SMCWPPP
C.3 Regulated Projects Guide

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Water Pollution
Prevention Program

Summary of Changes to the C.3 RPG

- New name and cover:
  C.3 Regulated Projects Guide (previously the C.3 Stormwater Technical Guidance) – part of the new "Green Suite" of guides
- Formatting: Match the look and feel of the new Green Infrastructure Design Guide (GIDG)
- Consistency/cross-referencing updates
- Technical guidance updates

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New Cover and Name

C.3 Regulated Projects Guide

For use by developers, builders and project applicants to design and build low impact development projects

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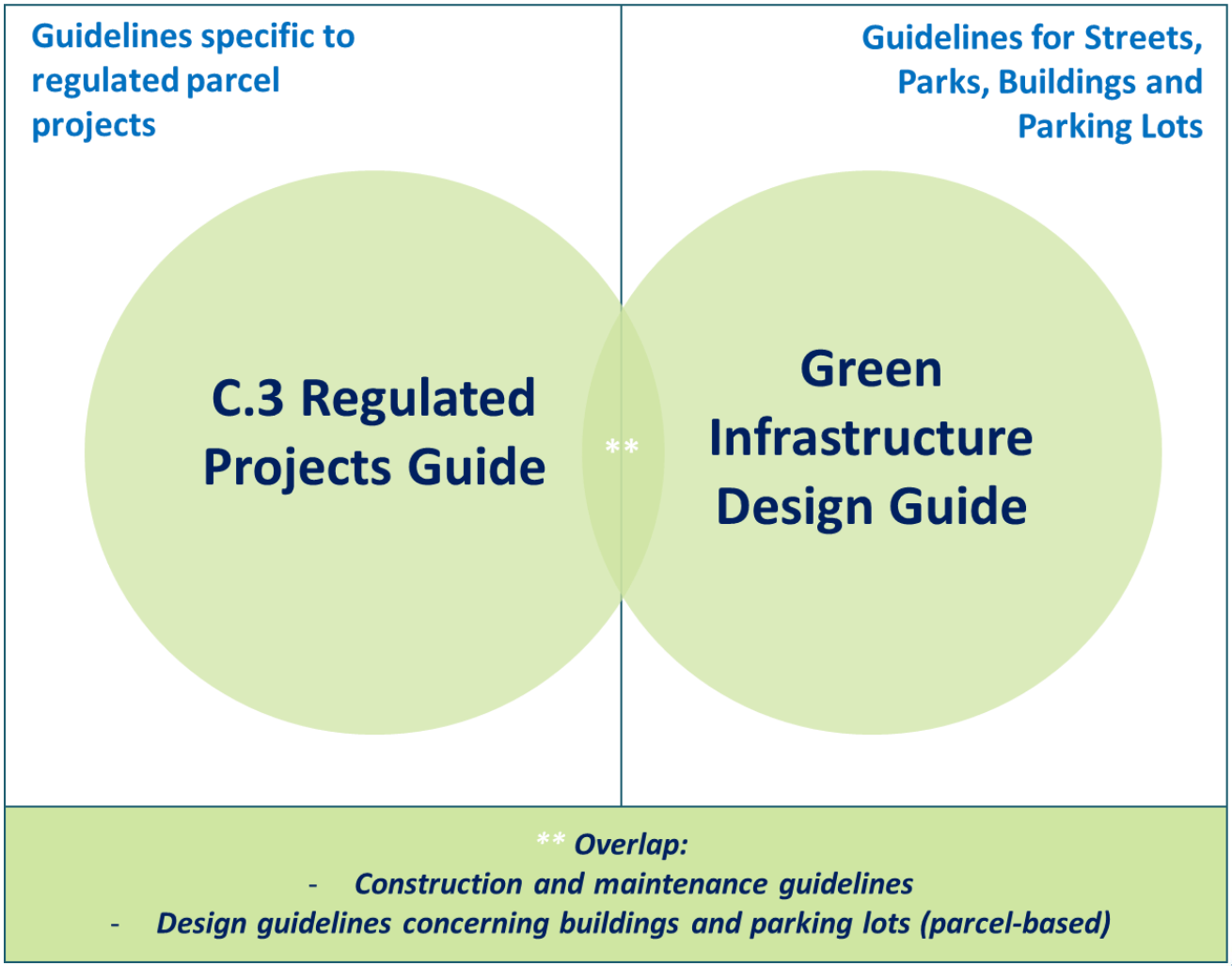
Clean Water. Healthy Community.

