

PRELIMINARY
WATER QUALITY TECHICAL REPORT
FOR THE
EDI MASTER PLAN

April 5, 2015

Wayne W. Chang, MS, PE 46548

ChangConsultants
Civil Engineering • Hydrology • Hydraulics • Sedimentation

P.O. Box 9496
Rancho Santa Fe, CA 92067
(858) 692-0760

FOR REVIEW ONLY

-TABLE OF CONTENTS -

1.0 Introduction.....1

1.1 Vicinity Map.....1

1.2 Project Description.....2

1.3 Site Map.....2

1.4 Constraints and Opportunities.....2

2.0 Water Quality Environment.....3

2.1 Beneficial Uses3

2.1.1 Inland Surface Waters.....4

2.1.2 Groundwater4

3.0 Pollutants and Conditions of Concern4

3.1 Pollutants from Project Area.....4

3.2 Pollutants of Concern in Receiving Waters5

4.0 Permanent Storm Water Best Management Practices6

4.1 Standard Site Design BMPs.....6

4.2 Source Control BMPs7

4.3 Low Impact Development Site Design BMPs.....10

4.4 Treatment Control BMPs.....10

4.5 Hydromodification.....10

5.0 Storm Water BMP Maintenance.....11

6.0 Summary/Conclusions11

7.0 Certification12

Table 1-1 Priority Development/SUSMP Projects
Site Plan

APPENDIX

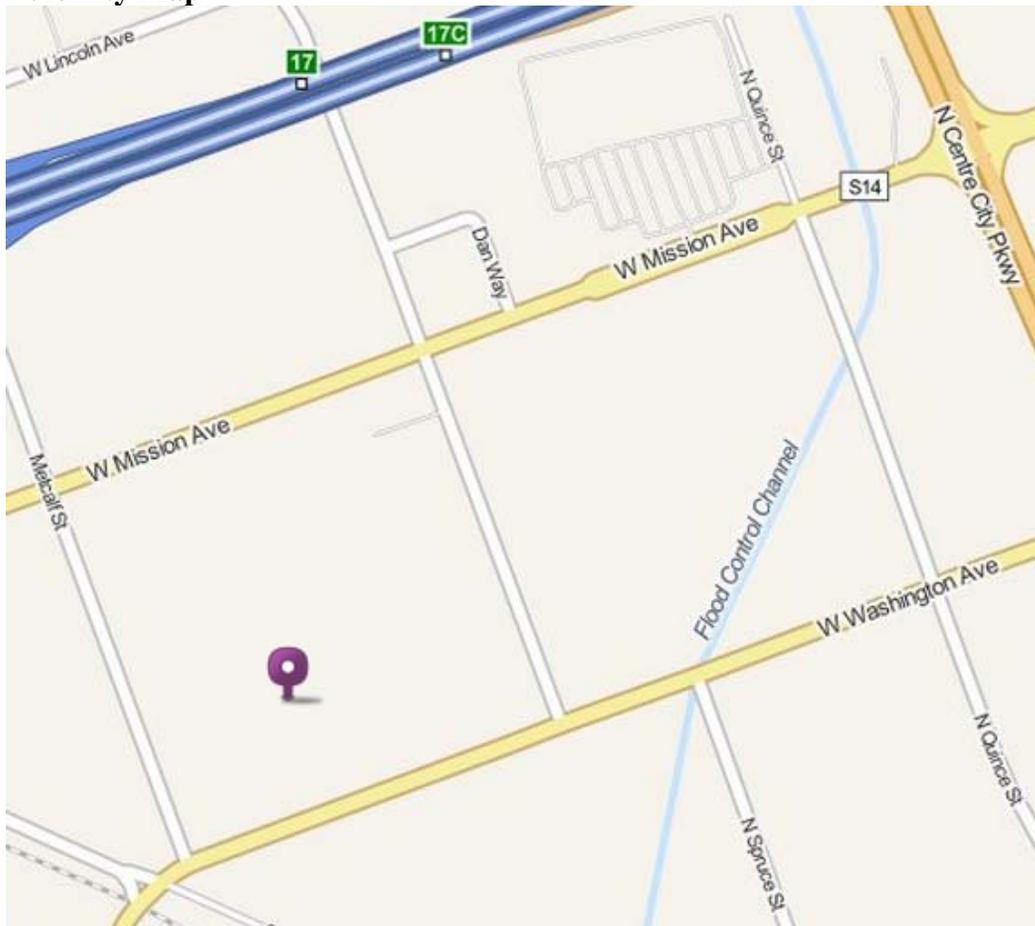
A. Low Impact Development Analyses

1.0 INTRODUCTION

This Water Quality Technical Report (WQTR) addresses water quality requirements associated with entitlement of Escondido Disposal, Inc.'s EDI Master Plan project, which will include redevelopment of the existing Escondido Resource Recovery transfer station and adjacent office/industrial buildings. This WQTR accompanies the Site Grading Plan by the project's civil engineer, Cherry Engineering, and follows the criteria outlined in the City of Escondido's January 2011, *Standard Urban Stormwater Mitigation Plan Requirements for Development Projects* (SUSMP).

According to Table 1-1 from the SUSMP (attached following this report text), the development is in the following three priority project categories: Pollutant-generating projects that disturb 1 acre or more of land; Parking lots 5,000 square feet or more; and Streets, roads, highways, and freeways. The SUSMP outlines the WQTR objectives, which are to identify constraints and opportunities, prepare and document the project's LID design, specify source control best management practices (BMPs), and provide for stormwater facility maintenance. BMPs will be utilized to the maximum extent practicable to provide a long-term solution for addressing runoff water quality. BMPs were selected to meet the objectives.

1.1 Vicinity Map



1.2 Project Description

Escondido Disposal, Inc. operates the Escondido Resource Recovery transfer station at 10444 W. Washington Avenue in the city of Escondido (see the Vicinity Map). The overall site also contains adjacent office, industrial, and warehouse buildings and is immediately north of W. Washington Avenue, immediately south of W. Mission Avenue, and approximately mid-block between Metcalf Street and Rock Springs Road. The entire site is currently developed with the industrial and associated uses. EDI proposes to redevelop the site pursuant to the EDI Master Plan (see the Site Plan after this report text). The Site Plan shows that some of the existing buildings will remain, but will be subject to renovation, while other buildings will be demolished and replaced. In addition, the remainder of the site will be completely revised with new parking spaces, drive aisles, and landscaping.

Under existing pre-project conditions, the northerly site runoff is tributary to a storm drain system approximately mid-way up the site that extends west to Metcalf Street. There is an off-site area to the east that is tributary to the northerly half of the site. The off-site runoff is conveyed through the site with the northerly on-site runoff to the existing storm drain system. The southerly site runoff is tributary to an existing storm drain system in West Washington Avenue. The two storm drain systems confluence at the intersection of Metcalf Street and West Washington Avenue.

Under proposed post-project conditions, the entire on- and tributary off-site runoff will be directed towards West Washington Avenue. An additional storm drain will be constructed in West Washington Avenue from the site towards the existing storm drain confluence location at Metcalf Street and West Washington Avenue. The additional storm drain will collect the added runoff, so that the on-site and off-site runoff will be conveyed to the same location as under existing conditions. A series of bioretention basins will be installed on-site to treat the redevelopment area runoff. A storm drain system will collect the off-site runoff at the easterly edge of the site in order to prevent commingling of the on- and off-site runoff until the on-site runoff is treated.

