

Stormwater Control Plan  
For a Regulated Project  
Creekwood Condominiums

July 14, 2023

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Table of Contents

|              |  |       |
|--------------|--|-------|
| <b>I.</b>    | <b>Project Data</b> .....  | 1     |
| <b>II.</b>   | <b>Setting</b> .....   | 1     |
|              | II.A. Project Location and Description.....  | 1     |
|              | II.B. Existing Site Features and Conditions .....                                  | 1     |
|              | II.C. Opportunities and Constraints for Stormwater Control .....                   | 2     |
| <b>III.</b>  | <b>Low Impact Development Design Strategies</b> .....                              | 2     |
|              | III.A. Optimization of Site Layout.....  | 2     |
|              | III.A.1. Limitation of Development Envelope .....                                  | 2     |
|              | III.A.2. Preservation of Natural Drainage Features.....                            | 2     |
|              | III.A.3. Setbacks from creeks, wetlands & riparian habitats.....                   | 2     |
|              | III.A.4. Minimization of imperviousness .....                                      | 2     |
|              | III.A.5. Use of drainage as a design element .....                                 | 2     |
|              | III.B. Use of Permeable Pavements.....   | 2     |
|              | III.C. Dispersal of runoff to Pervious Areas .....                                 | 2     |
|              | III.D. Stormwater Control Measures .....   | 2     |
| <b>IV.</b>   | <b>Documentation of Drainage Design</b> .....                                      | 2-3   |
|              | IV.A. Descriptions of each drainage management area .....                          | 2     |
|              | IV.A.1. Table of drainage management areas .....                                   | 2     |
|              | IV.A.2. Drainage Management Area descriptions .....                                | 2     |
|              | IV.B. Tabulation of Sizing calculations.....                                       | 2-3   |
|              | IV.B.1. Information summary for Bioretention Facility Design .....                 | 2     |
|              | IV.B.2. Self-Treating Areas .....  | 2     |
|              | IV.B.3. Self-Retaining Areas .....   | 2     |
|              | IV.B.4. Areas Draining to Self-Retaining Areas.....                                | 2     |
|              | IV.B.5. Areas Draining to Bioretention Facilities.....                             | 2     |
| <b>V.</b>    | <b>Source Control Measures</b> .....   | 4-11  |
|              | V.A. Site activities and potential sources of pollutants .....                     | 4-11  |
|              | V.B. Source control table .....  | 4-11  |
|              | V.C. Features, Materials, and Methods of Construction of Source Control BMPs ..... | 4-11  |
| <b>VI.</b>   | <b>Stormwater Facilities Maintenance</b> .....                                     | 12    |
|              | VI.A. Ownership Responsibility for Maintenance in Perpetuity .....                 | 12    |
|              | VI.B. Summary of Maintenance Requirements for Each Stormwater Facility .....       | 12-14 |
| <b>VII</b>   | <b>Construction Checklist</b> .....  | 15-16 |
| <b>VIII.</b> | <b>Certifications</b> .....  | 17    |
|              | <b>Figures</b>   |       |
|              | Vicinity Map.....  | 18    |
|              | Bioretention Area detail.....  | 19    |
|              | <b>Attachments</b>   |       |
|              | Stormwater Control Plan.....   | 20    |

## 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 59 condo units lots |
| Total Project Site Area (acres)                | 5.198 Acres   |
| Total New and Replaced Impervious Surface Area | 119,345 s.f. (2.74 ac)  |
| Total Pre-Project Impervious Surface Area      | 16,534 s.f. (0.379 ac)  |
| Total Post-Project Impervious Surface Area     | 119,345 s.f. (2.74 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, rectilinear 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 Makenna 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 Casa Grande Road to Adobe Creek to 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 private 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 | Facility Name        |                                     |                                      |
|--------------|-----------------|---------------------------|-------------------|--------------------------|----------------------|-------------------------------------|--------------------------------------|
| Roof         | 4,986           | Roof                      | 1.0               | 4,986.0                  | <b>BRA 1</b>         |                                     |                                      |
| Landscape    | 2,436           | Landscape                 | 0.1               | 243.6                    | <b>Sizing Factor</b> | <b>Minimum Facility Area (s.f.)</b> | <b>Proposed Facility Area (s.f.)</b> |
| Pavement     | 1,598           | Hardscape                 | 1.0               | 1,598.0                  |                      |                                     |                                      |
| <b>Total</b> |                 |                           |                   | 6,827.6                  | 0.04                 | 273.1                               | 295                                  |

| DMA 2        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name        |                                     |                                      |
|--------------|-----------------|---------------------------|-------------------|--------------------------|----------------------|-------------------------------------|--------------------------------------|
| Roof         | 4,913           | Roof                      | 1.0               | 4,913.0                  | <b>BRA 2</b>         |                                     |                                      |
| Landscape    | 2,693           | Landscape                 | 0.1               | 269.3                    | <b>Sizing Factor</b> | <b>Minimum Facility Area (s.f.)</b> | <b>Proposed Facility Area (s.f.)</b> |
| Pavement     | 1,524           | Hardscape                 | 1.0               | 1,524.0                  |                      |                                     |                                      |
| <b>Total</b> |                 |                           |                   | 6,706.3                  | 0.04                 | 268.3                               | 295                                  |

