Stormwater Control Plan
For Ritter Center
800 & 804 A Street,
San Rafael, Ca, USA

April 29, 2022

Owner: Ritter Center

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This Stormwater Control Plan was prepared using the template dated October 2018.

I. Project Data

Table 1. Project Data Form

Project Name/Number	Ritter Center
Application Submittal Date	29 April 2022
Project Location	800 & 804 A Street, San Rafael, Ca, USA
Project Phase No.	Not Applicable
Project Type and Description	21,305 SF Commercial Building with drive-through lane and parking
Total Project Site Area (acres)	0.489 acres
Total New and Replaced Impervious Surface Area	3,206 SF
Total Pre-Project Impervious Surface Area	5,341 SF±
Total Post-Project Impervious Surface Area	3,206 SF

II. Setting

II.A. Project Location and Description

This project involves renovation of an existing one story building located at 800 A, and removal of the residential structure located at 804 A Street replaced with site improvements including landscaping and parking. The proposed use of the renovated building will consist of clinic and offices and will be OSHPD 3 complaint for primary care.

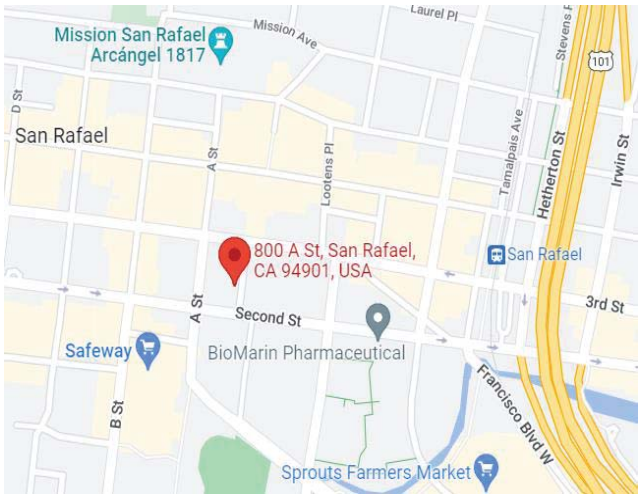

Figure 1. Location of 800 & 804 A Street, San Rafael.

II.B. Existing Site Features and Conditions

The site has 2 buildings, 1 parking lot and is generally flat. Most of the site is covered with buildings or is paved. There are some mature trees along the perimeter of the residential house and the parking lot.

See Figure 2. Soils are silty clays typical of the area (Hydrologic Soil Group "D"). The existing drainage system is connected to a municipal storm drain in the southbound lanes of Second Street in front of the site.

II.C. Opportunities and Constraints for Stormwater Control

Constraints include impermeable pavements, very high intensity land use since two third of the overall site is occupied by the existing building to remain, and flat slopes.
Disposal of runoff to deep infiltration is not feasible on this site due to the low permeability of the clay soils. High land values, the existing building to remain, and parking requirements limit opportunities to reduce site imperviousness.

Figure 2. Existing Site Conditions.

Setback areas—five feet at the frontage of A St, 3.6ft along Second St and two feet at the back of the parking lot—is usable as locations for treatment BMPs; however, these areas include some big trees which must be protected. The city's storm drain collection system in Second Street is shallow which constrains the use of deep stormwater detention facilities, such as depressed bioretention basins, from managing ground surface runoff. However, the City storm drain system provides sufficient hydraulic head to route runoff to pervious pavement, through this pavement, and then drain to the City storm drain.

III. Low Impact Development Design Strategies

III.A. Optimization of Site Layout

The site is densely developed infill within the existing urbanized area. 4 existing significant trees around the corner of the proposed parking lot are to be preserved. The rest of the tress around the residential house will be removed and replaced with new landscaped areas along the north, south and west of the project site. The new landscaped areas will be expanded to the extent practicable, given project parking and circulation requirements, to reduce impervious area of the project. Landscaping in these areas will be upgraded to maximize aesthetic value and ensure the continued health of the mature trees.

III.B. Use of Permeable Pavements

Conventional, impervious pavement are to be used to construct the circulation aisle of the parking area. Permeable pavement is proposed at the parking stalls. This condition necessitates a deep gravel base course because the site overlies expansive clay soils but is the best approach to manage stormwater where space for treatment facilities are limited and the City storm drain system is shallow.

III.C. Dispersal of Runoff to Pervious Areas

Landscaped areas at the perimeter of the site could be used to disperse runoff from some portions of the impervious pavements; and pervious pavement areas in the parking lot could be used to disperse runoff from impervious portions of the parking lot.