1.3 Site Map

The entitlement Site Plan is included following this report text.

1.4 Constraints and Opportunities

The redevelopment will occur within the existing developed industrial site, which is nearly entirely impervious. The development will increase the amount of pervious area by incorporating landscape islands throughout the drive aisles, parking areas, and along the westerly, northerly, and southerly site perimeters. The proposed landscape areas provide opportunities to treat runoff through contact and bio-filtration by vegetation. Therefore, bioretention basins will be used in landscape areas to meet treatment control requirements for the redevelopment area.

The grading plan by Cherry Engineering shows that the project is increasing the amount of pervious landscaping area from 31,280 square feet to 61,271 square feet. The drainage report

accompanying the entitlement package shows that the project will not increase the existing flow rate and that the project flows are being conveyed to the same location as under existing conditions. Therefore, the project is exempt from hydromodification.

2.0 WATER QUALITY ENVIRONMENT

2.1 Beneficial Uses

The beneficial uses for the hydrologic unit (see Section 3.1) are included in Tables 1 and 2. These tables were obtained from the *Water Quality Control Plan for the San Diego Basin (9)* compiled on August 28, 2012. The following contains definitions of the beneficial uses in the tables:

MUN – Municipal and Domestic Supply: Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

AGR – Agricultural Supply (AGR): Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

IND – Industrial Services Supply: Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

REC1 – Contact Recreation: Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.

REC2 – Non-Contact Recreation: Includes the uses of water for recreational involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

WARM – Warm Freshwater Habitat: Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

COLD – Cold Freshwater Habitat: Includes uses of water that support cold-water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

WILD – Wildlife Habitat: Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife, (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

2.1.1 Inland Surface Waters

Inland surface waters for the Escondido Creek Hydrologic Area (see Section 3.1) have the beneficial uses shown in Table 1:

Table 1. Beneficial Uses for Inland Surface Waters

Hydrologic Unit Code	Mun	Agr	Ind	Proc	Gwr	Frsh	Pow	Recl	Rec2	Biol	Warm	Cold	Wild	Rare	Spwn
904.62	●	●	o					●	●		●	●	●		

+ Exempted by the Regional Board from the municipal used designation.

● Existing Beneficial Use

2.1.2 Groundwater

Groundwater beneficial uses for the Escondido Creek Hydrologic Area are shown in Table 2:

Table 2. Beneficial Uses for Groundwater

Hydrologic Unit Code	Mun	Agr	Ind	Proc	Frsh	Gwr
904.62	●	●	●			

● Existing Beneficial Use

3.0 POLLUTANTS AND CONDITIONS OF CONCERN

3.1 Pollutants from Project Area

The project is located within the Escondido Hydrologic Subarea (904.62) of the Escondido Creek Hydrologic Area (904.60), which is within the Carlsbad Hydrologic Unit (904.00). The total drainage area of the hydrologic unit is approximately 210 square miles. Runoff from the site and portions of the hydrologic subarea ultimately drain to Escondido Creek, which is approximately 1,500 feet south of the site. Escondido Creek extends west to San Elijo Lagoon, then the Pacific Ocean. The project site represents less than one percent of the overall watershed.

The following table lists pollutants of concern that are anticipated or can potentially exist at proposed priority development project sites. The pollutants are from the city of Escondido's SUSMP. The project falls within the heavy industry; parking lots; and streets, roads, highways, and freeways priority project categories (highlighted yellow in the table). All of the listed pollutants are either anticipated or can potentially exist at the redeveloped site.

Table 3. Priority Project Pollutants

<i>Priority Project Categories</i>	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	p ⁽¹⁾	p ⁽²⁾	P	X
Commercial Development > one acre	p ⁽¹⁾	p ⁽¹⁾	X	p ⁽²⁾	X	p ⁽⁵⁾	X	p ⁽³⁾	p ⁽⁵⁾
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X ⁽⁴⁾⁽⁵⁾	X		X		
Restaurants					X	X	X	X	p ⁽¹⁾
Hillside Development >5,000 ft ²	X	X			X	X	X		X
Parking Lots	p⁽¹⁾	p⁽¹⁾	X		X	p⁽¹⁾	X		p⁽¹⁾
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Roads, Highways & Freeways	X	p⁽¹⁾	X	X⁽⁴⁾	X	p⁽⁵⁾	X	X	p⁽¹⁾

X = Anticipated

P = Potential

- (1) A potential pollutant if landscaping exists on-site
- (2) A potential pollutant if the project includes uncovered parking areas
- (3) A potential pollutant if land use involves food or animal waste products
- (4) Including petroleum hydrocarbons
- (5) Including solvents

3.2 Pollutants of Concern in Receiving Waters

The receiving waters for the site include Escondido Creek and the San Elijo Lagoon. According to the 2010 303(d) list approved by the State Water Resources Control Board (and by the US EPA in November 2010), Escondido Creek is 303(d) listed for DDT, enterococcus, fecal coliform, manganese, phosphate, selenium, sulfates, total dissolved solids, total nitrogen as N, and toxicity. San Elijo Lagoon is 303(d) listed for eutrophic, indicator bacteria, and sedimentation/siltation. Neither of the two water bodies is subject to total maximum daily loads (TMDLs). Based on this information, the project generates

pollutants of concern in the receiving waters for sediments, nutrients, heavy metals, organic compounds, and bacteria & viruses.

4.0 PERMANENT STORM WATER BEST MANAGEMENT PRACTICES

To address water quality for the project, best management practices (BMPs) will be implemented. The following discusses the Standard Site Design, Source Control, and Low Impact Development design BMPs for the project.

4.1 Standard Site Design BMPs

Standard objectives are required for all projects. The project will accomplish these goals through the following standard site design BMPs:

Standard Stormwater Requirements

Minimize Impervious Surfaces. The project will include pervious surfaces through landscaping within the development area.

Disconnect Discharges. Roof drains will discharge to adjacent landscape areas, where feasible.

Stenciling Inlets and Signage. The curb cuts and inlets within the project will be stenciled with prohibitive language such as “No Dumping – I live downstream” or approved similar.

Landscape Design. A landscape plan will be prepared that uses drought-tolerant species in accordance with the City’s landscape manual. The project will only use water as needed to support the landscaping.

Water Efficient Irrigation. The irrigation systems will be designed to each landscaped areas water requirements to avoid over irrigation. Rain shutoff devices will be used to prevent irrigation after rain events.

Protect Slopes And Channels. The grading design does not include large slopes or any channels. The design will prevent runoff from flowing uncontrolled over the tops of manufactured slopes.

Vegetate slopes with native or drought tolerant vegetation. Native and drought tolerant vegetation will be used to the extent feasible.

Material Storage Areas. The project does not propose outdoor material storage areas. Any required material storage shall be kept under cover in one of the large industrial buildings or warehouses.

