# Stormwater Control Plan For a Regulated Project

# **Brookdale Apartments**

November 10, 2021

Owner: Brookdale LLC Mike Folk PO Box 554 Corte Madera, CA 94925

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## Attachments

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Stormwater Control Plan Figure SW-1 Stormwater Control Plan Figure SW-2 Conceptual Drainage Plan Drawing C-2

This Stormwater Control Plan was prepared using the template dated July 14, 2014.

## I. Project Data

Table 1. Project Data Form

Project Name	Brookdale Apartments
Application Submittal Date	12-2-2021
Project Location	55 Lincoln Avenue San Rafael, CA 94901 APN 011-074-04 and 011-074-05
Project Phase No.	NA
Project Type and Description	Three story residential apartment buildings
Total Project Site Area (acres)	0.26 acres (11,394 sq ft)
Total New and Replaced Impervious Surface Area	6,404sq ft See attached drawing SW-1
Total Pre-Project Impervious Surface Area	309 sq ft See attached drawing SW-1
Total Post-Project Impervious Surface Area	6,404sq ft See attached drawing SW-1

## II. Setting

#### II.A. Project Location and Description

The project site is located on an undeveloped lot between Lincoln Avenue and Brookdale Avenue. The lot was formerly occupied by a single family home. The area includes a mixture of single family homes, apartment buildings and small office buildings.

#### II.B. Existing Site Features and Conditions

Site size and shape: 10,518 sq ft rectangular shaped parcel.

- Topography: The eastern half of the parcel is nearly flat. The western half slopes upward toward Lincoln Avenue.
- Hydrologic features
  - Contiguous natural areas: None
  - ➢ Wetlands: None
  - Watercourses: A 54 inch square box culvert crosses the property. The site does not drain into the box culvert.
  - ➢ Seeps, or springs: None
- Existing land uses: Vacant undeveloped

- Soil types and hydrologic soil groups:
- Vegetative cover: Grass and trees
- Impervious areas: 3,386 sq ft of asphalt paving
- Existing drainage for site and nearby areas: Site slopes toward Brookdale Avenue. There are no existing drainage improvements on the site other than the box culvert described above.
- Location of municipal storm drains: None

II.C. Opportunities and Constraints for Stormwater Control

#### **OPPORTUNITIES**

- Existing natural areas: None
- Low areas: None
- Oddly configured or otherwise unbuildable areas: None
- Easements: None
- Required landscape amenities, open space and buffers: San Rafael planning requirements apply to the project.
- Differences in elevation, which can provide needed hydraulic head: The finished grade of the site is lower than the elevation of Lincoln Avenue. The development plan for the site causes all the runoff to flow to the east toward Brookdale Avenue.

#### CONSTRAINTS:

- Impermeable soils:
- High groundwater: Unknown
- Groundwater pollution or contaminated soils: Unknown
- Steep slopes: None. Nearly flat site
- Geotechnical instability: None; nearly flat site.
- Topography: Standard bio-retention basins can be used provided the outflow is connected to the existing box culvert that runs through the site.
- Density/high-intensity land use: High density condominium project maximizes the building footprint on the site within the required property line setbacks.
- Heavy pedestrian or vehicular traffic: Heavy traffic on Fifth Avenue
- Utility locations: All utilities located in Fifth Avenue
- Safety concerns: None

## III. Low Impact Development Design Strategies

#### III.A. Optimization of Site Layout

#### III.A.1. Limitation of development envelope

The footprint of the building conforms to property line setbacks and uses all of the allowable building area on the site. This leaves little space for stormwater improvements.

#### III.A.2. Preservation of natural drainage features

The natural overland drainage slope toward Brookdale Avenue will be preserved. There are no drainage swales, wetlands or stream channels to preserve.

III.A.3. Setbacks from creeks, wetlands, and riparian habitats Not Applicable. No creeks, wetlands or riparian habitat on the site.

III.A.4. Minimization of imperviousness

Pervious concrete pavers will be used for the parking lot and patios. Gravel surfacing will be used for the central common patio.

