

Conceptual
Stormwater Control Plan
For a Regulated Project

Dipsea Ranch Tentative Map

June 6, 2018

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COUNTY OF MARIN
COMMUNITY DEVELOPMENT AGENCY
PLANNING DIVISION

Owner/Project Location:
Dan Weissman
455 Panoramic Highway
Mill Valley, CA 94941

Prepared by:
Ziegler Civil Engineering
Jaime Ziegler, P.E.
707-479-2170



6/6/18

FILE

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Attachments by Reference

For Additional Information, plans and details refer to the “Dipsea Ranch Tentative Map Plans and Drainage and Land Use Report.” as well as all related project consultant’s reports. These plans are incorporated by reference.

Note:

This Stormwater Control Plan was prepared using the template dated July 11, 2014, as directed by the Marin County Planning Department, Department of Public Works Department Planning Review, 1st submittal for the referenced project

A project specific Stormwater Control Plan will be prepared for the Construction Documents and Construction Permit and will be revised to reflect the final anticipated construction techniques, sequence, schedule, grading, erosion control, stormwater pollution prevention plan, improvement plan and specifications.

The final Stormwater Plan, and Stormwater Pollution Prevention plan will be submitted, and permitted as required, by all relative Agencies, prior to any land disturbing activities onsite.

1.0 - Project Data

Project Data Form: From Stormwater Template

Project Name/Number	Dipsea Ranch Land Division - Project ID P1589
Application Submittal Date	June 6, 2018
Project Location	455 Panoramic Highway, Mill Valley CA. APN 046-161-11
Project Phase No.	N/A
Project Type and Description	This project proposes to subdivide an existing lot into 3 lots, for a net creation of 2 new lots. The submittal includes schematic plans for the proposed improvements associated with the land division. As this is a Planning Submittal and not a Site Improvement Plan, no grading or land disturbance will occur at this time.
Total Project Site Area (acres)	8.29 Acres
Total New and Replaced Impervious Surface Area	13,500 sf = 0.31 Acres
Total Pre-Project Impervious Surface Area	11,664 sf = 0.27 Acres
Total Post-Project Impervious Surface Area	25,164 sf = 0.58 Acres

2.0 - Setting

Project Location and Description:

The project is located at 455 Panoramic Highway and is an existing 8.29 Acre Parcel. This Planning Application proposes to subdivide the existing parcel to 3 total parcels with the creation of 2 new parcels. The site is zoned RMP. The existing and proposed land use is residential. The Land Division Proposal includes conceptual plans for construction of a combined residential driveway to access all of the existing and proposed parcels.

Additional coverage proposed as a part of the conceptual improvement plans onsite at this time, includes the driveway to the new parcels and tie-in apron at Panoramic Highway. The existing driveway to the current residence will remain as is. No new floor area is proposed as a part of this Planning Submittal. Additional floor area and building coverage, as well as the construction of the conceptual driveway plan presented will be a part of future required permit submittals.

Runoff potential was estimated for the two new building envelopes proposed as a part of this submittal and added to the existing runoff from each area, in addition to the estimated runoff from the proposed new coverage for the driveway.

The onsite cisterns, bioretention facilities, bioswales, pipes, trench drains and other storm drainage features were then located accordingly on the site anticipating the future drainage patterns. Some modification of the facilities may occur during the final construction document phase of the proposed land division, as well as the ultimate development plans that are presented in future design review submittals for the individual building sites.

The conceptual designs presented offer maximum flexibility to implement the provisions of this Conceptual Stormwater Control Plan throughout all anticipated future development phases that will occur.

Existing Site Features and Conditions

The 8.29 acre site is located at the upper boundary of the Redwood Creek Watershed and Richardson Bay Watershed at an elevation range of 750 to 950 feet above sea level. The slopes range from 0% to greater than 50%. Soils per the NRCS Soil Survey onsite are Bonnydoon, with a general hydrologic soil group classification of D.

An unnamed "blue line" intermittent stream originates on the property. Also, an ephemeral stream leg originates on the property and joins the intermittent stream offsite. Both streams are influenced by the Pre-European Hydrologic Conditions of the Watershed, as well as the hydromodifications of the existing development and improvements within the sub-areas of the sub-watershed. The intermittent blue line stream is located mostly offsite, while the ephemeral stream is short but mostly located onsite. Stream setbacks were designated as a part of the proposed Tentative Map Plans consistent with the current

The onsite vegetation is dominated by non-native species of tree, grasses, shrubs and forbs. Site specific discussions of plant and animal species and communities found onsite can be found in the Biological Assessment prepared by LSA as a part of this Planning Application.

The vegetative cover onsite is good currently; however, it varies depending on fuels management activities, drought cycles, and plant succession. In general, fuels management is the manipulation of the surface fuel profile above the soil. Fuels management activities generally do not modify or alter the soils characteristics as they relate to hydrology and runoff. They can help to improve them by adding mulch and organic cover to the soil surface and improving the A and O soil horizons over the long term and by increasing the storage capacity of those horizons. Vegetative cover can influence the runoff characteristics from the site and will vary with both native and non-native plant characteristics. In addition to the proposed improvements, ongoing fuels management activities, though not a part of the specific Conceptual Improvement Plans

for the Tentative Map will be included the final Stormwater Control Plan.

The driveway entrance is existing and adjacent to Panoramic Highway. On the north and east side of the project area, surface runoff is routed through a variety of conveyance structures and includes a network of roadside ditches and culverts which route runoff from the developed subdivision alongside Panoramic Highway downstream. The runoff from these channels and structures is discharged onsite at the east and south portion of the parcel and flow through a series of eroded ditches to the ephemeral channel and blue line stream below.

The project area has been graded as a part of the modern historic development of the site with both permitted and unpermitted activities. The existing home and garage onsite does not have formal Stormwater Control Plan. As a part of the final construction documents for this project and future projects, the entire site and existing improvements will be included in the final Stormwater Control Plan, so that the site can be effectively regulated per the Stormwater Control Plan Requirements.

Opportunities and Constraints for Stormwater Control

Opportunities for the Stormwater Control plan were developed from a thorough investigation of the site with the assistance of many consultants. These include site specific Land Surveys, Biological, Archeologic, Arborist, Geotechnical Engineering, Hydrology, Traffic, Sewage Disposal, Architectural, Reports as well as Public Comments and input from a many Public Agencies including Marin County.

A detailed constraints map was developed using this information, per Marin County Planning Department and Marin County Code Standards. A project specific Drainage/BASMASAA Plan sheet consistent with the BASMAA Standard was prepared as a part of the Planning Submittal. Please refer to this information for site specific details and stormwater mitigation measures proposed for the project. The detailed constraints map formed the basis of the final design of the Tentative Map and Conceptual Improvement Plans.

Many opportunities for onsite Stormwater Control and management were identified as a part of the studies and reports, public input, code requirements, site constraints and site investigations. The project proposes the use of cisterns, bioretention and bioswales for the primary stormwater treatment, storage and conveyance system.

Because the site is relatively large compared to surrounding parcels, and the density proposed is low, there are many locations onsite between the proposed building envelopes, sewage disposal locations, and proposed access driveway to create a drainage system that will mimic natural processes. By creating a network of storage cisterns, with bioretention areas, and bioswales, it will be possible to create natural drainage elements for the low intensity design storms to mitigate the runoff created by the proposed improvements to the required standards.

When the site-specific plans are developed for the individual building envelopes and

because they are located on the relatively flat portions of the site, additional bioretention areas will be able to be designed and installed, beyond those proposed, which will further store stormwater onsite, and create natural landscaping features.

The stormwater systems proposed will exceed the minimum storage requirements using dispersed natural systems that will mimic the natural reference drainages and serve to create secondary habitat features for plant and animal species found in the area. Traditional engineering and architectural elements will also be a part of the plan area, but will be complemented by the natural systems proposed.

Because of the thoughtful location of the proposed lots, improvements and drainage features, only several non-native trees will be removed. All of the native trees onsite are proposed to be retained as a part of the Tentative Map Conceptual Improvement Plan.