4.2 Source Control BMPs

Source control BMPs will consist of measures to prevent polluted runoff. The following addresses the source control BMPs from Appendix 1 of the Carlsbad SUSMP:

Table 4. Pollutant Sources and Source Control Checklist

Potential Source of Runoff Pollutants	Permanent Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Mark all inlets with “No Dumping – I live downstream”	<ul style="list-style-type: none"> • Maintain and periodically repaint inlet markings • Provide stormwater pollution information to owners, lessees, and operators (Fact sheet SC-44 from the CASQA Stormwater Quality Handbook at www.cabmphandbooks.com) • Owner/lessee agreements shall state “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.
Interior Floor Drains	Interior floor drains will be plumbed to the sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.
Need for future indoor & structural pest control	Office buildings shall be designed to avoid openings that would encourage entry of pests.	Integrated Pest Management (e.g., the EPA’s <i>Citizen’s Guide to Pest Control and Pesticide Safety</i>) information shall be provided to owners, lessees, and operators.
Landscape/Outdoor Pesticide Use	<p>Final landscape plans will accomplish all of the following.</p> <ul style="list-style-type: none"> • Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. • 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. 	<p>Maintain landscaping using minimum or no pesticides.</p> <p>See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," and TC-30, “Vegetated Swale,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com</p> <p>Integrated Pest Management (e.g., the EPA’s <i>Citizen’s Guide to Pest Control and Pesticide Safety</i>) information shall be provided to owners, lessees, and operators.</p>

	<ul style="list-style-type: none"> • Where landscaped areas can retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. • Consider using pest-resistant plants, especially adjacent to hardscape. • To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions 	
Refuse areas	<ul style="list-style-type: none"> • Regular trash removal shall be performed. EDI is a refuse company, so trained in proper refuse handling and removal. • Signs will be posted on or near the refuse areas and receptacles with the words “Do not dump hazardous materials here” or similar. 	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.cabmphandbooks.com
Industrial processes	All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.”	See Fact Sheet SC-10, “Non-Stormwater Discharges” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Loading docks		Move loaded and unloaded items indoors as soon as possible. See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Fire Sprinkler Test Water	Provide a means to drain fire sprinkler test water to the	See the note in Fact Sheet SC-41, “Building and Grounds

	sanitary sewer.	Maintenance,” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Miscellaneous Drain or Wash Water		
Boiler drain lines		Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.
Condensate drain lines		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.
Rooftop equipment		Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.
Drainage sumps		Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.
Roofing, gutters, and trim.		Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.
Plazas, sidewalks, and parking lots.		Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Wash water containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.

4.3 Low Impact Development Site Design BMPs

Low Impact Development (LID) BMPs must be incorporated into the site design to meet the City of Escondido's January 2011 SUSMP requirements. The LID outlines five strategies:

1. Optimize the site layout by preserving natural drainage features and designing buildings and circulation to minimize the amount of roofs and paving.
2. Use pervious surfaces such as turf, gravel, or pervious pavement—or use surfaces that retain rainfall. All drainage from these surfaces is considered to be “self-retained”.
3. Disperse runoff from impervious surfaces on to adjacent pervious surfaces (e.g., direct a roof downspout to disperse runoff onto a lawn).
4. Drain impervious surfaces to engineered Integrated Management Practices (IMPs), such as bioretention facilities. IMPs infiltrate runoff to groundwater and/or percolate runoff through engineered soil and allow it to drain away slowly.

The project design is in compliance with these strategies. The site layout has been designed to for only the amount of roofs and paving needed. The project will increase the amount of pervious area. Shared drive aisles will provide access from adjacent streets and are designed with minimal widths.

Runoff from the roofs will flow towards pervious landscape areas, where possible, and ultimately enter a bioretention basin. Bioretention basins will be used to treat the additional on-site runoff. Bioretention basins provide high to medium removal effectiveness for the pollutants generated by the project, which are listed in Table 3. Sizing is included in Appendix A of this report.

4.4 Treatment Control BMPs

Treatment control BMPs were selected to treat the project pollutants of concern identified in Table 3. Bioretention basins will be used because they have a medium to high pollutant removal efficiency for the project's pollutants of concern. For treatment control only, a bioretention basin's surface area must be at least 4 percent of the total area determined from the Drainage Management Areas.

4.5 Hydromodification

The January 2011 SUSMP requires hydromodification (flow control) for priority development projects to ensure that post-development peak flows do not exceed pre-development peak flows. However, the proposed project is exempt from hydromodification. The grading plan by Cherry Engineering shows that the project is increasing the amount of pervious landscaping area from 31,280 square feet to 61,271 square feet. The drainage report accompanying the entitlement package shows that the project will not increase the existing flow rate and that the project flows are being conveyed to the same location as under existing conditions. Therefore, the exemption criteria based on not increasing the unmitigated post-project flows to the project discharge location is sought.

5.0 STORM WATER BMP MAINTENANCE

EDI will be responsible for funding and implementing the operations and maintenance of the project BMPs. EDI will be responsible for ongoing operations and maintenance. The following describes the specific BMP maintenance.

Bioretention Basins

The drainage outlet from the basins shall be inspected monthly and after large storm events. Debris, sediment, and other obstructions shall be removed immediately from the outlet. The habitat shall also be inspected annually and replanted as needed to maintain an adequate cover.

Landscaping

Maintenance will be performed by landscaping personnel. The vegetation will be maintained and inspected on a monthly basis by landscape maintenance staff and will be replaced or replanted, as necessary, to maintain a dense, healthy cover. The vegetation will also be inspected after major storm events. Maintenance shall include periodic mowing, weed control, irrigation, reseeding/replanting of bare areas, and clearing of debris. A design grass height of 6 inches is recommended. The private drainage system will shall be kept clear of debris and inspect prior to and during the rainy season to ensure it is free-flowing.

Efficient Irrigation

The landscaping personnel shall inspect and maintain the irrigation system on a regular basis. This will occur during the routine maintenance activities. All valves, heads, shutoff devices, lines, etc. shall be kept in a properly functioning condition. Any defective parts shall be replaced immediately. The irrigation system shall be adjusted to prevent excessive runoff from landscape areas. The irrigation schedule shall be adjusted based on seasonal needs.

Inlet Stenciling

Any stenciling shall be inspected at the beginning and end of each rainy season and repaired or replaced, as needed.

Hazardous Wastes

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous materials are not expected to be generated on-site; however, if discovered, hazardous materials will be handled and disposed of according to local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria listed in the California Code of Federal Regulations, Title 22, Article 11 (State of California, 1985).

6.0 SUMMARY/CONCLUSIONS

This preliminary WQTR has been prepared in accordance with the City of Escondido's January 2011, *Standard Urban Storm Water Management Plan*, and has evaluated and addressed potential pollutants associated with EDI Master Plan project and its effects on water quality. This WQTR has been based on the conceptual site grading plan by Cherry Engineering. A summary of the facts and findings associated with the project and the measures addressed by this WQTR are as follows:

- The beneficial uses for the receiving waters have been identified. BMPs will be used to protect the beneficial uses as outlined by the SUSMP.
- The project will not significantly alter drainage patterns and will meet hydromodification requirements.
- A Storm Water Pollution Prevention Plan for construction activities will address construction-related water quality objectives.
- Permanent BMPs will be incorporated into the project design in the form of site design, source control, and LID treatment control.
- Details for the treatment control bioretention BMPs are included after this text.
- The proposed BMPs address mitigation measures to protect water quality and beneficial uses to the maximum extent practicable.
- A final WQTR will be required and prepared for final engineering.

