

STORMWATER FACILITIES OPERATION AND
MAINTENANCE PLAN

for

Example Commercial Project

February 21, 2018

XYZ Corporation
Jane Jones, 925-555-1212

This example prepared by Dan Cloak Environmental Consulting
to assist users of the Contra Costa Clean Water Program's
Stormwater C.3 Guidebook

TABLE OF CONTENTS

Inspection and Maintenance Log	I
Update to Designation of Responsible Individuals	II
Updates, Revisions, and Errata	III
I. Introduction	1
I.A. Background	1
I.B. Associated Agreements	1
I.C. Funding for and Organization of Facility Operation and Maintenance	1
I.D. Site Description	2
II. Designation and Training of Responsible Individuals	2
II.A. Designated Contact for Operation and Maintenance	2
II.B. Off-Hours or Emergency Contact	2
II.C. Corporate Officer (authorized to execute agreements with Anytown, USA)	2
II.D. Initial Training of Responsible Individuals	2
II.E. Ongoing Training of Responsible Individuals	2
III. Facilities to be Maintained	3
III.A. Facility Descriptions	3
IV. Maintenance Activities	4
IV.A. General Maintenance Rules	4
IV.B. Maintenance Schedule	4
IV.B.1. Routine Activities	4
IV.B.2. Following Significant Rain Events	4
IV.B.3. Prior to the Start of the Rainy Season	5
IV.B.4. Annually During Winter	5

Figures

Figure 1. Organization of Facility Operation and Maintenance	1
Figure 2. Bioretention Cross-Section (Schematic)	2

Attachments

1. Stormwater Control Plan for an Example Commercial Project
2. Stormwater Control Plan Exhibit
3. “As-Built” drawings

Acronyms and Abbreviations

C.3	Provision C.3 in the Municipal Regional Stormwater Permit issued by the California Regional Water Quality Control Board for the San Francisco Bay Region
IMP	Integrated Management Practice
O&M Plan	Operations and Maintenance Plan

This Stormwater Facilities Operation and Maintenance Plan was prepared using the template dated February 2018.

INSPECTION AND MAINTENANCE LOG

Facility Name	
Address	
Begin Date	End Date

Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary.

- o BMP ID# — Always use ID# from the Operation and Maintenance Plan.
- o Inspected by — Note all inspections and maintenance on this form.
- o Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- o Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- o Comments and actions taken — Describe any maintenance done and need for follow-up.

UPDATE TO DESIGNATION OF RESPONSIBLE INDIVIDUALS

** Use this form to update the plan when responsible individuals change. **	
Date Completed	
Facility Name	
Facility Address	
Designated Contact for Operation and Maintenance	
Name:	Title or Position:
Telephone:	Alternate Telephone:
Email:	
Off-Hours or Emergency Contact	
Name:	Title or Position:
Telephone:	Alternate Telephone:
Email:	
Corporate Officer (authorized to execute contracts with the City, Town, or County)	
Name:	Title or Position:
Address:	
Telephone:	Alternate Telephone:
Email:	

I. INTRODUCTION

This plan addresses operation and maintenance of stormwater management facilities constructed as part of redevelopment of the Example Commercial Project site at 123 Main St., Anytown.

The final, approved Stormwater Control Plan for the project is in Appendix A.

I.A. Background

This Stormwater Facilities Operation and Maintenance Plan (O&M Plan) is for bioretention facilities constructed as part of redevelopment of the site in 2017. Construction of these facilities was required by Provision C.3 in the Municipal Regional Stormwater Permit issued by the California Regional Water Quality Control Board for the San Francisco Bay Region. Provision C.3. also requires Anytown, USA to verify ongoing operation and maintenance of the facilities.

I.B. Associated Agreements

This O&M Plan is referenced in an O&M Agreement between the property owner and Anytown. The agreement grants Anytown access to the property to conduct inspections and, if needed, to perform maintenance on the facilities at the owner’s expense. The agreement also grants access for inspections to the Contra Costa Mosquito and Vector Control District (CCMVCD).