| DMA 3 | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name |  |  |
|-------|-----------------|---------------------------|-------------------|--------------------------|---------------|--|--|
|-------|-----------------|---------------------------|-------------------|--------------------------|---------------|--|--|

|              |       | Surface Type |     | Runoff Factor |                      |                                     |                                      |
|--------------|-------|--------------|-----|---------------|----------------------|-------------------------------------|--------------------------------------|
| Roof         | 4,913 | Roof         | 1.0 | 4,913.0       | <b>BRA 3</b>         |                                     |                                      |
| Landscape    | 2,637 | Landscape    | 0.1 | 263.7         | <b>Sizing Factor</b> | <b>Minimum Facility Area (s.f.)</b> | <b>Proposed Facility Area (s.f.)</b> |
| Pavement     | 1,606 | Hardscape    | 1.0 | 1,606.0       |                      |                                     |                                      |
| <b>Total</b> |       |              |     | 6,782.7       | 0.04                 | 271.3                               | 295                                  |

| DMA 4        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name        |                                     |                                      |
|--------------|-----------------|---------------------------|-------------------|--------------------------|----------------------|-------------------------------------|--------------------------------------|
| Roof         | 4,986           | Roof                      | 1.0               | 4,986.0                  | <b>BRA 4</b>         |                                     |                                      |
| Landscape    | 2,836           | Landscape                 | 0.1               | 283.6                    | <b>Sizing Factor</b> | <b>Minimum Facility Area (s.f.)</b> | <b>Proposed Facility Area (s.f.)</b> |
| Pavement     | 1,962           | Hardscape                 | 1.0               | 1,962.0                  |                      |                                     |                                      |
| <b>Total</b> |                 |                           |                   | 7,231.6                  | 0.04                 | 289.3                               | 295                                  |

| DMA 5        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name        |                                     |                                      |
|--------------|-----------------|---------------------------|-------------------|--------------------------|----------------------|-------------------------------------|--------------------------------------|
| Roof         | 44,993          | Roof                      | 1.0               | 44,993.0                 | <b>BRA 5</b>         |                                     |                                      |
| Landscape    | 60,392          | Landscape                 | 0.1               | 6,039.2                  | <b>Sizing Factor</b> | <b>Minimum Facility Area (s.f.)</b> | <b>Proposed Facility Area (s.f.)</b> |
| Pavement     | 47,864          | Hardscape                 | 1.0               | 47,864.0                 |                      |                                     |                                      |
| <b>Total</b> |                 |                           |                   | 98,896.2                 | 0.04                 | 3955.8                              | 4350                                 |

## Appendix A. Stormwater Pollutant Sources/Source Controls Checklist

How to use this worksheet (also see instructions on page 3-7 of the *BASMAA Post-Construction Manual*):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding Structural Source Control BMPs in your Stormwater Control Plan drawings.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable Structural Source Control BMPs and Operational Source Control BMPs in a table in your Stormwater Control Plan. Use the format shown in Table 3-1 on page 3-7 of the *BASMAA Post-Construction Manual*. Describe your specific BMPs in an accompanying narrative and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs.

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...  | ... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs |  |   |
|---|--|--|---|
| <b>1</b><br>Potential Sources of Runoff Pollutants  | <b>2</b><br>Structural Source Controls—Show on Stormwater Control Plan Drawings      | <b>3</b><br>Structural Source Controls—List in SCP Table and Narrative   | <b>4</b><br>Operational Source Control BMPs—Include in SCP Table and Narrative  |
| <input type="checkbox"/> <b>A.</b> On-site storm drain inlets (unauthorized non-stormwater discharges and accidental spills or leaks) | <input type="checkbox"/> Locations of inlets.  | <input type="checkbox"/> Mark all inlets with the words "No Dumping! Flows to Bay" or similar.                             | <input type="checkbox"/> Maintain and periodically repaint or replace inlet markings.<br><input type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators.<br><input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a><br><input type="checkbox"/> 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." |
| <input type="checkbox"/> <b>B.</b> Interior floor drains and elevator shaft sump pumps  | <input type="checkbox"/> Show drains and pump locations                              | <input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer. | <input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.   |
| <input type="checkbox"/> <b>C.</b> Interior parking garages   | <input type="checkbox"/> Show drain locations  | <input type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.                     | <input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.   |