7.0 CERTIFICATION

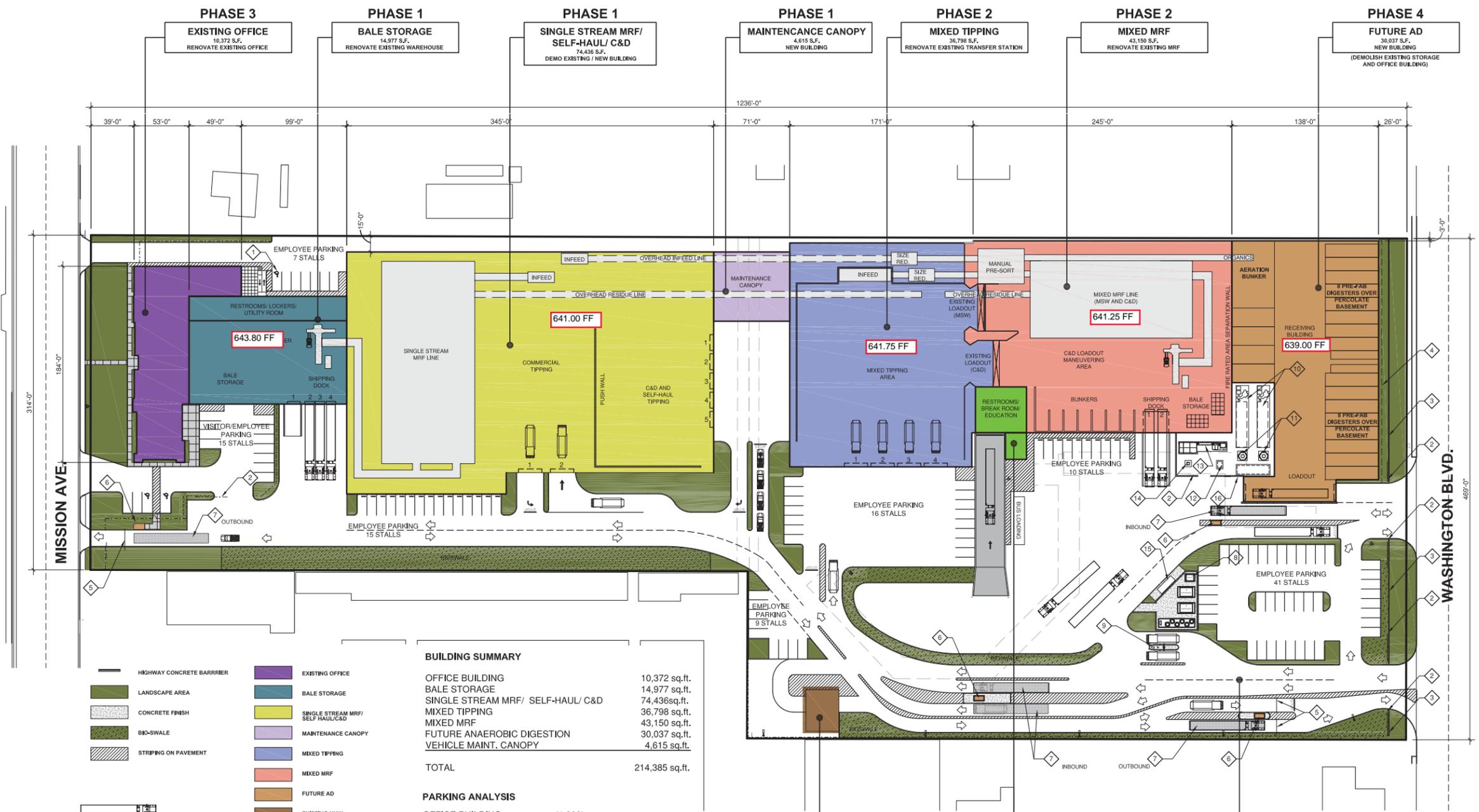
The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

Wayne W. Chang, MS, PE 46548

Date

Table 1-1. Priority Development/SUSMP Projects

		Is the project in any of these categories?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>	A	Housing subdivisions of 10 or more dwelling units. Examples: Single-family homes, multifamily homes, condominiums, and apartments.
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	B	Pollutant-generating projects that disturb 1 acre or more of land. Projects that generate pollutants at levels greater than background levels and disturb 1 acre or more of land are considered priority development projects. In most cases linear pathway projects that are for infrequent vehicle use (such as emergency or maintenance access) or for pedestrian or bicycle use are not considered pollutant generating above background levels if they are built with pervious surfaces, or if they allow runoff to sheet flow to surrounding pervious surfaces.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	C	Automotive repair shop. A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532–7534, or 7536–7539.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	D	Restaurant. Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except the requirements for structural treatment best management practices and numeric sizing criteria and hydromodification.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	E	Hillside development greater than 5,000 square feet. Any development that would create 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development would grade on any natural slope that is 25% or greater.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	F	Environmentally sensitive areas. All development located within or directly adjacent to, or discharging directly to, an environmentally sensitive area (ESA) (where discharges from the development or redevelopment would enter receiving waters within the ESA) that would either create 2,500 square feet of impervious surface on a proposed project site or increase the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. “Directly adjacent” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	G	Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	I	Retail gasoline outlets that (a) are 5,000 square feet or larger or (b) support projected average daily traffic of 100 or more vehicles per day.
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	H	Streets, roads, highways, and freeways. Any paved surface that is 5,000 square feet or greater used to transport automobiles, trucks, motorcycles, and other vehicles.



- ### KEYNOTES
- 1 ADA PARKING
 - 2 WROUGHT IRON SLIDING GATE
 - 3 8' HIGH DECORATIVE CMU WALL
 - 4 PERFORATED METAL SCREEN WALL ABOVE
 - 5 ARM GATE
 - 6 SCALE HOUSE
 - 7 SCALE
 - 8 CNG EQUIPMENT
 - 9 CNG FUELING AREA
 - 10 BIO-FILTER
 - 11 H2S VESSEL
 - 12 GENERATOR
 - 13 BIO-GAS / CHILLER SKID
 - 14 FLARE
 - 15 1,500 GALLON ABOVE GROUND DIESEL STORAGE TANK
 - 16 8' HIGH CMU SCREEN WALL

- HIGHWAY CONCRETE BARRIER
- LANDSCAPE AREA
- CONCRETE FINISH
- BIO-SWALE
- STRIPING ON PAVEMENT
- EXISTING OFFICE
- BALE STORAGE
- SINGLE STREAM MRF/ SELF-HAUL/C&D
- MAINTENANCE CANOPY
- MIXED TIPPING
- MIXED MRF
- FUTURE AD
- EXISTING HHW

BUILDING SUMMARY

OFFICE BUILDING	10,372 sq.ft.
BALE STORAGE	14,977 sq.ft.
SINGLE STREAM MRF/ SELF-HAUL/ C&D	74,436 sq.ft.
MIXED TIPPING	36,798 sq.ft.
FUTURE ANAEROBIC DIGESTION	43,150 sq.ft.
VEHICLE MAINT. CANOPY	4,615 sq.ft.
TOTAL	214,385 sq.ft.