3.0 - Low Impact Development Design Strategies and Stormwater Control Measures

Note:

The following is a general list of the low impact design strategies used in the conceptual development plans. A more detailed conceptual list and description of the proposed measures as well as details that will be implemented are a part of the Planning Submittal. Future Design Review Submittal will also incorporate some of the Low Impact Design Measures outlined.

- Optimization of Site Layout to the lowest slope areas of the project site.
- Limitation of development envelope
- Preservation of natural drainage features and vegetation.
- Setbacks from creeks, and riparian habitats
- Minimization of imperviousness
- Use of natural drainage features as a design element
- Use of Permeable Pavements via existing unpaved areas on flat locations retrofitted with runoff treatment.
- Dispersal of Runoff to Pervious Areas
- Use of Cisterns for Runoff Attenuation, Irrigation, and Sediment Removal.
- Mulching restoration of disturbed soils after disturbance.
- Limits of Grading
- Construction Mitigation Measures Plan including concrete, trash, materials, and waste management plan.
- Green Building Plans for Future Design Review Improvements
- Tree and Native Vegetation Protection Measures.
- Encourage Native Plants and Vegetation
- Implement Wildland Urban Interface Fuels Reduction Measures to prevent catastrophic stand replacing fire onsite.
- Water bars and dispersed sediment checks to encourage soils recovery and upland stormwater storage on existing or temporary disturbed areas.

Low Impact Development and Stormwater Control Design Strategies (Continued)

- Removal of non-native vegetation during fuels management to encourage native plan succession and habitat onsite.
- Use of Native Plants for Revegetation and Landscaping
- Use of Sod Roofs – To Be Determined.
- Gravel beneath decks for erosion control, runoff storage, and fuels management
- Greywater systems for irrigation
- Solar Systems for irrigation, greywater and stormwater reuse and control.
- Permeable paving for parking areas.
- Windrowing of tree boles along contour for slope revetment and soil productivity
- Trench drains for controlling concentrated runoff and routing to bioswales if flat slope areas.
- Bioretention Basins, and Bio-Swales and Sediment traps

4.0 Drainage Design

The drainage design for the Dipsea Ranch Tentative Map followed the guidelines outlined in the BASMAA manual for Post Construction activities as required by the Marin County Code and Municipal Waste Discharge Permit and Plan. The site was also modeled to ensure compliance with the Hydromodification Standards as required by the State Water Quality Control Board.

The drainage plan was developed using an analysis of the existing and proposed site topography, grading and improvement plans. Also, the existing structures and impervious surfaces were accounted for in the drainage design.

The Drainage Management Areas (DMA's) boundaries were designated and categorized based on the surface routing and the homogeneity of the surface. The Drainage Management Areas groups included Paved Driveway, Aggregate Base Driveway, Landscape, House, Outbuilding and Patio, Pervious Decks, and Remainder Building Envelope Areas. The areas of each DMA were calculated.

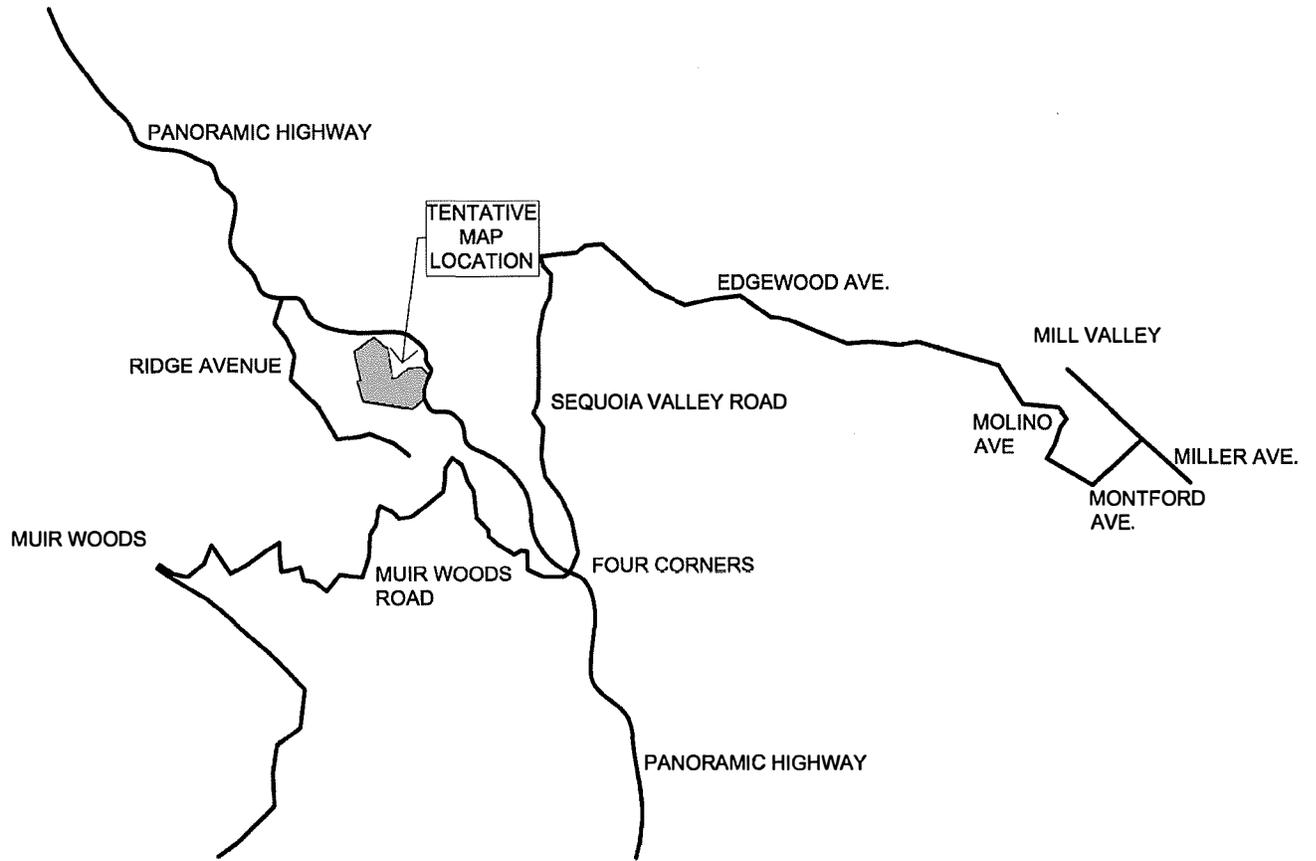
Each area was assigned a Runoff Coefficient consistent with the BASMAA criteria. Runoff volumes were then calculated from the areas based on the product of the DMA and the Runoff Coefficient.

Cisterns were selected for storage due to the site constraints. The DMA tributary areas were routed to the specific Cisterns modeled in the Hydrology Model to ensure that the required storage volume was available. Because the Hydromodification requirements is more rigorous than the BASMAA requirement, storage volumes are exceeded the routing of all DMA to their respective cisterns.

Additional storage was included in the design in the form of the bioswales and bioretention basins. These additional volumes are above the minimums calculated for the individual DMA's.