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|--|---|---|--|
| 1<br>Potential Sources of Runoff Pollutants  | 2<br>Structural Source Controls—Show on Stormwater Control Plan Drawings  | 3<br>Structural Source Controls—List in SCP Table and Narrative   | 4<br>Operational Source Control BMPs—Include in SCP Table and Narrative  |
| <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>D1.</b> Need for future indoor &amp; structural pest control</li> </ul>               |   | <ul style="list-style-type: none"> <li><input type="checkbox"/> Note building design features that discourage entry of pests.</li> </ul>  | <ul style="list-style-type: none"> <li><input type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.</li> </ul>   |
| <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>D2.</b> Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance</li> </ul>  | <ul style="list-style-type: none"> <li><input type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.</li> <li><input type="checkbox"/> Show self-retaining landscape areas, if any.</li> <li><input type="checkbox"/> Show bioretention facilities. (See instructions in Chapter 4.)</li> </ul> | <p>State that final landscape plans will accomplish all of the following.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.</li> <li><input type="checkbox"/> 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.</li> <li><input type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.</li> <li><input type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape.</li> <li><input type="checkbox"/> 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> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Maintain landscaping using minimum or no pesticides.</li> <li><input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a></li> <li><input type="checkbox"/> Provide IPM information to new owners, lessees and operators.</li> </ul> |
| <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>E.</b> Pools, spas, ponds, decorative fountains, and other water features.</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.</li> </ul>   | <ul style="list-style-type: none"> <li><input type="checkbox"/> If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.</li> </ul>  | <ul style="list-style-type: none"> <li><input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a></li> <li><input type="checkbox"/> The sanitary sewer operator must be notified and a clean out identified when pools are to be drained to the sanitary sewer.</li> </ul>                             |

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...         | ... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs   |  |  |
|--|--|--|--|
| <b>1</b><br>Potential Sources of Runoff Pollutants       | <b>2</b><br>Structural Source Controls—Show on Stormwater Control Plan Drawings  | <b>3</b><br>Structural Source Controls—List in SCP Table and Narrative   | <b>4</b><br>Operational Source Control BMPs—Include in SCP Table and Narrative   |
| <input type="checkbox"/> <b>F.</b> Food service          | <input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.<br><br><input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.   | <input type="checkbox"/> Describe the location and features of the designated cleaning area.<br><br><input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.                 | <input type="checkbox"/> State maintenance schedule for grease interceptor   |
| <b>G.</b> Refuse areas                                   | <input type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.<br><br><input type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.<br><br><input type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer. | <input type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans.<br><br><input type="checkbox"/> State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar. | State how the following will be implemented: <ul style="list-style-type: none"> <li><input type="checkbox"/> Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a></li> </ul> |
| <input type="checkbox"/> <b>H.</b> Industrial processes. | <input type="checkbox"/> Show process area.  | <input type="checkbox"/> If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."   | <input type="checkbox"/> See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a>   |



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|--|--|---|---|
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| <p><input type="checkbox"/> <b>1.</b> Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)</p> | <p><input type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.</p> <p><input type="checkbox"/> Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.</p> <p><input type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.</p> | <p><input type="checkbox"/> Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.</p> <p><input type="checkbox"/> Where appropriate, reference documentation of compliance with the requirements of programs for:</p> <ul style="list-style-type: none"> <li>▪ Hazardous Waste Generation</li> <li>▪ Hazardous Materials Release Response and Inventory</li> <li>▪ California Accidental Release (CalARP)</li> <li>▪ Aboveground Storage Tank</li> <li>▪ Uniform Fire Code Article 80 Section 103(b) &amp; (c) 1991</li> <li>▪ Underground Storage Tank</li> </ul> | <p><input type="checkbox"/> See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a></p> |

7

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| <input type="checkbox"/> <b>J. Vehicle and Equipment Cleaning</b> | <input type="checkbox"/> Show on drawings as appropriate: <ul style="list-style-type: none"> <li>(1) Commercial/industrial facilities having vehicle/ equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.</li> <li>(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).</li> <li>(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.</li> <li>(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.</li> </ul> | <input type="checkbox"/> If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced. | Describe operational measures to implement the following (if applicable): <ul style="list-style-type: none"> <li><input type="checkbox"/> Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.</li> <li><input type="checkbox"/> Car dealerships and similar may rinse cars with water only.</li> <li><input type="checkbox"/> See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a></li> </ul> |

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| <input type="checkbox"/> <b>K. Vehicle/Equipment Repair and Maintenance</b> | <input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.<br><input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.<br><input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained. | <input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.<br><input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.<br><input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. | <p>In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:</p> <input type="checkbox"/> No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.<br><input type="checkbox"/> No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.<br><input type="checkbox"/> No person shall leave unattended parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. |
| <input type="checkbox"/> <b>L. Fuel Dispensing Areas</b>                    | <input type="checkbox"/> Fueling areas shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.<br><input type="checkbox"/> Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area <sup>1</sup> .] The canopy [or cover] shall not drain onto the fueling area.   |   | <input type="checkbox"/> The property owner shall dry sweep the fueling area routinely.<br><input type="checkbox"/> See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a>  |

