

EXAMPLE
Stormwater Structural Control Measures
Inspection and Maintenance Plan
for a Residential Subdivision Project
Whispering Pines Lane
Anytown, USA

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XYZ Corporation
Jane Jones, 805-555-1212

This example prepared by Dan Cloak Environmental Consulting
for County of Santa Barbara Project Clean Water
to assist users of the *Stormwater Technical Guide*

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I. Introduction

The following Inspection and Maintenance Requirements are intended to sustain the long-term performance of storm water management measures and structural facilities at Name of Subdivision. This development was approved with special conditions to (select one or more) treat / retain / control rate of runoff in order to protect water resources and watershed processes.

The long-term maintenance of these measures and structural facilities is the responsibility of the owner(s). The original design and performance requirements are described in the Storm Water Control Plan, dated XX. Ongoing maintenance of the storm water facilities is required to assure their continued performance as originally intended.

This Inspection and Maintenance Plan should be reviewed annually and updated as needed from time-to-time. Any updates should be copied and transmitted to the County of Santa Barbara Attention: Project Clean Water, Water Resources Division, Public Works Department.

II. Ownership and Responsibility for Maintenance Over Life of Project

The Inspection and Maintenance Requirements for Name of Subdivision shall be executed by the project owner or designee. A qualified contractor may be employed to perform said duties. The staff and contractors shall familiarize themselves with the purpose, design specifications, functions, and mode of operation for these facilities. The Name of Owner shall retain self-inspection records onsite and shall be the signatory for any correspondence with the County of Santa Barbara regarding the status of ongoing inspections. Records will be retained onsite for a minimum of five years, and made available upon request to the County of Santa Barbara.

The failure to maintain or the physical removal of any feature described herein is a zoning violation under Chapter 35 of County Code and can result in penalties including but not limited to fines, property liens, and other actions for enforcement of a civil judgment.

CONTACT INFORMATION:

Name	_____
Title / Role	_____
Address	_____
Phone	_____
Email	_____

II.A. [Initial Training of Responsible Individuals]

If the developer’s contract maintains the storm water features for an initial start-up period, then include the following...otherwise name the HOA or entity responsible.

Following completion of construction, the bioretention facilities will be maintained by Name of Owner’s contractor for two years. During this time, Name of Owner’s contractor will provide written guidelines and conduct at least two on-site training sessions attended by the new owners’ contractor(s).

III. Facilities to be Maintained

The Name of Subdivision contains several drainages that are tributary to one or more Stormwater Control Measures located on the project site. The SCMs include consist of bioretention facilities that treat and retain storm water runoff for rainfall events up to and including the 95th percentile storm event. The treated runoff is then allowed percolate into the adjoining soils. Figure 1 delineates the locations of SCMs throughout the site.

III.A. Facility Descriptions

There are two bioretention facilities on-site as shown in Exhibit. Runoff flows to these depressed areas where it is filtered through the vegetated surface and unique bioretention soil blend of sand and compost. The treated rain water is collected in an underlying perforated drain and piped to the detention basin. The perforated pipe is placed at the top of a 12" gravel bed, below the soil mix.

Figure 1. Bioretention Cross-Section (schematic)

Each bioretention facility has the following features:

- Surrounded by a concrete curb. Where adjacent to pavement, curbs are thickened and an impermeable vertical cutoff wall protects the pavement subgrade from moisture intrusion.
- Each layer built flat and level. See Figure 1.
- Class 2 permeable, Caltrans specification 68-2.02F(3); depth as shown in Figure 1.
- 18 inches sand/compost mix (60-70% washed sand ASTM ### with 30-40% compost USComposting###)
- 4 in. dia. PVC SDR 35 perforated pipe underdrain, installed with the invert at the top of the Class 2 permeable layer with holes facing down, and connected to the overflow structure at that same elevation
- 6-inch-deep reservoir between top of soil elevation and overflow grate elevation
- Concrete drop inlet with frame overflow structure, with grate set to specified elevation, connected to storm drain in Main Street ?? See Exhibit
- Plantings
- Irrigation system with drip emitters and "smart" irrigation controllers
- Sign identifying the facility as a stormwater treatment facility.

INSERT EXAMPLE OF SIGNAGE:



III.A.1. Bioretention Facility #1

Bioretention Facility #1 receives drainage from the front portion of the roofs, and from the driveways, of Lots 1, 2, 3, and 4. It also receives drainage from the portion of the Whispering Pines Lane fronting these properties, from the crown to curb. Runoff collects in the curb and drains to an inlet and duct beneath the sidewalk, which conveys flows to the facility. The facility overflow and underdrain is connected via a [specify pipe] to the municipal storm drain system at a drop inlet near the corner of the site.