4.1 - Drainage Plans

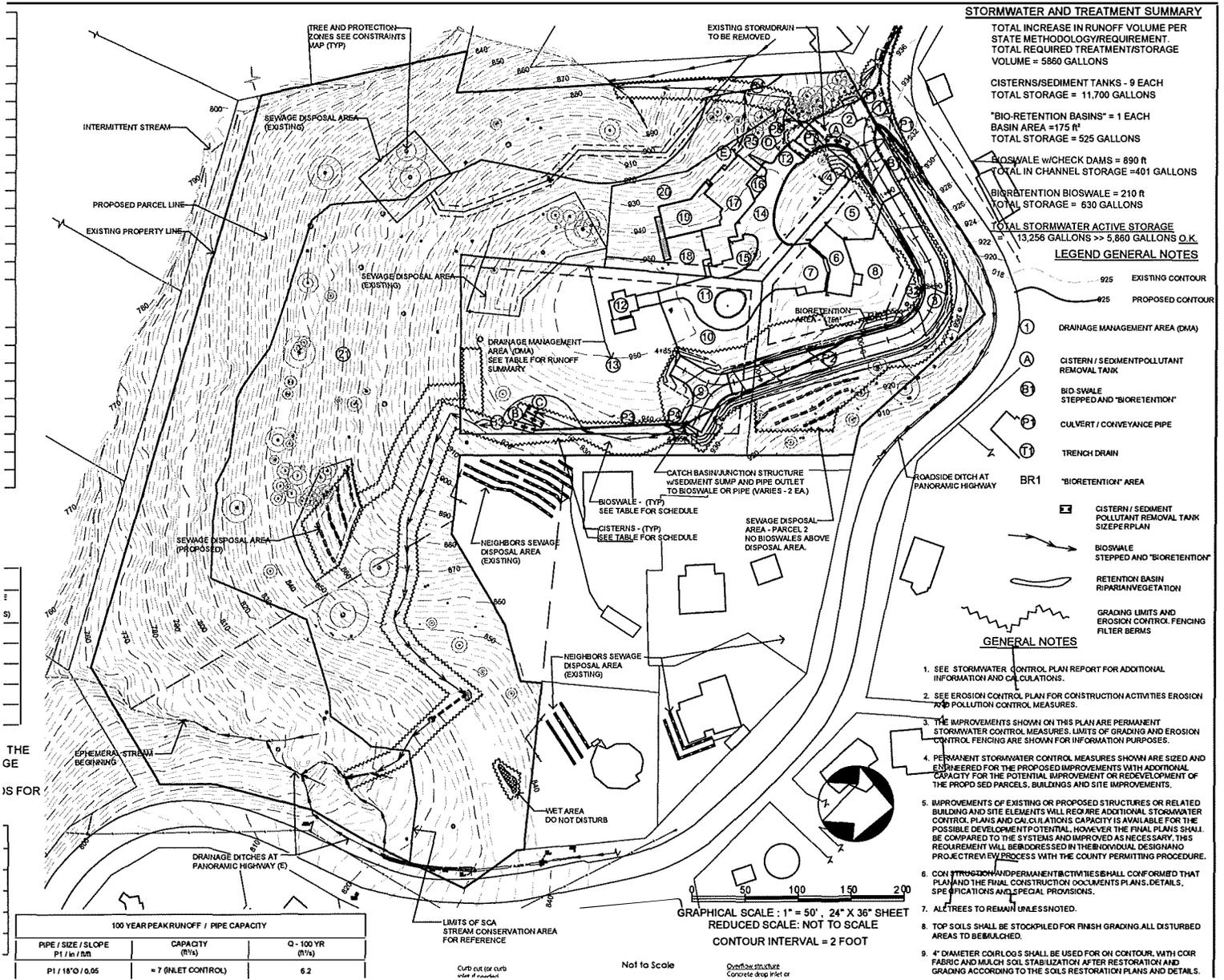
Note: See the following pages.



VICINITY MAP

NO SCALE





STORMWATER AND TREATMENT SUMMARY

TOTAL INCREASE IN RUNOFF VOLUME PER STATE METHODOLOGY/REQUIREMENT.
 TOTAL REQUIRED TREATMENT/STORAGE VOLUME = 5860 GALLONS

CISTERNS/SEDIMENT TANKS - 9 EACH
 TOTAL STORAGE = 11,700 GALLONS

"BIO-RETENTION BASINS" = 1 EACH
 BASIN AREA = 175 ft²
 TOTAL STORAGE = 525 GALLONS

BIOSWALE w/CHECK DAMS = 890 ft
 TOTAL IN CHANNEL STORAGE = 401 GALLONS

BIORETENTION BIOSWALE = 210 ft
 TOTAL STORAGE = 630 GALLONS

TOTAL STORMWATER ACTIVE STORAGE
 13,256 GALLONS >> 5,860 GALLONS O.K.

LEGEND GENERAL NOTES

- 925 EXISTING CONTOUR
- 925 PROPOSED CONTOUR
- ① DRAINAGE MANAGEMENT AREA (DMA)
- A CISTERN / SEDIMENT POLLUTANT REMOVAL TANK
- ② BIOSWALE STEPPED AND "BIORETENTION"
- ③ CULVERT / CONVEYANCE PIPE
- ④ TRENCH DRAIN
- BR1 "BIORETENTION" AREA
- ⑤ CISTERN / SEDIMENT POLLUTANT REMOVAL TANK SIZE PER PLAN
- ⑥ BIOSWALE STEPPED AND "BIORETENTION"
- ⑦ RETENTION BASIN RIPARIAN VEGETATION
- ⑧ GRADING LIMITS AND EROSION CONTROL FENCING FILTER BERMS

GENERAL NOTES

1. SEE STORMWATER CONTROL PLAN REPORT FOR ADDITIONAL INFORMATION AND CALCULATIONS.
2. SEE EROSION CONTROL PLAN FOR CONSTRUCTION ACTIVITIES EROSION AND POLLUTION CONTROL MEASURES.
3. THE IMPROVEMENTS SHOWN ON THIS PLAN ARE PERMANENT STORMWATER CONTROL MEASURES. LIMITS OF GRADING AND EROSION CONTROL FENCING ARE SHOWN FOR INFORMATION PURPOSES.
4. PERMANENT STORMWATER CONTROL MEASURES SHOWN ARE SIZED AND ENGINEERED FOR THE POTENTIAL IMPROVEMENT OR REDEVELOPMENT OF THE PROPOSED PARCELS, BUILDINGS AND SITE IMPROVEMENTS.
5. IMPROVEMENTS OF EXISTING OR PROPOSED STRUCTURES OR RELATED BUILDING AND SITE ELEMENTS WILL REQUIRE ADDITIONAL STORMWATER CONTROL PLANS AND CALCULATIONS CAPACITY IS AVAILABLE FOR THE POSSIBLE DEVELOPMENT POTENTIAL. HOWEVER THE FINAL PLANS SHALL BE COMPARED TO THE SYSTEMS AND IMPROVED AS NECESSARY. THIS REQUIREMENT WILL BE INCORPORATED IN THE BIOLOGICAL DESIGN AND PROJECT REVIEW PROCESS WITH THE COUNTY PERMITTING PROCEDURE.
6. CONSTRUCTION AND PERMANENT ACTIVITIES SHALL CONFORM TO THAT PLAN AND THE FINAL CONSTRUCTION DOCUMENTS PLANS, DETAILS, SPECIFICATIONS AND SPECIAL PROVISIONS.
7. ALL TREES TO REMAIN UNLESS NOTED.
8. TOP SOILS SHALL BE STOCKPILED FOR FINISH GRADING ALL DISTURBED AREAS TO BE REVEGETATED.
9. 4" DIAMETER CORROLOGS SHALL BE USED FOR ON CONTOUR, WITH COR FABRIC AND MESH SOIL STABILIZATION AFTER RESTORATION AND GRADING ACCORDING TO THE SOILS RESTORATION PLANS AND DETAILS.

100 YEAR PEAK RUNOFF / PIPE CAPACITY		
PIPE / SIZE / SLOPE P1 / 18" O / 0.05	CAPACITY (ft ³ /s)	Q - 100 YR (ft ³ /s)
	= 7 (INLET CONTROL)	6.2

GRAPHICAL SCALE : 1" = 50' 24" X 36" SHEET
 REDUCED SCALE: NOT TO SCALE
 CONTOUR INTERVAL = 2 FOOT

THE GE
 IS FOR

LIMITS OF SCA
 STREAM CONSERVATION AREA
 FOR REFERENCE

Curb cut (or curb
 inlet if present)