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|--|--|--|---|
| <b>1</b><br>Potential Sources of Runoff Pollutants           | <b>2</b><br>Structural Source Controls—Show on Stormwater Control Plan Drawings  | <b>3</b><br>Structural Source Controls—List in SCP Table and Narrative                             | <b>4</b><br>Operational Source Control BMPs—Include in SCP Table and Narrative  |
| <input type="checkbox"/> <b>M. Loading Docks</b>             | <input type="checkbox"/> Show the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected in a tank for ultimate discharge to the sanitary sewer.<br><br><input type="checkbox"/> Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.<br><br><input type="checkbox"/> Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer. |  | <input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible.<br><br><input type="checkbox"/> See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a> |
| <input type="checkbox"/> <b>N. Fire Sprinkler Test Water</b> |  | <input type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer. | <input type="checkbox"/> See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at <a href="http://www.casqa.org/resources/bmp-handbooks">www.casqa.org/resources/bmp-handbooks</a>  |

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...  | ... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs                                 |  |  |
|---|--|--|--|
| 1<br>Potential Sources of Runoff Pollutants   | 2<br>Structural Source Controls—Show on Stormwater Control Plan Drawings   | 3<br>Structural Source Controls—List in SCP Table and Narrative  | 4<br>Operational Source Control BMPs—Include in SCP Table and Narrative  |
| <p><b>O.</b> Miscellaneous Drain or Wash Water or Other Sources</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Boiler drain lines</li> <li><input type="checkbox"/> Condensate drain lines</li> <li><input type="checkbox"/> Rooftop equipment</li> <li><input type="checkbox"/> Drainage sumps</li> <li><input type="checkbox"/> Roofing, gutters, and trim.</li> <li><input type="checkbox"/> Other sources</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Show drain lines and drainage sumps</li> </ul>       | <ul style="list-style-type: none"> <li><input type="checkbox"/> Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.</li> <li><input type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.</li> <li><input type="checkbox"/> Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.</li> <li><input type="checkbox"/> Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.</li> <li><input type="checkbox"/> Include controls for other sources as specified by local reviewer.</li> </ul> | <p>If architectural copper is used, implement the following BMPs for management of rinsewater during installation:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> If possible, purchase copper materials that have been pre-patinated at the factory.</li> <li><input type="checkbox"/> If patination is done on-site, prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site.</li> <li><input type="checkbox"/> Consider coating the copper materials with an impervious coating that prevents further corrosion and runoff.</li> </ul> <p>Implement the following BMPs during routine maintenance:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site.</li> </ul> |
| <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>P.</b> Plazas, sidewalks, and parking lots.</li> </ul>   | <ul style="list-style-type: none"> <li><input type="checkbox"/> Show extent of permeable paving materials</li> </ul> |  | <ul style="list-style-type: none"> <li><input type="checkbox"/> Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.</li> </ul>   |

## 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 ensure 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-15. 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 15<sup>th</sup> 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



## Appendix B. Bioretention Facility Construction Inspection Checklist

### Layout (to be confirmed prior to beginning excavation)

- Square footage of the facility meets or exceeds minimum shown in Stormwater Control Plan
- Site grading and grade breaks are consistent with the boundaries of the tributary Drainage Management Area(s) (DMAs) shown in the Stormwater Control Plan
- Inlet elevation of the facility is low enough to receive drainage from the entire tributary DMA
- Locations and elevations of overland flow or piping, including roof leaders, from impervious areas to the facility have been laid out and any conflicts resolved
- Rim elevation of the facility is laid out to be level all the way around, or elevations are consistent with a detailed cross-section showing location and height of interior dams
- Locations for vaults, utility boxes, and light standards have been identified so that they will not conflict with the facility
- Facility is protected as needed from construction-phase runoff and sediment

### Excavation (to be confirmed prior to backfilling or pipe installation)

- Excavation conducted with materials and techniques to minimize compaction of soils within the facility area
- Excavation is to accurate area and depth
- Slopes or side walls protect from sloughing of native soils into the facility
- Moisture barrier, if specified, has been added to protect adjacent pavement or structures.
- Native soils at bottom of excavation are ripped or loosened to promote infiltration

### Overflow or Surface Connection to Storm Drainage

(to be confirmed prior to backfilling with any materials)

- Overflow is at specified elevation
- No knockouts or side inlets are in overflow riser
- Overflow location selected to minimize surface flow velocity (near, but offset from, inlet recommended)
- Grating excludes mulch and litter (beehive or atrium-style grates with ¼" openings recommended)
- Overflow is connected to storm drain via appropriately sized piping

### Underground connection to storm drain/outlet orifice

(to be confirmed prior to backfilling with any materials)

- Perforated pipe underdrain (PVC SDR 35 or approved equivalent) is installed with holes facing down
- Perforated pipe is connected to storm drain at specified elevation (typ. bottom of soil elevation)
- Cleanouts are in accessible locations and connected via sweep bends

