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Stormwater Control Plan – Regulated Project (BASMAA)
2960 Foothill Blvd

Prepared September 24, 2015

Site:
2960 Foothill Blvd
Calistoga, California
APN: 011-400-003
HLS Project # 1607

Owners:
RKMS Investments
2960 Foothill Blvd
Calistoga, California

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Stormwater Control Plan Exhibit

Project Data

Table 1. Project Data Form

Project Name/Number	2960 Foothill Blvd / 1607
Permit Number	
Project Type and Description	Lot line adjustment with new single family dwelling and ac driveway to access new parcel.
Disturbed Area (acres)	0.28
Pre-Project Impervious Surface Area	0.35
Post-Project Impervious Surface Area	0.59
Delta Impervious Surface Area	0.24

I. Setting

I.A. Project Location and Description

The subject parcel is located at 2960 Foothill Blvd in Calistoga, California. The site currently is a 2.16 parcel but ultimately will be subdivided into Lot 1, 1.0 acre and Lot 2, 1.16 acre. This drainage analysis will review the effects of the proposed development and lot subdivision. Currently the property has a pet clinic and ac parking lot.

I.B. Existing Site Features and Conditions

Topography of the site consists of shallow slopes range from 1-3%. Lot 2 is undeveloped with scattered walnut and oaks trees along with native grasses. The USDA existing soils classifications for the site is Bale Loam. This soil type was taken as hydrologic soil group B based on the attached web soil survey. Lot 2 development consists of a future paved driveway and main residence. Lot 2 will be accessed through a driveway easement over Lot 1. The predevelopment conditions include a veterinarian clinic, hardscape, and ac driveway & parking lot. Runoff from the veterinarian clinic and parking lot drains into existing vegetated swales which convey stormwater into the re-sized existing detention basin. Overflow from the basin will drain into the earth swale. The swale flows along the private road then turns at the north property corner and then follows the rear property line before leaving the site. Stormwater runoff flows within the existing earth swale for about 500 ft before discharging into Blossom Creek.

Figure 1.

I.C. Opportunities and Constraints for Stormwater Control

The hydraulic soil group of the site soils based on NRCS data is B, well drained. The site is not large enough to accommodate a vegetated buffer. However the site is relatively flat which allows for bioretention facilities to capture the increased stormwater runoff levels. The existing bioretention facility will be resized for lot 1 and two additional bioretention facilities will be added on lot 2 for the proposed impervious surfaces. There is also an existing 12 inch earth swale onsite which will provide treatment prior to discharge offsite.

II. Low Impact Development Design Strategies

II.A. Optimization of Site Layout

The proposed driveway is aligned to one side of the parcel sloped towards the AC berm which directs stormwater runoff towards the back of the property, directly to bioretention facility #2. This will also for treatment to occur with minimal exposure to the rest of the site. Bioretention facilities are placed near the existing earth swale and downhill from the proposed development in case of overflow. The site is narrow and the building envelope is conservative.

II.A.1. Limitation of development envelope

There are three septic areas on this site and all bioretention facilities were placed with a 50 foot minimum setback which limited possible locations. The construction area and associated disturbed area will be minimized to reduce soil compaction and maintain existing vegetation to the maximum extent practical.

II.A.2. Preservation of natural drainage features

The overall drainage course from pre to post development conditions will remain unchanged. All runoff from the site will be collected by the existing on site swale and leave the site at the west property corner.

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

The improvements are outside of the 0.2% annual chance floodplain and the development area are well outside waterway setbacks. Runoff from the site will flow approximately 500' prior to converging with Blossom Creek.

II.A.4. Minimization of imperviousness

The only proposed impervious surfaces under this development are the roofs and the ac driveway. The landscape areas have avoided impervious hardscape, opting for turf and pervious pathways.

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

The proposed bioretention facility to the southeast of the proposed residence is intended for use as a landscape element.

II.B. Use of Permeable Pavements

The proposed driveway is asphalt concrete. The areas surrounding the house are to remain pervious landscape. Impervious surfaces are limited to roofs, and limited hardscape around buildings for ADA accessibility and parking.

II.C. Dispersal of Runoff to Pervious Areas

Stormwater runoff from the entire development will be directed towards one of the bioretention facilities. Each facility has been sized to handle runoff from its surrounding areas. The bioretention facilities are pervious and have a crushed rock base to promote infiltration into the native soil.

II.D. Stormwater Control Measures

The erosion and sediment control plan associated with this development will minimize the risk of sediment discharge after construction but prior to final stabilization. All runoff from impervious areas is routed to an appropriately sized bio retention facility for treatment and retention prior to discharge to the existing earth swale for further treatment.

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III. Documentation of Drainage Design

III.A. Descriptions of Each Drainage Management Area

III.A.1. Table of Drainage Management Areas & Descriptions

DMA Names	DMA Square Feet	Description	Drains to...
DMA-1 Pet Clinic	14,907	Impervious	Bio-Retention Facility #1
DMA-2 Driveway	9,089	Impervious	Bio-Retention Facility #2
DMA-3 Residence	1,800	Impervious	Bio-Retention Facility #3

III.B. Tabulation and Sizing Calculations

See attached calculation worksheet

IV. Source Control Measures

IV.A. Site activities and potential sources of pollutants

Phase 1- Preconstruction meeting and installation of site perimeter controls
Prior to construction, the site will be protected with the installation of perimeter controls. Construction site will have designated staging areas and limit the number of active sites to the maximum extent practicable. Equipment and materials storage areas will be designated away from critical environmental areas. Specific BMPs will be implemented at designated area for sediment and erosion control mitigation. All existing drainage courses, inlets, channels and streams will be protected with specific BMPs. Phase 1 estimated time of completion:

- Estimated Start Date of Phase 1: Start of Work
- Duration: 1 week

Phase 2 - Rough Grade, Material and Staging, and Demolition
Upon completion of pre-construction meeting and perimeter control installation, rough grading of roads and pads will take place. Material and staging areas will be in place. Demolition of existing concrete pad should commence.

