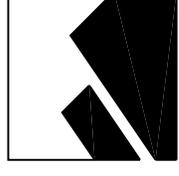


PRELIMINARY STORM WATER MITIGATION PLAN
THE REDWOOD APARTMENTS

APRIL 2019

CIVIL DESIGN CONSULTANTS, INC.
2200 Range Avenue, Suite 204
Santa Rosa, CA 95403
(707) 542-4820



**PRELIMINARY
STORM WATER MITIGATION PLAN**

FOR

REDWOOD APARTMENTS

*Located at
3422 Santa Rosa Avenue*

APN 134-132-070

Prepared for:

Pacific West Communities
430 E. State Street, Suite 100
Eagle, Idaho 83616

April 2019



Prepared by:

*CIVIL DESIGN CONSULTANTS, INC.
2200 RANGE AVENUE, SUITE 204
SANTA ROSA, CA 95403*

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BMP Selection Tables

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Standard Maintenance/Monitoring Agreement

1 INTRODUCTION

The Redwood Apartments project site is within the permit boundary of the recently adopted NPDES MS4 Storm Water Permit which regulates discharges into the watershed with the intent to reduce storm water pollution and protect the water quality of our local creeks and waterways and continue to promote groundwater recharge. The City of Santa Rosa and the County of Sonoma have adopted the Storm Water Low Impact Development (LID) Technical Design Manual. This Preliminary Storm Water Mitigation Plan (PSWMP) was developed to show compliance with its requirements.

Standard Urban Storm Water Mitigation Plan (SUSMP) requirements are part of the Storm Water Management Plan that is an enforceable part of the reissued municipal storm water National Pollutant Discharge Elimination System (NPDES) permit for the City of Santa Rosa, the County of Sonoma and the Sonoma County Water Agency. Satisfying the SUSMP and the NPDES Permit will require meeting the following goals to the maximum extent practicable:

1. Prevent pollutants generated at the site from leaving the site.
2. Prevent increases in Storm Water runoff for the 85th percentile 24-hour storm.
3. Strive to maximize the amount of land left in a natural undisturbed condition.

This PSWMP will provide the following information:

- Project Description
- Pollution Prevention Measures
- Types of Best Management Practices (BMPs) selected to mitigate pollutants and provide volume capture
- Responsibility for BMP maintenance
- Location and design of BMPs (on project drawings)

2 PROJECT DESCRIPTION

The Redwood Apartments project site is located at 3422 Santa Rosa Avenue within the City of Santa Rosa.

The Redwood Apartments property contains an area of 4.13 acres and is comprised of one assessor's parcel number, APN 134-132-070. The existing site is vacant, containing native grasses and is relatively flat and slopes at approximately less than 1% from both north to south and west to east.

The project is proposed by Pacific West Communities as a single, non-phased project. The project proposes to construct 96 affordable rental units within 4 separate 3-story buildings, a community building, site amenities and parking lot on the 4.13 acres. The project will collect overland flow and route it to a series of proposed stormwater treatment facilities before entering the underground drainage system. These features will be constructed over aggregate layers where stormwater will be retained and allowed to infiltrate through native soil before entering the underground storm drain system. This pre-treatment design feature shall not only remove pollutants, but also will reduce the amount of runoff by capturing and infiltrating storm water onsite. The treatment facilities are proposed at various locations throughout the project site, providing treatment for each of the site tributaries. The purpose of these devices and their effect on the quality and quantity of runoff leaving the developed site will be further explained throughout this report.

The attached plan titled "PSWMP Exhibit" shows the proposed general grading pattern for the project along with the drainage tributary areas and proposed treatment facilities. Treatment facility details showing volume capture designed to meet the 100% volume capture goal can be found in the attachments section of this document.

3 POLLUTION PREVENTION MEASURES

Storm drainage from the rooftop of the proposed apartment buildings will be allowed to splash onto concrete splash blocks within landscape areas and surface flow to a stormwater treatment facility before entering the underground storm drain system.

The project will incorporate field drains with inlet openings at least 3" above grade within bio-retention beds. This will allow sediment to settle out of storm water before entering storm drain systems. The field drains will be equipped with horizontal bars on the inlet openings to assist with trash capture.

Storm drain drop inlets and curb inlets will be equipped with removable trash basket inserts to prevent trash from entering the storm drain system and polluting the receiving body of water.

All storm drain inlets will also be marked with a "No Dumping, Drains to Creek" decals to discourage dumping of pollutants into the storm drain system.

The project will also utilize covered trash enclosures designed with area drains that will collect storm water runoff within the enclosure and drain to the projects sanitary sewer system.

The total tributary areas used for volume capture calculations have been reduced by taking credit for some of these measures.

4 TYPES OF BMP'S SELECTED TO MITIGATE POLLUTANTS AND PROVIDE VOLUME CAPTURE

Best Management Practices (BMP's) are design features that address the quality and quantity of the storm waters that flow from a development. In most cases, these BMP's are used to mitigate a development's impact on the quality of storm water by treating or cleaning the storm water. Some controls have dual treatment control measure capabilities, not only treating, but also containing a required volume of storm water. The Redwood Apartment project will implement bio-retention beds to mitigate pollutants and provide volume capture for the 85th percentile 24-hour storm. Volume capture is accomplished by incorporating an area for storm water storage beneath the bio-retention facilities.

Bio-retention beds have been selected for this project because of their ability to remove pollutants through a variety of natural physical, biological and chemical treatment processes. These BMP's are considered a Low Impact Development (LID) device for treatment control. They have also been selected because they provide an excellent opportunity for the runoff to settle any suspended solids and remove hydrocarbons. Both of which have been identified as pollutants that can degrade the downstream receiving waters of the project. Compared to pipe networks, bio-retention beds and permeable concrete with gravel storage areas will reduce runoff from the site and provide ground water recharge. For this project we have selected structural soil – which has a porosity of 30% - consisting of ¾ inch to 1-1/2 inch aggregate for the storage areas under the bio-retention beds, and, in some cases, extend under adjacent concrete sidewalks. All storm water runoff will pass through a vegetative component within the landscape-based bio-retention beds prior to entering the structural soil volume capture areas. The structural soil will also provide an environment for landscaping to thrive. This provides the opportunity to reduce the peak flow in a basin.

The structural soil shall meet standards set forth in the City of Santa Rosa Low Impact Development Design Manual reference document 'E' and geotechnical report. The structural soil will also provide an environment for landscaping to thrive as it is composed of angular rocks and fine organics, providing an excellent environment for water infiltration and plant growth.

This project meets the Design Goal by achieving 100% volume capture.

5 RESPONSIBILITY FOR BMP MAINTENANCE

All treatment control devices serving the Redwood Apartments project are located within the project site. The property owner will be responsible for the surface and sub-surface oversight and maintenance of the treatment control devices on site.

Attached is a Draft of the Declaration of Covenants Regarding Maintenance of Storm Water BMP Facilities.

ATTACHMENTS

FOR OFFICE USE ONLY:

Does this project require permanent storm water BMP's?

Y N

Date Submitted: _____



File No:	Quadrant
Related Files:	
Set:	
Department Use Only	

2017 Storm Water LID Determination Worksheet

PURPOSE AND APPLICABILITY: This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Part 1: Project Information

Project Name Applicant (owner or developer) Name

Project Site Address Applicant Mailing Address

Project City/State/Zip Applicant City/State/Zip

Permit Number(s) - (if applicable) Applicant Phone/Email/Fax

Designer Name Designer Mailing Address

Designer City/State/Zip Designer Phone/Email

Type of Application/Project:

Subdivision	Grading Permit	Building Permit	Hillside Development
DesignReview	Use Permit	Encroachment	Time Extensions
Other : _____			

PART 2: Project Exemptions

1. Is this a project that creates or replaces *less than* 10,000 square feet of impervious surface¹, including all project phases and off-site improvements?

Yes No

1 Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

2017 Storm Water LID Determination Worksheet

2. Is this project a routine maintenance activity² that is being conducted to maintain original line and grade, hydraulic capacity, and original purpose of facility such as resurfacing existing roads and parking lots?

