

## **APPENDIX F2**

Low Impact Development Plan (WQMP)



# Low Impact Development Plan (LID Plan)

**Project Name:**

**PATRIOT -PARCEL 3**

**3022 -026-003**

**Prepared for:**

**PBP INDUSTRIAL PROJECT.**

**455 WEST PALMDALE BLVD., SUITE P**

**PALMDALE, CA. 93551**

**(818) 212-9346**



**Prepared by:**

**RED BRICK SOLUTION, LLC.**

**331 SOUTH RIO GRANDE STREET, SUITE 203**

**SALT LAKE CITY, UTAH 84101**

**(801) 244-5335**



PE Stamp & Sign Here

**08/28/2022**



**REV1** 06/24/23

## **Project Owner's Certification**

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 the 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's Name:	ROBERT SARKISSIAN		
Owner's Title:	PRESIDENT		
Company:	PBP INDUSTRIAL PROJECT		
Address :	455 WEST PALMDALE BLVD., SUITE P PALMDALE, CA. 93551		
Email:	ROBERT.S@PATRIOTDEVELOPMENTS.COM		
Telephone No:	(818) 212-9346		
Signature:		Date:	07/28/2022

## Preparer (Engineer) Certification

Engineer's Name:	DAVID LARSON		
Engineer's Title:	CEO		
Company:	RED BRICK SOLUTION, LLC.		
Address:	331 SOUTH RIO GRANDE STREET, SUITE 203 SALT LAKE CITY, UTAH 84101		
Email:	DAVID@REDBRICKSOLUTION.COM		
Telephone No:	(801) 244-5335		
<p>I hereby certify that this Low Impact Development Plan is in compliance with, and meets the requirements set forth in, Order No. R4-2012-0175, of the Los Angeles Regional Water Quality Control Board.</p>			
Engineer's Signature		Date	08/28/2022
Place Stamp Here			

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# 1. PROJECT DESCRIPTION

## 1.1. PROJECT CATEGORY

Check which box best represents the proposed project category. Only check "Yes" for one box.

Category	YES	NO
1. Development <sup>a</sup> of a new project equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious area <sup>b</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Development <sup>a</sup> of a new industrial park with 10,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Development <sup>a</sup> of a new commercial mall with 10,000 square feet or more surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Development <sup>a</sup> of a new retail gasoline outlet with 5,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Development <sup>a</sup> of a new restaurant (SIC 5812) with 5,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Development <sup>a</sup> of a new parking lot with either 5,000 ft <sup>2</sup> or more of impervious area <sup>b</sup> or with 25 or more parking spaces	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Development <sup>a</sup> of a new automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area <sup>c</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA), <sup>d</sup> where the development will: a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and b. Create 2,500 square feet or more of impervious area <sup>b</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Redevelopment <sup>e</sup> of 5,000 square feet or more in one of the categories listed above <b>If yes, list redevelopment category here:</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Redevelopment <sup>e</sup> of 10,000 square feet or more to a Single Family Home, without a change in landuse.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a Development includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in land disturbance.
- b Surfaces that do not allow stormwater runoff to percolate into the ground. Typical impervious surfaces include: concrete, asphalt, roofing materials, etc.
- c The surface area is the total footprint of an area. Not to include the cumulative area above or below the ground surface.
- d An area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and would be disturbed or degraded by human activities and developments. Also, an area designated by the City as approved by the Regional Water Quality Control Board.
- e Land-disturbing activities that result in the creation, addition, or replacement of a certain amount of impervious surface area on an already developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of facility, nor does it include modifications to existing single family structures, or emergency construction activities required to immediately protect public health and safety.

## 1.2. PROJECT DESCRIPTION

Total Project Area (ft<sup>2</sup>): 262,109

Total Project Area (Ac): 6.02

### EXISTING CONDITIONS

Condition	Area (ft <sup>2</sup> )	Percentage (%)
Pervious Area:	257,529	98
Impervious Area:	5,256	2

### PROPOSED CONDITIONS

Condition	Area (ft <sup>2</sup> )	Percentage (%)
Pervious Area:	31,217	11.88
Impervious Area:	231,568	88.12

### SITE CHARACTERISTICS

<p><b>DRAINAGE PATTERNS/CONNECTIONS</b></p> <p>[Include a detailed description of existing and proposed drainage patterns. Describe the areas and sub-areas (to include square footage), treatment locations, direction of flow through each area, discharge point(s), ultimate termination point, etc.]</p>	<p>Existing: 6.03 AC SITE</p> <p>SHEET FLOWS FROM THE WEST TO THE EAST ACROSS FAIR COVERED GROUND CONSISTING OF BLUE SAGE AND ANNUAL GRASSES</p> <hr/> <p>Proposed: 6.03 AC SITE</p> <p>SHEET FLOWS FROM THE WEST TO THE EAST AROUND THE BUILDINGS AND BETWEEN CREATING ONE DRAINAGE AREA OF 262,785 SF COMPRISING OF 31,217 SF OF LANDSCAPING</p>
<p><b>NARRATIVE PROJECT DESCRIPTION:</b></p> <p>[Include a detailed description of project areas, type of facilities, activities conducted onsite, materials and products received and stored on site, SIC Code (if applicable), land uses, land cover, design elements, drainage management areas (DMAs), etc.]</p>	<p>DESIGNATED LAND USE OF INDUSTRIAL UNDER M-2 ZONING. THE SITE IS 262,785 SF COMPRISING OF 31,217 SF OF LANDSCAPING, (2) 50,990 INDUSTRIAL BUILDINGS, AND 143,752 SF OF PAVEMENT. PROVISIONS FOR OUTDOOR BRAKE AREAS AND POTENTIAL FOOD TRUCKS WILL BE INCORPORATED.</p> <p>THE SITE HAS ONLY ONE DRAINAGE AREA.</p>



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<p><b>OFFSITE RUNON</b></p> <p>[Describe any offsite runon anticipated and how the runon will be either accounted for in LID BMP sizing or directed around the site.]</p>	<p>OFFSITE RUNON IS BEING DIRECTED AROUND THE SITE VIA EXISTING STREETS</p>
<p><b>UTILITY AND INFRASTRUCTURE INFORMATION</b></p> <p>[Include a description of the existing and proposed onsite utility and infrastructure. Evaluate the potential impacts of stormwater infiltration on subsurface utilities, establish necessary setbacks, and if the utilities need to be relocated. Retention-based stormwater quality control measures should not be located near utility lines where an increased volume of water could damage utilities.]</p>	<p>PROJECT HAS PUBLIC WATER AND SEWER AVAILABLE IN BLACKBIRD DRIVE AS WELL AS POWER AND COMMUNICATION ON THE NORTH AND WEST LOCATED ON EXISTING POWER POLES. STORM WATER WILL BE CAPTURE IN A STORM DRAIN SYSTEM THAT WILL DIRECT THE STORM FLOWS TO THE EAST PROPERTY LINE WHERE AN UNDERGROUND INFILTRATION BASIN WILL NOT AFFECT UTILITY LINES AND STRUCTURES.</p>
<p><b>SIGNIFICANT ECOLOGICAL AREAS (SEAs)</b></p> <p>[Identify any known Significant Ecological Area (SEA) which the project is located in or directly adjacent to, or discharging directly to.]</p>	<p>THE PROJECT IS NOT LOCATED WITHIN A SIGNIFICANT ECOLOGICAL AREA</p>

### 1.3. HYDROMODIFICATION ANALYSIS

DOES THE PROPOSED PROJECT FALL INTO ONE OF THE FOLLOWING CATEGORIES? CHECK YES/NO.	YES	NO
1. <i>Project is a redevelopment that decreases the effective impervious area compared to the pre-project conditions.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Describe: NEW DEVELOPMENT		
2. <i>Project is a redevelopment that increases the infiltration capacity of pervious areas compared to the pre-project conditions.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Describe: NEW DEVELOPMENT		
3. <i>Project discharges directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q<sub>100</sub>) of 25,000 cfs or more.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Describe: INTO EXISTING SEASONAL DRAINAGE CONVEYANCES TO THE LITTLE ROCK WASH TO THE ROSAMOND DRY LAKEBED.		
4. <i>Project discharges directly or via a storm drain into concrete or otherwise engineered (not natural) channels (e.g., channelized or armored with rip rap, shotcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts.</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Describe: THE NATURL DRAINAGE CONVEYANCES, THE LITTLE ROCK WASH, AND THE ROSAMOND DRY LAKEBED ARE SUBJECT TO HYDROMODIFICATION CONTROL.		

[Check "Yes" or "No," as applicable.

If one or more of the above criteria are checked "Yes," the project is exempt from Hydromodification Control Measures. State as such.

If none of the above criteria are checked "Yes," the project will require Hydromodification control measures. Include detailed description of control measures to be implemented and a reference to calculations following the criteria outlined in MS4 Permit (Order R4-2012-0175) §VI.D.7.c.iv]

#### HYDROMODIFICATION ANALYSIS

THE PROJECT WILL COLLECT AND PRETREAT STORM FLOWS VIA BIO-FILTRATION FILTERS IN EACH CATRCH BASIN PRIOR TO ENTERING THE STORM DRAIN SYSTEM. AN ON-SITE OR REGIONAL RETENTION/DETENTION BASIN WILL MITIGATE THE DEVELOPED 50-YEAR CAPITAL STORM FLOWS TO BELOW 90% OF THE PRE-DEVELOPED CAPITAL STORM FLOW.

## **1.4. PROPERTY OWNERSHIP/MANAGEMENT**

<p>[Describe ownership of all portions of project and site. Include information on if any infrastructure transfer to public agencies (City, County, Caltrans, etc.). Describe any property management company/association that will be formed. Include leasee information, as applicable.]</p>	<p>PATRIOT BUSINESS PARK, LLC. 455 WEST PALMDALE BLVD., SUITE C PALMDALE, CA. 9355</p> <p>2-FOOT ROAD DEDICATION ALONG LOCKHEED WAY (8<sup>TH</sup> Street East)</p> <p>Public water facilities on Blackbird Drive will be conveyed to LA COUNTY WATER DISTRICT 40. Sewer along the eastern property line will be gifted to the City.</p>
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## 2. BEST MANAGEMENT PRACTICES (BMPs)

### 2.1. SITE DESIGN

<p>85<sup>TH</sup> PERCENTILE, 24-HOUR STORM DEPTH</p> <p>[Determined from the Los Angeles County 85th. 0.75 min.]</p>	<p>The 85<sup>th</sup> percentile map shows us that our storm flow is 0.50 inch</p> <p>The 0.75-inch storm will be used.</p>
<p>SITE DESIGN</p> <p>[Describe site design and drainage plan including; site design practices utilized and how BMPs are incorporated using the appropriate hierarchy.]</p>	<p>Storm flows will be collected via surface gutters that will convey the flows to localized low points where the flows will enter a catch basin stenciled with a “No Dumping Goes to River” BMP SD-13 and lined with an Old - Castle” bio-Clean filter BMP- MP-52. These filtered flows then enter a the storm drain system that directs them to an on-site or regional retention/detention basin bmp TC-11 that will mitigate the developed 50-year capital storm flows to below 90% of the pre-developed capital storm flow and infiltrate into the ground.</p>

#### BMP LIST

[Fill out the table below with information on the BMPs incorporated in each Drainage Management Area (DMA)]

DMA DESIGNATION	SQUARE FOOTAGE (SF)	ACREAGE (AC)	STORM WATER QUALITY DESIGN VOLUME (SWQDV, CF)	STORM WATER QUALITY DESIGN FLOWRATE (SWQDQ, CFS) [Delete if using volume-based BMPs]	BMP TYPE [Include make & model if proprietary]	MINIMUM BMP SIZE [Include units]	BMP SIZE PROVIDED [Include units]	GPS COORDINATES
1A	35,240	0.81	1,753.2	0.1551	MP-52	FF-T18	FF-T18	
2A	34,412	0.79	1,712.0	0.1479	MP-52	FF-T18	FF-T18	
3A	36,155	0.83	1,798.7	0.1592	MP-52	FF-T18	FF-T18	
4A	10,585	0.24	526.6	0.0505	MP-52	FF-T18	FF-T18	
5B	29,795	0.68	1482.3	0.1199	MP-52	FF-T18	FF-T18	
7C	30,623	0.70	1,523.5	0.1316	MP-52	FF-T18	FF-T18	
8C	30,318	0.70	1,508.3	0.1303	MP-52	FF-T18	FF-T18	
9C	30,318	0.70	1,508.3	0.1370	MP-52	FF-T18	FF-T18	
10C	18,992	0.44	944.9	0.0722	MP-52	FF-T18	FF-T18	

USE OLD CASTLE FLOGARD FF-T18 0.3 CFS

## 2.2. BMP SELECTION

### 2.2.1. INFILTRATION BMPs

NAME	INCLUDED [Check all that apply.]
Bioretention without underdrains	<input checked="" type="checkbox"/>
Infiltration Trench	<input type="checkbox"/>
Infiltration Basin	<input checked="" type="checkbox"/>
Drywell	<input type="checkbox"/>
Proprietary Subsurface Infiltration Gallery	<input type="checkbox"/>
Permeable Pavement (concrete, asphalt, pavers)	<input type="checkbox"/>
Other: FLOGARD FF-T18 CATCH BASIN INSERT	<input checked="" type="checkbox"/>
Other:	<input type="checkbox"/>

<p>DESCRIPTION</p> <p>[Describe Infiltration BMPs. Include descriptions on selection, sizing, and feasibility, as applicable. If infiltration is infeasible, provide brief explanation, including reference to the geotechnical report.]</p>	<p>EACH DMA-AREA CATCH BASIN INLET WILL HAVE A FLOGARD FF-T18 INSERT THAT CAN REMOVE SEDIMENT, TRASH, DEBRIS, AND PETROLEUM HYDROCARBONS AT A RATE OF 0.3 CFS &lt; 0.16 REQ'D - CLEAR FLOWS ARE CONVEYED VIA STORM DRAIN TO INFILTRATION/RETENTION/DETENTION BASIN. SINCE SOIL INFILTRATION RATES ARE 0.57 IN/HR AT A MINIMUM THAN TO DRAIN IN 72-HOURS WOULD LIMIT DEPTH OF BASIN TO <math>(0.57/12 \times 48) = 3.42</math> FEET</p>
<p>CALCULATIONS</p> <p>[Show calculations to demonstrate that the Storm Water Quality Design volume can be met with Infiltration BMPs.]</p>	<p>THE POST-DEVELOPMENT LID 0.75 IN. RAINFALL EVENT VOLUME WAS DETERMINED TO BE 12,700 CF. THUS, A BASIN WOULD NEED TO BE <math>(12,700/3.42) = 3,713</math> SF IN SIZE OR 100' LONG AND 37' WIDE.</p>

SEE ATTACHED  
HYDROCALC SHEETS

## PRE-DEVELOPED CONDITION

### Peak Flow Hydrologic Analysis

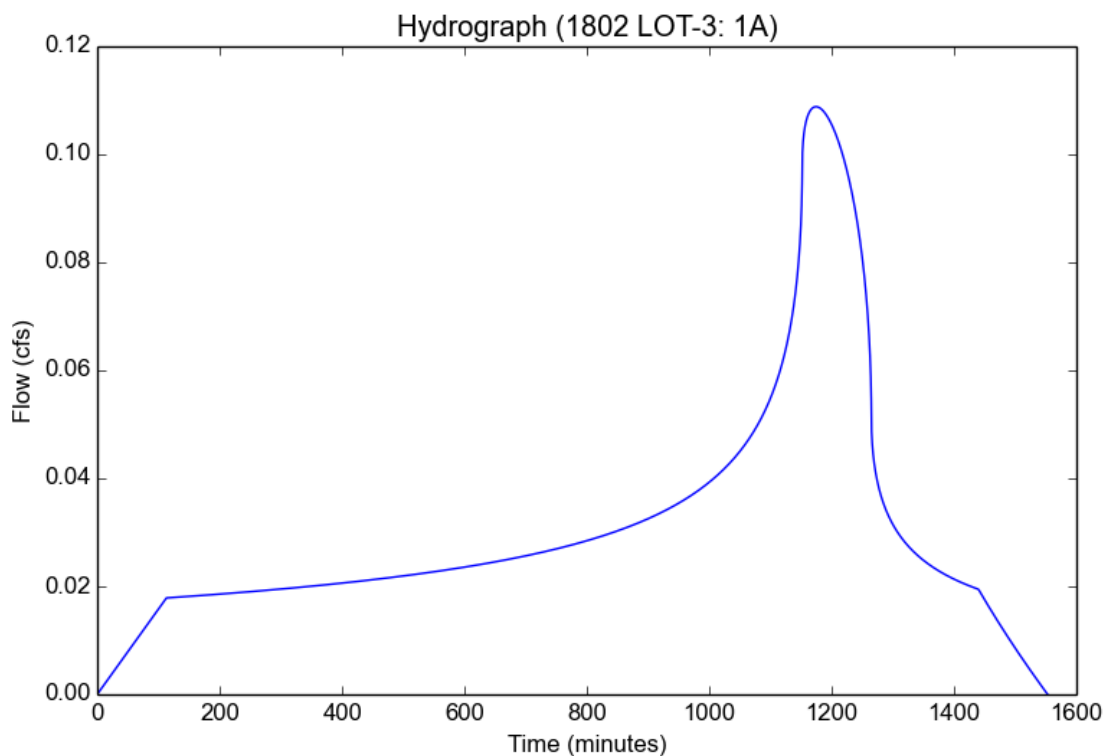
File location: C:/Users/larso/1802 LOT-3 Report.pdf  
Version: HydroCalc 1.0.3

#### Input Parameters

Project Name	1802 LOT-3
Subarea ID	1A
Area (ac)	5.85
Flow Path Length (ft)	724.6
Flow Path Slope (vft/hft)	0.008
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

#### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1034
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	113.0
Clear Peak Flow Rate (cfs)	0.1088
Burned Peak Flow Rate (cfs)	0.1088
24-Hr Clear Runoff Volume (ac-ft)	0.0653
24-Hr Clear Runoff Volume (cu-ft)	2843.5896



## POST-DEVELOPED CONDITION

### Peak Flow Hydrologic Analysis

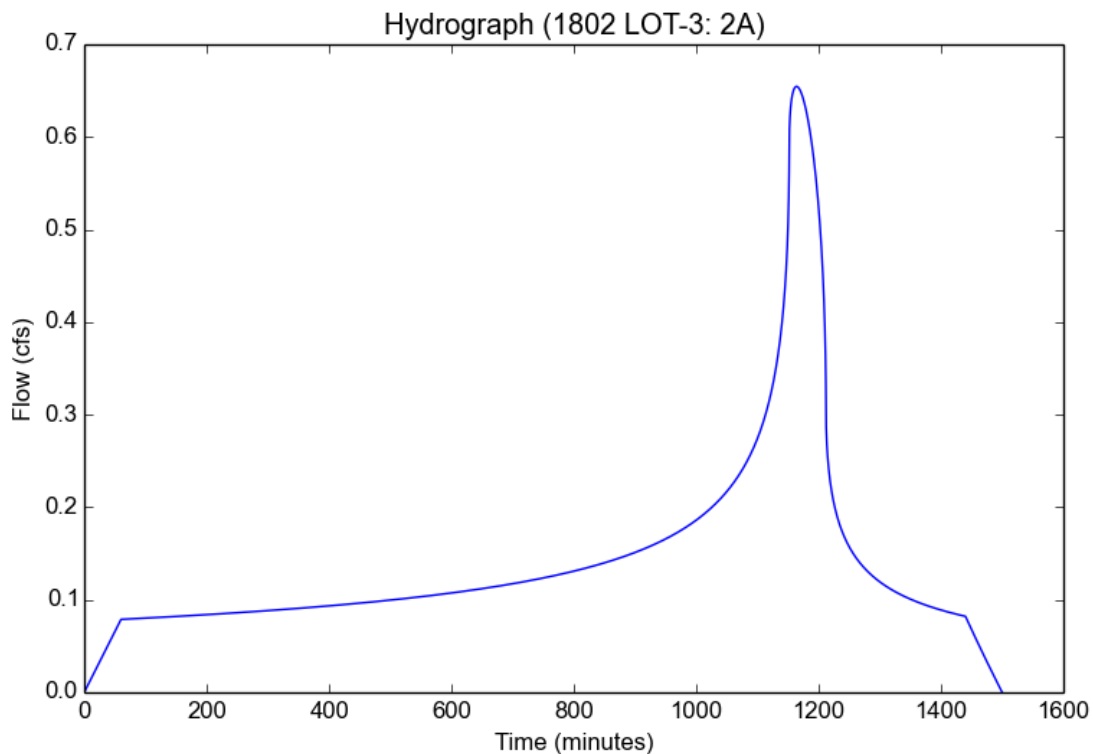
File location: C:/Users/larso/1802 LOT-3 Report.pdf  
Version: HydroCalc 1.0.3

#### Input Parameters

Project Name	1802 LOT-3
Subarea ID	2A
Area (ac)	5.85
Flow Path Length (ft)	1065.0
Flow Path Slope (vft/hft)	0.003474178
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.88
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

#### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.1392
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.804
Time of Concentration (min)	60.0
Clear Peak Flow Rate (cfs)	0.6546
Burned Peak Flow Rate (cfs)	0.6546
24-Hr Clear Runoff Volume (ac-ft)	0.2915
24-Hr Clear Runoff Volume (cu-ft)	12699.7749



**2.2.2. RAINWATER HARVEST AND USE BMPs (NOT APPLICABLE)**

NAME	INCLUDED [Check all that apply.]
Above-ground cisterns and basins	<input type="checkbox"/>
Underground detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

<p>DESCRIPTION</p> <p>[Describe Rainwater Harvest and Use BMPs. Include descriptions on selection, suitability, sizing, and infeasibility, as applicable.]</p>	<p>n/a</p>
<p>CALCULATIONS</p> <p>[Show calculations to demonstrate if the Storm Water Quality Design volume can be met with Rainwater Harvest and Use BMPs. If not, document how much can be met with Rainwater Harvest and Use and why it is not feasible to meet the full volume with Rainwater Harvest and Use BMPs.]</p>	<p>n/a</p>



### 2.2.3. ALTERNATIVE COMPLIANCE BMPs

**BIOFILTRATION BMPs (NOT APPLICABLE)**

*(If Infiltration BMPs and Rainwater Harvest and Use BMPs are Infeasible)*

NAME	INCLUDED [Check all that apply.]
Bioretention with underdrains (i.e. planter box, rain garden, etc.)	<input type="checkbox"/>
Constructed Wetland	<input type="checkbox"/>
Vegetated Swale	<input type="checkbox"/>
Vegetated Filter Strip	<input type="checkbox"/>
Tree-Well Filter	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

<p><b>DESCRIPTION</b></p> <p>[If the full Design Storm Capture Volume cannot be met with Infiltration BMPs, and/or Rainwater Harvest and Use BMPs, describe Biofiltration BMPs. Include descriptions on selection, suitability, sizing, and infeasibility, as applicable.]</p>	N/A
<p><b>CALCULATIONS</b></p> <p>[Show calculations to demonstrate how 1.5 times the Storm Water Quality Design volume and/or flowrate can be met with Biotreatment BMPs.]</p>	N/A

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**OFFSITE BMPs (NOT APPLICABLE)**

*(If Infiltration BMPs, Rainwater Harvest and Use BMPs, and Biofiltration BMPs are Infeasible)*

NAME	INCLUDED [Check all that apply.]
Offsite Infiltration	<input type="checkbox"/>
Ground Water Replenishment Projects	<input type="checkbox"/>
Offsite Project - Retrofit Existing Development	<input type="checkbox"/>
Regional Storm Water Mitigation Program	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

<p><b>DESCRIPTION</b></p> <p>[If the full Design Storm Capture Volume cannot be met with Infiltration BMPs, Rainwater Harvest and Use BMPs, or Biofiltration BMPs, describe proposed Alternative Compliance BMPs. Include descriptions on selection, suitability, sizing, and infeasibility, as applicable.]</p>	<p>N/A</p>
<p><b>CALCULATIONS</b></p> <p>[Show calculations to demonstrate how the conditions required by the MS4 Permit will be met with Alternative Compliance BMPs.]</p>	<p>N/A</p>

**2.2.4. TREATMENT CONTROL BMPs**

Treatment control BMPs can only be used as pre-treatment to LID BMPs.