Not to Scale

Structure
 Concrete slope 1:4 or

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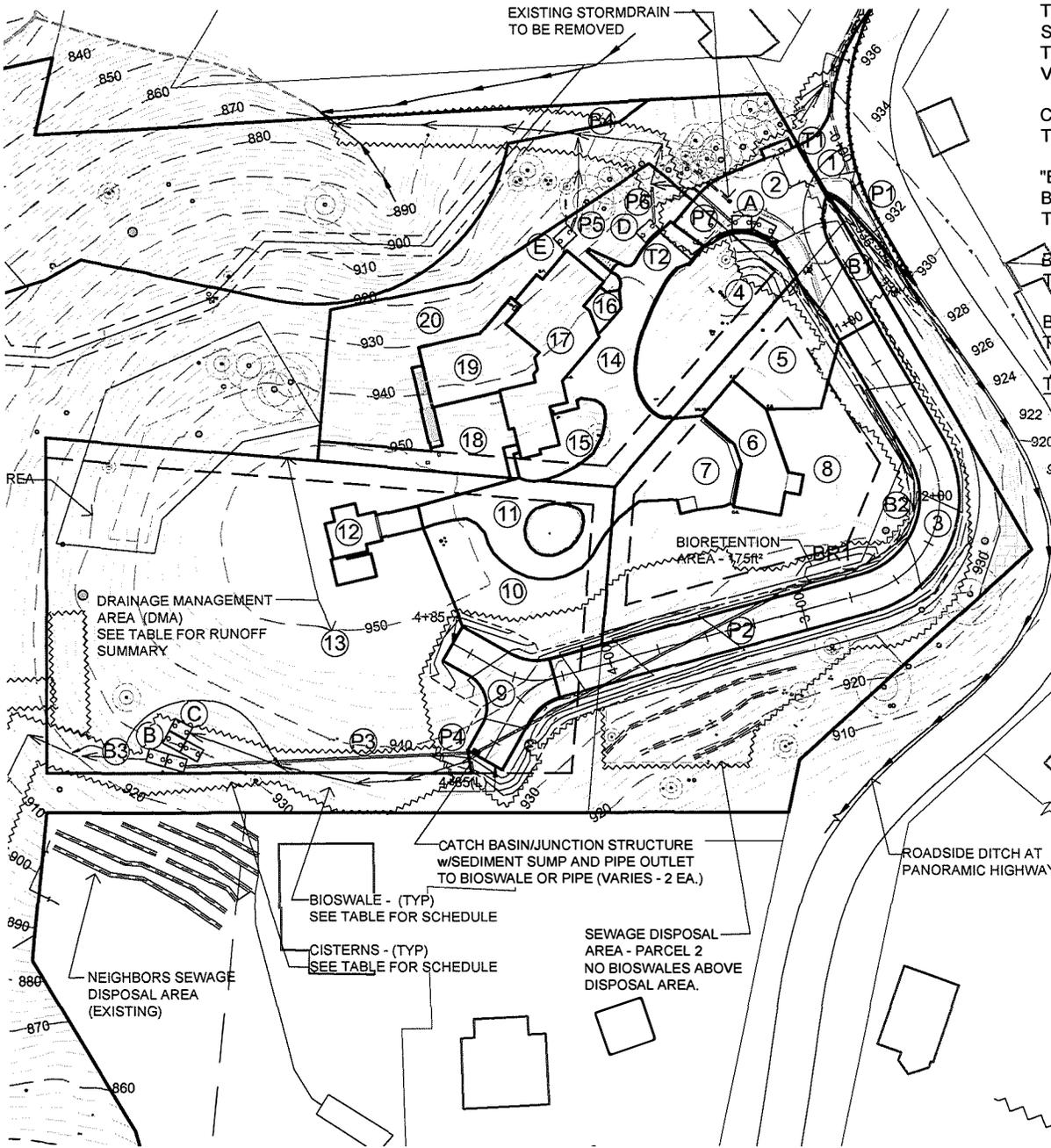
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- Ⓟ CULVERT / CONVEYANCE PIPE
- Ⓣ TRENCH DRAIN
- BR1 "BIORETENTION" AREA
- Ⓛ CISTERN / SEDIMENT POLLUTANT REMOVAL TANK SIZE PER PLAN
- ➔ BIOSWALE STEPPED AND "BIORETENTION"
- Ⓜ RETENTION BASIN RIPARIAN VEGETATION
- ⚡ GRADING LIMITS AND EROSION CONTROL FENCING FILTER BERMS

EXISTING STORMDRAIN TO BE REMOVED

DRAINAGE MANAGEMENT AREA (DMA) SEE TABLE FOR RUNOFF SUMMARY

BIORETENTION AREA - 175ft²

CATCH BASIN/JUNCTION STRUCTURE w/SEDIMENT SUMP AND PIPE OUTLET TO BIOSWALE OR PIPE (VARIES - 2 EA.)

BIOSWALE - (TYP) SEE TABLE FOR SCHEDULE

CISTERNS - (TYP) SEE TABLE FOR SCHEDULE

SEWAGE DISPOSAL AREA - PARCEL 2 NO BIOSWALES ABOVE DISPOSAL AREA.

NEIGHBORS SEWAGE DISPOSAL AREA (EXISTING)

ROADSIDE DITCH AT PANORAMIC HIGHWAY

4.2 - Drainage Management Area Runoff and Treatment Volumes Tables

Note: See the following pages.

DRAINAGE MANAGEMENT AREA RUNOFF VOLUME SUMMARY

DMA DESCRIPTION	AREA (ft ²)	BASMAA RUNOFF COEFFICIENT	RUNOFF VOLUME (ft ³)	RUNOFF VOLUME GALLONS
1 DRIVEWAY A.C.	1,412	1.0	22.6	170
2 DRIVEWAY A.C.	3,700	1.0	59.2	444
3 DRIVEWAY A.C.	6,465	1.0	103.4	776
4 LANDSCAPE	4,084	0.1	6.0	45
5 LANDSCAPE	2,712	0.1	4.3	33
6 HOUSE	1,600	1.0	25.6	192
7 DRIVEWAY A.B.	2,150	1.0	34.4	258
8 LANDSCAPE	10,783	0.1	17.3	130
9 DRIVEWAY A.B.	1,926	1.0	31	233
10 LANDSCAPE	3,851	0.1	6.2	47
11 DRIVEWAY A.B.	3,109	1.0	49.7	373
12 OUTBUILDING/PATIOS	1,040	1.0	16.6	125
13 REMAINDER BUILDING ENVELOPE ½ - LANDSCAPE ½ - IMPERVIOUS	32,112 TOTAL AREA 16,056 LANDSCAPE 16,056 IMPERVIOUS	0.1 1.0	25.6 256	192 1920
14 DRIVEWAY A.B.	3,505	1.0	56	421
15 LANDSCAPE	962	0.1	1.6	12
16 LANDING CONC.	250	1.0	4	30
17 HOME	2,743	1.0	43	323
18 LANDSCAPE	1,964	0.1	3.1	23
19 DECK PERVIOUS	2,037	0.1	3.3	25
20 LANDSCAPE	7,326	0.1	11.7	88
21 REMAINDER AREA	267,398	SELF TREATING	N/A	NA
TOTAL				

CISTERN / SEDIMENT TANK STORAGE VOLUMES AND INFLOW				
CISTERN	TRIBUTARY AREAS	CISTERN STORAGE VOLUME (GALLONS)	RUNOFF VOLUME (GALLONS)	EXCESS STORAGE VOLUME ABOVE MINIMUM (GALLONS)
A	2, 5, 6, 7	2,400	927	1,473
B	8, 3	2,400	906	1,494
C	9, 10, 11, 12, 13	4,500	2,890	1,610
D	14, 16, 4, 15	1,200	508	692
E	17, 18, 19, 20	1,200	459	741

NOTES:

1. STORAGE VOLUMES EXCEED MINIMUM VOLUMES REQUIRED TO ACCOUNT FOR THE HYDROMODIFICATION DESIGN CRITERIA WHICH REQUIRES ADDITIONAL STORAGE VOLUME TO MEET THE MORE RIGOROUS DESIGN STANDARD.
2. THE REQUIRED VOLUMES CALCULATED USING THE STATE MINIMUM STANDARDS FOR SMALL PROJECTS AS PRESENTED HEREIN FOR REFERENCE AND REVIEW.

BIOSWALE TREATMENT VOLUMES		
BIOSWALE TYPE	LENGTH (ft)	STORAGE/ INFILTRATION VOLUME (GALLONS)
B1 "BIORETENTION" BIOSWALE	70	210
B2 "BIORETENTION" BIOSWALE	140	420
B3 STEPPED BIOSWALE	630	284
B3 STEPPED BIOSWALE	260	117

NOTES:

1. STEPPED BIOSWALES ASSUME NO STORAGE FROM INFILTRATION WHICH IS OVERLY CONSERVATIVE.
2. BIORETENTION BIOSWALES ARE BASED UPON THE DESIGN PRESENTED IN THE BASMAA MANUAL AND MODIFIED FOR CONVEYANCE WITH STEPPED ROCK WEIR REVETMENT AS GRADE CONTROL AND ARE ASSUMED TO BE 1 FOOT WIDE FOR INFILTRATION PURPOSES. NET GRADES SHALL BE LESS THAN 5%.