Yes No

3. Is this project a stand alone pedestrian pathway, trail or off-street bike lane?

Yes No

4. **Did you answer "YES" to any of the questions in Part 2?**

YES: This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete the "Exemption Signature Section" on Page 4.**

NO: Please complete the remainder of this worksheet.

Part 3: Project Triggers

Projects that Trigger Requirements:

Please answer the following questions to determine whether this project requires permanent Storm Water BMP's and the submittal of a SW LIDs as required by the NPDES MS4 Permit order No. R1-2015-0030.

1. Does this project create or replace a combined total of 10,000 square feet or more of impervious surface¹ including all project phases and off-site improvements?

Yes No

2. Does this project create or replace a combined total or 10,000 square feet or more of impervious streets, roads, highways, or freeway construction or reconstruction³? Yes No

3. Does this project create or replace a combined total of 1.0 acre or more of impervious surface¹ including all project phases and off-site improvements? Yes No

4. **Did you answer "YES" to any of the above questions in Part 3?**

YES: This project will need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete remainder of worksheet and sign the "Acknowledgement Signature Section" on Page 4.**

NO: This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 permit. **Please complete the "Exemption Signature Section" on Page 4.**

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

² "Routine Maintenance Activity" includes activities such as overlays and/or resurfacing of existing roads or parking lots as well as trenching and patching activities and reroofing activities per section VI.D.2.b.

³ "Reconstruction" is defined as work that extends into the subgrade of a pavement per section VI.D.2.b.

Acknowledgment Signature Section:

As the property owner or developer, I understand that this project is required to implement permanent Storm Water Best Management Practices and provide a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit Order No. R1-2015-0030. *Any unknown responses must be resolved to determine if the project is subject to these requirements.



Applicant Signature



Date

Exemption Signature Section:

As the property owner or developer, I understand that this project as currently designed does not require permanent Storm Water BMP's nor the submittal of a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit*. I understand that redesign may require submittal of a new Determination Worksheet and may require permanent Storm Water BMP's.

Applicant Signature

Date

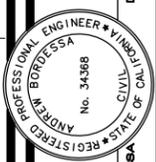
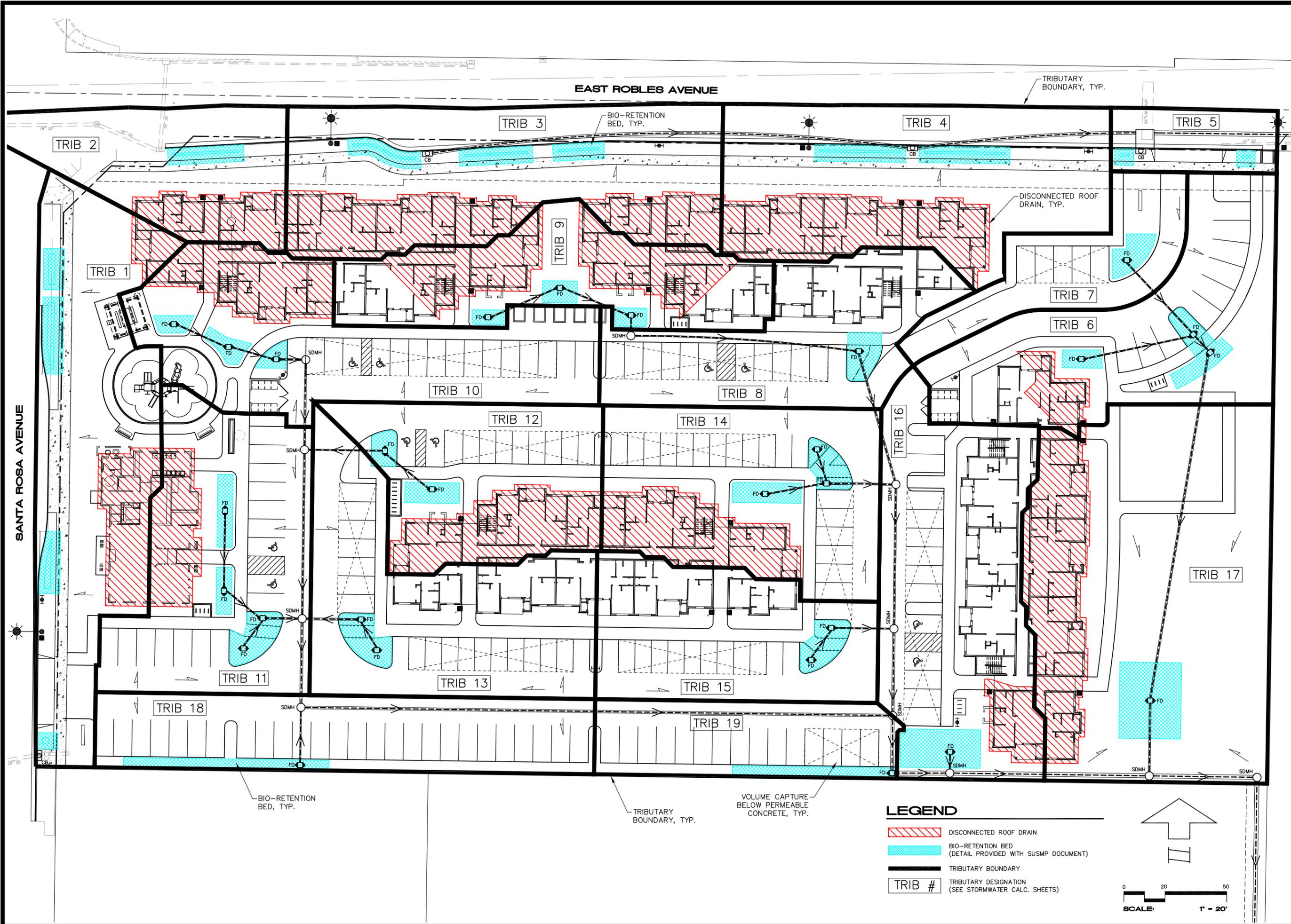
- * This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Implementation Requirements: All calculations shall be completed using the "Storm Water Calculator" available at: www.srcity.org/stormwaterLID

Hydromodification Control/100% Volume Capture: Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

Treatment Requirement: Treatment of 100% of the flow calculated using the modified Rational Method and a known intensity of 0.20 inches per hour.

Delta Volume Capture Requirement: Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

