Berkeley Environment, Health & Safety

Stormwater Checklist (5,000 SF and greater)

Project Information

Project Name: _____

Individual Completing the Form: _____ Date: _____

Project Type ☐ New Development ☐ Redevelopment ☐ Road ☐ Retrofit ☐ Utility ☐ Landscaping

☐ Other; describe: _____

Project Areas

Total Project Area (SF) _____

Pre-Impervious Area (SF) _____

Post Impervious Area (SF) _____

New Impervious Area (SF) _____

Replaced Impervious Area (SF) _____

Is the Project Exempt?

☐ Yes, select exemption(s) below. No further responses are required in this form.

☐ No; complete the rest of the form.

☐ Interior remodel

☐ Routine maintenance or repair projects such as: maintenance, repair and replacement work on existing underground utilities; exterior wall surface replacement; roof replacement; pavement or asphalt resurfacing within the existing footprint; sidewalk replacement within an existing footprint to replace concrete that is causing a trip hazard; routine replacement/repair of damaged pavement/asphalt such as pothole repair.

☐ Sidewalks built as part of new streets or roads and built to direct stormwater runoff to adjacent vegetated areas

☐ Bicycle lanes built as part of new streets or roads that direct stormwater runoff to adjacent vegetated areas

☐ Impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks

☐ Sidewalks, bicycle lanes, or trails constructed with permeable surfaces

Instructions: Use the State Water Board's Post-Construction Calculator to quantify the runoff reduction resulting from implementation of site design measures. Use the California Phase II LID Sizing Tool to size all LID measures.

Redevelopment Project Area (complete only if Redevelopment project type)

Does the Project result in an increase of more than 50% of the existing impervious surface?*

☐ Yes ☐ No

*If **yes** then runoff from the entire Project site including all existing, new, and/or replaced impervious surfaces must be included in the stormwater treatment and design calculations. If no then only runoff from the new and/or replaced impervious surfaces must be included in the stormwater treatment and design calculations.

Part A - Source Control Measures

Projects that will create an/or replace 5,000 square feet or more of impervious surface must implement standard permanent and/or operational source control measures for pollutant generating activities and sources associated with the end use of the Project site. This requires an evaluation of the equipment and activities that will be located or implemented at the project site after construction. Source control measures for the following pollutant generating activities shall be designed consistent with recommendations from the CASQA's Development BMP Handbook, or equivalent.

Check all pollutant-generating activities that apply to your Project

☐ Accidental spills or leaks
☐ Interior floor drains
☐ Parking/storage area maintenance
☐ Indoor and structural pest control
☐ Landscape/outdoor pesticide use
☐ Pools, spas, ponds, decorative fountains, and other water features
☐ Outdoor storage of equipment or materials
☐ Vehicle and equipment repair and maintenance
☐ Drain or washwater from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources
☐ fire sprinkler test water
☐ Loading docks
☐ Vehicle and equipment cleaning
☐ Fuel dispensing areas
☐ Storage and handling of solid waste
☐ Restaurants, grocery stores, and other food service operations
☐ Unauthorized non-stormwater discharges
☐ Building and grounds maintenance

Describe the source control measures that will be implemented for the Project for all pollutant generating activities checked in Part A.

Part B - Site Design Measures

One or more of the following site design measures are required, to the extent feasible, to reduce Project site runoff.

Use the State Water Board SMARTS Post-Construction Calculator, or equivalent, to quantify the runoff reduction resulting from implementation of site design measures. In addition, the State Water Board's California Phase II LID Sizing Tool, or equivalent, must be used to quantify the runoff reduction resulting from implementation of any site design measure specified below and attach the calculations.

Confirm the Project has attached each of the following:

☐ completed State Water Board's Post-Construction Calculator (or its equivalent)

☐ site maps that delineate square footage of relevant Site Design Measures

☐ construction details of the Site Design Measures.

All designs shall be in accordance with CASQA's Development BMP Handbook.

