

**PRELIMINARY STORM WATER CONTROL PLAN
SUPPLEMENTAL REPORT**

FOR

**PUBLIC STORAGE
231 W CAPITOL EXPY
SAN JOSE, CALIFORNIA**

Public Storage

PREPARED FOR:

**CITY OF SAN JOSE
PLANNING DIVISION
200 E Santa Clara St – 3rd Floor Tower
San José, CA 95113-1905**

JANUARY 2019

PREPARED BY:



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LARS ANDERSEN & ASSOCIATES, INC.

CIVIL ENGINEERS • LAND SURVEYORS • PLANNERS

CASp • LEED ACCREDITED • REA

4694 W JACQUELYN AVENUE

FRESNO, CA 93722

PH (559) 276-2790 FX (559) 276-0850



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INTRODUCTION

Lars Andersen & Associates, Inc. has prepared this proposed Storm Water Control Plan Supplemental Report for the proposed Public Storage redevelopment located at 231 W Capitol Expy in the City of San Jose, California. The emphasis of this study will be to describe the use of BMP's to meet the City of San Jose's Post-Construction Urban Runoff Management Policy No. 6-29 requirements. The process and design was based on direction from the Santa Clara Valley Urban Runoff Pollution Prevention Program C.3 Design Handbook. This supplemental report includes the City's Project Data Form and Screening worksheet for determining infiltration and/or harvest and use feasibility for compliance with C.3 treatment requirements. Based on these documents the bmp selected for use on this project will be a bioretention area. See Simplified Sizing Method Calculations and Fact Sheet in Appendix C.

PROJECT DESCRIPTION

The existing Public Storage is located north of Capitol Expressway and westerly side of Snell Avenue on the following Assessor's Parcel Number (APN): 462-19-013 and -014. The current zoning is Light Industrial (LI) and the current land use designation is Combined Industrial/Commercial (CIC). The existing parcel has a gross area of 6.40 acres, and the existing buildings have a gross floor area (GFA) of 133,701 square feet. Public Storage will be replacing 3 existing storage buildings with a new 5 story self-storage building with a gross floor area of 179,616 SF, for an aggregate gross floor area of 278,860 SF. The proposed development will consist of replacing a portion of the existing asphalt to create new parking stalls and fire truck access for the new building. Entry towers at lobby and office with new sliding glass doors and spandrel glass. Tower to have metal panels behind signage and stucco columns. Metal entry canopy and spandrel decorative features between existing building pilasters. Paint entire building with Public Storage brand striping at parapet. The standard hours to access the property are 6AM to 6PM every Monday thru Friday, and 6AM to 5PM Saturday and Sunday. Office hours for the property are 9:30AM to 6PM every Monday thru Friday, and 9:30AM to 5PM Saturday and Sunday. Two (2) to three (3) employees will be present at the maximum work shift. There will be a security gate located near the office that will be open to customers during operation hours.

Figure 1 shows the project site with respect to the existing roadways. Figure 2 represents the site plan.

RECEIVING WATER BODY

The proposed runoff will be conveyed to the City storm drain system after mitigated treatment. The runoff onto Capitol Expressway is received by the **Guadalupe River** to the northwest.

POLLUTANT SOURCES

The Pollutants of concern will be from vehicular traffic on the parking lot and the solid waste produced at the trash enclosure areas. See appendix B for source control checklist.



PREPARER'S CERTIFICATION

“The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Post-Construction Urban Runoff Management Policy No. 6-29 and any subsequent amendments thereto.”

Preparer's Signature

Date

Preparer's Printed Name

Preparer's Title/Position

Preparer's Licensure:



FORM #120 6/14/2017 SUBJECT TO CHANGE

PLANNING DIVISION

Stormwater Evaluation Form

FILE #

This form must be submitted with other Planning Permit applications ONLY if your project:

- **Creates or replaces 10,000 sq. ft. or more of impervious surface on a project site; OR**
- **Involves a restaurant, auto service facility, retail gasoline outlet, uncovered parking lot, or top uncovered portion of a parking structure that creates or replaces 5,000 sq. ft. or more of impervious surface on a project site.**

Such projects must comply with Provision C.3 of the Municipal Regional Stormwater Permit (MRP) and must complete this form. For more information and definitions, see the [Stormwater Management](#) web page at www.sanjoseca.gov/planning.

What is an impervious surface? An impervious surface is pavement or other surface covering that prevents land from absorbing rainfall and stormwater. Impervious surfaces include driveways, walkways, parking lots, rooftops and any other continuous watertight covering. Pervious pavement underlain with pervious soil or material, e.g., drain rock, that infiltrates rainfall at a rate equal to or greater than surrounding unpaved areas OR that stores and infiltrates the water quality design volume specified in Provision C.3.d of the MRP, is not considered an impervious surface.

1.a. Are any of these uses included in your project?

Check all that apply.

- Restaurant
- Retail Fuel Outlet
- Uncovered Parking
- Auto Service, as categorized by the Standard Industrial Classification (SIC) Codes 5013-5014, 5541, 7532-7534, 7536-7539. Determine your SIC Codes at www.osha.gov. List the applicable SIC Code/s: _____

1.b. Check the watershed in which your project is located.

See the [Watershed Maps](#) web page at www.sanjoseca.gov

- Baylands
- Calabazas
- Coyote (including Lower Penitencia)
- Guadalupe
- San Tomas

1.c. Special Project Status.

Use the online [Special Project Worksheet](#) at www.sanjoseca.gov to determine if your project qualifies as a Special Project. Does your project qualify?

- Yes *If yes, attach the Special Project Worksheet to this application.*
- No

Note: A separate Narrative is required for all Special Projects. Refer to the [Special Projects Worksheet](#) for requirements.

continued>



2. SURFACE DATA

- 2.a. Enter the Project Phase Number (1, 2, 3, etc. or N/A if Not Applicable): 1.00
- 2.b. Total area of site: 3.50 acres
- 2.c. Total Existing Impervious Surfaces on site: 139653.00 sq. ft.
- 2.d. Total area of site that will be disturbed: 1.64 acres

COMPARISON OF IMPERVIOUS AND PERVIOUS SURFACES AT PROJECT SITE	Existing Surface sq. ft.	Proposed Surface		RESET CALCULATIONS
		To Be Replaced sq. ft. ¹	New sq. ft. ²	
2.e. IMPERVIOUS SURFACES				
Roof Area	31,522.00	43,506.00	1,418.00	
Parking	33,108.00	11,850.00	139.00	
Sidewalks, Patios, Driveways, Etc.	563.00	2,852.00	183.00	
Public Streets				Total Proposed Impervious Surface (replaced + new)
Private Streets				
<i>Online form auto-calculates</i> Impervious Surfaces Total	e.1. 65193.00	e.2. 58208.00	e.3. 1740.00	e.4. 59948.00
2.f. PERVIOUS SURFACES				
Landscaped Area	6202.00	4089.00	3668.00	
Pervious Paving		373.00	3317.00	Total Proposed Pervious Surface (replaced + new)
Green Roof and other Pervious Surfaces				
<i>Online form auto-calculates</i> Pervious Surfaces Total	f.1. 6202.00	f.2. 4462.00	f.3. 6985.00	f.4. 11447.00

2.g. Percentage of Site's Impervious Area Replacement (e.2 ÷ 2.c) X 100: *Online form auto-calculates* **g. 41.68 %**

¹ *Proposed Replaced Impervious Surface:* Replacement of an existing impervious surface with another impervious surface.
² *Proposed New Impervious Surface:* New impervious surface that will cover an existing pervious surface.

3. PROVISION C.3 APPLICABILITY

3.a. Is box 2.e.4 above equal to 10,000 sq. ft. or more for any type of project, or 5,000 sq. ft. or more for restaurants, auto service facilities, retail gas outlets, and uncovered parking? Check one:

- Yes. Site Design, Source Control, and Treatment System requirements will all apply to the project area.
- No. Site Design and Source Control requirements will apply to the project area (Treatment Systems do not apply).

3.b. Is box 2.g above equal to or greater than 50%? Check one:

- Yes. Site Design, Source Control, and Treatment System requirements all apply to the entire site.
- No. Site Design, Source Control, and Treatment System requirements only apply to the area of site that is disturbed.

continued>



3.c. Indicate the Provision C.3 measures to be applied to your project. Check all that apply:

SITE DESIGN MEASURES	SOURCE CONTROL MEASURES	TREATMENT SYSTEMS
<p>PROTECTION MEASURES</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Protect existing trees, vegetation, and soil. <input type="checkbox"/> Protect riparian and wetland areas/buffers. <input checked="" type="checkbox"/> Preserve open space and natural drainage patterns. <input type="checkbox"/> Rainwater harvesting and use (e.g., rain barrel, cistern connected to roof drains) ¹ <p>LANDSCAPE DESIGN MEASURES</p> <ul style="list-style-type: none"> <input type="checkbox"/> Direct runoff from roofs, sidewalks, patios to landscaped areas. <input checked="" type="checkbox"/> Plant trees adjacent to and in parking areas and adjacent to other impervious areas. <p>DESIGN MEASURES TO MINIMIZE IMPERVIOUS SURFACE AREA</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Reduce existing impervious surfaces. <input type="checkbox"/> Cluster structures/pavement. <input checked="" type="checkbox"/> Create new pervious areas: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Landscaping <input type="checkbox"/> Parking stalls <input type="checkbox"/> Walkways and patios <input type="checkbox"/> Emergency vehicle access <input type="checkbox"/> Private streets and sidewalks <input type="checkbox"/> Install a Green Roof on all or a portion of the roof. <input type="checkbox"/> Parking: <ul style="list-style-type: none"> <input type="checkbox"/> On top of or under buildings <input type="checkbox"/> Not provided in excess of Code <input type="checkbox"/> Other: _____ 	<ul style="list-style-type: none"> <input type="checkbox"/> Beneficial landscaping ³ <input type="checkbox"/> Use water efficient irrigation systems. <input checked="" type="checkbox"/> Good housekeeping, e.g., sweep pavement and clean catch basin. <input checked="" type="checkbox"/> Label storm drains. <input checked="" type="checkbox"/> Connect to the sanitary sewer: ² <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Covered trash/recycling enclosures <input type="checkbox"/> Interior parking structures <input type="checkbox"/> Wash area/racks <input type="checkbox"/> Pools, spas, fountains <input type="checkbox"/> Covered loading docks and maintenance bays <input type="checkbox"/> Pumped groundwater <input type="checkbox"/> Fueling areas must (all required): <ul style="list-style-type: none"> - Be graded to prevent ponding. - Use a concrete surface. - Be separated from the site by a grade break to prevent run-on. - Have a canopy cover extending at least 10 feet from each pump. <input type="checkbox"/> Industrial, outdoor material storage, and recycling facilities must (all required): <ul style="list-style-type: none"> - Stockpile material on an impervious surface or under a permanent roof or covering. - Direct ponded water to the sanitary sewer,² an on-site treatment system, or off-site disposal. - Install berms or curbs to prevent runoff from the storage/processing areas. - Segregate pollutant-generating activities into a distinct drainage management area and provide treatment. <input type="checkbox"/> Other: _____ 	<p>LID TREATMENT</p> <ul style="list-style-type: none"> <input type="checkbox"/> Impervious surfaces drain to a self-retaining area that is sized per the design criteria listed in the C.3 Stormwater Handbook. <input type="checkbox"/> Rainwater harvest and use (e.g., cistern or rain barrel sized for C.3.d treatment) <input type="checkbox"/> Infiltration basin <input type="checkbox"/> Infiltration trench <input type="checkbox"/> Exfiltration trench <input type="checkbox"/> Underground detention and infiltration system (e.g. pervious pavement drain rock, large diameter pipe) <p>BIOTREATMENT</p> <p>For use when Infiltration and Rainwater Harvest and Use is proven infeasible</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Bioretention area <input checked="" type="checkbox"/> Flow-through planter <input type="checkbox"/> Tree box with bioretention soil ⁴ <input type="checkbox"/> Other: _____ <p>OTHER TREATMENT METHODS</p> <p>SPECIAL PROJECTS ONLY ⁵</p> <ul style="list-style-type: none"> <input type="checkbox"/> Proprietary tree box filter <input type="checkbox"/> Media filter (sand, compost, or proprietary media) <p>MULTI-STEP PROCESS ONLY ⁶</p> <ul style="list-style-type: none"> <input type="checkbox"/> Vegetated filter strip <input type="checkbox"/> Dry detention basin

FOOTNOTES

- 1 As a site design measure, it does not have to be sized to comply with Provision C.3.d treatment requirements.
- 2 Subject to the requirements of the sanitary sewer authority.
- 3 Landscaping that minimizes irrigation and runoff, promotes surface infiltration where possible, and minimizes the use of pesticides and fertilizers.
- 4 Bioretention soils shall infiltrate runoff at a minimum of 5 inches per hour during the life of the facility and sustain healthy, vigorous plant growth.
- 5 These treatment measures are only allowed if the project qualifies as a Special Project.
- 6 These treatment measures are only allowed as part of a multi-step treatment process.

continued>



4. TREATMENT SYSTEM SIZING FOR PROJECTS WITH TREATMENT REQUIREMENTS

For each treatment system component, indicate the hydraulic sizing criteria used and provide the calculated design flow or volume to be treated:

Treatment System Component	Hydraulic Sizing Criteria <small>Enter numbers from Table below</small>	Design Flow or Volume <small>cfs or cu.ft.</small>
Bioretention Basin	2c	720 cu.ft.
Flow Through Planter	2c	1,796 cu.ft.

CODING TABLE FOR HYDRAULIC SIZING CRITERIA		
Enter the appropriate number in the above column		
1a: Volume – WEF Method 1b: Volume – CASQA BMP Handbook Method	2a: Flow – Factored Flood Flow Method 2b: Flow – CASQA BMP Handbook Method 2c: Flow – Uniform Intensity Method	3: Combination Flow and Volume Design Basis

5. HYDROMODIFICATION MANAGEMENT (HM) APPLICABILITY

5.a. Does the project create or replace one acre or more of impervious surface AND create an increase in total impervious surface from the pre-project condition (from page 2, is 2.e.4 > 2.e.1 and ≥ one acre)? Check one:

- Yes. Continue to Question 5.b.
- No. Project is exempt from Hydromodification Management.

5.b. Is the project located in the green “Subwatersheds less than 65% Impervious” area on the [HM Applicability Map](#)?

Check one:

- Yes. Project must implement HM requirements. Continue to Question 5.c.
- No. Project is exempt from Hydromodification Management.