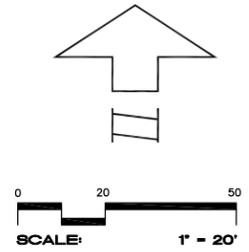


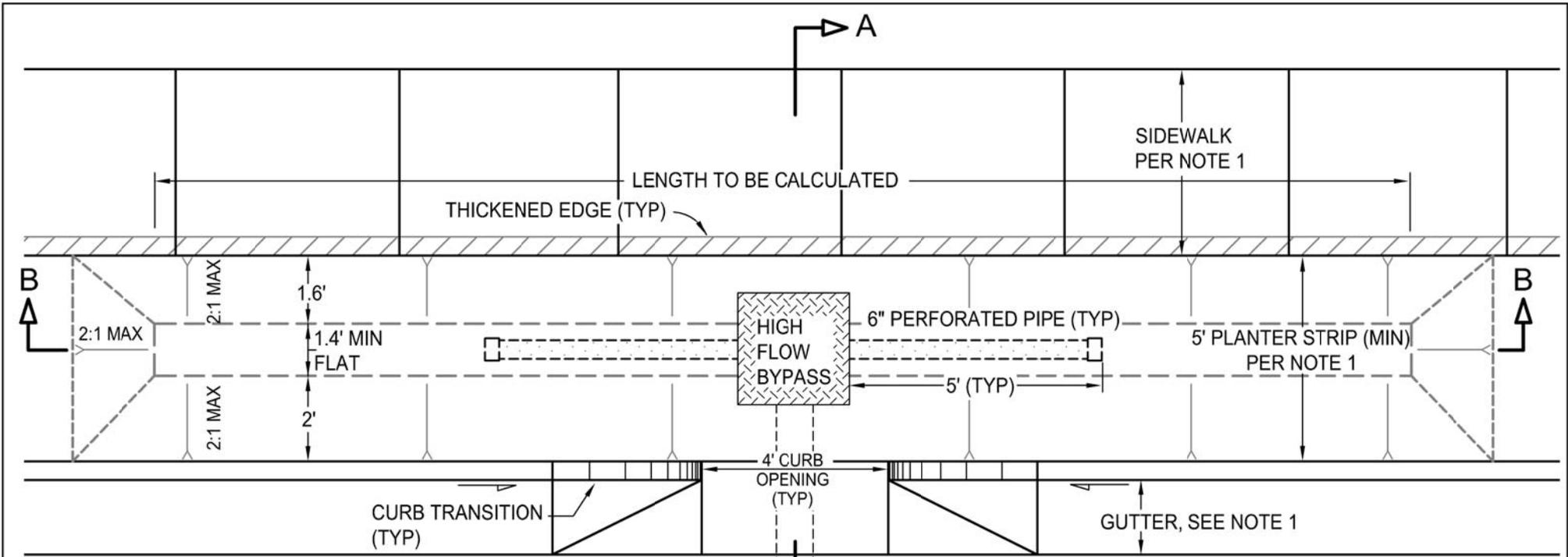
CIVIL DESIGN CONSULTANTS, INC.
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PSWMP EXHIBIT
REDWOOD APARTMENTS
 9422 SANTA ROSA AVENUE
 SANTA ROSA, CALIFORNIA

APRIL, 2019
 JOB NO. 18-135
 SHEET NO. 1
 OF 1 SHEETS

- LEGEND**
- DISCONNECTED ROOF DRAIN
 - BIO-RETENTION BED (DETAIL PROVIDED WITH SUSMP DOCUMENT)
 - TRIBUTARY BOUNDARY
 - TRIB #** TRIBUTARY DESIGNATION (SEE STORMWATER CALC. SHEETS)

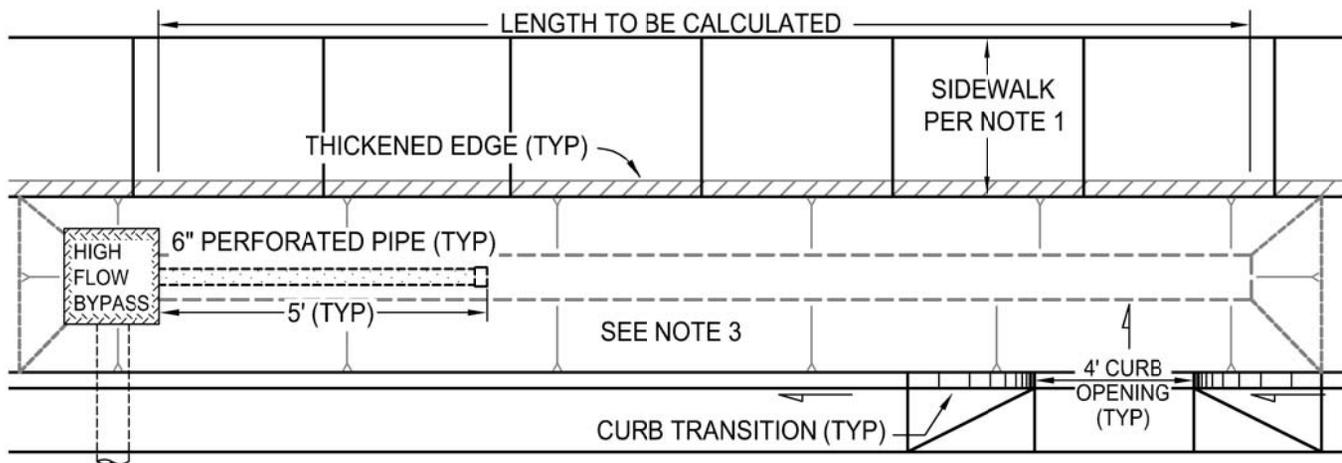




PLAN
TYPE A - CURB OPENING AT LOW POINT

NOTE:

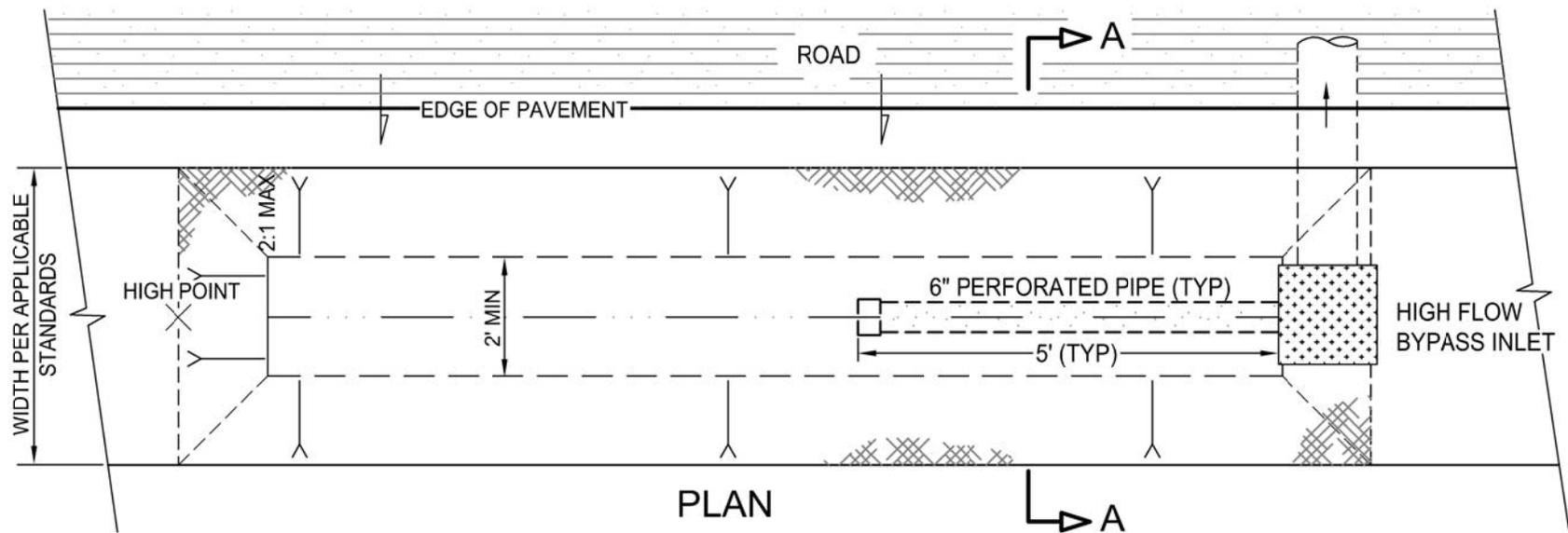
1. SIDEWALK, GUTTER AND PLANTER WIDTHS PER APPLICABLE MUNICIPAL STANDARDS (TYP).
2. TOP OF 6" PERFORATED PIPE TO BE SET 6" BELOW ROAD STRUCTURAL SECTION, MIN.
3. TYPE A MINIMUM DIMENSIONS AND GRADES APPLY TO TYPE B.



