinse hair with mixture.

Darken hair:

Rinse hair with strong black tea or black coffee.

Red tones:

Rinse with strong tea of rosehips or cloves, or use strong black coffee.

Cover gray:

½ cup dried sage

2 cups water

Boil sage for thirty minutes, then steep for several hours. Apply tea to hair after it cools. Allow to dry, then rinse and dry hair again. Apply weekly until you have the shade you want and then monthly to maintain color.

Hair Shampoo Alternatives

Everyday shampoo:

Castile bar soap

Water

¼ cup olive oil, almond oil or avocado oil

½ cup distilled water

Grate castile bar soap and mix it with water in a blender or food processor. Blend 1 cup of castile liquid with olive oil, avocado or almond oil and distilled water.

Dandruff remedy:

Wet hair and rub in a handful of dry baking soda, then rinse.

Jewelry Cleaning

Rub a small amount of toothpaste on jewelry with finger, rinse well and polish with a soft cloth.

Skin Freshener/Soother

Add pulp-free aloe vera juice to water in a spray bottle and spritz arms, legs, back and face.

PAINTS/REMOVERS

Enamel Paint Drips/Spill Remover

Wipe up spills and drips with a soft wet towel lathered with pumice soap (the sooner the better).

Removing Paint from Skin

Rub with mineral oil. Wash with soap and water.

Arts & Crafts Paints

½ cup cornstarch

2 cups cold water

Food coloring

Mix cornstarch and water in a saucepan. Bring the mixture to boil and continue to boil until it thickens. Let cool slightly. Pour into jars and color each with food coloring.

MISCELLANEOUS HOME MAINTENANCE

Homemade Glues

Option 1:

6 tablespoons gum arabic

1 cup water

½ cup plus 2 tablespoons natural glycerin

Dissolve gum arabic in water, add glycerin, and mix well. Apply to both surfaces with a toothpick or tongue depressor. Hold together for 5 minutes. Make fresh batch each time.

Option 2:

4 tablespoons wheat flour

6 tablespoons cold water

1 ½ cups boiling water

Blend flour into enough cold water to make a smooth paste. Boil water and stir into flour mixture until mixture is translucent. Use when cold.

Option 3:

3 tablespoons cornstarch

4 tablespoons cold water

2 cups boiling water

Blend cornstarch and cold water to make a smooth paste. Stir paste into boiling water, continue to stir until mixture becomes translucent. Use when cold.

Option 4:

4 tablespoons wheat flour

6 tablespoons cold water

1 ½ cups boiled water

Blend wheat flour and water to make a smooth paste. Boil 1 ½ cups water and stir in paste, cooking over very low heat for about 5 minutes. Use when cold.

Removing Grease Spots from Walls

Make a paste of baking soda and water. Apply thick paste to the grease stain and let it dry. Brush the residue off with a soft brush or cloth.

Car Wash Soap

3 cups grated castile soap

½ cup sodium lauryl sulfate

3 cups boiling water

1 tablespoon borax

1 tablespoon balsam fir essential oil

Dissolve castile soap and sodium lauryl sulfate in boiling water; add borax and essential oil and mix well.

Upholstery Cleaner and Rug Shampoo

4 cups water

1 cup white vinegar

3 tablespoons sodium lauryl sulfate

2 teaspoons baking soda

1/8 teaspoon lavender essential oil

1/8 teaspoon ginger essential oil

Mix all ingredients together and fill a handheld rug/upholstery shampoo bottle half full. Shake the bottle vigorously and shampoo furniture using small circular motions. Scrub sudsy area well.

Laundry Soap

1/4 cup clay powder

2-3 tablespoons essential oil of choice

13 cups borax

12 cups baking soda

4 cups sodium lauryl sulfate

Mix clay powder and essential oil. Add remaining ingredients and mix well in a 2-3 gallon pail. Use 1/8 cup of laundry powder per load.

Household Hazardous Waste can be DANGEROUS!

Here are a few helpful hints to BE SAFE...

Hazardous Waste is any toxic product located within the home that poses a threat to public health and environmental safety when handled, stored and disposed of improperly. Toxic products can be dangerous to our family's health if not handled properly – here are some tips on safe storage, ways to reduce the amount of household hazardous waste in your home, and proper disposal methods.

How to Handle Hazardous Waste

- Follow directions carefully and use only recommended portions
- Store in tightly sealed containers in cool, dry locations
- Store in original container
- Store out of reach of children in locked cupboard
- Do not reuse pesticide or other chemical containers for other purposes
- Do not repackage chemical products in containers normally used for food products or soft drinks – *Children have died from drinking chemicals stored in soft drink and juice bottles*
- Do not store corrosives, flammables and poisons together – separate these containers
- Do not mix chemical products or wastes – *dangerous reactions can occur*
- Do not smoke, eat or drink when handling household hazardous products
- Use indoor faucets to clean all applicators (paint brushes, cloths, etc.) -- *water from outdoor faucets runs into the street and storm drains, heading out to the ocean, untreated*

How to Reduce the Amount of Hazardous Waste in your Home

- Purchase only needed quantities
- When possible, purchase products that are water-based, less hazardous and non-toxic
- Use products up before purchasing new products
- Share unused products with your neighbors/friends
- Safely dispose of all unused toxic products at Household Hazardous Waste Roundups

Remember These Important Tips When...

- Maintaining Your Car
 - NEVER hose off engine cleaner -- degreasers or tire cleaners. The run-off goes into the storm drains, leading directly into the ocean
 - When changing car fluids, use a drip pan to catch spills. If a spill does occur, apply absorbent materials, such as kitty litter, and dispose of it at a Roundup

- When disposed of improperly, used motor oil is a major contributor to pollution. There are many locations in Los Angeles County to recycle your oil, oil filters and other automotive fluids. For locations call 1-888-CLEAN-LA or visit www.888CLEANLA.com
- Using Paint and Paint Products
 - Buy water-based latex paint. It does not contain the harsh solvents of oil-based paint, and brushes can be cleaned using water
 - NEVER rinse paint brushes off using outdoor water faucets
 - If you have leftover paint, share it with neighbors or donate to graffiti cleanup organizations
 - NEVER throw paint or paint products in the trash, down the sink or toilet, or down the storm drains -- dispose of it properly by taking it to a HHW Roundup

How to Dispose of Household Hazardous Waste Properly

Participate in a FREE Household Hazardous Waste Collection Event! Collection events are held at various sites throughout Los Angeles County and provide residents the opportunity to dispose of their unused toxic products (leftover paint, used motor oil, fertilizer, etc.) quickly, conveniently and free of charge.