"BIO-RETENTION" BASIN TREATMENT VOLUMES		
BIORETENTION AREA	AREA (ft ²)	STORAGE/INFILTRATION VOLUME (GALLONS)
BR1	175	525

NOTES:

1. BASED ON THE BASMAA MANUAL THIS AREA ALONE IS SUFFICIENT TO TREAT AN IMPERVIOUS AREA OF 4375 ft². USING A "SIZING" FACTOR OF 0.04.

5.0 – Source Control Measures.

Potential Source of Runoff Pollutants	Structural Source Control Best Management Practices	Operational Source Control Best Management Practices
Sediment	Sediment Traps, Bioswales, Bioretention Basins, Cisterns with Sediment Traps, Coir Wattle Checks, Revegetation.	Grading Limits, Filter Fabric Fencing, Rock Aprons, Staging Areas for Equipment, Construction Access Plan. Construction Schedule May 1 – Oct 15.
Oil and Grease	Cisterns with Oil and Grease Traps Construction Vehicle Maintenance Program.	Spill Prevention Plan and Spill Cleanup Plan and Supplies Onsite.
Fuels and Solvents	Designated refueling protocol and areas.	Spill Prevention Plan and Spill Cleanup Plan and Supplies Onsite.
Dust	Dust Control- Water Paving and Subgrade Compaction Mulches, Filter Fabrics,	Limit of Grading Activities During High Wind Events Daily Sweeping and Site Cleanup.
Nutrients	Fertilizer Management Plan Revegetation of Upland Areas to utilize mobilized nutrients. Soil Restoration	Use of Native Plants and Mulches and Native Compost for Revegetation. Limit use of fertilizers.
Construction Materials, Paints and Solvents	Designated Materials Staging Areas. Dust free sanding and Collection systems, Low VOC Coatings. Approved Coatings. Approved Construction Materials. Designated Stockpiling and Staging Areas.	Licensed Contractors In area of Construction associated with waste, i.e. a Painting Contractor trained in containment and coatings management.
Garbage and Waste	Designated Trash Enclosures and Solid Waste Management Plan. Stockpiling and reuse of materials from the site	Daily Site Cleanup or more frequently during construction as needed to contain construction waste generated onsite.

6.0 - Stormwater Facility Maintenance

As a part of the Parcel Map and associated Construction Documents and Improvement Plans for this project a Final Stormwater Facility Maintenance will be developed in consultation with Marin County Staff.

In general since this project is Residential in nature, all of the facilities will be maintained by the owner of the individual parcels where the stormwater improvements are specific to an individual site.

In the case where the stormwater systems benefit the use of multiple land owners, a cost sharing program will be determined, outlined and made a part of the final map and deed restrictions or CCR's as appropriate for the project.

In the interim, while the established parcels are held by a common owner – “ 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.”

7.0 - Construction Checklist

Source Control or Treatment Control Measure	Location in Plans
Sediment Traps, Bioswales, Bioretention Basins, Cisterns with Sediment Traps, Coir Wattle Checks, Revegetation.	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP
Cisterns with Oil and Grease Traps Construction Vehicle Maintenance Program.	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP
Designated refueling protocol and areas.	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP
Dust Control- Water Paving and Subgrade Compaction Mulches, Filter Fabrics,	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP
Fertilizer Management Plan Revegetation of Upland Areas to utilize mobilized nutrients. Soil Restoration	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP
Designated Materials Staging Areas. Dust free sanding and Collection systems, Low VOC Coatings. Approved Coatings. Approved Construction Materials. Designated Stockpiling and Staging Areas.	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP.
Designated Trash Enclosures and Solid Waste Management Plan. Stockpiling and reuse of materials from the site	Final Improvement Plan and Details Future – Stormwater Pollution Prevention Plan - SWPPP

8.0 Certifications

The preliminary design of the 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.

Note: Additional Certifications will be determined by the Marin County Department of PublicWorks and other departments during the review of this project.

Appendix A. Stormwater Pollutant Sources/Source Controls Checklist

Note: The following checked task boxes will be included in the Construction Documents and Final Stormwater Pollution Prevention Plan to ensure conformance with this manual and requirements.

Additional measures will be added when the final construction plans are developed

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
<input checked="" type="checkbox"/> A. On-site storm drain inlets (unauthorized non-stormwater discharges and accidental spills or leaks)	<input checked="" type="checkbox"/> Locations of inlets.	<input checked="" type="checkbox"/> Mark all inlets with the words “No Dumping! Flows to Bay” or similar.	<input checked="" type="checkbox"/> Maintain and periodically repaint or replace inlet markings. <input checked="" type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators. <input checked="" type="checkbox"/> See applicable operational BMPs in Fact Sheet SC44, “Drainage System Maintenance,” in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks <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.”

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
<input checked="" type="checkbox"/> B. Interior floor drains and elevator shaft sump pumps	Show drains and pump locations	<input checked="" type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	<input checked="" type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input checked="" type="checkbox"/> C. Interior parking garages	Show drain locations	<input checked="" type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.	<input checked="" type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.
<input checked="" type="checkbox"/> D1. Need for future indoor & structural pest control		<input checked="" type="checkbox"/> Note building design features that discourage entry of pests.	<input checked="" type="checkbox"/> 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
<input checked="" type="checkbox"/> D2. Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance	<input checked="" type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. <input checked="" type="checkbox"/> Show self-retaining landscape areas, if any. <input checked="" type="checkbox"/> Show bioretention facilities. (See instructions in Chapter 4.)	<p>State that final landscape plans will accomplish all of the following.</p> <input checked="" type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. <input checked="" 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. <input checked="" type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. <input checked="" type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape. <input checked="" 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.	<input checked="" type="checkbox"/> Maintain landscaping using minimum or no pesticides. <input checked="" type="checkbox"/> 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 <input checked="" type="checkbox"/> 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
<input checked="" type="checkbox"/> E. Pools, spas, ponds, decorative fountains, and other water features.	<input checked="" type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	<input checked="" 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.	<input checked="" type="checkbox"/> 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.
<input checked="" type="checkbox"/> F. Food service	<input checked="" 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. <input checked="" 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 checked="" type="checkbox"/> Describe the location and features of the designated cleaning area. <input checked="" 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.	State maintenance schedule for grease interceptor

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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
<input checked="" type="checkbox"/> G. Refuse areas	<input checked="" 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. <input checked="" 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. <input checked="" 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 checked="" type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans. <input checked="" type="checkbox"/> State that signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar.	<input checked="" type="checkbox"/> 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
<input type="checkbox"/> H. 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 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
<input checked="" type="checkbox"/> I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	<input checked="" 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. <input checked="" 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. <input checked="" 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.	<input checked="" type="checkbox"/> Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. <input checked="" type="checkbox"/> Where appropriate, reference documentation of compliance with the requirements of programs for: <ul style="list-style-type: none"> ▪ 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 	<input checked="" 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 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		
<input checked="" type="checkbox"/> J. Vehicle and Equipment Cleaning	<input checked="" type="checkbox"/> Show on drawings as appropriate: <ul style="list-style-type: none"> (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. 	<input checked="" 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.	<p>Describe operational measures to implement the following (if applicable):</p> <input checked="" type="checkbox"/> Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.	<input checked="" type="checkbox"/> Car dealerships and similar may rinse cars with water only.	<p>See Fact Sheet SC-21, “Vehicle and Equipment Cleaning,” in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks</p>

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<input checked="" type="checkbox"/> K. Vehicle/Equipment Repair and Maintenance	<input checked="" 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. <input checked="" 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. <input checked="" 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 checked="" type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. <input checked="" 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. <input checked="" 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 checked="" 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. <input checked="" 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. <input checked="" 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.