TYPE B - CURB OPENING ALONG A SLOPE

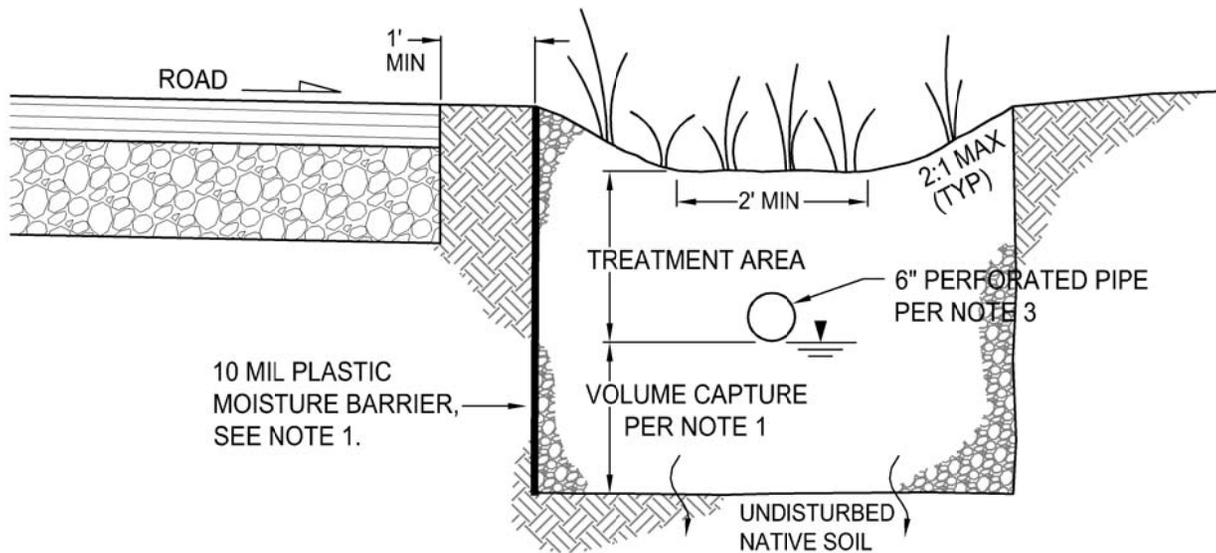
PRIORITY 2 ROADSIDE BIORETENTION - CURB OPENING		
SCALE: NONE	DATE: 04/06/17	
DWN. DIT CHK. HM	SHEET 1 of 2	P2-04

Not to Scale



NOTES:

1. SOIL TO BE SPECIFIED BY DESIGN ENGINEER TO PROVIDE VOLUME CAPTURE AND MEET GOVERNING AGENCY REQUIREMENTS. IF NON STRUCTURAL SOIL IS SELECTED A CUTOFF WALL IS REQUIRED IN PLACE OF A MOISTURE BARRIER.
2. SWALE MUST CONVEY DESIGN FLOWS PER GOVERNING AGENCY DESIGN STANDARDS.
3. TOP OF 6" PERFORATED PIPE TO BE SET 6" BELOW BOTTOM OF ROAD STRUCTURAL SECTION.



SECTION A-A

SIMILAR TO P1-02
WITH A PERFORATED
DRAIN PIPE

PRIORITY 2	
ROADSIDE BIORETENTION	
- NO CURB AND GUTTER	
SCALE: <i>NONE</i>	DATE: <i>04/06/17</i>
DWN. <i>DIT</i>	P2-05
CHK. <i>HM</i>	

Not to Scale



STORM WATER CALCULATOR

LID BMP Summary Page & Site Global Values

Project Information: Project Name: <u>The Redwood Apartments</u> Address/Location: <u>3442 Santa Rosa Avenue</u> Designer: <u>Jose Mederos</u> Date: <u>4/23/2019</u>	Site Information: Mean Seasonal Precipitation (MSP) of Project Site: <u>30.00</u> (inches) $K=MSP/30$ $K=$ <u>1.00</u> Impervious area - pre development: <u>14,280.0</u> ft ² Impervious area - post development: <u>150,327.0</u> ft ²	Based upon the pre and post development impervious area, the post construction BMP requirement is: <div style="text-align: center; color: red; font-weight: bold; font-size: 1.2em;">100% Capture & Treatment</div>
--	---	--

Summary of Saved BMP Results:

BMP ID:	Tributary Area		Requirements			BMP Design Results						
	Tributary Area (ft ²)	Runoff Reduction Measures (Y/N)	Type of Requirement Met	Type of BMP Design	Percent Achieved	Hydromodification Control		Flow Base Treatment		Delta Volume Capture		
						Required V _{Hydromod} (ft ³)	Achieved (ft ³)	Required Q Treatment (cfs)	Achieved (ft ³)	Required Vdelta (ft ³)	Achieved (ft ³)	
1	TRIB 1	13,742	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	102.8	618.2753	635.3910				
2	TRIB-2	7,107	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	102.8	224.6846	230.8800				
3	TRIB-3	13,792	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	100.8	424.3297	427.6710				
4	TRIB-4	13,535	Yes	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	103.5	326.4178	337.9200				
5	TRIB-5	2,485	No	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	105.2	83.2972	87.6000				
6	TRIB-6	11,373	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	107.2	375.0218	402.0000				
7	TRIB-7	5,015	No	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	101.7	168.1028	171.0000				
8	TRIB-8	8,685	No	Hydromod Volume Capture	Priority 3: P3-04 Roadside Bioretention - Curb Opening	101.4	291.1212	295.2000				
9	TRIB-9	8,541	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	101.1	253.8805	256.8000				
10	TRIB-10	12,206	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	106.0	388.7650	412.2000				
11	TRIB-11	11,616	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	105.3	375.4575	395.4000				
12	TRIB-12	8,655	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	104.5	265.2102	277.2000				
13	TRIB-13	11,308	No	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	102.3	379.0442	387.8100				
14	TRIB-14	11,065	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	116.6	347.3678	405.0000				
15	TRIB-15	8,369	No	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	106.7	280.5289	299.2500				
16	TRIB-16	13,050	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	100.7	429.7599	432.6000				
17	TRIB-17	20,754	Yes	Hydromod Volume Capture	Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter	100.8	660.6457	666.0000				
18	TRIB-18	8,869	No	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening	100.9	297.2889	300.0000				
19	TRIB-19	5,342	No	Hydromod Volume Capture	Priority 3: P3-04 Roadside Bioretention - Curb Opening	100.5	179.0638	180.0000				
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

STORM WATER CALCULATOR

The Redwood Apartments
3442 Santa Rosa Avenue
Jose Mederos
4/23/2019

BMP Input Worksheet

Enter BMP ID and BMP's Information:		Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells. To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons.	
To start a New BMP calculation, Press the Clear/Reset All Inputs button.	BMP ID (MUST BE unique): <input type="text" value="TRIB-3"/>	BMP's Physical Tributary Area: <input type="text" value="13,792"/> ft ² <input type="text" value="0.317"/> Acres	Action Buttons:
	BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>	Clear/Reset All Inputs Clear or load default values into cells of individual section or entire page.	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-04 Roadside Bioretention - Curb Opening"/>		Calculate Will load values into worksheet, calculate and displays results.	Save BMP Data and Results Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
BMP Notes:		Display Calculation Worksheet Will load the values, calculate and display the corresponding worksheet with results.	
Clear/Reset All Inputs	Calculate All Sections	Save BMP Data and Results	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees		
Number of new Evergreen Trees that qualify as interceptor trees:	<input type="text" value="0"/>	Interceptor Tree trunk must be no greater than 25 feet from impervious surface.
Number of new Deciduous Trees that qualify as interceptor trees:	<input type="text" value="0"/>	
Enter square footage of qualifying existing tree canopy :	<input type="text" value="0"/> ft ²	
Disconnected Roof Drains		
Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1		
Amount of rooftop area that drain to disconnected downspouts:	<input type="text" value="4,534"/> ft ²	INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2		
Percent of rooftop area to be disconnected from downspouts:	<input type="text" value="0"/> %	
Select Density:	<input type="text" value="1"/> Units per Acre	
Paved Area Disconnection		
Paved Area Type (select from drop down list):	<input type="text" value="Select paved area type"/>	
Enter area of alternatively designed paved area:	<input type="text" value="0.0"/> ft ²	
Buffer Strips & Bovine Terraces		
Area draining to a Buffer Strip or Bovine Terrace:	<input type="text" value="0.0"/> ft ²	Total Runoff Reduction Measures : <input type="text" value="1,134"/> ft ²
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="12,659"/> ft ²
Reset Reduction Measures Inputs	Display "Runoff Reduction Measures" calculation worksheet	Calculate Results