Some of the items you can bring to a collection event include: lighter fluid, nail polish remover, transmission fluid, antifreeze, motor oil, latex and oil-based paints, paint thinner, stains/varnishes, solvents, hazardous cleaning products, herbicides and pesticides, pool chemicals, hairspray, aerosol products, and expired medicine.

As you prepare your Household Hazardous Waste for disposal at a Roundup, follow these guidelines:

- Bring any unused chemicals that may be hazardous
- Keep the waste in its original container
- Make sure the container is not leaking
- Bring items in a sturdy box that can be left behind
- Don't bring explosives, ammunition, tires, bio-medical waste or radioactive materials

For more information about Household Hazardous Waste collection events, Roundup schedules and alternative disposal methods, call 1-888-CLEAN-LA (1-888-253-2652) or look on the Internet at www.888CLEANLA.com

The Stormwater Pollution and Household Hazardous Waste Connection

What is Stormwater Pollution?

Stormwater pollution occurs when litter, trash, debris, motor oil, paints, fertilizers, pesticides and animal droppings end up on the roadways and in the gutters. These contaminants mix with millions of gallons of rainwater, flow untreated into Los Angeles County's lakes, rivers and the Pacific Ocean, and can create health risks for children, kill marine life, and contribute to neighborhood flooding and beach closures.

What is Household Hazardous Waste?

Household Hazardous Waste is any chemical located within the home that poses a threat to public health and environmental safety when handled, stored and/or disposed of improperly. Products that can be found in your home, garage and garden area and can easily be identified by carefully reading product labels and checking for any of these key words: *toxic, poison, reactive, corrosive, flammable, combustible or irritant*. Examples include latex/oil-based paint, used motor oil, fertilizers, pesticides and

So what's the connection?

When people dispose of their household hazardous waste improperly by dumping it on the ground, in the street or down the storm drains -- *illegally* -- these toxic contaminants flow into our waterways, ending up in the ocean, untreated -- endangering the health of our families and environment.

Follow these guidelines to help prevent stormwater pollution:

- DON'T LITTER – throw your trash in a waste basket where it belongs
- Use, store and dispose of all household hazardous products properly
- Dispose of all leftover toxic products at monthly Household Hazardous Waste collection events. Call 1-888-CLEAN-LA or log onto www.888CLEANLA.com for more information and to find the date and location of a Roundup near you
- Make it a practice to purchase non-toxic or less-toxic products for home and garden use
- Use pesticides, herbicides and fertilizers sparingly. Do not apply any chemicals to the lawn or garden before a rain storm or watering
- Conserve water by not overwatering lawns
- Use yard trimmings and leaves as compost. This keeps debris off the streets and out of storm drains, *and* supplies gardens with valuable nutrients
- Dispose of all pet waste in trash cans
- All used motor oil can be recycled. Take your used motor oil to a certified used motor oil recycling center. For a location near you, call 1-888-CLEAN-LA or log onto www.888CLEANLA.com

KIDS – BE SAFE! Help keep your home a Toxic.Free.Home!

If you're not careful, products in
your home can make you sick...

Poisons are all around us -- bleach, drain cleaner, nail polish remover, perfume, laundry detergent and glue are all toxic products that can make us sick if they're not handled properly.

REMEMBER:

DO NOT touch...
DO NOT taste...
DO NOT smell...

➤ ...any household products – unless
you ask a grown-up you know.

- Make sure you understand warning labels on products in your home. Any product marked Warning, Caution, Danger, Poison, Toxic, Reactive, Corrosive or Flammable should NOT be handled by children and must be placed out of reach
- Little kids can't read -- when you're with your younger brothers and sisters, make sure dangerous cleaners are kept out of reach
- Little kids can't tell the difference between medicine and candy -- all medicine, even vitamins, should be locked up, safe from little hands
- Help keep your home and yard safe for family and pets -- keep fertilizer and bug spray out of reach

If you have a poison emergency and there is no help, call 9-1-1 or the California Poison Control System emergency hotline at 1-800-876-4766.

Help keep your home a Toxic.Free.Home. Ask your parents to get rid of leftover toxic products the RIGHT WAY by taking them to a Household Hazardous Waste Collection Event. It's free and easy, but most importantly, it helps keep our communities and environment safe and clean. Tell your parents to call 1-888-CLEAN-LA, or visit the Internet at www.888CLEANLA.com, to learn how to dispose of household hazardous waste without endangering our health.

Parents: Is Your Home a Toxic.Free.Home?

Potentially hazardous products are hiding all around your home that you may not even be aware of... nail polish and nail polish remover, glue, insect repellent, deodorizers and household cleaners are all safe to use when handled properly, but when these products are handled improperly or get into the hands of children, they can be very dangerous – *even lethal*.

Each year, millions of people are accidentally poisoned in their own homes. Although accidental poisonings happen to adults, the majority of poisonings happen to young children under the age of six years. 90% of poisonings happen in the home. Over 75% of the poisonings are accidental and most happen to children between the ages of six months to five years. Most of these accidental poisonings can be prevented with a little care -- don't let your child, your pet or yourself become a victim!

Take this simple survey to find out more about the household hazardous products that exist in your home -- and find out how you can properly dispose of household hazardous waste to make your home a Toxic.Free.Home.

❖ Look under your kitchen sink. What types of products are under there?

⇒ If any of the following products exist – your cupboard should be locked, or equipped with a child-safety device, to prevent children from accidentally handling toxic chemicals:

Ammonia	Carpet & upholstery cleaners
Cleaning fluid	Cleansers & scouring powders
Drain cleaner	Furniture polish
Metal cleaners	Oven cleaner
Rust remover	Powder & liquid detergents
Vitamins	

❖ Does your bedroom contain toxic products?