PARKING ANALYSIS

OFFICE BUILDING (1:300)	10,372 sq.ft. / 300	34 STALLS
BALE STORAGE (1:3,000)	14,977 sq.ft. / 3,000	5 STALLS
SINGLE STREAM MRF/ SELF-HAUL / C&D (1:3,000)	74,436 sq.ft. / 3,000	25 STALLS
MIXED TIPPING FLOOR (1:3,000)	36,798 sq.ft. / 3,000	12 STALLS
MIXED MRF (1:3,000)	43,150 sq.ft. / 3,000	15 STALLS
FUTURE ANAEROBIC DIGESTION (1:3,000)	30,037 sq.ft. / 3,000	10 STALLS
TOTAL REQUIRED		101 STALLS
PROVIDED		112 STALLS

- EXISTING HHW
1,566 S.F.
NO WORK
- NEW VISITOR ENTRY
500 S.F.
NEW BUILDING
- SITE IMPROVEMENTS
277,322 S.F.
RENOVATE EXISTING



SCALE: 1"=50'-0"

EDI MASTER PLAN

ESCONDIDO, CALIFORNIA

OVERALL SITE PLAN

APPENDIX A

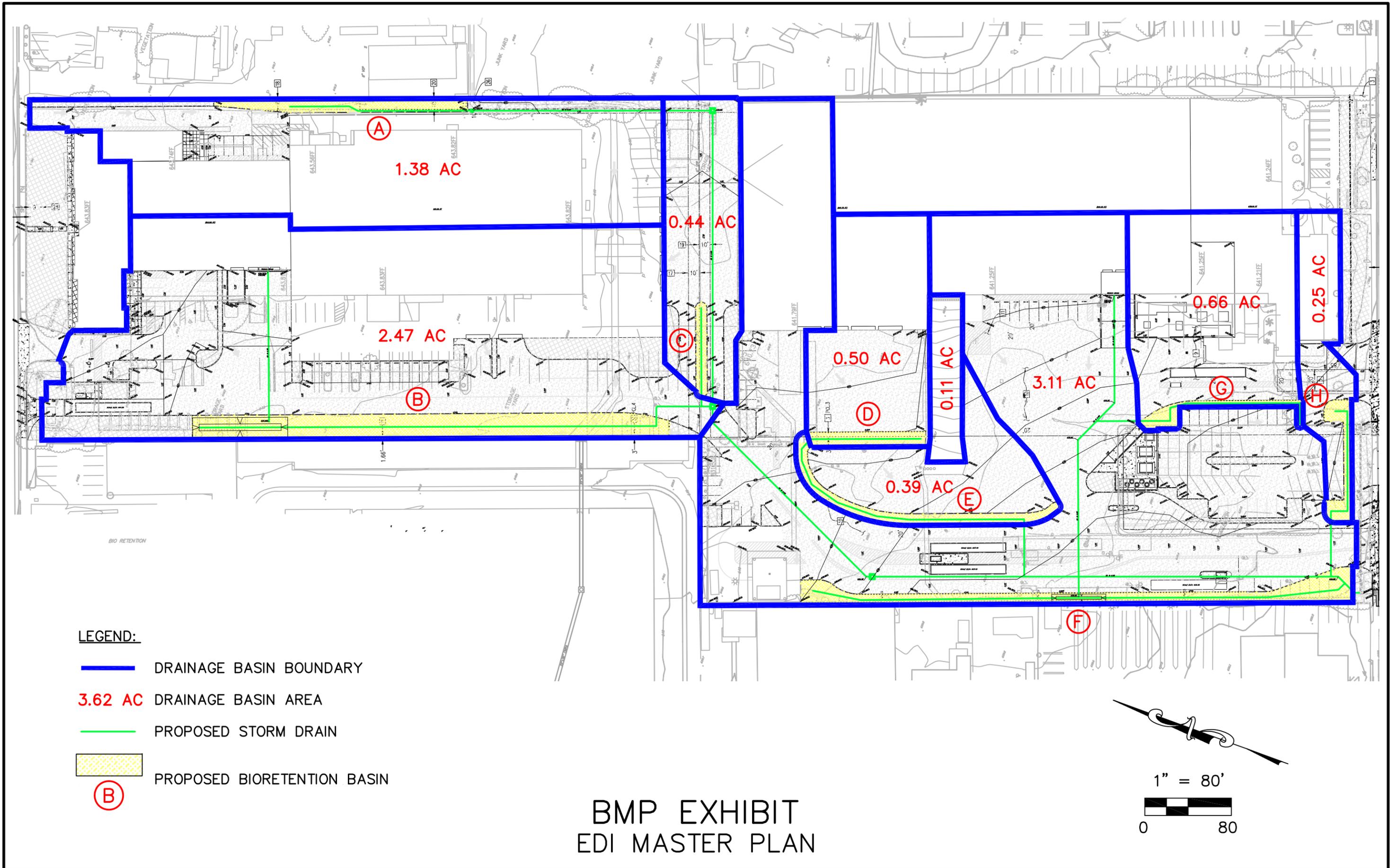
LOW IMPACT DEVELOPMENT ANALYSES

SUMMARY

Since the project is exempt from hydromodification (see Section 4.5), the proposed bioretention basins only need to be sized for treatment control. According to the City of Escondido SUSMP, a bioretention basin for just treatment control needs to be sized based on 4 percent of the impervious area. The attached BMP Exhibit delineates the tributary drainage area to each proposed bioretention basin. Table 1 outlines the tributary area, the area to be treated, and the required bioretention basin area. The area to be treated is based on 95 percent of the tributary area, i.e., for entitlement purposes, it is assumed that each tributary area is 95 percent impervious. The required bioretention basin area is 4 percent of the area to be treated. The preliminary site grading plan provides for the required bioretention basin areas from Table 1. There is an existing loading dock within the site (0.11 acre area on the BMP exhibit). Since this is an existing improvement, treatment control is not proposed.

Bioretention Basin	Tributary Area, acres	Tributary Area, square feet	Impervious Area to be Treated, sf	Required Basin Area, sf
A	1.38	60,255	57,242	2,290
B	2.47	107,574	102,195	4,088
C	0.44	19,024	18,073	723
D	0.50	21,761	20,673	827
E	0.39	17,055	16,202	648
F	3.11	135,487	128,713	5,149
G	0.66	28,865	27,422	1,097
H	0.25	10,706	10,171	407

Table 1. Summary of Bioretention Basin Sizing



A
1.38 AC

2.47 AC

B

0.44 AC

C

0.50 AC

D

0.11 AC

3.11 AC

0.39 AC

E

0.66 AC

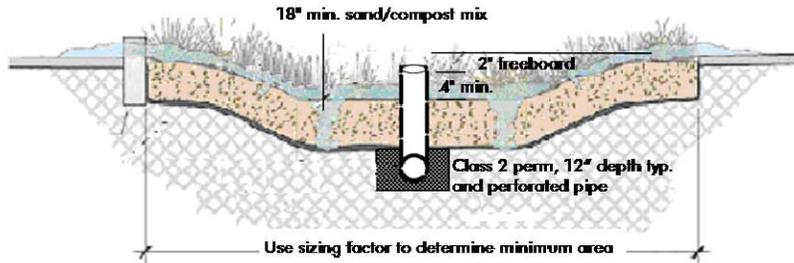
G

0.25 AC

H

F

Bioretention Facilities



Bioretention facility configured for treatment-only requirements. Bioretention facilities can be rectangular, linear, or nearly any shape.