Check which measures will be implemented.

Select	Site Design Measure	Description
☐	Stream Setbacks and Buffers	A vegetated area including trees, shrubs, and herbaceous vegetation that exists or is established to protect a stream system, lake reservoir, or coastal estuarine area.
☐	Soil Quality Improvement and Maintenance	Improvements and maintenance through soil amendments and creation of microbial communities.
☐	Tree Planting and Preservation	Planting and preservation of healthy established trees that include both evergreens and deciduous, as applicable.
☐	Rooftop and Impervious Area Disconnection	Rerouting of rooftop drainage pipes to drain rainwater to permeable areas instead of to the stormwater system.
☐	Porous Pavement (Requires Campus Architect Approval)	Pavement allows runoff to pass through it, thereby reducing the runoff from a site and surrounding areas and filtering pollutants. If selected, What is the gravel subbase thickness under the porous pavement and/or permeable pavers, in inches?
☐	Green Roofs (Requires Campus Architect Approval)	A vegetative layer grown on a roof (rooftop garden).
☐	Vegetated Swales (Requires Campus Architect Approval)	A vegetated, open-channel management practice designed specifically to treat and attenuate stormwater runoff.

Site Design Measures Implemented for Project

Description of Measure	Treatment Area	Treatment Flow or Volume	Targeted Pollutants*

*Sediment, trash/litter, dry weather flows (e.g., irrigation runoff)

Operation & Maintenance Procedures for Each Site Design Measure

Description of Measure	Inspection Frequency	Maintenance Frequency	Maintenance Method

Please include an O&M Manual, if available.

Is post-construction water balance achieved with site design measures only?

☐ Yes; checklist is complete

☐ No; additional stormwater treatment must be designed for the Project (see Parts C and D).

Part C - Stormwater Treatment/Baseline Hydromodification Measures met through Stormwater Credit Program

Select this measure for any Project

- ➔ Use the State Water Board SMARTS Post-Construction Calculator, or equivalent, to quantify the runoff reduction resulting from implementation of site design measures.
- ➔ Only required if site design measures listed in Part B cannot fully meet MS4 General Permit requirements (i.e.. Calculations on California Phase II LID Sizing Tool show that post-construction water balance is not achieved).
- ➔ Stormwater treatment for vehicular surfaces must be met onsite or before the point of discharge to surface waters (e.g., Strawberry Creek)

Stormwater Credit Program - Project is requesting

☐ Full credit coverage

EISA (SF):_____

WQV (CF): _____

☐ Partial credit coverage

EISA (SF):_____

WQV (CF): _____

☐ No credit; see Part D (only allowed in discussion with PEP and EH&S)

Part D - Stormwater Treatment/Baseline Hydromodification Measures met on Project Site

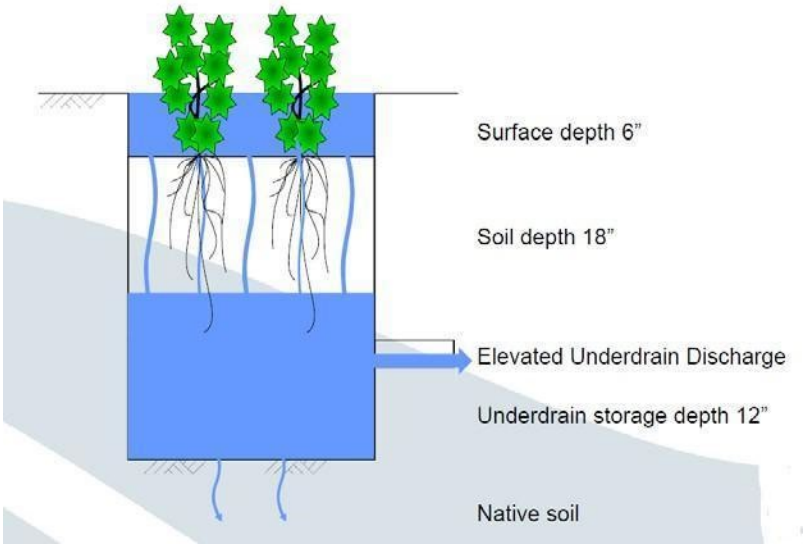
Only allowed if site design measures listed above cannot fully meet MS4 General Permit requirements (i.e. Calculations on California Phase II LID Sizing Tool show that post-construction water balance is not achieved) AND the Project cannot participate in the Stormwater Credit Program. All stormwater treatment BMPs shall be designed based on the flow-based or volume-based criteria specified in Section F.5.g.2.b (Numeric Sizing Criteria) of the MS4 General Permit.