5.c. If Yes to 5.b, select the specific flow duration controls for Hydromodification Management. Check all that apply:

- Detention basin
- Underground tank or vault
- Bioretention with outlet control
- Other: _____

6. OPERATION & MAINTENANCE (O&M) CONTACT INFORMATION

Please enter the contact information of the Responsible Party for Stormwater Treatment/Hydromodification Control O&M:

NAME	MAILING ADDRESS	EMAIL/PHONE
RESPONSIBLE PARTY IN CHARGE OF O&M	STREET: 701 Western Ave	EMAIL: mkennedy@publicstorage.com
NAME: Mark Kennedy	CITY: Glendale ZIP: 91201	PHONE: 818-244-8080 ext. 1520
FIRM NAME IF ANY: Public Storage		



**Screening Worksheet for
Determining Infiltration and/or Harvesting and Use Feasibility for
Compliance with C.3 Treatment Requirements**

*Complete this form to determine if Infiltration and/or Rainwater Harvesting and Use are feasible or infeasible Low Impact Development (LID) treatment measures for your **C.3 Regulated Project**.^{*} See the [Glossary \(Attachment 1\)](#) for definitions of terms marked with an asterisk (*). Contact the Planning Project Manager to determine if the project is smart growth development that meets **Special Project**[#] criteria included in the Municipal Regional Permit. If the project meets Special Project criteria, it may receive LID treatment reduction credits.*

APPLICATION INFORMATION

1. Contact Information

Contact Person Name: Daniel Zoldak Project Name: Public Storage - Capitol Expy
 Site Address: 231 W Capitol Expressway, San Jose APN: 462-19-013 File No.: C18-010
 Phone No.: (559) 276-2790 Ext. 117 E-Mail: dzoldak@larsandersen.com
 Mailing Address: 4694 W Jacquelyn Avenue, Fresno, CA 93722

INFILTRATION FEASIBILITY ANALYSIS

2. Evaluate the Feasibility for Infiltration

Do site soils either (a) have a **saturated hydraulic conductivity**^{*} (Ksat) that will NOT allow infiltration of 80% of the annual runoff (that is, the Ksat is LESS than 1.6 inches/hour), or, if the Ksat rate is not available, (b) consist of Type C or D soils?¹

- Yes – Infiltration is infeasible. Continue to Section 3.
 No – Infiltration might be feasible. Complete the [Infiltration Feasibility Worksheet](#) and Continue to Section 6.

RECYCLED WATER USE

3. Recycled Water Use

Check one of the boxes below to indicate if the project is installing and using a recycled water plumbing system for non-potable water use.

- Yes – The project is installing a recycled water plumbing system, and the installation of a second non-potable water system for harvested rainwater is impractical, and considered infeasible due to cost considerations. Continue to Section 6.
 No – The project is not installing a recycled water plumbing system. Continue to Section 4.

RAINWATER CAPTURE ANALYSIS

4. Calculate the Potential Rainwater Capture Area* for Screening of Potential Rainwater Harvesting and Use

*Complete this section for the entire project area. Note: If rainwater harvesting and use is infeasible for the entire site, **and** the project includes one or more buildings that each have an individual roof area of 10,000 sq. ft. or more, then it will be necessary to complete Sections 4 and 5 of this form for each of these buildings (after completing the 'entire project area' analysis).*

¹ Base this response on the site-specific soil report. If this is not available, consult the soil hydraulic conductivity map in [Attachment 3](#).

^{*}For definitions, see [Glossary \(Attachment 1\)](#).



4.1 Complete Table 1. This table represents the **entire project area**.

Table 1: Calculation of the Potential Rainwater Capture Area* <i>The Potential Rainwater Capture Area may consist of the entire project area.</i>				
	1	2	3	4
	Pre-Project Total Site Existing Impervious Surfaces ² (sq. ft.)	Proposed Impervious Surfaces ² (IS) of Site Area Disturbed (sq. ft.)		Post-Project Landscaped Areas for Site Area Disturbed (sq. ft.)
		Replaced ³ IS	New ⁴ IS	
a. Enter the totals for the area to be evaluated:	139,653	58,208	1,740	7,757
b. Sum of replaced and new impervious surfaces:	N/A	59,948		N/A
c. Area of existing impervious surfaces that will NOT be replaced by the project:	81,445	N/A		N/A

4.2 Answer this question for the entire project area ONLY. If existing impervious surface will be replaced by the project, does the area to be replaced equal 50% or more of the total existing impervious surface? (Refer to Table 1, Row "a". Is the area in Column 2 > 50% of Column 1?)

- Yes – C.3 stormwater treatment requirements apply to areas of impervious surface that will remain in place as well as the area created and/or replaced.
- No – C.3 requirements apply only to the impervious area created and/or replaced because the project **does not** include alteration of more than 50% of the total existing impervious surfaces.

4.3 Enter the square footage of the **Potential Rainwater Capture Area***. If you answered "no" to Question 4.2, this amount is from Row "b" in Table 1. If you answered "yes" to Question 4.2, this amount is the sum of Rows "b" and "c" in Table 1: 59,948 sq. ft.

4.4 Convert the measurement of the **Potential Rainwater Capture Area*** from square feet to acres (divide the amount in Item 4.3 by 43,560): 1.38 acres.

4.5 Does the project have at least one **building roof area of 10,000 square feet** or more? If so, **complete Table 2 and Items 4.6 and 4.7 below** (if not, continue to Item 5). Attach additional tables for each additional individual building roof area of 10,000 sq. ft. or more, as applicable.

Table 2: Calculation of the Potential Rainwater Capture Area* <i>The Potential Rainwater Capture Area may consist of a building(s) with a roof area(s) of 10,000 sq. ft. or more.</i>				
	1	2	3	4
	Pre-Project Total Site Existing Impervious Surfaces ⁵ (sq. ft.)	Proposed Impervious Surfaces ² (IS) of the Building Roof Area (sq. ft.)		Post-Project Landscaped Areas for Site Area Disturbed (sq. ft.)
		Replaced ³ IS	New ⁴ IS	
a. Enter the totals for the area to be evaluated:	N/A	43,381	1,523	N/A
b. Sum of replaced and new impervious surfaces:	N/A	44,904		N/A
c. Area of existing impervious surfaces that will NOT be replaced by the project:	N/A	N/A		N/A

4.6 Enter the square footage of the **Potential Rainwater Capture Area*** from Row "b" in Table 2: 44,904 sq. ft.

4.7 Convert the measurement of the **Potential Rainwater Capture Area*** from square feet to acres (divide the amount in Item 4.6 by 43,560): 1.03 acres.

² Enter the total of all impervious surfaces, including the building footprint, driveway(s), patio(s), impervious deck(s), unroofed porch(es), uncovered parking lot (including top deck of parking structure), impervious trails, miscellaneous paving or structures, and off-lot impervious surface (new, contiguous impervious surface created from road projects, including sidewalks and/or bike lanes built as part of new street). Impervious surfaces do NOT include vegetated roofs or pervious pavement that stores and infiltrates rainfall at a rate equal to immediately surrounding, unpaved landscaped areas, or that stores and infiltrates the **C.3.d amount of runoff***.

³ "Replaced" means that the project will install impervious surface where existing impervious surface is removed.

⁴ "New" means the project will install impervious surface where there is currently no impervious surface.

⁵ Enter the total of the building's roof area. Impervious surfaces do NOT include appropriately-designed vegetated roofs.

*For definitions, see [Glossary \(Attachment 1\)](#).



RAINWATER HARVESTING AND USE FOR LANDSCAPE IRRIGATION FEASIBILITY ANALYSIS

5. Evaluate the Feasibility for Rainwater Harvesting and Use

- 5.1 Is the onsite Post-Project Landscaping Area (*refer to the number in Column 4 of Table 1 if evaluating for entire site area, or the number in Column 4 of Table 2 if evaluating for an individual roof area*) LESS than 2.5 times the size of the **Potential Rainwater Capture Area*** (*refer to the number in Section 4.3 if evaluating for entire site area, or the number in Section 4.6 if evaluating for an individual roof area*)? (Note: landscape area(s) have to be contiguous and within the same Drainage Management Area to use harvested rainwater for irrigation via gravity flow.)
- Yes – Harvesting and Use for landscape irrigation is infeasible. Continue to Section 5.2.
- No – Harvesting and Use for landscape irrigation might be feasible. Direct runoff from impervious areas to **self-retaining areas*** OR refer to Table 11 on page 33 and the curves in Appendix F of the [BASMAA Feasibility Criteria Report](#) to evaluate feasibility of harvesting and using the C.3.d amount of runoff for irrigation.

RAINWATER HARVESTING AND USE FOR TOILET FLUSHING OR NON-POTABLE INDUSTRIAL USES FEASIBILITY ANALYSIS

- 5.2 Depending on the type for project you are evaluating, complete the appropriate Subsection(s) below (5.2.a through 5.2.e) to determine if harvested rainwater can be used for toilet flushing or non-potable industrial uses:
- a. **Residential Projects:** Proposed number of dwelling units: _____
- Calculate the dwelling units per impervious acre by dividing the number of dwelling units by the acres of the **Potential Rainwater Capture Area*** in Item 4.4 (if evaluating the entire project area) or in Item 4.7 (if evaluating the roof area of a building).
- When evaluating the entire project area, enter the result here: _____
- When evaluating the roof area of a building, enter the result here: _____
- Is the number of dwelling units per impervious acre LESS than 120 (assumes 2.34 occupants/unit⁶)?
- Yes – Harvest and Use is infeasible. Continue to Section 6.
- No – Harvest and Use might be feasible. Complete the [Rainwater Harvesting and Use Feasibility Worksheet](#).
- b. **Commercial/Industrial Projects:** Proposed interior floor area: _____ sq. ft.
- Calculate the proposed interior floor area (sq. ft.) per acre of impervious surface by dividing the interior floor area (sq. ft.) by the acres of the **Potential Rainwater Capture Area*** in Item 4.4 (if evaluating the entire project area) or in Item 4.7 (if evaluating the roof area of a building).
- When evaluating the entire project area, enter the result here: _____
- When evaluating the roof area of a building, enter the result here: _____
- Does square footage of the interior floor space per impervious acre equal LESS than 70,000?
- Yes – Harvest and Use is infeasible. Continue to Section 6.
- No – Harvest and Use might be feasible. Complete the [Rainwater Harvesting and Use Feasibility Worksheet](#).
- c. **School Projects:** Proposed interior floor area: _____ sq. ft.
- Calculate the proposed interior floor area per acre of impervious surface by dividing the interior floor area (sq. ft.) by the acres of the **Potential Rainwater Capture Area*** in Item 4.4 (if evaluating the entire project area) or in Item 4.7 (if evaluating the roof area of a building).
- When evaluating the entire project area, enter the result here: _____
- When evaluating the roof area of a building, enter the result here: _____
- Does square footage of the interior floor space per impervious acre equal LESS than 21,000?
- Yes – Harvest and Use is infeasible. Continue to Section 6.
- No – Harvest and Use might be feasible. Complete the [Rainwater Harvesting and Use Feasibility Worksheet](#).

⁶ Source: U.S. Census Bureau, 2006-2010 American Community Survey.

*For definitions, see [Glossary \(Attachment 1\)](#).



d. Mixed Commercial and Residential Use Projects:

- Evaluate the residential toilet flushing demand based on the dwelling units per impervious acre for the residential portion of the project, following the instructions in Item 5.2.a, except you will use a prorated acreage of impervious surface, based on the percentage of the project dedicated to residential use.
- Evaluate the commercial toilet flushing demand per impervious acre for the commercial portion of the project, following the instructions in Item 5.2.b, except you will use a prorated acreage of impervious surface, based on the percentage of the project dedicated to commercial use.

e. Industrial Projects: Estimated non-potable water demand (gallons/day): _____

Is the non-potable demand LESS than 2,400 gallons/day per acre of the Potential Rainwater Capture Area?

- Yes – Harvest and Use is infeasible. Continue to Section 6.
- No – Harvest and Use might be feasible. Refer to the curves in Appendix F of the [BASMAA Feasibility Criteria Report](#) to evaluate feasibility of harvesting and using the C.3.d amount of runoff for industrial use.

BIOTREATMENT DETERMINATION

6. Complete Sections 6.1 through 6.4 below to determine if Biotreatment facilities can be used to comply with C.3 treatment requirements

6.1 Were all the “Yes” boxes in Section 2: Feasibility for Infiltration checked?

- Yes – Continue to Section 6.2.
- No – Complete the [Infiltration Feasibility Worksheet](#).

6.2 Were all the “Yes” boxes in Section 3: Recycled Water Use checked?

- Yes – Continue to Section 7.
- No – Complete to Section 6.3.

6.3 Were all the “Yes” boxes in Section 5: Feasibility for Rainwater Harvesting and Use checked?

- Yes – Continue to Section 6.4.
- No – Complete the [Rainwater Harvesting and Use Feasibility Worksheet](#).

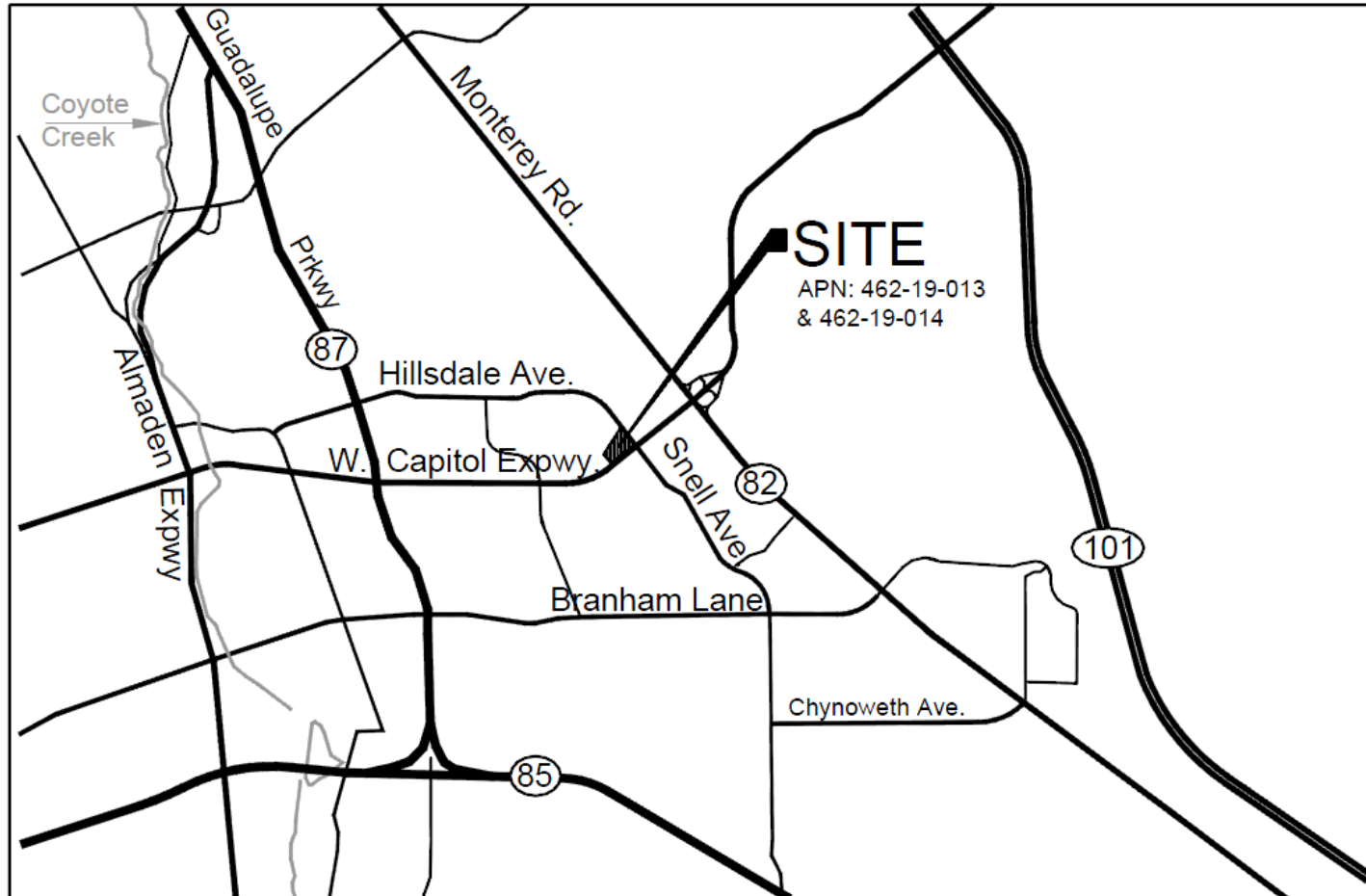
6.4 If only “Yes” boxes were checked for questions 6.1 through 6.3 above, then the applicant may use appropriately designed **biotreatment facilities** for compliance with C.3 treatment requirements. The applicant is encouraged to maximize infiltration of stormwater as site conditions allow.

