

STORM WATER CONTROL PLAN

FOR

350 MERRYDALE ROAD

350 MERRYDALE ROAD

SAN RAFAEL, CA

APN 179-041-27 & 28

JUNE 2019

APPLICANT/OWNER:

CAMPUS PROPERTY GROUP

P.O. Box 564
Larkspur, CA 94977

PRELIMINARY

BY: _____

**MICHAEL HOOPER
APPLICANT'S REPRESENTATIVE**

As the Applicant/Owner, I declare that permanent storm water Best Management Practices will be installed and maintained in accordance with this document and municipal regulations.

CIVIL ENGINEER

This document was prepared by BKF Engineers to summarize storm water Best Management Practices proposed with this development. Storm water elements reflected in this document have been designed using sound engineering principals in general conformance with the municipality's guidelines.

PRELIMINARY

**JASON KIRCHMANN, PE
JUNE 17, 2019
NO. C-78079**

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Vicinity Map
Storm Water Control Plan Exhibit

Appendices

Bioretention Facility Sizing Calculations
Stormwater Facility Operation and Maintenance Fact Sheet (Bioretention Areas)
Stormwater IMP Inspection and Maintenance Log (Sample)

I. Project Data

Table 1. Project Data

Project Name/Number	350 Merrydale Road
Application Submittal Date	June 17, 2019
Project Location	350 Merrydale Road, San Rafael, CA 94903
Project Phase No.	One and Two
Project Type and Description	Nine (9) new condominium buildings providing 45 new residences.
Total Project Site Area (acres)	±2.3 acres
Total New and Replaced Impervious Surface Area	±57,525 square feet (1.3 acres)
Total Pre-Project Impervious Surface Area	±76,000 square feet (1.7 acres)
Total Post-Project Impervious Surface Area	±57,525 square feet (1.3 acres)

II. Setting

II.A. Project Location and Description

The proposed project is located at 350 Merrydale Road in San Rafael.

The proposed improvements will consist of new condominium buildings, underground utilities, storm water treatment facilities, and landscape improvements.

II.B. Existing Site Features and Conditions

The site in its existing condition drains generally to Las Gallinas Creek that straddles the property line to the north. Storm water on site is picked up by a series of drainage inlets and routed to a private underground storm drain system which ultimately discharges to the Creek.

II.C. Opportunities and Constraints for Stormwater Control

An opportunity with this project site is the relatively flat existing topography that will facilitate the installation of bioretention facilities. Constraints include limited space for site improvements and existing conditions such as existing trees and the Creek to the north of the site.

III. Low Impact Development Design Strategies

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

The development envelope has been limited to the maximum extent practicable.

III.A.2. Preservation of natural drainage features

On-site natural drainage features will be preserved to the maximum extent practicable.

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

No known riparian habitats are located within the footprint of this project and are not anticipated to be negatively impacted. Setbacks to the nearby waterway will be honored with this development.

III.A.4. Minimization of imperviousness

Impervious surfaces have been limited to the maximum extent practicable.

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

A project Landscape Architect has been retained to design attractive water efficient landscaping best suited on the surface of storm water treatment facilities. The Storm Water Control Plan Exhibit reflects the proposed geometry and location of each storm water treatment facility.

III.B. Use of Permeable Pavements

Permeable pavements will be incorporated into the site driveways and into the pedestrian path on the North side of the site adjacent to Las Gallinas Creek.

III.C. Dispersal of Runoff to Pervious Areas

Dispersal of runoff to pervious areas is utilized to the maximum extent practicable.

III.D. Stormwater Control Measures

The development proposes to integrate bioretention facilities to treat runoff from the site.

IV. Documentation of Drainage Design

IV.A. Descriptions of each Drainage Management Area

See Appendix for descriptions of drainage management areas. Pool areas have been excluded from drainage management areas since it is anticipated that they will be plumbed to the sanitary sewer system.

IV.B. Tabulation and Sizing Calculations

IV.B.1. Table 2. Information Summary for Bioretention Facility Design

Total Project Area:	±2.3 acres
Average Annual Precipitation:	±35 inches
IMPs Designed For:	Treatment Only

IV.B.2. Areas Draining to Bioretention Facilities

See Appendix for treatment calculations.