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>		
Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/>		
CN _{POST} =	<input type="text" value="92"/>	
User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="424.33"/> ft ³
Reset Hydromod Inputs	Display "Hydromod" calculation worksheet	Calculate Results

BMP Sizing Tool: Hydromodification Control Requirement				The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground		Ponded Water Above Ground	
	Imported BMP Soil Porosity:	<input type="text" value="0.30"/>	Depth:	<input type="text" value="0.00"/> ft
	Depth:	<input type="text" value="1.83"/> ft	Width:	<input type="text" value="0.00"/> ft
	Width:	<input type="text" value="ft"/>	Length:	<input type="text" value="0.00"/> ft
Length:	<input type="text" value="ft"/>			
-- OR -- Entering an Area information will override Width & Length information!				
Area BMP:	<input type="text" value="779.00"/> ft ²	Ponded Area:	<input type="text" value="ft<sup>2</sup>"/>	
		Total Volume achieved in BMP:	<input type="text" value="427.67"/> ft ³	
Reset Hydromod Sizing Inputs	Display "Hydromod Sizing" calculation worksheet	Calculate Results	Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-4"/> BMP's Physical Tributary Area: <input type="text" value="13,535"/> <input type="text" value="0.311"/> ft² Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-04 Roadside Bioretention - Curb Opening"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes:		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. <i>Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.</i>
<input type="button" value="Clear/Reset All Inputs"/>		<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: <input type="text" value="0"/> Number of new Deciduous Trees that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Select disconnection condition"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="3,797"/> ft²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft²		Total Runoff Reduction Measures : <input type="text" value="3,797"/> ft²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>		<input type="text" value="9,738"/> ft²
Resulting reduced Tributary Area used for BMP sizing:		

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{POST} = <input type="text" value="92"/> User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
<input type="button" value="Reset Hydromod Inputs"/>		V _{Hydromod} : <input type="text" value="326.42"/> ft³
<input type="button" value="Display 'Hydromod' calculation worksheet"/>		<input type="button" value="Calculate Results"/>

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.		BMP Volume Below Ground Imported BMP Soil Porosity: <input type="text" value="0.30"/> Depth: <input type="text" value="1.60"/> ft Width: <input type="text" value=""/> ft Length: <input type="text" value=""/> ft	Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input type="text" value="704.00"/> ft²		Ponded Area: <input type="text" value=""/> ft²	
Total Volume achieved in BMP: <input type="text" value="337.92"/> ft³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>		<input type="button" value="Calculate Results"/>	
<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>		Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-5"/> BMP's Physical Tributary Area: <input type="text" value="2,485"/> <input type="text" value="0.057"/> ft² Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-04 Roadside Bioretention - Curb Opening"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: <input type="text" value="0"/> Number of new Deciduous Trees that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="0"/> ft²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft²		Total Runoff Reduction Measures : <input type="text" value="0"/> ft²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>
<input type="button" value="Calculate Results"/>		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="2,485"/> ft²

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{POST} = <input type="text" value="92"/> User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
<input type="button" value="Reset Hydromod Inputs"/>		<input type="button" value="Display 'Hydromod' calculation worksheet"/>
<input type="button" value="Calculate Results"/>		V _{Hydromod} : <input type="text" value="83.30"/> ft³

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.		BMP Volume Below Ground Imported BMP Soil Porosity: <input type="text" value="0.30"/> Depth: <input type="text" value="2.00"/> ft Width: <input type="text" value=""/> ft Length: <input type="text" value=""/> ft	
Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft		Percent of Requirement Achieved: <input type="text" value="105.17"/> % Results must be at least 100%	
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input type="text" value="146.00"/> ft²		Ponded Area: <input type="text" value=""/> ft²	
Total Volume achieved in BMP: <input type="text" value="87.60"/> ft³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>		<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>	
<input type="button" value="Calculate Results"/>		Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	

STORM WATER CALCULATOR

The Redwood Apartments
3442 Santa Rosa Avenue
Jose Mederos
4/23/2019

BMP Input Worksheet

Enter BMP ID and BMP's Information:		Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons.	
To start a New BMP calculation, Press the Clear/Reset All Inputs button.	BMP ID (MUST BE unique): <input type="text" value="TRIB-7"/>	BMP's Physical Tributary Area: <input type="text" value="5.015"/> <input type="text" value="0.115"/> ft² Acres	Action Buttons:
	BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>	Clear/Reset All Inputs Clear or load default values into cells of individual section or entire page.	
Type of BMP Design (select from pull down):		Calculate Will load values into worksheet, calculate and displays results.	
Priority 2: P2-04 Roadside Bioretention - Curb Opening		Display Calculation Worksheet Will load the values, calculate and display the corresponding worksheet with results.	
BMP Notes:		Save BMP Data and Results Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.	
Clear/Reset All Inputs	Calculate All Sections	Save BMP Data and Results	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees		
Number of new Evergreen Trees that qualify as interceptor trees:	<input type="text" value="0"/>	Interceptor Tree trunk must be no greater than 25 feet from impervious surface.
Number of new Deciduous Trees that qualify as interceptor trees:	<input type="text" value="0"/>	
Enter square footage of qualifying existing tree canopy :	<input type="text" value="0"/> ft²	
Disconnected Roof Drains		
Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1		
Amount of rooftop area that drain to disconnected downspouts:	<input type="text" value="0"/> ft²	INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2		
Percent of rooftop area to be disconnected from downspouts:	<input type="text" value="0"/> %	
Select Density:	<input type="text" value="1"/> Units per Acre	
Paved Area Disconnection		
Paved Area Type (select from drop down list):	<input type="text" value="Select paved area type"/>	
Enter area of alternatively designed paved area:	<input type="text" value="0.0"/> ft²	
Buffer Strips & Bovine Terraces		
Area draining to a Buffer Strip or Bovine Terrace:	<input type="text" value="0.0"/> ft²	Total Runoff Reduction Measures : <input type="text" value="0"/> ft²
Reset Reduction Measures Inputs		Display "Runoff Reduction Measures" calculation worksheet
		Calculate Results
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="5.015"/> ft²

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>		
Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/>		
CN _{POST} =	<input type="text" value="92"/>	
User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="168.10"/> ft³
Reset Hydromod Inputs	Display "Hydromod" calculation worksheet	Calculate Results

BMP Sizing Tool: Hydromodification Control Requirement			The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.		
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground		Ponded Water Above Ground		
	Imported BMP Soil Porosity:	<input type="text" value="0.30"/>		Depth: <input type="text" value="0.00"/> ft	
	Depth:	<input type="text" value="2.00"/> ft		Width: <input type="text" value="0.00"/> ft	
	Width:	<input type="text" value="ft"/>		Length: <input type="text" value="0.00"/> ft	
Length:	<input type="text" value="ft"/>				
-- OR -- Entering an Area information will override Width & Length information!					
Area BMP:	<input type="text" value="285.00"/> ft²	Ponded Area:	<input 2"="" type="text" value="ft<sup>2</sup></td> </tr> <tr> <td colspan="/> Total Volume achieved in BMP:	<input type="text" value="171.00"/> ft³	
Reset Hydromod Sizing Inputs	Display "Hydromod Sizing" calculation worksheet	Calculate Results			
			Percent of Requirement Achieved: <input type="text" value="101.72"/> % Results must be at least 100%		
			Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes		

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-8"/>	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
		BMP's Physical Tributary Area: <input type="text" value="8,685"/> ft ² <input type="text" value="0.199"/> Acres	
		BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>	Action Buttons:
Type of BMP Design (select from pull down): <input type="text" value="Priority 3: P3-04 Roadside Bioretention - Curb Opening"/>		<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate"/>
BMP Notes: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate"/>
		<input type="button" value="Calculate All Sections"/>	<input type="button" value="Display Calculation Worksheet"/>
		<input type="button" value="Save BMP Data and Results"/>	<input type="button" value="Save BMP Data and Results"/>