Bioretention detains runoff in a surface reservoir, filters it through plant roots and a biologically active soil mix, and then infiltrates it into the ground. Where native soils are less permeable, an underdrain conveys treated runoff to the storm drain or surface drainage.

Bioretention facilities can be configured in nearly any shape. When configured as linear **swales**, they can convey high flows while percolating and treating lower flows.

Bioretention facilities can be configured as in-ground or aboveground planter boxes, with the bottom open to allow infiltration to native soils underneath. If infiltration cannot be allowed, use the sizing factors and criteria for the flow-through planter.

► CRITERIA

For development projects subject only to runoff treatment requirements, the following criteria apply:

Parameter	Criterion
Soil mix depth	18 inches minimum
Soil mix minimum percolation rate	5 inches per hour minimum sustained (10 inches per hour initial rate recommended)
Soil mix surface area	0.04 times tributary impervious area (or equivalent)

Best Uses

- Commercial areas
- Residential subdivisions
- Industrial developments
- Roadways
- Parking lots
- To fit in setbacks, medians, and other landscaped areas

Advantages

- Can be any shape
- Low maintenance
- Can be landscaped

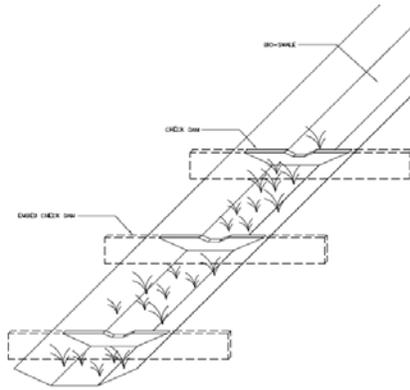
Limitations

- 4% of tributary impervious square footage required
- 3–4 feet of head typically required
- Irrigation typically required

Parameter	Criterion
Surface reservoir depth	6 inches minimum; may be sloped to 4 inches where adjoining walkways.
Underdrain	Required in Group “C” and “D” soils. Perforated pipe embedded in gravel (“Class 2 permeable” recommended), connected to storm drain or other accepted discharge point.

► **DETAILS**

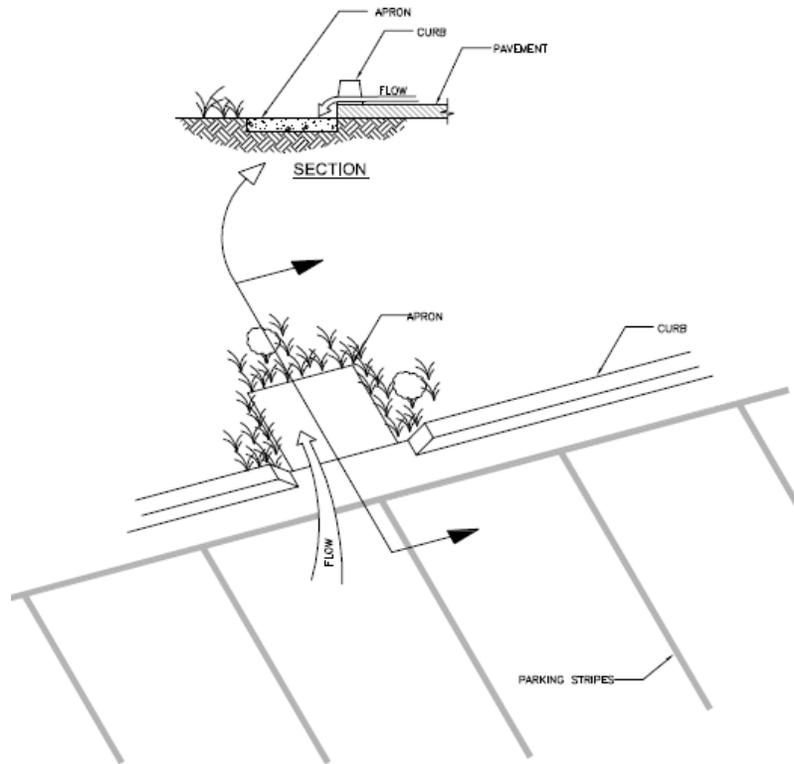
Plan. On the surface, a bioretention facility should be one level, shallow basin, or a series of basins. As runoff enters each basin, it should flood and fill throughout before runoff overflows to the outlet or to the next downstream basin. This will help prevent movement of surface mulch and soil mix.



Use check dams for linear bioretention facilities (swales) on a slope.

In a linear swale, check dams should be placed so that the lip of each dam is at least as high as the toe of the next upstream dam. A similar principle applies to bioretention facilities built as terraced roadway shoulders.

Inlets. Paved areas draining to the facility should be graded, and inlets should be placed, so that runoff remains as sheet flow or as dispersed as possible. Curb cuts should be wide (12 inches is recommended) to avoid clogging with leaves or debris. Allow for a minimum reveal of 4–6 inches between the inlet and soil mix elevations to ensure that turf or mulch buildup does not block the inlet. In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet.



Recommended design details for bioretention facility inlets (see text).

Where runoff is collected in pipes or gutters and conveyed to the facility, protect the landscaping from high-velocity flows with energy-dissipating rocks. In larger installations, provide cobble-lined channels to better distribute flows throughout the facility.

Upturned pipe outlets can be used to dissipate energy when runoff is piped from roofs and upgradient paved areas.

Soil mix. The required soil mix is similar to a loamy sand. It must maintain a minimum percolation rate of 5 inches per hour throughout the life of the facility, and it must be suitable for maintaining plant life. Typically, on-site soils will not be suitable because of their clay content.

Storage and drainage layer. Class 2 permeable material, California Department of Transportation specification 68-1.025, is recommended. Open-graded crushed rock, washed, may be used, but requires that 4–6 inches of washed pea gravel be substituted at the top of the crushed rock gravel layers. Do not use filter fabric to separate the soil mix from the gravel drainage layer or the gravel drainage layer from the native soil.

Underdrains. No underdrain is required where native soils beneath the facility are Hydrologic Soil Group A or B. For treatment-only facilities where native soils are Group C or D, a perforated pipe must be bedded in the gravel layer and must terminate at a storm drain or other approved discharge point.