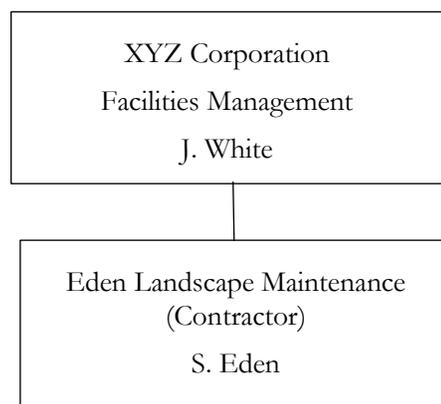
As provided in the O&M Agreement, this O&M Plan may be modified, but only with the review and consent of Anytown’s Public Works Director. The official O&M Plan is the version which is on file at the Anytown Department of Public Works. Any modifications made to the O&M Plan with the consent of the Public Works Director must be filed with Anytown.

I.C. Funding for and Organization of Facility Operation and Maintenance

Maintenance of stormwater facilities is the responsibility of the property owner. Funding is derived from income generated by the property. XYZ Corporation’s statement of Net Operating Income includes sufficient budget for routine maintenance and a separate annual contribution for replacement reserves. These line items include costs for routine maintenance of the stormwater facilities and replacement of the facilities at the end of their expected useful life.

Maintenance of bioretention facilities is performed by the owner’s contractor as part of routine maintenance of grounds and landscaping. Responsibilities for stormwater facilities operation and maintenance are organized as shown in Figure 1.

Figure 1. Organization of Facility Operation and Maintenance



I.D. Site Description

The 0.6-acre site is nearly square and generally flat. The perimeter of the site (except for the frontage on Main Street) is landscaped with mature trees. Redevelopment of the site in 2017 included construction of a 4,680 SF single-story building, and 16,370 SF of parking and access lanes, including a drive-through lane for a coffee shop. Soils are silty clays typical of the area (Hydrologic Soil Group “D”).

Previously existing and new landscaped areas are self-retaining. The building roof and pavement drain to three bioretention facilities (see Section VI, below). Bioretention underdrains and overflows are connected to an on-site drainage system that connects to the City storm drain at a drop inlet on Main St. near the northeast corner of the site.

II. DESIGNATION AND TRAINING OF RESPONSIBLE INDIVIDUALS

II.A. Designated Contact for Operation and Maintenance

S. Eden
Eden Landscaping
456 Xanadu Lane
Anytown, USA
123-456-7890 s.eden@edenland.com

II.B. Off-Hours or Emergency Contact

S. Eden
Eden Landscaping
456 Xanadu Lane
Anytown, USA
123-456-7890 s.eden@edenland.com

II.C. Corporate Officer (authorized to execute agreements with Anytown, USA)

Jane Jones, President
XYZ Corporation
925-555-1212 jjones@xyzcorp.com

II.D. Initial Training of Responsible Individuals

Following completion of construction, the bioretention facilities will be maintained by the contractor for two years, except for routine policing for trash, which will be done by the owner’s and lessee’s personnel. During this 2-year period, the owner’s landscape maintenance crew will coordinate to meet with the contractor’s personnel on-site during maintenance. At these times, the contractor’s personnel will demonstrate proper maintenance procedures.

II.E. Ongoing Training of Responsible Individuals

The maintenance activity directions in Section VII below are incorporated into Eden Landscaping’s work orders for work at the site. They have been reviewed by all current employees. All new employees are trained in special requirements for each site at which they work.

The main training messages for use at 123 Main Street are:

- No synthetic pesticides or fertilizers are to be used.
- No soil amendments are to be added, except aged compost mulch.

- The top of soil elevation is to be maintained at six inches below the overflow top of grate elevation.

III. FACILITIES TO BE MAINTAINED

III.A. Facility Descriptions

Runoff from impervious areas on the site, including roofs and paved areas, is routed to three bioretention facilities.

Bioretention Facility #1 is located near the northwest corner of the site, and will integrate visually with existing trees and new landscaping along the northern perimeter. The facility is adjacent to parking and to the refuse area.

Bioretention Facility #2 is located adjacent to the sidewalk surrounding the building and adjacent to the parking area north of the building. This facility is visible from the interior of the retail space and from the outdoor seating area, and is planted to provide a visual amenity.

Bioretention Facility #3 is located within the narrow median separating the drive-through lane from the parking area. It is connected to the building roof via a tightlined bubble-up.

