PRELIMINARY STORMWATER CONTROL PLAN FOR A REGULATED PROJECT

890 Petaluma Blvd N.

890 PETALUMA BLVD N. Petaluma, CA, 94952



CIVIL STRUCTURAL ELECTRICAL WATER | WASTEWATER

Project No. 2020150 May 14, 2021 Updated: September 23, 2021 Updated: March 31, 2022

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Vicinity Map Stormwater Control Plan

This Stormwater Control Plan was prepared using the Bay Area Stormwater Management Agencies Association (BASMAA) template dated January 2019.

I. PROJECT DATA

Table 1. Project Data

Project Name/Number	Petaluma Blvd N. / 2020150
Application Submittal Date	
Project Location	890 Petaluma Blvd N., Petaluma, CA 94952 APN 006-051-076
Project Phase No.	1
Project Type and Description	Project Type: Regulated – This project consists of the construction of a generational cooperative housing facility and parking and driveway entrance improvements.
Total Project Site Area (acres)	0.375 acres
Total New and Replaced Impervious Surface Area	9,455 sqft (0.22 acres)
Total Pre-Project Impervious Surface Area	14,283 sqft (0.328 acres)
Total Post-Project Impervious Surface Area	13,610 sqft (0.312 acres)

II. SETTING

II.A. Project Location and Description

The 890 CoOp project site comprises approximately 0.375 acres and is located at 890 Petaluma Blvd N, in Petaluma, California. The project site is located approximately, 0.6 miles southwest of U.S. Highway 101, 0.3 miles west of Petaluma River, and has approximate coordinates of 38.244701° N & 122.644362° W. See the Vicinity Map in Figure A.

II.B. Existing Site Features and Conditions

The project site is currently developed with an existing building on the corner of the intersection of W. Payran St. and Petaluma Blvd. N. Stormwater sheet flows from the existing building to valley gutters and drainage inlets on the north, west and south sides of the property. Storm drains convey stormwater from the drainage inlets to the City's storm drain system located on Petaluma Blvd N. or into the valley gutter on West Payran Street. Drainage from the site eventually discharges to the Petaluma River. The area surrounding the project boundary consists of paved roads and urban infrastructure. Based on mapping from the National Resources Conservation Service (NRCS) Web Soil Survey, the project site soils are classified as Clear Lake clay (Hydrologic Soil Group "D") on the east side of the parcel and Yolo clay loam (Hydrologic Soil Group "C") on the west side of the parcel. According to the NRCS, Group "C" Soils have a slow infiltration rate when thoroughly wet, consisting chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission. Group "D" Soils have a very slow infiltration rate (high runoff potential) when thoroughly wet, consisting chiefly of clays that have a high shrink-swell potential, soils that have

a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

II.C. Opportunities and Constraints for Stormwater Control

Constraints of the project include the relatively small parcel size and flat slopes which make it challenging to direct stormwater from all impervious surfacing to treatment areas and design overflow outlets in bioretention facilities to connect into the existing City storm drain system. The proposed improvements incorporate stormwater treatment measures as part of the project including bio-retention facilities, roof gardens, and landscaping. These measures are located throughout the site to account for the challenging site constraints. There are some areas where it is not feasible to collect and treat stormwater. The proposed stormwater treatment areas have been oversized to account for the impervious areas where stormwater will not be treated. After treatment, runoff will flow to the southwestern and northeaster corners of the parcel towards existing city storm drains. Overall, the resurfacing and installation of new vegetation areas will improve the stormwater control for the site.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

The small parcel size and large area of existing impervious surfacing limits the development of large pervious areas.

III.A.2. Preservation of natural drainage features

The current site drains to an existing storm drain system which eventually discharges to Petaluma River. The existing drainage pattern for the site shall be preserved where feasible as a majority of the stormwater from the site will be conveyed to this outlet.

III.A.3. Setbacks from creeks, wetlands, and riparian habitats

Development was not performed within 20 feet or more of nearby creeks and riparian habitats.

III.A.4. Minimization of imperviousness

Impervious surfacing of the site was minimized to meet the needs and requirements of the development.

III.A.5. Use of drainage as a design element

Vegetated areas adjacent to the new building shall be utilized for both treatment and aesthetics.

III.B. Use of Permeable Pavements

The proposed dividers between planter areas for the offsite improvements North & South of the proposed cooperative housing development will be surfaced with pervious pavers in accordance with the information in "Criteria for Pervious Pavements" on page 4-6 of the Bay Area Stormwater Management Agencies Association (BASMAA) Post-construction Manual.