NAME	INCLUDED [Check all that apply.]
Media Filter	<input type="checkbox"/>
Filter Insert	<input checked="" type="checkbox"/>
CDS Unit	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

<p>DESCRIPTION</p> <p>[Include descriptions on selection, suitability, sizing, and infeasibility, as applicable.]</p>	<p>Old-Castle catch basin insert bio-clean filter.</p>
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**2.2.5. HYDROMODIFICATION CONTROL BMPs**

NAME	INCLUDED [Check all that apply.]
Infiltration System	<input type="checkbox"/>
Above-ground Cistern	<input type="checkbox"/>
Above-ground Basin	<input checked="" type="checkbox"/>
Underground Detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

<p><b>DESCRIPTION</b></p> <p>[If the site is susceptible to hydromodification, include descriptions on selection and sizing of Hydromodification Control Measures.]</p>	
<p><b>CALCULATIONS</b></p> <p>[If the site is susceptible to hydromodification, show calculations to demonstrate how the volume, flowrate, and duration conditions can be met with Hydromodification Control Measures BMPs.]</p>	

**2.2.6. NON-STRUCTURAL SOURCE CONTROL BMPs**

NAME	CHECK ONE	
	Included	Not Applicable
Education for Property Owners, Tenants and Occupants	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Activity Restrictions	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Common Area Landscape Management	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Common Area Litter Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Housekeeping of Loading Docks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Common Area Catch Basin Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**2.2.7. STRUCTURAL SOURCE CONTROL BMPs**

NAME	CHECK ONE	
	Included	Not Applicable
Provide storm drain system stenciling and signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Design and construct outdoor material storage areas to reduce pollution introduction	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Design and construct trash and waste storage areas to reduce pollution introduction	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protect slopes and channels and provide energy dissipation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Loading docks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Maintenance bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vehicle wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoor processing areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Equipment wash areas/racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fueling areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hillside landscaping	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Attachment A

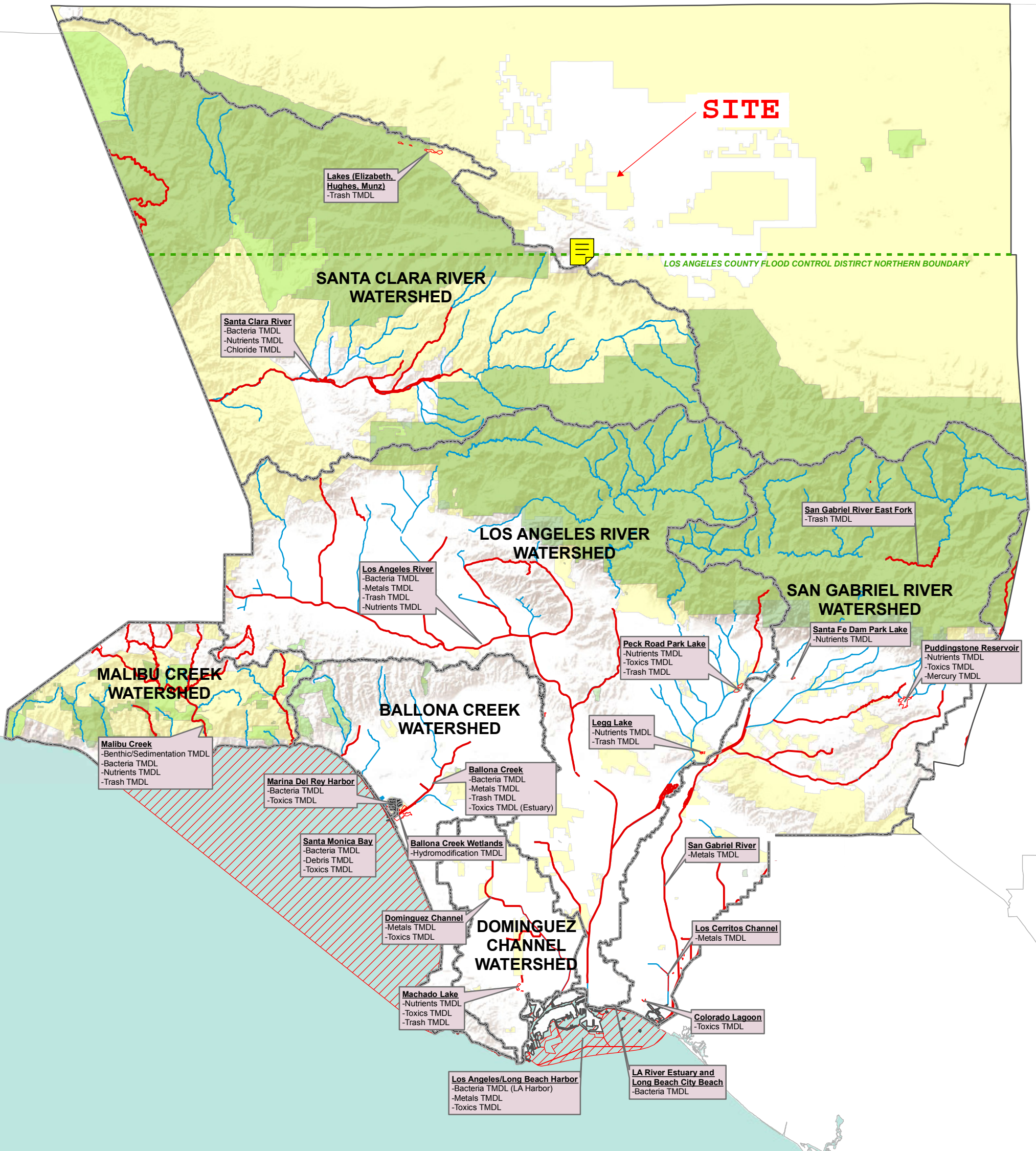
## Calculations

[Include calculations for each BMP following an approved published design standard (i.e. City Manuals, County Manuals, Caltrans, CASQA, etc.). Calculations must be followed step-by-step with no alterations. Also, include an excerpt from the design standard used.]



# EXHIBIT A COUNTY OF LOS ANGELES MAJOR WATERSHEDS

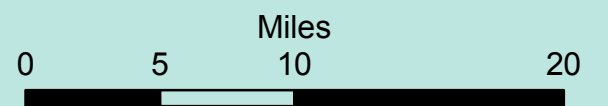
## and EFFECTIVE TOTAL MAXIMUM DAILY LOADS (as of October 2013)



**EXHIBIT A  
LOCATION MAP**

**LEGEND**

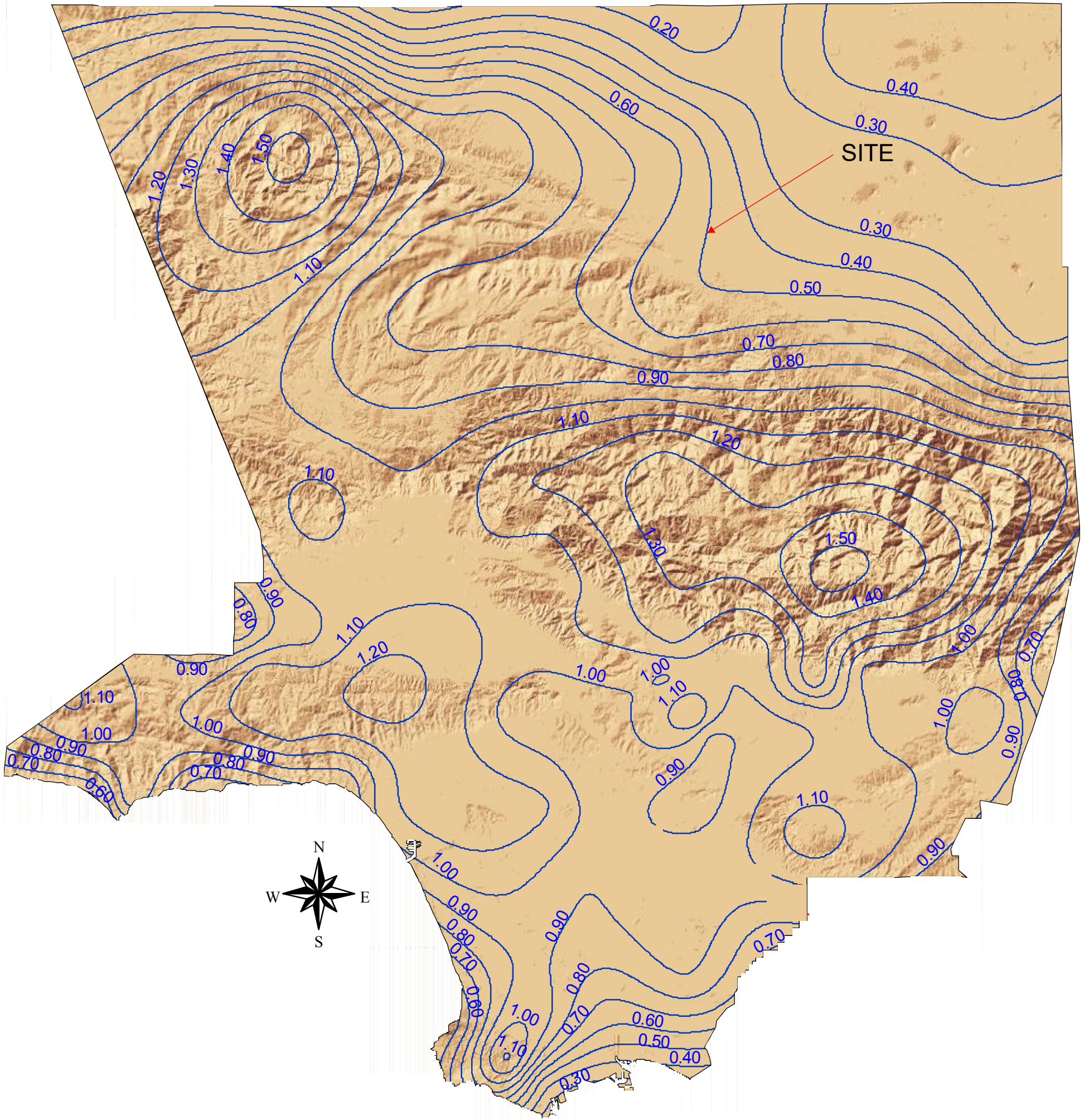
- WATERSHED BOUNDARY
- UNINCORPORATED AREA
- IMPAIRED WATERBODY
- MAJOR CHANNEL
- NATIONAL FOREST/STATE PARK





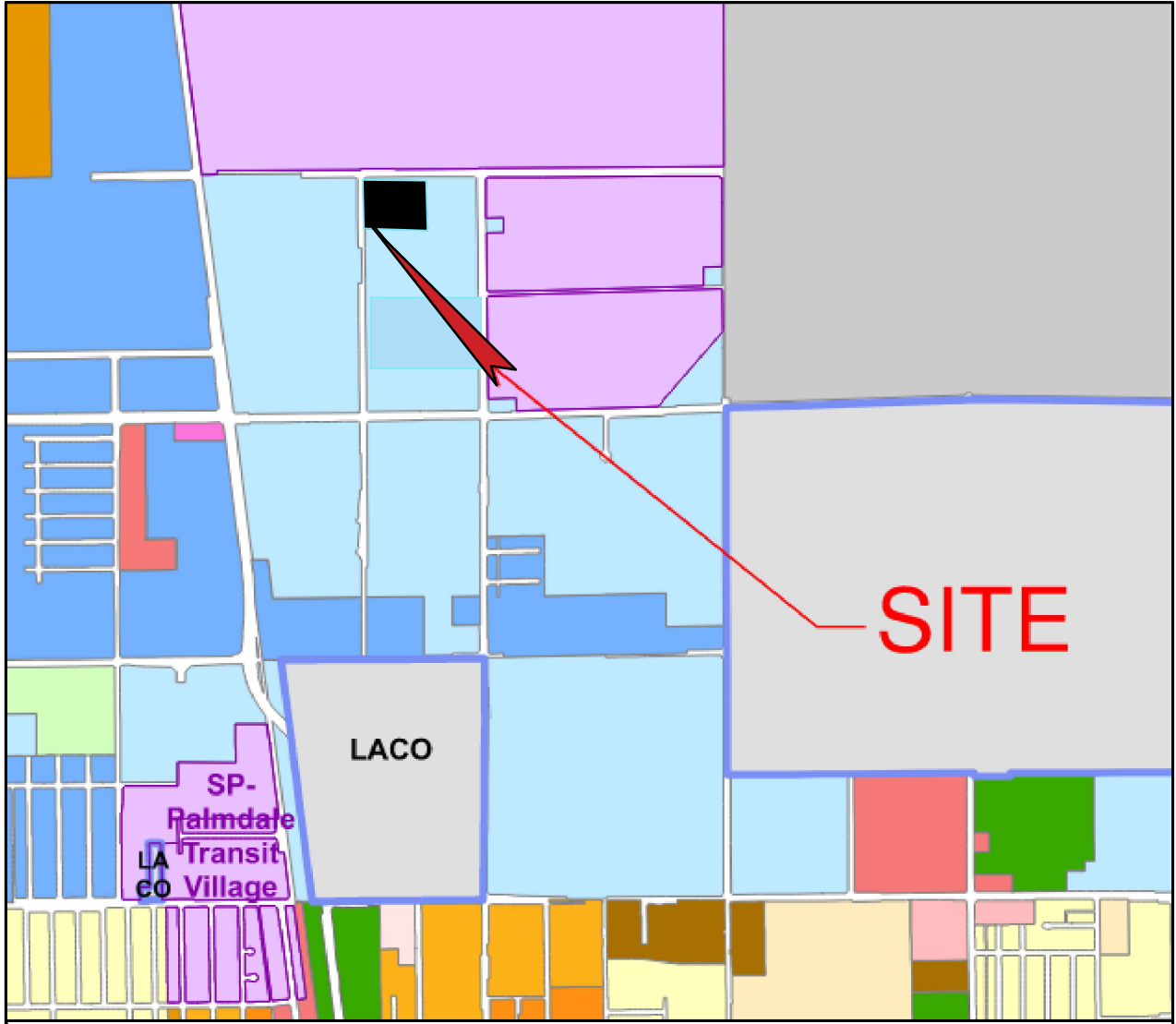
# 85th Percentile 24-hr Rainfall Isohyetal Map

## EXHIBIT B



 85th Percentile 24-hr Rainfall Depth

## EXHIBIT B



**CITY OF PALMDALE GENERAL PLAN LAND USE**  
ADOPTED BY THE CITY COUNCIL 1/25/93

**Legend**

Parcel	Neighborhood Commercial (NC)	Industrial (IND)	Equestrian Residential (ER)	Medium Residential (MR)	Public Facility (PF)
City of Palmdale	Office Commercial (OC)	Business Park (BP)	Low Density Residential (LDR)	Multifamily Residential (MFR)	Open Space (OS)
	Community Commercial (CC)	Airport and Related Uses (AR)	Single Family Residential (SFR-1)	Medium High Density Residential (MHDR)	Mineral Resource Extraction (MRE)
	Downtown Commercial (DC)		Single Family Residential (SFR-2)	High Density Residential (HDR)	Specific Plan (SP)
	Commercial Manufacturing (CM)		Single Family Residential (SFR-3)	Special Development (SD)	California Aqueduct
	Regional Commercial (RC)				Other Jurisdiction



Data Source: Copyright 2012. All rights reserved. The City of Palmdale owns and licenses geographic data from a variety of sources. The information contained herein is the proprietary property of the following owners excepted under license and may not be reproduced except as licensed by their owners: City of Palmdale & Los Angeles County Assessor's Office.

<b>DATE:</b> 08/17/2022
<b>DRAWN BY:</b> DWL
<b>CHECKED BY:</b> DWL
<b>SCALE:</b> NTS

**EXHIBIT C**  
**LAND USE MAP**  
**PATRIOT BUSINESS PARK, LLC**  
**PALMDALE, CA**  
**APN: 3022-026-003**





Latitude

34.608746

Longitude

-118.115920

**DATE: 08/27/2022**

**DRAWN BY: DWL**

**CHECKED BY: DWL**

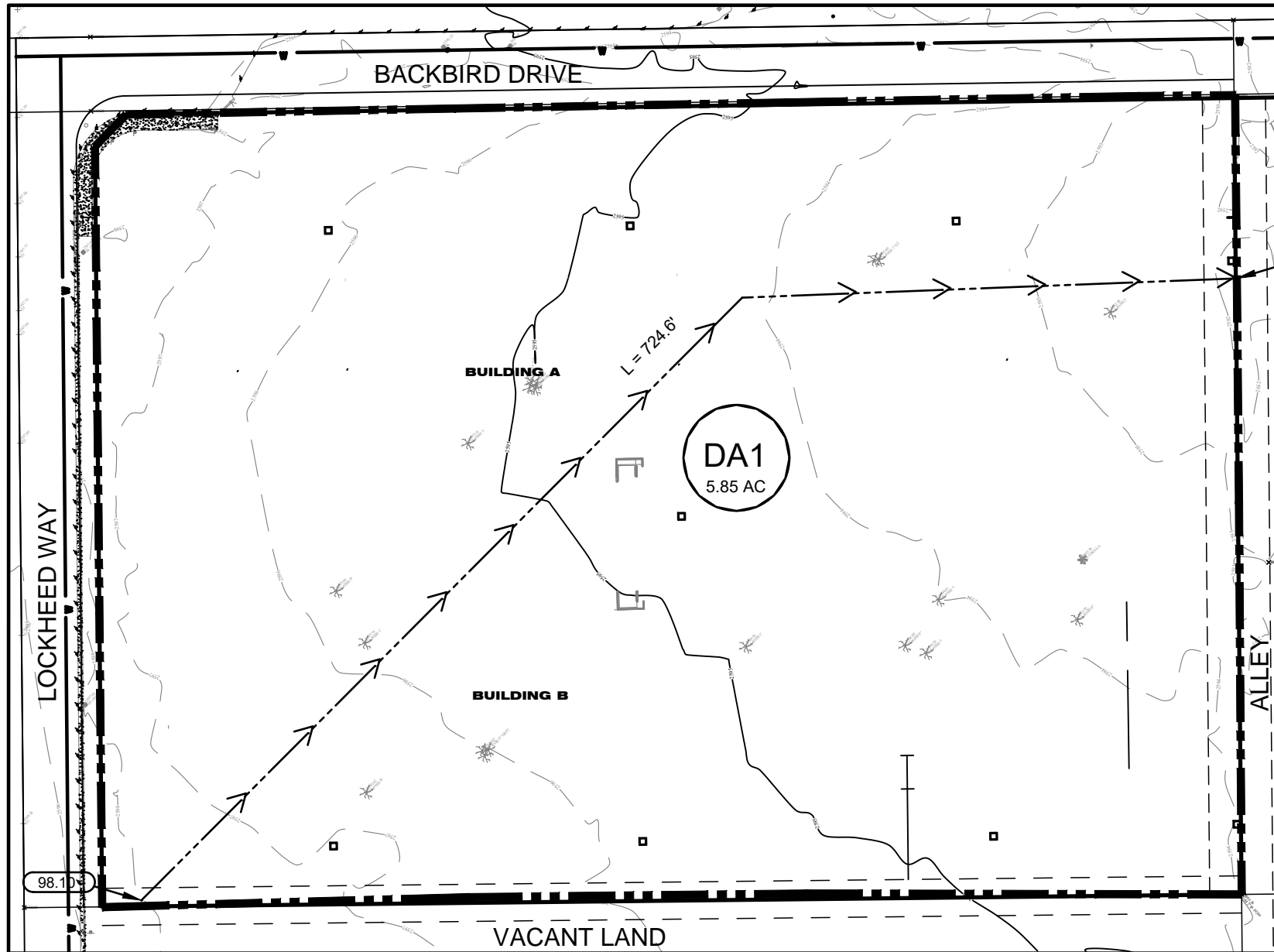
**SCALE: NTS**

***EXHIBIT D  
LOCATION MAP***





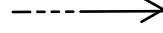
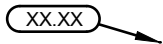
**PALMDALE, CA  
APN: 3022-026-003**



CONSULTING ENGINEERS  
& ARCHITECTS



**LEGEND:**

-  DRAINAGE AREA
-  DRAINAGE MANAGEMENT AREA
-  OVERALL BOUNDARY
-  DMA AREA BOUNDARY
-  SUBAREA FLOWLINE
-  SPOT ELEVATION