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

No area of the site is available..

III.B. Use of Permeable Pavements

Pervious concrete pavers will be used for the parking lot and patios.

III.C. Dispersal of Runoff to Pervious Areas

#### III.D. Stormwater Control Measures

Bioretention planters will be constructed to receive runoff from nearly all impervious area.

#### IV. Documentation of Drainage Design

IV.A. Descriptions of Each Drainage Management Area

IV.A.1. Table of Drainage Management Areas. See Figure Sw-1.

DMA Name	Surface Type	Area (square feet)	
#1A Building #3 Roof	Impervious	1,301	
#1B Building #3 Patio	Pervious	100	
#2A Building #1 Roof	Impervious	1,931	
#2B Building #1 Patio	Pervious	225	
#2C Building #1 Walkway	Impervious	109	
#3 Parking	Pervious	703	
#4A Building #2 Roof	Impervious	1,552	
#4B Building #2 Patio	Pervious	154	

#4C Building #2 Walkway	Impervious	54
#5 Storage and Exercise Mat	Impervious	469
#6 Parking	Pervious	897
#7A Walkway	Impervious	90
#7B Walkway	Impervious	525
#8 Accessible Parking	Impervious	373

IV.A.2. Drainage Management Area Descriptions

DMA #1A, 1,301 square feet, drains the roof of Building #3 to bioretention basin #3. DMA #1B, 100 square feet, drains concrete paver patios to the bioretention basin #3 DMA #2A, 1,931 square feet, drains the roof of Building #1 to bioretention basin #1 DMA #2B, 225 square feet, drains concrete paver patios to bioretention basin #4 DMA #2C, 109 square feet, drains concrete walkways to bioretention basin #4 DMA #3, 703 square feet, drains concrete paver parking area to Brookdale Avenue DMA #4A, 1,552 square feet, drains, the roof of Building #2 to bioretention basin #2. DMA #4B, 154 square feet, drains concrete paver patios to bioretention basin #2 DMA #4B, 154 square feet, drains concrete walkways to bioretention basin #2 DMA #4C, 54 square feet, drains concrete walkways to bioretention basin #2 DMA #4C, 54 square feet, drains concrete paver parking area to Brookdale Avenue DMA #6, 897 square feet, drains concrete paver parking area to Brookdale Avenue DMA #7A, 90 square feet, drains concrete walkways to bioretention basin #4 DMA #7B, 525 square feet, drains concrete walkways to bioretention basin #4 DMA #7B, 525 square feet, drains concrete walkways to bioretention basin #4

IV.B. Tabulation and Sizing Calculations

Total Project Area	0.26 acres (11, 394 sq ft)
DMA #2A	1,931 sq ft
DMA #4A	1,552 sq ft
DMA #4B	154 sq ft
DMA #4C	54 sq ft

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

DMA #1A	1,301 sq ft
DMA #1B	100 sq ft
DMA #2B	225 sq ft
DMA #2C	109 sq ft
DMA #7A	90 sq ft
DMA #7B	525 sq ft

IV.B.2. Self-Treating Areas

Table 2 Self Treating Areas

DMA Name	Area (square feet)
Self Treating A	areas Not Used

IV.B.3. Self-Retaining Areas

Table 3 Self Retaining Areas

DMA Name	Area (square feet)					
Self Retaining Areas Not Used						

## IV.B.4. Areas Draining to Self-Retaining Areas

Table 4 Are	<u> </u>		
DMA	D	D CC	Due des et

DMA Name	Area (square feet)	Post- project surface type	Runoff factor	Product (Area x runoff factor)[A]	Receiving self- retaining DMA	Receiving self- retaining DMA Area (square feet) [B]	Ratio [A]/[B]	
Self Retaining Areas Not Used								

IV.B.5. Areas Draining to Bioretention Facilities

DMA Name	DMA Area (square	Post- project surface	DMA Runoff factor	DMA Area runoff		Facility Na	ame
	feet)	type		factor	Bio-R	etention Bas	in No. 1
#2A	1931	impervious	1.0	1931			
					Sizing	Minimum Facility	Proposed Facility
					factor	•	Size