III.C. Dispersal of Runoff to Pervious Areas

A majority of the new or reworked impervious areas will runoff to vegetated bioretention facilities, and landscaped areas.

III.D. Stormwater Control Measures

This project will follow the "Design Guidance for Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solano Counties (DGSTC)", prepared for the Bay Area Stormwater Management Agencies Association. Bioretention LID Facilities were sized at a minimum of 4% of the equivalent tributary area, as specified in the Phase II Stormwater National Pollutant Discharge Elimination System (NPDES) Permit.

Bioretention LID Facilities will be located adjacent to the impervious areas they serve varying in size. These facilities are designed in accordance with the Bioretention Facility Design Criteria beginning on Page 4-3 of the DGSTC, as well as Figures 4-1 and 4-2. Locations of LID facilities can be seen in the Drainage Map attached.

Storm drains will be utilized throughout the project to convey stormwater from impervious areas to the bioretention facilities at locations specified in the Stormwater Management Plan.

IV. DOCUMENTATION OF DRAINAGE DESIGN

IV.A. Descriptions of Each Drainage Management Area

IV.A.1. Table of Drainage Management Areas

Table 2. Drainage Management Areas

DMA	DMA Sub-		Area
Region	Region	Surface Type	(acres)
	1A	Rooftop	0.026
1	1B	Rooftop	0.022
1	1C & 1D	Rooftop Balcony	0.003
	1E & 1F	Rooftop Balcony	0.002
	2A	Rooftop	0.015
2	2B	Rooftop	0.013
2	2C	Rooftop	0.002
	2D & 2E	Rooftop Balcony	0.002
	3A	Rooftop	0.009
3	3B	Rooftop	0.007
	3C	Rooftop	0.002
	4A	Above Ground Walkways	0.016
4	4B	Above Ground Walkways	0.006
4	4C	Above Ground Walkways	0.005
	4D	Above Ground Walkways	0.005
5	-	Concrete	0.010
6	-	Concrete	0.010
7	-	Concrete/Building Canopy	0.022
8	-	Concrete	0.004
9	9A	Concrete/Asphalt Concrete/Parking Canopy	0.103
5	9B	Concrete	0.010

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DMA	DMA Sub-		Area
Region	Region	Surface Type	(acres)
10	-	Concrete/Building Canopy	0.010
11	-	Trash Enclosure	0.002
12	-	Concrete	0.002

IV.A.2. Drainage Management Area Descriptions

DMA 1A, totaling 1,146 square feet, is an impervious area, comprised of rooftop from Building 1. DMA 1A drains to Stormwater Control Measure Bioretention Facility LIDF#2.

DMA 1B, totaling 968 square feet, is an impervious area, comprised of rooftop from Building 1. DMA 1B drains to Stormwater Control Measure Bioretention Facility LIDF#1.

DMA 1C & 1D, totaling 150 square feet, are impervious areas, comprised of rooftop from Building 1 balconies. DMA 1C & 1D drain to Stormwater Control Measures SRA 2A-2C.

DMA 1E, totaling 44 square feet, is an impervious area, comprised of rooftop from Building 1 balconies. DMA 1E drains to Stormwater Control Measures SRA 5.

DMA 1F, totaling 17 square feet, is an impervious area, comprised of rooftop from Building 1 balconies. DMA 1F drains to Stormwater Control Measures Bioretention Facility LIDF#1.

DMA 2A, totaling 656 square feet, is an impervious area, comprised of rooftop from Building 2. DMA 2A drains to Stormwater Control Measure Bioretention Facility LIDF#3.

DMA 2B, totaling 582 square feet, is an impervious area, comprised of rooftop from Building 2. DMA 2A drains to Stormwater Control Measure Bioretention Facility LIDF#2.

DMA 2C, totaling 72 square feet, is an impervious area, comprised of rooftop from Elevator. DMA 2C drains to Stormwater Control Measures SRA 3A-3E.

DMA 2D & 2E, totaling 77 square feet, are impervious areas, comprised of rooftop from Building 2 balconies. DMA 2D & 2E drain to Stormwater Control Measures SRA 3A-3E.

DMA 3A-3C, totaling 775 square feet, are impervious areas, comprised of rooftop from Building 3. DMA 3A-3C drain to Stormwater Control Measure Bioretention Facility LIDF#4.