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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
<input checked="" type="checkbox"/> L. Fuel Dispensing Areas Note: Modify to Construction Equipment Refueling	<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. <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 ¹ .] The canopy [or cover] shall not drain onto the fueling area.		<input type="checkbox"/> The property owner shall dry sweep the fueling area routinely. <input type="checkbox"/> 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
<input type="checkbox"/> M. Loading Docks	<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 for ultimate discharge to the sanitary sewer. <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. <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. <input type="checkbox"/> See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
<input checked="" type="checkbox"/> N. Fire Sprinkler Test Water		<input checked="" type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.	<input checked="" type="checkbox"/> 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

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
<p>O. Miscellaneous Drain or Wash Water or Other Sources</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Boiler drain lines <input checked="" type="checkbox"/> Condensate drain lines <input checked="" type="checkbox"/> Rooftop equipment <input checked="" type="checkbox"/> Drainage sumps <input checked="" type="checkbox"/> Roofing, gutters, and trim. <input checked="" type="checkbox"/> Other sources 	<p>Show drain lines and drainage sumps</p>	<ul style="list-style-type: none"> <input checked="" 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. <input checked="" 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. <input checked="" type="checkbox"/> Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. <input checked="" type="checkbox"/> Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. <input checked="" type="checkbox"/> Include controls for other sources as specified by local reviewer. 	<p>If architectural copper is used, implement the following BMPs for management of rinsewater during installation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> If possible, purchase copper materials that have been pre-patinated at the factory. <input checked="" 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. <input checked="" type="checkbox"/> Consider coating the copper materials with an impervious coating that prevents further corrosion and runoff. <p>Implement the following BMPs during routine maintenance:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site.
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> P. Plazas, sidewalks, and parking lots. 	<p>Show extent of permeable paving materials</p>		<ul style="list-style-type: none"> <input checked="" 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.

Appendix B. Bioretention Facility Construction Inspection Checklist

Note: The following checked task boxes will be included in the Construction Documents and Final Stormwater Pollution Prevention Plan to ensure conformance with this manual and requirements.

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 are recommended and may be required by local 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 and 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