#### **Drain Rock/Subdrain** (to be confirmed prior to installation of soil mix)

- Rock is installed as specified, 12" min. depth. Class 2 permeable, Caltrans specification 68-2.02F(3) recommended
- Rock is smoothed to a consistent top elevation. Depth and top elevation are as shown in plans
- Slopes or side walls protect from sloughing of native soils into the facility
- No filter fabric is placed between the subdrain and soil mix layers

#### **Soil Mix**

- Soil mix is as specified.
- Mix installed in lifts not exceeding 12"
- Mix is not compacted during installation but may be thoroughly wetted to encourage consolidation
- Mix is smoothed to a consistent top elevation. Depth of mix (18" min.) and top elevation are as shown in plans, accounting for depth of mulch to follow and required reservoir depth

#### **Irrigation**

- Irrigation system is installed so it can be controlled separately from other landscaped areas. Smart irrigation controllers and drip emitters recommended and may be required by code or ordinance.
- Spray heads, if any, are positioned to avoid direct spray into outlet structures

#### **Planting**

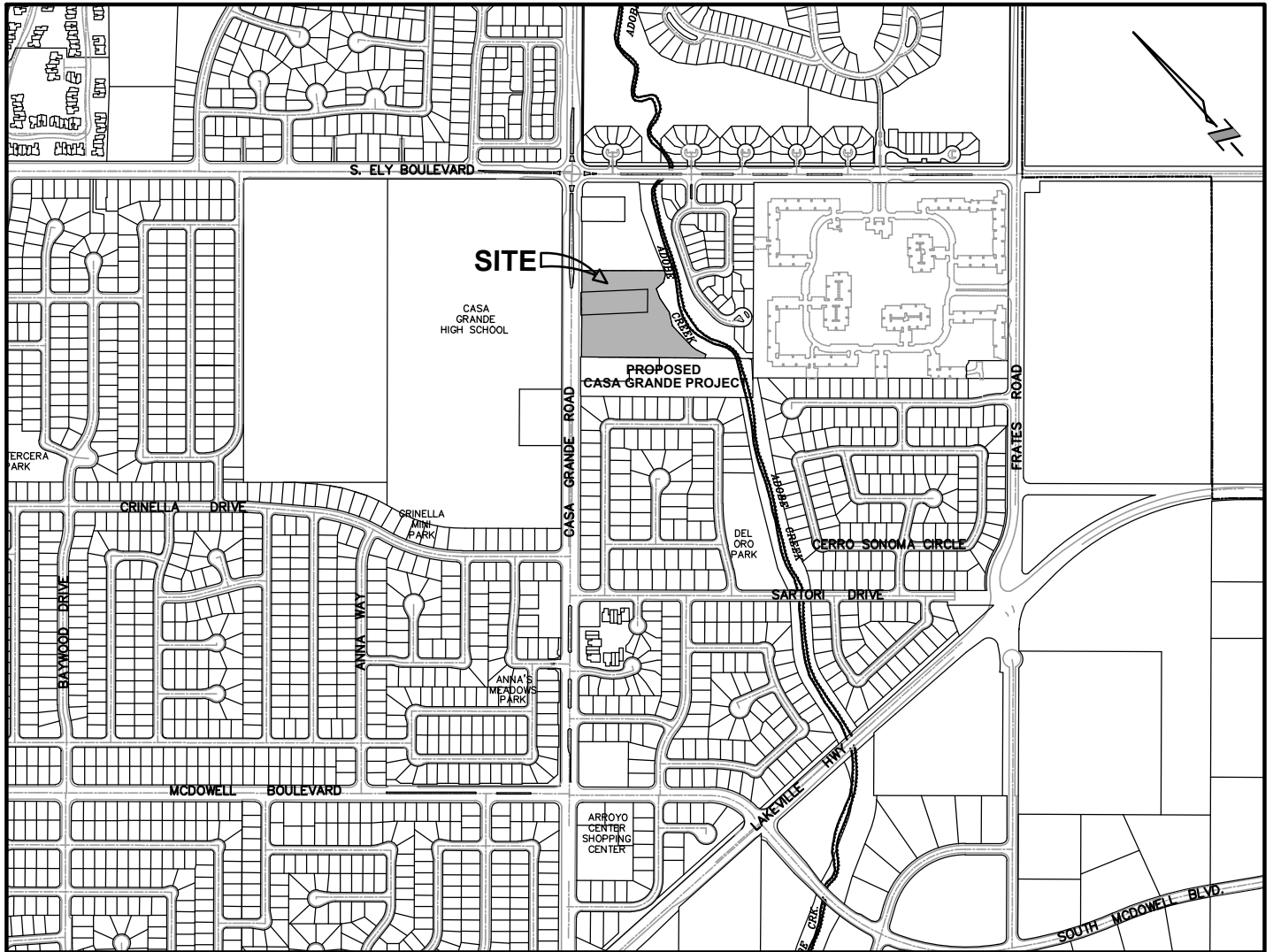
- Plants are installed consistent with approved planting plan, consistent with site water allowance
- Any trees and large shrubs are staked securely
- No fertilizer is added; compost tea may be used
- No native soil or clayey material are imported into the facility with plantings
- 1"-2" mulch may be applied following planting; mulch selected to avoid floating
- Final elevation of soil mix maintained following planting
- Curb openings are free of obstructions