**LID**  
**LOW IMPACT DEVELOPMENT PLAN**

**FOR:**  
**PATRIOT DEVELOPMENT**

**IN**  
**THE CITY OF PALMDALE, CA**

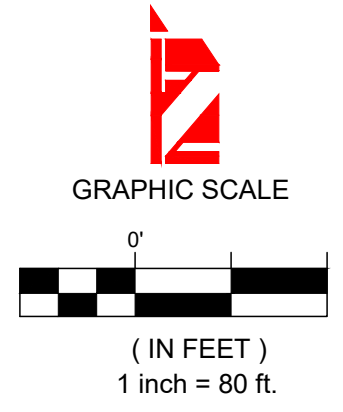
**APN:**  
**3022-026-003**

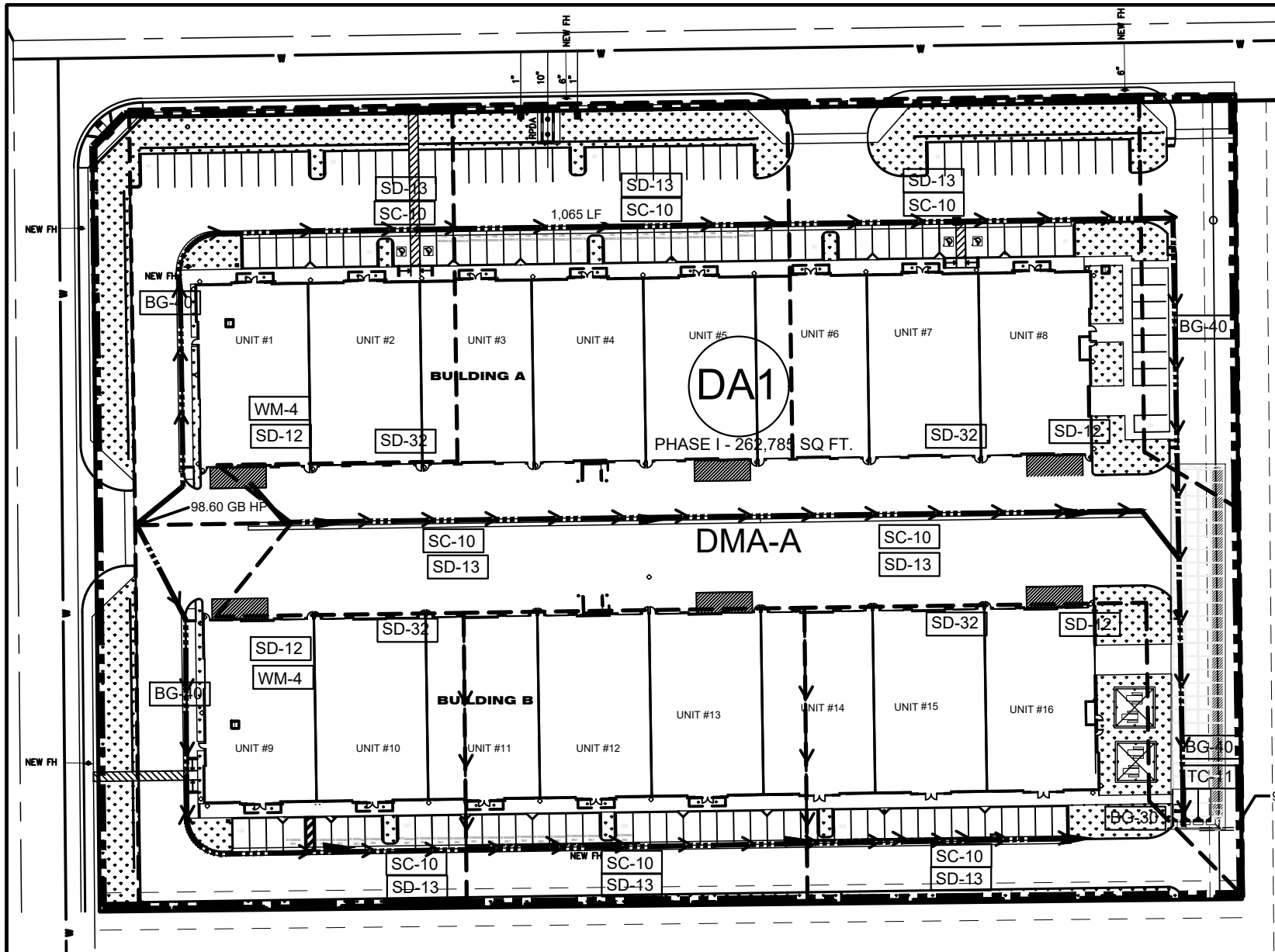
**PRE-DEVELOPED CONDITION**

**RED BRICK SOLUTION**

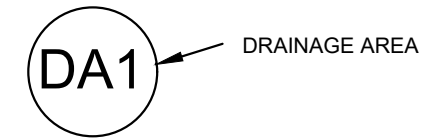
CONSULTING ENGINEERS & ARCHITECTS

**EXHIBIT E**





**LEGEND:**

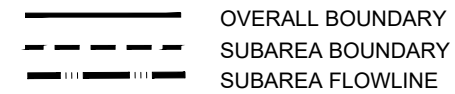


DRAINAGE AREA

DMA-A DRAINAGE MANAGEMENT AREA - A



SPOT ELEVATION



OVERALL BOUNDARY  
SUBAREA BOUNDARY  
SUBAREA FLOWLINE

EG EXISTING GRADE  
FG FINISH GRADE  
FS FINISH SURFACE  
FF FINISH FLOOR  
IE INVERT ELEVATION



**DMA-A**

AREA = 231,443 SF IMPERMEABLE  
31,342 SF PERMEABLE = 11.88%  
262,785 SF TOTAL  
PARKING TREES  
PARKING AREA = 143,752 SF  
P-LANDSCAPING = 14,162 SF = 9.85%

**MAINTENANCE BMP'S**

TC-11 — INFILTRATION BASIN

SD-12 — EFFICIENT IRRIGATION

SD-13 — STORM DRAIN SIGNAGE

SD-32 — TRASH ENCLOSURE

SC-10 — CATCH BASIN O&M

BG-40 — LANDSCAPE INSPECTION O&M

BG-30 — FOOD PREPARATION AREA

WM-4 — SPILL KIT INSPECTION O & M

**WQMP**

**WATER QUALITY  
MANAGEMENT  
PLAN**

**FOR:  
PATRIOT  
DEVELOPMENT**

**IN  
THE CITY OF  
PALMDALE, CA**

**APN:  
3066-261-08,10  
3066-251-14**

**POST-DEVELOPED  
CONDITION  
PHASE I**

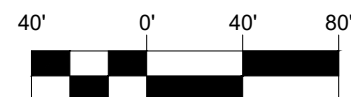
**RED  
BRICK  
SOLUTION**

CONSULTING ENGINEERS  
& ARCHITECTS

**EXHIBIT F**



GRAPHIC SCALE



( IN FEET )

1 inch = 80 ft.

## Peak Flow Hydrologic Analysis

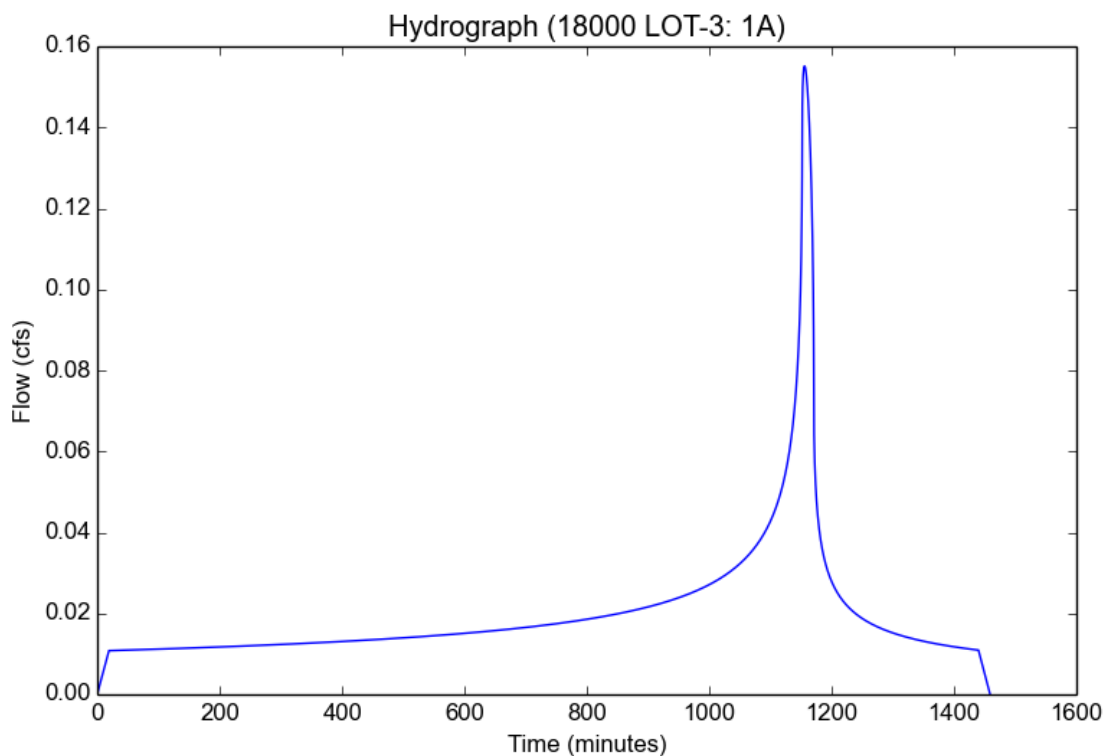
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	1A
Area (ac)	0.809
Flow Path Length (ft)	231.2
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2389
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	0.1551
Burned Peak Flow Rate (cfs)	0.1551
24-Hr Clear Runoff Volume (ac-ft)	0.0402
24-Hr Clear Runoff Volume (cu-ft)	1753.2146



## Peak Flow Hydrologic Analysis

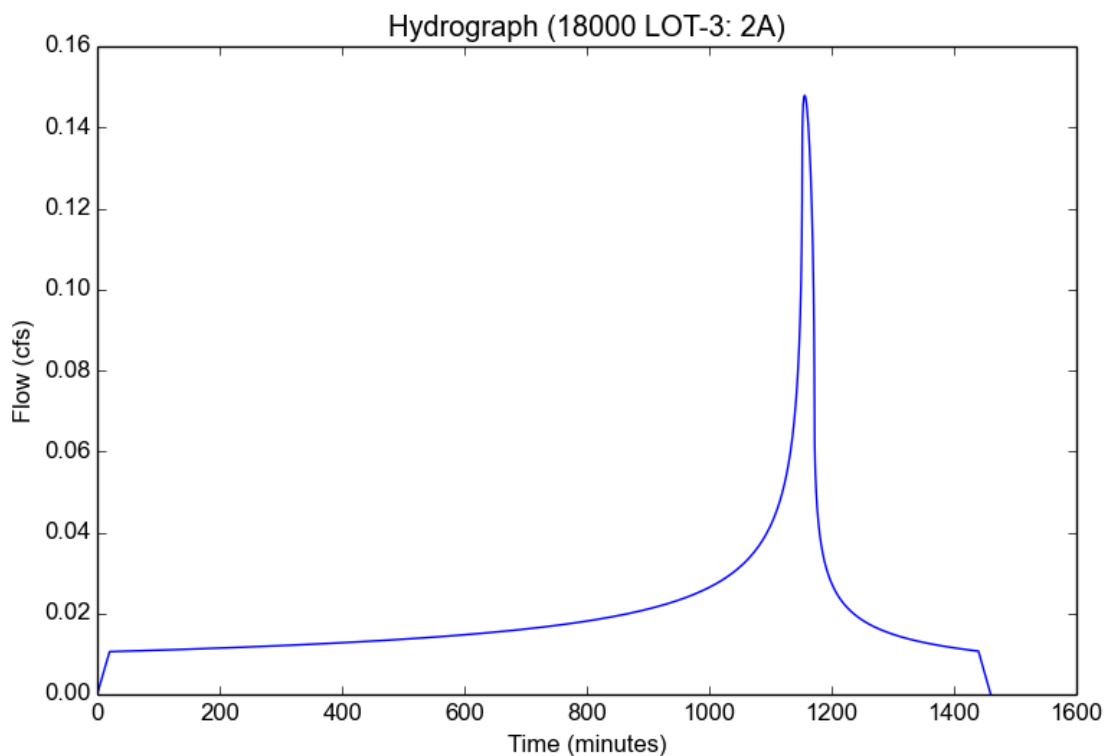
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	2A
Area (ac)	0.79
Flow Path Length (ft)	217.5
Flow Path Slope (vft/hft)	0.006
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2332
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.1479
Burned Peak Flow Rate (cfs)	0.1479
24-Hr Clear Runoff Volume (ac-ft)	0.0393
24-Hr Clear Runoff Volume (cu-ft)	1712.0398



## Peak Flow Hydrologic Analysis

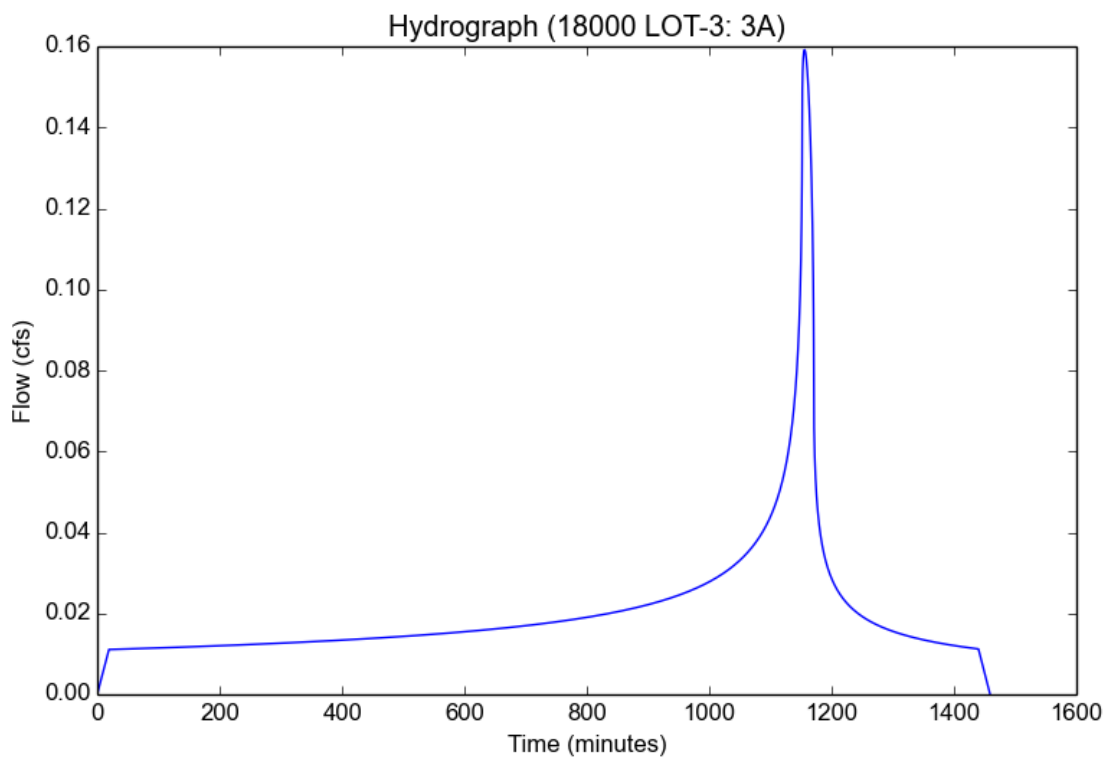
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	3A
Area (ac)	0.83
Flow Path Length (ft)	217.5
Flow Path Slope (vft/hft)	0.007
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2389
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	19.0
Clear Peak Flow Rate (cfs)	0.1592
Burned Peak Flow Rate (cfs)	0.1592
24-Hr Clear Runoff Volume (ac-ft)	0.0413
24-Hr Clear Runoff Volume (cu-ft)	1798.7245





## Peak Flow Hydrologic Analysis

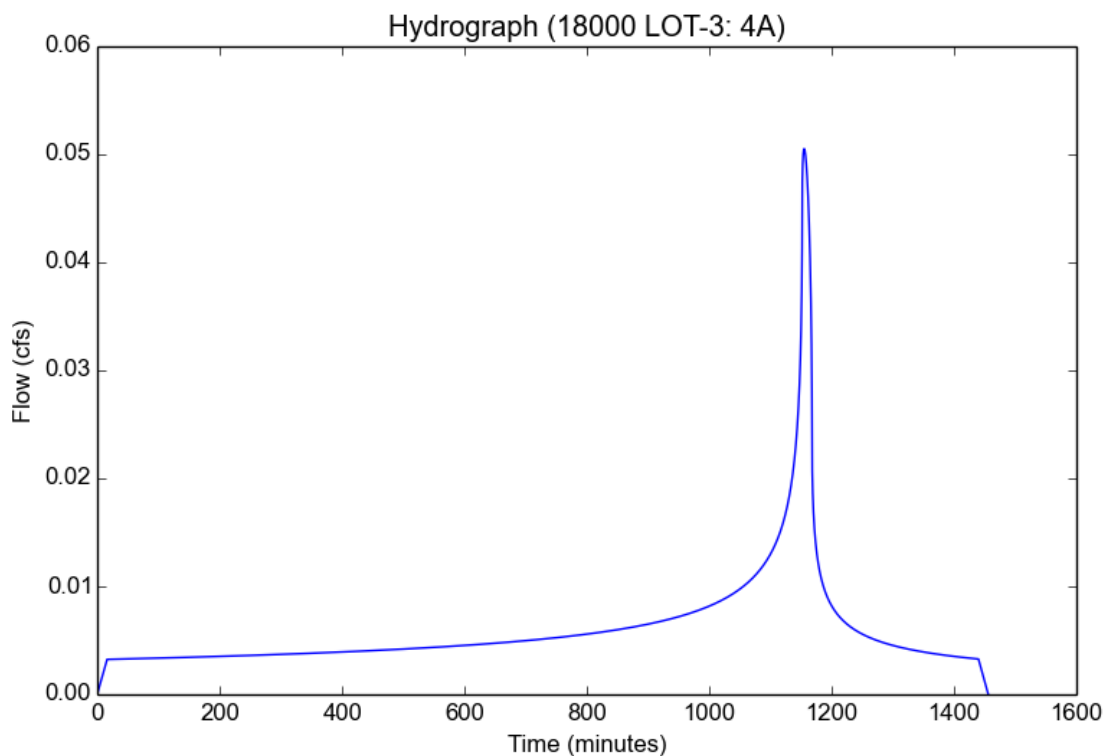
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	4A
Area (ac)	0.243
Flow Path Length (ft)	170.0
Flow Path Slope (vft/hft)	0.007
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.259
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	0.0505
Burned Peak Flow Rate (cfs)	0.0505
24-Hr Clear Runoff Volume (ac-ft)	0.0121
24-Hr Clear Runoff Volume (cu-ft)	526.6138



## Peak Flow Hydrologic Analysis

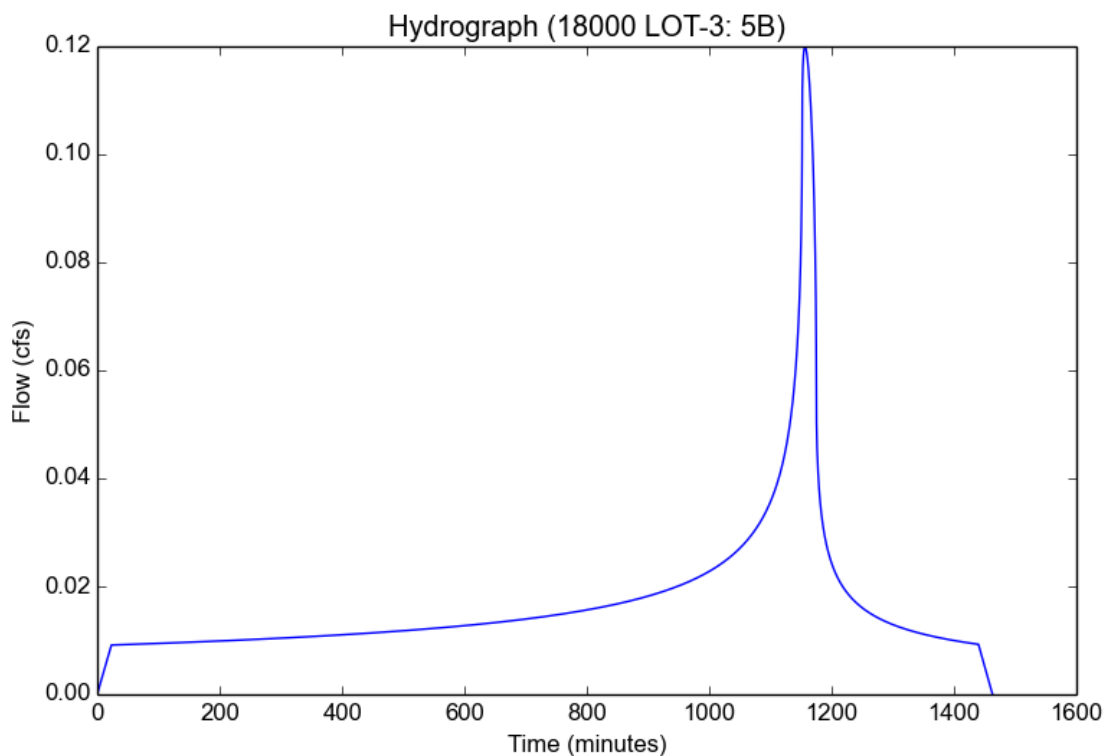
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	5B
Area (ac)	0.684
Flow Path Length (ft)	272.0
Flow Path Slope (vft/hft)	0.006
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2184
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	23.0
Clear Peak Flow Rate (cfs)	0.1199
Burned Peak Flow Rate (cfs)	0.1199
24-Hr Clear Runoff Volume (ac-ft)	0.034
24-Hr Clear Runoff Volume (cu-ft)	1482.3255



## Peak Flow Hydrologic Analysis

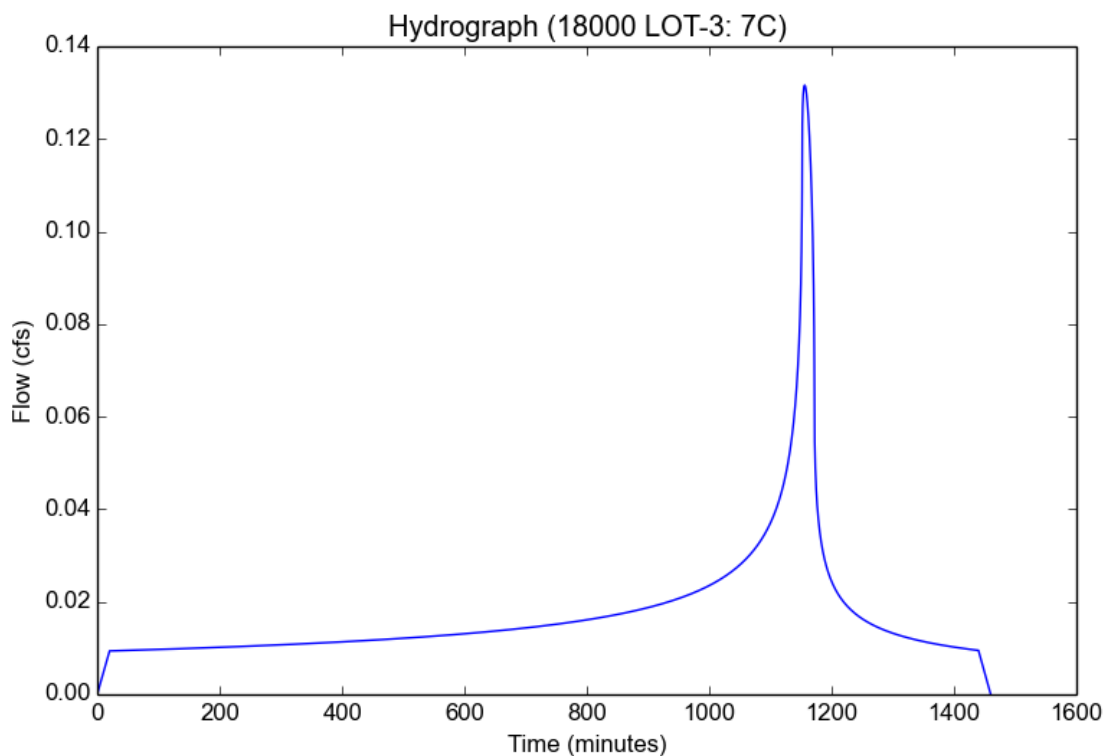
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	7C
Area (ac)	0.703
Flow Path Length (ft)	239.0
Flow Path Slope (vft/hft)	0.009
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2332
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.1316
Burned Peak Flow Rate (cfs)	0.1316
24-Hr Clear Runoff Volume (ac-ft)	0.035
24-Hr Clear Runoff Volume (cu-ft)	1523.4987