Bioretention Facility Plant Matrix

Scientific name	Common name	Plant Categories	Light Preference			Size (feet)		Watering					Tolerances					High Performers		CA Native	Notes
			Sun	Part	Shade	HL	Width	L	M	H	Summer	Heat	Coast	Wind	Zone 1	Zone 2	Best for irrigated sites	Best for non-irrigated sites			
Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13	Column14	Column15	Column16	Column17	Column18	Column19	Column20	Column21	
<i>Agrostis exarata</i>	Spike bentgrass	Grasses and Grass-like Plants	✓	✓		1	1.25														Moist sand dunes / adapts to shady woodlands from San Diego to Sonoma County
<i>Bouteloua gracilis</i>	bluegrama	Grasses and Grass-like Plants	✓			1.5	1	✓													Tolerates no summer water, good for non-irrigated remote sites. AKA= Mosquito Grass
<i>Bromus carinatus</i>	California brome	Grasses and Grass-like Plants	✓			2	1				ok	✓	✓	✓	✓	✓					Good for erosion control / not a good meadow grass
<i>Carex barbarea</i>	Santa Barbara sedge	Grasses and Grass-like Plants	✓	✓		3	2	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Stays green w/ summer H2O, moist to drought tolerant, spreading large statured sedge
<i>Carex divulsa</i>	grassland sedge	Grasses and Grass-like Plants	✓	✓	✓	1	1				ok	✓	✓	✓	✓	✓	✓				Widely sold in CA as <i>Carex tumulicola</i> (Berkeley sedge). Native to Eurasia. Full sun along coast. Tolerates drought once established. Needs regular water in sun.
<i>Carex nudata</i>	California black sedge	Grasses and Grass-like Plants	✓	✓		2	2	✓	✓		✓	✓	✓	✓	✓	✓					Turns orange in frost, showy black flower spikes
<i>Carex obnupta</i>	slough sedge	Grasses and Grass-like Plants	✓	✓		2	1			✓	✓	✓	✓	✓	✓	✓					Some salt tolerance, drought tolerant once established. Thick, graceful, bright green stands in wetlands.
<i>Carex pansa</i>	lunesedge	Grasses and Grass-like Plants	✓	✓		2	2				✓	✓	✓	✓	✓	✓					Native to Asilomar; Plug not seed planting; mow end of summer if desired.
<i>Carex praegracilis</i>	clustered field sedge	Grasses and Grass-like Plants	✓	✓		1.5	1.5			✓	✓	✓	✓	✓	✓	✓					Lawn alternative, tolerates some foot traffic; summer dormant in warmer areas
<i>Chondropetalum tectorum</i>	small-leaf rush	Grasses and Grass-like Plants	✓	✓		4	3				✓	✓	✓	✓	✓	✓					Native to S. Africa, drought tolerant
<i>Danthonia californica</i>	California oat grass	Grasses and Grass-like Plants	✓	✓		1.5	1.5				✓	✓	✓	✓	✓	✓					Bunch grass, recommend plugs not seed to start, tolerates some foot traffic
<i>Distichlis spicata</i>	saltgrass	Grasses and Grass-like Plants	✓	✓		0.3	3				✓	✓	✓	✓	✓	✓					Looks like bermuda grass, withstands foot traffic, for soils with high salt
<i>Festuca californica</i>	California fescue	Grasses and Grass-like Plants	✓	✓	✓	2	2	✓			ok	✓	✓	✓	✓	✓					Use only in driest areas of basin
<i>Festuca idahoensis</i>	Idaho fescue	Grasses and Grass-like Plants	✓	✓		1	1	✓	✓		ok	✓	✓	✓	✓	✓					Can mow. Needs light summer water at hot sites
<i>Festucarubra</i>	red fescue	Grasses and Grass-like Plants	✓	✓		1	1.5			✓	ok	✓	✓	✓	✓	✓					Can mow. Lawn alternative; Water conservation LDS; Bio Strips; Infiltration basins
<i>Festuca rubra 'molate'</i>	molate fescue	Grasses and Grass-like Plants	✓	✓		1	1.5	✓	✓		ok	✓	✓	✓	✓	✓					Can mow. Lawn alternative
<i>Juncus effusus</i>	common rush	Grasses and Grass-like Plants	✓	✓		2.5	2.5				ok	✓	✓	✓	✓	✓					Forms dense clumps
<i>Juncus pallidus</i>	glantrush	Grasses and Grass-like Plants	✓			4	2	✓			ok	✓	✓	✓	✓	✓					Evergreen, heat and drought tolerant.
<i>Juncus patens</i>	blue-rush	Grasses and Grass-like Plants	✓			2	1			✓	✓	✓	✓	✓	✓	✓					Plant from plugs; irrigate occasionally summer
<i>Leymus trichoides</i>	creeping wildrye	Grasses and Grass-like Plants	✓	✓		3	1	✓	✓		ok	✓	✓	✓	✓	✓					Can mow 4 x yr... Sub-surface H2O best. Can be aggressive in moist areas.
<i>Muhlenbergia rigens</i>	deergrass	Grasses and Grass-like Plants	✓	✓		3	3	✓	✓		ok	✓	✓	✓	✓	✓					Evergreen, forms mounds.
<i>Sisyrinchium bellum</i>	blue-eyed grass	Grasses and Grass-like Plants	✓	✓		1	1				ok	✓	✓	✓	✓	✓					Needs occasional summer water, tolerates some foot traffic
<i>Achillea millefolium</i>	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
<i>Arenaria douglasiana</i>	jugwort	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	3	✓	✓		ok	✓	✓	✓	✓	✓					Rhizomatous
<i>Arenaria ludoviciana</i>	whitesagebrush	Herbaceous Perennials and Groundcovers	✓	✓	✓	1.5	2	✓	✓		✓	✓	✓	✓	✓	✓					Aromatic. Tolerates foot traffic and wide range of conditions
<i>Asclepias fascicularis</i>	narrowleaf milkweed	Herbaceous Perennials and Groundcovers	✓	✓		3	2	✓	✓		ok	✓	✓	✓	✓	✓					Monarch butterfly host plant, deciduous
<i>Darmera peltata</i>	Indian rhubarb	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	5			✓	✓	✓	✓	✓	✓	✓					Prefers cool summers. Native to N CA, S OR; found on stream banks and in woodlands.
<i>Epilobium canum</i>	California fuchsia	Herbaceous Perennials and Groundcovers	✓	✓		1	4	✓			ok	✓	✓	✓	✓	✓					dormant in winter, best with winter mowing
<i>Epipactis gigantea</i>	stream orchid	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	1.5			✓	✓	✓	✓	✓	✓	✓					Goes dormant with drought, salt tolerant
<i>Fragaria chiloensis</i>	beach strawberry	Herbaceous Perennials and Groundcovers	✓	✓	✓	0.3	2	✓	✓		ok	✓	✓	✓	✓	✓					Evergreen groundcover, performs well as filler at the upper edges of facility.
<i>Heuchera micrantha</i>	alumroot	Herbaceous Perennials and Groundcovers	✓	✓	✓	2	1.5	✓	✓		✓	✓	✓	✓	✓	✓					Dainty white flowers
<i>Heuchera pilosissima</i>	hairy alum root	Herbaceous Perennials and Groundcovers		✓	✓	1.5	1.5	✓	✓		✓	✓	✓	✓	✓	✓					Tolerates sand, best at basin edges
<i>Iris douglasiana</i>	Douglas iris	Herbaceous Perennials and Groundcovers	✓	✓		1.5	2	✓	✓		ok	✓	✓	✓	✓	✓					Also, Iris hybrids
<i>Lilium pardalinum</i>	leopard lily	Herbaceous Perennials and Groundcovers	✓	✓		6	4	✓	✓		✓	✓	✓	✓	✓	✓					Native to dry summer areas, deciduous
<i>Lobelia cardinalis</i>	cardinal flower	Herbaceous Perennials and Groundcovers	✓	✓	✓	2	2	✓	✓		✓	✓	✓	✓	✓	✓					Not drought tolerant, requires regular water
<i>Lotus scoparius</i>	deerweed	Herbaceous Perennials and Groundcovers	✓	✓		4	3	✓	✓		✓	✓	✓	✓	✓	✓					Short-lived, nitrogen fixer
<i>Mimulus aurantiacus</i>	common monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓		3	3	✓			ok	✓	✓	✓	✓	✓					Drought tolerant, stress deciduous
<i>Mimulus cardinalis</i>	scarlet monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓	✓	3	3	✓	✓		✓	✓	✓	✓	✓	✓					Aggressive seeder, needs summer water
<i>Mimulus guttatus</i>	hep monkeyflower	Herbaceous Perennials and Groundcovers	✓	✓		3	3	✓	✓		✓	✓	✓	✓	✓	✓					Attract Bees, stress deciduous, needs summer water
<i>Mirabilis multiflora</i>	glam four o'clock	Herbaceous Perennials and Groundcovers	✓	✓	✓	2	4	✓	✓		✓	✓	✓	✓	✓	✓					Best for hot sites, native to Southern California
<i>Oenothera hookeri</i>	Hooker's evening primrose	Herbaceous Perennials and Groundcovers	✓	✓		3	2	✓	✓		ok	✓	✓	✓	✓	✓					Easy to establish biennial, self seeds
<i>Polypodium californicum</i>	California Polypody fern	Herbaceous Perennials and Groundcovers	✓	✓	✓	2	2	✓			✓	✓	✓	✓	✓	✓					Summer dormant except at coast, spreads slowly by rhizomes, frost tender
<i>Prunella vulgaris</i>	self heal	Herbaceous Perennials and Groundcovers	✓	✓		0.5	2	✓	✓		ok	✓	✓	✓	✓	✓					Somewhat drought tolerant, long flowering
<i>Rudbeckia californica</i>	California coneflower	Herbaceous Perennials and Groundcovers	✓	✓		3	2	✓	✓		ok	✓	✓	✓	✓	✓					Native to dry summer areas, deciduous
<i>Scaevola 'mauve clusters'</i>	fan flower	Herbaceous Perennials and Groundcovers	✓	✓		1	4	✓	✓		✓	✓	✓	✓	✓	✓					Native to Australia, sensitive to frost
<i>Scutellaria austriaca</i>	skullcap	Herbaceous Perennials and Groundcovers	✓	✓		1	2	✓	✓		✓	✓	✓	✓	✓	✓					Dies back in drought
<i>Sisyrinchium californicum</i>	yellow eyed grass	Herbaceous Perennials and Groundcovers	✓	✓		1	1	✓	✓		✓	✓	✓	✓	✓	✓					Can be drought tolerant
<i>Verbena lasiostachys</i>	Western vervain	Herbaceous Perennials and Groundcovers	✓	✓		2	2	✓	✓		ok	✓	✓	✓	✓	✓					Attract butterflies, can be weedy, pioneer species
<i>Verbena ilicifolia</i>	cadros island verbena	Herbaceous Perennials and Groundcovers	✓	✓		2	4	✓	✓		ok	✓	✓	✓	✓	✓					Drought tolerant, best with minimal irrigation, native to Baja CA
<i>Allyogyne huegelii</i>	blue hibiscus	Shrubs	✓	✓		8	7	✓	✓		✓	✓	✓	✓	✓	✓					Very low water after second year, Sunset zones 15-17 & 20-24, prune to encourage flowering
<i>Baccharis pilularis</i>	push baccharis	Shrubs	✓	✓		6	6	✓	✓		ok	✓	✓	✓	✓	✓					Fast growing, somewhat short-lived, deer proof
<i>Calycanthus occidentalis</i>	western spicabush	Shrubs	✓	✓		8	8	✓	✓		✓	✓	✓	✓	✓	✓					Deer resistant, deciduous. Bright green leaves, good for hedgerow/screen. Riparian areas.
<i>Carpenteria californica</i>	push anemone	Shrubs	✓	✓		6	4	✓	✓		✓	✓	✓	✓	✓	✓					Inferior climate with occasional water otherwise low water needs
<i>Comus senecioidea</i>	redwing 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.
<i>Erigeron glaucus</i>	seaside daisy	Shrubs	✓	✓		1	1.5				ok	✓	✓	✓	✓	✓					Not good for dusty sites
<i>Lonicera hispidula</i>	California honeysuckle	Shrubs	✓	✓	✓	4	2			✓	✓	✓	✓	✓	✓	✓					Climbing vine-like. Best in part shade. Attract birds
<i>Lonicera involucrata</i>	winberry honeysuckle	Shrubs	✓	✓		6	3			✓	✓	✓	✓	✓	✓	✓					Needs good drainage. Best in part shade. Attracts birds
<i>Mahonia pinnata</i>	California holly grape	Shrubs	✓	✓	✓	4	4	✓	✓		✓	✓	✓	✓	✓	✓					Slow but easy to grow