Each of the facilities includes the following features:

- Surrounded by a concrete curb. The curb is at a consistent elevation all the way around the perimeter. Adjacent to pavement, curbs are thickened. A plastic cutoff wall separates the facilities from the pavement in these areas.
- Built flat and level to specified elevations for each layer:
 - Bottom of Gravel Layer (BGL)
 - Top of Gravel Layer (TGL)
 - Top of Soil Layer (TSL)
- An overflow structure, with the overflow grate set at a specified elevation. There is a 6-inch-deep reservoir between top of soil elevation and overflow grate elevation. A pipe draining the bottom of this overflow structure is connected to the onsite drainage system, which connects to the municipal storm drain at a drop inlet in Main Street near the northeast corner of the site.
- A bottommost layer of 12 inches Class 2 permeable, Caltrans specification 68-2.02F(3).
- Planting medium comprising 18 inches sand/compost mix meeting the specifications approved by the Regional Water Quality Control Board in April 2016.
- A 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

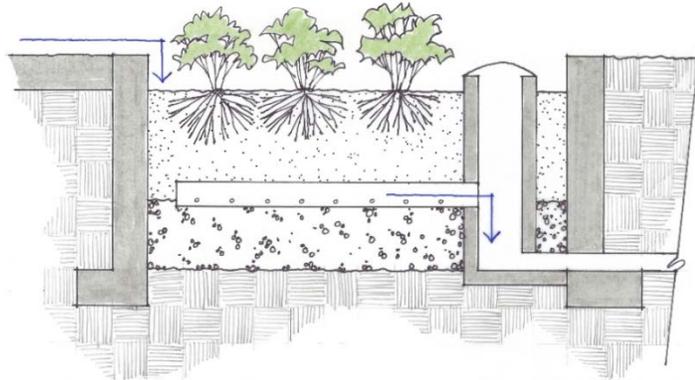


Figure 2. Bioretention Cross-Section (schematic)

- Plantings selected for water conservation
- Irrigation system on a separate zone, with drip emitters and “smart” irrigation controllers

IV. MAINTENANCE ACTIVITIES

IV.A. General Maintenance Rules

At no time will synthetic pesticides or fertilizers be applied, nor will any soil amendments, other than aged compost mulch or sand/compost mix, be introduced. The top of soil surface will be maintained at or near the design elevation throughout. Irrigation systems will be maintained to conserve water while maintaining plant health.

Although it is unlikely to be needed, if plants are not thriving compost tea may be applied at a recommended rate of 5 gallons mixed with 15 gallons of water per acre, up to once per year between March and June. Compost tea will not be applied when temperatures are below 50°F or above 90°F or when rain is forecast within the next 48 hours.

The following may be applied for pest control if needed:

- Beneficial nematodes
- Safer® products
- Neem oil

Plants were selected for the each bioretention facility to ensure thriving vegetation, minimize water use, and achieve aesthetic objectives. Replacement plants should be consistent with the project planting plan, or selected by a landscape professional experienced with bioretention facilities.

IV.B. Maintenance Schedule

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

IV.B.1. Routine Activities

Tenant employees will examine the facilities daily for visible trash, and trash will be removed. Any graffiti, vandalism, or other damage will be noted and addressed within 48 hours.

Eden Landscaping will weed the bioretention facilities by hand approximately monthly. At this time, plants will be inspected for health and the irrigation system will be turned on manually and checked for any leaks or broken lines, misdirected spray patterns etc. Any dead plants will be replaced.

IV.B.2. Following Significant Rain Events

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

- The surface of the facility will be observed to confirm there is no ponding.
- Inlets will be inspected, and any accumulations of trash or debris will be removed. Any erosion at inlets should be restored to grade.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.
- Outlet structure will be inspected for any obstructions to assure that mulch is not washed out.

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

In September or each year, the entire site will be inspected and compared to the Stormwater Control Plan Exhibit to confirm there have been no changes to site drainage. Facility inlets and outlets will be inspected to confirm there is no accumulation of debris that would block flow. Stormwater should drain freely into the bioretention facilities. If not previously addressed during monthly maintenance, any growth and spread of plantings that blocks inlets or the movement of runoff across the surface of the facility will be cut back or removed.

IV.B.4. Annually During Winter

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