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new <i>Evergreen Trees</i> that qualify as interceptor trees: <input type="text" value="0"/> Number of new <i>Deciduous Trees</i> that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft ²		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="0"/> ft ²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft ²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft ²		Total Runoff Reduction Measures : <input type="text" value="0"/> ft ²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>		<input type="button" value="Calculate Results"/>
Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="8,685"/> ft ²		

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>		
Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/>		
CN _{post} = <input type="text" value="92"/>		
User Composite post development CN: <input type="text" value=""/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="291.12"/> ft ³
<input type="button" value="Reset Hydromod Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Hydromod' calculation worksheet"/>		

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground		Ponded Water Above Ground
	Imported BMP Soil Porosity: <input type="text" value="0.30"/>	Depth: <input type="text" value="3.00"/> ft Width: <input type="text" value=""/> ft Length: <input type="text" value=""/> ft	Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input type="text" value="328.00"/> ft ²		Ponded Area: <input type="text" value=""/> ft ²	
Total Volume achieved in BMP: <input type="text" value="295.20"/> ft ³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>		<input type="button" value="Calculate Results"/>	
<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>		Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	
Percent of Requirement Achieved: <input type="text" value="101.40"/> % Results must be at least 100%			

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-10"/> BMP's Physical Tributary Area: <input type="text" value="12,206"/> ft ² <input type="text" value="0.280"/> Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells. To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes:		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: <input type="text" value="0"/> Number of new Deciduous Trees that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft ²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="2,433"/> ft ²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft ²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft ²		Total Runoff Reduction Measures : <input type="text" value="608"/> ft ²
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="11,598"/> ft ²
<input type="button" value="Reset Reduction Measures Inputs"/>	<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>	<input type="button" value="Calculate Results"/>

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{post} = <input type="text" value="92"/> User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="388.76"/> ft ³
<input type="button" value="Reset Hydromod Inputs"/>	<input type="button" value="Display 'Hydromod' calculation worksheet"/>	<input type="button" value="Calculate Results"/>

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	Imported BMP Soil Porosity: <input type="text" value="0.30"/>	Pondered Water Above Ground	Percent of Requirement Achieved: <input type="text" value="106.03"/> % Results must be at least 100%
	Depth: <input type="text" value="3.00"/> ft Width: <input type="text" value="ft"/> ft Length: <input type="text" value="ft"/> ft	Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft	
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input type="text" value="458.00"/> ft ²		Pondered Area: <input type="text" value="ft<sup>2</sup>"/>	
Total Volume achieved in BMP: <input type="text" value="412.20"/> ft ³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>	<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-11"/> BMP's Physical Tributary Area: <input type="text" value="11,616"/> <input type="text" value="0.267"/> ft² Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes:		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
<input type="button" value="Clear/Reset All Inputs"/>		<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: <input type="text" value="0"/> Number of new Deciduous Trees that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="1,660"/> ft²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft²		Total Runoff Reduction Measures : <input type="text" value="415"/> ft²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>		<input type="button" value="Calculate Results"/>
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="11,201"/> ft²

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{post} = <input type="text" value="92"/> User Composite post development CN: <input type="text" value=""/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="375.46"/> ft³
<input type="button" value="Reset Hydromod Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Hydromod' calculation worksheet"/>		<input type="button" value="Calculate Results"/>

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.		BMP Volume Below Ground Imported BMP Soil Porosity: <input type="text" value="0.30"/> Depth: <input type="text" value="1.00"/> ft Width: <input type="text" value=""/> ft Length: <input type="text" value=""/> ft	Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input type="text" value="1,318.00"/> ft²		Ponded Area: <input type="text" value=""/> ft²	
Total Volume achieved in BMP: <input type="text" value="395.40"/> ft³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>		<input type="button" value="Calculate Results"/>	
<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>		Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): TRIB-12 BMP's Physical Tributary Area: 8,655 ft ² 0.199 Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells. To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
		BMP Design Criteria: 100% Capture & Treatment	Action Buttons:
Type of BMP Design (select from pull down): Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter		<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate"/>
BMP Notes:		<input type="button" value="Display Calculation Worksheet"/>	<input type="button" value="Save BMP Data and Results"/>
		<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>
		<input type="button" value="Save BMP Data and Results"/>	Clear or load default values into cells of individual section or entire page. Will load values into worksheet, calculate and displays results. Will load the values, calculate and display the corresponding worksheet with results. Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: 0 Number of new Deciduous Trees that qualify as interceptor trees: 0 Enter square footage of qualifying existing tree canopy : 0 ft ²		
Disconnected Roof Drains Select disconnection condition: Runoff is directed across landscape; Width of area: 5' to 9'		
Method 1 Amount of rooftop area that drain to disconnected downspouts: 2,972 ft ²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: 0 % Select Density: 1 Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): Select paved area type Enter area of alternatively designed paved area: 0.0 ft ²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: 0.0 ft ²		Total Runoff Reduction Measures : 743 ft ²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>		Resulting reduced Tributary Area used for BMP sizing: 7,912 ft ²

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: D: 0 - 0.05 in/hr infiltration (transmission) rate Post development ground cover description: Residential - 1/8 acre or less (town houses) CN _{POST} = 92 User Composite post development CN:		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : 265.21 ft ³
<input type="button" value="Reset Hydromod Inputs"/>		<input type="button" value="Calculate Results"/>
<input type="button" value="Display 'Hydromod' calculation worksheet"/>		

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground Imported BMP Soil Porosity: 0.30 Depth: 2.00 ft Width: ft Length: ft	Ponded Water Above Ground Depth: 0.00 ft Width: 0.00 ft Length: 0.00 ft	Percent of Requirement Achieved: 104.52 % Results must be at least 100%
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: 462.00 ft ²		Ponded Area: ft ²	
Total Volume achieved in BMP: 277.20 ft ³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>		<input type="button" value="Calculate Results"/>	
<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>		Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	

STORM WATER CALCULATOR

The Redwood Apartments
3442 Santa Rosa Avenue
Jose Mederos
4/23/2019

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-13"/> BMP's Physical Tributary Area: <input type="text" value="11,308"/> <input type="text" value="0.260"/> Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells. To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes:		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: <input type="text" value="0"/> Number of new Deciduous Trees that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="0"/> ft²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft²		Total Runoff Reduction Measures : <input type="text" value="0"/> ft²
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="11,308"/> ft²
<input type="button" value="Reset Reduction Measures Inputs"/>	<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>	<input type="button" value="Calculate Results"/>

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{post} = <input type="text" value="92"/> User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="379.04"/> ft³
<input type="button" value="Reset Hydromod Inputs"/>	<input type="button" value="Display 'Hydromod' calculation worksheet"/>	<input type="button" value="Calculate Results"/>

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground Imported BMP Soil Porosity: <input type="text" value="0.30"/> Depth: <input type="text" value="3.10"/> ft Width: <input type="text" value=""/> ft Length: <input type="text" value=""/> ft		Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft
	-- OR -- Entering an Area information will override Width & Length information!		
Area BMP: <input type="text" value="417.00"/> ft²		Ponded Area: <input type="text" value=""/> ft²	
Total Volume achieved in BMP: <input type="text" value="387.81"/> ft³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>	<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	Percent of Requirement Achieved: <input type="text" value="102.31"/> % Results must be at least 100%
			Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes

STORM WATER CALCULATOR

The Redwood Apartments
3442 Santa Rosa Avenue
Jose Mederos
4/23/2019

BMP Input Worksheet

Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-15"/> BMP's Physical Tributary Area: <input type="text" value="8,369"/> <input type="text" value="0.192"/> ft² Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells . To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-05 Roadside Bioretention - No Curb AND Gutter"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. <i>Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.</i>
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new <i>Evergreen Trees</i> that qualify as interceptor trees: <input type="text" value="0"/> Number of new <i>Deciduous Trees</i> that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="0"/> ft²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft²		Total Runoff Reduction Measures : <input type="text" value="0"/> ft²
<input type="button" value="Reset Reduction Measures Inputs"/>		<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>
<input type="button" value="Calculate Results"/>		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="8,369"/> <input type="text" value="ft<sup>2</sup>"/>

