

Stormwater Control Plan
For a Regulated Project
Creekwood Condominiums

March 23, 2021

Prepared by:
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- **Draft Maintenance Agreement For Monitoring Storm Water BMP Facilities and Declaration of Covenants**
- **Draft Maintenance Agreement Exhibit**

I. Project Data

Table 1. Project Data Form

Project Name/Number	Creekwood Condominium
Application Submittal Date	March 23, 2021
Project Location	270 & 280 Casa Grande Road, Petaluma CA 94952 APN 017-040-051 & 016
Project Phase No.	N/A
Project Type and Description	This project proposes a new diverse high density residential development of 42 condo units lots
Total Project Site Area (acres)	5.198 Acres
Total New and Replaced Impervious Surface Area	124,220 s.f. (2.85 ac)
Total Pre-Project Impervious Surface Area	16,534 s.f. (0.379 ac)
Total Post-Project Impervious Surface Area	124,220 s.f. (2.85 ac)

II. Setting

II.A. Project Location and Description

The project site is approximately 5.20 acres, located at 270 & 250 Casa Grande Road, Petaluma, California. The existing site consists of two single family residences and a large barn/shop. Much of the project area is undeveloped with a gravel driveway connecting the structures. Along the rear of the project site to the southeast is Adobe Creek. The project will establish a looped public street through the condominium complex, with a private storm drain system that will discharge to the easterly limits of the site with water returning to adobe creek after treatment on site. Final design & coordination outfall locations will be coordinated with RWQCB & CA Fish & Wildlife as needed during development of construction drawings.

II.B. Existing Site Features and Conditions

The project site is approximately 5.20 acres, recilinear and with elevation change across the site of roughly four feet. The property is surrounded by Casa Grande Road and Casa Grande High School to the Northwest, the PEP Housing Facility to the Northeast, and the approved Casa Grande Subdivision to the Southwest. There is currently no storm drain system on the site or in the portion of Casa Grande Road the fronts the site. The site slopes gently away from the Casa Grande Road side to Adobe Creek at the Southeast.

II.C. Opportunities and Constraints for Stormwater Control

The proposed site is designed so that impervious surface area flow is directed into bio-retention basins sized to accept the run-off from a minimum storm intensity of 0.2 inches per hour per BASMAA requirements. Stormwater runoff exceeding the 2-year event storm intensity of 0.5 inches per hour will bypass the bioretention basins as water levels rise and be routed to the proposed on site public storm drain system. Discharge flows will be directed to the E/SE and returned to Adobe Creek.

There are no significant constraints to on site stormwater routing and treatment.

III. Low Impact Development Design Strategies

III.A. Use of Permeable Pavements

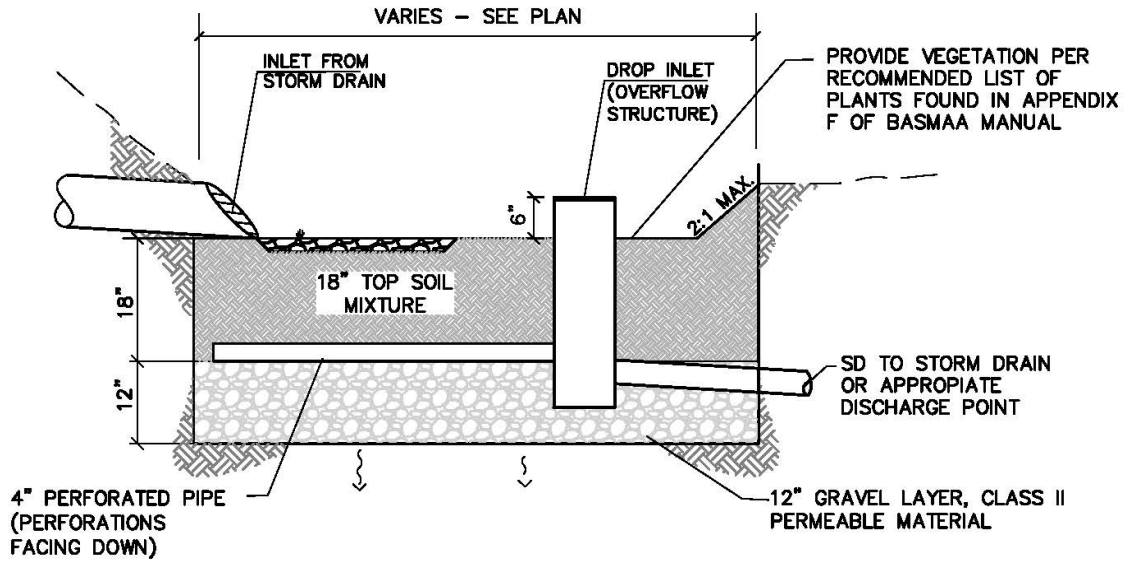
The proposed private walkway along the South of the site near Adobe Creek is GraniteCrete. It is a permeable pavement that can absorb up to an inch of water an hour. It is laid upon a minimum of 3” of crushed rock for rainfall retention and a uniform subgrade to promote infiltration back into the soil.