## Peak Flow Hydrologic Analysis

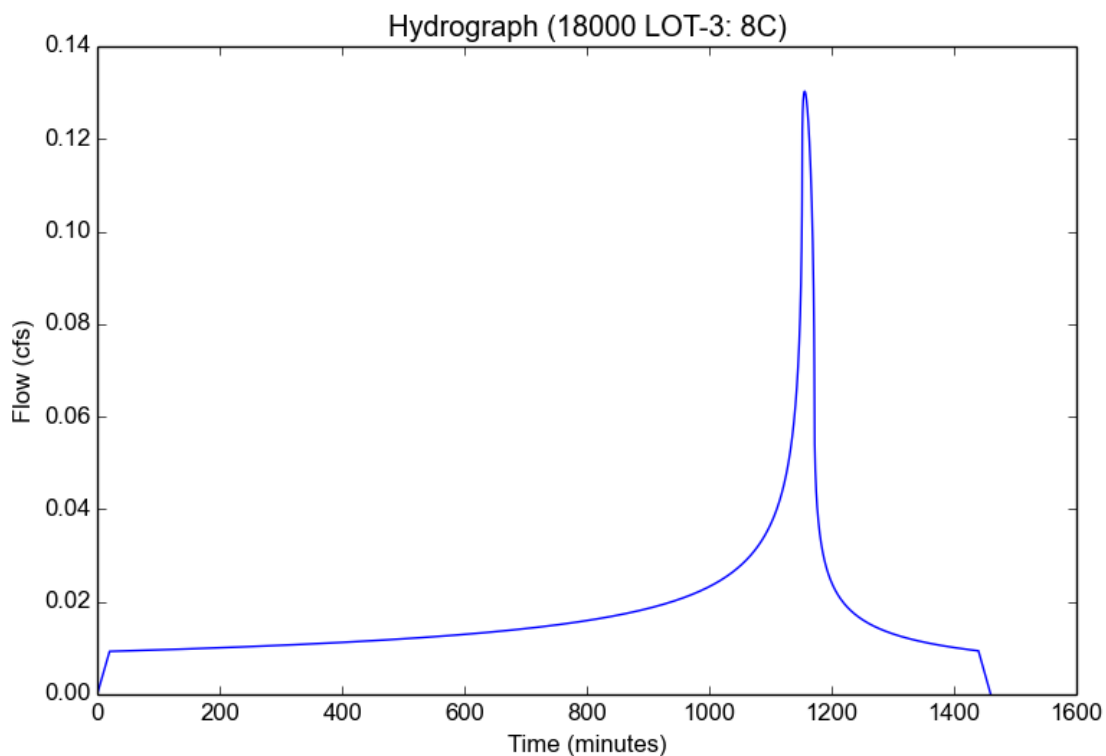
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Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	8C
Area (ac)	0.696
Flow Path Length (ft)	224.0
Flow Path Slope (vft/hft)	0.007
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2332
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	20.0
Clear Peak Flow Rate (cfs)	0.1303
Burned Peak Flow Rate (cfs)	0.1303
24-Hr Clear Runoff Volume (ac-ft)	0.0346
24-Hr Clear Runoff Volume (cu-ft)	1508.3287



## Peak Flow Hydrologic Analysis

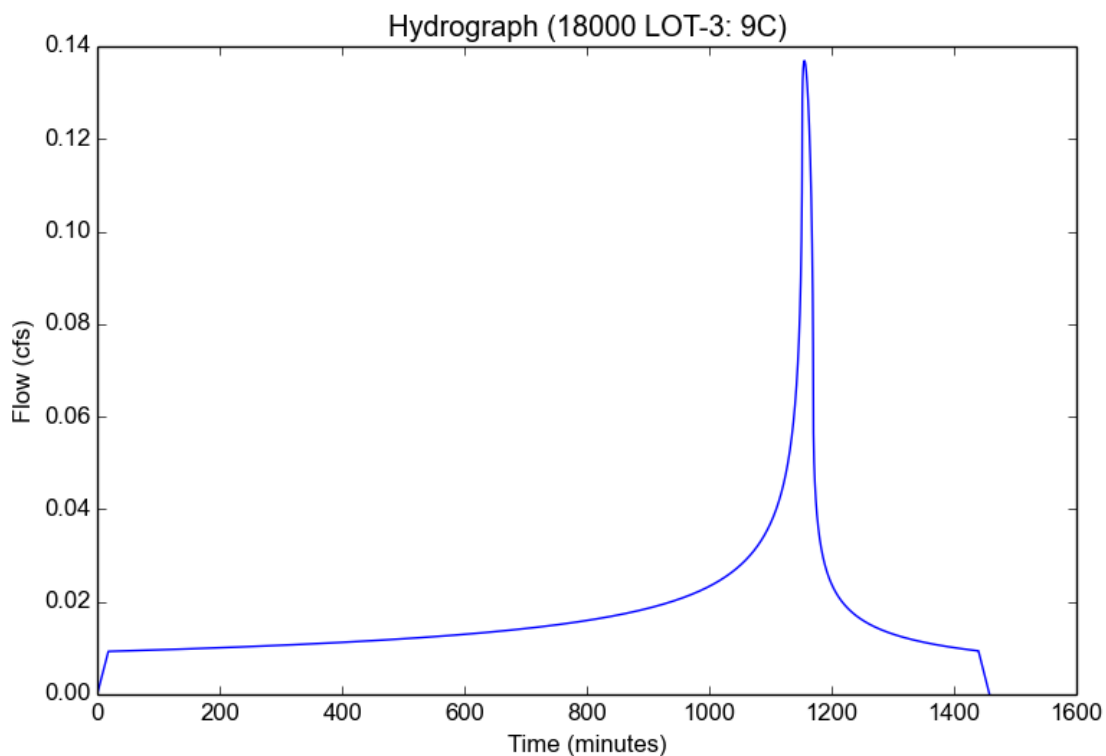
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	9C
Area (ac)	0.696
Flow Path Length (ft)	224.0
Flow Path Slope (vft/hft)	0.011
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2451
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	18.0
Clear Peak Flow Rate (cfs)	0.1369
Burned Peak Flow Rate (cfs)	0.1369
24-Hr Clear Runoff Volume (ac-ft)	0.0346
24-Hr Clear Runoff Volume (cu-ft)	1508.3273



## Peak Flow Hydrologic Analysis

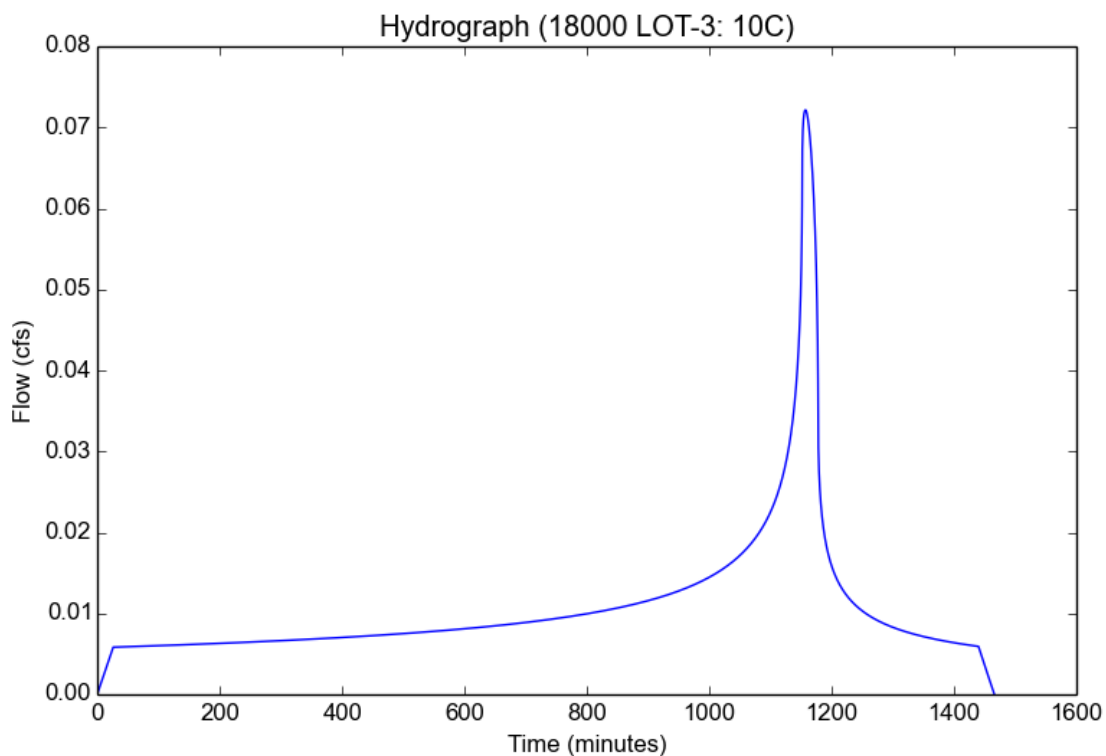
File location: C:/Users/larso/18000 LOT-3 DEVReport.pdf  
Version: HydroCalc 1.0.3

### Input Parameters

Project Name	18000 LOT-3
Subarea ID	10C
Area (ac)	0.436
Flow Path Length (ft)	351.0
Flow Path Slope (vft/hft)	0.008
85th Percentile Rainfall Depth (in)	0.75
Percent Impervious	0.8783
Soil Type	134
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

### Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.75
Peak Intensity (in/hr)	0.2062
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.8026
Time of Concentration (min)	26.0
Clear Peak Flow Rate (cfs)	0.0722
Burned Peak Flow Rate (cfs)	0.0722
24-Hr Clear Runoff Volume (ac-ft)	0.0217
24-Hr Clear Runoff Volume (cu-ft)	944.8759



# Attachment B

## Geotechnical Investigation

[Include all geotechnical documents relevant to infiltration feasibility (i.e. Geotechnical Report, Soils Report, Percolation Report, Soils Letter, etc.). The document(s) must detail the results of the soil investigation, the infiltration rate, groundwater depths, soil characterization, etc. Note that soil borings must be conducted in the area of the proposed BMPs. In addition to the complete soils report, a letter signed and stamped with wet ink application by a geotechnical engineer must be provided. The letter must state that the soil will or will not exhibit instability as a result of implementing the proposed BMPs, that the seasonal high groundwater depth is or is not at the required depth (5-10 feet depending on BMP type) below the base of the infiltration BMP, and the infiltration rate is or is not at least 0.3 in/hr.]

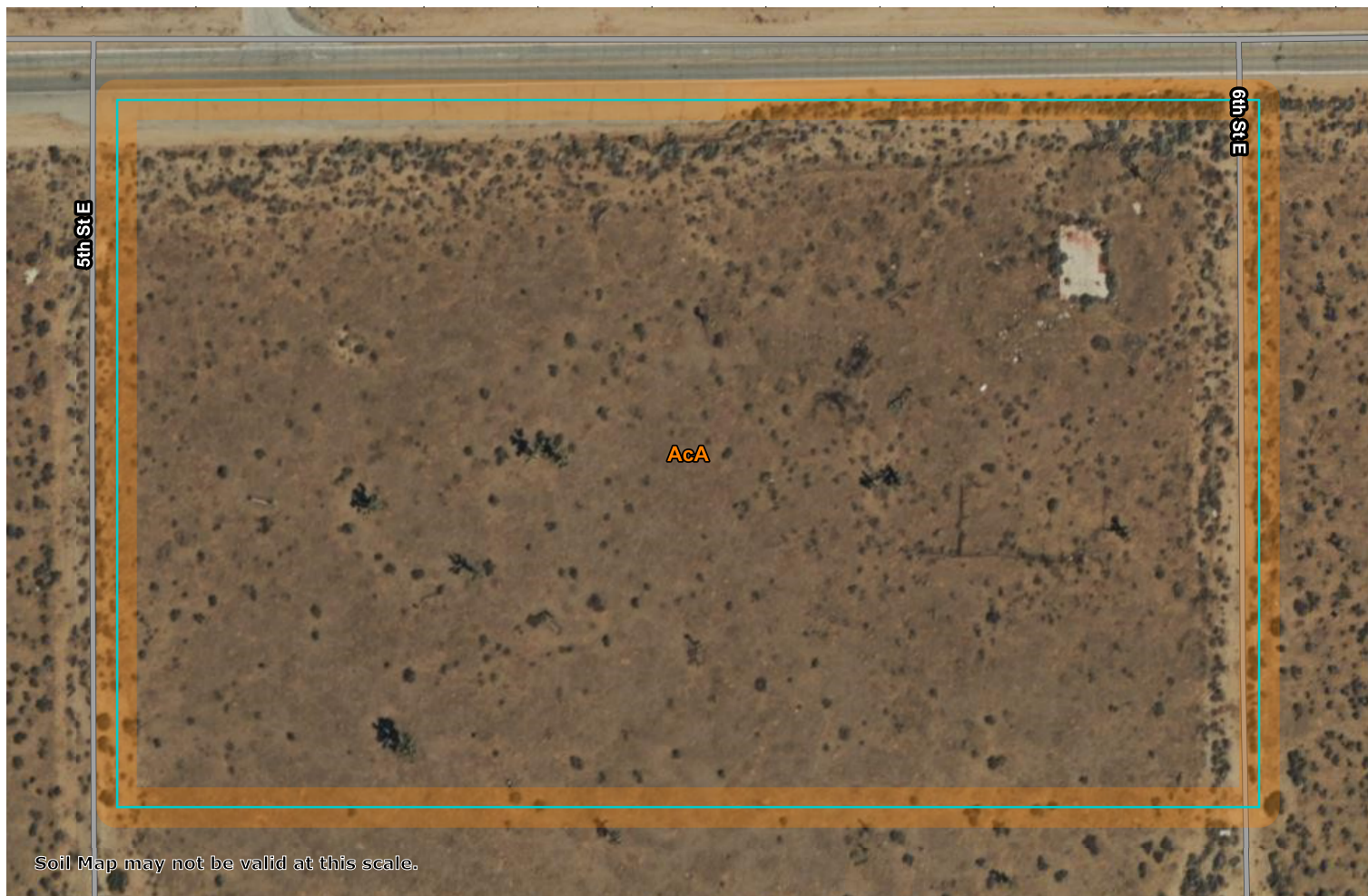


A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Antelope Valley Area, California

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AcA	Adelanto coarse sandy loam, 2 to 5 percent slopes	6.1	100.0%
<b>Totals for Area of Interest</b>		<b>6.1</b>	<b>100.0%</b>



Soil Map may not be valid at this scale.



## Antelope Valley Area, California

### AcA—Adelanto coarse sandy loam, 2 to 5 percent slopes

#### Map Unit Setting

*National map unit symbol:* hccm  
*Elevation:* 2,000 to 3,000 feet  
*Mean annual precipitation:* 6 inches  
*Mean annual air temperature:* 63 degrees F  
*Frost-free period:* 250 to 260 days  
*Farmland classification:* Prime farmland if irrigated

#### Map Unit Composition

*Adelanto and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Adelanto

##### Setting

*Landform:* Terraces, alluvial fans  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Alluvium derived from granite

##### Typical profile

*H1 - 0 to 16 inches:* coarse sandy loam  
*H2 - 16 to 41 inches:* sandy loam  
*H3 - 41 to 80 inches:* sandy loam  
*H4 - 80 to 86 inches:* stratified loamy sand to coarse sandy loam

##### Properties and qualities

*Slope:* 0 to 2 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Moderate (about 7.0 inches)

##### Interpretive groups

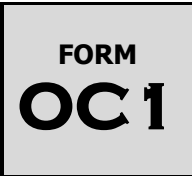
*Land capability classification (irrigated):* 2s  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* A  
*Ecological site:* R030XG021CA - LOAMY 4-9"  
*Hydric soil rating:* No

# Attachment C

## City Forms

[Complete and include all City forms (i.e. Form OC1, Form P1, Form P2, Form PC, etc.)]

# OWNER'S CERTIFICATION MINIMUM BMPs FOR ALL CONSTRUCTION SITES



PLAN CHECK # PA-18-15

Project Name <u>PATRIOT PARCEL 3</u> Project Location <u>APN: 3022-026-003</u>	<b>BUILDING/GRADING PERMIT NUMBER</b>
Owner Name <u>PBP INDUSTRIAL PROJECT</u> Address <u>455 WEST PALMDALE BLVD, SUITE P PALMDALE, CA 93551</u> Phone <u>(818) 212-9346</u> FAX/Email <u>ROBERT.S@PATRIOTDEVELOPMENTS.COM</u>	Contractor Name <u>455 WEST PALMDALE BLVD, SUITE P</u> Address <u>PALMDALE, CA 93551</u> Phone <u>(818) 212-9346</u> FAX/Email <u>ROBERT.S@PATRIOTDEVELOPMENTS.COM</u>

The National Pollutant Discharge Elimination System (NPDES) is the portion of the Clean Water Act that applies to the protection of receiving waters. Under permits from the Los Angeles Regional Water Quality Control Board (RWQCB), certain activities are subject to RWQCB enforcement. To meet the requirements of the Los Angeles County Municipal Separate Storm Sewer System (MS4) Permit (R4-2012-0175), minimum requirements for sediment control, erosion control and construction activities must be implemented on each project site. Minimum requirements include:

- **EROSION:** Erosion from slopes and channels shall be controlled by implementing an effective combination of BMPs, such as the limiting of grading activities during the wet season; inspecting graded areas during rain events; planting and maintenance of vegetation on slopes; and covering erosion susceptible slopes.
- **SEDIMENT CONTROL:** Eroded sediments from areas disturbed by construction and from stockpiles of soil shall be retained on site to minimize sediment transport from the site to streets, drainage facilities and/or adjacent properties via runoff, vehicle tracking or wind.
- **CONSTRUCTION MATERIALS CONTROL:** Construction related materials, wastes, spills or residues shall be retained on site to minimize transport from the site to streets, drainage facilities or adjoining properties by wind or runoff. Runoff from equipment and vehicle washing shall be contained at construction sites unless treated to remove sediment and pollutants.
- **NON-STORMWATER RUNOFF:** Non-stormwater runoff from equipment and vehicle washing and any other activity shall be contained at the project site.
- **EROSION AND SEDIMENT CONTROL PLAN (ESCP):** Required for projects one acre or more. The ESCP must be developed and certified by a Qualified SWPPP Developer (QSD).
- **HILLSIDE:** Construction upon slopes 25% or more requires the implementation of additional BMPs to protect slopes and prevent erosion and sediment runoff.

*Minimum BMPs include:* (1) Soil piles must be covered with tarps or plastic, (2) leaking equipment must be repaired immediately, (3) refueling must be conducted away from catch basins, (4) catch basins must be protected when working nearby, (5) vacuum all concrete saw cutting, (6) never wash concrete waste into the street, (7) keep the site clean, sweep the gutters at the end of each working day and keep a trash receptacle on site.

As the engineer of record, I have selected appropriate BMPs to effectively minimize the negative impacts of this project's construction activities on stormwater quality. The project owner and contractor are aware that the selected BMPs shall be installed, monitored, and maintained to ensure their effectiveness. The BMPs not selected for implementation are redundant or deemed not applicable to the proposed construction activity.

\_\_\_\_\_  
Engineer of Record Name

\_\_\_\_\_  
Engineer of Record Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person(s) who manage the system or those person(s) directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that submitting false and/or inaccurate information, failing to update the BMPs or ESCP to reflect conditions, or failing to properly and/or adequately implement the BMPs may result in revocation of grading and/or other permits or other sanctions provided by law.

\_\_\_\_\_  
Landowner or Agent Name

\_\_\_\_\_  
Landowner or Agent Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

**STORMWATER PLANNING PROGRAM**  
**PRIORITY DEVELOPMENT & REDEVELOPMENT PROJECTS**  
**PLAN CHECK #** PA 18-15

**FORM**  
**P1**

Project Name	<u>PATRIOT PARCEL 3</u>
Project Location	<u>APN: 3022-026-003</u>
Company Name	<u>PBP INDUSTRIAL PROJECT</u>
Address	<u>455 WEST PALMDALE BLVD, SUITE P PALMDALE, CA 93551</u>
Contact Name / Title	<u>ROBERT SARKISSIAN, CEO</u>
Phone / FAX / Email	<u>ROBERT.S@PATRIOTDEVELOPMENTS.COM</u>

**GENERAL PROJECT CERTIFICATION**

*A completed original of this form must accompany all LID Plan submittals.*

(818) 212-9346

**Best Management Practices (BMPs) have been incorporated into the design/maintenance/construction of this project to accomplish the following:**

1. Minimize impacts from stormwater runoff on the biological integrity of Natural Drainage Systems and water bodies in accordance with requirements under CEQA (Cal. Pub. Resources Code § 21100), CWC § 13369, CWA § 319, CWA § 402(p), CWA § 404, CZARA § 6217(g), ESA § 7, and local government ordinances.
2. Maximize the percentage of pervious surfaces to allow more percolation of stormwater into the ground.
3. Minimize the amount of stormwater directed to impermeable surfaces and to the MS4.
4. Minimize pollution emanating from parking lots through the use of appropriate Treatment Control BMPs and good housekeeping practices.
5. Minimize breeding of Vectors
6. Reduce pollutant loads in stormwater from the development site.

I certify that this Low Impact Development Plan and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered/evaluated the information submitted.

**Post Construction / Maintenance Certification**

As the responsible party, I certify that the proposed BMPs will be implemented, monitored and maintained to ensure their continued effectiveness. In the event of a property transfer, the new owner/lessee will be notified of the BMPs in use at this site and I will include written conditions in the sales or lease agreement, which requires the new owner (or lessee) to assume responsibility for maintenance and conduct a maintenance inspection at least once a year. The information contained herein is, to the best of my knowledge and belief, true, accurate, and complete.

In consideration of the execution of City of Palmdale approval of the proposed Low Impact Development (LID) Plan including any proposed treatment system, the applicant hereby agrees to indemnify, save and keep the City of Palmdale, its officers, agents and employees free and harmless from and against any and all claims for injury, damage, loss, liability, cost and expense of any nature whatsoever, which the City of Palmdale, its officers, agents, or employees may suffer, sustain, incur, pay out as a result of any and all actions, suits, proceedings, claims and demands which may be brought, made, or filed against the City of Palmdale, its officers, agents or employees by reason of or arising out of, or in any manner connected with any and all operations permitted by this approval. This indemnification extends to further agree that the City of Palmdale is not responsible for any additional requirements or restrictions due to changes in regulations, policies or enforcement practices of the California Regional Water Quality Control Board, or any other applicable regulatory agencies.

