

Stormwater Control Plan

10192 San Pablo Avenue
EL CERRITO, CALIFORNIA

February 10, 2017

Prepared For:

WINFIELD DEVELOPMENT, LLC
3800 Mount Diablo Blvd
Lafayette, CA 94549



Prepared By:



**Carlson, Barbee
& Gibson, Inc.**

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ATTACHMENTS

Attachment A Stormwater Control Plan Exhibit
Attachment B IMP Sizing Calculations (Treatment Only)

I. PROJECT DATA

Table 1 Project Data

Project Name/Number	10192 San Pablo Avenue
Application Submittal Date	February 10, 2017
Project Location	10192 San Pablo Avenue
Name of Developer	Winfield Development, LLC
Project Phase No.	N/A
Project Type and Description	Residential with 18 Condominium Units
Project Watershed	
Total Project Site Area (acres)	0.42
Total Area of Land Disturbed (acres)	0.42
Total New Impervious Surface Area (sq. ft.)	1,177
Total Replaced Impervious Surface Area	8,682
Total Pre-Project Impervious Surface Area	14,449
Total Post-Project Impervious Surface Area	9,859
50% Rule	Does not Apply
Project Density	42 DU/Acre
Applicable Special Project Categories	C
Percent LID and non-LID treatment	100% LID
HMP Compliance	Option 1, C.3 Guidebook, Page 9.

II. SETTING

A. Project Location and Description

This Stormwater Control Plan for 10192 San Pablo Avenue project is submitted to the City of El Cerrito as a recommendation on the use of permanent Best Management Practices (BMPs) on the site as part of the Tentative Map Submittal. The BMP Technical Requirements are based on the Contra Costa Clean Water Program (CCCWP) Stormwater C.3 Guidebook 6th Edition in effect since February 15, 2012.

The proposed improvements to the existing 0.42 acre site include 1 residential building with 21 condominium townhomes, private drives, and parking. There will be one point of ingress and egress to the site at Lincoln Avenue.

B. Existing Site Features and Conditions

The existing site general slopes from the northeast down to the southwest with roughly five feet of grade differential across the site. Drainage from the site is collected in the existing 24" storm drain line running parallel to San Pablo Avenue.

The USDA Natural Resources Conservation Service Web Soil Survey indicates the site is underlain by Tierra Loam (TaC). This soil is classified under Hydrologic Soil Group D, indicating a very slow infiltration rate when thoroughly wet. These soils consist mainly of clays with very slow rate of water transmission.

C. Opportunities and Constraints for Stormwater Control

The topography of the site generally grades from the northeast down to the southwest. Due to limited landscape areas for adequately bioretention facilities, a combination of pervious pavers and LID treatment measures will be utilized to treat stormwater runoff. The drive aisle within the project will consist of pervious pavers with a 6" underdrain to convey runoff from the northeast portion of the site to the bioretention facility located along the southwest edge of the site. Treated water will be conveyed off-site with a new 12" storm drain pipe which will tie into the existing 24" storm drain along San Pablo Avenue. Another bioretention facility along the northwest edge of the site will treat roof drainage and minimal landscape portions of the site. Treated water from the bioretention facilities will also be conveyed off-site with a 12" storm drain and tie into the existing 24" storm drain lines along San Pablo Avenue.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

A. Optimization of Site Layout

1. Limitation of Development Envelope

Development of the site is limited by the constraints of the adjoining improvements and the high density of the site. The site is a high density infill project that is highly constrained by adjoining grades and improvements.

2. Preservation of Natural Drainage Features

The site does not propose any drastic changes to the topography of the site.

3. Setbacks from Creeks, Wetlands, and Riparian Habitats

There are no creeks, wetlands, or riparian habitats adjacent to the site.

4. Minimization of Imperviousness

Roadway paving has been reduced by limiting the street design to the minimum dimensions allowed for fire and pedestrian safety. The project consists of three story units maximizing the ratio of livable space to building footprint.

5. Use of Drainage as a Design Element

Bioretention areas have been designed to be integrated with landscape areas.