⇒ You may not be aware that these products must be kept out of reach from children and pets as well:

Cologne	Perfume
Cosmetics	Medications

❖ When was the last time you cleaned out the toxic products in your garage, basement or workshop?

⇒ Leftover hazardous products should be disposed of properly – by taking them to a Household Hazardous Waste collection event. Call 1-888-CLEAN-LA or visit

www.888CLEANLA.com to find a Roundup date and location near you and take your unused toxic products:

Antifreeze	Adhesives/glues
Car Wax	Fertilizer
Gasoline & oil	Kerosene
Latex/oil-based paint	Lighter fluid
Lime, cement, mortar	Lead acid batteries
Paint thinner/remover	Transmission fluid
Turpentine	Used motor oil
Windshield washer solution	

❖ What about under the bathroom sink or in the medicine cabinet?

⇒ Toxic products in the bathroom? You bet! Make sure these products are safely stored and out of your child's reach:

Aftershave	Bath oil
Deodorizers	Depilatories
Hair dyes/relaxers	Isopropyl alcohol
Medicine	Nail polish
Nail polish remover	Permanent wave solution
Room deodorizers	Rubbing alcohol
Shaving lotion	Toilet bowl cleaner

❖ Have you peaked in your closets, attic and storage places lately?

⇒ Kids will find things in the tiniest spaces – and will put *anything* in their mouths! Watch out for these toxic products lying around:

Moth balls & sprays	Rat/mouse poison
Insecticides	Batteries
Cigarette lighters	

❖ Dispose of your household hazardous waste the RIGHT WAY!

⇒ Now that you've successfully completed our household hazardous products survey and safely stored your products out of reach from children and pets, gather up the leftover toxic products that are ready to be thrown out and place them in a sturdy box. Make sure they're not leaking – and never mix products together.

❖ Take your toxic products to a Household Hazardous Waste Collection Event.

Now you're ready to take your box of household hazardous waste to a Countywide Roundup! Roundups are one-day, drive-through collection events scheduled in different areas throughout the County where residents can take their household hazardous waste. They are free, open to the public and are usually held on a

Saturday from 9am to 3pm. It's that easy! Additionally, some cities provide permanent HHW collection sites that accept unused toxic products from residents of that specific city during defined hours of operations.

- ❖ To find a Collection Event near you...
- Call 1-888-CLEAN-LA or visit the Internet at www.888CLEANLA.com for the location and date of the next Roundup near you **or call your city for more information about permanent HHW collection facilities.**
 - ⇒
- ❖ Thanks for helping the County of Los Angeles to keep our communities healthy and our environment clean!
 - ⇒ By properly disposing of your leftover toxic products, you're not only reducing the amount of hazardous waste in your home – protecting your family's health – but also protecting the environment from toxic contaminants entering our landfills, sewers and storm drains!

CAUTION!

INHALING TOXIC PRODUCTS CAN BE DANGEROUS!

You already know that toxic products exist in your home – household cleaners, air fresheners and furniture polish under the kitchen sink, motor oil, varnish and leftover latex and oil-based paint in the garage – but did you know that many of these products are being used by children to “get high?”

Inhalant use occurs when children abuse common household products such as glue, paint, air fresheners, correction fluid or markers to “catch a buzz.”

Take a look at these alarming statistics:

- A 1998 nationwide survey of students indicates that 20.5% of eighth graders have used inhalants compared to 22.2% who have used marijuana/hashish
- Chronic inhalant users can suffer severe and permanent brain damage; some die the first time they try it; other possible risks include loss of consciousness and irreversible damage to the liver, kidneys and bone marrow
- Inhalants are a “gateway” drug often leading to other illicit substance abuse. They are often the first substance young people try because they are legal, easy to obtain and difficult to detect
- More than 1,000 common, useful and legal household, office and classroom products can be used to “get high”
- Because the chemicals in inhalants enter the lungs in such high concentrations, they have a more formidable toxic profile than other types of abused drugs
- Every year kids die from inhalant use, but many parents and educators remain ignorant of this silent epidemic

Be on the lookout for signs of use:

- ◆ Problems in school – failing grades, chronic absences and general apathy
- ◆ Paint or stains on body, clothing, rags or bags
- ◆ Spots or sores around the mouth; red or runny eyes or nose; chemical breath odor; drunk, dazed or dizzy appearance; nausea, loss of appetite; anxiety, excitability, irritability
- ◆ Missing abusable household items

THE KEY TO PREVENTING INHALANT ABUSE IS EDUCATION

Make your home a Toxic.Free.Home. and help prevent inhalant abuse:

- ◆ Buy smart! Purchase non-toxic/less-hazardous products and only what you need. Avoid products labeled "danger," "warning," "do not ingest," "corrosive," "flammable," or "toxic"
- ◆ Store properly! Use safety locks on all cabinets and store all poisonous household and chemical products out of sight and reach of children and pets
- ◆ Use it up! Finish all unused products and recycle the containers or donate leftover products to a neighbor or community group
- ◆ Dispose properly! Don't throw unused products in the trash, in the storm drain or down the drain. Dispose of HHW properly at free, convenient HHW Collection Events. For information on an upcoming HHW Roundup in your area, call 1-888-CLEAN-LA or visit www.888CLEANLA.com
- ◆ Educate your family! Talk with children about the potential dangers associated with HHW products. Educate your children *before* they educate themselves

For More Information...

- About safe use and management of HHW and the Toxic.Free.Home. campaign, contact the Los Angeles County Department of Public Works at 1-888-CLEAN-LA or visit www.888CLEANLA.com
- On inhalants and the National Inhalant Prevention Coalition, call 800-269-4237
- On poison prevention, contact the California Poison Control Center at 800-876-4766 or the American Association of Poison Control Centers at www.aapcc.org

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

AND THE SANITATION DISTRICTS OF
LOS ANGELES COUNTY

YOUR HOUSEHOLD HAZARDOUS WASTE GUIDE

Your Guide to Household Hazardous waste

IN LOS ANGELES COUNTY



WHAT IS
HOUSEHOLD HAZARDOUS WASTE?