Appendix C
2014

Bioretention Facility Plant Matrix

June 4,

Scientific name	Common name	Plant Categories	Light Preference			Size (feet)			Watering			Tolerances					High Performers		CA Native	Notes
			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		
<i>Physocarpus capitatus</i>	Pacificinibark	Shrubs	✓	✓		8	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Part shade and summer water required in hot locations
<i>Rhamnus californica</i>	California coffeeberry	Shrubs	✓	✓		12	8	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	'Eve Case' is compact with broad foliage. Syn. <i>Frangula californica</i>
<i>Rhamnus crocea</i>	Yedberry	Shrubs	✓	✓		5	5	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Pea sized fruits attract birds, stain concrete
<i>Rhododendron occidentale</i>	Western azalea	Shrubs	✓	✓		8	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Summer deciduous
<i>Ribes aureum gracillimum</i>	Golden current	Shrubs	✓	✓		4	3	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Easy, fall color, deciduous
<i>Ribes divaricatum</i>	Coast black gooseberry	Shrubs	✓	✓		5	5	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Thorny, good for discouraging entry, deciduous
<i>Ribes sanguineum</i>	Red flowering currant	Shrubs	✓	✓		5	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Needs good air movement to avoid white fly, more drought tolerant at coast
<i>Ribes speciosum</i>	Fuchsia-flowered gooseberry	Shrubs	✓	✓		4	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Prefers only light summer water after 2nd year, stress deciduous
<i>Rosa californica</i>	California wild rose	Shrubs	✓	✓		3	6	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Hooked thorns, good for discouraging entry. Shade in interior, sun at coast
<i>Rosa gymnocarpa</i>	Wood rose	Shrubs	✓	✓		2	3	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Easy to grow, thorny
<i>Rubus parviflorus</i>	Thimbleberry	Shrubs	✓	✓		8	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Spreads readily in wet areas, prefers regular water
<i>Rubus spectabilis</i>	Salmonberry	Shrubs	✓	✓		8	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Deciduous, soft spiny stems
<i>Rubus ursinus</i>	California blackberry	Shrubs	✓	✓		3	5	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Thorny, good for discouraging entry. Harbors beneficial insects
<i>Symphoricarpos albus</i>	Common snowberry	Shrubs	✓	✓		4	4	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Adaptable to many conditions, by <i>Symphoricarpos mollis</i> at coast
<i>Whipplea modesta</i>	Whipplevine	Shrubs	✓	✓		0.5	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Best for moist shady spots near coast
<i>Acer circinatum</i>	Vine maple	Small Trees	✓	✓		20	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	In wide riparian areas, top of slope. Avoid hot inland climates and coastal conditions/salt spray.
<i>Baccharis viminea</i>	Beep-willow	Small Trees	✓	✓		8	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Important plant for butterflies and beneficial insects.
<i>Chilopsis linearis</i>	Pleser-willow	Small Trees	✓	✓		15	15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Does best inland
<i>Corylus cornuta v. californica</i>	California hazel	Small Trees	✓	✓		10	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Deciduous, edible nut
<i>Fraxinus dipetala</i>	California ash	Small Trees	✓	✓		20	20	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Drought tolerant, slow to establish, then fast
<i>Garrya elliptica</i>	Coast silk tassel	Small Trees	✓	✓		12	12	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Winter blooms. 'Eve' is compact variety. Best at coast. Afternoon shade inland, deer resistant
<i>Heteromeles arbutifolia</i>	Toyon	Small Trees	✓	✓		8	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Doesn't respond well to pruning low branches, no summer water at coast
<i>Launus nobilis 'Saratoga'</i>	Greilanbay	Small Trees	✓	✓		20	20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Specify 'standard' and prune for tree form, easy
<i>Myrica californica</i>	Pacific wax myrtle	Small Trees	✓	✓		25	12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Best at coast
<i>Sambucus mexicana</i>	Elderberry	Small Trees	✓	✓		20	15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Deciduous, edible fruit, attracts bees and birds, unripe fruits are poisonous but useful and common landscape plant
<i>Acer negundo</i>	Box elder	Trees	✓	✓		35	35	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Tough shade tree, deciduous
<i>Fraxinus latifolia</i>	Oregon ash	Trees	✓	✓		70	40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Plant in moist areas with rich soil.
<i>Fraxinus velutina</i>	Velvet ash	Trees	✓	✓		30	45	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Withstands poor drainage and drought
<i>Pittosporum eugenioides</i>	Herale	Trees	✓	✓		40	15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Shear to control height
<i>Platanus acerifolia</i>	London planetree	Trees	✓	✓		80	30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Large tree, aggressive roots will lift pavement
<i>Platanus racemosa</i>	California sycamore	Trees	✓	✓		80	30	✓	✓	OK	✓	✓	✓	✓	✓	✓	✓	✓	✓	Asymmetrical shape and wide trunk when mature. Give lots of room.
<i>Populus fremontii</i>	Cottonwood	Trees	✓	✓		80	30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Riparian species with limited drought tolerance. Aggressive roots will lift pavement. Give lots of room.
<i>Quercus agrifolia</i>	Coast live oak	Trees	✓	✓		60	60	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Large evergreen tree, tolerant and widespread, important for wildlife, no summer water
<i>Vitis californica</i>	California grape	Vine	✓	✓		10	1-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Climbing vine. Best in full sun. Can be aggressive in moist area.

APPENDIX C
Bioretention Facility Plant Matrix (Key), June 6, 2014

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.

Appendix D: Section 6 - Excerpt from Hydrology and Land Use Report

Section 6: Stormwater “Best Management Practices” (BMP) Construction/Permanent

Section 6.1. – Stormwater “Best Management Practices” (BMP) Summary

Stormwater Best Management Practices (BMP) are typically divided into two categories, construction and permanent. They may have overlap because permanent BMP's may be constructed in a sequence that they will be used to also mitigate construction activities. Construction BMP's will be constructed and used as a part of construction stormwater BMP's. Sometimes construction BMPs will be left in place to support the long term or permanent BMP systems as they stabilize, especially in relation to the vegetated components of the permanent BMP's. Typically, the phasing of BMPs are specified as a part of the improvement plans various elements.

This project, because its size and scope will require a Stormwater Pollution Prevention Plan per the State regulations (SWPPP). This is in addition to the typical erosion sediment and water quality control plans provided for on the Improvement Plans, and the Stormwater Control Plan. All the related stormwater pollution prevention plans are typically in effect during construction of the project and require monitoring and reporting as to the implementation and performance of the BMPs. This is to ensure that they are continually monitored and maintained, and to assure if deficiencies are identified that they are acknowledged they are accounted for and remedied. The plans also provide a Guidance Manual for all the various contractors that will operate onsite and that could impact stormwater quality in a multitude of ways. In some cases, discharge standards will be applied to a project and long-term monitoring will be required beyond the construction phase.

Section 6.2 - Construction Best Management Practices

Construction Best Management Practices are engineered to account for and mitigate the potential stormwater impacts that construction activities can impart on a project area. The following is a list of the typical practices that are used during construction to minimize potential effects of construction. If necessary, as a part of this review, more information can be provided on each practice from a variety of public resources. The California Department of Transportation has assembled a comprehensive manual template with descriptions and graphics, used on most Regulated Projects in California. The following are the most common typical practices used during construction.

- Erosion Control Fencing
- Tree and Vegetation Protection Fencing
- Limits of Construction and Fencing
- Limits of Operations
- Portable Onsite Restroom Facilities aka “Sani-Hut” and Washing Station
- Construction Phasing and Scheduling
- Mulching and Soil Protection
- Rock Aprons for Truck/Tire/ Equip. Cleaning as necessary and at
- Roadway Tie-ins
- Dust Control and Abatement
- Stockpiling of Top soils for reuse.
- Staging and Storage areas for Materials and Construction logistics

- Hazardous Materials Storage Use and Containment Plans
- Fire Prevention Measures and Firefighting Supplies Onsite
- Pre-grading Meeting
- SWPPP – Stormwater Pollution Prevention Plan
- Informational Plans and Specifications related to Stormwater
- Cementitious Washout Criteria.
- Paint Washout Criteria
- Temporary/Permanent Sediment and Stormwater Tanks and Basins.
- Bio and Geotextile Slope Protection
- Rip Rap Slope Protection
- Stormwater Control Plans a part of CCR's for individual parcel development
- Stormwater Control Plans a part Improvement plans for Construction

Section 6.3 - Development Constraints and Permanent Best Management Practices

The permanent Best Management Practices constructed to mitigate the effects of runoff are as follows. In some cases, they will be constructed and used to mitigate the effects of future development as with the individual parcel stormwater tanks and related downstream bio-swales and retention basins. Construction BMP's will be implemented during the development of each individual parcel to protect water quality during the construction of the future residences. Some of the possible additional stormwater protection measures that may occur on final development plans are as follows.

- Bio-swales for stormwater conveyance, where applicable
- Culverts, for stormwater conveyance where applicable
- Rolled Dikes to stabilize edges of pavements and contain slopes
- In sloping of Driveway to Bioswales and Bioretention elements
- Bio-Retention Basins
- Cisterns and Runoff Storage Elements
- Regulated Outlets and Flow Control from Storage Elements
- Sod Roofs
- Pervious Pavements
- Slope Wattling, Bio textile Revetments, and Hydroseeding.
- Soils Restoration
- Vegetation Restoration
- Uplands Restoration
- Stream Restoration
- Drainage Ditch Stabilization
- Fuels Management to minimize impacts from Wildland Fires.
- Designated Trails and Driveways
- Long-Term Maintenance of Stormwater Elements
- Chipping and mulching to promote recycling of nutrients, promote soils productivity and enhance the physical characteristics of the upland soils.
- Constraints Mapping
- Limits of Grading