DMA 4A, totaling 699 square feet, is an impervious area, comprised of rooftop from the above ground walkways & stairs within the courtyard. DMA 4A drains to Stormwater Control Measure Bioretention Facility LIDF#3.

DMA 4B, totaling 275 square feet, is an impervious area, comprised of rooftop from the above ground walkways within the courtyard. DMA 4B drains to Stormwater Control Measure Bioretention Facility LIDF#4.

DMA 4C, totaling 228 square feet, is an impervious area, comprised of rooftop from the above ground walkways & stairs within the courtyard. DMA 4C drains to Stormwater Control Measure Bioretention Facility LIDF#1.

DMA 4D, totaling 218 square feet, is an impervious area, comprised of rooftop from the above ground walkways within the courtyard. DMA 4D drains to Stormwater Control Measure Bioretention Facility LIDF#2.

DMA 5, totaling 447 square feet, is an impervious area, comprised of concrete within the open courtyard at ground level. DMA 5 drains to Stormwater Control Measure Bioretention Facility LIDF#4.

DMA 6, totaling 432 square feet, is an impervious area, comprised of concrete sidewalk. DMA 6 drains to Stormwater Control Measure SRA 4.

DMA 7, totaling 973 square feet, is an impervious area, comprised of concrete sidewalk. DMA 7A & 7B drain to Stormwater Control Measure SRA 2A-2C.

DMA 8, totaling 157 square feet, is an impervious area, comprised of concrete sidewalk. DMA 8 drains to Stormwater Control Measures SRA 3A-3E.

DMA 9A, totaling 4,507 square feet, is an impervious area, comprised of existing concrete parking, parking canopy & asphalt concrete driveway. Stormwater within DMA 9A will maintain the current drainage pattern and drain towards the existing drainage inlet (DI #2) on the neighboring parcel. Due to site constraints DMA 9A will not drain to a Stormwater Control Measure. The impervious surface area can be offset by the oversized bioretention facilities (LIDF#1-4).

DMA 9B, totaling 450 square feet, is an impervious area, comprised of concrete surfacing for the accessible parking stall & bike racks. Stormwater within DMA 9B will maintain the current drainage pattern and drain towards the existing drainage inlet (DI #2) on the neighboring parcel. Due to site constraints DMA 9B will not drain to a Stormwater Control Measure. The impervious surface area can be offset by the oversized bioretention facilities (LIDF#1-4).

DMA 10, totaling 422 square feet, is an impervious area, comprised of concrete sidewalk. Stormwater within DMA 10 will maintain the current drainage pattern and drain towards the street. Due to site constraints DMA 10 will not drain to a Stormwater Control Measure. The impervious surface area can be offset by the oversized bioretention facilities (LIDF#1-4).

DMA 11, totaling 102 square feet, is an impervious area, comprised of rooftop form the trash enclosure. DMA 10 drains to Stormwater Control Measure Bioretention Facility LIDF#4.

DMA 12, totaling 98 square feet, is an impervious area, comprised of rooftop form the trash enclosure. DMA 10 drains to Stormwater Control Measure Bioretention Facility LIDF#4.

IV.B. Descriptions of each Self-Retaining Area

IV.B.1. Table of Self-Retaining Areas

Table 3. Self-Retaining Areas

SRA Region	SRA Sub-Region	Surface Type	Area (acres)
1	-	Self-Retaining (Landscape)	0.003
2	2A-2B	Self-Retaining (Landscape)	0.010
3	3A-3E	Self-Retaining (Landscape)	0.010
4	-	Self-Retaining (Landscape)	0.003

IV.B.2. Self-Retaining Area Descriptions

SRA 1, totaling 128 square feet, is a self-treating area, comprised of landscape vegetation.

SRA 2A-2B, totaling 419 square feet, are self-treating areas, comprised of landscape vegetation.

SRA 3A-3E, totaling 423 square feet, are self-treating areas, comprised of landscape vegetation.

SRA 4, totaling 142 square feet, is a self-treating area, comprised of landscape vegetation.