SUMMARY RESULTS OF THE ENTIRE SCREENING WORKSHEET ANALYSIS

7. Based on this screening worksheet, the following steps will be taken (check all that apply)

- Infiltration and/or Harvest and Use are infeasible. Appropriately-designed biotreatment measures will be used to comply with C.3 treatment requirements.
- Infiltration might be feasible. Applicant will conduct further analysis of infiltration feasibility by completing the Infiltration Feasibility Worksheet.
- Harvest and Use might be feasible. Applicant will conduct further analysis of rainwater harvesting and use by (check one):
- Completing the Rainwater Harvesting and Use Feasibility Worksheet for:
 - The entire project area.
 - Individual building(s) with a roof area(s) of 10,000 sq. ft. or more, if applicable, describe: _____
 - Evaluating the feasibility of harvesting and using the C.3.d amount of runoff for irrigation, based on Table 11 (on page 33) and the curves in Appendix F of the BASMAA LID Feasibility Criteria Report.
 - Evaluating the feasibility of harvesting and using the C.3.d amount of runoff for non-potable industrial use, based on the curves in Appendix F of the BASMAA LID Feasibility Criteria Report.

*For definitions, see [Glossary \(Attachment 1\)](#).



Vicinity Map

No Scale

FIGURE 1. VICINITY MAP



BUILDING CODE ANALYSIS

APPLICABLE REGULATIONS... BUILDING CODE: 2018 CALIFORNIA... ELECTRICAL CODE: 2018 CALIFORNIA... FIRE CODE: 2018 CALIFORNIA...

CONSTRUCTION NOTES:

- PROPOSED CURB SIDEWALK... PROPOSED COERCIVE CURB... PROPOSED TRANSITION CONCRETE CURB... PROPOSED COERCIVE CURB...

- REMOVE OR REPAIR... PROPOSED ROLLING GATE... PROPOSED PORTABLE TOILET... PROPOSED PORTABLE TOILET...

- PROPOSED LOW VOLT... PROPOSED SIGNAGE... PROPOSED SIGNAGE... PROPOSED SIGNAGE...

PARKING STALL NOTES:

- ADAPTIVE VEHICLE STALL... STALL WITH VEHICLE... STALL WITH VEHICLE... STALL WITH VEHICLE...

BUILDING AREA

Table with 2 columns: Description, Value. Includes ON LOT, 1st FLOOR STORAGE, 2nd FLOOR STORAGE, 4TH FLOOR STORAGE, 4TH FLOOR STORAGE, SUBTOTAL, TOTAL.

GENERAL NOTES:

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF SAN JOSE... PROPOSED CURB SIDEWALK... PROPOSED TRANSITION CONCRETE CURB...

LEGEND:



PROJECT INFORMATION

Table with 2 columns: Field Name, Value. Includes PROJECT ADDRESS, SITE AREA, CITY AREA PORTAL, ZONE, GENERAL NAME, USE, F.A.R. MAX, F.A.R. PROPOSED, COVERAGE PROPOSED, FOOTPRINT, BUILDING SETBACKS REQUIRED, FRONT SETBACK, SIDE SETBACK, REAR SETBACK, PARKING SETBACKS REQUIRED, PARKING SETBACKS PROVIDED, PARKING SETBACKS REQUIRED, SIDE SETBACK, REAR SETBACK, MAXIMUM HEIGHT, PROPOSED HEIGHT, LANDSCAPE COVER, PARKING & LOADING.

BUILDING AREA

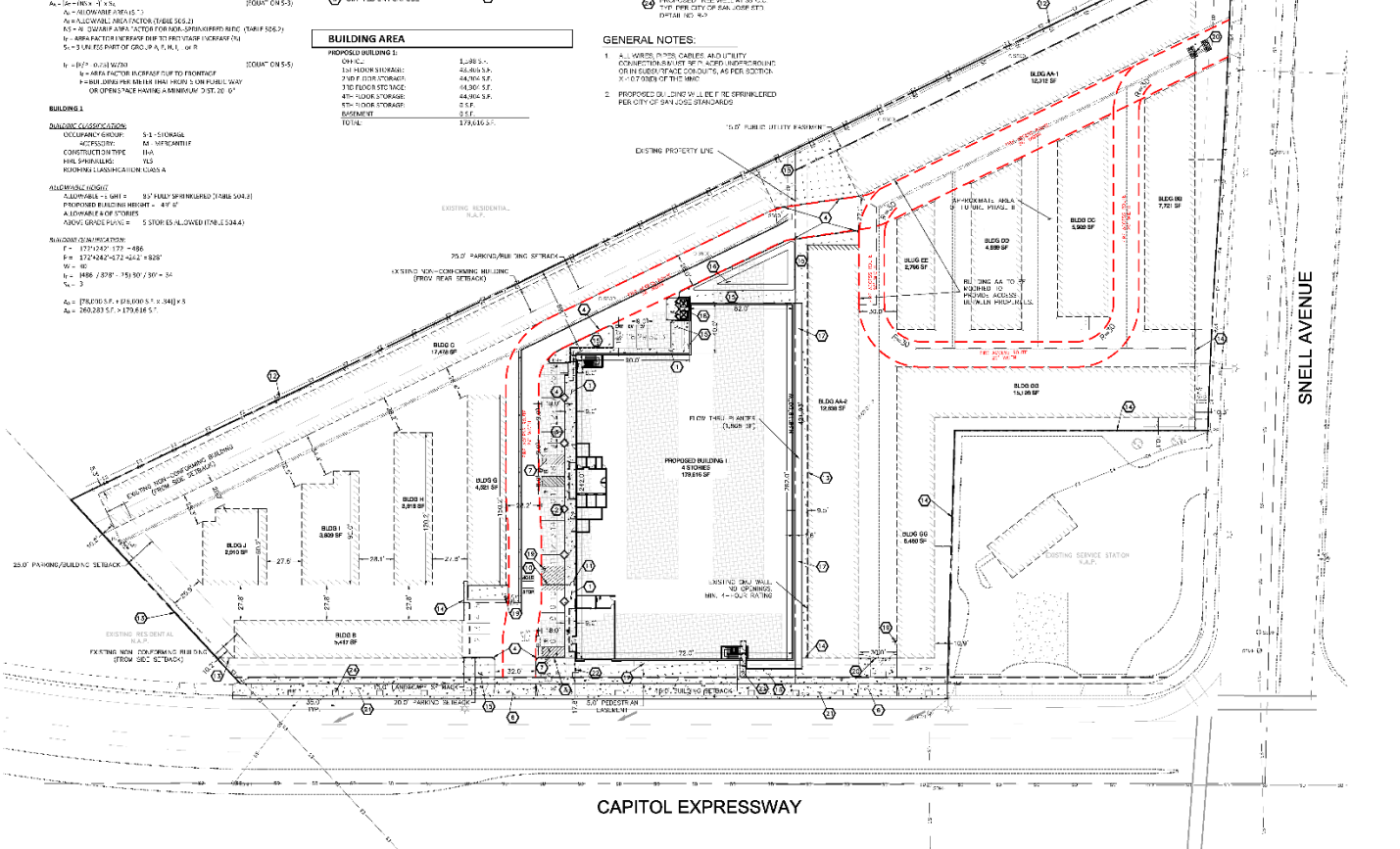
Table with 2 columns: Description, Value. Includes PROPOSED BUILD, SET FLOOR STORAGE, SET FLOOR STORAGE, 2ND FLOOR STORAGE, 4TH FLOOR STORAGE, 4TH FLOOR STORAGE, SUBTOTAL.

Table with 2 columns: Description, Value. Includes KPI RATIO, R.F.C.P., D.D.C., D.D.C., D.D.C., D.D.C., D.D.C. 1, R.N.O.A.R., R.D.C., D.D.C., R.D.C., R.D.C., SUBTOTAL.

Table with 2 columns: Description, Value. Includes NET AREA, BUILDING, TOTAL, SETBACKS, BUILDING AREA EXCLUDED IN PHASE.

PARKING ANALYSIS

Table with 2 columns: Description, Value. Includes PARTIAL PARKING, PROPOSED FOR NEW BUILDING, PROPOSED, SLOTTING, CONVP, ADA, NETIC PARKING, PROPOSED FOR NEW BUILDING, PROPOSED, NETIC PARKING, PROPOSED FOR NEW BUILDING, PROPOSED.



Public Storage

231 W CAPITOL EXPY CONCEPTUAL SITE PLAN SAN JOSE, CA 95136 01.22.18 PROJECT FILE NO. H18-048

SHEET 2 LARS ANDERSEN & ASSOCIATES, INC. CIVIL ENGINEERS • LAND SURVEYORS • PLANNERS KSP architecture + engineering 200 BRIDGEMAN ROAD, SUITE 200 LAKE FOREST, CA 92630

FIGURE 2. SITE PLAN



LEGEND:

- DWA AREA - PERVIOUS (SPRINGALLED)
- DWA AREA - LANDSCAPE/STREET (SPRINGALLED)
- L3 BMP AREA (GRASS-THROUGHT PLANTING)
- L3 BMP AREA (BIOTREATMENT PLANTING)
- PROPOSED PERVIOUS PAVEMENT
- DWA AREA
- 1.5" MIN
- LIMITS OF IMPROVEMENTS BY AREA
- ORNDOWN RELEASE TANK

POST-CONSTRUCTION URBAN RUNOFF MANAGEMENT POLICY NO. 6-29

PROPOSED IMPROVED PAVEMENT AREA = 17,264 SF
 MINIMUM PERCENTAGE OF PERVIOUS PAVEMENT = 10%
 MINIMUM PERVIOUS PAVEMENT AREA REQUIRED = 1,726 SF
 PROPOSED IMPROVED ROOF AREA = 44,004 SF
 MINIMUM PERCENTAGE OF PERVIOUS PAVEMENT = 10%
 MINIMUM PERVIOUS PAVEMENT AREA REQUIRED = 4,400 SF

PROJECT SITE INFORMATION:

- SOLA TYPE: **SILTY CLAY**
- GROUND WATER DEPTH: **2.1 FT**
- NAME OF RECEIVING BODY: **QUADALUPE RIVER**
- FLOOD ZONE: **ZONE D**
- FLOOD ELEVATION (IF APPLICABLE):

- STORMWATER CONSTRUCTION NOTES:**
- EXISTING & PROPOSED DRAINAGE
 - PROPOSED TRAP AND DEBRIS
 - INSTALL 2' VERTICAL CURB TO RAISE IN
 - PROPOSED 2' VERTICAL CURB TO RAISE IN
 - PROPOSED COVERED TRASH ENCLOSURE
 - PROPOSED COVERED TRASH ENCLOSURE
 - PROPOSED 2' VERTICAL CURB

- SITE NOTES:**
- GROUNDWATER AT 21 FT BELOW EXISTING GROUND SURFACE
 - SOILS IN FLOOD ZONE WILL ALLOW FOR FLOODING FROM THE FLOODPLAIN
 - FLOOD ZONE 3 - 100-YEAR FLOOD ELEVATION (BASED ON FEMA 1981) IS 10.0 FT
 - SOILS WITHIN SUBWATERSHED LOSS THROUGH IMPERVIOUS
 - SITE IS ADJACENT TO QUADALUPE WATERSHED
- SOURCE CONTROL MEASURES:**
- CONNECT THE FOLLOWING FEATURES TO SANITARY SEWER:
 - COVERED TRASH / ESCROW NO. TWO DUMPS
 - MAINTAINING PAVEMENT SWEEPING, CATCH BASIN CLEANING, GOOD HOUSEKEEPING.
 - STORM DRAIN LABELING.

PERVIOUS PAVEMENT REQUIREMENTS

CONCRETE OR ASPHALT PAVING SHALL:

- BE PERVIOUS TO WATER AND AIR
- BE MANUFACTURED FROM A PERVIOUS MANUFACTURER THAT THE MANUFACTURER HAS BEEN CERTIFIED BY THE CALIFORNIA PERVIOUS PAVEMENT ASSOCIATION (CPPA) TO BE PERVIOUS TO WATER AND AIR
- ONLY CONTRACTORS INCLUDING CERTIFICATION OF COMPLIANCE WITH THE PERVIOUS PAVEMENT ASSOCIATION (CPPA) SHALL BE ALLOWED TO BID FOR THIS PROJECT
- TECHNICAL COURSE SHALL BE USED TO INSTALL THE PAVEMENT AND AT LEAST ONE PERSON MUST BE CERTIFIED TO INSTALL THE PAVEMENT AT ALL TIMES
- EXCESSIVE COMPACTING SHALL BE AVOIDED TO PREVENT DAMAGE TO THE PERVIOUS PAVEMENT

STANDARD STORMWATER CONTROL NOTES:

- STANDARD CATCH BASIN SHALL NOT REMAIN IN THE TREATMENT BASIN UNLESS THE TREATMENT BASIN IS FULLY OPERATIONAL
- CONTRACTOR SHALL PROVIDE A LETTER TO THE CITY ENGINEER AT THE TIME OF SUBMITTAL
- CONTRACTOR SHALL PROVIDE A LETTER TO THE CITY ENGINEER AT THE TIME OF SUBMITTAL
- CONTRACTOR SHALL PROVIDE A LETTER TO THE CITY ENGINEER AT THE TIME OF SUBMITTAL

BIOTREATMENT SOIL REQUIREMENTS

- BIOTREATMENT SOIL SHALL MEET THE FOLLOWING REQUIREMENTS:
 - BE A MINIMUM OF 18" DEEP
 - BE A MINIMUM OF 18" DEEP
 - BE A MINIMUM OF 18" DEEP
- CONTRACTOR SHALL OBTAIN A COPY OF THE CITY HANDBOOK AT: [HTTP://WWW.SANJOSECA.GOV/INDEX.ASPX?NID=1761](http://www.sanjoseca.gov/index.aspx?nid=1761)
- CONTRACTOR SHALL OBTAIN A COPY OF THE CITY HANDBOOK AT: [HTTP://WWW.SANJOSECA.GOV/INDEX.ASPX?NID=1761](http://www.sanjoseca.gov/index.aspx?nid=1761)