B. Feasibility Assessment of Harvesting and Use for Treatment and Flow-Control

1. Permeability of Site Soils

Although on-site permeability tests were not conducted, it is anticipated that site soils have a saturated hydraulic permeability of 0.00 to 0.06 in/hour. Bioretention facilities will require underdrains.

2. Potential Opportunities for Harvesting and Use

Rainwater harvesting and reuse is not feasible for high density residential projects. Contiguous roof areas are less than 10,000 square feet and there are no other identifiable contiguous impervious areas from which runoff may be harvested and used. Feasibility calculations are shown below for the 12 unit building as an example of the infeasibility of harvesting and reuse of storm runoff.

3. Harvesting and Use Feasibility Calculations

Table 2 Assessment of Harvesting and Use Feasibility

A	Building or other Impervious Area Description	Roof
B	Square feet of impervious surface	5,445
C	Acres	0.12
D	Uses and User Units	86.8
E	Toilet and Urinal Water Usage (gal/day)	266.6
F	Water Use per Acre (gal/day/ acre)	889
G	Required demand (gal/day/acre).	5,900
H	Is Projected Use > Required Demand? (Row F > Row G?)	No
I	Can runoff be piped to an irrigated area 2.5x the impervious area (Row B)?	No
J	Is there any other consistent, reliable demand for the quantity in Row G?	No

This Project will develop a relatively small, high density residential neighborhood that will require minimal public space irrigation. Furthermore, the Project is located in the San Francisco Bay Area which has a tendency of not incorporating rainwater harvesting due to the lack of rain (the mean annual precipitation of the Project site is only 21.3 inches per year). Thus, as explained and demonstrated by the above analysis, rainwater harvesting may be considered infeasible.

C. Integrated Management Practices

IV. DOCUMENTATION OF DRAINAGE DESIGN

A. Descriptions of Each Drainage Management Area

1. Table of Drainage Management Areas

Table 3 Table of Drainage Management Areas

<i>DMA NAME</i>	<i>Surface Type</i>	<i>Area (SF)</i>
<i>DMA 1</i>	<i>Roofs, Concrete, Landscaping,</i>	<i>3,141</i>
<i>DMA 2</i>	<i>Roofs, Concrete, Landscaping, Pervious Pavers</i>	<i>9,359</i>

2. Drainage Management Area Descriptions

DMA 1 drains the northwestern area of the site and includes roofs, concrete walks, patios, and landscaped open space. DMA 1 drains to the bioretention area northwest of Building 1 on the side of Lincoln Avenue.

DMA 2 drains the entire drive aisle and also includes roofs, patios and landscaped private yards. DMA 2 drains to the bioretention are located along the southwestern edge of Building 1.

B. Tabulation and Sizing Calculations

1. Information Summary for IMP Design

Table 4 Information Summary for IMP Design

Total Project Area (Square Feet)	12,500
Mean Annual Precipitation	21.3
IMPs Designed For	Treatment

2. Areas Draining to IMPs

See attached calculations from the CCCWP IMP Calculator.

V. SOURCE CONTROL MEASURES

A. Site Activities and Potential Sources of Pollutants

Storm drain inlets, indoor and structural pest control, landscape and outdoor pesticide use and debris from street and sidewalks are all potential sources and activities that may introduce pollutants to receiving waters.

B. Source Control Table

Table 5 Sources and Source Control Measures

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>
On-site storm drain inlets	Mark all inlets with the words “No Dumping! Flows to Creek”	Maintain and periodically repaint or 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,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com Include the following in purchase agreements: “Owner 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.”
Vehicle Cleaning	Discourage on-site car washing and explain how these will be enforced through HOA CC&R’s	Washwater from vehicle washing operations shall not be discharged to the storm drain system.
Need for future indoor & structural pest control	Note building design features that discourage entry of pests.	Provide Integrated Pest Management information to new home owners and HOA operators.