- Estimated Start Date of Phase 2: End of Phase 1
- Duration: 1-2 months

Phase 3 - Vertical Construction
Upon completion of Phase 2 grading, vertical construction will occur at the proposed residence.

- Estimated Start Date of Phase 3: End of Phase 2
- Duration: 7-12 months

Phase 4 - Site Vegetation
Upon completion of Phase 2 grading, and concurrent to Phase 3, site will be fully stabilized and revegetation will reach 70%.

- Estimated Start Date of Phase 4: Completion of Phase 2
- Duration: 1-2 months

IV.B. Source Control Table

See "Stormwater Pollutant Sources/Source Control Checklist" Attached

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

Natural Buffers or Equivalent Sediment Controls

You must ensure that any stormwater discharges offsite from the disturbed portions of the property are treated by an area of undisturbed natural buffer and/or additional erosion and sediment controls in order to achieve a reduction in sediment load equivalent to that achieved by a 50-foot natural buffer.

Perimeter Controls

Goal: Prevent sediment form leaving construction site.

Installation Requirements: You shall install sediment controls along those perimeter areas of your site that will receive runoff from earth disturbing activities.

Maintenance Requirements: You must remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control.

Pollution Prevention Practice

Description

- Silt Fence/Fiber Roll - SE-1/SE-5
  - Silt Fence/Fiber Rolls will be installed at all material stock pile, drainage inlets and at limits of disturbed areas.
  - BMP Sheet SE-1/SE-5 for further information.

Maintenance Requirements

- See BMP Sheet SE-1/SE-5 for further Inspection/Maintenance information

Minimize Sediment Tracking

Goal: Minimize tracking sediment offsite.

You must minimize the tracking of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting your construction site. To comply with this requirement, you must:

- Restrict vehicle use to properly designated exit points;
- Use appropriate stabilization techniques at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit;
- Where necessary, use additional controls to remove sediment from vehicle tires prior to exit;
- Where sediment has been tracked-out from your site onto the surface of off-site streets, other paved areas, and sidewalks, you must remove the deposited sediment by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. You must remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked out sediment into any stormwater conveyance (unless it is connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet.

Pollution Prevention Practice

Description

- Stabilized Construction Entrance/Exit - TC-1
  - A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area.
  - The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets.
  - See BMPs Sheet TC-1

Installation

- Onsite installation time will vary pending construction phase and schedule, as needed.

Maintenance Requirements

- See BMPs Sheet TC-1 for further Inspection/Maintenance information

Control Discharges from Temporary Construction Stockpiles

Goal: Prevent sediment laden discharge from stockpile areas.

For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

- Locate the piles outside of any natural buffers established and physically separated from other stormwater controls implemented
- Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.
- Where practicable, provide cover or appropriate temporary stabilization to avoid direct contact with precipitation or to minimize sediment discharge;
- Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet; and
- Protect from wind erosion.

Pollution Prevention Practice

Description

- Fiber Roll - SE-5
  - A fiber roll consists of straw, flax, or other similar materials bound into a tight tubular roll. When fiber rolls are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff.
  - See BMPs Sheet SE-5 for further information

Installation

- Installed immediately after creation of stock pile if within winterization period. Installed immediately if rain is expected to prevent stormwater contamination. Fiber rolls shall be left for the life of the fiber roll or until stock pile is removed.

Maintenance Requirements

- See BMPs Sheet SE-5 for further Inspection/Maintenance information

Alternative Measures
- Cover with sheet plastic.

Preserve Top Soil

Goal: Preserve native vegetation and groundcover structure to maximum extent practical.

You must preserve native topsoil on your site to the maximum extent practical. Areas to remain native should be fenced off from active construction site prevent soil disturbance. Limit construction activity and soil disturbance to the immediate vicinity of the proposed development to the maximum extent practical.

Pollution Prevention Practice

Description
- Preservation of Existing Vegetation - EC-2
  - Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion. Fence off the construction site to avoid unnecessary soil disturbance beyond limits of disturbed.
- Straw Mulch - EC-6
  - Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil with a studded roller or anchoring it with a tackifier stabilizing emulsion. Straw mulch protects the soil surface from the impact of rain drops, preventing soil particles from becoming dislodged
- See BMPs Sheet EC-2 and EC-6 for further information

Installation
- Installation at areas requiring temporary protection until permanent stabilization is established.

Maintenance Requirements
- See BMPs Sheet EC-2 and EC-6 for further Inspection/Maintenance information

Minimize Soil Compaction

Goal: Maintain natural structure of site soils to maximum extent practical.

In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed, you must either:
- Restrict vehicle / equipment use: Restrict vehicle and equipment use in these locations to avoid soil compaction; or
- Use soil conditioning techniques: Prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible.

Pollution Prevention Practice

Description
- Scheduling – EC-1
  - Use sound judgement on scheduling of grading areas around adverse weather cycles.
- Perimeter Control/Fencing – SE-1 & SE-5
  - Use of fiber rolls, silt fence, or perimeter control fencing off native areas from active construction sites.

- Stabilized Construction Roadway - TC-2
  - Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion, control dust, and minimize soil compaction.
- Perimeter Control/Fencing – SE-1 & SE-5
  - Use of fiber rolls, silt fence, or perimeter control fencing off native areas from active construction sites.
- See BMPs Sheet TC-2, EC-4, EC-6, SE-1 & SE-5 for further information.