COMPARISON OF IMPERVIOUS AND PERVIOUS SURFACES AT PROJECT SITE	Existing Surface		Proposed Surface		NET RESULT
	sq. ft	%	sq. ft	%	
1.1. IMPERVIOUS SURFACES					
Roof Area	31,322.00		31,322.00		
Parking	23,109.00		13,950.00		
Sidewalks, Patios, Driveways, etc.	363.00		2,652.00		
Public Streets					
Private Streets					
Imperious Surfaces Total	55,824.00		48,924.00		
1.2. PERVIOUS SURFACES					
Landscaped Areas	4,207.00		8,099.00		
PerVIOUS Pavement			375.00		
Green Roof and other PerVIOUS Surfaces			337,500.00		
PerVIOUS Surfaces Total	4,207.00		444,974.00		
1.3. Percentage of Site's ImperVIOUS Area Replacement	$(48,924 / 55,824) \times 100 = 87.64\%$				

OPERATION AND MAINTENANCE INFORMATION:

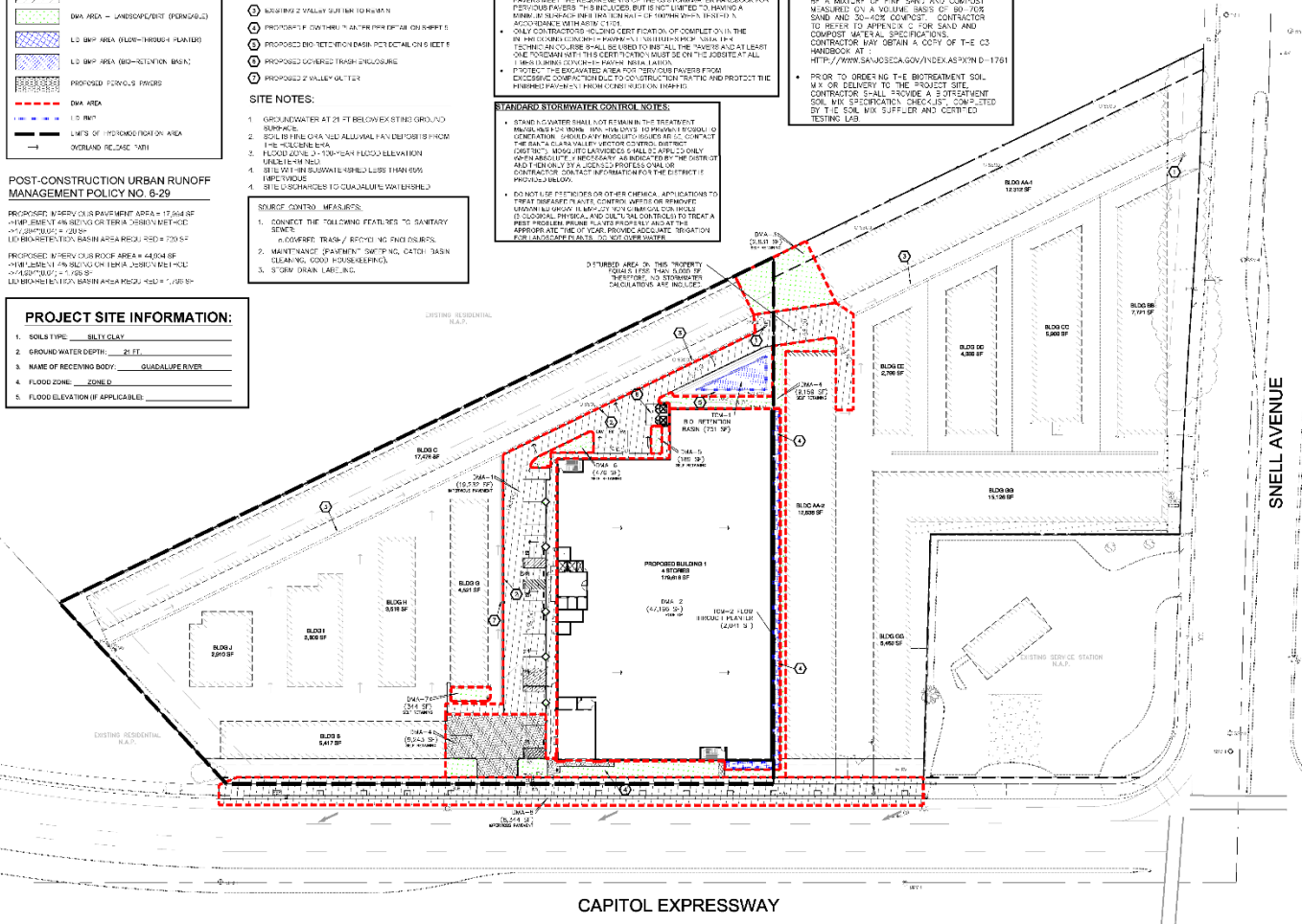
- PROPERTY INFORMATION:
 - PROPERTY ADDRESS: 231 W CAPITOL EXPY, SAN JOSE, CA 95136
 - PROPERTY OWNER: PUBLIC STORAGE, 700 WESTERN AVENUE, CLLENDALE, CA 91201
- RESPONSIBLE PARTY FOR MAINTENANCE:
 - CONTACT: MARK ANDERSON, DEVELOPMENT MANAGER
 - PHONE NUMBER OR CONTACT: (916) 244-2000, EXT. 2000
 - EMAIL: MANDERSON@PUBLICSTORAGE.COM
 - ADDRESS: 700 WESTERN AVENUE, CLLENDALE, CA 91201

BIOTREATMENT & FLOOD-TROUGH PLANTING NOTES:

- SET CURB TO 2" ABOVE FINISH GRADE TO PREVENT FLOODING
- PLANT 3' WIDE OF COMPOSTED, NON-DISINTEGRATING MULCH IN AREAS BETWEEN STORMWATER PLANTINGS
- SEE LANDSCAPE PLAN FOR MULCH, PLANT MATERIALS AND INSTALLATION REQUIREMENTS
- CURB CUTS SHALL BE A MINIMUM 18" WIDE AND SPACED AT A MAXIMUM 10' O.C. (INTERVALS AND SPACING TO BE DETERMINED BY THE DESIGNER) AND SHALL BE PLACED IN THE OPEN TOP OF CURB CUTS. SEE LANDSCAPE PLAN FOR MORE DETAIL ON LOCATIONS OF CURB CUTS.
- A MINIMUM 0.2" DRAIN BELOW 18" WIDE WATER BY THE SIDE (OR 0.1" BELOW 18" WIDE CURB, ETC.) AND ADJACENT LANDSCAPED FINISH GRADE.
- DO NOT COMPACT NATIVE SOIL / SUBGRADE AT BOTTOM OF BASIN. LOOSEN SOIL TO 12" DEPTH.

SITE DESIGN MEASURES:

- PROTECT EXISTING TREES, VEGETATION, AND SOIL
- PREPARE GRD. SPACE AND NATURAL DRAINAGE PATTERNING
- PLANT AND MAINTAIN PERVIOUS SURFACES
- CREATE NEW PERVIOUS AREAS
- LANDSCAPE
- MAINTAIN AND PATROL
- MAINTAIN AND PATROL (IF ANY) A BARRIAGE AREA AND ADJACENT TO OTHER IMPERVIOUS AREAS
- PREVENT
- ON TOP OF OR UNDER BUILDINGS
- NOT PROPERLY IN EXCESS OF 200'



Public Storage

231 W CAPITOL EXPY
 SAN JOSE, CA 95136

STORMWATER CONTROL PLAN
 01.22.18
 PROJECT FILE NO. H18-048

SHEET 4

LARS ANDERSEN & ASSOCIATES, INC.
 CIVIL ENGINEERS - LAND SURVEYORS - PLANNERS
 23 ORCHARD ROAD, SUITE 200
 LAKEFOREST, CA 92033
 TEL: 949.260.2000 FAX: 949.260.2777
WWW.LARSANDERSEN.COM

KSP
 STUDIO
 architecture + engineering
 23 ORCHARD ROAD, SUITE 200
 LAKEFOREST, CA 92033
 TEL: 949.260.2000 FAX: 949.260.2777

FIGURE 3. STORM WATER CONTROL PLAN



SIMPLIFIED SIZING METHOD CALCULATIONS

Lars Andersen Associates, Inc.

**Public Storage
231 W Capitol Expy**

Date: 10-11-2018

Simplified Sizing Method (4 Percent Rule) -flow based sizing method

Equations:

$BMP\ Surface\ Area = (RI) \times (Aimp) / (Inf)$

RI = Runoff Inflow= Intensity = 0.2 inches/hour

Inf = Infiltration rate = 5 inches/hour

Aimp= Impervious Area

BMP-1: BIORETENTION

D-1=Aimp= 17,994 Square Feet

BMP 1 Surface Area = 720 Square Feet

BMP 1 Surface Area Provided

Label	Surface Area	
TCM-1	751	Square Feet
Total	751	Square Feet

BMP-2: FLOW THRU PLANTER

D-1=Aimp= 44,904 Square Feet

BMP 1 Surface Area = 1796 Square Feet

BMP 2 Surface Area Provided

Label	Surface Area	
TCM-2	1953	Square Feet
Total	1953	Square Feet



APPENDIX A**SCVURPPP HANDBOOK CHAPTER 5 GENERAL TECHNICAL GUIDANCE FOR TREATMENT MEASURES –
SIMPLIFIED SIZING METHOD****Simplified Sizing Method**

A simplified sizing method for bioinfiltration and biotreatment measures is often used to help evaluate, during the planning phase, whether sufficient land has been allocated for stormwater treatment. This method can also be used for final design, although it may result in conservatively large stormwater treatment measures.

A biotreatment measure (e.g., bioretention area or flow-through planter) can be sized by assuming a surface area equal to 4 percent of the contributing impervious area. This is a flow-based sizing method, assuming a runoff inflow of 0.2 inches per hour (equal to the rainfall intensity), with an infiltration rate of 5 inches per hour ($0.2 \text{ in/hr} \div 5 \text{ in/hr} = 0.04$). This 4 percent “rule of thumb” does not take into consideration the volume of water that is temporarily detained in the surface ponding area; however, it is a useful, conservative method for planning purposes.



APPENDIX B
SOURCE CONTROL CHECKLIST

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p align="center">Potential Sources of Runoff Pollutants</p>	<p align="center">2</p> <p align="center">Permanent Controls—Shown on WQMP Drawings</p>	<p align="center">3</p> <p align="center">Permanent Controls—Listed in WQMP Table and Narrative</p>	<p align="center">4</p> <p align="center">Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input checked="" type="checkbox"/> A. On-site storm drain inlets</p>	<p><input checked="" type="checkbox"/> Locations of inlets.</p>	<p><input checked="" type="checkbox"/> Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.</p>	<p><input checked="" type="checkbox"/> Maintain and periodically repaint or replace inlet markings.</p> <p><input type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators.</p> <p><input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmhandbooks.com</p>
<p><input type="checkbox"/> B. Interior floor drains and elevator shaft sump pumps</p>	<p><input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.</p>	<p><input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.</p>	<p><input type="checkbox"/> Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."</p> <p><input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.</p>
<p><input type="checkbox"/> C. Interior parking garages</p>	<p><input type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.</p>	<p><input type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.</p>	<p><input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.</p>

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p style="text-align: center;">1</p> <p style="text-align: center;">Potential Sources of Runoff Pollutants</p>	<p style="text-align: center;">2</p> <p style="text-align: center;">Permanent Controls—Shown on WQMP Drawings</p>	<p style="text-align: center;">3</p> <p style="text-align: center;">Permanent Controls—Listed in WQMP Table and Narrative</p>	<p style="text-align: center;">4</p> <p style="text-align: center;">Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input type="checkbox"/> D1. Need for future indoor & structural pest</p> <p><input checked="" type="checkbox"/> D2. Landscape/ Outdoor Pesticide Use</p>	<p><input type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.</p> <p><input checked="" type="checkbox"/> Show self-retaining landscape areas, if any.</p> <p><input type="checkbox"/> Show stormwater treatment and hydrograph modification management SIVIPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)</p>	<p><input type="checkbox"/> Note building <i>design</i> features that discourage entry of pests.</p> <p>State that final landscape plans will accomplish all of the following.</p> <p><input type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.</p> <p><input checked="" type="checkbox"/> D e s i g n landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.</p> <p><input checked="" type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.</p> <p><input checked="" type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape.</p> <p><input type="checkbox"/> To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.</p>	<p><input type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.</p> <p><input checked="" type="checkbox"/> Maintain landscaping using minimum or no pesticides.</p> <p><input type="checkbox"/> See applicable operational BMPs in "What you should know for....Landscape and Gardening" at http://rcflood.org/stormwater/Error! Hyperlink reference not valid.</p> <p><input type="checkbox"/> Provide IPM information to new owners, lessees and operators.</p>

STORM WATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

1	2	3	4
Potential Sources of Runoff Pollutants	Permanent Controls—Shown on WQMP Drawings	Permanent Controls—Listed in WQMP Table and Narrative	Operational BMPs—Included in WQMP Table and Narrative
<input type="checkbox"/> E. Pools, spas, ponds, decorative fountains, and other water features.	<input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	<input type="checkbox"/> if the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	<input type="checkbox"/> See applicable operational BMP's in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
<input type="checkbox"/> F. Food service	<input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. <input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	<input type="checkbox"/> Describe the location and features of the designated cleaning area. <input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	<input type="checkbox"/> See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ . Provide this brochure to new site owners, lessees, and operators.
<input checked="" type="checkbox"/> G. Refuse areas	<input checked="" type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. <input checked="" type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent runoff and show locations of berms to prevent runoff from the area. <input type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	<input type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans. <input checked="" type="checkbox"/> State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	<input checked="" type="checkbox"/> State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p>Potential Sources of Runoff Pollutants</p> <p><input type="checkbox"/> H. Industrial processes.</p>		<p align="center">2</p> <p>Permanent Controls—Shown on WQMP Drawings</p> <p><input type="checkbox"/> Show process area.</p>	<p align="center">3</p> <p>Permanent Controls—Listed in WQMP Table and Narrative</p> <p><input type="checkbox"/> If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."</p>	<p align="center">4</p> <p>Operational BMPs—Included in WQMP Table and Narrative</p> <p><input type="checkbox"/> See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmpbhandbooks.com</p> <p>See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/</p>