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

BKF Engineers does not anticipate significant potential for pollutants on the project site. The sources listed in the table below are taken from the BASMAA *Post-Construction Manual: Design Guidance for Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solano Counties (January, 2019)*.

V.B. Sources and Source Control Measures

Table 3. Sources and Source Control Measures

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
On-site storm drain inlets	Mark all inlets with a “No Dumping - Flows to Creek” message	Maintain and periodically repaint or replace inlet markings.

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

To be determined at time of construction.

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The applicant commits to execute any necessary agreements and/or annex into a fee mechanism in accordance with local requirements. The applicant will accept responsibility for operation and maintenance of facilities until that responsibility is formally transferred.

All storm water treatment facilities described in this report will be owned and maintained in perpetuity by the private owner of the subject property. The applicant will accept responsibility for interim operation and maintenance of the facilities until such time as this responsibility is formally transferred to subsequent owners.

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

See the attached sample Operation and Maintenance Fact Sheet for Bioretention Areas.

VII. Construction Plan Checklist

Table 4. Construction Plan Checklist

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s
Attachments	Integrated Management Practices (IMP) sizes as specified and designed to capture and route drainage from areas delineated on Exhibit.	Storm Water Control Plan
	Plant selection to minimize irrigation, minimize use of fertilizers and pesticides, and for pest resistance.	Landscape Plan

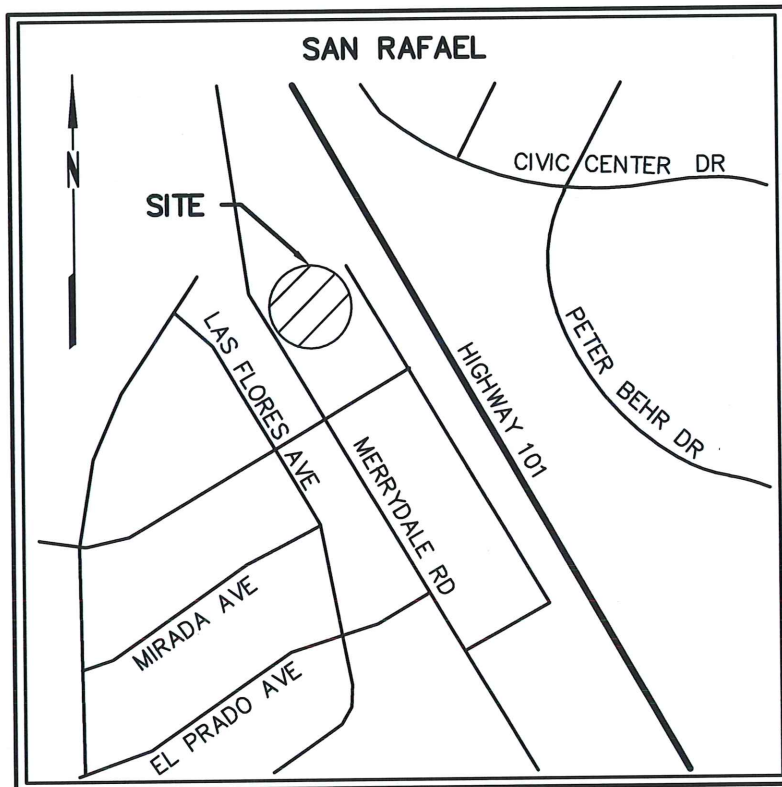
VIII. Certifications

The preliminary design of storm water treatment facilities and other storm water pollution control measures in this plan are in accordance with the BASMAA *Post-Construction Manual: Design Guidance for Stormwater Treatment and Control for Projects in Marin, Sonoma, Napa, and Solano Counties (January, 2019)*.