Installation
- Installation at areas of equipment location and temporary construction traffic.

Maintenance Requirements
- See BMPs Sheet TC-2 and EC-6 for further Inspection/Maintenance information

Protect Storm Drain Inlets

Goal: Prevent stormwater discharges through the existing or proposed stormdrain network.

If you discharge to any storm drain inlet that carries stormwater flow from your construction site, you must:
- Install inlet protection measures that remove sediment from your discharge prior to entry into the storm drain inlet.
- Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

Pollution Prevention Practice

Description
- Storm Drain Inlet Protection - SE-10
  - Storm drain inlet protection consists of a sediment filter or an impounding area around or upstream of a storm drain, drop inlet, or curb inlet
- Fiber Rolls - SE-5
  - A fiber roll consists of straw, flax, or other similar materials bound into a tight tubular roll. When fiber rolls are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff.
- See BMPs Sheet SE-10 and SE-5 further information

Installation
- Installation required prior to grading around storm drain inlets

Maintenance Requirements
- See BMPs Sheet SE-10 and SE-5 for further Inspection/Maintenance information

Site Stabilization Requirements

Deadline to Initiate Stabilization:

You must initiate soil stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site.

Criteria for Stabilization:
To be considered adequately stabilized, you must meet the criteria below depending on the type of cover you are using, either vegetative or non-vegetative.

Vegetative Stabilization:
For all sites, except those located in arid or semi-arid areas or on agricultural lands:

- If you are vegetatively stabilizing any exposed portion of your site through the use of seed or planted vegetation, you must provide established uniform vegetation *(e.g., evenly distributed without large bare areas)*, which provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities. You should avoid the use of invasive species; Documentation of the predevelopment conditions should be provided in photographs to determine if 70% revegetation has been accomplished.
- For final stabilization, vegetative cover must be perennial; and
- Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover *(e.g., mulch, rolled erosion control products)* to the area while vegetation is becoming established.

Description of Practice

- Hydroseeding
  - Hydroseeding typically consists of applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydromulch equipment, to temporarily protect exposed soils from erosion by water and wind.
- Straw Mulch
  - Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil with a studded roller or anchoring it with a tackifier stabilizing emulsion.
- See BMPs Sheet EC-4 and EC-6 for further information

Installation

- Site stabilizing practice will be initiated during grading activates and until 70% of disturbed area is revegetated

Maintenance Requirements
See BMPs Sheet EC-4 and EC-6 for further Inspection/Maintenance information

V. Stormwater Facility Maintenance

V.A. Ownership and Responsibility for Maintenance in Perpetuity

The property owner/developer accepts responsibility for interim operation and maintenance of stormwater treatment and flow-control facilities until such time as this responsibility is transferred to a subsequent owner.

Owner Date

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

The maintenance responsibilities of the stromwater bioretention facilities fall to the present property owner. These responsibilities run with the land and shall be transferred to the new owner upon sale of the parcel. The standard bioretention facility as outlined in the 7/14 BASMAA Guidelines is utilized for this development with cross section illustrated in the figure below.

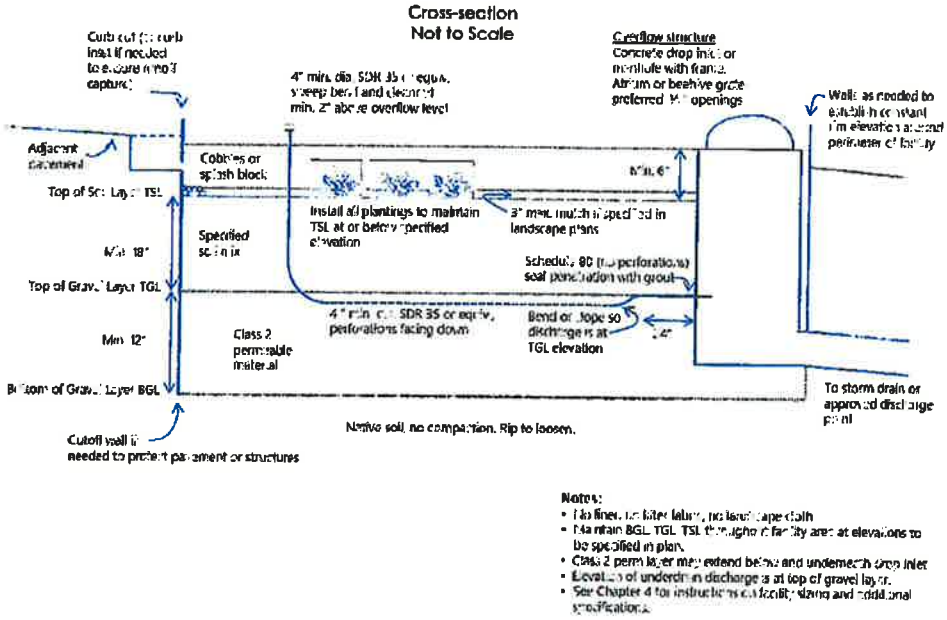

Figure 2. Typical Bioretention Facility

The location of the proposed bioretention facilities are shown on the included Stormwater Control Plan as well as on the site Grading & Drainage Plans. These treatment and infiltration areas shall be protected from unauthorized development such as grading, paving, and building. The surrounding areas should maintain a grade to divert runoff TOWARDS the facility so stormwater may receive treatment prior to discharge. The overflow structures for each area shall be held slightly higher than the adjacent grades to allow shallow ponding prior to entering the stormdrain network. This will allow infiltration into the sand/compost mix and retention in the underlying gravel cavity. The responsible party shall observe the facilities during use to ensure proper function. If sustained ponding occurs there is likely an issue with the sub drain system and the drain line should be inspected by a qualified plumbing contractor. In no instance should the ponding area sustain standing water for over 72 hours after the end of a storm event. The owner shall ensure that the impervious surfaces continue to route to the proposed bioretention facilities for treatment. Additional annual routine maintenance activities include:

- Clean Up – Remove any soil or debris blocking the overflow inlets.
- Prune or Cut Back vegetation to promote healthy density and maintain ability of flow. A list of approved plan species for bioretention facilities is provided in the appendix.
- Control weeds by manual methods and soil amendment. Only eco-friendly natural herbicides should be used.
- Maintain the topsoil mix, replacing as necessary.
- If irrigation is used, check periodically and prevent over watering

- Do not add fertilizers to bioretention facility areas. Only select Compost Tea fertilizers should be applied at the rate recommended by the supplier. Limit application to late spring months to reduce contamination risk of stormwater.
- Do not use synthetic pesticides. If necessary use only eco-friendly natural pesticides such as Neem oil and Safer Products.

VI. Construction Checklist

Source Control or Treatment Control Measure	See Plan Sheet #s
Perimeter Controls	
Minimize Sediment Tracking	
Control Discharges from Temporary Construction Stockpiles	
Minimize Soil Compaction	
Protect Storm Drain Inlets	

CASQA BMP Fact Sheets are available at: https://www.casqa.org/resources/bmp-handbooks

VII. 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*.

Appendix A. Stormwater Pollutant Sources/Source Controls Checklist

How to use this worksheet (also see instructions on page 3-6 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 applicable 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 3-6 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		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
☐ **A.** On-site storm drain inlets (unauthorized non-stormwater discharges and accidental spills or leaks)	☐ Locations of inlets.	☐ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	☐ Maintain and periodically repaint or replace inlet markings. ☐ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☐ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks ☐ 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."

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
☐ **B.** Interior floor drains and elevator shaft sump pumps	Show drains and pump locations	☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **C.** Interior parking garages	Show drain locations	☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **D_1.** Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
❑ **D2. Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance**	❑ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show bioretention facilities. (See instructions in Chapter 4.)	State that final landscape plans will accomplish all of the following. ❑ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ❑ 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. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ❑ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks ❑ Provide IPM information to new owners, lessees and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ 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.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks The sanitary sewer operator must be notified and a clean out identified when pools are to be drained to the sanitary sewer.
❑ **F.** Food service	❑ 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. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	State maintenance schedule for grease interceptor

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
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☐ **G.** Refuse areas	☐ 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. ☐ 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. ☐ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	☐ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☐ 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: 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 www.casqa.org/resources/bmp-handbooks
☐ **H.** Industrial processes.	☐ Show process area.	☐ 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."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN (SCP) SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ 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. ❑ 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. ❑ 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.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. ❑ Where appropriate, reference documentation of compliance with the requirements of programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ 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 www.casqa.org/resources/bmp-handbooks

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☐ **J.** Vehicle and Equipment Cleaning	☐ Show on drawings as appropriate: (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. (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). (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. (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.	☐ 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): ☐ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ☐ Car dealerships and similar may rinse cars with water only. See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

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❑ **K. Vehicle/Equipment Repair and Maintenance**	❑ 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. ❑ 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. ❑ 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.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ 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. ❑ 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.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ 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. ❑ 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. ❑ 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.

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☐ L. Fuel Dispensing Areas	☐ 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. ☐ 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[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Business Guide Sheet, "Automotive Service–Service Stations" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

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1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
☐ **M.** Loading Docks	☐ 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 for ultimate discharge to the sanitary sewer. ☐ 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. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
☐ **N.** Fire Sprinkler Test Water		☐ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☐ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

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1 Potential Sources of Runoff Pollutants	2 Structural Source Controls—Show on Stormwater Control Plan Drawings	3 Structural Source Controls—List in SCP Table and Narrative	4 Operational Source Control BMPs—Include in SCP Table and Narrative
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☐ Rooftop equipment ☐ Drainage sumps ☐ Roofing, gutters, and trim. ☐ Other sources	Show drain lines and drainage sumps	☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ 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. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☐ Include controls for other sources as specified by local reviewer.	If architectural copper is used, implement the following BMPs for management of rinsewater during installation: ☐ If possible, purchase copper materials that have been pre-patinated at the factory. ☐ 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. ☐ Consider coating the copper materials with an impervious coating that prevents further corrosion and runoff. Implement the following BMPs during routine maintenance: ☐ Prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site.
☐ **P.** Plazas, sidewalks, and parking lots.	Show extent of permeable paving materials		☐ 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.

Provision E.12 Sizing Calculator

See the instructions and the BASMAA Post-Construction Manual

Step 1: Enter Total Site Area	Step 2: List names of all DMAs and square footage of each	Step 3: If DMA is "Self-Treating" or "Self-Retaining," copy square footage to appropriate column	Step 4: If the DMA is "Drains to Self Retaining" or "Drains to Bioretention" enter runoff factor from Table 4-1	Step 6: For "Drains to Self-Retaining" DMAs, enter the name of receiving DMA	Step 5: Slide (move) number from this column to correct column (F or H-Q)

Total Site Area: 26841

Version 0.2. 2015-01-30.