#### **Final Engineering Inspection**

- Drainage Management Area(s) are free of construction sediment; landscaped areas are stabilized
- Inlets are installed to provide smooth entry of runoff from adjoining pavement, have sufficient reveal (drop from the adjoining pavement to the top of the mulch or soil mix, and are not blocked)
- Inflows from roof leaders and pipes are connected and operable
- Temporary flow diversions are removed
- Rock or other energy dissipation at piped or surface inlets is adequate
- Overflow outlets are configured to allow the facility to flood and fill to near rim before overflow
- Plantings are healthy and becoming established
- Irrigation is operable
- Facility drains rapidly; no surface ponding is evident
- Any accumulated construction debris, trash, or sediment is removed from facility
- Permanent signage is installed and is visible to site users and maintenance personnel

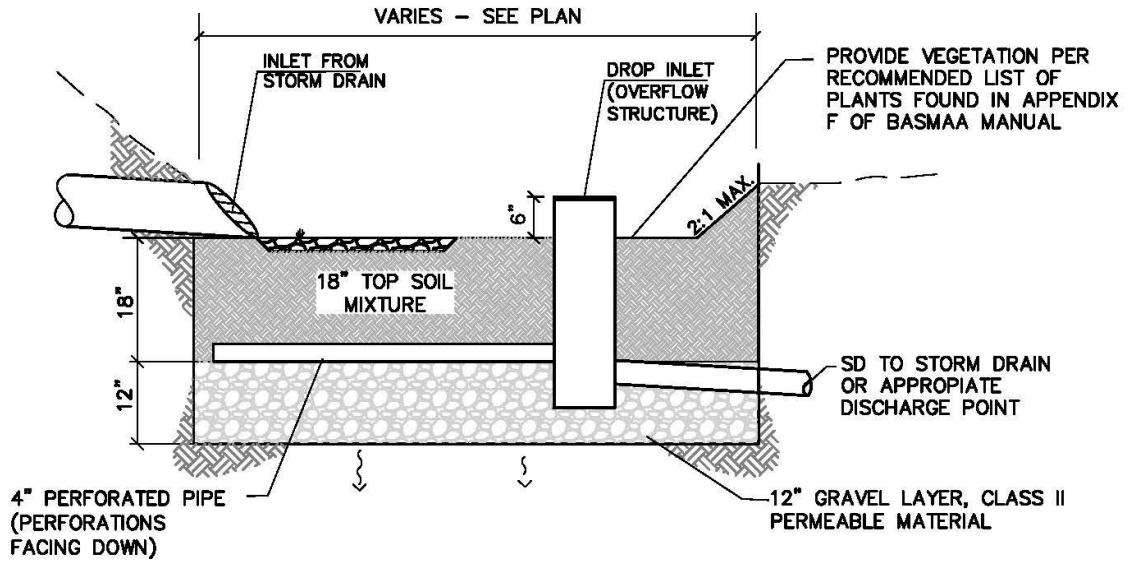
## **VI. Certifications**

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*



**VICINITY MAP**

N.T.S.