ATTACHMENTS

Vicinity Map

Storm Water Control Plan Exhibit

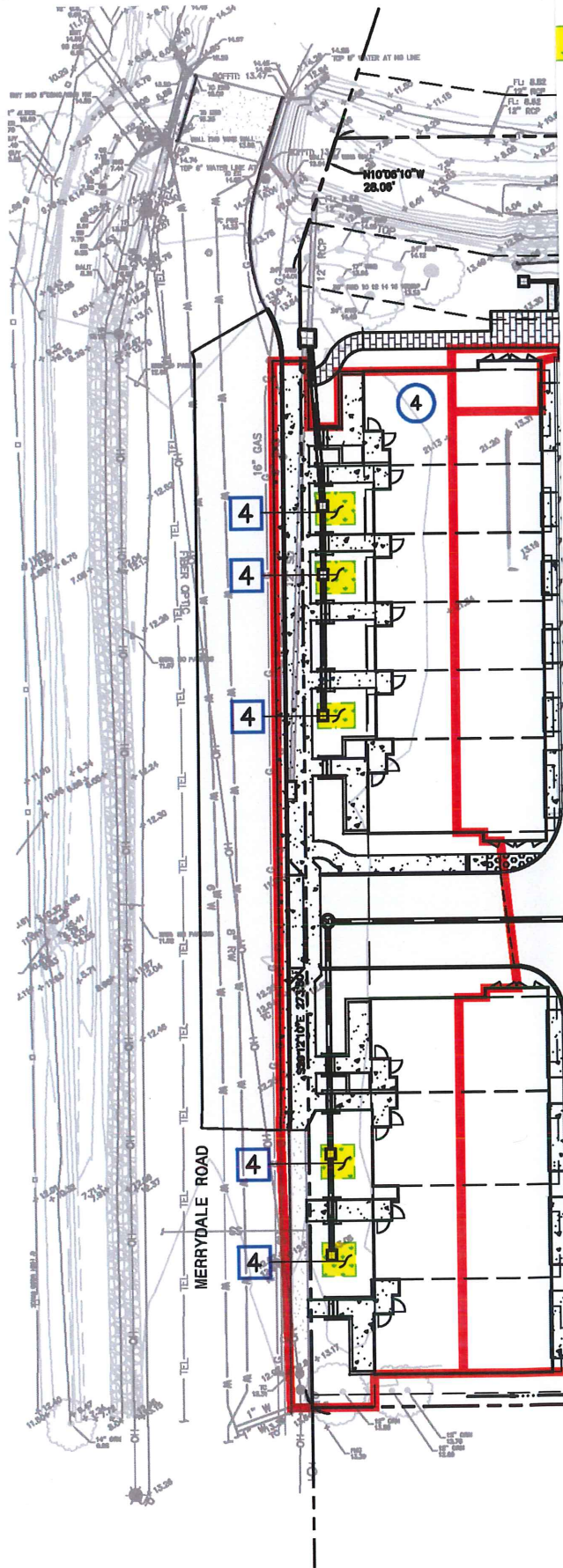


VICINITY MAP

NOT TO SCALE

Plot Jun 14, 2019 at 2:42pm

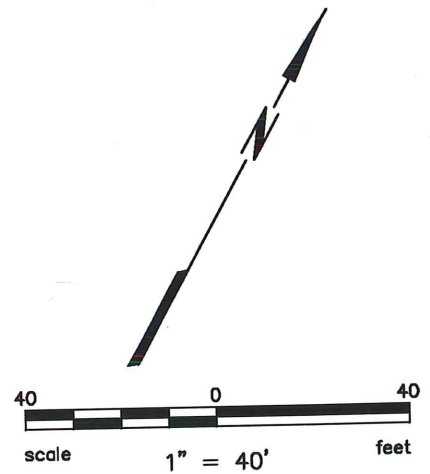
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BIORETENTION FACILITY

DRAINAGE MANAGEMENT AREA (DMA) #

INTEGRATED MANAGEMENT AREA (IMP) #



STORM WATER CONTROL PLAN

350 MERRYDALE ROAD
SAN RAFAEL, CALIFORNIA
JUNE 2019



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SHEET 1 OF 1 SHEETS

APPENDICES

Bioretention Facility Sizing Calculations

**Stormwater Facility Operation and Maintenance Fact Sheet
(Bioretention Areas)**

Stormwater IMP Inspection and Maintenance Log (Sample)

