

Example  
Stormwater Control Plan  
For a Commercial Project  
123 Main Street  
Anytown, USA

January 2017

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

# Table of Contents

I.	Project Data .....	1
	II. Setting	1
	II.A. Project Location and Description .....	1
	II.B. Existing Site Features and Conditions .....	2
	II.C. Opportunities and Constraints for Stormwater Control.....	2
III.	Low Impact Development Design Strategies.....	2
	III.A. Site Design and Runoff Reduction.....	2
	III.B. Site Constraints .....	2
	III.C. Dispersal of Runoff to Pervious Areas.....	3
IV.	Documentation of Drainage Design.....	3
	IV.A. Descriptions of Each Drainage Management Area.....	3
	IV.A.1. Drainage Management Areas	3
	IV.A.2. Drainage Management Area Descriptions	3
	IV.B. Stormwater Control Measures .....	4
	IV.C. Tabulation and Sizing Calculations.....	5
	IV.C.1. Information Summary for LID Facility Design	5
V.	Source Control Measures.....	5
	V.A. Site activities and potential sources of pollutants .....	5
	V.B. Potential Pollutant Sources and Source Control Measures.....	5
VI.	Stormwater Facility Maintenance .....	6
	VI.A. Ownership and Responsibility for Maintenance in Perpetuity .....	6
	VI.B. Summary of Maintenance Requirements for Each Stormwater Facility.....	7
VII.	Construction Checklist .....	8
VIII.	Certifications .....	8

## **Tables**

Table 1. Project Data	1
Table 2. Drainage Management Areas	3
Table 3. Sources and Source Control Measures	5
Table 4. Construction Checklist	8

## **Figures**

Figure 1. Vicinity Map	1
Figure 2. Existing Site Conditions	2
Figure 3. Bioretention Cross-Section	3

## **Attachments**

Stormwater Control Plan Exhibit

Central Coast Post-Construction Requirements Calculator Spreadsheet

This Stormwater Control Plan was prepared using the template dated January 2017.

## I. Project Data

Table 1. Project Data

Project Name/Number	Example Commercial Project
Project Location	123 Main St., Anytown, USA
Project Phase No.	Not Applicable
Project Type and Description	4,680 SF Retail Building with drive-through lane and parking
Total Project Site Area (acres)	0.6 acres
Total New Impervious Surface Area	0 SF
Total Replaced Impervious Surface Area	21,050 SF
Total Pre-Project Impervious Surface Area	24,000 SF±
Total Post-Project Impervious Surface Area	21,050 SF
Net Impervious Area	18,100 SF
Applicable Requirements	Tier 3
Watershed Management Zone	1
Design Storm Frequency and Depth	2.1 inches (95 <sup>th</sup> percentile)
Urban Sustainability Area	The project is not in an Urban Sustainability Area

## II. Setting

### II.A. Project Location and Description

This project involves the demolition of an existing restaurant building and parking lot and replacement with a new restaurant/retail building and parking lot. The parcel fronts an arterial roadway. See Figure 1.

The proposed use is consistent with current commercial zoning. The project will include a drive-through lane for a planned coffee shop, plus two additional retail spaces within the same building.

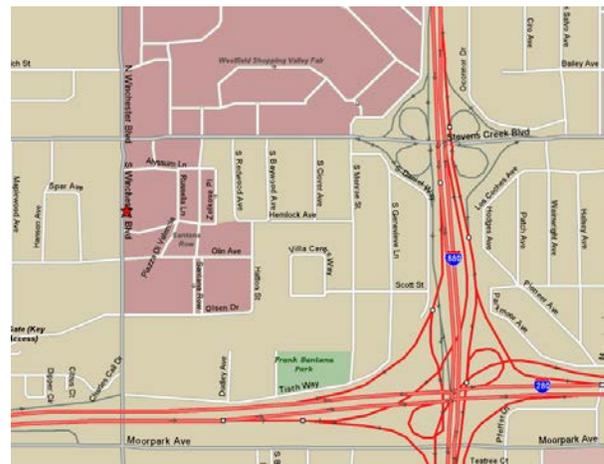


Figure 1. Location of 123 Main Street, Anytown.

## II.B. Existing Site Features and Conditions

The site is nearly square and generally flat. Most of the site is covered with buildings or is paved. The perimeter of the site (except for the frontage on Main Street) is landscaped with mature trees. See Figure 2. Soils are silty clays typical of the area (Hydrologic Soil Group “D”). The existing drainage system is connected to a municipal storm drain in the southbound lanes of Main Street in front of the site.



Figure 2. Existing Site Conditions.

## II.C. Opportunities and Constraints for Stormwater Control

Constraints include impermeable soils (hydrologic soil group D), very high intensity land use, and flat slopes. Disposal of runoff to deep infiltration is not feasible on this site due to the low permeability of the clay soils. High land values, the objective of creating a dense retail area, and parking requirements limit opportunities to reduce site imperviousness.

Setback areas—five feet on each side of the site and ten feet at the back of the site—might be usable as locations for treatment BMPs; however, these areas include significant trees which must be protected. The City storm drain system in Main Street is deep enough to provide sufficient hydraulic head to route runoff across the surface of the site to a stormwater treatment facility, through the facility, and then to drain treated runoff to the City storm drain.