Total>	1931	0.04	77	96
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DMA Name	DMA Area (square	Post- project surface	DMA Runoff factor	DMA Area runoff		Facility Na	ame
	feet)	type		factor	Bio-R	etention Bas	in No. 2
#4A	1552	impervious	1.0	1552			
#4B	154	pervious	0.1	15	Sizing	Minimum Facility	Proposed Facility
#4C	54	impervious	1.0	54	factor	•	Size
Total>				1621	0.04	65	95

Table 5b LID Facility Sizing Calculations Bioretention Basin #2

Table 5c LID Facility Sizing Calculations Bioretention Basin #3

DMA Name	DMA Area (square	Post- project surface	DMA Runoff factor	DMA Area runoff	<b>Facility Name</b>		ame
	feet)	type		factor	Bio-R	etention Bas	in No. 3
#1A	1301	impervious	1.0	1301			
#1B	100	pervious	0.1	10	Ciging	Minimum Sizing Facility	Proposed Facility
					factor	•	Size
Total>				1311	0.04	53	75

Table 5d LID Facility Sizing Calculations Bioretention Basin #4

DMA Name	DMA Area (square	Post- project surface	DMA Runoff factor	DMA Area runoff	Facility Name
	feet)	type		factor	Bio-Retention Basin No. 4

#2B	225	pervious	0.1	23			
#2C	109	impervious	1.0	109			
#7A	90	impervious	1.0	90			
#7B	525	impervious	1.0	525			
					Sizing	Minimum Facility	Proposed Facility
					factor	Facility Size	Size
Total>				747	0.04	30	75

## V. Source Control Measures

V.A. Site activities and potential sources of pollutants

Parking lot for apartments will be a source of oil, grease and other materials from parked vehicles.

Residential trash collection area will be a potential source of pollutants

Landscape areas will be a potential source of fertilizers, pesticides and herbicides.

#### V.B. Source Control

#### Table 6 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 the words "No dumping! Flows to Bay"	<ul> <li>Maintain and periodically repaint or replace inlet markings.</li> <li>Provide stormwater pollution prevention information to new site owners, lessees, or operators.</li> <li>See applicable operational BMPs in Fact Sheet SC-44, "Drainage System</li> </ul>

		<ul> <li>Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp- handbooks</li> <li>Include the following in lease agreements: "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."</li> </ul>
Interior floor drains and elevator shaft sump pumps	Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	• Inspect and maintain drains to prevent blockages and overflow.
Interior Parking Garage	Parking garage floor drains will be plumbed to the sanitary sewer except for the portions of the garage exposed to direct rainfall.	Inspect and maintain drains to prevent blockages and overflow.
Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance	<ul> <li>Final landscape plans will accomplish all of the following.</li> <li>Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.</li> <li>Design landscaping to minimize irrigation and runoff, to promote surface infiltration</li> </ul>	<ul> <li>Maintain landscaping using minimum or no pesticides.</li> <li>See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmphandbooks</li> <li>Provide IPM information to new owners, lessees and operators.</li> </ul>

	where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater	
	<ul> <li>pollution.</li> <li>Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.</li> <li>Consider using pest-resistant plants, especially adjacent to hardscape.</li> <li>To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions</li> </ul>	
Refuse Areas	Refuse will be collected in dumpsters. Signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here".	<ul> <li>Provide adequate number of receptacles.</li> <li>Inspect receptacles regularly; repair or replace leaky receptacles.</li> <li>Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes.</li> <li>Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately.</li> <li>Keep spill control materials available onsite. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA</li> </ul>

	Stormwater Quality Handbooks at www.casqa.org/resources/bmp handbooks
	Hanubooks

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

Standard construction methods and materials will be used conforming to the Building Code. Details will be provided on the construction drawings issued for building permit.

#### VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

The Project Owner agrees to execute any necessary maintenance agreements.