III.A.2. Bioretention Facility #2

Bioretention Facility #2 receives drainage from the front portion of the roofs, and from the driveways, of Lots 5, 6, 7, 8, and 9. It also receives drainage from the portion of the Whispering Pines Lane fronting these properties, from the crown to curb. Runoff collects in the curb and drains to an inlet and duct beneath the sidewalk, which conveys flows to the facility. The facility overflow and underdrain is connected via a [specify pipe] to the City's storm drain system at a drop inlet near the corner of the site.

III.A.3. Other Inspection and Maintenance Activities

Identify other features associated with the storm drain system that should be inspected to assure performance of the Structural Control Measures, such as area drains, street drainage, primary outlet from site, ditches or watercourses, common areas such as recreation areas, parking lots, parks and open spaces, etc.

IV. Inspection and Maintenance Requirements

IV.A. General Maintenance

Synthetic pesticides or fertilizers should not be applied to bioretention areas. Soil amendments, if needed to restore a flat elevation in the bioretention areas 6" below the overflow grate, shall consist of the sand/compost mix specified in II.A, with 2" of aged compost mulch. The top of soil surface will be maintained at the specified design elevation within each bioretention area. Irrigation systems, if used, will be maintained to conserve water while maintaining plant health.

Although it is unlikely to be needed, if plants are not thriving compost tea may be applied at a recommended rate of 5 gallons mixed with 15 gallons of water per acre, up to once per year between

March and June. Compost tea will not be applied when temperatures are below 50°F or above 90°F or when rain is forecast within the next 48 hours.

The following are examples of acceptable measures for pest control if needed:

- Beneficial nematodes
- Safer® products
- Neem oil

IV.B.Maintenance Schedule

The bioretention facilities will be maintained on the following schedule at a minimum.

IV.B.1. Routine Activities

The facilities will be examined weekly or as needed for trash, and trash will be promptly removed. Any graffiti will be removed, and vandalism or other damage will be noted and repaired promptly. Bioretention signage will be visible.

The planted areas will be weeded by hand as needed depending on growth. Plants will be inspected for health and vigor. Replace mulch with aged or composed mulch to maintain one to two-inch depth; do not use bark chips. Prior to the summer, if irrigation system is used, system will be turned on manually and checked for any leaks or broken lines, misdirected spray patterns etc. Any dead plants will be replaced.

IV.B.2. Inspections Following Significant Rain Events

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

- The surface of the facility will be inspected to confirm there is no ponding. If ponding, possible solutions include replacing the bioretention soil or checking the underdrain inspection port for clogging. There should be no filter fabric placed between the soil and the gravel layers. If standing water is present more than 72 hours, check for mosquito larvae and treat as necessary (or contact local Vector Control District).
- Inlets will be inspected, and any accumulations of trash or debris will be removed.
- The surface of the mulch layer will be inspected for movement of material. Mulch should not float or be buoyant. Mulch will be replaced and raked smooth if needed.
- Overflow outlet structure will be inspected for clogging or debris build-up. Any material in the outlet structure should be removed.
- Inspect side slopes for erosion and restore grade if needed. If erosion is occurring, place mulch or redistribute the inflow to reduce velocities.
- Sweep and remove debris, including leaf litter, in the drainage area.

IV.B.3. Prior to the Start of the Rainy Season

In September of each year, inspect the facility inlets and outlets to confirm there is no accumulation of debris that would block flow. If not previously addressed during monthly maintenance, any growth and spread of plantings that blocks inlets or the even distribution of runoff across the surface of the facility will be cut back or removed.

Prune large shrubs or trees if necessary to maintain clear and open flowpath into the bioretention facilities.

IV.B.4. Annually During Winter Wet Season

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

V. Maintenance Cost Estimate

Modify as appropriate -

Maintenance Costs by Item

Annual Routine Inspection & Maintenance	
Equipment / Material	
Labor	
Total	\$

Maintenance Costs by Structural Control Measure

SCM #1	Frequency	Rate/Cost	Total
inspections			\$
maintenance			\$
Total Annual			\$

SCM #2	Time	Rate/Cost	Total
inspections			\$
maintenance			\$
Total Annual			\$

etc.

VI. Certification

The design of the stormwater treatment facilities and other stormwater pollution control measures in this Inspection and Maintenance Plan were designed in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide.

INSERT ENGINEER'S STAMP OR APPROPRIATE CERTIFICATION

INSPECTION AND MAINTENANCE LOG

NAME OF DEVELOPMENT

Date	Facility Description	Inspection Type	Observations	Maintenance Performed or Recommended

Facility - Name and location that describes the Stormwater Control Measure
Inspection -Type of inspection, i.e. weekly/as-needed, prior to rainy season, or after 0.5 inch rain event
Observation - Describe the conditions observed in detail
Maintenance - Describe the maintenance activity that was performed, or whether future action is recommended. Otherwise, indicate "none". Photo documentation is helpful.

For questions including the Stormwater Control Plan and construction documents:
Project Clean Water, Water Resources Division, Public Works Department (805) 568-3440
www.SBProjectCleanWater.org