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>
Landscape/Outdoor Pesticide Use	<p>State that final landscape plans will accomplish all of the following.</p> <p>Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.</p> <p>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.</p> <p>Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.</p> <p>Consider using pest-resistant plants, especially adjacent to hardscape.</p> <p>To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.</p>	<p>Maintain landscaping using minimum or no pesticides.</p> <p>See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com</p> <p>Provide IPM information to new home owners and HOA operators.</p>
Streets and sidewalks		Sweep streets and sidewalks regularly to prevent accumulation of litter and debris.
Trash Enclosures (Refuse Areas)	Within project construction drawings, provide design details of the proposed enclosed trash/recycling area	<p>State how the following will be implemented:</p> <ul style="list-style-type: none"> • Provide adequate number of

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>
	<p>depicted for use at the mid-block location of the project's frontage.</p> <p>Install and maintain signs posted on, or near, dumpsters with the words "Do not dump hazardous materials here" or approved equivalent language.</p> <p>Document that the number, type and size of project trash and recycling bins have been determined adequate by the solid waste purveyor.</p> <p>Trash/recycling area shall be plumbed to the sanitary sewer system.</p>	<p>receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered.</p> <p>Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs.</p> <ul style="list-style-type: none"> • Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site.

VI. STORMWATER FACILITY MAINTENANCE

A. Ownership and Responsibility for Maintenance in Perpetuity

Proper operation and maintenance of stormwater management facilities will be the responsibility of the HOA in perpetuity.

The applicant will prepare and submit, for the City's review, an acceptable Stormwater Control Operation and Maintenance Plan prior to the completion of construction and will execute a Stormwater Management Facilities Operation and Maintenance Agreement before sale, transfer, or permanent occupancy of the site. The applicant accepts the responsibility for maintenance of stormwater management facilities until such responsibility is transferred to another entity.

B. Summary of Maintenance Requirements for Each Stormwater Facility

Treatment BMPs require minimum maintenance similar to that for any landscape areas. BMPs must be regularly maintained to insure that they continue to be effective and do not cause flooding or other harmful nuisances. The maintenance requirements are:

- Irrigate landscape infiltration areas throughout the dry season. Irrigation will be provided with sufficient quantity and frequency to allow plants to thrive.
- Limit the use of fertilizers and/or pesticides. Mosquito larvicides should be applied only when absolutely necessary.
- Replace and amend plants and soils as necessary to insure the BMPs are effective and attractive. Plants must remain healthy and trimmed if overgrown. Soils must be maintained to efficiently filter the stormwater.
- After all major storm events, inspect storm drain inlets and drain pipes for obstructions and remove if necessary.
- Continue general landscape maintenance, including pruning and cleanup throughout the year.
- A BMP maintenance plan agreement shall be prepared and entered in an agreement with the Town of Moraga with the building permit process.
- Structural BMP units shall be annually inspected and maintained. Any collected debris shall be removed from the unit, typically by a vacuum truck industry.

VII. CONSTRUCTION PLAN C.3 CHECKLIST

Table 6 Construction Plan C.3 Checklist

<i>Stormwater Control Plan</i>	<i>BMP Description</i>
DMA 1	Bioretention Area
DMA 2	Bioretention Area

VIII. CERTIFICATIONS

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R2-2009-0074 and Order R2-2011-0083.

Attachment A
Stormwater Control Plan Exhibit

LINCOLN AVENUE

SAN PABLO AVENUE

APN
504-012-001

APN
504-012-002

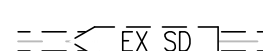
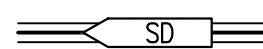
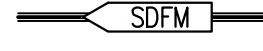




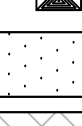
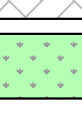