The Project Owner 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.Summary of Maintenance Requirements for Each Stormwater Facility

During final design of the project, and operation and maintenance plan will be prepared in accordance with Chapter 5 of the *Post-Construction Manual*.

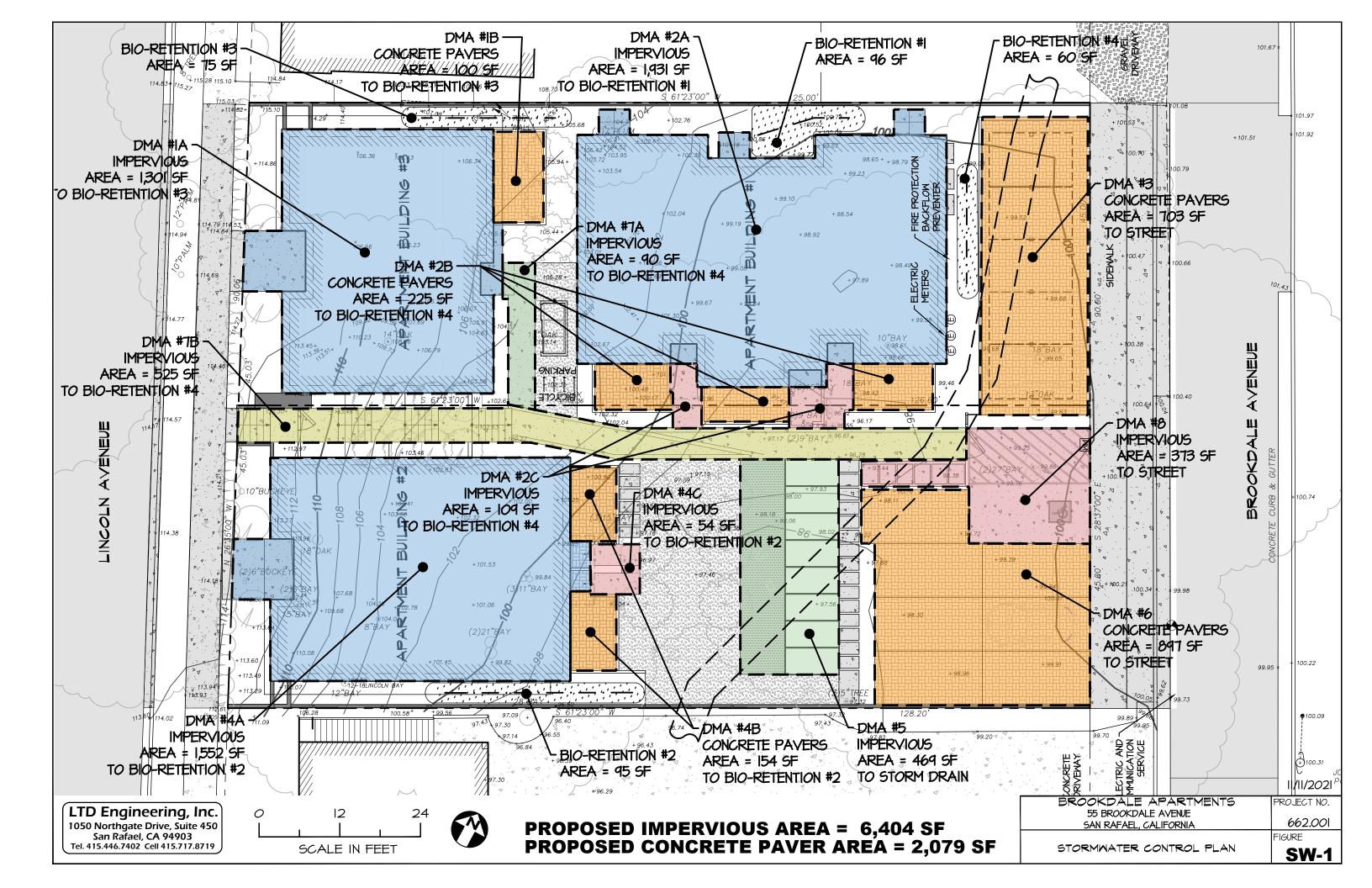
#### VII. Construction Checklist

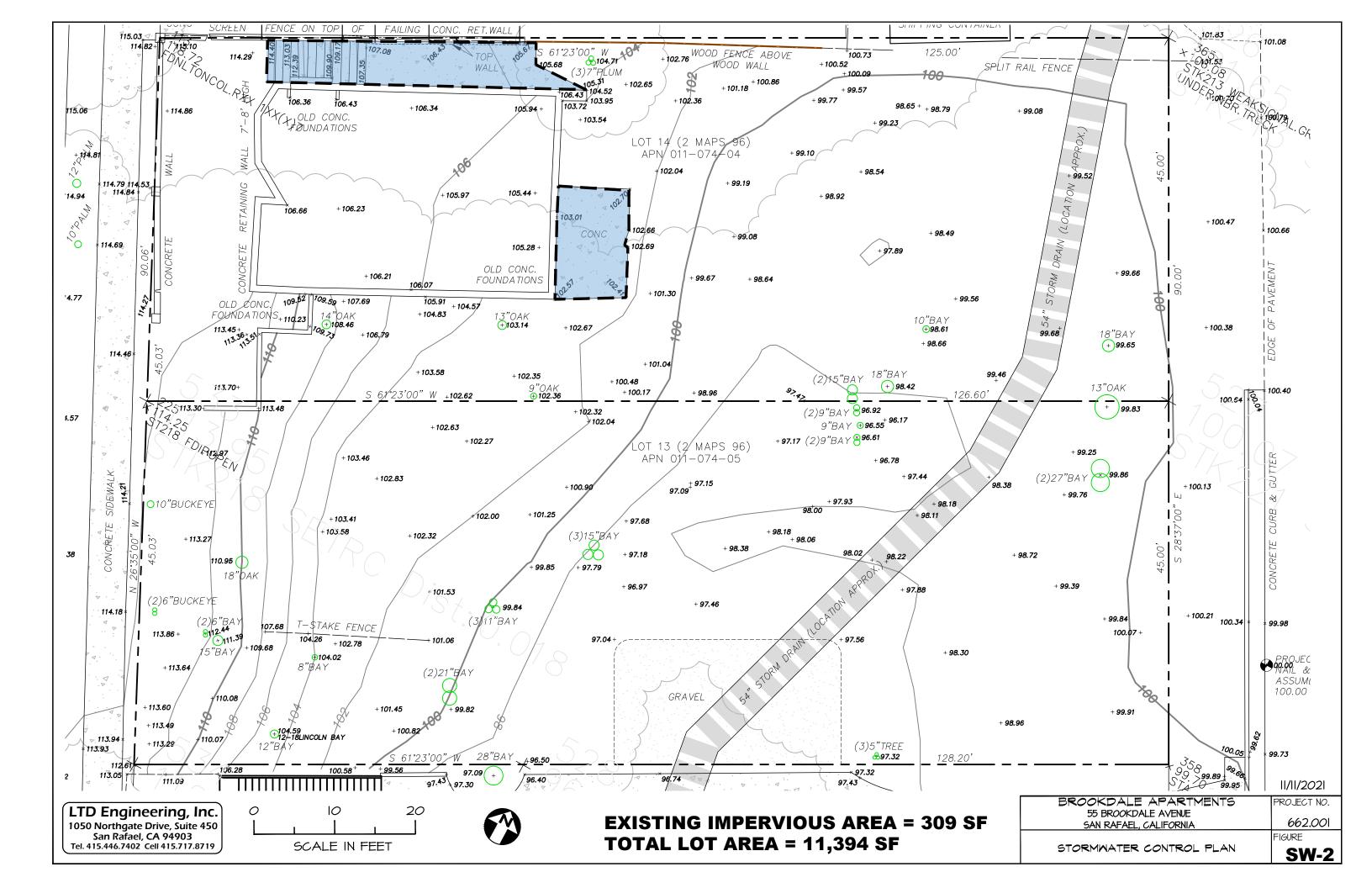
Table 7 Construction Plan C-3 Checklist

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Construction Plan Sheet No.
	Bioretention planters	C-2