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p>1 Potential Sources of Runoff Pollutants</p> <p><input type="checkbox"/> I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)</p>	<p align="center">2 Permanent Controls—Show on WQMP Drawings</p> <p><input type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent runoff or run-off from area.</p> <p><input type="checkbox"/> Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.</p> <p><input type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.</p>	<p align="center">3 Permanent Controls—List in WQMP Table and Narrative</p> <p>Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.</p> <p>Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:</p> <ul style="list-style-type: none"> ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 ▪ Section 103(b) & (c) 1991 ▪ Underground Storage Tank <p>www.cchealth.org/groups/hazmat</p>	<p align="center">4 Operational BMPs—Include in WQMP Table and Narrative</p> <p><input type="checkbox"/> See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbook at www.cabmphandbooks.com</p>
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STORM WATER POLLUTANT SOURCES / SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p align="center">Potential Sources of Runoff Pollutants</p>	<p align="center">2</p> <p align="center">Permanent Controls—Shown on WQMP Drawings</p>	<p align="center">3</p> <p align="center">Permanent Controls—Listed in WQMP Table and Narrative</p>	<p align="center">4</p> <p align="center">Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input type="checkbox"/> J. Vehicle and Equipment Cleaning</p>	<p><input type="checkbox"/> Show on drawings as appropriate:</p> <p>(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.</p> <p>(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).</p> <p>(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.</p> <p>(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.</p>	<p><input type="checkbox"/> If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.</p>	<p>Describe operational measures to implement the following (if applicable):</p> <p><input type="checkbox"/> Wastewater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://reflood.org/stormwater/</p> <p><input type="checkbox"/> Car dealerships and similar may rinse cars with water only.</p>

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p>Potential Sources of Runoff Pollutants</p> <p><input type="checkbox"/> K. Vehicle/Equipment Repair and Maintenance</p>	<p align="center">2</p> <p>Permanent Controls—Shown on WQMP Drawings</p> <p><input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.</p> <p><input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.</p> <p><input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.</p>	<p align="center">3</p> <p>Permanent Controls—Listed in WQMP Table and Narrative</p> <p><input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.</p> <p><input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.</p> <p><input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.</p>	<p align="center">4</p> <p>Operational BMPs—Included in WQMP Table and Narrative</p> <p>In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:</p> <p><input type="checkbox"/> No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.</p> <p><input type="checkbox"/> No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.</p> <p><input type="checkbox"/> No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.</p> <p>Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/. Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/.</p>
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STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p align="center">Potential Sources of Runoff Pollutants</p>	<p align="center">2</p> <p align="center">Permanent Controls—Shown on WQMP Drawings</p>	<p align="center">3</p> <p align="center">Permanent Controls—Listed in WQMP Table and Narrative</p>	<p align="center">4</p> <p align="center">Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input type="checkbox"/> L. Fuel Dispensing Areas</p>	<p><input type="checkbox"/> Fueling areas⁶ shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.</p> <p><input type="checkbox"/> Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area.] The canopy for cover] shall not drain onto the fueling area.</p>		<p><input type="checkbox"/> The property owner shall dry sweep the fueling area routinely.</p> <p><input type="checkbox"/> See the Fact Sheet SD-30, "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabrophandbooks.com</p>

⁶ The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p>Potential Sources of Runoff Pollutants</p>	<p align="center">2</p> <p>Permanent Controls—Shown on WQMP Drawings</p>	<p align="center">3</p> <p>Permanent Controls—Listed in WQMP Table and Narrative</p>	<p align="center">4</p> <p>Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input type="checkbox"/> M. Loading Docks</p>	<p><input type="checkbox"/> Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.</p> <p><input type="checkbox"/> Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.</p> <p><input type="checkbox"/> Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.</p>		<p><input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible.</p> <p><input type="checkbox"/> See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmp.com/handbooks.com</p>

STORM WATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p align="center">Potential Sources of Runoff Pollutants</p>	<p align="center">2</p> <p align="center">Permanent Controls—Show on WQMP Drawings</p>	<p align="center">3</p> <p align="center">Permanent Controls—Listed in WQMP Table and Narrative</p>	<p align="center">4</p> <p align="center">Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input checked="" type="checkbox"/> N. Fire Sprinkler Test Water</p>		<p><input checked="" type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.</p>	<p><input checked="" type="checkbox"/> See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com</p>
<p>O. Miscellaneous Drain or Wash Water or Other Sources</p> <ul style="list-style-type: none"> <input type="checkbox"/> Boiler drain lines <input checked="" type="checkbox"/> Condensate drain lines <input checked="" type="checkbox"/> Rooftop equipment <input type="checkbox"/> Drainage sumps <input checked="" type="checkbox"/> Roofing, gutters, and trim• <input type="checkbox"/> Other sources 		<p><input type="checkbox"/> Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.</p> <p><input checked="" type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.</p> <p><input checked="" type="checkbox"/> Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.</p> <p><input type="checkbox"/> Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.</p> <p><input type="checkbox"/> Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.</p>	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

<p align="center">1</p> <p align="center">Potential Sources of Runoff Pollutants</p>	<p align="center">2</p> <p align="center">Permanent Controls—Shown on WQMP Drawings</p>	<p align="center">3</p> <p align="center">Permanent Controls Listed in WQMP Table and Narrative</p>	<p align="center">4</p> <p align="center">Operational BMPs—Included in WQMP Table and Narrative</p>
<p><input checked="" type="checkbox"/> P. Plazas, sidewalks, and parking lots.</p>			<p><input checked="" type="checkbox"/> Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.</p>



APPENDIX C
LID BMP FACT SHEETS

6.1 Bioretention Area



Figure 6-1: Bioretention area in office building parking lot in San José. Source: City of San José.

Best uses

- Any type of development
- Any size drainage area
- Landscape design element

Advantages

- Landscape feature of any shape that works with a variety of plants
- Low maintenance
- Reliable once established

Limitations

- Geotechnical conditions must be suitable if runoff is infiltrated
- May require irrigation
- Susceptible to clogging – especially if installed prior to construction site soil stabilization.

Bioretention areas, or “rain gardens,” function as soil and plant-based filtration measures that remove pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a ponding area, a mulch layer, plants, and biotreatment soil mix, underlain by drain rock and an underdrain (if required). Bioretention areas are designed to distribute stormwater runoff evenly across the surface ponding area. Water stored in the ponding area percolates through the biotreatment soil mix to the drain rock layer and then either infiltrates into native soil or flows out through the underdrain to the storm drain system.

Bioretention areas can be any shape, including linear. Bioretention areas with underdrains should be designed to maximize infiltration to native soils by placing the underdrain near the top of the drain rock layer unless infiltration is not permitted due to site conditions (e.g., high groundwater table, steep slopes, proximity to structures, presence of contaminated soil or groundwater, etc.). Bioretention areas without underdrains are sometimes referred to as “bioinfiltration” measures. All bioretention areas should include an overflow/bypass system to convey runoff volumes that are greater than the water quality design volume.

Design and Sizing Guidelines

DRAINAGE AREA AND SETBACK REQUIREMENTS

- The area draining to the bioretention area is limited by available surface area for the unit, and maintenance considerations. Multiple units can be installed to serve any size area.
- The drainage area should not contain a significant source of sediment, such as unstabilized and unvegetated areas.
- The bioretention area should be set back from structures at least 10 feet or as required by the structural or geotechnical engineer or local jurisdiction, unless it has a waterproof lining.
- If the bioretention area is designed to infiltrate stormwater to underlying soils and the site includes a septic system leach field, a 100-foot setback is required from the leach field.

TREATMENT MEASURE DIMENSIONS AND SIZING

- The bioretention area may be sized to be 4% of the impervious surface area on the project site. The area of tributary impervious surface multiplied by the 0.04 sizing factor will equal the required surface area of the bioretention area. This sizing factor is derived from the flow-based treatment standard (runoff from 0.2 in/hr intensity rainfall) and a desired surface loading rate of 5 in/hr through the biotreatment soil mix. Alternatively, bioretention sizing may be calculated using a volume-based sizing method or a combination flow- and volume-based sizing method described in Section 5.1 of the C.3 Handbook.
- The surface of the bioretention area should be primarily flat, but elevations may vary as needed to distribute stormwater flows throughout the surface area. Edges may slope up to meet surrounding grade. Side slopes should not exceed 3:1.
- Bioretention areas, including linear treatment measures, should not be constructed on slopes greater than 4%, unless constructed as a series of relatively horizontal bioretention cells. Separate bioretention cells by check dams up to 24 inches high and at least 25 feet apart. The slope within cells should not exceed 2%. Bioretention cells are not recommended if overall slope exceeds 8%.
- Surface ponding depths may vary, with a recommended 6-inch depth, and a maximum 12-inch depth if allowed by the municipality. If ponding depths exceed 6 inches, the landscape architect should approve the planting palette for desired depth.
- The inlet to the overflow pipe or catch basin should be at least 6 inches above the low point of the bioretention planting area and at least 2 inches above the high point of the bioretention area (i.e., the top of planting mounds). Additional freeboard requirements may apply to protect nearby structures from flooding; check with the local jurisdiction.

INLETS TO TREATMENT MEASURE

Flow may enter the treatment measure in the following way(s):

- As overland flow from landscaping (no special requirements)
- As overland flow from pavement (cutoff wall required)
- Through a curb opening (minimum 18 inches)
- Through a curb drain
- With drop structure through a stepped manhole
- Through a pop-up or bubble-up emitter
- Through roof leader or other conveyance from building roof
- Where flows enter the bioretention area, allow a change in elevation of 4 to 6 inches between the paved surface and biotreatment soil elevation, so that vegetation or mulch build-up does not obstruct flow.
- Install cobbles or rocks, underlain by geotextile fabric, to dissipate flow energy and avoid erosion at the point where runoff enters the bioretention area.

See Section 5.2 of the SCVURPPP C.3 Handbook for example inlets and additional guidance.

UNDERDRAIN AND OVERFLOW STRUCTURES

- An underdrain system is generally required for installations in slow-draining native soils. If the water quality design volume will infiltrate into native soils in 72 hours or less, based on local percolation tests, and the local jurisdiction allows, then no underdrain is required.
- The underdrain should consist of a minimum 4-inch diameter perforated pipe with cleanouts and connection to a storm drain or discharge point. To help prevent clogging, two rows of perforation may be used.
- The underdrain trench should include a minimum 12-inch thick layer of drain rock, such as Caltrans Standard Section 68-1.025 Class 2 permeable material or equivalent. At least two inches of drain rock should cover the underdrain. The underdrain should be placed with perforations facing downward, at a minimum 0.5% slope to the storm drain or

discharge point (unless a flatter slope is allowed by the municipality based on site-specific conditions).

- To avoid clogging, filter fabric should not be used in or around the underdrain or between the biotreatment soil mix and the drain rock. If desired, a 2-inch pea gravel layer may be used between the biotreatment soil mix and the drain rock.
- If there is 10 feet or more separation between the base of the bioretention facility and the groundwater table and infiltration is permitted on site, the underdrain should be installed at least 6 inches above the base of the trench to maximize infiltration into native soils.
- If there is less than 10 feet separation to the groundwater table, or infiltration is not permitted due to site-specific conditions, the facility should be lined with a waterproof fabric and the underdrain should be placed just above the waterproof fabric (see Figure 6-6).
- A cleanout for the underdrain should be provided, consisting of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 4 inches and a watertight cap fit flush with the biotreatment soil surface.
- The design should include an overflow or bypass system, with the overflow inlet elevation set to achieve the design ponding depth, to convey the runoff volume that exceeds the water quality design volume.

PLANTING SOIL REQUIREMENTS

- Soil used in the bioretention area should meet the biotreatment soil mix specifications included in Appendix C of this Handbook. A minimum infiltration rate of 5 inches per hour and a maximum infiltration rate of 10 inches/hour are required (initial infiltration rate may exceed this to allow for tendency of infiltration rate to reduce over time).
- Bioretention areas should have a minimum biotreatment soil mix depth of 18 inches.

VEGETATION

- Plant species selected should be suitable for the location of the bioretention area, biotreatment soils and occasional inundation. A variety of plants, including ground cover, shrubs and small trees, helps maintain a healthy soil environment and pollutant removal capabilities. See planting guidance in Appendix D.
- Plants within the bioretention area need to be spaced closely enough to ensure substantial plant coverage to prevent scour, keep mulch in place and provide pleasing aesthetics. The local jurisdiction may have landscaping guidelines that specify plant spacing.
- Trees may be planted in the bioretention area as allowed by the municipality (see Appendix D for recommended tree species). If larger trees are selected, plant them at the periphery of bioretention area. No trees should be planted within 20 feet of an overflow inlet. Biotreatment soil mix depth may need to be increased to accommodate tree root systems.
- Install and maintain a 2-inch layer of composted mulch in areas between plantings. Rock and cobble or large bark mulches that resist floating may also be used. "Micro-bark" and "gorilla hair" mulches are not recommended.
- The underdrain trench should be offset from the edge of tree planting zone, as needed, to maximize distance between tree roots and the underdrain. The underdrain should be solid pipe for a distance 10 feet upstream and downstream of any tree.
- Drought tolerant plants are preferred, and may be required by the local municipality. Provide sufficient irrigation for the initial establishment period as well as long term maintenance of plant life.
- Use integrated pest management (IPM) principles in the landscape design to help avoid the need for synthetic pesticides and quick-release fertilizer. Check with the local jurisdiction regarding local IPM policies.

- Trees and vegetation should not block inflow, create traffic or safety issues, or obstruct utilities.

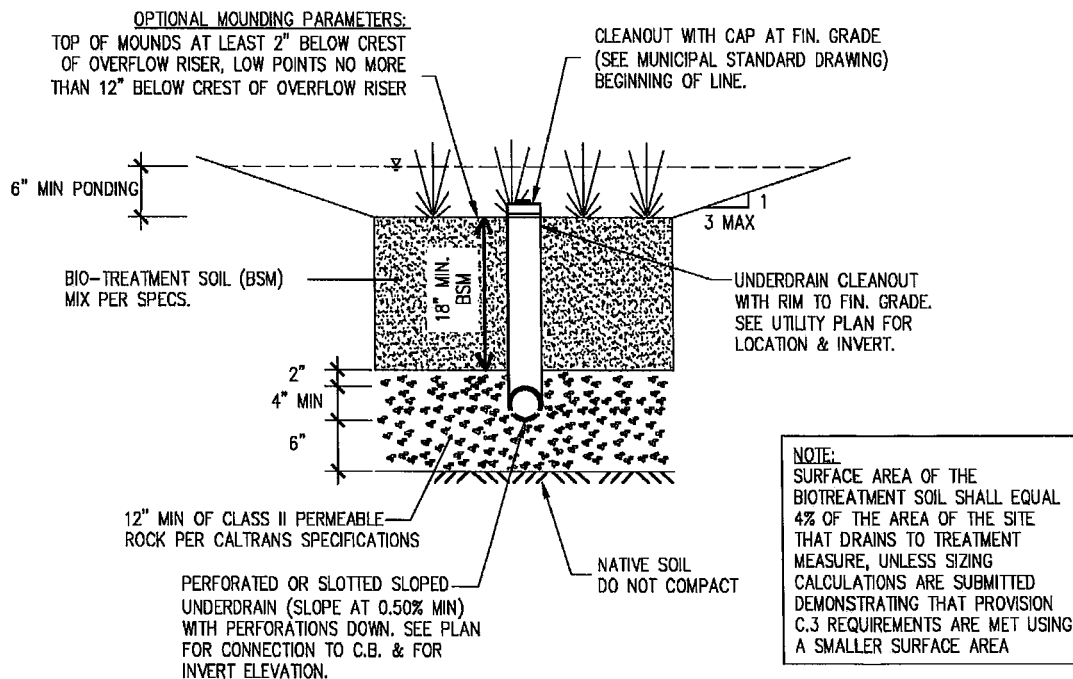
Construction Requirements

- Bioretention areas are not intended to work as construction-phase BMPs. Protect the area from construction site runoff; divert runoff from unstabilized areas away from completed bioretention areas.
- If the bioretention area will be used for infiltration, avoid spreading fines of the soils on bottom and side slopes while excavating. Loosen soils at the bottom of the excavation prior to constructing the bioretention area.
- Minimize compaction of existing soils in the location of bioretention areas; protect from construction traffic.