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{POST} = <input type="text" value="92"/> User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
<input type="button" value="Reset Hydromod Inputs"/>		<input type="button" value="Display 'Hydromod' calculation worksheet"/>
<input type="button" value="Calculate Results"/>		V _{Hydromod} : <input type="text" value="280.53"/> ft³

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.		BMP Volume Below Ground Imported BMP Soil Porosity: <input type="text" value="0.30"/> Depth: <input type="text" value="2.50"/> ft Width: <input type="text" value="ft"/> ft Length: <input type="text" value="ft"/> ft	
Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft		Percent of Requirement Achieved: <input type="text" value="106.67"/> % <i>Results must be at least 100%</i>	
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input type="text" value="399.00"/> ft²		Ponded Area: <input type="text" value="ft<sup>2</sup>"/>	
Total Volume achieved in BMP: <input type="text" value="299.25"/> ft³			
<input type="button" value="Reset Hydromod Sizing Inputs"/>		<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>	
<input type="button" value="Calculate Results"/>		Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes	

STORM WATER CALCULATOR

BMP Input Worksheet

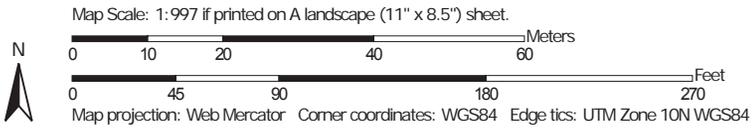
Enter BMP ID and BMP's Information: To start a New BMP calculation, Press the Clear/Reset All Inputs button.		BMP ID (MUST BE unique): <input type="text" value="TRIB-18"/> BMP's Physical Tributary Area: <input type="text" value="8,869"/> <input type="text" value="0.204"/> ft² Acres	Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells. To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons. CAUTION - MUST USE the Calculate button(s) to update results!
BMP Design Criteria: <input type="text" value="100% Capture & Treatment"/>		Action Buttons:	
Type of BMP Design (select from pull down): <input type="text" value="Priority 2: P2-04 Roadside Bioretention - Curb Opening"/>		<input type="button" value="Clear/Reset All Inputs"/>	Clear or load default values into cells of individual section or entire page.
BMP Notes:		<input type="button" value="Calculate"/>	Will load values into worksheet, calculate and displays results.
		<input type="button" value="Display Calculation Worksheet"/>	Will load the values, calculate and display the corresponding worksheet with results.
		<input type="button" value="Save BMP Data and Results"/>	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All Sections"/>	<input type="button" value="Save BMP Data and Results"/>	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.
Interceptor Trees Number of new Evergreen Trees that qualify as interceptor trees: <input type="text" value="0"/> Number of new Deciduous Trees that qualify as interceptor trees: <input type="text" value="0"/> Enter square footage of qualifying existing tree canopy : <input type="text" value="0"/> ft²		
Interceptor Tree trunk must be no greater than 25 feet from impervious surface.		
Disconnected Roof Drains Select disconnection condition: <input type="text" value="Runoff is directed across landscape; Width of area: 5' to 9'"/>		
Method 1 Amount of rooftop area that drain to disconnected downspouts: <input type="text" value="0"/> ft²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.
OR Method 2 Percent of rooftop area to be disconnected from downspouts: <input type="text" value="0"/> % Select Density: <input type="text" value="1"/> Units per Acre		
Paved Area Disconnection Paved Area Type (select from drop down list): <input type="text" value="Select paved area type"/> Enter area of alternatively designed paved area: <input type="text" value="0.0"/> ft²		
Buffer Strips & Bovine Terraces Area draining to a Buffer Strip or Bovine Terrace: <input type="text" value="0.0"/> ft²		Total Runoff Reduction Measures : <input type="text" value="0"/> ft²
		Resulting reduced Tributary Area used for BMP sizing: <input type="text" value="8,869"/> ft²
<input type="button" value="Reset Reduction Measures Inputs"/>	<input type="button" value="Display 'Runoff Reduction Measures' calculation worksheet"/>	<input type="button" value="Calculate Results"/>

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.
Post development hydrologic soil type within tributary area: <input type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/> Post development ground cover description: <input type="text" value="Residential - 1/8 acre or less (town houses)"/> CN _{post} = <input type="text" value="92"/> User Composite post development CN: <input type="text"/>		
Entering a calculated composite CN will override selections made from the pull down menus above.		
		V _{Hydromod} : <input type="text" value="297.29"/> ft³
<input type="button" value="Reset Hydromod Inputs"/>	<input type="button" value="Display 'Hydromod' calculation worksheet"/>	<input type="button" value="Calculate Results"/>

BMP Sizing Tool: Hydromodification Control Requirement		The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.	
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	BMP Volume Below Ground Imported BMP Soil Porosity: <input type="text" value="0.30"/> Depth: <input type="text" value="2.00"/> ft Width: <input type="text" value=""/> ft Length: <input type="text" value=""/> ft		Ponded Water Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.00"/> ft Length: <input type="text" value="0.00"/> ft
	-- OR -- Entering an Area information will override Width & Length information!		
Area BMP: <input type="text" value="500.00"/> ft²		Poned Area: <input type="text" value=""/> ft²	
		Total Volume achieved in BMP: <input type="text" value="300.00"/> ft³	
<input type="button" value="Reset Hydromod Sizing Inputs"/>	<input type="button" value="Display 'Hydromod Sizing' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	Percent of Requirement Achieved: <input type="text" value="100.91"/> % Results must be at least 100%
			Select Hydromodification BMP Design when Saving? <input checked="" type="checkbox"/> Yes

HYDROLOGIC SOIL GROUP D



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California

Survey Area Data: Version 12, Sep 13, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 31, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WoA	Wright loam, shallow, wet, 0 to 2 percent slopes	4.1	100.0%
Totals for Area of Interest		4.1	100.0%

Project Name: **The Redwood Apartments**

Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...			Achieves...			BMP in priority selected?		Unique Identifier of BMP per planes	Explanation of selection	Other notes:
			High Ground Water	Contamination	Slope Constraints	Treatment	Volume Capture	Runoff Reduction Measure	Yes	No			
Universal BMP- to be considered on all projects.	Living Roof	N/A	N/A	X	X	X	X	X					
	Rainwater Harvesting	N/A	N/A	X	X	X		X					
Runoff Reduction Measures	Interceptor Trees	N/A	N/A	X	X	X			X				
	Bovine Terrace	RRM-01	Bovine Terrace	X					X				
	Vegetated Buffer Strip	RRM-02	Vegetated Buffer Strip						X				
	Impervious Area Disconnection	N/A	N/A	X	X	X			X				
Priority 1- to be installed with no underdrains or liners. Must drain all stading water within 72 hours.	Bioretention	P1-02	Roadside Bioretention - no C & G					X	X				
	Vegetated Swale-with Bioretention	P1-06	Swale with Bioretention					X	X				
	Constructed Wetlands	N/A	N/A					X	X				
Priority 2 BMPs- with subsurface drains installed above the capture volume.	Bioretention	P2-02	Roadside Bioretention - Flush Design Roadside					X	X				
		P2-03	Roadside Bioretention- Contiguous SW					X	X				
		P2-04	Roadside Bioretention- Curb Opening					X	X		✓		
		P2-05	Roadside Bioretention- No C & G					X	X		✓		
	Constructed Wetlands	N/A	N/A					X	X				