## **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*.





#### DESIGN REVIEW NOTES

#### STORMWATER DRAINAGE PLAN

I. THE CONCEPTUAL STORMWATER DRAINAGE PLAN IS DESIGNED TO COMPLY WITH THE CITY REQUIREMENTS FOR ON-SITE STORMWATER MANAGEMENT AND CONTROL OF STORMWATER RUNOFF TO MINIMIZE OFF-SITE IMPACTS AND IMPROVE STORMWATER QUALITY.

2. THE EXISING IMPERVIOUS AREA ON THE SITE TOTALS 309 SQ FT.

3. THE PROPOSED DEVELOPMENT PLAN INCLUDES 6,404 SQ FT OF IMPERVIOUS AREA. THE TOTAL LOT AREA IS 11,394 SQ FT. THE PROPOSED TOTAL IMPERVIOUS AREA AMOUNTS TO 56 PERCENT OF THE LOT AREA.

4. THE PROPOSED DEVELOPMENT PLAN MINIMIZES THE USE OF IMPERVIOUS HARDSCAPE. CONCRETE PAVERS WILL BE USED FOR PARKING AREAS AND PATIOS.

5. RUNOFF FROM 5.562 SQ FT OF THE PROPOSED NEW IMPERVIOUS AREA WILL BE COLLECTED IN A PIPED DRAINAGE SYSTEM AND DIRECTED TO FOUR BIO-RETENTION BASINS. THE IMPERVIOUS AREA DIRECTED TO THE BIO-RETENTION BASINS INCLUDES THE ENTIRE ROOF AREA OF THE THREE APARTMENT BUILDINGS, WALKWAYS AND PATIOS, RUNOFF FROM REMAINING IMPERVIOUS AREA WILL SHEET FLOW TO LANDSCAPE AREAS OR TO THE STREET.

6. AREA DRAINS IN LANDSCAPE AND HARDSCAPE AREAS ARE LIMITED TO LOCATIONS WHERE THEY ARE NECESSARY TO PREVENT WATER PONDING THAT COULD DAMAGE THE BUILDINGS.

T. THE BIO RETENTION BASING ARE DESIGNED TO CAPTURE THE IO-YEAR STORM AND INFILTRATE IT INTO THE GROUND IN ACCORDANCE WITH MCSTOPPP GUIDELINES. THE SURFACE AREA OF THE BASING AND DETAILS OF CONSTRUCTION COMPLY WITH MCSTOPPP GUIDELINES.

8. A FOUNDATION DRAINAGE AND RETAINING WALL BACK DRAINAGE SYSTEM WILL BE CONSTRUCTED USING PERFORATED PVC PIPE. THE SYSTEM WILL OUTLET TO THE GROUND SURFACE AT A SUITABLE LOCATION. PERMANENT EROSION CONTROL WILL BE INSTALLED AT THE OUTLET LOCATION.

#### EXCAVATION & GRADING PLAN

I. SITE GRADING WILL BE COMPLETED IN CONFORMANCE WITH THE PROJECT GEOTECHNICAL REPORT AND THE APPROVED SITE GRADING PLAN.

2. EXCESS EXCAVATED MATERIAL WILL BE LEGALLY DISPOSED OF AT AN OFF-SITE LOCATION TO BE DETERMINED BY THE CONSTRUCTION CONTRACTOR.

#### EROSION CONTROL

I. EROSION CONTROL MEASURES WILL BE INCORPORATED INTO THE PROJECT DURING CONSTRUCTION AND IMPLEMENTED BY THE CONSTRUCTION CONTRACTOR. STRAW WATTLES WILL BE PLACED AROUND THE DOWN-SLOPE PERIMETER OF THE DISTURBED AREA. EXCAVATED AREAS AND SOLL STOCKPILES WILL BE COVERED WITH PLASTIC TARPS TO MINIMIZE EROSION. AREAS DISTURBED DURING CONSTRUCTION WILL BE RESTORED BY SEEDING AND INSTALLATION OF EROSION CONTROL BLANKET AND STRAW WATTLES.