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IV.C. Tabulation and Sizing Calculations

IV.C.1. Information Summary for Bioretention Facility Design

Total Project Area: 0.375 acres					
LIDF 1 Area: 70 sf	DMA 1B, 1F & 4C Area: 1,213 sf				
LIDF 2 Area: 60 sf	DMA 1A, 4D Area: 1,364 sf				
LIDF 3 Area: 60 sf	DMA 2A, 4A Area: 1,335 sf				
LIDF 4 Area: 297 sf	DMA 2B, 3B, 3C, 5, 11 & 12 Area: 2,279 sf				

IV.C.2. Self-Treating Areas

None

IV.C.3. Self-Retaining Areas

SRA Region	SRA Area (sf)
1	128 sf
2A-2B	419 sf
3A-3E	423 sf
4	142 sf
Total	1,112 sf

IV.C.4. Areas Draining to Self-Retaining Areas

Table 4. Areas Draining to Self-Retaining Areas

DMA Region	Area (sf)	Post-project Surface Type	Runoff Factor	DMA Area x Runoff Factor (sf) [A]	Receiving SRA	Receiving SRA Area (sf) [B]	Ratio [A]/[B] (2:1 Max)
1E	44	Rooftop Balcony	1.0	44	SRA 1	128	0.3
1C, 1D, 7	1,123	Rooftop Balcony, Building Canopies & Concrete	1.0	1,123	SRA 2A- 2B	419	2.7*
2C-2E & 8	306	Rooftop Balcony, Building Canopies & Concrete	1.0	306	SRA 3A- 3E	423	0.7
6	432	Concrete	1.0	432	SRA 4	142	3.0*

* Due to site constraints, the size of the receiving SRA exceeds the maximum ratio of 2:1. The excess impervious surface area (totaling 217 sf) for the contributing DMAs can be offset by the oversized SRAs 1, 3A-3E.

IV.C.5. Areas Draining to Bio-retention Facilities

Table 5. LID Facility 1

DMA DMA Region (sf)		Post-project surface type	DMA Runoff factor	DMA Area × runoff factor (sf)	Fac	ility Name	: LIDF 1
1B	968	Rooftop	1.0	968			
1F	17	Rooftop Balcony	1.0	17	SCM	Minimum	Dropocod
4C	228	Above Ground Walkways	1.0	228	Sizing factor	SCM Size (sf)	Proposed SCM Size (sf)
Total>	1,213	0.04	49	70			

Table 6. LID Facility 2

DMA Region	DMA Area (sf)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor (sf)	Facility Name: LIDF 2		: LIDF 2
1A	1,146	Rooftop	1.0	1,146	SCM	Minimum	Proposed
4D	218	Above Ground Walkways	1.0	218	Sizing factor	SCM Size (sf)	SCM Size (sf)
Total>	1,364	0.04	55	60			

Table 7. LID Facility 3

DMA Region	DMA Area (sf)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor (sf)	Facility Name: LIDF 3		: LIDF 3
2A	656	Rooftop	1.0	656	SCM	Minimum	Proposed
4A	699	Above Ground Walkways	1.0	699	Sizing factor	SCM Size (sf)	SCM Size (sf)
Total>	1,355	0.04	54	60			

Table 8. LID Facility 4

DMA Region	DMA Area (sf)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor (sf)	Facility Name: LIDF 4		: LIDF 4
2B	582	Rooftop	1.0	582			
3A-3C	775	Rooftop	1.0	775			
4B	275	Above Ground Walkways	1.0	275			
5	447	Concrete	1.0	447		scm	
11	102	Rooftop	1.0	102	SCM		Proposed SCM
12	98	Concrete	1.0	98	Sizing factor		Size (sf)
Total>				2,279	0.04	91	313

* Due to site constraints, DMAs 9A, 9B, & 10 will not drain to a Stormwater Control Measure. The impervious surface area (totaling 5,379 sf) for these DMAs can be offset by the oversized Bioretention Facilities (LIDF#1-4).

V. SOURCE CONTROL MEASURES

V.A. Site activities and potential sources of pollutants

- On-site Storm Drain Inlets
- New Accessible Parking Stall
- Landscape Maintenance

V.B. Source Control Table

- New accessible parking stall shall be designed to minimize impervious surface.
- Existing trees, shrubs and groundcover shall be preserved where feasible.
- Plant species tolerant of saturated soil conditions shall be specified in landscaped areas to be utilized for stormwater infiltration and treatment.
- Trash storage areas shall be paved and stormwater from adjacent areas shall not be directed to the storage area. Containers shall have lids.
- All roofs, gutters, and downspouts made of unprotected metals shall discharge to landscaped areas designed to infiltrate and detain stormwater runoff.