Date: _____

Page ____ of ____

Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...			Slope Constraints Achieves...	Treatment	Volume Capture	Runoff Reduction Measure	BMP in priority selected?		Unique Identifier of BMP per planes	Explanation of selection	Other notes:	
			High Ground Water	Contamination						Yes	No				
Priority 3 BMPs- installed with subdrains and/or impermeable liner. Does not achieve volume capture and must be used as part of a treatment train.	Bioretention	P3-02	Roadside Bioretention - Flush Design Roadside	X	X	X	X								
		P3-03	Roadside Bioretention- Contiguous SW	X	X	X	X								
		P3-04	Roadside Bioretention- Curb Opening	X	X	X	X								
	Flow Through Planters	P3-05	Flow Through Planters	X	X	X	X								
	Vegetated Swale	P3-06	With Bioretention	X	X	X	X	X							
		P3-07	Vegetated Swale	X	X	X	X								
	Priority 4 BMPs- does not achieve volume capture and must be used as part of a	Tree Filter Unit			X	X	X	X							
Modular Bioretention				X	X	X	X								
Priority 5 BMPs- does not achieve volume capture and must be used as part of a treatment train.	Chambered Separator Units			X	X	X	X								
	Centrifugal Separator Units			X	X	X	X								
	Trash Excluders			X	X	X	X								
	Filter Inserts			X	X	X	X								
Priority 6 BMPs- see the "Offset Program" chapter for details.	Offset Program						N/A	N/A	N/A						
Other	Detention			X											

Storm Water Quality Special Feature Maintenance Check List

Date: _____
 Start Time: _____
 Stop Time: _____

Inspector: _____
 Project: _____
 Address: _____

Inspection Status Codes:
S = Satisfactory * - See Notes on Form C
D = Deficient

Special Feature or Conditions

Reference code	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Additional Special Maintenance Inspection Criterial	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.
BMP ID:											

Office Use: _____
 Complete: _____ Issues Corrective Action: _____ Re-Inspection Required: _____

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO: _____

City of Santa Rosa- Utilities Department
Storm Water & Creeks Section- Supervising Engineer
69 Stony Circle
Santa Rosa CA 95401

Project/Property: _____
APN(s): _____

Santa Rosa, California

**DECLARATION OF COVENANTS REGARDING MAINTENANCE OF
STORM WATER BMP FACILITIES**

This Declaration of Covenants Regarding Maintenance of Storm Water BMP Facilities (“Declaration”) is made on this _____ day of _____, 20____, by _____ (“Landowner”) _____.

RECITALS

- A. Landowner is the fee simple owner of certain real property located in the City of Santa Rosa (“City”), Sonoma County, California, APN 134-132-070 and more fully described in Exhibit A to this Declaration (“Property”).
- B. The City’s National Pollutant Discharge Elimination System (“NPDES”) Municipal Separate Storm Sewer System (“MS4”) Permit, Order number R1-2009-0050, issued by the North Coast Regional Water Quality Control Board, requires the City to implement and enforce specific requirements for the construction and maintenance of onsite storm water management facilities/best management practices (collectively, “BMP”) for development, redevelopment, and other applicable projects with the goal of mitigating impacts to storm water quality and runoff volume discharges into the MS4.
- C. Provisions of Chapter 17-12 and other applicable sections of the Santa Rosa City Code shall apply to the construction, inspection and maintenance of BMP facilities and the enforcement of MS4 Permit requirements.
- D. On INSERT DATE, WHO (City Engineer OR Chief Building Official) approved Landowner’s IMPROVEMENT PLANS or BUILDING PERMIT SITE PLAN (“Plan”) and a Final Standard Urban Stormwater Mitigation Plan (SUSMP”) for the Property which require the construction and maintenance of BMP facilities on the Property (the “BMP Facilities”) by Landowner. The BMP Facilities required under the SUSMP may include both built and

landscaping features. The SUSMP may be inspected at the City of Santa Rosa, Department of Utilities, Storm Water & Creeks Section, 69 Stony Circle upon appointment.

- E. The SUSMP requires that Landowner make and execute this Declaration.

DECLARATION OF COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals, Landowner hereby covenants, agrees and declares as follows:

1. Landowner shall, at Landowner's sole cost and expense, construct, inspect, and maintain the BMP Facilities in accordance with the Plan and the SUSMP. Landowner shall assure that all BMPs remain fully functional and that all areas identified in the Plan and SUSMP for treatment and/or volume capture discharge to the specified BMP as designed.
2. Landowner shall keep all records related to annual inspections of BMP's by City and all records related to BMP maintenance for a period of at least five years. The records shall include records of any BMP Facilities corrections, repairs, and replacements. Landowner shall make these records available to the City upon request.
3. In the event Landowner fails to maintain the BMP Facilities in good working condition as solely determined by the City, the City may enter upon the Property and take whatever steps it deems reasonably necessary to maintain and/or make in good working condition, such BMP Facilities. It is expressly understood that the City is under no obligation to maintain or repair the BMP Facilities, and in no event shall this Declaration be construed to impose such an obligation on the City.
4. In the event that the City performs work of any nature, or expends any funds in the performance of such work for labor, use of equipment, supplies, materials, or the like, due to failure of the Landowner to perform its maintenance obligations under this Declaration, as solely determined by City, Landowner shall reimburse the City within 60 days of receipt of notice for all costs incurred by the City to undertake such work. Costs shall include, but are not limited to, the actual cost of construction, maintenance and/or repair, and administrative costs directly related to such work.
5. Any violation of the Plan or SUSMP by Landowner shall be deemed a public nuisance under Chapter 1-30 of the Santa Rosa City Code and City shall be entitled to the remedies available to it under Chapter 1-30 in addition to those available to it under Chapter 17-12. The remedies identified herein shall be in addition to and cumulative of all other remedies, criminal or civil, which may be pursued by the City.

6. Landowner shall indemnify, defend and hold harmless the City and its employees, officials, and agents, from and against any liability, (including liability for claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, interest, defense costs, and expert witness fees), where the same relates to, or arises out of, the construction, presence, existence, inspection, or maintenance of BMP Facilities on the Property or the performance of the covenants underlying this Declaration by Landowner, its officers, employees, agents, contractors or sub-contractors, excepting only that resulting from the sole, active negligence or intentional misconduct of the City, its employees, officials, or agents. This indemnification obligation is not limited in any way by any limitation on the amount or type of damages or compensation payable to or for the Landowner or its agents under workers' compensation acts, disability benefits acts or other employees' benefits acts. If any judgment or claim against the City, its officials, agents, or employees, shall be entered, Landowner shall pay all cost and expenses in connection therewith.
7. If any provisions of this Declaration shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.
8. This Declaration shall be governed according to the laws of the State of California. The parties hereto agree that the forum for the adjudication of any dispute related to this Declaration shall be brought exclusively and solely in Sonoma County, California.
9. Landowner shall not assign this Declaration to a third party without the express prior written consent of the City, provided that such consent will not be unreasonably withheld and that such consent shall not be required for Landowner to sell or lease the property to a third party.
10. Landowner binds itself, its partners, successors, legal representatives and assigns to the City, and to the partners, successors, legal representatives and assigns of the City with respect to all promises and agreements contained herein.
11. This Declaration shall be recorded by Landowner, and shall: a) constitute a "covenant running with the land;" b) be binding upon Landowner and Landowner's successors, heirs, and assigns in perpetuity; and, 3) benefit the City of Santa Rosa, its successors, and assigns. Any breach of this Declaration shall render Landowner

or Landowner's heirs, successors or assigns liable pursuant to the provisions of the Santa Rosa City Code.

12. Any notice, submittal or communication required or permitted to be served on Landowner or City may be served by personal delivery to the person or the office of the person identified below. Service may also be made by mail, by placing first-class postage, and addressed as indicated below, and depositing in the United States mail to:

City Representative:

City of Santa Rosa
Utilities Department
Storm Water & Creeks Section
Supervising Engineer
69 Stony Circle
Santa Rosa CA 95401

Landowner or Landowner Representative:

Name: Pacific West Communities
Address: 430 E. State Street, Suite 100
Eagle, Idaho 83616

Executed as of the day and year first above stated.

LANDOWNER:

Name: Pacific West Communities

Signatures of Authorized Persons:

By: _____

Print Name: _____

Title: _____

By: _____

Print Name: _____

Title: _____

ATTACHMENTS:

- Exhibit A- Property Description
- Notary Acknowledgment