350 Merrydale Road
BKF Engineers
June 2019

DMA Name	DMA Area (sf)	Post-project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					IMP 1		
Area 1	14,890	Hardscape	1	14,890	Sizing Factor	Minimum Facility Size (sf)	Proposed Facility Size (sf)
Area 1	6,050	Landscape	0.1	605			
Area 1	5,425	Pervious	0.1	543			
Area 1	16,790	Roof	1	16,790			
Total -->				32,828	0.04	1,313	1,320

DMA Name	DMA Area (sf)	Post-project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					IMP 2		
Area 2	6,805	Hardscape	1	6,805	Sizing Factor	Minimum Facility Size (sf)	Proposed Facility Size (sf)
Area 2	2,105	Landscape	0.1	211			
Area 2	3,210	Pervious	0.1	321			
Area 2	7,430	Roof	1	7,430			
Total -->				14,767	0.04	591	600

DMA Name	DMA Area (sf)	Post-project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					IMP 3		
Area 3	200	Hardscape	1	200	Sizing Factor	Minimum Facility Size (sf)	Proposed Facility Size (sf)
Area 3	860	Landscape	0.1	86			
Area 3	2,000	Roof	1	2,000			
Total -->				2,286	0.04	91	95

DMA Name	DMA Area (sf)	Post-project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					IMP 4		
Area 4	3,415	Hardscape	1	3,415	Sizing Factor	Minimum Facility Size (sf)	Proposed Facility Size (sf)
Area 4	3,485	Landscape	0.1	349			
Area 4	3,685	Roof	1	3,685			
Total -->				7,449	0.04	298	310

350 Merrydale Road
 BKF Engineers
 June 2019

DMA Name	DMA Area (sf)	Post-project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					IMP 5		
Area 5	75	Hardscape	1	75	Sizing Factor	Minimum Facility Size (sf)	Proposed Facility Size (sf)
Area 5	515	Landscape	0.1	52			
Area 5	740	Roof	1	740			
Total -->				867	0.04	35	45

DMA Name	DMA Area (sf)	Post-project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Facility Name		
					IMP 6		
Area 6	295	Hardscape	1	295	Sizing Factor	Minimum Facility Size (sf)	Proposed Facility Size (sf)
Area 6	435	Landscape	0.1	44			
Area 6	1,000	Roof	1	1,000			
Total -->				1,339	0.04	54	60

Stormwater Facility Operation and Maintenance Fact Sheet

► **BIORETENTION AREAS**

These facilities remove pollutants primarily by filtering runoff slowly through an active layer of soil. Routine maintenance is needed to ensure that flow is unobstructed, that erosion is prevented, and that soils are held together by plant roots and are biologically active. Typical maintenance consists of the following:

- Inspect **inlets** for channels, exposure of soils, or other evidence of erosion. Clear any obstructions and remove any accumulation of sediment. Examine rock or other material used as a splash pad and replenish if necessary.
- Inspect **outlets** for erosion or plugging.
- Inspect **side slopes** for evidence of instability or erosion and correct as necessary.
- Observe soil at the bottom of the swale or filter for uniform **percolation** throughout. If portions of the swale or filter do not drain within 48 hours after the end of a storm, the soil should be tilled and replanted. Remove any debris or accumulations of sediment.
- Confirm that **check dams** and **flow spreaders** are in place and level and that channelization within the swale or filter is effectively prevented.
- Examine the **vegetation** to ensure that it is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary, remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas. When mowing, remove no more than 1/3 height of grasses. Confirm that irrigation is adequate and not excessive. Replace dead plants and remove noxious and invasive vegetation.
- Abate any potential **vectors** by filling holes in the ground in and around the swale and by insuring that there are no areas where water stands longer than 48 hours following a storm. If mosquito larvae are present and persistent, contact the Marin/Sonoma Mosquito and Vector Control District for information and advice. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.

Stormwater IMP Inspection and Maintenance Log

Facility Name	
Address	
Begin Date	End Date

Date	IMP ID#	IMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment IMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality, and start a new log at that time.

- IMP ID# — Always use ID# from the Operation and Maintenance Manual.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.