**BIORETENTION AREA**

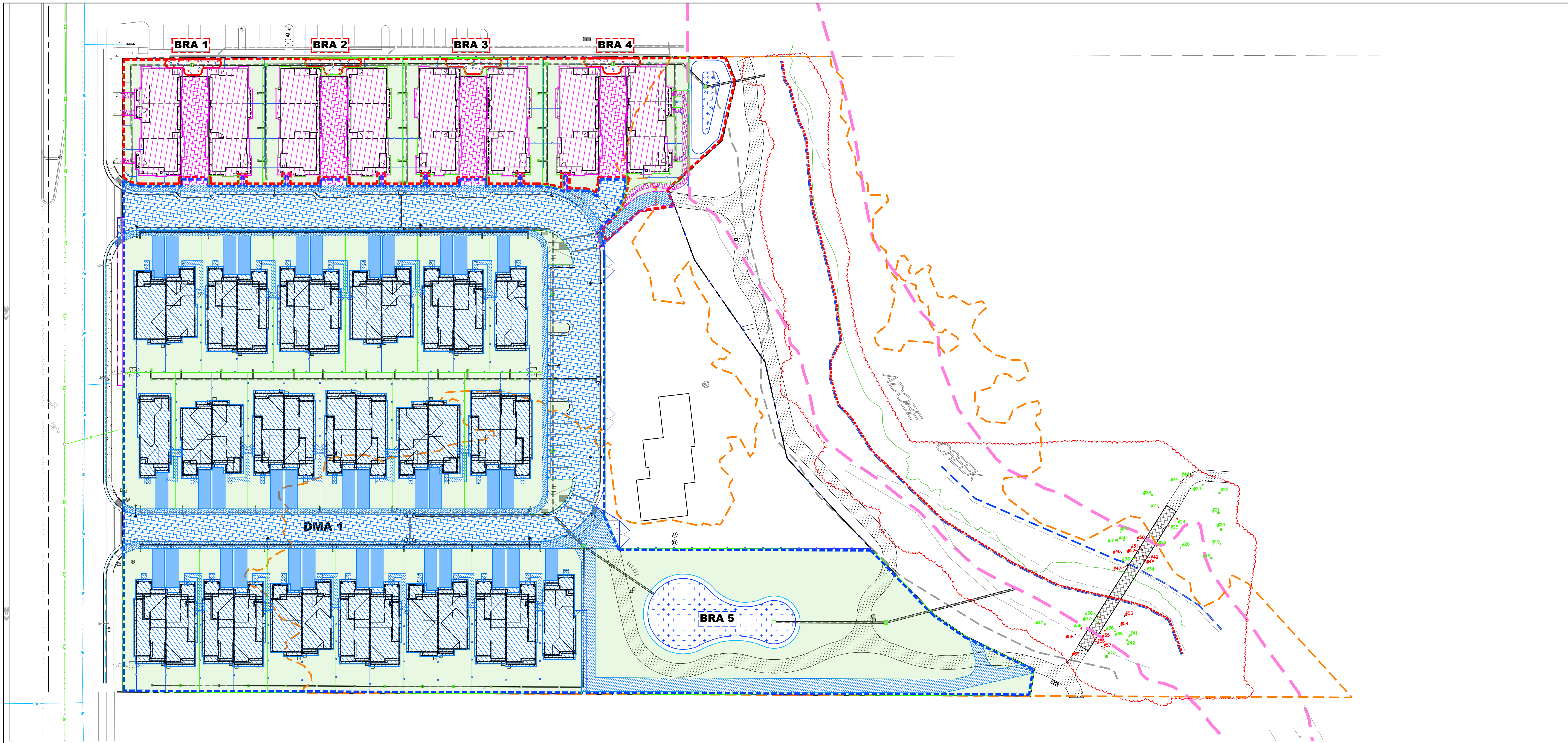
N.T.S.

| REVISIONS | BY |
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|           |    |
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**POST CONSTRUCTION STORM WATER CONTROL & TREATMENT PLAN**  
 CREEKWOOD CONDOMINIUM PROJECT  
 270 & 280 CASA GRANDE ROAD APN 017-040-051 & -016  
 PETALUMA CALIFORNIA

**STEVEN J. LAFRANCHI & ASSOCIATES, INC.**  
 CIVIL ENGINEERS - LAND SURVEYORS  
 LAND PLANNERS - LANDSCAPE ARCHITECTS  
 440 SECOND STREET, SUITE 312  
 PETALUMA, CALIFORNIA 94952  
 (707) 762-3122 FAX (707) 762-2529

DATE: 2023.07.14  
 SCALE: 1"=30'  
 DESIGN: S.J.L., N.O.F.  
 DRAWN: O.R.H., H.M., J.T.G., N.O.F.  
 CHECKED: S.J.L.  
 JOB: CREEKWOOD  
 JOB No: 192119  
 SHEET  
**C-15**  
 OF 19 SHEETS



**LEGEND**

- PROPERTY LINE
- STORM DRAIN LINE
- BASIN RETENTION AREA**  
BRA-1/2/3/4/5 SEE DETAIL SHEET C-15.
- DRAINAGE MANAGEMENT AREA LIMITS**  
AREAS DRAINING TO NORTHERLY BASIN BRA-1/2/3/4
- DRAINAGE MANAGEMENT AREA LIMITS**  
AREAS DRAINING TO SOUTHERLY BASIN BRA-5
- IMPERVIOUS SURFACES (PINK)**  
Draining to BRA-1/2/3/4  
ROOFS, AC PAVEMENT, SIDEWALK, DRIVEWAYS.
- IMPERVIOUS SURFACES (BLUE)**  
Draining to BRA-5  
ROOFS, AC PAVEMENT, SIDEWALK, DRIVEWAYS.
- PERVIOUS SURFACES**  
LANDSCAPE AREAS, TURFBLOCK OR GRAVEL, OPEN OR POROUS PAVERS, GRANULAR PAVEMENT, GROUND COVER)
- FEMA FLOOD PLAIN EFFECTIVE SEPTEMBER 25, 2023 PER CLOMR PERFORMED BY BALANCE HYDROLOGICS.**
- FLOOD PLAIN PER MODELING BY WEST CONSULTANTS JULY 2023.**

**ABBREVIATION**

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

**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.

**FLOODPLAIN NOTE**

1. THE FLOOD PLAINS PRESENTED HEREIN ARE BASED ON HYDROLOGICAL MODELING AND ANALYSIS COMPLETED BY WEST CONSULTANTS DATED JULY 2023 AND BALANCE HYDROLOGICS DATED JULY 19, 2022. FEMA CLOMR ISSUED MAY 11, 2023 AND EFFECTIVE SEPTEMBER 25, 2023.