\_\_\_\_\_  
Property Owner Name

\_\_\_\_\_  
Property Owner Signature

\_\_\_\_\_  
Applicant Title

\_\_\_\_\_  
Date

# PLANNING BEST MANAGEMENT PRACTICES

BMP Type	✓ if to be used
Infiltration Trench	
Bioretention with no Underdrain	
Bioinfiltration	X
Drywell	
Permeable Pavement (concrete, asphalt, and pavers)	
Underground Infiltration (Proprietary)	
Bioretention with Underdrains	
Vegetated Swale	
Vegetated Filter Strip	
Wet Detention Basin	
Constructed Wetland	
Dry Extended Detention Basin	
Proprietary Biotreatment	
Velocity Dissipation Device	
Inlet Trash Screen	X
Media Filter	
Filter Insert	X
Landscape Management	X
Common Area Litter Control	X
Common Area Catch Basin Inspection	X
Street Sweeping Private Streets and Parking Lots	X
Storm Drain System Stenciling and Signage	X
Design and Construct Outdoor Material Storage Areas to Reduce Pollutant Introduction	
Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction	
Efficient Irrigation	X
Maintenance Bays	
Vehicle and Equipment Cleaning	
Outdoor Loading/Unloading	
Protect Slopes and Channels	
Materials Management	
Vehicle and Equipment Fueling	
Other:	

# STORMWATER TREATMENT CERTIFICATION

**FORM  
P2**

**SITE NAME and ADDRESS**

**APPROXIMATE PROJECT CHARACTERISTICS**

PATRIOT PARCEL 3 \_\_\_\_\_  
 SE CORNER OF BLACKBIRD AVENUE AND \_\_\_\_\_  
 LOCKHEED WAY \_\_\_\_\_  
 APN:3022-0216-003 \_\_\_\_\_  
 PALMDALE, CALIF. \_\_\_\_\_  
 Plan Check # TBD \_\_\_\_\_  
 Planning # PA-18-15 \_\_\_\_\_

Roofed Area	101,980	ft <sup>2</sup>
Roadway/Parking Area (exposed)	129,588	ft <sup>2</sup>
Landscaped/Vegetation	31,217	ft <sup>2</sup>
Other Ground Level Impervious Areas (Ex: Outdoor work or storage areas)	0	ft <sup>2</sup>
Other: _____	0	ft <sup>2</sup>
<b>TOTAL</b>	<u>262,785</u>	ft <sup>2</sup>

## STRUCTURAL/TREATMENT BMPs

(attach additional sheets as necessary) or see back

Area Designation (must correspond with plans)	Tributary Area (ft <sup>2</sup> )	Average Impervious Factor	Estimated Flow Rate or Volume*	Anticipated Potential Pollutants	Type of BMP (include size, make, and model, if any)	BMP Location (briefly describe)	Design Treatment Flow Rate or Volume Capacity

**By stamping this form, I acknowledge that each treatment BMP is provided with adequate bypass or overflow so as not to contribute to localized flooding or soil instability.**

\*Flow rates and volumes based on the 0.75 inch, 24-hour rain event or the 85th percentile, 24-hour rain event, whichever is greater.

**I certify that I am a Professional Civil Engineer registered in the State of California, and that the treatment methods and capacities herein comply with the requirements established by the California Regional Water Quality Control Board, Los Angeles Region, and the State Water Resources Control Board for Low Impact Development (LID) Plans.**

**Affix Registered Engineer Wet Ink Stamp Here:**

David W. Larson



8/30/2022

**Print Name**

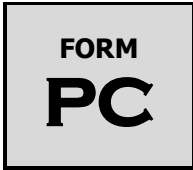
**Signature**

**Date**





# STORMWATER PLANNING PROGRAM LID PLAN CHECKLIST



Project Name <b>PARTRIO PARCEL 3</b>	Owner Name <b>PBP INDUSTRIAL PROJECT</b>	Developer Name <b>PARTRIO DEVELOPMENT</b>
Project Address APN: 3022-026-003	Owner Address 455 WEST PALMDALE BLVD, SUITE P PALMDALE, CA 93551	Developer Address 455 WEST PALMDALE BLVD, SUITE ;P PALMDALE, CA 93551
Plan Check # <b>PA-18-15</b>	Owner Phone <b>(818) 212-9346</b>	Developer Phone <b>(818) 212-9346</b>

## TYPE OF PROJECT

Does the proposed project fall into one of the following categories? Please check Yes/No YES NO

### PRIORITY PROJECTS

1. Development* of a new project equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious* surface area*	Y	
2. Development* of a new industrial park with 10,000 square feet or more of surface area*	Y	
3. Development* of a new commercial mall with 10,000 square feet or more surface area*		N
4. Development* of a new retail gasoline outlet with 5,000 square feet or more of surface area*		N
5. Development* of a new restaurant (SIC 5812) with 5,000 square feet or more of surface area*		N
6. Development* of a new parking lot with either 5,000 ft <sup>2</sup> or more of impervious* surface area* or with 25 or more parking spaces		N
7. Development* of a new automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area*		N
8. Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA)*, where the development will: a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and b. Create 2,500 square feet or more of impervious surface area*		N
9. Redevelopment* of 5,000 square feet or more in one of the categories listed above		N

If any of the boxes 1-9 are checked YES, this project will require the preparation of a Low Impact Development (LID) \* Plan with a Maintenance Agreement\*

### SPECIAL PROVISION PROJECTS

10. Green street* project		N
11. Single family hillside* home		N

If any of the boxes 10-11 are checked YES, this project will require the preparation of a plan with special provisions associated with the type of development.

\* Defined on back.

\_\_\_\_\_  
Applicant Name

\_\_\_\_\_  
Applicant Signature

\_\_\_\_\_  
Applicant Title

\_\_\_\_\_  
Date



## DEFINITIONS:

**LID:** Low Impact Development (LID) is a stormwater management strategy that emphasizes conservation and the use of existing natural site features integrated with stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial, and industrial settings.

**Development:** Development includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in land disturbance.

**Impervious:** Surfaces that do not allow stormwater runoff to percolate into the ground. Typical impervious surfaces include: concrete, asphalt, roofing materials, etc.

**Hillside:** A property where the slope is 25% or greater and where grading contemplates cut or fill slopes. Single family hillside homes will require a less extensive plan. During the construction of a single-family hillside home, the following measures are implemented:

- a. Conserve natural areas
- b. Protect slopes and channels
- c. Provide storm drain system stenciling and signage
- d. Divert roof runoff to vegetated areas before discharge unless the diversion would result in slope instability
- e. Direct surface flow to vegetated areas before discharge unless the diversion would result in slope instability.

**Green Streets:** Any street and road construction of 10,000 square feet or more of impervious surface area. Street and road construction applies to standalone streets, roads, highways, and freeway projects, and also applies to streets within larger projects. These sites are required to develop a Green Streets Plan with the following provisions:

- a. Follow an approved green streets manual to the maximum extent practicable. Stormwater mitigation measures must be in compliance with the approved green streets manual requirements.

**Redevelopment:** Land-disturbing activities that result in the creation, addition, or replacement of 5,000 ft<sup>2</sup> or more of impervious surface area on an already developed site.

Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of facility, nor does it include modifications to existing single family structures, or emergency construction activities required to immediately protect public health and safety.

**Significant Ecological Area:** An area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and would be disturbed or degraded by human activities and developments. Also, an area designated by the City as approved by the Regional Water Quality Control Board.

**Maintenance Agreement and Transfer:** All developments subject to LID requirements must provide verification of maintenance provisions for Structural and Treatment Control BMPs. Verification at a minimum shall include:

- Recorded maintenance covenant; and
- The developer's and/or owner's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and
- A signed statement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance and conduct a maintenance inspection at least once a year.

**BMP:** Best Management Practices (BMPs) are practices or physical devices or systems designed to prevent or reduce pollutant loading from stormwater or non-stormwater discharges to receiving waters, or designed to reduce the volume of stormwater or non-stormwater discharged to the receiving water.

**Surface Area:** The surface area is the total footprint of an area. Not to include the cumulative area above or below the ground surface.

## Low Impact Development (LID) Plan Determination Form

Project name PARTRIO PARCEL 3	Owner name PBP INDUSTRIAL PROJECT	Developer name PARTRIO DEVELOPMENT
Project address APN: 3022-026-003	Owner address 455 WEST PALMDALE BLVD, SUITE P PALMDALE, CA 93551	Developer address 455 WEST PALMDALE BLVD, SUITE P PALMDALE, CA 93551
Plan check #  <b>PA-18-15</b>	Owner phone (818) 212-9346	Developer phone (818) 212-9346
	Owner email ROBERT.S@PATRIOTDEVELOPMENTS.COM	Developer email ROBERT.S@PATRIOTDEVELOPMENTS.COM

**PRIORITY REDEVELOPMENT PROJECTS.** Complete this section if the project will redevelop an existing development.

The redevelopment will **create and/or replace 5,000 square feet** or more of impervious surface and will be:

1. a restaurant (SIC 5812)	Yes <input type="checkbox"/>
2. a parking lot	Yes <input type="checkbox"/>
3. an automotive service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539)	Yes <input type="checkbox"/>
4. a retail gasoline outlet	Yes <input type="checkbox"/>
5. on an existing site of 10,000 square feet or more of impervious surface area	Yes <input type="checkbox"/>
6. within an industrial park of 10,000 square feet or more of surface area	Yes <input checked="" type="checkbox"/>
7. within a commercial mall (including strip malls) of 10,000 square feet or more of surface area	Yes <input type="checkbox"/>

Or the redevelopment project will:

8. create and/or replace 2,500 square feet or more of impervious area; discharge stormwater likely to impact sensitive biological species or habitat; and be in, directly adjacent to, or discharge directly to an ASBS or "Sensitive Ecological Area"	Yes <input type="checkbox"/>
--	------------------------------

**PRIORITY NEW DEVELOPMENT PROJECTS.** Complete this section if the existing project site is undeveloped.

The new development project will:

9. create 5,000 square feet or more of impervious surface and will be either a restaurant, parking lot, auto service facility (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539), or retail gasoline outlet	Yes <input type="checkbox"/>
10. disturb 1 acre or more and add 10,000 square feet or more of impervious surface	Yes <input checked="" type="checkbox"/>
11. be an industrial park of 10,000 square feet or more of surface area	Yes <input type="checkbox"/>
12. be a commercial mall (including strip malls) of 10,000 square feet of surface area	Yes <input type="checkbox"/>
13. create 2,500 square feet or more of impervious area; discharge stormwater likely to impact sensitive biological species or habitat; and be in, directly adjacent to, or discharge directly to an ASBS or "Sensitive Ecological Area"	Yes <input type="checkbox"/>

**NON-PRIORITY (SMALL SITE) DEVELOPMENT PROJECTS.** Complete this section if the project is **not** a priority project as identified above.

14. The new or redevelopment project will create 500 square feet or more of impervious surface	Yes <input type="checkbox"/>
--	------------------------------

**STREET OR ROAD CONSTRUCTION PROJECTS.** Complete this section if the project is a street or road.

15. The street or road project will construct 10,000 square feet or more of impervious area	Yes <input type="checkbox"/>
---	------------------------------

**CERTIFICATION**

If any of the boxes from 1 to 13 are checked, I understand the project will require a LID Plan.  
 If box 14 is checked, I understand the project will require a Small Site LID Plan.  
 If box 15 is checked, I understand the project will require a Green Streets Plan.

\_\_\_\_\_  
Applicant name

\_\_\_\_\_  
Applicant Signature

\_\_\_\_\_  
Applicant Title

\_\_\_\_\_  
Date

# Definitions

**Areas of Special Biological Significance (ASBS).** As defined in the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan), ASBS are all those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that maintenance of natural water quality is assured.

**Best Management Practices (BMPs):** Practices or physical devices or systems designed to prevent or reduce pollutant loading from stormwater or non-stormwater discharges to receiving waters.

**Development:** Any construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail and other non-residential projects, including public agency projects; or mass grading for future construction. It does not include 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.

**Directly Adjacent:** Projects situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of an environmentally sensitive area.

**Green Streets Plan:** A plan that follows U.S. EPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets (December 2008 EPA-833-F-08-009) to the maximum extent practicable. Street and road construction applies to standalone streets, roads, highways, and freeway projects. Temporary access roads are not subject to this requirement. Projects under this category are exempt from the BMP Performance Requirements of a LID Plan.

**Impervious:** Surfaces that do not allow stormwater runoff to percolate into the ground. Impervious surfaces include but are not limited to concrete, asphalt, and roofing materials.

**Low Impact Development (LID):** The implementation of systems and practices that use or mimic natural processes to: 1) infiltrate and recharge, 2) evapotranspire and/or 3) harvest and use precipitation near to where it falls to earth.

**LID Plan:** A plan that meets the Priority Development Project requirements in Part VIII.F of the MS4 NPDES Permit, Order No. R4-2021-0105, Permit No. CAS004004.

**Maintenance Agreement and Transfer:** Developments subject to post-construction BMP requirements, with the exception of simple LID BMPs implemented on single family residences, must provide an operation and maintenance plan, monitoring plan, where required, and verification of ongoing maintenance provisions for LID practices, Treatment Control BMPs, and Hydromodification Control BMPs including but not limited to: final map conditions, legal agreements, covenants, conditions or restrictions, CEQA mitigation requirements, conditional use permits, and/or other legally binding maintenance agreements. Maintenance records must be kept on site for treatment BMPs implemented on single family residences. Verification must include the developer's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and either: (a) A signed statement from the public entity assuming responsibility for BMP maintenance; or (b) written conditions in the sales or lease agreement, which require the property owner or tenant to assume responsibility for BMP maintenance and conduct a maintenance inspection at least once a year; or (c) written text in project covenants, conditions, and restrictions for residential properties assigning BMP maintenance responsibilities to the Homeowners Association; or (d) any other legally enforceable agreement or mechanism that assigns responsibility for the maintenance of BMPs.

**Sensitive Ecological Area:** Sensitive Ecological Areas are identified by the County of Los Angeles' Significant Ecological Areas Program. See <http://planning.lacounty.gov/site/sea/home/>

**Surface Area:** The surface area is the total footprint, not to include the cumulative area above or below the ground surface.

# Attachment D

## Master Covenant Agreement (MCA)

Include a Master Covenant Agreement (MCA) form along with an attached Operations and Maintenance (O&M) Plan, Site Plan, and Owner's Certification. The MCA must list the type and dimensions of each BMP. Once the MCA is approved by the City, it will need to be notarized and recorded (along with attachments) with the County Recorder's Office.

**Recording requested by and mail to:**

Name: City of Palmdale  
Department of Public Works  
**ATTN: Director of Public Works**  
Address: 8300 Sierra Highway  
Palmdale, CA 93550

\*\*\*\*\* Space Above This Line For Recorder's Use \*\*\*\*\*

**MASTER COVENANT AND AGREEMENT**  
REGARDING ON-SITE BMP MAINTENANCE

The undersigned hereby certifies I am (we are) the owner(s) of the hereinafter legally described real property located in the City of Palmdale, County of Los Angeles, State of California (please give legal description: assessor's ID, tract no., lot no., etc.): **Parcel 3, RS BK 65 P 19 APN: 3022-026-003**

Site Address SE corner of Blackbird Avenue & Lockheed Way

Owner(s) do hereby covenant and agree to and with the City of Palmdale to maintain all on-site structural Best Management Practices (BMPs) in accordance with the Site Map and the Operations & Maintenance (O&M) Plan set forth in Attachment 1 hereto and incorporated herein by this reference. The specific structural BMPs are listed as follows:

**Trash enclosure, landscape, bio-filtration areas, and efficient irrigation**

Owner(s) shall maintain the listed drainage devices above on the property indicated and as shown on plans permitted by the City of Palmdale in a good and functional condition to safeguard the property owners and adjoining properties from damage and pollution.

Owner(s) hereby consent to inspection of the Property by an inspector authorized by the City Manager, or his or her designee, for the purpose for verifying compliance with the provisions of this Agreement.

Owner(s) shall provide printed educational materials with any sale of the property which provide information on what stormwater management facilities are present, the type(s) and location(s) of maintenance signs that are required, and how the necessary maintenance can be performed.

Owner(s) shall provide actual notice of this Agreement and its terms to any respective successor(s) in interest to the Property prior to transfer of said interest to such successor(s) in interest. This covenant and agreement shall run with the land and shall be binding upon any future owners, encumbrances, their successors, heirs or assigns and shall continue in effect until the City of Palmdale approves its termination.

\_\_\_\_\_  
(Print Name of Property Owner)

\_\_\_\_\_  
(Print Name of Property Owner)

\_\_\_\_\_  
(Signature of Property Owner)

\_\_\_\_\_  
(Signature of Property Owner)

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_

\*\*\*\*\* Space Below This Line For Notary's Use \*\*\*\*\*

ALL PURPOSE ACKNOWLEDGEMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of \_\_\_\_\_ }

County of \_\_\_\_\_ }

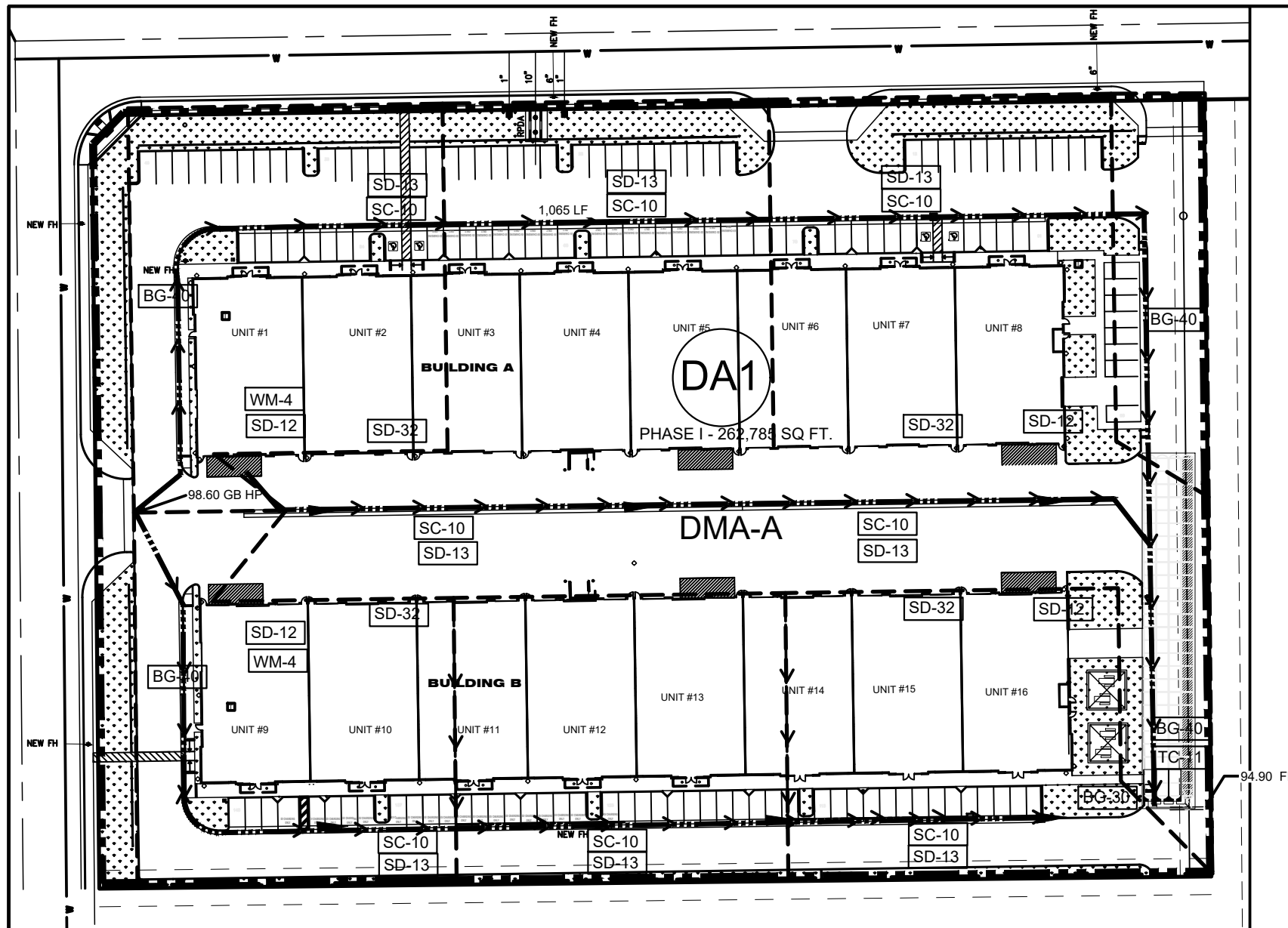
On \_\_\_\_\_ before me, \_\_\_\_\_  
(Insert Name of Notary Public and Title)

personally appeared \_\_\_\_\_, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf on which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

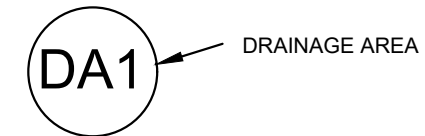
WITNESS my hand and official seal.

Signature \_\_\_\_\_ (Seal)

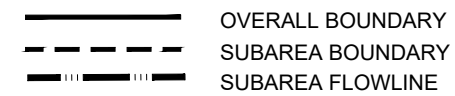


TC-11 ON-SITE INFILTRATION /RETENTION BASIN - 0.448 AC - FT  
0.292 AC-FT REQ'D INFILTRATION

**LEGEND:**



DMA-A DRAINAGE MANAGEMENT AREA - A



EG EXISTING GRADE  
FG FINISH GRADE  
FS FINISH SURFACE  
FF FINISH FLOOR  
IE INVERT ELEVATION



**DMA-A**

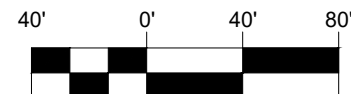
AREA = 231,443 SF IMPERMEABLE  
31,342 SF PERMEABLE = 11.88%  
262,785 SF TOTAL  
PARKING TREES  
PARKING AREA = 143,752 SF  
P-LANDSCAPING = 14,162 SF = 9.85%

**MAINTENANCE BMP'S**

- TC-11 — INFILTRATION BASIN
- SD-12 — EFFICIENT IRRIGATION
- SD-13 — STORM DRAIN SIGNAGE
- SD-32 — TRASH ENCLOSURE
- SC-10 — CATCH BASIN O&M
- BG-40 — LANDSCAPE INSPECTION O&M
- BG-30 — FOOD PREPARATION AREA
- WM-4 — SPILL KIT INSPECTRION O & M



GRAPHIC SCALE



( IN FEET )  
1 inch = 80 ft.