Treatment BMPs must be designed for each Drainage Management Area (DMA). Bioretention facilities are preferred for treatment but alternative treatment BMPs can be used if the proper documentation and supporting calculations are provided and attached to this checklist. If Alternative BMPs are selected then all sizing and calculations should be prepared by a Registered Civil Engineer.

Step 1: Bioretention Facilities or Flow-Through Planters

Bioretention facilities can be sized based on 4% of the total impervious tributary area to the bioretention facility (see section F.5.g.2.c. of permit) and in accordance with the typical section below.

Permit-Prescribed Bioretention Vertical Profile



Additional Bioretention Design Requirements

- Bioretention facilities located in areas with highly infiltrative soils or high groundwater tables may omit the underdrain.
- The 18" Soil layer (Planting layer) shall be a mixture of sand (60-70%) and compost (30- 40%) and shall meet ASTM C33 Standards.
- The 12" Storage layer shall be composed of gravel and underdrain shall be placed near the top of this layer.
- No liners or other barriers shall be used unless there is a structure or other geotechnical hazard located within 10 feet of the facility.
- The appropriate plant palette should be selected based on the soil type, maximum available water use during wet periods, and drought tolerance during dry season.

Part D - Stormwater Treatment/Baseline Hydromodification Measures met on Project Site

Step 2: Alternative Treatment BMPs Prepared by a Registered Civil Engineer

Select alternative treatment BMPs used:

☐ Extended Detention Basin
☐ Infiltration Basin or Infiltration Trench
☐ High-Rate Biofilters (e.g. Tree wells or other) (1)
☐ High-Rate Media Filter (e.g. Vault unit with replaceable cartridges) (1)
☐ Other effective BMP (brief title here, explain in documentation): _____

(1) High-rate Biofilters or Media Filters are only allowed if bioretention or equivalent facility is proven to be infeasible for the project and if the following conditions apply: a) project is creating or replacing an acre or less and is located in an area that has at least 85% of the site covered by permanent structures; and b) The proposed facility is receiving runoff solely from existing (pre-project) impervious areas.

Alternative Treatment BMPs - Calculating What is Required

Alternative Treatment BMPs shall be designed using the flow-based or volume-based criteria specified in Section F.5.g.2.b (Numeric Sizing Criteria) of the MS4 General Permit.

Check one of the following volume or flow-based criteria:

☐ Volume-Based BMP Sizing Criteria: The maximized stormwater capture volume for the tributary based on historical rainfall records and determined in accordance with Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998), pages 175-178 (the 85th percentile, 24-hour storm event).

☐ Volume-Based BMP Sizing Criteria: The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with CASQA's Stormwater BMP Handbook for New and Redevelopment (2003) using local rainfall.

Flow-Based BMP Sizing Criteria:

☐ Flow-based BMP Sizing Criteria: The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity.

☐ Flow-based BMP Sizing Criteria: The flow of runoff produced from a rain event is equivalent to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records.

Treatment Rate or Volume Required for Project: _____ cubic feet or ft/s (circle one)
(if multiple DMAs, attach additional calculations to this checklist

Attach all supporting designs and calculations for Alternative Treatment BMPs. Include all relevant site maps, construction details, operations and maintenance manuals, and sizing calculations