Maintenance Requirements

- Provide a Maintenance Agreement (or other document or mechanism) that states the parties' responsibility for maintenance and upkeep.
- Prepare a maintenance plan and submit with Maintenance Agreement. Refer to Chapter 8 and Appendix G for specific maintenance requirements.

Figure 6-2: Cross Section of a Bioretention Area (with Maximized Infiltration)



NOT TO SCALE
SEE FIGURE 6-3 FOR TYPICAL OVERFLOW

Figure 6-3: Cross Section of a Bioretention Area (Side View)

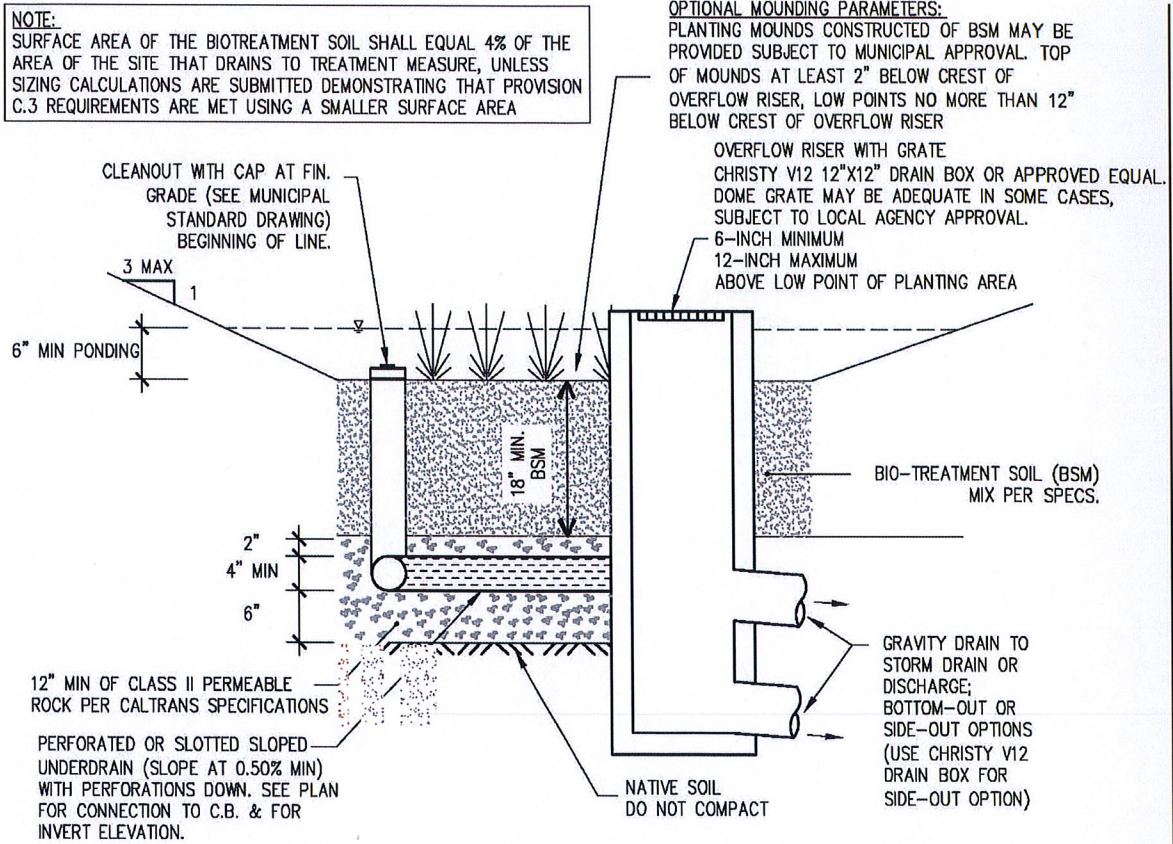


Figure 6-4: Check Dam (plan view and profile) for installing a series of linear treatment measures (bioretention cells) in sloped area

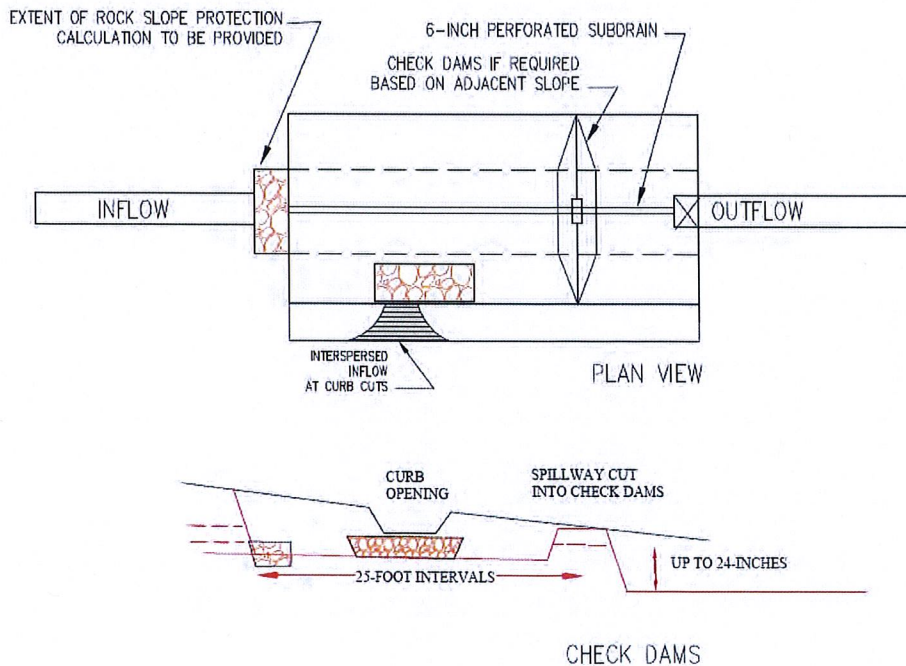
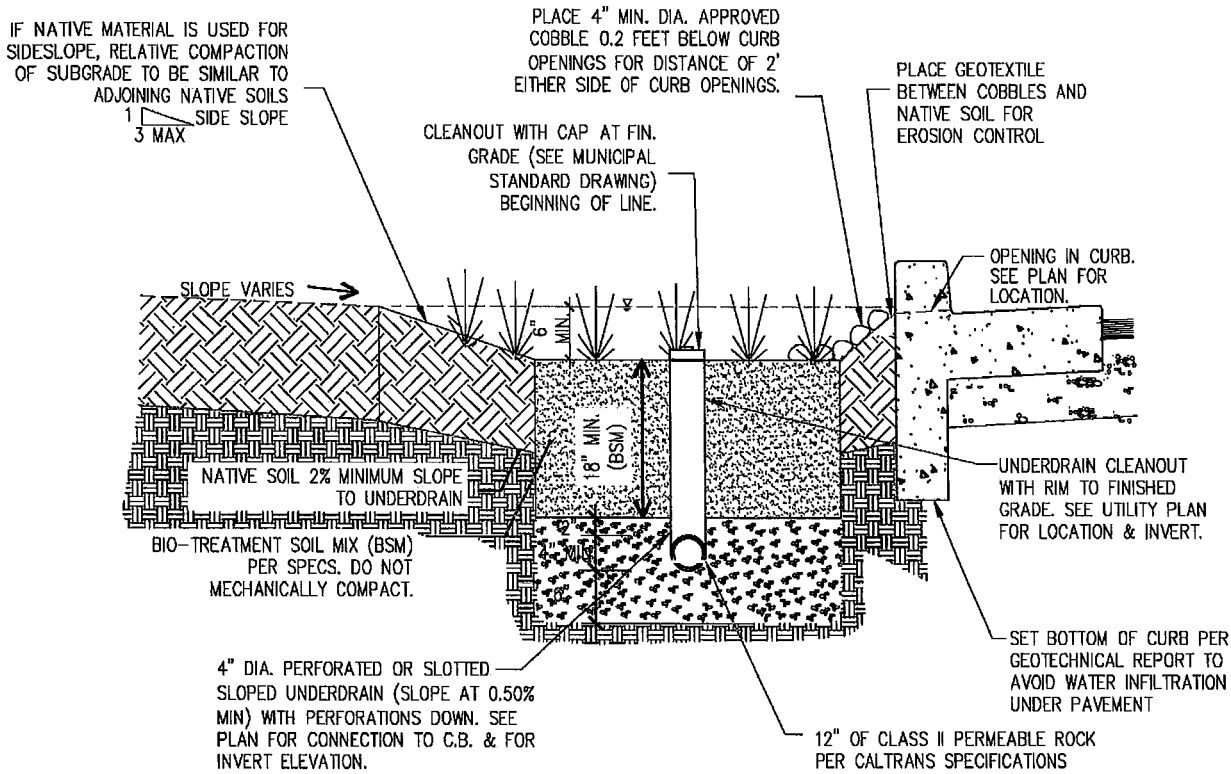


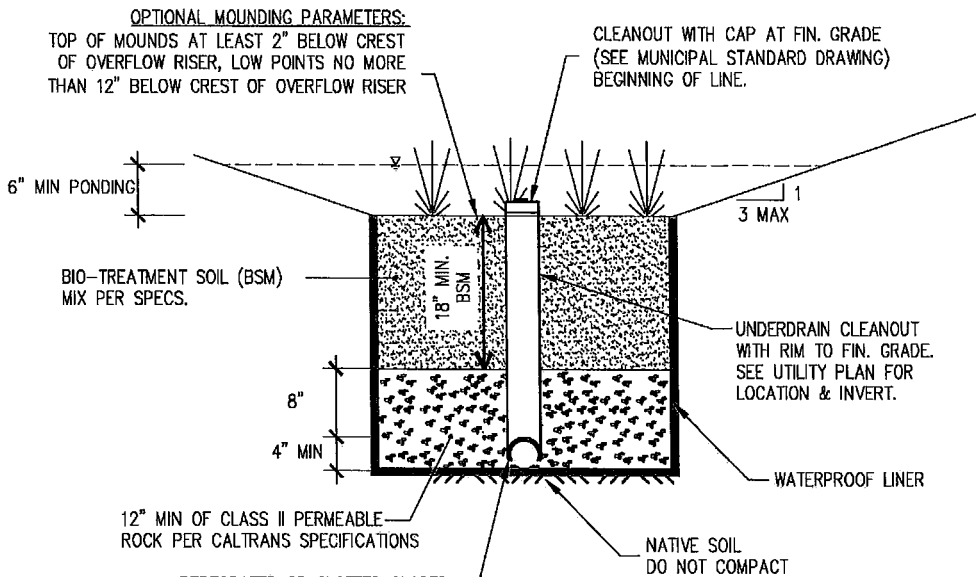
Figure 6-5: Cross Section of a Linear Bioretention Area (with Maximized Infiltration)



NOTE:
 SURFACE AREA OF THE BIOTREATMENT SOIL SHALL EQUAL 4% OF THE AREA OF THE SITE THAT DRAINS TO TREATMENT MEASURE, UNLESS SIZING CALCULATIONS ARE SUBMITTED DEMONSTRATING THAT PROVISION C.3 REQUIREMENTS ARE MET USING A SMALLER SURFACE AREA

NOT TO SCALE
 SEE FIGURE 6-3 FOR TYPICAL OVERFLOW

Figure 6-6: Cross Section of Lined Bioretention Area (Infiltration Not Allowed)



NOTE:
 SURFACE AREA OF THE BIOTREATMENT SOIL SHALL EQUAL 4% OF THE AREA OF THE SITE THAT DRAINS TO TREATMENT MEASURE, UNLESS SIZING CALCULATIONS ARE SUBMITTED DEMONSTRATING THAT PROVISION C.3 REQUIREMENTS ARE MET USING A SMALLER SURFACE AREA



Maintenance Concerns, Objectives, and Goals

- Clogged Soil or Outlet Structures
- Invasive Species
- Vegetation/Landscape Maintenance
- Erosion
- Channelization of Flow
- Aesthetics

General Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through a sand bed and is subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

Inspection/Maintenance Considerations

Bioretention requires frequent landscaping maintenance, including measures to ensure that the area is functioning properly, as well as maintenance of the landscaping on the practice. In many cases, bioretention areas initially require intense maintenance, but less maintenance is needed over time. In many cases, maintenance tasks can be completed by a landscaping contractor, who may already be hired at the site. In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

Targeted Constituents

✓ Sediment	■
✓ Nutrients	▲
✓ Trash	■
✓ Metals	■
✓ Bacteria	■
✓ Oil and Grease	■
✓ Organics	■
✓ Oxygen Demanding	■

Legend (Removal Effectiveness)

- Low
- High
- ▲ Medium



<ul style="list-style-type: none"> ■ Inspect soil and repair eroded areas. 	Monthly
<ul style="list-style-type: none"> ■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. 	Semi-annual inspection
<ul style="list-style-type: none"> ■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. 	
<ul style="list-style-type: none"> ■ Check for debris and litter, and areas of sediment accumulation. 	
<ul style="list-style-type: none"> ■ Inspect health of trees and shrubs. 	
<ul style="list-style-type: none"> ■ Water plants daily for 2 weeks. 	At project completion
<ul style="list-style-type: none"> ■ Remove litter and debris. 	Monthly
<ul style="list-style-type: none"> ■ Remove sediment. ■ Remulch void areas. ■ Treat diseased trees and shrubs. ■ Mow turf areas. ■ Repair erosion at inflow points. ■ Repair outflow structures. ■ Unclog underdrain. ■ Regulate soil pH regulation. 	As needed
<ul style="list-style-type: none"> ■ Remove and replace dead and diseased vegetation. 	Semi-annual
<ul style="list-style-type: none"> ■ Add mulch. ■ Replace tree stakes and wires. 	Annual
<ul style="list-style-type: none"> ■ Mulch should be replaced every 2 to 3 years or when bare spots appear. Remulch prior to the wet season. 	Every 2-3 years, or as needed

Additional Information

Landscaping is critical to the function and aesthetic value of bioretention areas. It is preferable to plant the area with native vegetation, or plants that provide habitat value, where possible. Another important design feature is to select species that can withstand the hydrologic regime they will experience. At the bottom of the bioretention facility, plants that tolerate both wet and dry conditions are preferable. At the edges, which will remain primarily dry, upland species will be the most resilient. It is best to select a combination of trees, shrubs, and herbaceous materials.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: <http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm>

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, revised February, 2002.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at:
cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

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

6.2 Flow-Through Planter



Figure 6-7: Flow-through planters at Hampton Park residences in San Jose. Photo: EOA, Inc.