III.B. Dispersal of Runoff to Pervious Areas

Runoff within the 50’ setback of Adobe Creek will flow back to the river in historic drainage pattern.

IV. Documentation of Drainage Design

DMA 1	DMA Area (s.f.)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Basin Area A		
Roof	53,614.00	Roof	1.0	53,614.0	BRA 1		
Landscape	62,060	Landscape	0.1	6,206.0	Sizing Factor	Minimum Facility Area	Proposed Facility Area
Pavement	61,592	Hardscape	1.0	61,592.2			
Total				121,412.2	0.04	4856.5	4977
DMA 2	DMA Area (s.f.)	Post-Project Surface Type	DMA Runoff Factor	DMA Area x Runoff Factor	Basin Area B		
Roof	9,013	Roof	1.0	9,013.0	BRA 2		
Landscape	11,794	Landscape	0.1	1,179.4	Sizing Factor	Minimum Facility Area	Proposed Facility Area
Pavement	0	Hardscape	1.0	0.0			
Total				10,192.4	0.04	407.7	510



BIORETENTION AREA

N.T.S.

V. Operations and Maintenance Plan

Ownership and Responsibility for Maintenance in Perpetuity

The 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.

Summary of Maintenance Requirements for Each Stormwater Facility

This operation and maintenance manual shall be a guide to insure the facilities included in the stormwater treatment system are inspected and maintained in good repair and working order.

Facilities to be Maintained:

Bioretention Basins

The site contains six bioretention basins as shown and labeled on Post Construction Stormwater Control Plan C-17. The size of each basin is provided in the Documentation of the Drainage Design section of this Plan. Each basin shall be a minimum of 30 inches in depth (18" Minimum Planting Medium above 12" Gravel Layer). Each basin will have a hydraulically flat bottom, meaning all points in the bottom of the bioretention basin shall have the same elevation.

Drainage Swales & Storm Drain Lines

There are drainage swales on each lot that direct runoff from the back half of the lot to the rear. The runoff is then directed to an area drain and into the rear lot storm drain systems. The front half of the lots have the under-sidewalk drains empty into the curb and gutters which routes stormwater runoff into the public street storm drain system that outfalls to the main bioretention basin.

Annual Inspection

The stormwater treatment system shall be inspected annually prior to October 15th of each year. A report shall be prepared, signed and sealed by a Civil Engineer registered in the State of California and submitted to the County. The report shall indicate the results of the inspection and identify any actions necessary to ensure the proper operation of the stormwater treatment system. Inspection shall include condition of bioretention basins, inlet swales, vegetation and plant health, weed growth, erosion, slope stability, debris, siltation and blockage.