**NOTES**

1. SEE LAYOUT C-2 FOR SITE CONTEXT & ADJACENT LAND USES
2. SEE LAYOUT C-3 FOR THE EXISTING CONDITIONS
3. SEE LAYOUT C-4 FOR THE DEMOLITION & PRESERVATION
4. SEE LAYOUT C-5 FOR SITE DENSITY & LAND USE
5. SEE LAYOUT C-6 FOR SITE COVERAGE DATA
6. SEE LAYOUT C-7 FOR THE VESTING TENTATIVE MAP
7. SEE LAYOUT C-8 FOR THE PRELIMINARY CONDOMINIUM PLAN
8. SEE LAYOUT C-9 FOR THE PARKING PLAN
9. SEE LAYOUT C-11 FOR SITE DEVELOPMENT PLAN
10. SEE LAYOUT C-12 FOR PRELIMINARY GRADING DESIGN
11. SEE LAYOUT C-13 FOR PRELIMINARY BRIDGE CROSSING PROFILE
12. SEE LAYOUT C-14 FOR PRELIMINARY UTILITY INFORMATION
13. SEE LAYOUT C-16 FOR THE MAINTENANCE EXHIBIT
14. SEE LAYOUT C-17 FOR THE FIRE APPARATUS ROUTING

| DMA 1        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name |                       |                        |
|--------------|-----------------|---------------------------|-------------------|--------------------------|---------------|-----------------------|------------------------|
| Roof         | 4,986           | Roof                      | 1.0               | 4,986.0                  | BRA 1         |                       |                        |
| Landscape    | 2,436           | Landscape                 | 0.1               | 243.6                    | Sizing Factor | Minimum Facility Area | Proposed Facility Area |
| Pavement     | 1,598           | Hardscape                 | 1.0               | 1,598.0                  |               |                       |                        |
| <b>Total</b> |                 |                           |                   | <b>6,827.6</b>           |               |                       |                        |

| DMA 2        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name |                       |                        |
|--------------|-----------------|---------------------------|-------------------|--------------------------|---------------|-----------------------|------------------------|
| Roof         | 4,913           | Roof                      | 1.0               | 4,913.0                  | BRA 2         |                       |                        |
| Landscape    | 2,693           | Landscape                 | 0.1               | 269.3                    | Sizing Factor | Minimum Facility Area | Proposed Facility Area |
| Pavement     | 1,524           | Hardscape                 | 1.0               | 1,524.0                  |               |                       |                        |
| <b>Total</b> |                 |                           |                   | <b>6,706.3</b>           |               |                       |                        |

| DMA 3        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name |                       |                        |
|--------------|-----------------|---------------------------|-------------------|--------------------------|---------------|-----------------------|------------------------|
| Roof         | 4,913           | Roof                      | 1.0               | 4,913.0                  | BRA 3         |                       |                        |
| Landscape    | 2,637           | Landscape                 | 0.1               | 263.7                    | Sizing Factor | Minimum Facility Area | Proposed Facility Area |
| Pavement     | 1,606           | Hardscape                 | 1.0               | 1,606.0                  |               |                       |                        |
| <b>Total</b> |                 |                           |                   | <b>6,782.7</b>           |               |                       |                        |

| DMA 4        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name |                       |                        |
|--------------|-----------------|---------------------------|-------------------|--------------------------|---------------|-----------------------|------------------------|
| Roof         | 4,986           | Roof                      | 1.0               | 4,986.0                  | BRA 4         |                       |                        |
| Landscape    | 2,836           | Landscape                 | 0.1               | 283.6                    | Sizing Factor | Minimum Facility Area | Proposed Facility Area |
| Pavement     | 1,962           | Hardscape                 | 1.0               | 1,962.0                  |               |                       |                        |
| <b>Total</b> |                 |                           |                   | <b>7,231.6</b>           |               |                       |                        |

| DMA 5        | DMA Area (s.f.) | Post-Project Surface Type | DMA Runoff Factor | DMA Area x Runoff Factor | Facility Name |                       |                        |
|--------------|-----------------|---------------------------|-------------------|--------------------------|---------------|-----------------------|------------------------|
| Roof         | 44,993          | Roof                      | 1.0               | 44,993.0                 | BRA 5         |                       |                        |
| Landscape    | 60,392          | Landscape                 | 0.1               | 6,039.2                  | Sizing Factor | Minimum Facility Area | Proposed Facility Area |
| Pavement     | 47,864          | Hardscape                 | 1.0               | 47,864.0                 |               |                       |                        |
| <b>Total</b> |                 |                           |                   | <b>98,896.2</b>          |               |                       |                        |