## III. Low Impact Development Design Strategies

### III.A. Site Design and Runoff Reduction

The site is densely developed infill within the existing urbanized area. Future retail areas have been included in the development plan, in addition to the initial use of a portion of the building as a drive-through coffee shop. Existing significant trees around the perimeter of the site are to be preserved. The landscaped setback areas surrounding the trees will be expanded to the extent practicable, given project parking and circulation requirements, to reduce impervious area of the project. Landscaping in these areas will be upgraded to maximize aesthetic value and ensure the continued health of the mature trees.

### III.B. Site Constraints

Conventional concrete and conventional asphalt are to be used to construct the circulation and parking areas. Permeable pavements are not cost-effective for this site, in part because the pavements overlie expansive clay soils. This condition would necessitate a very deep gravel base course, which would, in turn, require large quantities of excavation and off-haul.

### III.C. Dispersal of Runoff to Pervious Areas

Landscaped areas at the perimeter of the site could be used to disperse runoff from some portions of the parking lot; however, the areas are at a slightly higher elevation and can't be re-graded without removing or damaging the existing trees.

## IV. Documentation of Drainage Design

### IV.A. Descriptions of Each Drainage Management Area

#### IV.A.1. Drainage Management Areas

Table 2. Drainage Management Areas (DMAs) as shown on the Exhibit.

DMA Name	DMA Type	Area (SF)	Surface Type
DMA-1	Drains to SCM	2805	Paving
DMA-2	Drains to SCM	6130	Paving
DMA-3	Drains to SCM	4680	Roof
DMA-4	Self-Retaining	1770	Landscape
DMA-5	Self-Retaining	155	Landscape
DMA-6	Self-Retaining	550	Landscape
DMA-7	Self-Retaining	4285	Landscape
DMA-8	Drains to SCM	6369	Paving

#### IV.A.2. Drainage Management Area Descriptions

**DMA 1**, totaling 2,805 square feet, drains the northwest section of the parking area, the roof of the trash enclosure, and a portion of a paved traffic island. DMA-1 drains to Bioretention Facility #1. Runoff will enter the facility through curb cuts.

**DMA 2**, totaling 6,130 square feet, drains the northeast section of the parking area and a portion of the plaza surrounding the building. DMA-2 drains to Bioretention Facility #2.

**DMA 3**, totaling 4,680 square feet, drains the roof of the building. DMA 3 drains to Bioretention Facility #3, and will be connected via a tight-lined downspout and bubble-up.

**DMA 4**, totaling 1,770 square feet, is a landscaped area with existing trees. The trees will be retained and the area reconfigured. Drainage from DMA 4 will be retained by a surrounding curb.

**DMA 5**, totaling 155 square feet, is a landscaped area with existing trees. The trees will be retained and the area reconfigured. Drainage from DMA 5 will be retained by a surrounding curb.

**DMA 6**, totaling 550 square feet, is a landscaped area with some existing trees, as well as some new landscaping adjacent to Main St. Drainage from DMA 6 will be retained by a surrounding curb.

**DMA 7**, totaling 4,285 square feet, is a landscaped area with existing trees on the west and south sides of the site. Drainage from DMA 7 will be retained by a surrounding curb.

**DMA 8**, totaling 6,369 square feet, comprises the paved drive-through and travel lanes on the south side of the site and parking on the west side of the site, as well as walkway and plaza areas on the west,

south, and east sides of the building. DMA 8 drains to Bioretention Facility #3, with runoff entering via curb cuts.

#### IV.B. Stormwater Control Measures

Runoff from all impervious areas on the site, including roofs and paved areas, will be routed to three bioretention facilities (see Exhibit). The facilities will be designed and constructed to the criteria in the Project Clean Water Stormwater Technical Guide (February 2014), including the following features:

- Surrounded by a concrete curb. Where adjacent to pavement, curbs will be thickened and an impermeable vertical cutoff wall will be included.
- Each layer built flat, level, and to the elevations specified in the plans:
  - Bottom of Gravel Layer (BGL)
  - Top of Gravel Layer (TGL)
  - Top of Soil Layer (TSL)
  - Overflow Gate
  - Facility Rim

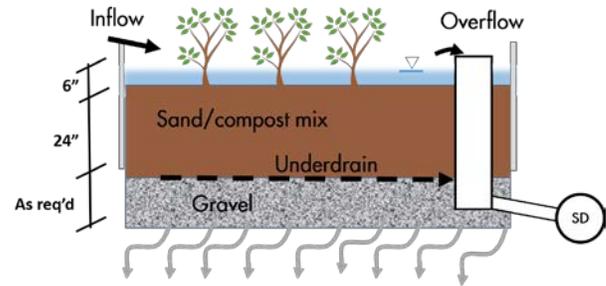


Figure 3. Bioretention Facility Cross-Section (Schematic)

- Class 2 permeable, Caltrans specification 68-2.02F(3), depth as specified in the Stormwater Control Measure Sizing Calculator output
- 24 inches sand/compost mix meeting BASMAA specifications
- 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
- Vertical cutoff walls to protect adjacent pavement
- Plantings selected for water conservation
- Irrigation system on a separate zone, with drip emitters and “smart” irrigation controllers
- Sign identifying the facility as a stormwater treatment facility.