**WQMP**

**WATER QUALITY  
MANAGEMENT  
PLAN**

**FOR:  
PATRIOT  
DEVELOPMENT**

**IN  
THE CITY OF  
PALMDALE, CA**

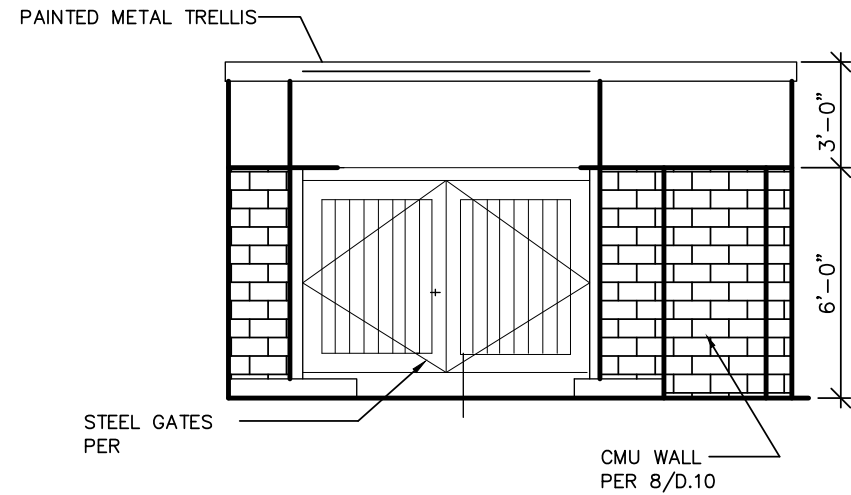
**APN:  
3066-261-08,10  
3066-251-14**

**POST-DEVELOPED  
CONDITION  
PHASE I**

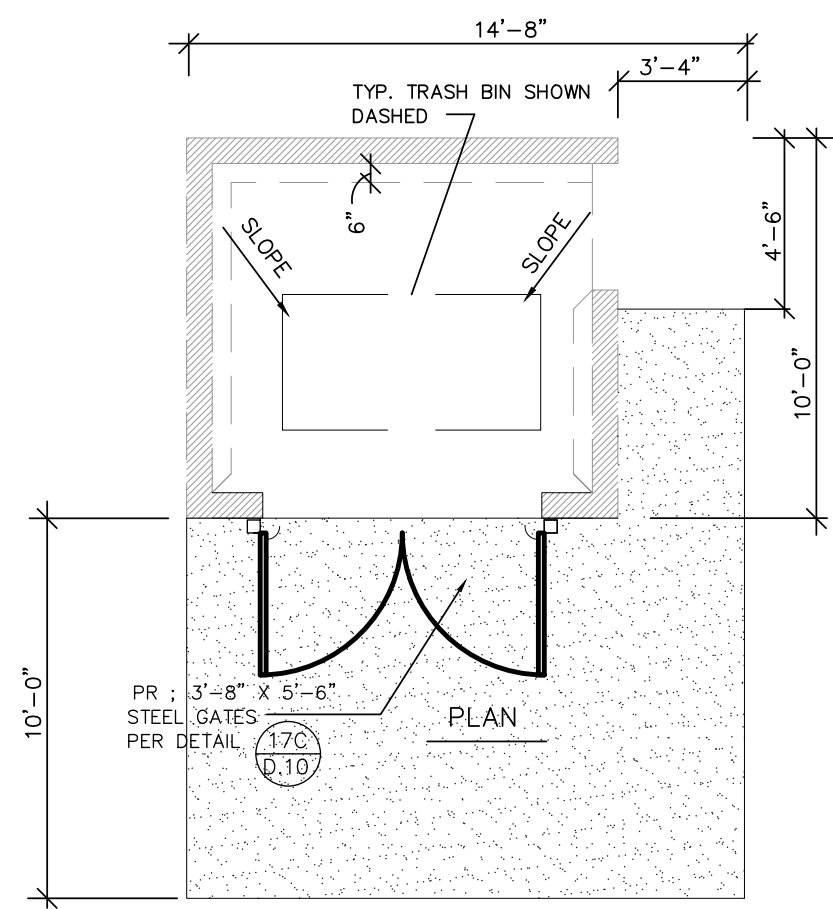
**RED  
BRICK  
SOLUTION**

CONSULTING ENGINEERS  
& ARCHITECTS

**EXHIBIT B**



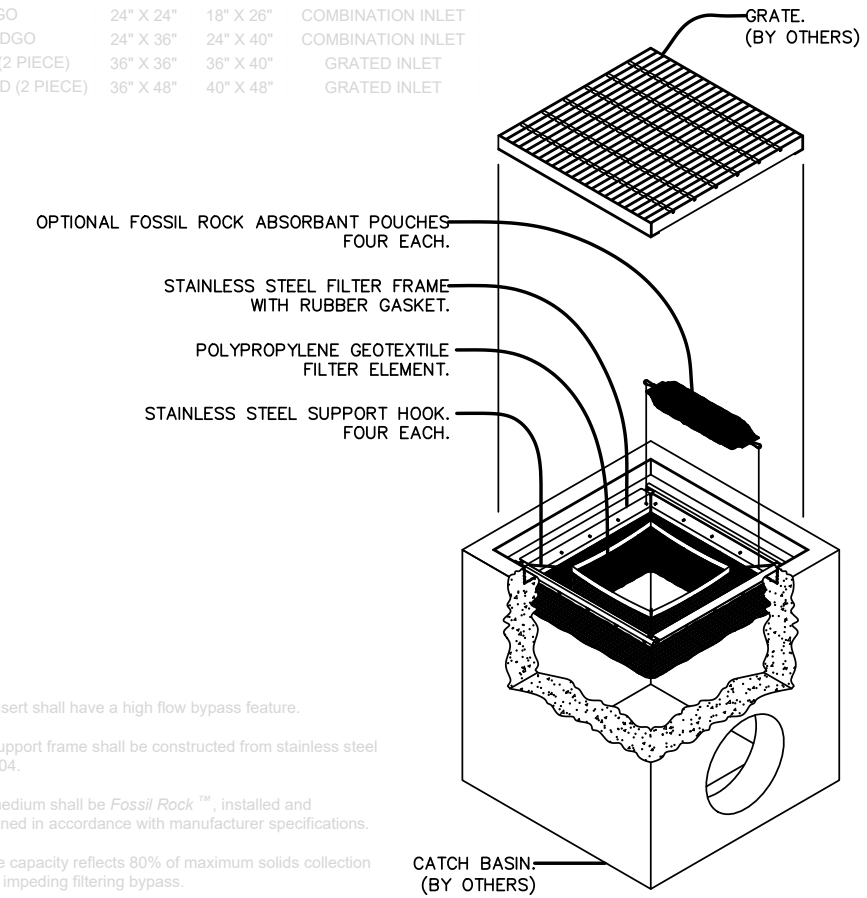
ELEVATION



1 TRASH ENCLOSURE DETAIL  
SCALE 1"=5'

FG-0001

MODEL	INLET ID	GRATE OD	COMMENTS
FF-12D	12" X 12"	15" X 15"	GRATED INLET
FF-16D	16" X 16"	18" X 18"	GRATED INLET
FF-18D	18" X 18"	20" X 20"	GRATED INLET
FF-1836SD	18" X 36"	18" X 40"	GRATED INLET
FF-1836DGO	18" X 36"	18" X 40"	COMBINATION INLET
FF-24D	24" X 24"	26" X 26"	GRATED INLET
FF-2436SD	24" X 36"	24" X 40"	GRATED INLET
FF-24DGO	24" X 24"	18" X 26"	COMBINATION INLET
FF-2436DGO	24" X 36"	24" X 40"	COMBINATION INLET
FF-36D (2 PIECE)	36" X 36"	36" X 40"	GRATED INLET
FF-3648D (2 PIECE)	36" X 48"	40" X 48"	GRATED INLET



NOTES:

- Filter insert shall have a high flow bypass feature.
- Filter support frame shall be constructed from stainless steel Type 304.
- Filter medium shall be *Fossil Rock*™, installed and maintained in accordance with manufacturer specifications.
- Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

NO DUMPING  
DRAINS TO RIVER

3 STENCIL DETAIL  
SCALE

2 SDM FILTER  
SCALE 1"=5'

**LID**  
**LOW IMPACT DEVELOPMENT (LID)**

**FOR: PATRIOT DEVELOPMENT**  
**IN THE CITY OF PALMDALE, CA**

**APN: 3022-026-003**

**POST-DEVELOPED CONDITION**

**RED BRICK SOLUTION**

CONSULTING ENGINEERS & ARCHITECTS

**EXHIBIT 3**



## 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**

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## ***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

# Site Design & Landscape Planning SD-10

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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.



## Design Objectives

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

## Description

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

## Approach

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

## Suitable Applications

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

## Design Considerations

### *Designing New Installations*

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

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



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

***Redeveloping Existing Installations***

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

**Other Resources**

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

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

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

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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.

### **Other Resources**

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

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

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

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## Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

## Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

## 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

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

## Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

## Design Objectives

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



- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

***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.

**Additional Information*****Maintenance Considerations***

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

**Other Resources**

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

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

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

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# BG-40 Landscape Maintenance

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Photo Credit: Geoff Brosseau

## Description

This category includes businesses that provide landscaping and landscape maintenance/gardening services.

## Pollutant Sources

The following are sources of pollutants:

- Selecting plants or landscape design,
- Installing new landscaping,
- Maintaining landscapes,
- Using pesticides and fertilizers, and
- Using gas-powered equipment.

Pollutants can include:

- Nutrients (fertilizers, yard wastes),
- Pesticides,
- Heavy metals (copper, lead, and zinc),
- Hydrocarbons (fuels, oils and grease), and
- Sediments.

## Approach

Minimize the potential for stormwater pollution and the need for resources/controls (water, pesticides, fertilizers) by creating and maintaining landscapes in a way that is compatible with the local soils, climate, and amount of rain and sun. Make stormwater pollution prevention BMPs a part of standard operating procedures and the employee training program.



# BG-40 Landscape Maintenance

Provide employee education materials in the first language of employees, as necessary.

## Source Control BMPs

The best management practices are listed by activity or area.

<p><b>Landscape Design</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Specify native, low maintenance, and insectary (attract beneficial insects) plants and landscape designs.</li> <li><input type="checkbox"/> Design zoned, water-efficient irrigation systems using technologies such drip irrigation, soaker hoses, or microspray systems. Landscape design should be consistent with the local Water Efficient Landscape Ordinance. See the following website for a list of local ordinances: <a href="ftp://ftp.water.ca.gov/Model-Water-Efficient-Landscape-Ordinance/Local-Ordinances/">ftp://ftp.water.ca.gov/Model-Water-Efficient-Landscape-Ordinance/Local-Ordinances/</a></li> <li><input type="checkbox"/> Do not landscape riparian areas, except to remove non-native plants and replace them with native riparian landscaping.</li> <li><input type="checkbox"/> Replant with native species where possible when landscaping or building an ornamental pond. Do not assume something is native because you have seen it in your area. Contact the local nursery for information or visit the California Exotic Pest Plant Council website (<a href="http://www.caleppc.org">www.caleppc.org</a>).</li> </ul>
<p><b>Landscape Installation</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Protect stockpiles and landscaping materials from wind and rain by storing them under tarps or secured plastic sheeting.</li> <li><input type="checkbox"/> Schedule grading and excavation projects during dry weather.</li> <li><input type="checkbox"/> Divert runoff from exposed soils or lower its velocity by leveling and terracing.</li> <li><input type="checkbox"/> Use temporary check dams or ditches to divert runoff away from storm drains.</li> <li><input type="checkbox"/> Protect storm drains with sandbags or other sediment controls.</li> <li><input type="checkbox"/> Revegetation is an excellent form of erosion control for any site. Keep soils covered with vegetation or temporary cover material (mulch) to control erosion.</li> <li><input type="checkbox"/> Check plant roots before buying a plant. Do not buy plants with roots are that kinked or circling around the container. Do not buy plants with soft, rotten, or deformed root crowns.</li> <li><input type="checkbox"/> Do not pile soil around the plant any higher than the root crown.</li> </ul>
<p><b>Landscape Maintenance</b></p>	<p>Yard Waste</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Allow leaf drop to become part of the mulch layer in tree, shrub, and groundcover areas.</li> <li><input type="checkbox"/> Keep lawn mower blades sharp, and grasscycle.</li> </ul>

# BG-40 Landscape Maintenance

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	<ul style="list-style-type: none"><li>□ Grasscycle – leave grass clippings on the lawn when mowing. Once cut, grass clippings first dehydrate, and then decompose, quickly disappearing from view. Proper mowing is required for successful grasscycling. Cut grass when the surface is dry, and keep mower blades sharp. Follow the "1/3 Rule": mow the lawn often enough so that no more than 1/3 of the length of the grass blade is cut in any one mowing. Frequent mowing will produce short clippings that will not cover up the grass surface. The lawn may have to be cut every seven days when the lawn is growing fast but only every 7 to 14 days when the lawn is growing slowly.</li><li>□ Do not leave clippings on pavement or sidewalks where they can wash off into the street, gutter, or storm drain.</li><li>□ Collect lawn and garden clippings, pruning waste, and tree trimmings. Chip if necessary, and compost or take to the local municipal yard waste recycling/composting facility.</li><li>□ In communities with curbside pick-up of yard waste, place clippings and pruning waste at the curb in approved bags or containers. No curbside pickup of yard waste is available for commercial properties.</li><li>□ Do not blow or rake leaves or other yard waste into the street, or place yard waste in gutters or on dirt shoulders, unless it is being piled up for recycling (allowed by some municipalities). After pick-up, sweep up any leaves, litter, or residue in gutters or on street.</li></ul> <p>Fertilizing and Pruning</p> <ul style="list-style-type: none"><li>□ Perform soil analysis seasonally to determine actual fertilization need and application rates.</li><li>□ Fertilize garden areas with a mulch of leaves, bark, or composted manure and/or garden waste.</li><li>□ Apply chemical fertilizer only as needed, when plants can best use it, and when the potential for it being carried away by runoff is low. Make sure the fertilizer spreader is calibrated.</li><li>□ Prune plants sparingly, if at all. A healthy plant – one that is native to the area and growing under the right conditions – should not need pruning, except when it is not in the right location (where safety or liability is a concern).</li></ul> <p>Watering</p> <ul style="list-style-type: none"><li>□ Use soil probes to determine soil moisture depth, overall moisture levels, and the need to adjust irrigation schedules.</li><li>□ Check sprinklers regularly. Adjust as needed to minimize or eliminate overspray onto impervious surfaces. Replace broken sprinklers or lines.</li></ul>
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# BG-40 Landscape Maintenance

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	<p>Pest and Weed Control</p> <ul style="list-style-type: none"><li>□ Obtain appropriate licenses for pest control and pesticides. Contact the Department of Pesticide Regulation for more information.</li><li>□ Become trained in and offer customers less-toxic pest control or Integrated Pest Management (IPM).</li><li>□ The label on a pesticide container is a legal document. Use a pesticide only as instructed on the label.</li><li>□ Store pesticides, fertilizers, and other chemicals indoors or in a shed or storage cabinet.</li><li>□ Use pesticides sparingly, according to instructions on the label. Rinse empty containers, and use rinsewater as product.</li><li>□ Dispose of rinsed, empty containers in the trash. Dispose of unused pesticides as hazardous waste.</li><li>□ To control weeds, use drip irrigation and mulch. Hand-pull weeds including roots or cut down to ground. Repeat cutting before they flower, grow new leaves, or go to seed. Use herbicides containing pelargonic acid or herbicidal soap as a last resort.</li></ul> <p>Handling Gasoline</p> <ul style="list-style-type: none"><li>□ Use only containers approved by a nationally recognized testing lab, such as Underwriters Laboratories (UL). Keep the container tightly sealed. Containers should be fitted with a spout to allow pouring without spilling and to minimize the generation of vapors.</li><li>□ Fill cautiously. Always use a funnel and/or spout to prevent spilling or splashing when fueling power mowers, blowers, and all other gas-powered equipment.</li><li>□ Avoid spilling gasoline on the ground, especially near wells. If a spill occurs use kitty litter, saw dust, or an absorbent towel to soak up the spill, then dispose of it properly.</li><li>□ Store carefully. Gasoline moves quickly through soil and into groundwater, therefore, store and use gasoline and fuel equipment as far away from your drinking water well as possible. Be certain to keep a closed cap on the gasoline container. Store at ground level, not on a shelf to minimize the danger of falling and spilling.</li><li>□ Do not dispose of gasoline down the drain, into surface water, onto the ground, or in the trash. Contact the local municipality for directions on proper disposal of excess or old gasoline. Transport old gas in an approved gasoline container.</li></ul> <p>Working Near Waterbodies</p> <ul style="list-style-type: none"><li>□ Do not dump lawn clippings, other yard waste, or soil along creek banks or in creeks.</li></ul>
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# BG-40 Landscape Maintenance

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	<ul style="list-style-type: none"><li>□ Do not store stockpiles of materials (soil, mulch) along creek banks. These piles can erode over time into a creek.</li><li>□ Do not spray pesticides or fertilizers by creeks.</li><li>□ Do not over water near streams. The excess water may carry pesticides, fertilizers, sediments, and anything else in its path directly into the creek.</li></ul>
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## Treatment Control BMPs

Not applicable.

## More Information

Bay Area Stormwater Management Agencies Association, 1999. Start at the Source – Design Guidance Manual for Stormwater Quality Protection. Available on-line at: <http://www.scvurppp-w2k.com/pdfs/0910/StartAtTheSource.pdf>.

Bay Area Stormwater Management Agencies Association, Undated. *Landscape designs for Stormwater Management - Stormwater Control for Small Projects*. Available at: [http://www.acterra.org/programs/stewardship/doc/landscape\\_dispersion.pdf](http://www.acterra.org/programs/stewardship/doc/landscape_dispersion.pdf).

Bay Area Water Pollution Prevention Agencies, 2001. Less-Toxic Pest Management- Problem Pesticides. Available on-line at: <http://www.sccgov.org/sites/iwm/hhw/Documents/505018Problem%20Pesticides.pdf>.

California Invasive Plant Council, Undated Website. *Prevention BMPs for Land Managers*. Available on-line at: <http://www.cal-ipc.org/ip/prevention/landmanagers.php>.

California Department of Resources Recycling and Recovery (CalRecycle), 1999. *Grasscycle! Make the Most of Your Lawn. Make the Most of Your Time*. Available on-line at: <http://www.calrecycle.ca.gov/publications/Documents/Organics/44399011.pdf>.

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Southern Sonoma County Resource Conservation District, Undated pamphlet. *A Guide for Rural Landowners and Residents of Petaluma and Sonoma Creek Watersheds*. Available on-line at: [http://www.conservation.ca.gov/dlrp/watershedportal/Documents/SSCRCD%20Creek%20Care%20Guide%20\(southern%20sonoma%20rcd\).pdf](http://www.conservation.ca.gov/dlrp/watershedportal/Documents/SSCRCD%20Creek%20Care%20Guide%20(southern%20sonoma%20rcd).pdf).

USEPA, Office of Water National Pollution Discharge Elimination System, Undated website. *Stormwater Menu of BMPs Municipal Landscaping*. Available on-line at: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=1>.

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Bay Area Stormwater Management Agencies Association, 1999. Start at the Source – Design Guidance Manual for Stormwater Quality Protection. Available on-line at: <http://www.scvurppp-w2k.com/pdfs/0910/StartAtTheSource.pdf>.

# BG-40 Landscape Maintenance

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Bay Area Stormwater Management Agencies Association, Undated. *Landscape designs for Stormwater Management - Stormwater Control for Small Projects*. Available at: [http://www.acterra.org/programs/stewardship/doc/landscape\\_dispersion.pdf](http://www.acterra.org/programs/stewardship/doc/landscape_dispersion.pdf).

City of San Diego, 2012. *Storm Water Standards*. Available on-line at: <http://www.sandiego.gov/development-services/news/pdf/stormwatermanual.pdf>.

City of San Francisco, 2009. *San Francisco Stormwater Design Guidelines*. Available on-line at: <http://www.sfwater.org/modules/showdocument.aspx?documentid=2779>.

County of Los Angeles Department of Public Works, 2009. *Stormwater Best Management Practice Design and Maintenance Manual For Publicly Maintained Storm Drain Systems*. Available on-line at: <http://dpw.lacounty.gov/idd/publications/Stormwater%20BMP%20Design%20and%20Maintenance%20Manual.pdf>.



# BG-30 Food Service Facilities

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Photo Credit: Geoff Brosseau

## Description

This category includes:

- Restaurants
- Food truck commissaries
- Institutional cafeterias
- Grocery stores, bakeries, and delicatessens
- Any facility requiring a Health Department permit for food preparation

## Pollutant Sources

The following are sources of pollutants:

- Cleaning of equipment
- Grease handling and disposal
- Spills
- Surface cleaning
- Cooling and refrigeration equipment maintenance
- Landscaping and grounds maintenance
- Dumpster and loading dock area
- Parking lots
- Illicit connections to storm drain system

Pollutants can include:

- Organic materials (food wastes)



# BG-30 Food Service Facilities

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- Oil and grease
- Toxic chemicals in cleaning products, disinfectants, and pesticides

## Approach

Minimize exposure of rain and runoff to outdoor cleaning and storage areas by using cover and containment. In and around these areas, use good housekeeping to minimize the generation of pollutants. Make stormwater pollution prevention BMPs a part of standard operating procedures and the employee training program. Provide employee education materials in the first language of employees.

## Source Control BMPs

The best management practices are listed by activity or area in the following table.