DANGERS OF IMPROPER DISPOSAL

SAFE USE, STORAGE AND DISPOSAL

HHW COLLECTION EVENTS

HOW TO REDUCE HHW USE

ALTERNATIVE PRODUCTS

1-888-CLEAN-LA
www.888CleanLA.com

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phone numbers

Los Angeles County Environmental Hotline **1-888-CLEAN-LA**
(1-888-253-2652)
www.888CleanLA.com

Information on Household Hazardous Waste Collection Events, certified used motor oil recycling centers, recycling, composting and other County environmental programs. Residents can report illegal dumping into the storm drain system.

Los Angeles Department of Health Services **1-800-427-8700**
www.ladhs.org

Los Angeles County Fire Department **323-890-4089**
Health & Hazardous Materials Division **www.lacofd.org**

Information on waste management and regulatory compliance.

County Sanitation Districts **1-800-238-0172**
of Los Angeles County **www.lacsd.org**

Information on wastewater treatment and solid waste facilities, water reuse, industrial waste, and Household Hazardous Waste Collection Events.

Los Angeles City Residential and Small **1-800-98-TOXIC**
Business HHW Program **(1-800-988-6942)**

Information on upcoming Household Hazardous Waste Collection Events, certified used motor oil recycling centers and hazardous waste collection from qualifying small businesses.

City of Los Angeles Stormwater Hotline **1-800-974-9794**
www.lastormwater.org

Report abandoned waste, accidental spills, clogged catch basins, illegal dumping, and illicit discharges into the streets or storm drain system.

California Environmental Protection Agency **916-445-3846**
(CAL/EPA) **www.calepa.ca.gov**

Information on CAL/EPA and how to safeguard California's natural environment — air, water, and land.

California Integrated Waste **916-341-6000**
Management Board (CIWMB) **www.ciwmb.ca.gov**

Information on waste reduction programs, recycling centers, composting and grasscycling.

Earth's 911 **800-CLEAN-UP**
Information on environmental **(1-800-253-2687)**
programs nationwide. **www.1800cleanup.org**

Los Angeles Regional Drug & Poison **1-800-8-POISON**
Information Center **(1-800-876-4766)**
www.calpoison.org

24-hour emergency information on poison contact including swallowing, eye or skin irritation, inhalation, animal or insect bites, food or drug reactions, and pet exposure.

National Inhalant Prevention Coalition **1-800-269-4237**
(NIPC) **www.inhalants.org**

Information on toxic products that are used as inhalants.

National Office of Housing and Urban **1-800-HUDS-FHA**
Development (HUD) **1-800-483-7342**
www.hud.gov/consumer/hhhchild.cfm

Tips on making your home safe and healthy.

What is household hazardous waste?

Household hazardous waste is any product labeled: toxic, poison, corrosive, flammable, combustible or irritant that is to be disposed of.

A typical home can contain a vast array of household hazardous products used for cleaning, painting, beautifying, lubricating and disinfecting the house, yard, workshop and garage.

The chemical-based household products from a single home may seem insignificant; but, when millions of homes across Los Angeles County use similar products — handling, storing and disposing of them improperly — the combined effect becomes a major problem. The health and safety of people and animals, as well as the health of our communities and the environment is endangered when these types of products are discarded in household garbage, sinks or storm drains.

The health and safety of our families, neighborhoods and environment is threatened when household hazardous waste is stored or disposed of improperly.



The following are examples of household hazardous products that may be found in and around your home:

Lawn/Garden-Care Products

Bug spray
Fertilizer
Pesticide/insecticide
Fungicide
Herbicide
Weed killer



Paint and Paint-Related Products

Latex/water-based paint
Oil-based paint
Turpentine paint stripper
Rust remover
Paint thinner
Varnish



Automotive Fluids and Batteries

Used motor oil and filters
Gasoline and diesel fuel
Kerosene
Auto body repair products
Windshield washer solution
Antifreeze
Brake and transmission fluid
Lead acid batteries
Metal polish with solvent



Beauty Products and Medicines

Alcohol-based lotions
Isopropyl alcohol
Medicine
Nail polish and nail polish remover
Hair relaxers, dyes and permanents
Products in aerosol cans



Household Cleaners

Ammonia-based cleaners
Oven and drain cleaners
Floor care products
Aerosol cleaners
Window cleaners
Furniture polish
Metal polishes and cleaners
Tub, tile and toilet bowl cleaners



Miscellaneous

Fluorescent lights
Mercury thermometers
Photographic chemicals
Lighter fluid
Shoe polish
Fiberglass epoxy
Swimming pool chemicals
Moth balls
Glue
Mercury batteries



For more information about the date and location of Household Hazardous Waste Collection Events and certified used motor oil recycling centers, please contact:

1-888-CLEAN-LA
www.888CleanLA.com

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County of Los Angeles
Department of Public Works
and the Sanitation Districts of
Los Angeles County

Dangers of improper disposal

When used, stored and disposed of according to label directions, most household products like cleaners, beauty products, medicines, auto fluids, paint and lawn care products pose little hazard to people or to the environment.

Improper disposal of HHW includes throwing it in the trash, pouring it on the ground, flushing down the toilet, sink or drain, or pouring it in the gutter or storm drain.

However, these products may become dangerous and hazardous when used, stored or disposed of carelessly.

When thrown in with the regular trash, household hazardous waste can injure sanitation workers. In addition, the hazardous waste will end up in landfills not intended or permitted for those type of wastes which could in turn impact groundwater.

When poured on the ground, household hazardous waste may seep into and contaminate our groundwater and/or the ocean we swim in.

When flushed down a toilet, sink or drain, household hazardous waste goes through the sewage system to treatment plants not equipped to handle hazardous waste. At treatment plants, hazardous waste interferes with the biological treatment process by killing bacteria and contaminating the effluent that runs into the ocean and the biosolids which cannot then be reused as fertilizer.

When hazardous waste is thrown on the street, it goes down storm drains leading into our area waterways, impacting the Pacific Ocean, our lakes, and our local beaches.

Improper use, storage and disposal of household hazardous products can potentially harm our families, children, and pets, pollute our neighborhoods and contaminate our ground, water and air.

The illegal dumping of hazardous waste carries a minimum fine of \$5,000 per day per violation up to \$100,000 per day per violation and imprisonment.