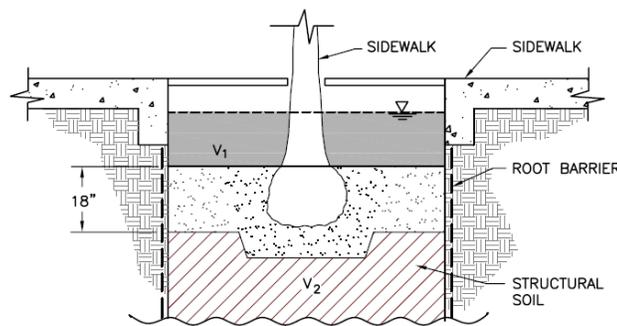
Outlets. In treatment-only facilities, outlets must be set high enough to ensure that the surface reservoir will fill and the entire surface area of soil mix will be flooded before the outlet elevation is reached. In swales, this can be achieved with appropriately placed check dams. The outlet should be designed to exclude floating mulch and debris.

Vaults, utility boxes, and light standards. It is best to locate utilities outside the bioretention facility, in adjacent walkways or in a separate area set aside for this purpose. If utility structures are to be placed within the facility, the locations should be anticipated and adjustments made to ensure that the minimum bioretention surface area and volumes are achieved. Leaving the final locations to each individual utility can produce a haphazard, unaesthetic appearance and make the bioretention facility more difficult to maintain.

Emergency overflow. The site grading plan should anticipate extreme events and potential clogging of the overflow and route emergency overflows safely.

Trees. Bioretention areas can accommodate small or large trees. There is no need to subtract the area taken up by roots from the effective area of the facility. Extensive tree roots maintain soil permeability and help retain runoff. Normal maintenance of a bioretention facility should not affect tree life span.

The bioretention facility can be integrated with a tree pit of the required depth and filled with structural soil. If a root barrier is used, it can be located to allow tree roots to spread throughout the bioretention facility while protecting adjacent pavement. Locations and planting elevations should be selected to avoid blocking the facility's inlets and outlets.



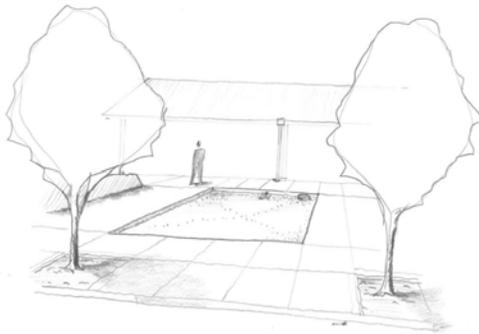
Bioretention facility configured as a tree well.
The root barrier is optional.

► **APPLICATIONS**

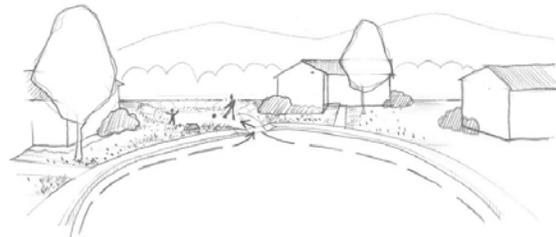
Multipurpose landscaped areas. Bioretention facilities are easily adapted to serve multiple purposes. The loamy sand soil mix will support turf or a plant palette suitable to the location and a well-drained soil.

Example landscape treatments include:

- lawn with a sloped transition to adjacent landscaping,
- a swale in the setback area,
- a swale in the parking median,
- lawn with hardscaped edge treatment,
- a decorative garden with formal or informal plantings,
- a traffic island with low-maintenance landscaping,
- a raised planter with seating, and
- bioretention on a terraced slope.



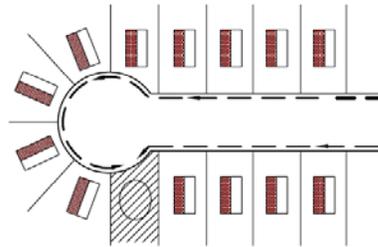
Bioretention facility configured as a recessed decorative lawn with hardscaped edge.



Bioretention facility configured and planted as a lawn/play area.

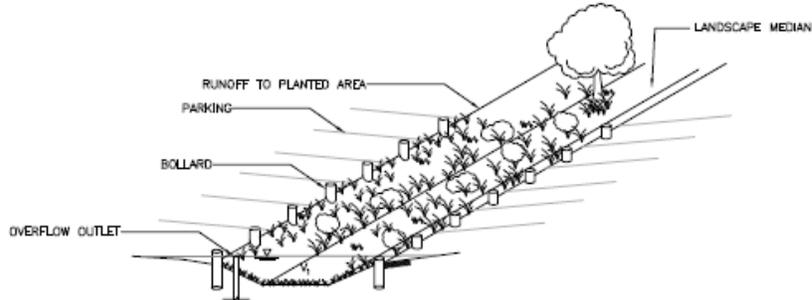
Residential subdivisions. Some subdivisions are designed to drain roofs and driveways to the streets (in the conventional manner) and then drain the streets to bioretention areas, with one bioretention area for each one to six lots, depending on subdivision layout and topography.

Bioretention areas can be placed on a separate, dedicated parcel with joint ownership.



Bioretention facility receiving drainage from individual lots and the street in a residential subdivision.

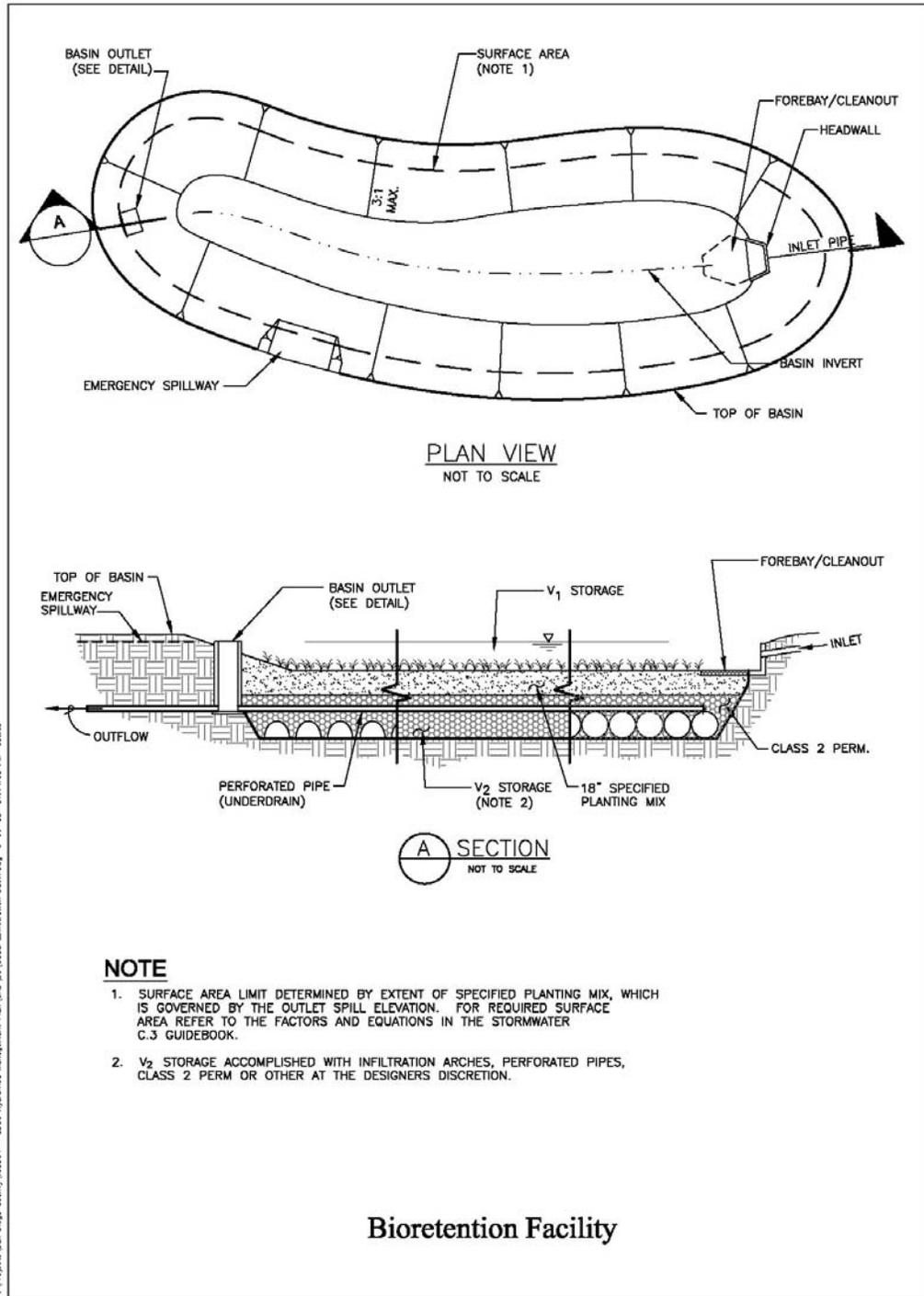
Sloped sites. Bioretention facilities must be constructed as a basin, or series of basins, with the circumference of each basin set level. It may be necessary to add curbs or low retaining walls.