<b>Dumpster and Loading Dock Areas</b>	<ul style="list-style-type: none"><li>□ Store and transfer all solid and liquid wastes, such as tallow, in watertight covered containers.</li><li>□ Keep litter from accumulating around loading docks by providing trash receptacles and encouraging employees to use them.</li><li>□ Bag and seal food waste before putting it in the dumpster. Do not place uncontained liquids, or leaking containers or garbage bags into a dumpster.</li><li>□ Keep dumpster lids closed to keep out rainwater and to prevent trash from spilling out.</li><li>□ If the dumpster regularly overflows, get a bigger one or arrange for more frequent collection. If the dumpster is shared with other tenants, speak with the property/lease manager about scheduling more frequent trash pickups or a larger dumpster.</li><li>□ Don't hose out dumpsters. Apply absorbent over any fluids spilled in dumpster. Absorbent will usually be knocked out when the dumpster is emptied.</li><li>□ Have the dumpster leasing company repair or replace leaky dumpsters and compactors, and have them clean out dirty dumpsters.</li><li>□ Install a spill cleanup kit near the dumpster and loading dock areas.</li><li>□ Post employee reminder signs such as "Keep lid closed" near tallow bins and dumpsters.</li><li>□ Consider enclosing the dumpster in a roofed and bermed area to prevent exposure to rainwater, and draining the area to the sanitary sewer. Contact the local wastewater treatment plant or the county environmental health department for guidance.</li><li>□ Keep dumpsters or the dumpster enclosure locked to prevent illegal dumping.</li><li>□ For more information on cleaning dumpster areas see the Mobile Cleaning - Food Service Business-related business guide sheet in this series.</li></ul>
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# BG-30 Food Service Facilities

<p><b>Equipment and Outdoor Cleaning</b></p>	<ul style="list-style-type: none"> <li>❑ Make sure all discharges from cooling equipment go to the sanitary sewer and not the street, gutter, or storm drain.</li> <li>❑ Clean floor mats, filters, and garbage cans in a mop sink, floor drain, or proper outside area connected to the sanitary sewer with an oil and water separator. Don't wash them in a parking lot, alley, sidewalk, or street.</li> <li>❑ Consider installing anti-slip floors when you remodel.</li> <li>❑ Consider cleaning filters in the dishwasher. Contact the local wastewater treatment plant or the county environmental health department for guidance.</li> <li>❑ Pour wash water into a janitorial or mop sink. Don't pour it out onto a parking lot, alley, sidewalk, or street.</li> <li>❑ For outdoor cleaning, have employees or contractors follow the instructions in the following business guide sheet in this series:             <ul style="list-style-type: none"> <li>✓ Mobile Cleaning - Food Service Business-related</li> <li>✓ Mobile Cleaning – Surface cleaning</li> </ul> </li> <li>❑ For more information in general on cleaning floor mats, equipment, exhaust filters, and outdoor surfaces see the Mobile Cleaning - Food Service Business-related business guide sheet in this series.</li> </ul>
<p><b>Spill Cleanup</b></p>	<ul style="list-style-type: none"> <li>❑ Prepare a spill cleanup plan that includes:             <ul style="list-style-type: none"> <li>✓ Procedures for different types of spills</li> <li>✓ Schedule for initial and annual training of employees</li> <li>✓ Cleanup kits in well-marked, accessible areas</li> <li>✓ Designation of key employee who monitors cleanup</li> <li>✓ Posting the plan in the work area</li> </ul> </li> <li>❑ If a spill occurs, immediately stop the spill at its source.</li> <li>❑ Keep the spill from entering the street, gutter, or storm drain.</li> <li>❑ Use dry methods for spill cleanup (sweeping, cat litter, etc.). Don't hose down spills.</li> <li>❑ If wet cleaning (including high-temperature or high pressure washing) is required, dry clean first and then mop (or if it is absolutely necessary, wash) and collect the water. Dispose of water in sink or other indoor drain, not in the street, gutter, or storm drain.</li> <li>❑ If a final rinse is necessary for health reasons, collect the rinsewater and dispose it to the sink or indoor floor drain. If outdoors, block the storm drain before applying water. Mop up or wet-vacuum water, and dispose it to a sink or indoor drain.</li> <li>❑ Do not use bleach or disinfectants if there is a possibility that rinsewater could flow to a street, gutter, or storm drain.</li> </ul>

# BG-30 Food Service Facilities

	<ul style="list-style-type: none"> <li>□ For more information on cleaning outdoor surfaces see the Mobile Cleaning - Surface Cleaning business guide sheet in this series.</li> </ul>
<p><b>Recycling and Disposal</b></p>	<ul style="list-style-type: none"> <li>□ Separate wastes. Keep your recyclable wastes in separate containers according to the type of material. They are easier to recycle if separated.</li> <li>□ Recycle the following materials:             <ul style="list-style-type: none"> <li>✓ Food waste (non-greasy, non-animal food waste can be composted). Donate leftover, edible food whenever possible to local food banks.</li> <li>✓ Paper and cardboard</li> <li>✓ Container glass, aluminum, and tin</li> <li>✓ Pallets and drums</li> </ul> </li> <li>□ Dispose of toxic waste properly. Toxic waste includes used cleaners, and rags (soaked with solvents, floor cleaners, and detergents).</li> </ul>
<p><b>Grease Handling and Disposal</b></p>	<ul style="list-style-type: none"> <li>□ Never pour oil, grease, or large quantities of oily liquids such as sauces or salad dressings or waste grease down a sink, floor drain, storm drain, or into a dumpster.</li> <li>□ Install screens and solid traps in sink and floor drains to catch larger solids. Clean these screens and traps frequently.</li> <li>□ Don't try to "dissolve" grease by adding hot water or emulsifying chemicals – it will only move the grease further down the building's sewer line and make it harder to remove later.</li> <li>□ Recycle grease and oil. Don't pour it into sinks, floor drains, or onto a parking lot or street. Look in the phone book for "Renderers" or call the local recycling or household hazardous waste information line.</li> <li>□ Use tallow bins or sealed containers with tamper-proof lids. Keep the exterior of the container clean. Check for leaks. Ask the recycler for a leak-free tallow bin and replace any leaky grease containers. If grease is stored outside, keep it under a roof, if possible.</li> <li>□ Do not contaminate the recyclable oils and grease in the tallow bin with the waste grease from the grease trap or grease interceptor.</li> <li>□ Inspect and clean all waste grease removal devices (grease trap or grease interceptor) often enough to keep them functioning properly and efficiently.</li> <li>□ For disposal of waste grease from the grease trap or grease interceptor, see "Grease Traps" or "Septic Tanks" in the phone book.</li> </ul>

# BG-30 Food Service Facilities

<p><b>Land-scaping and Grounds Maintenance</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Never dispose of leftover pesticides in the gutter, street, or storm drain. Leftover pesticides must be either used up or disposed of as hazardous waste.</li> <li><input type="checkbox"/> Do not blow or rake leaves, grass, or garden clippings into the street, gutter, or storm drain.</li> <li><input type="checkbox"/> If pesticides are used, do not over apply or apply when rain is forecast.</li> <li><input type="checkbox"/> Do not use copper-based algaecides in pools or fountains. Control algae with chlorine or other alternatives to copper-based products.</li> </ul>
<p><b>Pest Control</b></p>	<p>Food Sources</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Keep the kitchen free of food scraps.</li> <li><input type="checkbox"/> Take out garbage each night in a closed container.</li> <li><input type="checkbox"/> Refrigerate all food or store in pest-proof containers each night.</li> <li><input type="checkbox"/> Keep ventilation system working properly to keep greasy residue off walls.</li> </ul> <p>Appliances</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Keep dishwasher area clean. Check the trap nightly.</li> <li><input type="checkbox"/> Where possible, elevate appliances at least 6 inches off the floor.</li> <li><input type="checkbox"/> Clean under appliances nightly.</li> <li><input type="checkbox"/> Steam clean or wash appliances weekly.</li> <li><input type="checkbox"/> Remember to clean under the counter, under the sink, and the refrigerator vent.</li> </ul> <p>Drains and Trash Cans</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Steam clean or scrub floor drains with a brush to help eliminate fruit flies.</li> <li><input type="checkbox"/> Keep dumpster area clean – inside and out.</li> <li><input type="checkbox"/> Wash garbage cans regularly.</li> </ul> <p>Supplies and Entry Points</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Check for pests before bringing supplies in to the kitchen. Roaches like corrugated boxes.</li> <li><input type="checkbox"/> Don't store boxes in the kitchen – take boxes away or store in a refrigerated area.</li> <li><input type="checkbox"/> Seal any gaps below doors.</li> </ul> <p>Reduce Habitat</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Inspect the entire establishment – inside and out.</li> <li><input type="checkbox"/> Suggest physical modifications that may help to eliminate pest behavior.</li> </ul>

# BG-30 Food Service Facilities

	<ul style="list-style-type: none"> <li>❑ Suggest changes in food storage or cleanup practices to eliminate food sources for pests.</li> <li>❑ Place boric acid powder in wall voids.</li> <li>❑ Seal cracks and crevices.</li> </ul> <p>Monitor for Pests</p> <ul style="list-style-type: none"> <li>❑ Use sticky traps to monitor how well the pest control program is working. Pests caught in the traps warn of a possible problem.</li> <li>❑ When hiring a pest control service, look for a company that provides Integrated Pest Management (IPM) services.</li> </ul> <p>Use Baits First</p> <ul style="list-style-type: none"> <li>❑ Use baits for controlling pests. Remove bait when pests are gone, or else the bait may attract more pests.</li> <li>❑ Use chemicals only as a last resort. If absolutely necessary, choose less-toxic chemicals, and ask the pest service to provide label information.</li> <li>❑ Apply pesticides only if necessary, not on a regular schedule. Follow label directions. Do not apply pesticides around floor drains, sinks, or food.</li> </ul> <p>Purchasing</p> <ul style="list-style-type: none"> <li>❑ Use non-disposable products. Serve food on ceramic dishware rather than paper, plastic or Styrofoam, and use cloth napkins rather than paper ones. If you must use disposable products, use paper instead of Styrofoam.</li> <li>❑ Buy the least toxic products available:             <ul style="list-style-type: none"> <li>✓ Look for “non-toxic,” “non-petroleum based,” “free of ammonia, phosphates, dye, or perfume,” or “readily biodegradable” on the label. Don’t assume biodegradable products are safe. Biodegradable means the product will eventually break down, but it may harm the environment in the meantime.</li> <li>✓ Avoid chlorinated compounds, petroleum distillates, phenols, formaldehyde, and caustic or acidic products.</li> <li>✓ Use water-based products.</li> <li>✓ Look for and purchase “recycled” and “recyclable” containers. By doing so, you help ensure a use for the recyclable materials that people collect and recycle.</li> </ul> </li> </ul>
<p><b>Education and Training</b></p>	<ul style="list-style-type: none"> <li>❑ Employees can help prevent pollution when urban runoff training is included in employee orientations and reviews.</li> <li>❑ Train all employees upon hiring and annually thereafter.</li> <li>❑ Use a training log to document employee training.</li> </ul>

# BG-30 Food Service Facilities

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	<ul style="list-style-type: none"><li>□ Post information about or labels for BMPs where employees and customers can see them.</li><li>□ Remember the facility is liable for the behavior of contractors. Be sure all contractors hired to clean inside or outside are aware of and implement these BMPs.</li><li>□ Explain BMPs to other food businesses through your business associations or chambers of commerce.</li></ul>
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## Treatment Control BMPs

If treatment controls are installed at the facility, see Section 4 of this Handbook for information on inspecting and maintaining the BMPs.

For information on designing treatment controls, see Section 5 of the Development and Redevelopment Handbook.

## References

Bay Area Pollution Prevention Group, 2010. *Gravity Grease Interceptor (GGI) Fact Sheet*. Available on-line at <http://bacwa.org/Portals/0/GGI%20Fact%20Sheet-Final.pdf>

Bay Area Pollution Prevention Group, 2010. *Hydromechanical Grease Interceptor (HGI) Fact Sheet*. Available on-line at <http://bacwa.org/Portals/0/HGI%20Fact%20Sheet%20-%20Final.pdf>

Bay Area Pollution Prevention Group, 2010. *Grease Removal Device (GRD) Fact Sheet*. Available on-line at: <http://bacwa.org/Portals/0/GRD%20Fact%20Sheet%20-%20Final.pdf>

Bay Area Pollution Prevention Group, 2007. *Avoid Fines and Health Risks from Grease Overflows*. Available on-line at: <http://bacwa.org/Portals/0/Committees/BAPPG/Archive/bappgfs.pdf>

City of Pleasanton. *BMPs for Restaurants*. Available on-line at: <http://www.cityofpleasantonca.gov/pdf/bmprest.pdf>

Contra Costa County Public Works Department. Municipal Stormwater NPDES Compliance. *Food Service Facilities*. Available on-line at: <http://www.co.contra-costa.ca.us/DocumentCenter/View/6979>

Food and Beverage Association of San Diego. *What's Cookin', Eating and Drinking Establishments Stormwater Best Management Practices*. Available on-line at: [http://www.sdcounty.ca.gov/dpw/watersheds/watershedpdf/whats\\_cookin05-03.pdf](http://www.sdcounty.ca.gov/dpw/watersheds/watershedpdf/whats_cookin05-03.pdf)

Orange County Public Works, OC Watersheds. Industrial/Commercial Business Activities Best Management Practices. Available on-line at: <http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities>

Sacramento Stormwater Management Program. *Waste Disposal Guidelines for Food-Handling Facilities*. Available on-line at: <http://www.sacstormwater.org/StormwaterDocuments/StormwaterBrochures/WasteDisposalforFoodHandlingFacilities.pdf>

San Mateo Countywide Stormwater Pollution Prevention Program. *Stormwater Best Management Practices for Restaurants and Food Facilities*. Training Presentation. Available on-line at: [www.calfog.org/docs/SanMateoBMP071405.ppt](http://www.calfog.org/docs/SanMateoBMP071405.ppt).

# BG-30 Food Service Facilities

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Santa Cruz County Department of Public Works, Environmental Compliance Unit. Best Environmental Management Practices. *Restaurant Wastewater*. Available on-line at: <http://www.dpw.co.santa-cruz.ca.us/Pretreatment/BMPs%20Restaurants.pdf>



## Description

Drain inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris. There are a multitude of inserts of various shapes and configurations, typically falling into one of three different groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene “bag” is placed in the wire mesh box. The bag takes the form of the box. Most box products are one box; that is, the setting area and filtration through media occur in the same box. Some products consist of one or more trays or mesh grates. The trays may hold different types of media. Filtration media vary by manufacturer. Types include polypropylene, porous polymer, treated cellulose, and activated carbon.

## California Experience

The number of installations is unknown but likely exceeds a thousand. Some users have reported that these systems require considerable maintenance to prevent plugging and bypass.

## Advantages

- Does not require additional space as inserts as the drain inlets are already a component of the standard drainage systems.
- Easy access for inspection and maintenance.
- As there is no standing water, there is little concern for mosquito breeding.
- A relatively inexpensive retrofit option.

## Limitations

Performance is likely significantly less than treatment systems that are located at the end of the drainage system such as ponds and vaults. Usually not suitable for large areas or areas with trash or leaves than can plug the insert.

## Design and Sizing Guidelines

Refer to manufacturer’s guidelines. Drain inserts come any many configurations but can be placed into three general groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene “bag” is placed in the wire mesh box. The bag takes the form of the box. Most box products are

## Design Considerations

- Use with other BMPs
- Fit and Seal Capacity within Inlet

## Targeted Constituents

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

### Removal Effectiveness

See New Development and Redevelopment Handbook-Section 5.



one box; that is, the setting area and filtration through media occurs in the same box. One manufacturer has a double-box. Stormwater enters the first box where setting occurs. The stormwater flows into the second box where the filter media is located. Some products consist of one or more trays or mesh grates. The trays can hold different types of media. Filtration media vary with the manufacturer: types include polypropylene, porous polymer, treated cellulose, and activated carbon.

### ***Construction/Inspection Considerations***

Be certain that installation is done in a manner that makes certain that the stormwater enters the unit and does not leak around the perimeter. Leakage between the frame of the insert and the frame of the drain inlet can easily occur with vertical (drop) inlets.

### **Performance**

Few products have performance data collected under field conditions.

### **Siting Criteria**

It is recommended that inserts be used only for retrofit situations or as pretreatment where other treatment BMPs presented in this section area used.

### **Additional Design Guidelines**

Follow guidelines provided by individual manufacturers.

### **Maintenance**

Likely require frequent maintenance, on the order of several times per year.

### **Cost**

- The initial cost of individual inserts ranges from less than \$100 to about \$2,000. The cost of using multiple units in curb inlet drains varies with the size of the inlet.
- The low cost of inserts may tend to favor the use of these systems over other, more effective treatment BMPs. However, the low cost of each unit may be offset by the number of units that are required, more frequent maintenance, and the shorter structural life (and therefore replacement).

### **References and Sources of Additional Information**

Hrachovec, R., and G. Minton, 2001, Field testing of a sock-type catch basin insert, Planet CPR, Seattle, Washington

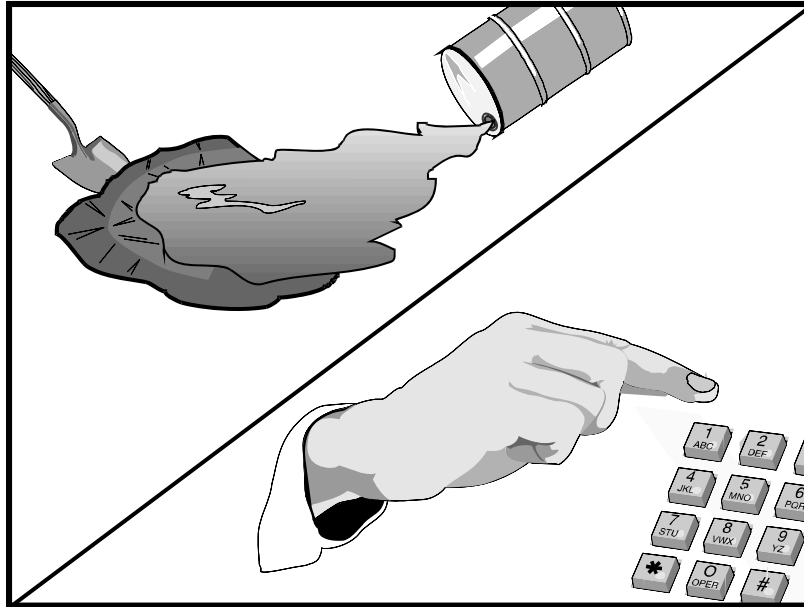
Interagency Catch Basin Insert Committee, Evaluation of Commercially-Available Catch Basin Inserts for the Treatment of Stormwater Runoff from Developed Sites, 1995

Larry Walker Associates, June 1998, NDMP Inlet/In-Line Control Measure Study Report

Manufacturers literature

Santa Monica (City), Santa Monica Bay Municipal Stormwater/Urban Runoff Project - Evaluation of Potential Catch basin Retrofits, Woodward Clyde, September 24, 1998

Woodward Clyde, June 11, 1996, Parking Lot Monitoring Report, Santa Clara Valley Nonpoint Source Pollution Control Program.



## Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

## Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

## Categories

<b>EC</b>	Erosion Control	
<b>SE</b>	Sediment Control	
<b>TC</b>	Tracking Control	
<b>WE</b>	Wind Erosion Control	
<b>NS</b>	Non-Stormwater Management Control	
<b>WM</b>	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

## Legend:

- Primary Objective**
- Secondary Objective**

## Targeted Constituents

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

## Potential Alternatives

None



- Fuels
- Lubricants
- Other petroleum distillates

## **Limitations**

- In some cases it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

## **Implementation**

The following steps will help reduce the stormwater impacts of leaks and spills:

### ***Education***

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor’s superintendent or representative oversee and enforce proper spill prevention and control measures.

### ***General Measures***

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn’t compromise clean up activities.
- Do not bury or wash spills with water.

- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

## ***Cleanup***

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

## ***Minor Spills***

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

## ***Semi-Significant Spills***

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

### ***Significant/Hazardous Spills***

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

### ***Reporting***

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

## ***Vehicle and Equipment Maintenance***

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Regularly inspect onsite vehicles and equipment for leaks and repair immediately
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

## ***Vehicle and Equipment Fueling***

- If fueling must occur onsite, use designate areas, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

## **Costs**

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

## **Inspection and Maintenance**

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.



- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## 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 (m<sup>2</sup>)

WQV = water quality volume (m<sup>3</sup>)

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/ft<sup>3</sup> 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.

**References and Sources of Additional Information**

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- Galli, J. 1992. *Analysis of Urban BMP Performance and Longevity in Prince George's County, Maryland*. Metropolitan Washington Council of Governments, Washington, DC.
- Hilding, K. 1996. Longevity of infiltration basins assessed in Puget Sound. *Watershed Protection Techniques* 1(3):124-125.
- Maryland Department of the Environment (MDE). 2000. *Maryland Stormwater Design Manual*. <http://www.mde.state.md.us/environment/wma/stormwatermanual>. Accessed May 22, 2002.
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- Nightingale, H.I., 1987b, "Accumulation of As, Ni, Cu, and Pb in Retention and Recharge Basin Soils from Urban Runoff," *Water Resources Bulletin*, Vol. 23, p. 663-672.
- Nightingale, H.I., 1987c, "Organic Pollutants in Soils of Retention/Recharge Basins Receiving Urban Runoff Water," *Soil Science* Vol. 148, pp. 39-45.
- Nightingale, H.I., Harrison, D., and Salo, J.E., 1985, "An Evaluation Technique for Ground-water Quality Beneath Urban Runoff Retention and Percolation Basins," *Ground Water Monitoring Review*, Vol. 5, No. 1, pp. 43-50.
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- Schueler, T. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*. Metropolitan Washington Council of Governments, Washington, DC.
- Schroeder, R.A., 1995, *Potential For Chemical Transport Beneath a Storm-Runoff Recharge (Retention) Basin for an Industrial Catchment in Fresno, CA*, USGS Water-Resource Investigations Report 93-4140.

Southeastern Wisconsin Regional Planning Commission (SWRPC). 1991. ***Costs of Urban Nonpoint Source Water Pollution Control Measures***. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI.

U.S. EPA, 1983, ***Results of the Nationwide Urban Runoff Program: Volume 1 – Final Report***, WH-554, Water Planning Division, Washington, DC.

Watershed Management Institute (WMI). 1997. ***Operation, Maintenance, and Management of Stormwater Management Systems***. Prepared for U.S. Environmental Protection Agency Office of Water, Washington, DC.

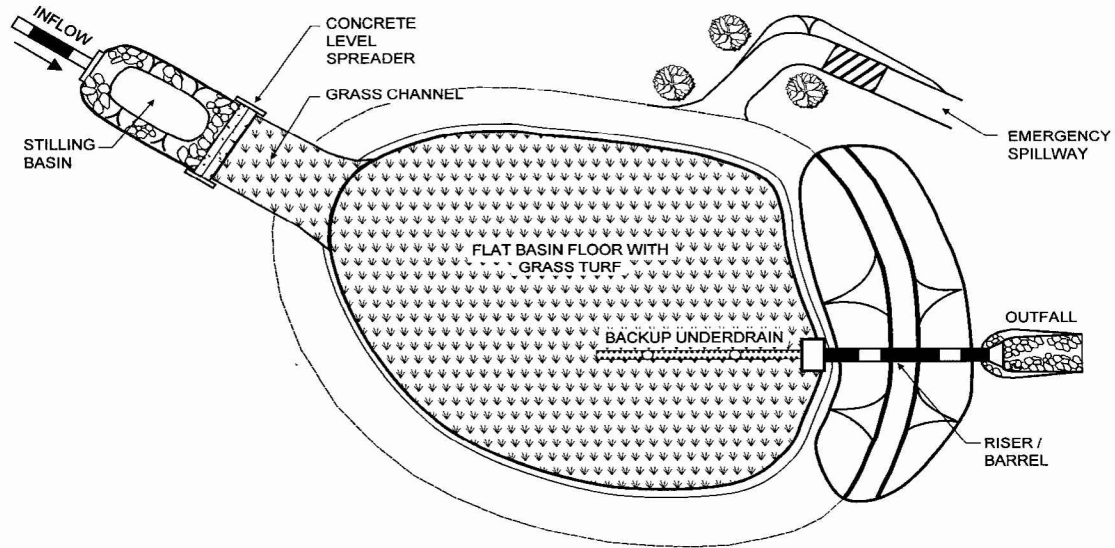
### ***Information Resources***

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.