Section 25189.5,
Health & Safety Code.

Poisoning Prevention Tips:

- Keep all hazardous products in their original containers and out-of-reach of children. Medicines should have child-resistant caps.
- Install child safety latches on all drawers or cabinets containing harmful products.
- Store harmful products away from food.
- Keep original labels on all containers, read and follow directions carefully.
- Keep syrup of ipecac on hand and have the Poison Control Center number on the telephone.

To report illegal dumping, call 1-888-CLEAN-LA.

For more information about the date and location of Household Hazardous Waste Collection Events and certified used motor oil recycling centers, please contact:

1-888-CLEAN-LA
www.888CleanLA.com

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and the Sanitation Districts of
Los Angeles County

Safe use, storage, and disposal practices

Many of the products found in our homes are toxic. They can cause serious human and animal health and environmental problems if used, stored and disposed of improperly. The simple practices listed below can help keep your family, home, neighborhood and environment safe.

Do's

- Think carefully before buying a product. Do you really need it? Do you already have something similar?
- Buy just enough to do the job.
- Look for a non-hazardous or less hazardous substitute.
- Read the label and follow use, storage and disposal directions carefully. Watch for signal words such as *caution*, *warning*, *poison* or *danger*. If directions are unclear, contact the manufacturer or dealer before using.
- Keep all chemical products and waste out of reach of children and animals.
- Keep leftover products in original labeled containers so that you can refer to directions for use and proper disposal.
- Share unused products with others if each product is in its original container with a label.
- Dispose of household hazardous waste properly by taking it to a Collection Event scheduled near you.
- Locate auto repair shops and gas stations that recycle used motor oil, antifreeze and batteries.
- Completely finish products in containers before disposal. Clean, empty containers can be put in the trash. (Note: Some cities will even recycle empty paint cans and aerosol containers.)
- Triple rinse all containers of water-soluble materials. Use rinse water according to label directions.

do's

Dispose of household hazardous waste properly by taking it to a Collection Event scheduled near you. Call 1-888-CLEAN-LA for more information.

don'ts

Don'ts

- Do not dump leftover products into the street, storm drains or ground. It is illegal.
- Do not burn used or leftover products or product containers. Burning may produce toxic fumes and contribute to air pollution.
- Do not bury leftover products or containers in your yard or garden.
- Do not reuse pesticide or other chemical containers for other purposes.
- Do not mix chemical products or wastes.
- Do not put any household hazardous waste in the trash or sink.
- Do not repackage chemical products in containers that are normally used for food products or soft drinks. Children have died from drinking chemicals stored in soft drink and juice bottles.
- Do not store corrosives, flammables and poisons together. Separate these containers.
- Never mix household hazardous materials. Dangerous reactions can occur.
- Do not smoke, eat or drink when handling household hazardous products.

The illegal dumping of hazardous waste carries a minimum fine of \$5,000 per day per violation up to \$100,000 per day per violation and imprisonment.

Section 25189.5,
Health & Safety Code.

To report illegal dumping, call 1-888-CLEAN-LA.

For a list of alternative products or for more information about the date and location of Household Hazardous Waste Collection Events and certified used motor oil recycling centers, please contact:

1-888-CLEAN-LA
www.888CleanLA.com

PROJECT
Pollution
PREVENTION

County of Los Angeles
Department of Public Works
and the Sanitation Districts of
Los Angeles County

Events for collecting household hazardous waste

A Household Hazardous Waste Collection Event, operated by the County of Los Angeles Department of Public Works and the Los Angeles County Sanitation Districts, is a one-day, drive-through event where residents are invited to a specific location to drop off their household hazardous waste.

Collection events are scheduled in different areas throughout the County. They are free, open to the public and are usually held on a Saturday from 9 a.m. to 3 p.m. No appointment is needed.

**FREE HHW
Collection Events
are held WEEKLY in
Los Angeles County.**

The City of Los Angeles operates collection events which service over 20 different areas each year within the City of Los Angeles. All residents in the County are invited to dispose of their household hazardous waste at these events. They are free and usually operated Friday through Saturday (occasionally Thursday through Saturday) from 9 a.m. to 3 p.m.

Additionally, certain cities have set up their own collection events for city residents. Call your city for more information, or our hotline at 1-888-CLEAN-LA for the location and date of any of the collection events near you or look up the schedule on the Internet at www.888CleanLA.com.

What Happens to Household Hazardous Waste Collected by the County?

Most of the paint is reused for the County's anti-graffiti program. Motor oil is recycled/ reused

as lubricants, marine diesel fuel, supplemental fuel and tar by-products such as asphalt cover and re-refined motor oil. Miscellaneous solvents are reused as supplemental fuel in the manufacture of cement.

Household hazardous waste that cannot be recycled or reused is carefully packed into special drums for disposal.

Preparing Household Hazardous Waste for a Collection Event

- Pack household hazardous waste in a cardboard box so that it does not spill during transport. Be prepared to leave your containers.
- Put like chemicals together. Separate unlike chemicals.
- Label materials that are not in their original containers.
- Make sure containers are not leaking and lids are tightly sealed.
- Put your box of household hazardous waste in the trunk of your car, away from passengers during transport.
- At the collection site, trained personnel will ask you to remain in your car while they remove the household hazardous waste from your trunk.

Certified Used Oil Collection Centers

Many private businesses like gas stations, auto parts stores and auto repair shops participate in used motor oil recycling programs. In Los Angeles County there are more than 650 such locations.

County Household
Hazardous Waste Collection
Events will NOT accept:

- **Radioactive waste**
- **Ammunition**
- **Explosives**
- **Infectious/medical waste**
- **Compressed gas cylinders**
- **Business/commercial waste**

For more information about the date and location of Household Hazardous Waste Collection Events and certified used motor oil recycling centers, please contact:

1-888-CLEAN-LA
www.888CleanLA.com

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How to reduce HHW

One way to reduce the generation of **household hazardous waste** and prevent potential pollution is to find nonhazardous or less hazardous alternative products. This will help protect the health of your family, neighbors and the environment.

What You Can Do to Reduce Household Hazardous Waste

As you make your choices about the use of hazardous and nonhazardous products, remember that the decisions you make affect the way manufacturers design products.