Best uses

- Treating roof runoff
- Next to buildings
- Dense urban areas
- Locations where infiltration is not desired

Advantages

- Can be adjacent to structures
- Versatile
- May be any shape
- Low maintenance

Limitations

- Requires sufficient head
- Careful selection of plants
- Requires level installation
- Susceptible to clogging

Flow-through planters function similar to bioretention areas but are designed to detain and treat runoff without allowing seepage into the underlying soil. They are a type of biotreatment facility that is completely lined and surrounded with concrete or other structural planter box walls with waterproof membranes. They can be used next to buildings and other locations where soil moisture is a potential concern. Flow-through planters typically receive runoff via downspouts leading from the roofs of adjacent buildings. However, flow-through planters can also be set level with the surrounding grade and receive runoff as sheet flow. Pollutants are removed as the runoff passes through the biotreatment soil mix and is collected in an underlying drain rock layer and perforated underdrain. The underdrain must be directed to a storm drain or other discharge point. An overflow inlet conveys flows that exceed the capacity of the planter.

Design and Sizing Guidelines

TREATMENT MEASURE DIMENSIONS AND SIZING

- It is recommended that flow-through planters be designed with a surface area that is 4% of the impervious area draining to it. This sizing factor is derived from the flow-based treatment standard (runoff from 0.2 in/hr intensity rainfall) and a desired surface loading rate of 5 in/hr. Alternatively, if there are site constraints, planter size may be calculated using a volume-based treatment method or a combination flow- and volume-based treatment method described in Appendix B.
- The surface of the planting bed should be relatively level but may have a slight slope if needed to distribute stormwater flows throughout the surface area.
- Surface ponding depths may vary, with a recommended 6-inch depth and a maximum 12-inch depth if allowed by the municipality. The depth is measured from the surface of the biotreatment soil and not adjusted for the application of mulch. If the design ponding depth exceeds 6 inches, the landscape architect should approve the planting palette for the desired depth.

- The inlet elevation of the overflow drain should be at least 6 inches above the low point of the planting area and at least 2 inches above the high point of the planting area (i.e., the top of planting mounds). Planter box walls should be higher than overflow elevation. The maximum head requirements should be checked using the maximum flow and planter outlet configuration. Four inches of freeboard should be provided, and an overflow point away from structures should be designed. Additional freeboard requirements may apply to protect nearby structures from flooding; check with the local jurisdiction.
- Waterproofing should be installed as required to protect adjacent building walls.
- Units should be located in areas that can be accessible at any given time for the purpose of operation and maintenance and inspections.

INLETS TO TREATMENT MEASURE

Flows may enter the planter in the following ways:

- As overland flow from landscaping or pavement
- Through a curb opening (minimum 18 inches with the number and locations designed so that runoff is dispersed throughout the bioretention area)
- Through a curb drain
- Through a pop-up or bubble-up emitter
- Through roof leader or other conveyance from building roof
- If the flow-through planter is installed at grade, allow a change in elevation of 4 to 6 inches between the surrounding paved surface and the planting soil elevation, so that vegetation or mulch build-up does not obstruct flow.
- Install splash blocks, cobbles or rocks, underlain by geotextile fabric as needed, to dissipate flow energy and avoid erosion where runoff enters the planter.
- For long linear planters, space inlets to the planter at 10-foot intervals or install a flow spreader (see Figures 6-12 and 6-13).
- Flow-through planters should be designed so that drainage into and out of the treatment measure is by gravity flow. This promotes effective, low-maintenance operation and helps avoid mosquito problems. Pumped systems should only be used on retrofit projects, as a last resort.

See Section 5.2 of the SCVURPPP C.3 Handbook for example inlets and additional guidance.

UNDERDRAIN AND OVERFLOW STRUCTURES

- An underdrain system is required for flow-through planters.
- The underdrain should consist of a minimum 4-inch diameter perforated pipe with cleanouts and connection to a storm drain or discharge point. To help prevent clogging, two rows of perforation may be used.
- The underdrain trench should include a minimum 12-inch thick layer of drain rock, such as Caltrans Standard Section 68-1.025 permeable material Class 2 or equivalent. The underdrain should be placed near the bottom of the drain rock layer, with perforations facing downward, at a minimum 0.5% slope (unless a flatter slope is allowed by the municipality based on site-specific conditions).
- A cleanout for the underdrain should be provided, consisting of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 4 inches and a watertight cap fit flush with the planter bed surface.
- To avoid clogging, filter fabric should not be used in or around the underdrain or between the biotreatment soil mix and the drain rock. If desired, a 2-inch pea gravel layer may be used between the biotreatment soil mix and the drain rock.
- To avoid excess hydraulic pressure on subsurface concrete treatment system structures:

1. The depth to seasonal high groundwater level should be at least 5 feet from the bottom of the structure.
2. A geo technical engineer should be consulted for situations where the bottom of the structure is less than 5 feet from the seasonal high groundwater level.

PLANTING SOIL REQUIREMENTS

- Soils used in the planter should meet the biotreatment soil mix specifications included in Appendix C of this Handbook. A minimum long term infiltration rate of 5 inches per hour is required (initial infiltration rate may exceed this to allow for tendency of infiltration rate to reduce over time).
- Flow-through planters should have a minimum biotreatment soil mix depth of 18 inches.

VEGETATION

- Plant species selected should be suitable for the flow-through planter location, biotreatment soils and occasional inundation. A variety of plants, including ground cover, grasses, and shrubs, helps maintain a healthy soil environment and pollutant removal capabilities. See planting guidance in Appendix D.
- Plants within the planter area need to be spaced closely enough to ensure substantial plant coverage to prevent scour, keep mulch in place and provide pleasing aesthetics. The local jurisdiction may have landscaping guidelines that specify plant spacing.
- Use integrated pest management (IPM) principles in the landscape design, i.e., select native and/or pest resistant plants, to avoid the need for synthetic pesticides and quick-release fertilizer. Check with the local jurisdiction regarding local IPM policies.
- Drought tolerant plants are preferred and may be required by the local municipality. Provide sufficient irrigation for the initial establishment period as well as long term maintenance of plant life.
- Install and maintain a 3-inch layer of composted arbor mulch (also called “aged mulch”) in areas between plantings. Pea gravel or large bark mulches that resist floating may also be used. “Micro-bark” and “gorilla hair” mulches are not recommended. Cobbles should only be used for erosion protection at inlets. Large boulders should not be placed in the bioretention area.
- Vegetation should not block inflow, create safety issues, or obstruct utilities.

Construction Requirements

- At-grade planters are not intended to work as construction-phase BMPs. Protect the area from construction site runoff; divert runoff from unstabilized areas away from completed planter areas.

Maintenance Requirements

- Provide a Maintenance Agreement (or other document or mechanism) that states the parties’ responsibility for maintenance and upkeep.
- Prepare a maintenance plan and submit it with the Maintenance Agreement. Refer to Chapter 8 and Appendix G for specific maintenance requirements.

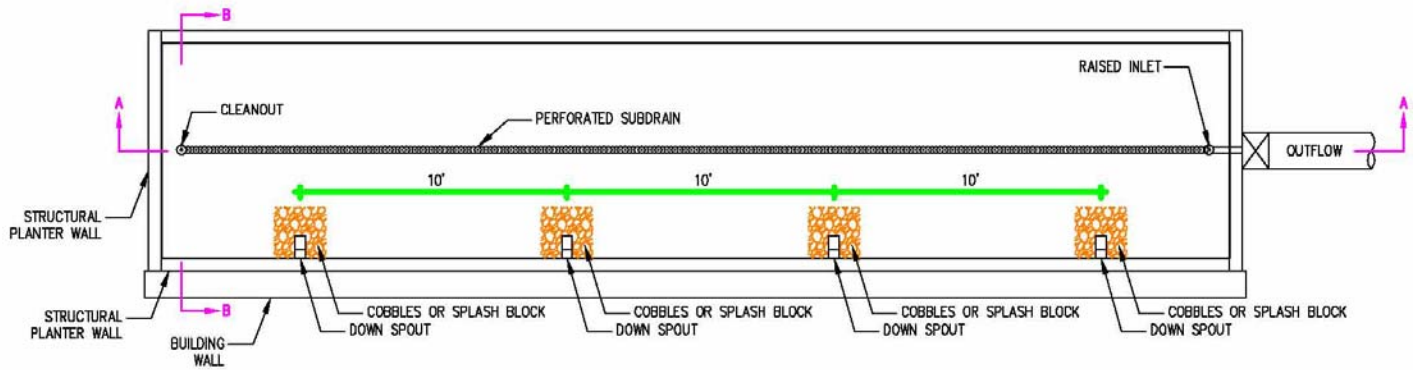


Figure 6-8: Plan view of long, linear planter, with inlets to the planter distributed along its length at 10' intervals.

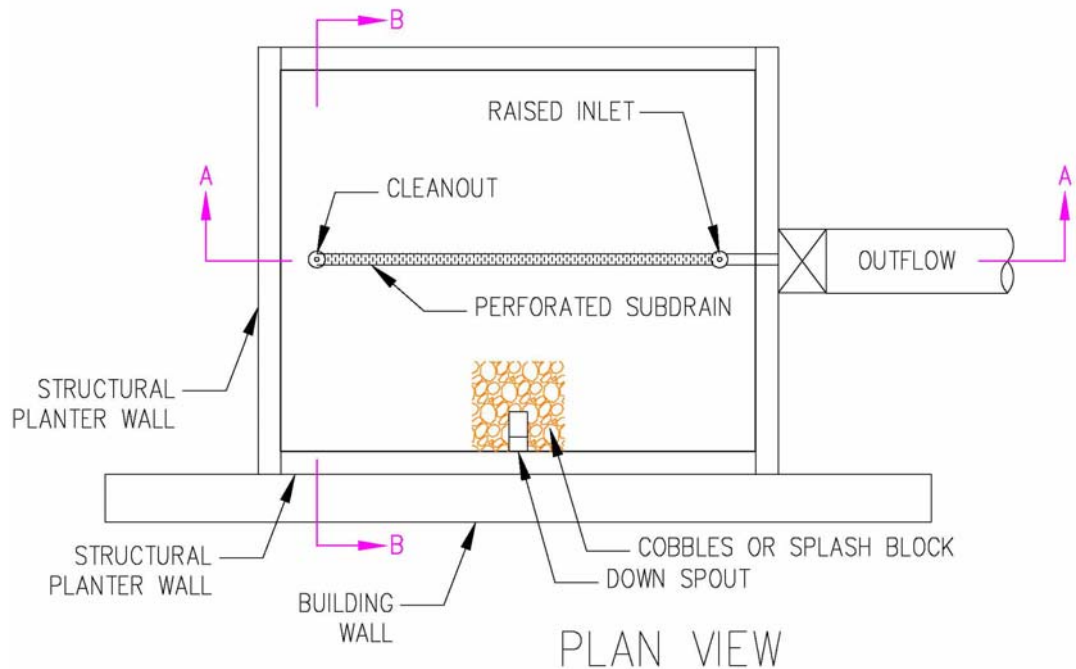


Figure 6-9: Plan view of planter designed to disperse flows adequately with only one inlet to planter

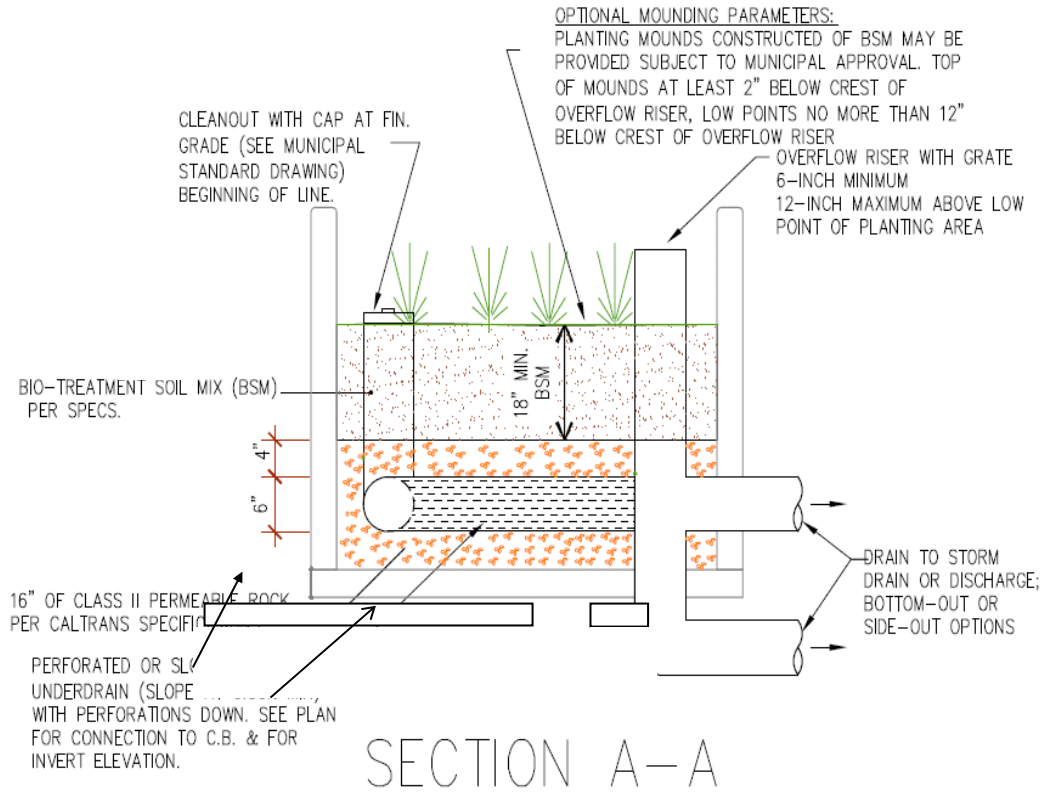


Figure 6-10: Cross section A-A of flow-through planter, shows side view of underdrain

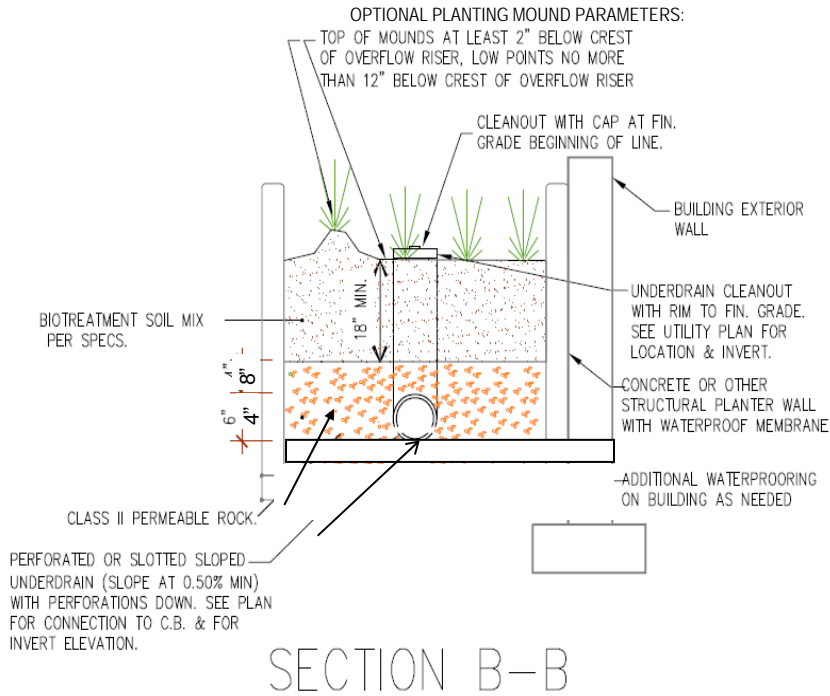


Figure 6-11: Cross section B-B of flow-through planter, shows cross section of underdrain



Figure 6-12: Half-buried, perforated flexible pipe serves as a flow spreader to distribute stormwater evenly throughout a long flow-through planter in Emeryville (Source: GreenGrid/Weston Solutions).