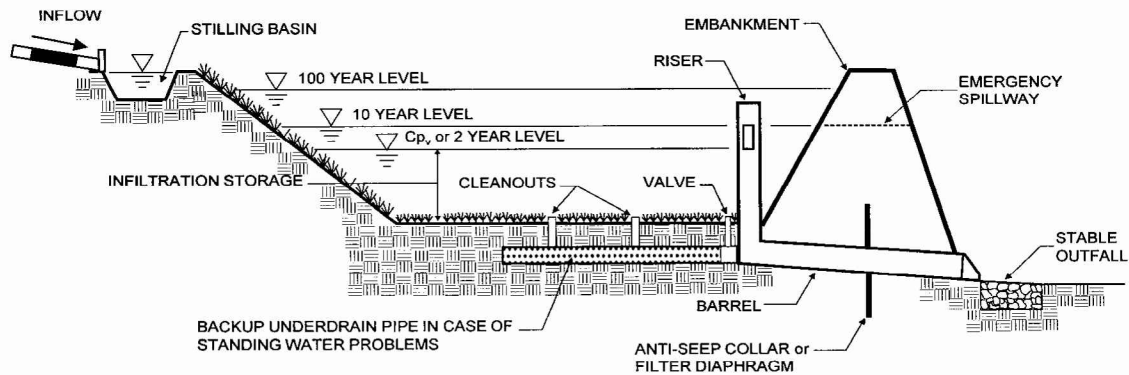
Ferguson, B.K., 1994. ***Stormwater Infiltration***. CRC Press, Ann Arbor, MI.

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.





PLAN VIEW



PROFILE

# Attachment E

## Operations and Maintenance (O&M) Plan

[Include an Operations and Maintenance (O&M) Plan. This should include the components of the BMPs, the frequency of inspections and maintenance, the responsible entity, etc.]

**PATRIOT BUSINESS PARK – PARCEL 3 -RS 65-19**

**APN: 3022-026-003**

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF PALMDALE, IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 3, IN THE CITY OF PALMDALE, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS SHOWN ON A RECORD OF SURVEYS MAP FILED IN BOOK 65 PAGE 19 OF RECORD OF SURVEYS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

**REQUIRED PERMITS**

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

- Permits for connection to sanitary sewer
- Permits from California Department of Fish and Game
- Encroachment permits

If no permits are required, a statement to that effect should be made.

**RECORDKEEPING**

All records must be made available for review upon request.

**RESPONSIBLE PARTY**

The owner is aware of the maintenance responsibilities of the proposed BMPs. A funding mechanism is in place to maintain the BMPs at the frequency stated in the LID Plan. The contact information for the entity responsible is below:

Name:	ROBERT SARKISSIAN
Company:	PATRIOT BUSINESS PARK, LLC.
Title:	CEO
Address 1:	455 WEST PALMDALE BLVD., SUITE C
Address 2:	PALMDALE, CA. 93551
Phone Number:	(818) 212-9346
Email:	ROBERT.S@PATRIOTDEVELOPMENTS.COM

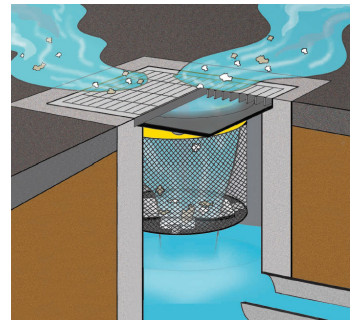


# STORM FLOGARD® T-SERIES WATER Catch Basin Insert

## Catch Basin Insert Designed to Capture Sediment, Gross Solids, Trash and Petroleum Hydrocarbons from “First-Flush” Flows.

The FloGard T-Series insert is an economical alternative catch basin insert for the collection of sediment and debris from stormwater runoff and other sources both during and after construction.

The working chamber of the T-Series is made of durable geo-textile fabric which is easily replaced and provides for flexibility, ease of maintenance and economy. It is designed to collect silt and debris as well as petroleum hydrocarbons. As with all FloGard inserts, the built-in high-flow bypass will not impede the system’s maximum design flow.



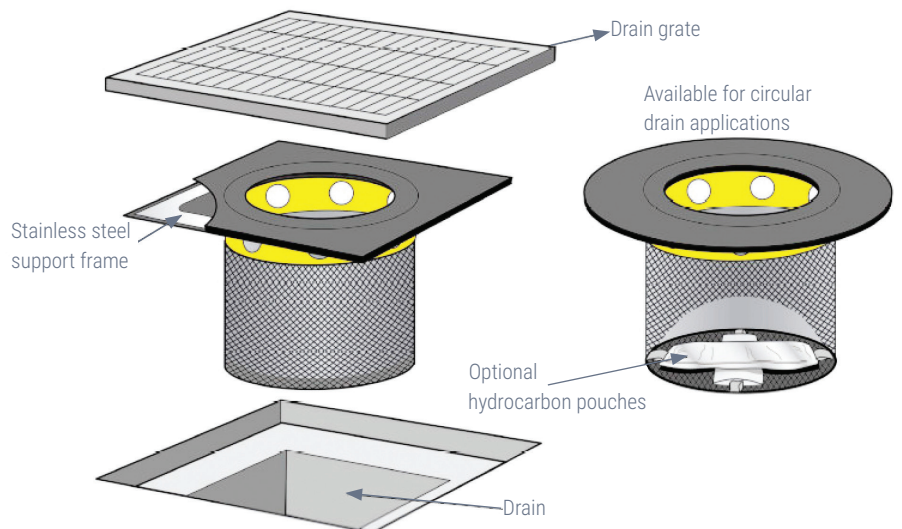
FloGard T-Series inserts are available in sizes to fit most industry-standard flat-grated drainage inlets and yard drains. The inserts are recommended for areas subject to sediment and debris. They can also be used in areas with low-to-moderate levels of petroleum hydrocarbons with optional sorbent pouches. Examples of such areas include private residences, vehicle parking lots, aircraft ramps, truck and bus storage yards, subdivisions and public streets.

### COURSE OF CONSTRUCTION SEDIMENTATION CONTROL

- Captures sediment, trash and debris
- Reusable to move from site to site
- Stainless steel support frame secures filter in place

### POST-CONSTRUCTION FILTRATION

- Optional sorbent pouches to capture petroleum hydrocarbons
- Available for trench drain applications
- Incorporates many of the same effective features of permanent FloGard® and FloGard +Plus® filters



## Types, Sizes and Capacities

Additional sizes, including custom options are available.

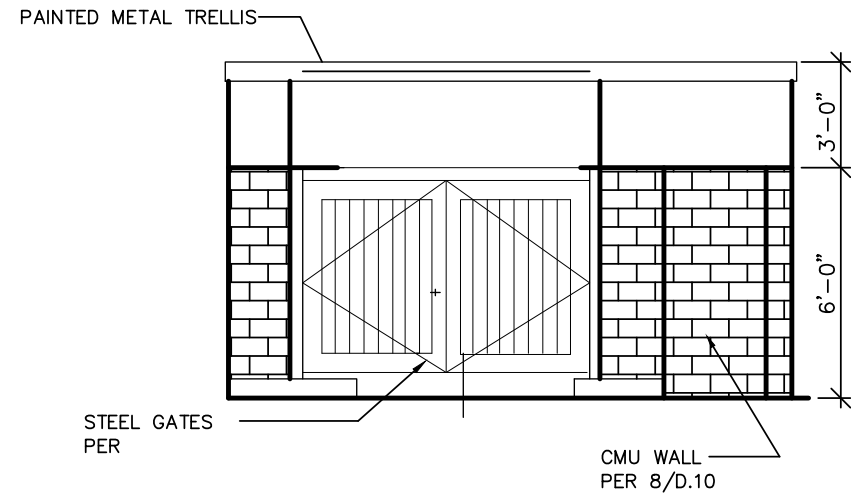
SQUARE MODEL	INLET ID (in x in)	GRATE OD (in x in)	TOTAL DEPTH (in)	SEDIMENT STORAGE CAPACITY (cu ft)	FILTERED FLOW CAPACITY (cfs)	BYPASS FLOW CAPACITY (cfs)
FF-TV9	9 x 14	10 x 15.5	9	0.17	0.3	0.1
FF-TV64	9 x 14	16 x 16	9	0.33	0.4	0.3
FF-T9	9 x 14	9 x 9	6	0.04	0.1	0.1
FF-T1212	9 x 14	12 x 12	6	0.05	0.1	0.1
FF-T18	9 x 14	18 x 18	9	0.18	0.3	0.2
FF-T24	9 x 14	24 x 24	14	0.33	0.4	0.3
FF-T26	9 x 14	26 x 26	14	0.33	0.4	0.3

ROUND MODEL	INLET ID (in)	GRATE OD (in)	TOTAL DEPTH (in)	SEDIMENT STORAGE CAPACITY (cu ft)	FILTERED FLOW CAPACITY (cfs)	BYPASS FLOW CAPACITY (cfs)
FF-TR12	10	12	7	0.07	0.1	0.1
FF-TR15	12	15	9	0.12	0.2	0.2
FF-TR18	15	18	9	0.46	0.4	0.3
FF-TR20	18	20	9	0.70	0.6	0.4
FF-TR24	22	24	14	1.09	0.8	0.5
FF-TR25	24	25	14	1.32	0.9	0.5

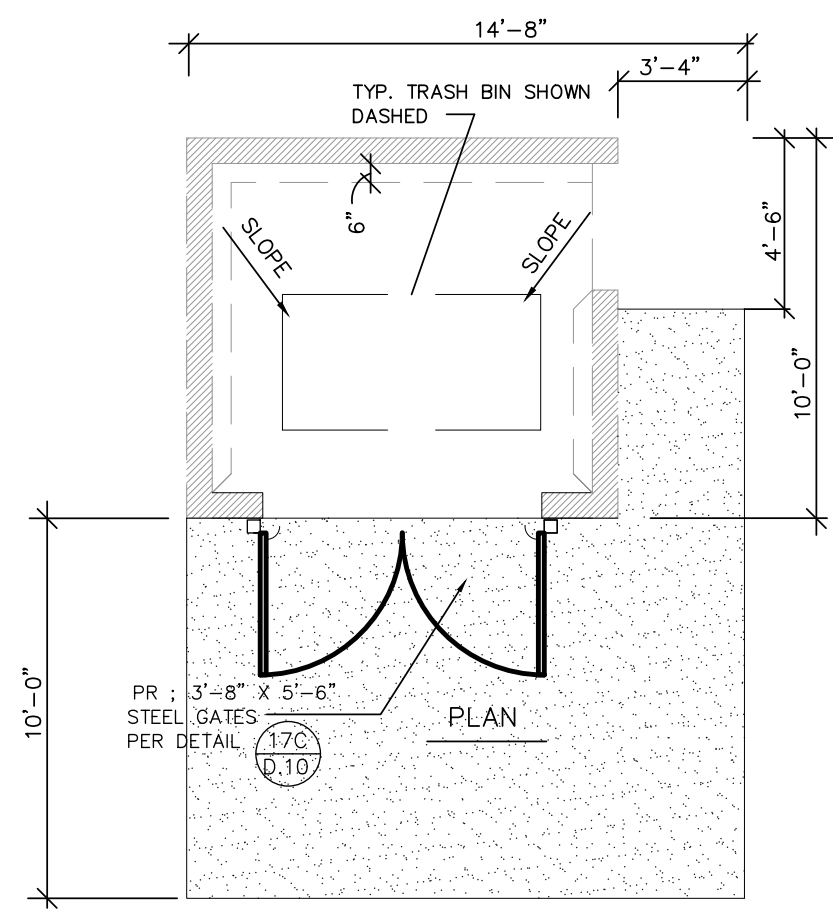
TRENCH DRAIN MODEL*	INLET ID (in)	GRATE OD (in)	TOTAL DEPTH (in)	SEDIMENT STORAGE CAPACITY (cu ft)	FILTERED FLOW CAPACITY (cfs)	BYPASS FLOW CAPACITY (cfs)
FF-TD6T	4	6	6	0.06	0.2	0.1
FF-TD8T	6	8	6	0.11	0.2	0.1
FF-TD10T	8	10	6	0.17	0.3	0.2
FF-TD12T	10	12	6	0.22	0.3	0.2
FF-TD14T	12	14	6	0.28	0.4	0.2

\*Trench Drain inserts available in standard 24" lengths.





ELEVATION



**1 TRASH ENCLOSURE DETAIL**  
SCALE 1"=5'

FG-0001

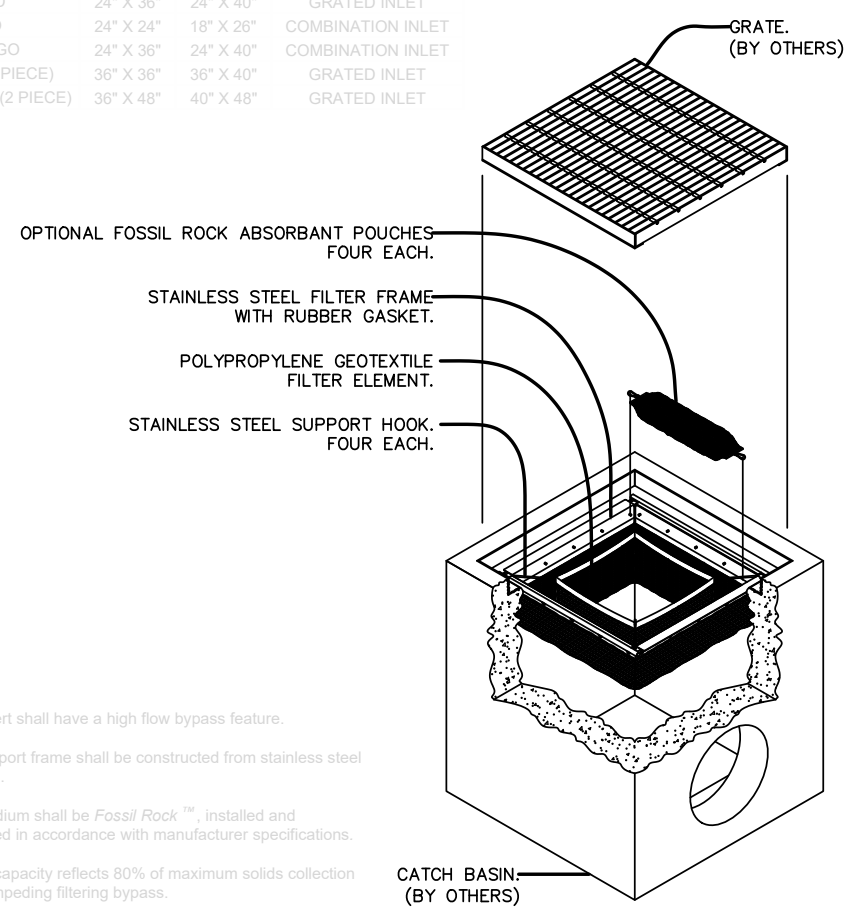
MODEL	INLET ID	GRATE OD	COMMENTS
FF-12D	12" X 12"	15" X 15"	GRATED INLET
FF-16D	16" X 16"	18" X 18"	GRATED INLET
FF-18D	18" X 18"	20" X 20"	GRATED INLET
FF-1836SD	18" X 36"	18" X 40"	GRATED INLET
FF-1836DGO	18" X 36"	18" X 40"	COMBINATION INLET
FF-24D	24" X 24"	26" X 26"	GRATED INLET
FF-2436SD	24" X 36"	24" X 40"	GRATED INLET
FF-24DGO	24" X 24"	18" X 26"	COMBINATION INLET
FF-2436DGO	24" X 36"	24" X 40"	COMBINATION INLET
FF-36D (2 PIECE)	36" X 36"	36" X 40"	GRATED INLET
FF-3648D (2 PIECE)	36" X 48"	40" X 48"	GRATED INLET

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock*™, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

**NO DUMPING**  
  
**DRAINS TO RIVER**

**3 STENCIL DETAIL**  
SCALE



**2 SDM FILTER**  
SCALE 1"=5'

**LID**  
**LOW IMPACT DEVELOPMENT (LID)**

**FOR: PATRIOT DEVELOPMENT**  
**IN THE CITY OF PALMDALE, CA**

**APN: 3022-026-003**

**POST-DEVELOPED CONDITION**

**RED BRICK SOLUTION**

CONSULTING ENGINEERS & ARCHITECTS

**EXHIBIT 3**

## 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 & Maintenance Responsibility
<b>Non-Structural Source Control BMPs</b>			
YES	<p><b>Education for Property Owners, Tenants and Occupants</b></p> <p>Within 2 days for new hires and walk-thru of the site where treatment BMPs are located and restrictions. Within 2 months, a signed acknowledgement of site policies and restrictions. Educational materials available from the LA county Stormwater Program.</p>	All new employees will be trained prior to commencement of work.	OWNER
YES	<p><b>Activity Restriction</b></p> <p>Conditions, covenants and restrictions (CCRs) will be prepared by the developer restricting dumping waste down catch basins for the purpose of surface water quality protection.</p>	CCR will be reviewed on an annual basis.	OWNER AND ASSIGNS
YES	<p><b>Common Area Landscape Management</b></p> <p>CC&amp;R's will be prepared limiting fertilizer and/or pesticide. usage. At a minimum, pesticides shall be placed by a licensed applicator. /Owner/site operator(s) shall ensure landscaping/Groundskeeping Service providers do not blow or sweep debris, cutting, leaves, etc., into treatment BMPs and/or City maintained right of ways. All landscape maintenance contractors will be required to sweep up all landscape cuttings, mowing and fertilizer materials off paved areas weekly and dispose of properly.</p>	CCR will be reviewed on an BI-annual basis.	OWNER
YES	<p><b>BMP Maintenance</b></p> <p>Property owner shall be responsible for the maintenance of all site BMP's. The responsible person in charge, will hire an independent testing laboratory to test clarifiers after each storm event to determine if any contamination has reached off-site areas. The RPIC will also schedule cleaning and/or maintenance of all structural BMP facilities. When BMP replacement(s) is required, the Owner shall order and provide materials to assigned personnel/staff. .</p>	Monthly	OWNER
NO	<p><b>Title 24 CCR Compliance</b></p> <p>Insert BMP narrative.</p>		
NO	<p><b>Spill Contingency Plan</b></p> <p>Insert BMP narrative.</p>		



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 & Maintenance Responsibility
NO	<b>Underground Storage Tank Compliance</b> Insert BMP narrative.		
NO	<b>Hazardous Materials Disclosure Compliance</b> Insert BMP narrative.		
YES	<b>Uniform Fire Code Implementation</b> Signage will be provided identifying Exit paths, fire extinguishers locations, and yearly inspections maintained by the local fire authority as outlined in Article 80 of UFC.	Bi-annually	OWNER
NO	<b>Common Area Litter Control</b> Insert BMP narrative.		
YES	<b>Employee Training</b> Owner/POA training manual will be provided, and training of staff and residence will occur bi-annually and with new occupant.	All new employees will be trained prior to commencement of work.	OWNER
NO	<b>Housekeeping of Loading Docks</b> Insert BMP narrative.		
NO	<b>Common Area Catch Basin Inspection</b> Insert BMP narrative.		
YES	<b>Street Sweeping Private Streets and Parking Lots</b> The owner/POA will sweep Streets and parking lots shall be swept at a minimum in late summer or early fall, prior to the start of the rainy season or equivalent, as required by the governing jurisdiction.	Bi-annually	OWNER
NO	<b>Retail Gasoline Outlets</b> Insert BMP narrative.		
<b>Structural Source Control BMPs</b>			
YES	<b>Provide Storm Drain System Stenciling and Signage</b> Storm drain inlets and catch basins will be labeled with no less than 2" letters stating "No Dumping" and will maintain legibility of stencils and signs.	Bi-annually	OWNER

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 & Maintenance Responsibility
NO	<b>Design and Construct Outdoor Material Storage Areas to Reduce Pollutant Introduction</b> Insert BMP narrative.		
YES	<b>Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction</b> The enclosure area will be paved with an impervious surface and provide solid roof or awning to prevent exposure to direct precipitation.	Bi-Monthly	OWNER
YES	<b>Use Efficient Irrigation Systems &amp; Landscape Design</b> All landscaped areas will be designed based on efficient irrigation systems such as timing and application methods and group plans with similar water requirements to minimize the runoff of excess irrigation water.	Bi-annually	OWNER
YES	<b>Protect Slopes and Channels and Provide Energy Dissipation</b> Storm Dain Channel Slope Protection will be concrete lining with velocity dissipation drop structures and riprap.	Annually	OWNER
NO	<b>Loading Docks</b> Insert BMP narrative.		
NO	<b>Maintenance Bays</b> Insert BMP narrative.		
NO	<b>Vehicle Wash Areas</b> Insert BMP narrative.		
NO	<b>Outdoor Processing Areas</b> Insert BMP narrative.		
NO	<b>Equipment Wash Areas</b> Insert BMP narrative.		
NO	<b>Fueling Areas</b> Insert BMP narrative.		

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 & Maintenance Responsibility
NO	<b>Hillside Landscaping</b> Insert BMP narrative.		
NO	<b>Wash Water Controls for Food Preparation Areas</b> Insert BMP narrative.		
NO	<b>Community Car Wash Racks</b> Insert BMP narrative.		
<b>Treatment Control BMPs</b>			
Yes	<b>Treatment Control BMP # 1</b> Insert BMP narrative.		
Yes	<b>Treatment Control BMP #2</b> Insert BMP narrative.		

**BMP OPERATION & MAINTENANCE LOG**

PARCEL 3, RS 65-19 APN: 3022-026-003

**Today's Date:** \_\_\_\_\_

**Name of Person Performing Activity  
(Printed):** \_\_\_\_\_

**Signature:** \_\_\_\_\_

<b>BMP Name (As Shown in O&amp;M Plan)</b>	<b>Brief Description of Implementation, Maintenance, and Inspection Activity Performed</b>
SD-10 (Site Design & Landscape Planning)	
SD-12 (Efficient Irrigation)	
SD-13 (Storm Drain Signage)	
SD-32 (Trash Storage Areas)	
SD-34 (Outdoor Material Storage Areas)	
TC-11 (Infiltration Basin) Including pretreatment infiltration filter	

Note: annual cost to maintain the post construction BMPs shall be determined by the owner.

# Attachment F

## Plans

[Include full sized copies (24" x 36" or larger) of all relevant plans (i.e. grading plans, plumbing plans, drainage plans, etc.) signed, stamped, and dated with wet ink application by a California licensed civil engineer with all water quality notes and details. This is to properly evaluate the site design and ensure all BMPs are located on plans which will be used by the contractor during construction. The plans must indicate the locations of all BMPs, cross-sectional details of all BMPs, conveyance systems, drainage connections, overflow processes, elevations, inverts, etc. All conveyance systems (i.e. ribbon gutters, area drains, storm drains, swales, etc.) must be indicated with inverts and elevations. The cross-sectional details of the BMPs must show the type and depth of all layers (i.e. amended soil layer, gravel layer, etc.) and must follow the criteria from the design standard used.]