Table 10. Source Control Table	Table	10.	Source	Control	Table
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Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
On-site Storm Drain Inlets	Mark all inlets with the words "No Dumping! Flows to Creek" or similar.	 Maintain and periodically replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance"
Landscaping/Pesticide Use/Ground Maintenance	 State that final landscaping will accomplish all the following: Preserve existing native trees, shrubs, and ground cover to maximum extent possible Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. 	 Maintain landscaping using minimum or no pesticides See applicable operational BMPs in Fact Sheet SC-41, "building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks Provide IPM information to new owners, lessees, and operators

	 Where landscaped areas are used to retain or detain stormwater, specify plats that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. For successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions. 	
Plazas, Sidewalks, and Parking Areas	N/A	Sweep plazas, sidewalks and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.
Refuse Areas	State how site refuse will be handled and provide supporting detail to what Is shown on plans State that signs will be posted on or near dumpsters with words "Do not dump hazardous materials here" or similar.	State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly' repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available onsite. See Fact sheet SC-34, "Waste Handling and Disposal"

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

All Source Control BMPs listed in the previous section will be implemented with corresponding and appropriate features, materials, and methods of construction.

VI. STORMWATER FACILITY MAINTENANCE

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The applicant accepts responsibility for interim operation and maintenance of stormwater treatment and flowcontrol facilities until such time as this responsibility is formally transferred to a subsequent owner. The owner then accepts full responsibility for the proper operation and maintenance of all stormwater facilities. VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

Any maintenance of all bio-retention facilities will be financed and implemented by the owner of the 890 CoOp property. All facilities shall be inspected annually and documented. Any necessary repairs to facilities shall also be documented. Updated information, including contact information, must be provided to the municipality if property is sold and whenever designated individuals or contractors change.

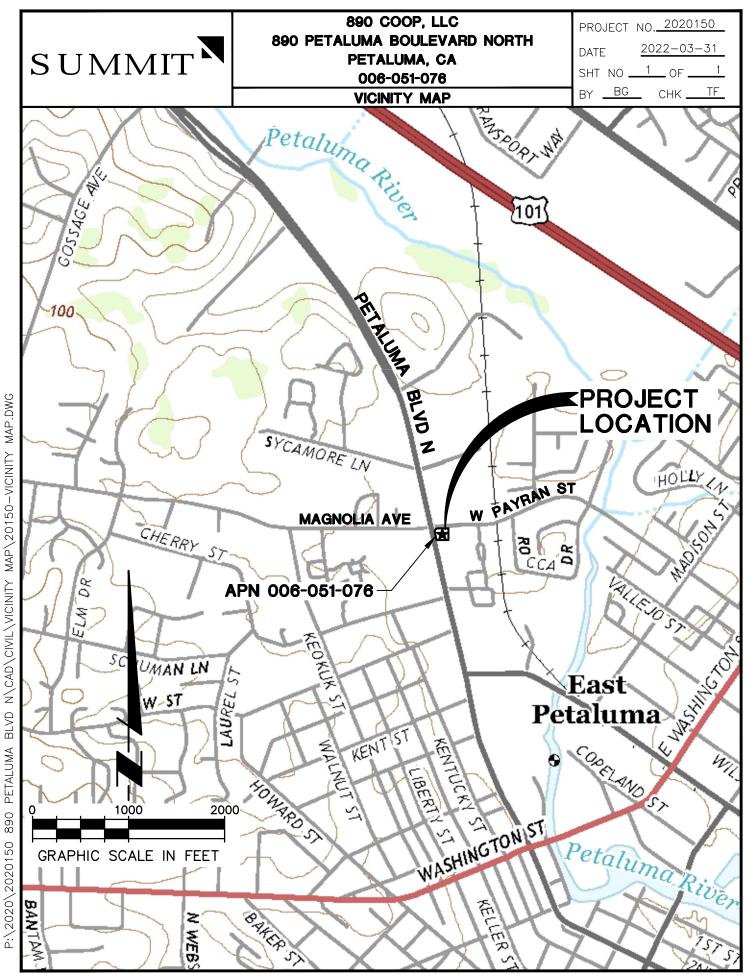
VII. CONSTRUCTION CHECKLIST

Table 11. Construction Checklist

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s
7	LIDF 1-2	SCP1
8	LIDF 3-4	SCP1

VIII. CERTIFICATIONS

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the BASMAA *Post-Construction Manual*.



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