III.D. Stormwater Control Measures

In proposed project, we implemented pervious concrete, self-retaining and self-treating areas in order to minimize impervious surface and surface runoff.

There will be pervious concrete in parking area that will treat surface runoff from all over the parking area. Pervious concrete thickness subject to vehicular traffic will be at least 4" thick. Pervious concrete section will have minimum 8" subbase/base structure consisting of open-graded, crushed aggregate with a void space not less than 35% to provide adequate storage to meet C.3 requirements. There will be minimum 4" diameter perforated pipe at bottom of crushed aggregate section of pervious concrete.

There will be landscape areas along North, West and South property line which will function as self-treating areas. Runoff from almost all impervious areas on the site, including sidewalk and paved areas, will be sheet-flowed to permeable pavements and landscape area.

The driveway at the west side of the parking lot and the ramp at the northwest corner will be sheet-flowed towards the adjacent landscape areas. The size of these areas has been minimized by designing the grading and drainage to place the grade break as close to the street as practicable.

IV. Documentation of Drainage Design

IV.A. Descriptions of Each Drainage Management Area

IV.A.1. Drainage Management Areas

Table 2. Drainage Management Areas (DMAs) as shown on the Exhibit.

DMA Name	Surface Type	Area (SF)
DMA-1	Asphalt Concrete/Pervious Concrete	3586
DMA-2	Asphalt Concrete/Pervious Concrete	1836
DMA-3	Concrete Sidewalk/Landscape	543
DMA-4	Landscape	887
DMA-5	Landscape	352
DMA-6	Landscape	92
DMA-7	Pavement	144
DMA-8	Pavement	33

IV.A.2. Drainage Management Area Descriptions

DMA 1, totaling 3,586 square feet, with a pervious concrete in parking stalls and conventional concrete pavement in the circulation aisle of parking area and the doorway in front of the commercial building. The pervious concrete will have minimum 4" perforated subdrain underneath, and the subdrain pipe will convey the stormwater toward Inlet#1 which in turn drain into the city's main.

DMA 2, totaling 1,836 square feet, with pervious concrete in parking stalls and conventional concrete pavement in sidewalk, and the ramp. The pervious concrete will have minimum 4" perforated subdrain underneath, and the subdrain pipe will convey the stormwater toward Inlet#2 which in turn drain into the city's main.

DMA 3, totaling 543 square feet, is a landscaped area with sidewalk and existing tree. The surface runoff from the sidewalk will sheet flow toward the landscape area. The trees will be retained and the area reconfigured.

DMA 4, totaling 887 square feet, is a newly replaced landscaped area. This area will be self-treating area.

DMA 5, totaling 155 square feet, is a new landscaped area. This area will be self-treating area.

DMA 6, totaling 92 square feet, is a newly replaced landscaped area. This area will be self-treating area.

DMA 7, totaling 144 square feet, is a driveway of the new proposed parking lot. Surface runoff from DMA 7 will be sheet flowed toward adjacent landscape area, DMA 4.

DMA 8, totaling 33 square feet, is a newly proposed ramp at the north-west corner of the parking lot. Surface runoff from DMA 8 will be sheet flowed towards adjacent landscape area, DMA 6.

IV.B. Tabulation and Sizing Calculations

See Attachment 1 : Provision E.12 Sizing Calculator

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

On-site activities that could potentially produce stormwater pollutants include:

- Driveways and parking lots
- Trash Management

V.B. Potential Pollutant Sources and Source Control Measures

Table 3. Pollutant Sources and Source Control Measures

Potential source of runoff pollutants	**Permanent source control BMPs**	**Operational source control BMPs**
Inlets (Area drains in the parking lot)	All inlets will be marked with "No Dumping! Flows to Local Waterways" or similar	Markings will be regularly inspected and repainted or replaced as needed. Lessees will receive stormwater pollution prevention brochures. Lease agreements will include the following provision: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Indoor and structural pest control		Owner will retain only companies that are certified in Integrated Pest Management (IPM) for on-site pest-management.
Landscape maintenance	Existing mature trees to be retained. Landscaping will minimize irrigation and runoff and be selected for pest resistance, and will minimize the need for fertilizers and pesticides. Plants will be selected appropriate to site soils, slopes, climate, sun, wind rain, land use, air movement, ecological consistency, and plant interactions.	Landscaping will be maintained using minimum or no pesticides. IPM information will be provided to new owners, lessees, and operators.