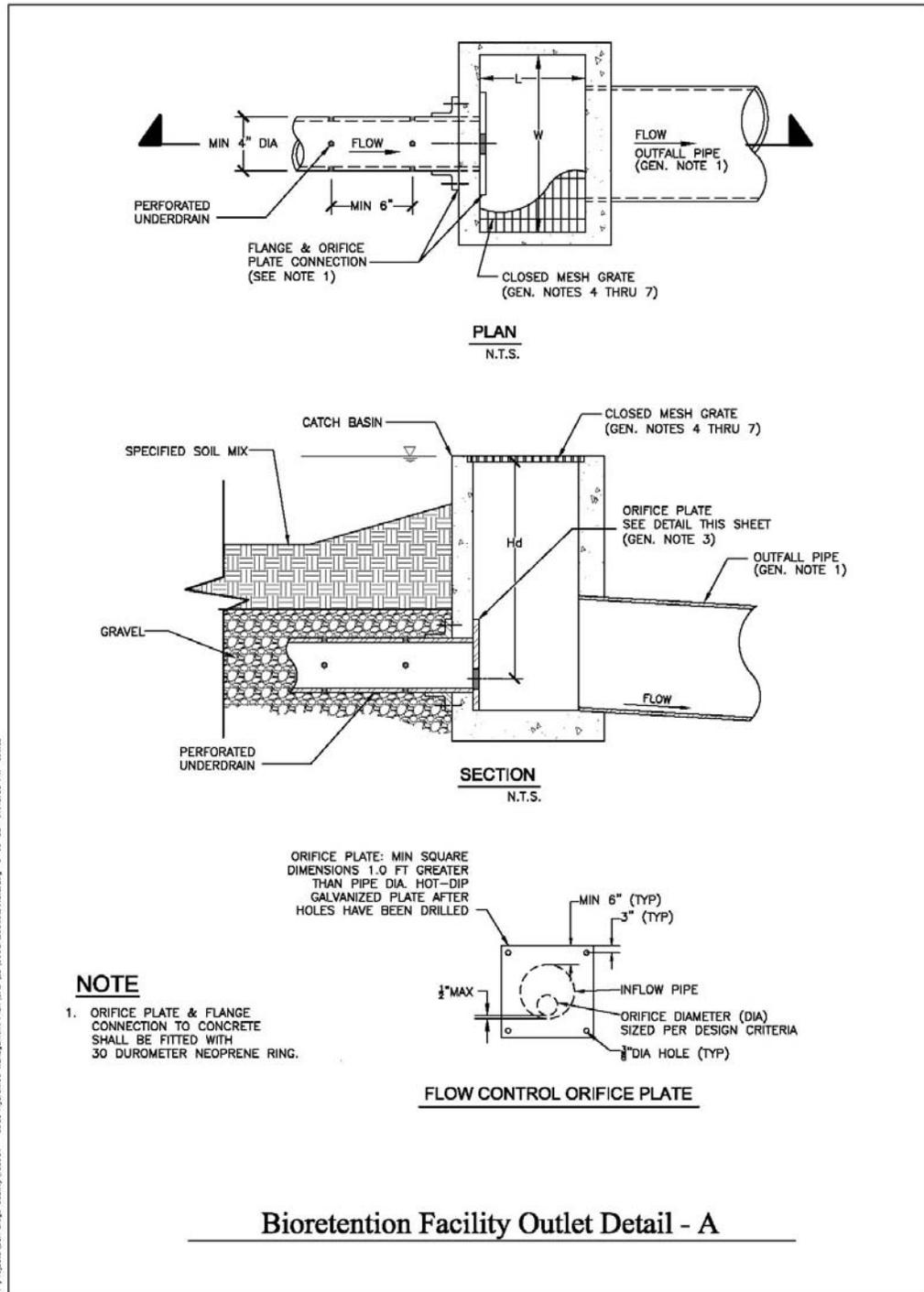
Bioretention facility configured as a parking median. Note the use of bollards in place of curbs, eliminating the need for curb cuts.

Design Checklist for Bioretention

- The volume or depth of the surface reservoir meets or exceeds the minimum.
- An 18-inch-deep “loamy sand” soil mix is used with a minimum long-term percolation rate of 5 inches per hour.
- The area of soil mix meets or exceeds the minimum.
- A perforated-pipe underdrain is bedded in a “Class 2 perm” drainage layer with connection and sufficient head to the storm drain or discharge point (except in “A” or “B” soils).
- No filter fabric is being used.
- The underdrain has a clean-out port consisting of a vertical, rigid, nonperforated PVC pipe, with a minimum diameter of 6 inches and a watertight cap.
- The location and footprint of the facility are shown on the site plan and landscaping plan.
- The bioretention area is designed as a basin (level edges) or a series of basins, and the grading plan is consistent with these elevations. If the facility is designed as a swale, check dams are set so the lip of each dam is at least as high as the toe of the next upstream dam.
- Inlets are 12 inches wide, have 4–6 inches of reveal and an apron or other provision to prevent blockage when vegetation grows in, and energy dissipation as needed.
- Overflow is connected to a downstream storm drain or approved discharge point.
- Emergency spillage will be safely conveyed overland.
- Plantings are suitable to the climate and a well-drained soil.
- An irrigation system is in use with connection to a water supply.
- Vaults, utility boxes, and light standards are located outside the minimum soil mix surface area.
- When excavating, the soils are not smeared on the bottom and side slopes. Compaction of native soils and “rip” soils is minimized if soils are clayey and/or compacted. The area is protected from construction site runoff.



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