DMA Names	Square Feet	Self-Treating	Self-Retaining	Runoff Factor	Drains to Self-Retaining	Name of Receiving DMA	BIORETENTION FACILITIES									
							Facility 1	Facility 2	Facility 3	Facility 4	Facility 5	Facility 6	Facility 7	Facility 8	Facility 9	Facility 10
DMA-1	14907			1			14907									
DMA-2	9089			1				9089								
DMA-3	1800			1					1800							
DMA-4																
DMA-5																
DMA-6																
DMA-7																
DMA-8																
DMA-9																
DMA-10																
DMA-11																
DMA-12																
DMA-13																
DMA-14																
DMA-15																
DMA-16																
DMA-17																
DMA-18																
DMA-19																
DMA-20																
Total DMAs	25796	0	0		14907		14907	9089	1800	0	0	0	0	0	0	0
						Sizing Factor	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
						Minimum Size	596.28	363.56	72	0	0	0	0	0	0	0
Total Facilities	1045	Step 7: Enter Facilty Footprints				Footprint on Exhibit	600	370	75							
DMAs + Facilities	26841						OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	OK															

Step 8: Iterate sizes of facility footprints and DMAs until all footprints are at least the minimum **AND** DMAs + Facilities equals Total Site Area

Step 9: Check to make sure Areas Draining to each Receiving Self-Retaining Area do not exceed maximum 2:1 ratio.

Step 10: Check results on this spreadsheet are consistent with what is shown on the SCP Exhibit.