- Use products containing hazardous materials and fertilizers sparingly or use a nonhazardous alternative.
- Before purchasing a product, read the label carefully to make sure it will do what you want it to do. Once you buy something you are also legally responsible for disposing of it properly.
- Buy just what you need to do the job. Use it up. Give leftovers to a friend, neighbor, business or charity that can use them up. Excess pesticide might be offered to a greenhouse or garden center.
- Select water-based products over solvent-based products when available (e.g., paint, glue, shoe polish).
- Avoid aerosol sprays. Choose the pump spray or other alternatives.
- Be smart when you apply pesticides or fertilizers. Do not apply

The most common household products involved in poisonings are: prescription and non-prescription drugs, cleaning agents, plants and cosmetics.

before a rain. Not only will you lose most of the pesticides or fertilizer through runoff, but you also will be harming the environment. Do not overwater after application. Read the label. Do not apply more than is recommended.

- Have a professional change your motor oil. For a few dollars more,

you not only save yourself time and energy, but it's more likely that the used motor oil collected is recycled.

- Dispose of household hazardous waste according to the directions on the container, or at a Household Hazardous Waste Collection Event, a used motor oil recycling center, auto parts store or service station. Call 1-888-CLEAN-LA or check the Internet at www.888CleanLA.com for the location of an event or facility near you.
- Ask for re-refined motor oil for your vehicle. Re-refined oil is oil that has been recycled and then reprocessed so it is as good or better than virgin oil. By using re-refined motor oil, you are closing the loop and saving natural resources.

Consumer Choices

We can easily reduce the amount and toxicity of waste in and around our homes, and at the same time save money.

- Careful planning can help avoid the need for many potentially toxic products; and
- Careful shopping will allow us to find products that can be recycled, reused or be disposed of safely.

Many sources of household hazardous waste can be replaced with other products that are safer, cheaper and equally effective.

Careful planning and shopping lend themselves to source reduction – meaning reducing the amount of hazardous materials entering the household as well as reducing the toxicity of the waste generated. We can do this by shopping thoughtfully, reading labels and looking for non-hazardous or less hazardous products.

For information on alternative products or more information about the date and location of Household Hazardous Waste Collection Events and certified used motor oil recycling centers, please contact:

1-888-CLEAN-LA
www.888CleanLA.com

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Pollution
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Department of Public Works
and the Sanitation Districts of
Los Angeles County

What are alternative products?

Alternative Cleaning Products

Try these easy alternatives to minimize household hazardous products. Most of these products are very common and are found in most household cabinets:

Kitchen

Spray Disinfectant Cleaner

½ cup borax
1 gallon hot water
Dissolve borax in hot water.
Wipe down areas to be disinfected.

Abrasive Cleaner for Counter Tops

Sprinkle baking soda or borax, add juice of 1/2 lemon and scrub.

Drain Cleaner/Opener

1/4 cup vinegar
1/4 cup baking soda
Mix ingredients and pour mixture down drain. Let stand for a few minutes and rinse with boiling water.

Oven Cleaner

Mix equal parts of castille soap, borax and water. Let mixture set for 20 minutes and scrub with mixture of baking soda and salt

Window Wash

Juice from one fresh lemon
2 cups water or club soda
1 teaspoon cornstarch
Mix all ingredients and pour into plastic spray bottle. Shake well.

Bathroom

Bathtub/Sink Stains

Scrub with paste made from cream of tartar and hydrogen peroxide.

Soap Film on Fiberglass Surface

Apply baking soda with damp cloth, rub and rinse off residue well.

Soap Film/Mildew on Shower Curtains

Pour full-strength vinegar on the shower curtain to remove soap film and mildew.

Shower-Door Track Cleaning

Pour full-strength vinegar into the track, let soak for a few minutes, rinse.

Toilet Lime Deposit Removal

Pour full strength white vinegar in the bowl, let sit for several hours. Scrub with sturdy brush.

Other recipes

Spot Remover

Club Soda

Pour on fresh spots and stains to remove wine and foods from clothing, carpets and liners.

Water Spot Furniture Polish

Toothpaste (not gel)

Baking Soda

Pecan

Apply equal parts of toothpaste and baking soda with soft, damp cloth. Rinse out the cloth and wipe off any residue. When the finish is smooth, buff with a clean soft cloth. Restore color and shine by rubbing the spot with the meat of a half pecan, then buff.

Dark Wood Furniture Polish

1 tsp. lemon oil

Juice of one lemon

1 tsp. brandy or whisky

1 tsp. water

Mix and apply with soft cloth. Must be made fresh each time.

Unscented Wood Polish

3 parts olive oil

1 part vinegar

Mix and apply with soft cloth.

Pet Stains

Soak stained area in warm soapy water. Sponge with equal parts of water and white vinegar. Blot dry.

Pest Repellent

Dog House Flea Repellent

Wash dog house with salt water. Scatter fresh pine needles or cedar shavings under your pet's sleeping pad. Keep bedding clean.

Insecticide

Mix dishwashing liquid and water and spray on infected area.

Ant Repellent

Option 1:

Sprinkle cucumber peelings near ant infestations.

Option 2:

Sprinkle red chili powder, cream of tartar powder, salt or sage near ant infestations.

Visit www.888CleanLA.com for more alternative product recipes.

For information about how to dispose of household hazardous waste please contact:

1-888-CLEAN-LA
www.888CleanLA.com

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County of Los Angeles
Department of Public Works
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Los Angeles County

Upon 72 hours notice, the Department can provide program information and publications in alternate formats or make other accommodations for people with disabilities. To request accommodations ONLY, or for more ADA information, please contact our departmental ADA Coordinator at (626) 458-4081 or TDD (626) 282-7829, Monday through Thursday, from 7:00 a.m. to 5:30 p.m.

Storm Drains are for Rain...

More than 390,000 times each month,



lawns and gardens throughout LA County are overwatered. This can cause fertilizers and pesticides on grass and plants to flow into storm drains and to the ocean, untreated — harming the environment.

Please use fertilizers and pesticides wisely, not before a rain, and water carefully.

...not fertilizer.