- Inlets and swales leading to basins shall be inspected for erosion and damage due to traffic, either foot or vehicular and repaired accordingly. Minimum depth for inlet swales is 9-inches with 2:1 side slopes. Rock lining will be required when the running slope is greater than 5% (20:1) otherwise ensure that the vegetation in the swales remains in good health.
- Bioretention basins shall be inspected to be free of silt and free draining to the gravel layer and be maintained to a minimum depth of 30-inches and be hydraulically flat. The inspection shall ensure that the upslope berm is intact and functions as intended.

Document Facilities “As Built”

Include from the final construction drawings:

- Plans, elevations, and details of the bioretention facilities. If necessary, annotate the drawings with the designations used in the Stormwater Control Plan so it is clear which drawing refers to which facility.
- Construction details and specifications, including depths of sand or soil, compaction, pipe materials, and bedding.
- Location and layouts of inflow piping and piping to off-site discharge.
- Native soils encountered (e.g., sand or clay lenses beneath or near facilities).

Changes made in the field during construction must be noted in the *final* Plan to be submitted following construction.

Schedule Maintenance Activities

The *number & type* facilities will be maintained on the following schedule at a minimum with the frequency adjusted in response to the needs of each particular facility.

Routine Activities

The facilities will be examined daily for visible trash, and trash will be removed. Any graffiti, vandalism, or other damage will be noted and addressed within 48 hours.

The planted areas will be weeded by hand approximately monthly. In response to problem areas or threatening invasions, corn gluten, white vinegar, vinegar-based products, or non-selective natural herbicides such as Burnout or Safer’s Sharpshooter may be used. At this time, plants will be inspected for health and the irrigation system will be turned on manually and checked for any leaks or broken lines, misdirected spray patterns etc. Any dead plant will be replaced from the mix specified by the landscape architect or with similar plantings appropriate for the unique conditions. When replanting, maintain the design surface elevation and minimize the introduction of soil.

Following Significant Rain Events

A significant rain event will be considered to be one that produces approximately a half-inch or more of rainfall in a 24-hour period. Within 24 hours after each such event, the following will be conducted:

- The surface of the facility will be observed to confirm there is no ponding.
- Inlets will be inspected, and any accumulation of trash or debris will be removed. Any erosion at inlets should be restored to grade.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed. Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps soil moist, and replenishes soil nutrients. Mulch is added from time to time as necessary to maintain a mulch layer thickness (some agencies require 3"). However, ensure the underlying soil surface beneath the mulch layer is a minimum 6" below the overflow elevation, consistently throughout the surface area of the facility. In particular, ensure that the top of the mulch layer is below the facility overflow, so that as the facility fills during a major storm, and that the entire surface is wetted before the overflow elevation is reached.

- Outlet structure will be inspected for any obstructions to assure that mulch is not washed out.

Prior to the Start of the Rainy Season

In September of each year, facility inlets and outlets will be inspected to confirm there is no accumulation of debris that would block flow. Stormwater should drain freely into the bioretention facilities. If not previously addressed during monthly maintenance, any growth and spread of plantings that blocks inlets or the movement of runoff across the surface of the facility will be cut back or removed.

If the facilities are not completely drained in 24 hours, the underdrain may be clogged. Check the overflow outlet to determine if the underdrain is performing properly. There should be no filter fabric or geotextile in the horizontal layers or wrapped at the underdrain. If the underdrain is working, the bioretention area may contain fines. Replace material with mixture of 30-40% aged compost and 60-70% washed granular sand, no fines.

Annually During Winter

Once, in December – February of each year, vegetation will be cut back as needed, debris removed, and plants and mulch replaced as needed. The concrete work will be inspected for damage. The elevation of the top of soil and mulch layer will be confirmed to be consistent with the 6-inch reservoir depth.

Landscape maintenance personnel should be aware of the following:

At no time will synthetic pesticides or fertilizers be applied, nor will any soil amendments, other than aged compost or sand/compost mix, be introduced. The top of soil surface will be maintained at or near the design elevation throughout. Irrigation systems will be maintained to conserve water while maintaining plant health.