Scientific name	Common name	Plant Categories	Light Preference: Sun	Part	Shade	Size (feet): Ht.	Width	Watering: L	M	H	Summer	Tolerances: Heat	Coast	Wind	Zone 1	Zone 2	High Performers: Best for irrigated sites	Best for non-irrigated sites	CA Native	Notes
Agrostis pallens	Spike bentgrass	Grasses and Grass-like Plants	✓	✓		1	1.25		✓	✓	✓		✓		✓	✓				Moist sand dunes ;adapts to shady woodlands from San Diego to Sonoma County
Bouteloua gracilis	blue grama	Grasses and Grass-like Plants	✓			1.5	1	✓				✓		✓		✓				Tolerates no summer water, good for non-irrigated remote sites, AKA= Mosquito Grass
Bromus carinatus	California brome	Grasses and Grass-like Plants	✓			2	1	✓			ok	✓		✓		✓			✓	Good for erosion control ; not a good meadow grass
Carex barbarae	Santa Barbara sedge	Grasses and Grass-like Plants	✓	✓		3	2	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	Stays green w/ summer H20, moist to drought tolerant, spreading large statured sedge
Carex divulsa	grassland sedge	Grasses and Grass-like Plants	✓	✓	✓	1	1		✓		ok		✓	✓	✓	✓	✓			Widely sold in CA as Carex tumulicola (Berkeley sedge). Native to Eurasia. Full sun along coast. Tolerates drought once established. Needs regular water in sun.
Carex nudata	California black sedge	Grasses and Grass-like Plants	✓	✓		2	2	✓	✓		✓	✓	✓		✓	✓			✓	Turns orange in frost, showy black flower spikes
Carex obnupta	slough sedge	Grasses and Grass-like Plants	✓	✓		2	1		✓	✓	✓		✓	✓	✓				✓	Some salt tolerance, drought tolerant once established. Thick, graceful, bright green stands in wetlands.
Carex pansa	dune sedge	Grasses and Grass-like Plants	✓	✓		2	2		✓		✓	✓	✓	✓	✓	✓	✓		✓	Native to Asilomar; Plug not seed planting; mow end of summer if desired.
Carex praegracilis	clustered field sedge	Grasses and Grass-like Plants	✓	✓		1.5	1.5		✓	✓	✓	✓	✓	✓	✓	✓			✓	Lawn alternative, tolerates some foot traffic; summer dormant in warmer areas
Chondropetalum tectorum	small cape rush	Grasses and Grass-like Plants	✓	✓		4	3			✓	✓	✓	✓		✓	✓				Native to S. Africa, drought tolerant
Danthonia californica	California oat grass	Grasses and Grass-like Plants	✓	✓		1.5	1.5		✓		✓		✓		✓	✓			✓	Bunch grass, recommend plugs not seed to start, tolerates some foot traffic
Distichlis spicata	salt grass	Grasses and Grass-like Plants	✓			0.5	3		✓	✓	✓	✓	✓	✓	✓	✓			✓	Looks like bermuda grass, withstands foot traffic, for soils with high salt
Festuca californica	California fescue	Grasses and Grass-like Plants	✓	✓	✓	2	2	✓			ok	✓	✓	✓					✓	Use only in driest areas of basin
Festuca idahoensis	Idaho fescue	Grasses and Grass-like Plants	✓	✓		1	1	✓	✓		ok	✓	✓	✓		✓			✓	Can mow, Needs light summer water at hot sites
Festuca rubra	red fescue	Grasses and Grass-like Plants	✓	✓		1	1.5		✓	✓	ok	✓	✓	✓		✓			✓	Can mow, Lawn alternative; Water conservation LDS; Bio Swipe; Infiltration basins
Festuca rubra 'molate'	molate fescue	Grasses and Grass-like Plants	✓	✓		1	1.5	✓	✓		ok	✓	✓	✓		✓			✓	Can mow, Lawn alternative
Juncus effusus	common rush	Grasses and Grass-like Plants	✓	✓		2.5	2.5		✓		ok		✓	✓	✓	✓	✓		✓	Forms dense clumps
Juncus pallidus	giant rush	Grasses and Grass-like Plants	✓			4	2	✓			ok	✓	✓	✓	✓	✓	✓			Evergreen, heat and drought tolerant.
Juncus patens	blue rush	Grasses and Grass-like Plants	✓			2	1		✓	✓	✓	✓			✓	✓	✓		✓	Plant from plugs; irrigate occasionally summer
Leymus triticoides	creeping wildrye	Grasses and Grass-like Plants	✓	✓		3	1	✓	✓		ok	✓	✓	✓	✓	✓			✓	Can mow 4 x yr.. Sub-surface H20 best. Can be aggressive in moist areas.
Muhlenbergia rigens	deergrass	Grasses and Grass-like Plants	✓			3	3	✓	✓		ok	✓				✓			✓	Evergreen, forms mounds.
Sisyrinchium bellum	blue eyed grass	Grasses and Grass-like Plants	✓	✓		1	1		✓		ok		✓	✓		✓	✓		✓	Needs occasional summer water, tolerates some foot traffic
Achillea millefolium	common yarrow	Herbaceous Perennials and Groundcovers	✓			1.5	1	✓			ok	✓				✓	✓	✓	✓	Good for hot sites, Tolerates mowing, and can be used in a lawn replacement mix.
Artemisia douglasiana	mugwort	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	3	✓	✓		ok	✓	✓	✓	✓	✓	✓	✓	✓	Rhizomatous
Artemisia ludoviciana	white sagebrush	Herbaceous Perennials and Groundcovers	✓	✓	✓	1.5	2	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	Aromatic. Tolerates foot traffic and wide range of conditions
Asclepias fascicularis	narrowleaf milkweed	Herbaceous Perennials and Groundcovers	✓			3	2	✓	✓		ok	✓	✓			✓	✓	✓	✓	Monarch butterfly host plant, deciduous
Darmera peltata	indian rhubarb	Herbaceous Perennials and Groundcovers		✓	✓	3	5			✓	✓					✓			✓	Prefers cool summers. Native to N CA, S OR; found on stream banks and in woodlands.
Epilobium canum	California fuchsia	Herbaceous Perennials and Groundcovers	✓	✓		1	4	✓			ok	✓				✓			✓	dormant in winter, best with winter mowing
Epipactis gigantea	stream orchid	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	1.5		✓	✓			✓		✓	✓			✓	Goes dormant with drought, salt tolerant
Fragaria chiloensis	beach strawberry	Herbaceous Perennials and Groundcovers	✓	✓	✓	0.3	2	✓	✓		ok		✓	✓					✓	Evergreen groundcover, performs well as filler at the upper edges of facility.
Heuchera micrantha	alum root	Herbaceous Perennials and Groundcovers		✓	✓	2	1.5	✓	✓		✓			✓		✓			✓	Dainty white flowers
Heuchera pilosissima	hairy alum root	Herbaceous Perennials and Groundcovers		✓	✓	1.6	1.5	✓	✓		✓		✓			✓			✓	Tolerates sand, best at basin edges
Iris douglasiana	Douglas iris	Herbaceous Perennials and Groundcovers	✓	✓		1.5	2	✓	✓		ok	✓	✓	✓		✓	✓		✓	Also, Iris hybrids
Lilium pardalinum	leopard lily	Herbaceous Perennials and Groundcovers	✓	✓		6	4	✓	✓				✓		✓	✓			✓	Native to dry summer areas, deciduous
Lobelia cardinalis	cardinal flower	Herbaceous Perennials and Groundcovers		✓	✓	2	2		✓				✓			✓				Not drought tolerant, requires regular water
Lotus scoparius	deerweed	Herbaceous Perennials and Groundcovers	✓			4	3	✓				✓				✓			✓	Short-lived, nitrogen fixer
Mimulus aurantiacus	common monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓		3	3	✓			ok	✓				✓			✓	Drought tolerant, stress deciduous
Mimulus cardinalis	scarlet monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	3		✓	✓	✓	✓				✓			✓	Aggressive seeder, needs summer water
Mimulus guttatus	seep monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓		3	3		✓	✓	✓	✓	✓		✓	✓			✓	Attracts Bees, stress deciduous, needs summer water
Mirabilis multiflora	Giant four o'clock	Herbaceous Perennials and Groundcovers		✓	✓	2	4	✓			✓	✓				✓			✓	Best for hot sites, native to Southern California
Oenothera hookeri	Hooker's evening primrose	Herbaceous Perennials and Groundcovers	✓	✓		3	2	✓			ok	✓			✓	✓	✓	✓	✓	Easy to establish biennial, self seeds
Polypodium californicum	California Polypody fern	Herbaceous Perennials and Groundcovers		✓	✓	2	2	✓			✓		✓							Summer dormant except at coast, spreads slowly by rhizomes, frost tender
Prunella vulgaris	self heal	Herbaceous Perennials and Groundcovers	✓	✓		0.5	2	✓	✓		ok		✓	✓		✓			✓	Somewhat drought tolerant, long flowering
Rudbeckia californica	California coneflower	Herbaceous Perennials and Groundcovers	✓			3	2	✓	✓		ok	✓			✓	✓			✓	Native to dry summer areas, deciduous
Scaevola 'mauve clusters'	fan flower	Herbaceous Perennials and Groundcovers	✓	✓		1	4	✓				✓		✓		✓				Native to Australia, sensitive to frost
Scutellaria austinae	skullcap	Herbaceous Perennials and Groundcovers	✓			1	2	✓	✓		✓	✓		✓		✓			✓	Dies back in drought
Sisyrinchium californicum	yellow eyed grass	Herbaceous Perennials and Groundcovers	✓	✓		1	1		✓		✓		✓	✓	✓	✓			✓	Can be drought tolerant
Verbena lasiostachys	Western vervain	Herbaceous Perennials and Groundcovers	✓	✓		2	2	✓			ok	✓			✓	✓	✓	✓	✓	Attracts butterflies, can be weedy pioneer species
Verbena lilacina	Cedros Island verbena	Herbaceous Perennials and Groundcovers	✓	✓		2	4	✓			ok	✓	✓			✓				Drought tolerant, best with minimal irrigation, native to Baja CA
Alyogyne huegelii	blue hibiscus	Shrubs	✓			8	7	✓				✓				✓				Very low water after second year, Sunset zones 15-17 & 20-24, prune to encourage flowering
Baccharis pilularis consanguinea	bush baccharis	Shrubs	✓			8	8	✓	✓		ok	✓	✓	✓	✓	✓	✓	✓	✓	Fast-growing, somewhat short-lived; deer proof
Calycanthus occidentalis	western spicebush	Shrubs	✓	✓		8	8	✓			✓		✓		✓	✓			✓	Deer resistant, deciduous. Bright green leaves, good for hedgerow/screen. Riparian areas.
Carpenteria californica	bush anemone	Shrubs	✓	✓		6	4	✓	✓		ü	✓			✓	✓			ü	Interior climate with occasional water otherwise low water needs
Cornus sericea	redtwig dogwood	Shrubs	✓	✓		5	4	✓			✓	✓	✓		✓	✓			✓	Deciduous, red stems for winter color, best with afternoon shade. Can cut to ground to maintain small size and red stems.
Erigeron glaucus	seaside daisy	Shrubs	✓			1	1.5				ok		✓	✓		✓			✓	Not good for dusty sites
Lonicera hispidula	California honeysuckle	Shrubs	✓	✓	✓	4	2		✓	✓	✓		✓			✓			✓	Climbing vine-like, Best in part shade, Attracts birds
Lonicera involucrata	twinberry honeysuckle	Shrubs	✓	✓	✓	6	3		✓	✓	✓		✓			✓			✓	Needs good drainage, Best in part shade, Attracts birds
Mahonia pinnata	California holly grape	Shrubs	✓	✓	✓	4	4	✓	✓			✓		✓	✓	✓			✓	Slow but easy to grow