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Fertilizing Tips:

Fertilizers contain toxic chemicals that are harmful to people and the environment. You can keep your lawn and garden green and, at the same time, solve the pollution problem by taking these easy steps.

- Do not over-fertilize and do not fertilize near ditches, gutters or storm drains.
- Follow the directions on the label carefully.
- Do not overwater after fertilizing. Overflow water and your fertilizer will run into the street, down the storm drain and into the ocean.
- Do not fertilize before a rain.
- Store fertilizers and chemicals in a covered area and in sealed containers to prevent runoff.
- Do not blow, sweep, hose or rake leaves or other yard trimmings into the street, gutter or storm drain.



Printed on recycled paper

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Printed on recycled paper

Storm Drains are for Rain...

More than 80,000 dog owners walk



their dogs each month and repeatedly leave disease-causing animal waste



laying on the ground. Dog waste washes from the ground and

streets into storm drains, and flows straight to the ocean — untreated.

Remember to bring a bag and clean up after your dog.

...they're not pooper scoopers.



1(888)CLEAN LA
www.888CleanLA.com

Dog Owner Tips:

Dog owners can help solve the stormwater pollution problem by taking these easy steps...

- Clean up after your dog every single time.
- Take advantage of the complimentary waste bags offered in dispensers at local parks.
- Ensure you always have extra bags in your car so you are prepared when you travel with your dog.
- Carry extra bags when walking your dog and make them available to other pet owners who are without.
- Teach children how to properly clean up after a pet. Encourage them to throw the used bags in the nearest trash receptacle if they are away from home.
- Put a friendly message on the bulletin board at the local dog park to remind pet owners to clean up after their dogs.
- Tell friends and neighbors about the ill effects of animal waste on the environment. Encourage them to clean up after pets as well.



Printed on recycled paper

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Appendix **G:**
BMP Maintenance, Inspection, and Repair Log and Checklist

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____ Page: _____ of _____

[illegible]

PLEASE MAKE COPIES OF ORIGINALS

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____

Page: 1 of 3

SD-12 – Efficient Irrigation

No. Onsite: _____ No. Inspected: _____ No. Requiring Action: _____

- _____ Timing of irrigation is proper for efficient irrigation
- _____ Sprinkler heads are oriented properly to avoid overspray on pavement
- _____ Proper amount of water is dispersed for the type of landscaping
- _____ Drip line irrigation systems are still functioning properly
- _____ Valves and switches are working properly

Corrective Action Required:

Scheduled Completion Date:

SD-10 – Landscape Planning

No. Onsite: _____ No. Inspected: _____ No. Requiring Action: _____

- _____ Planted areas allow water to enter, but not to leave the area
- _____ Adequate mulch or gravel is present in the landscape areas

Corrective Action Required:

Scheduled Completion Date:

PLEASE MAKE COPIES OF ORIGINALS

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____

Page: 2 of 3

Infiltration Tank

No. Onsite: _____ No. Inspected: _____ No. Requiring Action: _____

- _____ Device is clean and free of all debris
- _____ Filter insert is replaced with a new filter
- _____ No nuts or bolts are loose
- _____

Corrective Action Required:

Scheduled Completion Date:

SE-7 – Street Sweeping & Vacuuming

No. Onsite: _____ No. Inspected: _____ No. Requiring Action: _____

- _____ No evidence of sediment or trash accumulation
- _____ Contractor scheduled for regular visits (more frequent during rainy season)
- _____ Signs posted indicating sweeping schedule

Corrective Action Required:

Scheduled Completion Date:

PLEASE MAKE COPIES OF ORIGINALS

MAINTENANCE, INSPECTION, AND REPAIR LOG

Site: _____

Page: 3 of 3

SD-13 – Storm Drain Signage

No. Onsite: _____ No. Inspected: _____ No. Requiring Action: _____

_____ Signs are in good condition and have not faded or broken

Corrective Action Required:

Scheduled Completion Date:

Catch Basin Insert

No. Onsite: _____ No. Inspected: _____ No. Requiring Action: _____

_____ Signs are in good condition and have not faded or broken

Corrective Action Required:

Scheduled Completion Date:

PLEASE MAKE COPIES OF ORIGINALS

Appendix
O&M

H:

Attachment I

Operations and Maintenance (O&M) Plan

**Low Impact Development
For
137 San Bernardino Road
141 W Geneva Place
Covina, CA 91723**

**Bently Real Estate, LLC
100 N. Barranca Suite 900
West Covina, CA 91791
Contact: Tarif Alhassen
Tel: (626) 616-3605**

October 2017

Exhibit A, Operations and Maintenance Plan

BMP Applicable? Yes/ No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation and Maintenance Responsibility
Non-Structural Source Control BMPs			
Yes	Education for Property Owners, Tenants, and Occupants This will be addressed through educational materials. All included materials provide ways of mitigating stormwater pollution in everyday activities associated with residents as well as employees of the property management company and their sub-contractors. Practical informational materials are provided to residents, occupants, or tenants to increase the public's understanding of stormwater quality, sources of pollutants, and what they can do to reduce pollutants in stormwater.	The distribution of these materials will be the responsibility of the Homeowner's Association (HOA) at the time of the leasing signing or home purchase per property owner, tenant or occupant.	HOA
Yes	Activity Restriction (CC&Rs) Covenant, Conditions & Restrictions for the development are to be established within the appropriate documents which prohibit activities that can result in discharges of pollutants.	The distribution of these materials will be the responsibility of the HOA at the time of the leasing signing or home purchase per property owner, tenant or occupant.	HOA
Yes	Common Area Landscaped Management Specific practices are followed and ongoing maintenance is conducted to minimize erosion and over-irrigation, conserve water, and reduce pesticide and fertilizer applications.	Landscape maintenance should be practiced at least once per week or to the desire of the HOA. Overall landscape care should be inspected monthly.	The HOA will maintain or hire professionals to manage the upkeep of the project's landscaped areas.
Yes	BMP Maintenance In order to ensure adequate and comprehensive BMP implementation, all responsible parties are identified for implementing all non-structural and structural BMPs, cleaning, inspection, and other maintenance activities are specified including responsible parties for conducting such activities.	2 Inspections/ Cleanings per year per manufacturer's specifications starting on or near October 1 st (before the rainy season)	HOA (During the first year, a contract between the HOA and manufacturer will be established for inspections. Afterwards, the BMP can be inspected by a HOA chosen maintenance supplier)
Yes	Title 22 CCR Compliance Hazardous waste is managed properly through compliance with applicable Title 22 regulations. Hazardous materials or wastes will be generated, handled, transported, or disposed of in association with the project,	The distribution of these materials will be the responsibility of the HOA at the time of the leasing signing	HOA