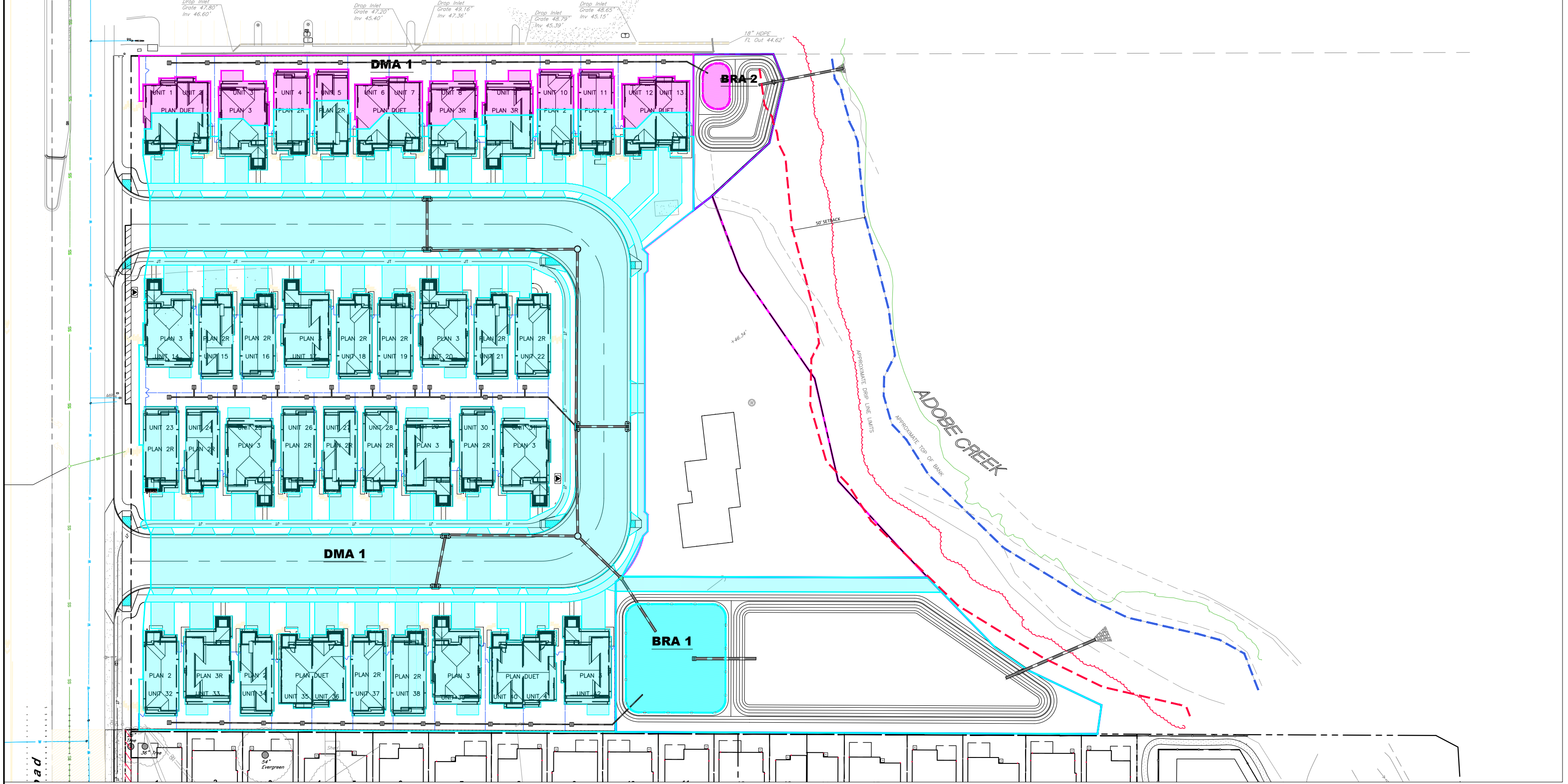
Although it is unlikely to be needed, if plants are not thriving compost tea may be applied at a recommended rate of 5 gallons mixed with 15 gallons of water per acre, up to once per year between March and June. Compost tea will not be applied when temperatures are below 50°F or above 90°F or when rain is forecast within the next 48 hours.