The only areas on the site which do not drain to a bioretention facility are small portions of the two entrances from Main Street. These areas drain toward the street. The size of these areas has been minimized by designing the grading and drainage to place the grade break as close to the street as practicable.

The pervious setback areas are higher in elevation than the parking area. Drainage from these areas will be retained by new concrete curbs surrounding the areas.

## IV.C. Tabulation and Sizing Calculations

### IV.C.1. Information Summary for LID Facility Design

See the attached entries and output from the Central Coast Stormwater Control Measure Sizing Calculator.

## V. Source Control Measures

### V.A. Site activities and potential sources of pollutants

On-site activities that could potentially produce stormwater pollutants include:

- Driveways and parking lots
- Food Service
- Trash Management

### V.B. Potential Pollutant Sources and Source Control Measures

Table 3. Pollutant Sources and Source Control Measures

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
Inlets (bioretention overflows)	All inlets will be marked with “No Dumping! Flows to Local Waterways” or similar	Markings will be regularly inspected and repainted or replaced as needed.  Lessees will receive stormwater pollution prevention brochures.  Lease agreements will include the following provision: “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.”
Indoor and structural pest control		Owner will retain only companies that are certified in Integrated Pest Management (IPM) for on-site pest-management.
Landscape maintenance	Existing mature trees to be retained. Landscaping will minimize irrigation and runoff and be selected for pest resistance, and will minimize the need for fertilizers and pesticides.	Landscaping will be maintained using minimum or no pesticides.  IPM information will be provided to new owners, lessees, and operators.

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
	Plants will be selected appropriate to site soils, slopes, climate, sun, wind rain, land use, air movement, ecological consistency, and plant interactions.	
Food service.	<p>Coffee shop will include a floor sink for cleaning floor mats, containers, and equipment.</p> <p>The floor sink will be connected to a grease interceptor before discharging to the sanitary sewer.</p>	
Refuse area.	<p>Refuse and recycled materials will be handled in the refuse area shown on the Exhibit.</p> <p>This area is to be roofed, bermed, and equipped with a drain to a grease interceptor and then to the sanitary sewer.</p>	All dumpsters will be posted with signs stating “Do not dump hazardous materials here” or similar.
Plazas, sidewalks, and parking lots		<p>Trash receptacles to be provided in plaza area and on drive-through and emptied daily. Site to be policed at least twice daily for trash.</p> <p>Plazas, sidewalks, and parking lots will be swept regularly.</p> <p>Debris and washwater from periodic pressure washing will be collected and disposed of to the sanitary sewer.</p>

## VI. Stormwater Facility Maintenance

### VI.A. Ownership and Responsibility for Maintenance in Perpetuity

Maintenance of stormwater facilities will be the responsibility of the property owner and will be performed by the owner’s contractors or employees as part of routine maintenance of buildings, grounds, and landscaping. The applicant has reviewed the Anytown, USA, standard agreement

regarding the maintenance of stormwater facilities and commits to execute any necessary agreements prior to completion of construction. 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.

#### **VI.B. Summary of Maintenance Requirements for Each Stormwater Facility**

The three bioretention facilities will be maintained on the following schedule at a minimum. Details of maintenance responsibilities and procedures will be included in a Stormwater Facility Operation and Maintenance Plan to be submitted for approval as required in the conditions of approval.

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.

**Daily:** The facilities will be examined for visible trash during regular policing of the site, and trash will be removed.

**After 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, the following will be conducted:

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.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.

**Prior to the Start of the Rainy Season:** In September or each year, the facility will be inspected to confirm there is no accumulation of debris that would block flow, and that growth and spread of plantings does not block inlets or the movement of runoff across the surface of the facility.

**Annual Landscape Maintenance:** 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.

## VII. Construction Checklist

Table 4. Construction Checklist Table to be incorporated in Construction Drawings

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s
3 and Exhibit	Drainage from DMAs 4, 5, 6, and 7 is retained by surrounding curbs.	
3 and Exhibit	DMA 1 drains to Bioretention Facility #1; facility is designed as specified	
3 and Exhibit	DMA 2 drains to Bioretention Facility #2; facility is designed as specified	
3 and Exhibit	DMA 3 is connected via tight-lined downspout to Bioretention Facility #3	
3 and Exhibit	DMA 8 drains to Bioretention Facility #3; facility is designed as specified	
5	Bioretention Facility #1, #2, #3 overflows are marked with "No Dumping" message	
5	Existing mature trees are preserved	
6	Coffee shop/food service facility is equipped with a floor sink connected to a grease interceptor and then to sanitary sewer	
6	Trash receptacles are located in plaza area and are accessible to drive-through lane	

## VIII. Certifications

The preliminary design of Stormwater Control Measures and other stormwater pollution control measures in this plan are in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide.

Example Commercial Site

123 Main Street

Anytown, USA

No Scale