	measures are taken to comply with applicable local, state, and federal regulation to avoid harm to humans and the environment.	or home purchase per property owner, tenant or occupant or at the initial hiring on an employee.	
Yes	Common Area Litter Control The proposed project will have various trash receptacles located near the common areas. Trash management and litter control procedures are specified within this report, including responsible parties, and implemented to reduce pollution of drainage water.	It will be the responsibility of the HOA to empty and maintain the upkeep of these areas on a weekly basis.	HOA
Yes	Employee/ Tenant Training Practical informational materials and/or training are provided to employees at the initial time of hiring by the HOA to increase their understanding of stormwater quality, sources of pollutants, and their responsibility for reducing pollutants in stormwater.	The distribution of these materials will be the responsibility of the HOA at the initial hiring of the employee/ tenant.	HOA
No	N13. Housekeeping of Loading Docks		
Yes	Common Area Catch Basin Inspection In order to ensure adequate and comprehensive BMP implementation, all responsible parties are identified for implementing all non-structural and structural BMPs, cleaning, inspection, and other maintenance activities are specified including responsible parties for conducting such activities.	Common inspection should occur weekly or prior to any significant storm events by method of clearing any trash/ debris from the catch basin.	HOA
Yes	Street Sweeping Private Streets and Parking Lots Regular sweeping is conducted to reduce pollution of drainage water.	City's Street Sweeping Services or approved Private Company on a weekly basis	HOA
No	Retail Gasoline Outlets		
Structural Source Control BMPs			
Yes	Provide Storm Drain System Stenciling and Signage Catch Basin Stenciling and Signage will be placed on all on-site catch basins to the satisfaction of the City Engineer.	Stenciling and Signage should be implemented prior to construction completion by the Contractor. Any defacement of the signage should be addressed immediately by the HOA.	HOA
No	Design and Construct Outdoor Material Storage Areas to Reduce Pollutant Introduction		

No	Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction		
Yes	Use Efficient Irrigation Systems and Landscape Design Site efficient irrigation and landscaping has been implemented by the project's landscape architect to the satisfaction of the City Engineer and Planning Department.	Efficient irrigation and landscaping should be implemented prior to construction completion by the Contractor. The HOA will be responsible for the upkeep. Irrigation piping, timers, and landscaped areas should be inspected at least 4 times per year by the HOA or a professional landscaper.	The HOA will maintain or hire professionals to manage the upkeep of the project's landscaped
No	Protect Slopes and Channels and Provide Energy Dissipation		
No	Loading Docks		
No	Maintenance Bays		
No	Vehicle Wash Areas		
No	Outdoor Processing Areas		
No	Equipment Wash Areas		
No	Fueling Areas		
Yes	Trash Storage Areas	It will be the responsibility of the HOA to empty and maintain the upkeep of these areas on a weekly basis.	HOA
No	Hillside Landscaping		
No	Wash Water Controls for Food Preparation Areas		
Treatment Control BMPs			
Yes	Treatment Control BMP #1 – Katchall Kleerstream 120 Media Chamber (or approved equal)	Pasadena Lots 70, LLC as the owner will be responsible to hire or contract a maintenance supplier conduct visual inspections, maintain, inspect, and repair as necessary and inform appointed HOA of necessary maintenance requirements.	Katchall Kleerstream system maintenance will conform to manufacturer's specifications. Refer to attached installation, operation and maintenance manual. Inspections shall be schedule 2 times per year or as recommended by the maintenance supplier.

			All maintenance shall be performed by the maintenance supplier only.
Yes	Treatment Control BMP #10 – Brentwood Infiltration Chamber	Maintenance shall be conducted 2 times each year or at the advisement of the manufacturer.	HOA
Yes	Treatment Control BMP #52 - Catch Basin Inserts	Maintenance shall be conducted by the HOA. This includes removal of trash, plants or other obstructing objects.	HOA

Required Permits

This section must list any permits required for the implementation, operation, and maintenance of the BMPs. Possible examples are:

- No required permits are needed for the implementation, operation, and maintenance of the previously listed BMPs.

Forms to Record the BMP Implementation, Maintenance, and Inspection

The form that will be used to record the implementation, maintenance, and inspection of the BMPs is attached.

Recordkeeping

All records must be maintained for at least five (5) years and must be made available for review upon request.

Manufacturer's Maintenance Specifications

Katchall Kleerstream Suggested Annual Maintenance Procedures

In Line Systems

- Dry Season (June-September) – Vaults should be visually inspected not less than once (1) to determine if any obstructions (trash net area) have occurred and debris removed, if needed
- Wet Season (October-May) – Vaults should be visually inspected not less than once every four (4) months to determine if any debris obstructions have occurred and/ or if excessive sediments, oils and grease, have accumulated on the filtration weir walls. Clean and/ or replaced, if needed.

Off Line Systems

- Generally, one visual inspection per year, removing debris/ trash if present and cleaning filtration weir walls should an excessive amount of sediments, oil and grease have accumulated.

Anticipated Life Cycles of Medias

Every installation has unique parameters, without pre-installation water quality tests conducted to determine project specific pollutant effluent levels, it is difficult to accurately forecast the life cycles of a particular application.

The information present hereon was based on historical data compiled over 7 years of water quality sampling and testing on different media applications. Samples were collected from actual field installations. This information was utilized to formulate a guideline.

- **Residential Applications**
 - Filtration Fabrics – 2 years
 - Mixed Media – 3-5 years

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: _____

Name of Person Performing Activity: _____
(Printed)

Signature: _____

BMP Name (As Shown on O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Appendix I:
Soils Report

Appendix J:
Maintenance Covenant for On-Site Best Management Practices
Requirements