The following may be applied for pest control if needed:

- Beneficial nematodes
- Safer® products
- Neem oil

VI. 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*



LEGEND

- PROPERTY LINE
- STORM DRAIN LINE
- BRA BASIN RETENTION AREA. SEE DETAIL SHEET C-15.
- DMA DRAINAGE MANAGEMENT AREA (IMPERVIOUS SURFACES) ROOFS, AC PAVEMENT, SIDEWALK, DRIVEWAYS.
- DMA DRAINAGE MANAGEMENT AREA (PERVIOUS SURFACES) LANDSCAPE AREAS, TURFBLOCK OR GRAVEL, OPEN OR POROUS PAVERS, GRANULAR PAVEMENT, GROUND COVER)

ABBREVIATION

- BRA BASIN RETENTION AREA OR FACILITY
- DMA DRAINAGE MANAGEMENT AREA

KEYNOTES

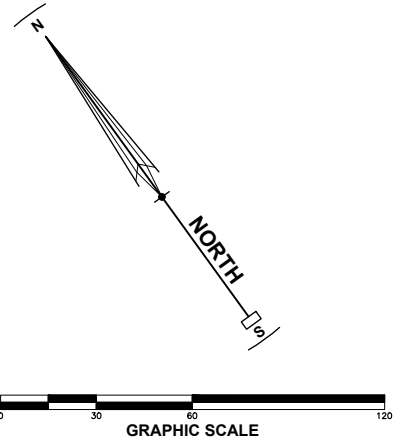
- Ⓢ ADD AS NEEDED

STORM WATER TREATMENT NOTES

1. THE STORM WATER TREATMENT AND CONTROL PLAN IS BASED ON POST-CONSTRUCTION MANUAL GUIDELINES PREPARED BY THE BAY AREA STORM WATER MANAGEMENT AGENCIES ASSOCIATION (BASMAA) PHASE II COMMITTEE.
2. THE PRELIMINARY STORM WATER CONTROL PLAN EXHIBIT IDENTIFIES DRAINAGE MAINTENANCE AREAS (DMA) WITH CORRESPONDING BASIN RETENTION AREAS (BRA). THE BRA'S HAVE BEEN SIZED PER BASMAA TABLE 4.1 THROUGH 4.5. THE CALCULATIONS REQUIRE A BRA SIZE TO BE 4% OF THE CORRESPONDING DMA.
3. THE STORM WATER CONTROL PLAN IS SUBJECT TO REVISION BASED ON FINAL APPROVED CONSTRUCTION DOCUMENTS.

NOTES

1. SEE SHEET C-10 FOR PRELIMINARY GRADING AND DRAINAGE PLAN.
2. SEE SHEET C-11 FOR PRELIMINARY UTILITY PLAN.
3. SEE SHEET C-13 FOR SECTIONS
4. SEE SHEET C-16 FOR DETAILS.
5. SEE BASMAA STORM WATER CONTROL PLAN PREPARED BY SJLA AND DATED 10-09-2019 FOR BMP DESCRIPTIONS, SIZING CALCULATIONS, OPERATIONS AND MAINTENANCE.



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Pavement	0	Hardscape	1.0	0.0			
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REVISIONS	BY

PRELIMINARY LID & BASMAA BASIN EXHIBIT
 CREEKWOOD CONDOMINIUM PROJECT
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016
 PETALUMA CALIFORNIA

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DATE: 2021.03.24
 SCALE: 1"=30'
 DESIGN: SJL, ADF, NOF
 DRAWING: ORK, HSM, JTG, NOF
 CHECK: SJL
 JOB: CREEKWOOD
 JOB No: 192119
 SHEET
C-14
 OF 20 SHEETS

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