Appendix F

Bioretention Facility Plant Matrix

June 4, 2014

		Plant Categories	Light Preference			Size (feet)		Watering				Tolerance					High Performers			
Scientific name	Common name		Sun	Part	Shade	Ht.	Width	L	M	H	Summer	Heat	Coast	Wind	Zone 1	Zone 2	Best for irrigated sites	Best for non-irrigated sites	CA Native	Notes
Physocarpus capitatus	pacific ninebark	Shrubs	✓	✓		8	8	✓	✓	✓	✓	✓	✓		✓	✓			✓	Part shade and summer water required in hot locations
Rhamnus californica	California coffeeberry	Shrubs	✓	✓		12	8	✓			✓	✓		✓		✓	✓	✓	✓	'Eve Case' is compact with broad foliage. Syn. *Frangula californica*
Rhamnus crocea	redberry	Shrubs	✓	✓	✓	5	5	✓				✓	✓	✓		✓			✓	Pea sized fruits attract birds, stain concrete
Rhododendron occidentale	western azalea	Shrubs	✓	✓	✓	8	8		✓	✓	✓		✓		✓	✓			✓	Summer deciduous
Ribes aureum gracillimum	golden currant	Shrubs	✓	✓		4	3	✓	✓	✓	ok	✓		✓		✓			✓	Easy, fall color, deciduous
Ribes divaricatum	coast black gooseberry	Shrubs		✓	✓	5	5	✓	✓		ok		✓	✓		✓			✓	Thorny, good for discouraging entry, deciduous
Ribes sanguineum	red flowering currant	Shrubs		✓	✓	5	5	✓	✓		✓		✓		✓	✓	✓		✓	Needs good air movement to avoid white fly, more drought tolerant at coast
Ribes speciosum	fuchsia-flowered gooseberry	Shrubs	✓	✓	✓	4	4	✓	✓			✓	✓			✓			✓	Prefers only light summer water after 2nd year, stress deciduous
Rosa californica	California wild rose	Shrubs	✓	✓		3	5		✓	✓	ok	✓	✓	✓	✓	✓	✓		✓	Hooked thorns, good for discouraging entry. Shade in interior, sun at coast
Rosa gymnocarpa	wood rose	Shrubs	✓	✓	✓	2	3		✓		ok	✓	✓			✓	✓		✓	Easy to grow, thorny
Rubus parviflorus	thimbleberry	Shrubs	✓	✓		8	5			✓	✓		✓		✓	✓			✓	Spreads readily in wet areas, prefers regular water
Rubus spectabilis	salmonberry	Shrubs		✓	✓	8	5		✓	✓	✓		✓	✓	✓	✓			✓	deciduous, soft spiny stems
Rubus ursinus	California blackberry	Shrubs		✓	✓	3	5		✓	✓	ok	✓	✓	✓	✓	✓			✓	Thorny, good for discouraging entry. Harbors beneficial insects
Symphoricarpos albus	common snowberry	Shrubs	✓	✓	✓	4	4	✓	✓	✓	ok	✓				✓	✓		✓	Adaptable to many conditions, by Symphoricarpos mollis at coast
Whipplea modesta	whipplevine	Shrubs		✓	✓	0.5	3		✓	✓	✓					✓			✓	Best for moist shady spots near coast
Acer circinatum	vine maple	Small Trees		✓	✓	20	10		✓	✓	✓					✓			✓	In wide riparian areas; top of slope. Avoid hot inland climates and coastal conditions/salt spray.
Baccharis viminea	mule-fat	Small Trees	✓			8	5	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	Important plant for butterflies and beneficial insects.
Chilopsis linearis	desert-willow	Small Trees	✓			15	15		✓		✓	✓			✓	✓	✓		✓	Does best inland
Corylus cornuta v. californis	California hazel	Small Trees		✓	✓	10	10		✓				✓		✓	✓			✓	Deciduous, edible nut
Fraxinus dipetala	California ash	Small Trees	✓	✓		20	20				ok	✓			✓	✓	✓		✓	drought tolerant, slow to establish, then fast
Garrya elliptica	coast silktassel	Small Trees	✓	✓		12	12	✓	✓		ok	✓	✓	✓		✓			✓	Winter blooms. 'Evie' is compact variety. Best at coast. Afternoon shade inland, deer resistant
Heteromeles arbutifolia	toyon	Small Trees	✓	✓	✓	8	5	✓	✓		✓	✓	✓			✓			✓	Doesn't respond well to pruning low branches, no summer water at coast
Laurus nobilis 'Saratoga'	Grecian bay	Small Trees	✓	✓		20	20	✓				✓		✓		✓				Specify 'standard' and prune for tree form, easy
Myrica californica	Pacific wax myrtle	Small Trees	✓	✓	✓	25	12	✓	✓				✓	✓		✓			✓	Best at coast
Sambucus mexicana	elderberry	Small Trees	✓	✓		20	15	✓	✓						✓	✓	✓		✓	Deciduous, edible fruit, attracts bees and birds, unripe fruits are poisonous but useful and common landscape plant
Acer negundo	box elder	Trees	✓	✓	✓	35	35	✓	✓		ok	✓	✓	✓	✓	✓	✓		✓	Tough shade tree, deciduous
Fraxinus latifolia	Oregon ash	Trees	✓	✓	✓	70	40			✓	✓		✓		✓	✓			✓	Plant in moist areas with rich soil.
Fraxinus velutina	velvet ash	Trees	✓			30	45	✓	✓		ok	✓		✓		✓	✓			Withstands poor drainage and drought
Pittosporum eugenioides	tarata	Trees	✓	✓		40	15	✓	✓		✓	✓		✓		✓				Shear to control height
Platanus acerifolia	London plane tree	Trees	✓	✓		80	30		✓			✓				✓				Large trees, aggressive roots will lift pavement
Platanus racemosa	California sycamore	Trees	✓	✓		80	30		✓	✓	ok	✓				✓				Asymmetrical shape and wide trunk when mature. Give lots of room.
Populus fremontii	cottonwood	Trees	✓	✓		80	30		✓			✓				✓			✓	Riparian species with limited drought tolerance. Aggressive roots will lift pavement. Give lots of room.
Quercus agrifolia	coast live oak	Trees	✓	✓		60	60	✓				✓	✓	✓		✓			✓	Large evergreen tree, tolerant and widespread, important for wildlife, no summer water
Vitis californica	California grape	Vine	✓	✓		10	1-3	✓	✓		✓	✓	✓	✓	✓	✓			✓	Climbing vine. Best in full sun. Can be aggressive in moist area.