APN
504-012-003

APN
504-012-004

APN
504-012-005

APN
504-012-039

LEGEND

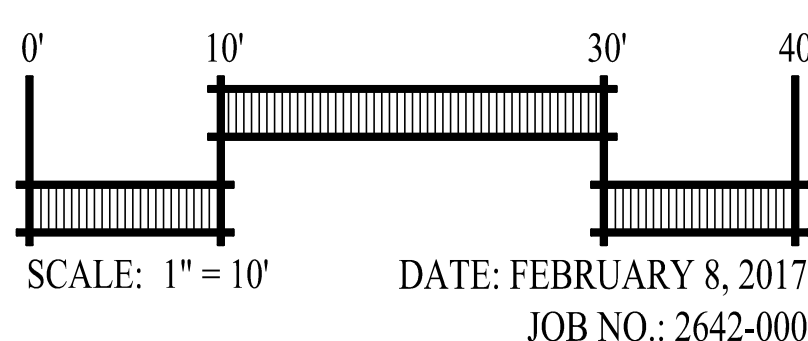
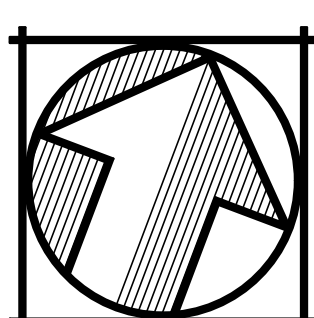
-  EX SD EXISTING STORM DRAIN
-  SD PROPOSED STORM DRAIN
-  SDFM PROPOSED STORM DRAIN FORCE MAIN
-  DMA BOUNDARY
-  PROPOSED VALLEY GUTTER
-  DRAINAGE MANAGEMENT AREA 1
-  INTEGRATED MANAGEMENT PRACTICE 1
-  PROPOSED STORM DRAIN MANHOLE
-  PROPOSED FIELD INLET
-  PROPOSED PATHWAY
-  PROPOSED PERVIOUS PAVERS/SELF TREATING
-  STORMWATER TREATMENT PLANTERS

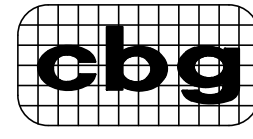
TREATMENT AREA SUMMARY					
DMA	TOTAL AREA (SF)	IMPERVIOUS AREA (SF)	PERVIOUS PAVER AREA (SF)	4% REQUIRED TREATMENT AREA (SF)	TREATMENT AREA PROVIDED (SF)
1	6,242	5,630	0	228	259
2	12,180	4,229	5,397	201	205
TOTALS	18,422	9,859	5,397	429	464

NOTE:
SEE SHEET C6 FOR BIoretention PLANTER DETAILS.

10192 SAN PABLO AVE PRELIMINARY STORMWATER CONTROL PLAN

CITY OF EL CERRITO CONTRA COSTA COUNTY CALIFORNIA





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SHEET NO.
C5
OF 7 SHEETS

Attachment B
IMP Sizing Calculations (Treatment Only)

Project Name: 10192 San Pablo Avenue
Project Type: Treatment Only
Location: El Cerrito
APN: 504-012-036-1 & 504-012-037
Drainage Area: 18423 sf
Mean Annual Precipitation: 21.3 in

IV. Areas Draining to IMPs

IMP Name: IMP 1 (Soil Type: D)

IMP Type: Bioretention Facility
 Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
DMA 1 - IMPERVIOUS	5,630	Conventional Roof	1.00	5,630	0.040	1.000	228	259
DMA 1 - PERVIOUS	612	Landscape	0.10	61				
Total				5,691				
Area					0.040	1.000	228	259

IMP Name: IMP 2 (Soil Type: D)

IMP Type: Bioretention Facility
 Soil Type: D

DMA Name	DMA Area (sq ft)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	IMP Sizing			
					IMP Sizing Factor	Rain Adjustment Factor	Minimum Area or Volume	Proposed Area or Volume
DMA 2 - IMPERVIOUS	4,229	Conventional Roof	1.00	4,229	0.040	1.000	200	205
DMA 2 - PERVIOUS	2,349	Landscape	0.10	235				
DMA 2 - PERVIOUS PAV	5,397	Pervious Concrete	0.10	540				
Total				5,004				
Area					0.040	1.000	200	205

Software Tool Warnings

No warnings to report.

Report generated on 2/9/2017 12:00:00 AM by the [Contra Costa Clean Water Program](#) IMP Sizing Tool software (version 1.3.1.0).