Figure 6-13: The same planter as shown in Figure 6-12, after vegetation has matured and partially conceals the half-buried pipe from view (Source: San Francisco Estuary Partnership).

Planter Boxes



Source: www.americastusa.com, 2003

General Description

There are two types of planter boxes: contained and infiltration/flow-through design. The contained planter boxes are designed to intercept rainfall and slowly drain through filter media and out of the planter. The infiltration and flow-through planter boxes are designed to intercept rainfall or receive runoff (e.g., downspout from rooftop), filter it through the planter, and allow infiltration into native soil (infiltration planter) or allow filtered runoff to be collected in a pipe and discharged off-site (flow-through planter). Pollution reduction is achieved as the water filters through the soil and plant roots. Water should drain through the planter within 3-4 hours after a storm event.

Inspection/Maintenance Considerations

Planter boxes require maintenance of filter media to allow uniform percolation of stormwater through planter. Vegetation needs to be kept healthy and dense enough to provide filtering function while protecting underlying soils from erosion. Obstructions and debris need to be removed from source of runoff (e.g., downspout) to allow unimpeded flow to the planter. All holes, cracks and damage to planter construction need to be repaired to maintain structural integrity of planter.

Maintenance Concerns, Objectives, and Goals

- Clogged Soil
- Vegetation Management
- Aesthetics

Targeted Constituents

- | | |
|--------------------|---|
| ✓ Sediment | ■ |
| ✓ Nutrients | ■ |
| ✓ Trash | |
| ✓ Metals | ■ |
| ✓ Bacteria | ■ |
| ✓ Oil and Grease | ■ |
| ✓ Organics | ■ |
| ✓ Oxygen Demanding | ■ |

Legend (Removal Effectiveness)

- | | |
|----------|--------|
| ● Low | ■ High |
| ▲ Medium | |



Planter Boxes

Inspection Activities	Suggested Frequency
<ul style="list-style-type: none"> ■ Inspect for proper construction. ■ Inspect for accumulated sediment/debris. 	<p>Immediately following construction</p> <p>As needed</p>
<ul style="list-style-type: none"> ■ Inspect runoff inlet structure to insure flow is unimpeded. Inspect rock splash pads to insure inflow is not creating erosion. ■ Inspect filter media for clogging and check that infiltration rate meets target (drains 3-4 hours after storm event). ■ Inspect planter box for structural deficiencies and needed repairs. ■ Inspect vegetation for health and check if plant growth is interfering with planter operation. Inspect irrigation to see if it is working properly. ■ Inspect overflow pipe for obstructions and debris. 	<p>Annually, or as needed</p>
Maintenance Activities	Suggested Frequency
<ul style="list-style-type: none"> ■ Excavate, clean and or replace filter media (sand, gravel, topsoil) to insure adequate infiltration rate. ■ Plug holes in planter that are not consistent with the original design. ■ Allow water to flow directly through the planter to the ground. ■ Remove litter and debris, including fallen leaves from deciduous plants and accumulated sediments from the planter. ■ Repair all cracks and structural deficiencies in planter. ■ Add mulch to planter soil. ■ Replant, and prune or remove plants that interfere with planter operation. 	<p>Annually, or as needed</p>

References

Stormwater Management Manual, Chapter 6, O & M Requirements, City of Portland, 2002.



APPENDIX D
OPERATION & MAINTENANCE REPORT & CHECKLIST

**Stormwater Treatment Measure Operation and Maintenance
Inspection Report to the [[=Insert Name of Municipality=]], California**

This report and attached Inspection and Maintenance Checklists document the inspection and maintenance conducted for the identified stormwater treatment measure(s) subject to the Maintenance Agreement between the City and the property owner during the annual reporting period indicated below.

I. Property Information:

Property Address or APN: _____

Property Owner: _____

II. Contact Information:

Name of person to contact regarding this report: _____

Phone number of contact person: _____ Email: _____

Address to which correspondence regarding this report should be directed:

III. Reporting Period:

This report, with the attached completed inspection checklists, documents the inspections and maintenance of the identified treatment measures during the time period from _____ to _____.

IV. Stormwater Treatment Measure Information:

The following stormwater treatment measures (identified treatment measures) are located on the property identified above and are subject to the Maintenance Agreement:

Identifying Number of Treatment Measure	Type of Treatment Measure	Location of Treatment Measure on the Property

V. Summary of Inspections and Maintenance:

Summarize the following information using the attached Inspection and Maintenance Checklists:

Identifying Number of Treatment Measure	Date of Inspection	Operation and Maintenance Activities Performed and Date(s) Conducted	Additional Comments

VI. Sediment Removal:

Total amount of accumulated sediment removed from the stormwater treatment measure(s) during the reporting period: _____ cubic yards.

How was sediment disposed?

- landfill
- other location on-site as described in and allowed by the maintenance plan
- other, explain _____

VII. Inspector Information:

The inspections documented in the attached Inspection and Maintenance Checklists were conducted by the following inspector(s):

Inspector Name and Title	Inspector's Employer and Address

VIII. Certification:

I hereby certify, under penalty of perjury, that the information presented in this report and attachments is true and complete:

Signature of Property Owner or Other Responsible Party

Date

Type or Print Name

Company Name

Address

Phone number: _____ Email: _____

Bioretention Area Maintenance Plan for [[= Insert Project Name =]]

[[= Insert Date =]]

Project Address and Cross Streets _____

Assessor's Parcel No.: _____

Property Owner: _____ Phone No.: _____

Designated Contact: _____ Phone No.: _____

Mailing Address: _____

The property contains [[= insert number =]] bioretention area(s), located as described below and as shown in the attached site plan¹.

- **Bioretention Area No. 1** is located at [[= describe location =]].
- [[= Add descriptions of other bioretention areas, if applicable. =]]

I. Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to bioretention area failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

Table 1 Routine Maintenance Activities for Bioretention Areas		
No.	Maintenance Task	Frequency of Task
1	Remove obstructions, debris and trash from bioretention area and dispose of properly.	Monthly, or as needed after storm events
2	Inspect bioretention area for ponded water. If ponded water does not drain within 2-3 days, till and replace the surface soil and replant.	Monthly, or as needed after storm events
3	Inspect inlets for channels, soil exposure or other evidence of erosion. Clear obstructions and remove sediment.	Monthly, or as needed after storm events
4	Remove and replace all dead and diseased vegetation.	Twice a year
5	Maintain vegetation and the irrigation system. Prune and weed to keep bioretention area neat and orderly in appearance. Remove and or replace any dead plants.	Twice a year
6	Check that mulch is at appropriate depth (2 inches per soil specifications) and replenish as necessary before wet season begins.	Monthly
7	Inspect the energy dissipation at the inlet to ensure it is functioning adequately, and that there is no scour of the surface mulch.	Annually, before the wet season begins
8	Inspect bioretention area using the attached inspection checklist.	Monthly, or after large storm events, and after removal of accumulated debris or material

¹ Attached site plan must match the site plan exhibit to Maintenance Agreement.

II. Use of Pesticides

The use of pesticides and quick release fertilizers shall be minimized, and the principles of integrated pest management (IPM) followed:

1. Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.
2. Prune plants properly and at the appropriate time of year.
3. Provide adequate irrigation for landscape plants. Do not over water.
4. Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable. Check with municipality for specific requirements.
5. Pest control should avoid harming non-target organisms, or negatively affecting air and water quality and public health. Apply chemical controls only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, apply the least toxic and the least persistent pesticide that will provide adequate pest control. Do not apply pesticides on a prescheduled basis.
6. Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.
7. Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.
8. Only licensed, trained pesticide applicators shall apply pesticides.
9. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.
10. Unwanted/unused pesticides shall be disposed as hazardous waste.

III. Vector Control

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the Santa Clara Valley Vector Control District (District). Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the District, and then only by a licensed professional or contractor. Contact information for the District is provided below.

Santa Clara Valley Vector Control District
1580 Berger Dr.
San José, California 95112
Phone: (408) 918-4770 / (800) 675-1155 - Fax: (408) 298-6356
www.sccgov.org/portal/site/vector

IV. Inspections

The attached Bioretention Area Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Bioretention Area Inspection and Maintenance Checklist

Property Address: _____ Property Owner: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: Monthly After heavy runoff Pre-Wet Season
 Inspector(s): _____ Other: _____ End of Wet Season

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Standing Water	Water stands in the bioretention area between storms and does not drain within 2-3 days after rainfall.			There should be no areas of standing water once storm event has ceased. Any of the following may apply: sediment or trash blockages removed, improved grade from head to foot of bioretention area, or added underdrains.
2. Trash and Debris Accumulation	Trash and debris accumulated in the bioretention area.			Trash and debris removed from bioretention area and disposed of properly.
3. Sediment	Evidence of sedimentation in bioretention area.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, and/or other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased and/or overgrown.			Vegetation is healthy and attractive in appearance.
6. Mulch	Mulch is missing or patchy in appearance. Areas of bare earth are exposed, or mulch layer is less than 2 inches in depth.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even in appearance, at a depth of 2 inches.
7. Miscellaneous	Any condition not covered above that needs attention in order for the bioretention area to function as designed.			Meets the design specifications.

Flow-Through Planter Maintenance Plan for [[== Insert Project Name ==]]

[[== Insert Date =]]

Project Address and Cross Streets _____

Assessor's Parcel No.: _____

Property Owner: _____ Phone No.: _____

Designated Contact: _____ Phone No.: _____

Mailing Address: _____

The property contains [[== insert number ==]] Flow-Through Planter(s), located as described below and as shown in the attached site plan¹.

Flow-Through Planter No. 1 is located at [[== describe location ==]].

[[== Add descriptions of other Flow-Through Planters, if applicable. ==]]

I. Routine Maintenance Activities

The principal maintenance objectives are to ensure that water flows unimpeded into the flow-through planter and landscaping remains attractive in appearance. Table 1 shows the routine maintenance activities, and the frequency at which they will be conducted.

Table 1 Routine Maintenance Activities for Flow-Through Planters		
No.	Maintenance Task	Frequency of Task
1	Inspect the planter surface area, inlets and outlets for obstructions and trash; clear any obstructions and remove trash.	Quarterly
2	Inspect planter for standing water. If standing water does not drain within 2-3 days, the surface biotreatment soil should be tilled or replaced with the approved soil mix and replanted. Use the cleanout riser to clear any underdrains of obstructions or clogging material.	Quarterly
3	Check for eroded or settled biotreatment soil media. Level soil with rake and remove/replant vegetation as necessary.	Quarterly
4	Maintain the vegetation and irrigation system. Prune and weed to keep flow-through planter neat and orderly in appearance.	Quarterly
5	Evaluate health and density of vegetation. Remove and replace all dead and diseased vegetation. Remove excessive growth of plants that are too close together.	Annually, before the rainy season begins
6	Use compost and other natural soil amendments and fertilizers instead of synthetic fertilizers, especially if the system uses an underdrain.	Annually, before the rainy season begins
7	Inspect the overflow pipe to make sure that it can safely convey excess flows to a storm drain. Repair or replace any damaged or disconnected piping. Use the cleanout riser to clear underdrains of obstructions or clogging material.	Annually, before the rainy season begins
8	Inspect the energy dissipator at the inlet to ensure it is functioning adequately, and that there is no scour of the surface mulch. Remove any accumulation of sediment.	Annually, before the rainy season begins
9	Inspect and, if needed, replace wood mulch. It is recommended that 2" to 3" of composted arbor mulch be applied once a year.	Annually, before the rainy season begins
10	Inspect system for erosion of biotreatment soil media, loss of mulch, standing water, clogged overflows, weeds, trash and dead plants. If using rock mulch, check for 3" of coverage.	Annually at the end of the rainy season and/or after large storm events,

¹ Attached site plan must match the site plan exhibit to Maintenance Agreement.

Flow-Through Planter Maintenance Plan
Property Address: _____

Date of Inspection: _____
Treatment Measure No.: _____

11	Inspect system for structural integrity of walls, flow spreaders, energy dissipators, curb cuts, outlets and flow splitters.	Annually at the end of the rainy season and/or after large storm events,
----	--	--

II. Use of Pesticides

Do not use pesticides or other chemical applications to treat diseased plants, control weeds or removed unwanted growth. Employ non-chemical controls (biological, physical and cultural controls) to treat a pest problem. Prune plants properly and at the appropriate time of year. Provide adequate irrigation for landscape plants. Do not over water.

III. Vector Control

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the Santa Clara Valley Vector Control District (District). Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the District, and then only by a licensed professional or contractor. Contact information for the District is provided below.

Santa Clara Valley Vector Control District
1580 Berger Dr.
San José, California 95112
Phone: (408) 918-4770 / (800) 675-1155 - Fax: (408) 298-6356
www.sccgov.org/portal/site/vector

IV. Inspections

The attached Flow-Through Planter Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Flow-Through Planter Inspection and Maintenance Checklist

Property Address: _____ Property Owner: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: Quarterly Pre-Wet Season
 After heavy runoff End of Wet Season
 Inspector(s): _____ Other: _____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Vegetation	Vegetation is dead, diseased and/or overgrown.			Vegetation is healthy and attractive in appearance.
2. Soil	Soil too deep or too shallow.			Soil is at proper depth (per soil specifications) for optimum filtration and flow.
3. Mulch	Mulch is missing or patchy in appearance.			Mulch is even in appearance and 2-3" deep.
4. Sediment, Trash and Debris Accumulation	Sediment, trash and debris accumulated in the flow-through planter. Planter does not drain within 3-4 hours.			Sediment, trash and debris removed from flow-through planter and disposed of properly. Planter drains within 3-4 hours.
5. Clogs/Drainage	Planter does not drain within 3-4 hours after rainfall.			Planter drains per design specifications.
6. Downspouts and Sheet Flow	Flow to planter is impeded. Downspouts are clogged or pipes are damaged. Splash blocks and rocks in need of repair, replacement or replenishment.			Downspouts and sheet flow is conveyed efficiently to the planter.
7. Overflow Pipe	Does not safely convey excess flows to storm drain. Piping damaged or disconnected.			Overflow pipe conveys excess flow to storm drain efficiently.
8. Structural Soundness	Planter is cracked, leaking or falling apart.			Cracks and leaks are repaired and planter is structurally sound.
9. Miscellaneous	Any condition not covered above that needs attention in order for the flow-through planter to function as designed.			Meet the design specifications.