Plant Categories	
Grasses and Grass-like Plants	Grass refer to those species that are monocotyledonous plants with slender-leaved herbage.
Herbaceous Perennials and Groundcovers	Herbaceous refers to those species with soft upper growth rather than woody growth. Some species will die back to the roots at the end of the growing season and grow again at the start of the next season. This list only includes those that are perennial, i.e. live for several years.
Shrubs	Shrub is a horticultural distinction that refers to those species of woody plants which are distinguished from trees by their multiple stems and lower height. A large number of plants can be either shrubs or trees, depending on the growing conditions they experience.
Small Tree	Small trees refers to those species of woody plants with one main trunk and a distinct and elevated head with a maximum size of 25' tall and wide.
Tree	Tree refers to those species of woody plants with one main trunk and a rather distinct and elevated head with a size greater than 25' tall or wide.
Water Preference	
Water Preference-Low/Moderate/High	We have provided recommendations for irrigation. All plants should be watered with more frequency during the first two years after planting. After this establishment period, Low water use plants will only need supplemental irrigation at the hottest and driest sites. Plants with Moderate irrigation needs will be best with occasional supplemental water (once per week to once per month) and plants with High irrigation needs will be best with more frequent watering especially during periods of drought in the cooler seasons.
Water Preference-Summer Irrigation	Plants with a check in this column will not withstand a long period of summer drought without irrigation. Plants with an 'ok' in this column are tolerant of, but do not require, frequent summer irrigation. Plants with nothing in this column may not tolerate summer irrigation after establishment.
Stress Tolerance	
Tolerates Heat	A check in the heat column indicates that the plant will tolerate hot sites. It should not be confused with a plants preference for sun. Absence of the check indicates it should only be used in areas close to the Bay or other cool sites.
Tolerates Coast	The coast column indicates plants that perform well within 1,000 feet of the ocean or bay. Most of these plants tolerate some amount of salt air, fog, and wind.
Tolerates Wind	A check in the wind column means that the plant will tolerate winds of ten miles per hour or more.
Zone 1	Plants that tolerate Zone 1 are common riparian, wetland and bog plants capable of surviving in saturated soils for long durations throughout the year. Most of these plants are not drought tolerant and require some water throughout the growing season.
Zone 2	Plants that tolerate Zone 2 are common in riparian/upland transition areas, moist woodlands, and seasonal wetlands. They are capable of surviving in saturated soils for shorter durations especially in the winter or spring. Many of these plants tolerate summer drought but could benefit from some year-round moisture.
High Performers	
Best for Irrigated sites	These plants have been used successfully in irrigated bioretention areas in the Bay Area.
Best for non-Irrigated sites	These plants have been used successfully in non-irrigated bioretention areas in the Bay Area. Temporary irrigation for establishment is highly recommended.
Origin	
CA Native	Indicates native or cultivar of California native. Cultivars offer habitat benefits to native wildlife and are adapted to the local climate but have reduced genetic diversity.