Plazas, sidewalks, and parking lots	Trash receptacles to be provided in parking lot area and on site and emptied daily. Site to be policed at least twice daily for trash. Sidewalks, and parking lots will be swept regularly. Debris and washwater from periodic pressure washing will be collected and disposed of to the sanitary sewer.

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

Maintenance of stormwater facilities will be the responsibility of the property owner and will be performed by the owner's contractors or employees as part of routine maintenance of buildings, grounds, and landscaping. The applicant has reviewed the Anytown, USA, standard agreement regarding the maintenance of stormwater facilities and commits to execute any necessary agreements prior to completion of construction. Applicant accepts responsibility for interim operation and maintenance of stormwater treatment and flow-control facilities until such time as this responsibility is formally transferred to a subsequent owner.

VI.B.S Summary of Maintenance Requirements for Each Stormwater Facility

The pervious concrete will be maintained on the following schedule at a minimum. Details of maintenance responsibilities and procedures will be included in a Stormwater Facility Operation and Maintenance Plan to be submitted for approval prior to the completion of construction.

Semi-annually (beginning and end of rainy season): Pervious surface will be vacuumed.

Annually or as needed: Damaged or settled pavement will be replaced or repaired. Planted areas adjacent to pavement will be maintained.

Every 10-15 years or as needed: Surface paving units will be lifted to be cleaned and/or to be replaced underlying aggregate. Special disposal may be required if the pavers contain metals of hazardous materials.

Upon failure (expected to be > 20 years): If routine maintenance does not restore the infiltration rate, pavement will be rehabilitated by removing and replacing clogged section.

VII. Construction Plan E.12 Checklist

Table 4. Construction Checklist Table to be incorporated in Construction Drawings

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s
Exhibit	DMA 1 drains to pervious concrete; facility is designed as specified.	
Exhibit	DMA 2 drains to pervious concrete; facility is designed as specified	
Exhibit	Pervious concrete #1, #2, overflows are marked with "No Dumping" message	
Exhibit	Existing mature trees are preserved	

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*

Attachment 1

Provision E.12 Sizing Calculator

See the instructions and the BASMAA Post-Construction Manual

Step 1: Enter Total Site Area	**Step 2:** List names of all DMAs and square footage of each	**Step 3:** If DMA is "Self-Treating" or "Self-Retaining," **copy** square footage to appropriate column	**Step 4:** If the DMA is "Drains to Self Retaining" or "Drains to Bioretention" enter runoff factor from Table 4-1		**Step 6:** For "Drains to Self-Retaining" DMAs, enter the **name of receiving DMA**	**Step 5:** Slide (move) number from this column to correct column (F or H-Q)

Version 0.3. 2015-12-02.

Total Site Area:	7473						**BIORETENTION FACILITIES**									
DMA Names	**Square Feet**	**Self-Treating**	**Self-Retaining**	**Runoff Factor**	**Drains to Self-Retaining**	**Name of Receiving DMA**	**Facility 1**	**Facility 2**	**Facility 3**	**Facility 4**	**Facility 5**	**Facility 6**	**Facility 7**	**Facility 8**	**Facility 9**	**Facility 10**
DMA-1A	1225		1225													
DMA-1B	2361				2361	DMA-1A										
DMA-2A	1389		1389													
DMA-2B	447				447	DMA-2A										
DMA-3	543	326														
DMA-4	887	887														
DMA-5	352	352														
DMA-6	92	88														
DMA-7	144					DMA-4										
DMA-8	33					DMA-6										
Total DMAs	**7473**	**1653**	**2614**		**2808**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
						Sizing Factor	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**
						Minimum Size	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Facilities	**0**	**Step 7:** Enter Facility Footprints				**Footprint on Exhibit**										
DMAs + Facilities	**7473**						**OK**	**OK**	**OK**	**OK**	**OK**	**OK**	**OK**	**OK**	**OK**	**OK**
	OK	**Step 8:** Iterate sizes of facility footprints and DMAs until all footprints are at least the minimum **AND** DMAs + Facilities equals Total Site Area														
		Step 9: Check to make sure Areas Draining to each Receiving Self-Retaining Area do not exceed maximum 2:1 ratio.														
		Step 10: Check results on this spreadsheet are consistent with what is shown on the SCP Exhibit.														

Attachment 2: Stormwater Control Plan Exhibit
Ritter Center
800 & 804 A Street
San Rafael, CA, USA
No Scale