2. PERMANENT EROSION CONTROL WILL BE PROVIDED BY LANDSCAPING THE ENTIRE DISTURBED AREA AT THE COMPLEITON OF THE WORK IN ACCORDANCE WITH THE LANDSCAPING PLANS.

#### STORMWATER POLLUTION PREVENTION

I. SPECIFICATIONS WILL BE INCLUDED ON THE PROJECT DRAWINGS OUTLINING CONSTRUCTION PRACTICES THAT MUST BE FOLLONED TO PREVENT STORMWATER POLLUTION. CONSTRUCTION WORKERS WILL BE ADVISED OF REQUIRED CONSTRUCTION MEASURES FOR AVOIDING STORMATER POLLUTION. THESE MEASURES WILL INCLUDE PROCEDURES FOR MATERIAL STORAGE, USE AND DISPOSAL OF HAZARDOUS MATERIALS (PAINT, SOLVENTS, ADHESIVES, ETC.), WASTE DISPOSAL OF CONCRETE WASHOUT REQUIREMENTS AND OTHER CONSTRUCTION PRACTICES.

#### UTILITY PLAN

I. WATER: WATER SERVICE WILL BE PROVIDED BY A NEW SERVICE CONNECTION TO THE EXISTING WATER MAIN IN BROOKDALE AVENUE AND AN APPROPRIATELY SIZED METER AS SHOWN ON DRAWING C-2. ALL WATER SYSTEM IMPROVEMENTS WILL BE COMPORTANCE WITH MARIN MUNICIPAL WATER DISTRICT STANDARDS.

2. ELECTRIC POWER: ELECTRIC SERVICE WILL BE LOCATED UNDERGROUND FROM THE NEAREST JOINT POLE AS SHOWN ON DRAWING C-2. ALL ELECTRIC POWER SYSTEM IMPROVEMENTS WILL BE COORDINATED WITH PACIFIC GAS AND ELECTRIC (PG&E) AND COMPLETED IN CONFORMANCE WITH PG&E STANDARDS.

3. COMMUNICATION: PHONE AND CABLE TV SERVICE WILL BE LOCATED UNDERGROUND FROM THE NEAREST JOINT POLE AS SHOWN ON DRAWING C-2. ALL COMMUNICATION SYSTEM IMPROVEMENTS WILL BE COORDINATED WITH AT&IT AND COMCAST. THE WORK WILL BE COMPLETED IN CONFORMANCE WITH THEIR STANDARDS.

4. NATURAL GAS: GAS SERVICE WILL BE PROVIDED WITH A NEW SERVICE LINE AND METER AS SHOWN ON DRAWING C-2INED. ALL GAS SYSTEM IMPROVEMENTS WILL BE COORDINATED WITH PACIFIC GAS AND ELECTRIC (PG&E) AND COMPLETED IN CONFORMANCE WITH PG&E STANDARDS.

5. NATURAL GAS: ALL GAS SYSTEM IMPROVEMENTS WILL BE COORDINATED WITH PACIFIC GAS AND ELECTRIC (PG4E) AND COMPLETED IN CONFORMANCE WITH PG4E STANDARDS.

 $\scriptstyle 6.$  SANITARY SEWER: A NEW SEWER LATERAL AND BACK FLOW PREVENTION DEVICES AT EACH BUILDING WILL BE CONSTRUCTED AS SHOWN ON DRAWING C-2. THE LATERAL WILL CONROM TO SAN RAFAEL SANITATION DISTRICT STANDARDS.

#### RETAINING WALL CONSTRUCTION NOTES

I. ALL RETAINING WALLS WILL BE REINFORCED CONCRETE CONSTRUCTION SUPPORTED BY SPREAD FOOTINGS OR DRILLED PIERS AS DETERMINED BY THE PROJECT GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER.