Linkage between C.3 RPG and GIDG



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Chapter 6: New Template

- Content rearranged and standardized between all fact sheets

New Template Sections:

- 1st Section: General summary of treatment system and siting locations
- 2nd Section: Design and sizing, dimensions, inlets, vegetation guidance, etc.
- 3rd Section: Construction and maintenance
- 4th Section: Typical cross-section design details for each treatment system

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Chapter 6: Technical Guidance for Specific Treatment Measures

Introduction

The technical guidance in this chapter is intended to help prepare permit application submittals for your project. Municipalities will require you to prepare more specific drawings taking into consideration project site conditions, materials, plumbing connections, etc., in your application. This technical guidance covers the most common treatment measures (See Table 6-1) and was developed using best engineering judgment and based on a review of various documents and guidance from Water Board staff as available.

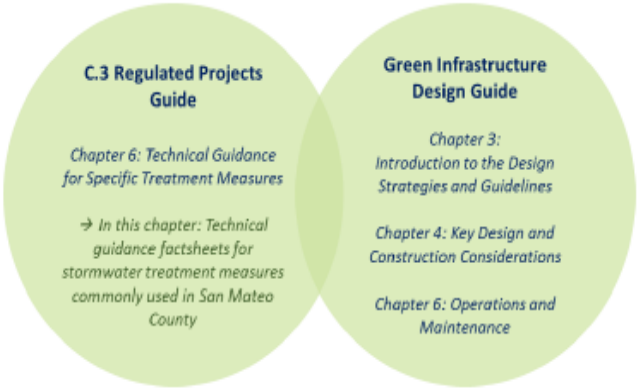

Figure 6-1: Chapter 6 details and cross-references to the companion Green Infrastructure Design Guide

Table 6-1: Treatment Measures for which Technical Guidance is provided

Treatment Measures		Section
Biotreatment	Bioretention areas	6.1
	Flow-through planter box	6.2
	Tree well filter	6.3
Infiltration	Infiltration trench	6.4
Other	Extended detention basin	6.5
Infiltration	Pervious pavement	6.6
Infiltration	Turf block and Grid Pavements	6.7
Biotreatment	Green roof	6.8
Other	Rainwater harvesting and use	6.9
Other	Media filter	6.10
Infiltration	Subsurface infiltration system	6.11

6.1 Bioretention

Overview

Description

Figure 6-2: Bioretention area. Source: City of Brisbane

Bioretention areas (also known as stormwater planters or "rain gardens"), are concave landscaped areas that function as soil and plant-based filtration devices that remove pollutants through physical, biological, and chemical treatment processes. Bioretention areas can be any shape, including linear. Linear bioretention areas are sometimes referred to as bioretention swales. Bioretention areas consist of the following layers, starting from the top: a surface ponding area, a layer of mulch, planting soil and plants, and an underlying rock layer with an underdrain that connects to the municipal storm drain system.

Bioretention areas are designed to distribute stormwater runoff evenly within the surface ponding area. The water is temporarily stored in the ponding area and infiltrates through the planting soil, which is engineered to have a high rate of permeability. From there, the water filters down into the underlying rock layer.

The rock layer of the bioretention area may be designed to either maximize infiltration or prevent infiltration to the underlying soils. In bioretention areas that maximize infiltration, the underdrain is raised at least 6 inches above the bottom of the rock layer, and there is no liner between the rock layer or planting soil and the surrounding soils. Maximizing infiltration is only allowed where conditions are suitable for infiltration – check with the geotechnical engineer. Where infiltration is precluded, the bioretention area is fully lined with waterproof material, and the underdrain is placed at the bottom of the rock layer.

Best uses
- Any type of development
- Drainage area up to 2 acres
- Landscape design element

Advantages
- Detains low flows
- Landscape feature
- Low maintenance
- Reliable once established

Limitations
- Not appropriate where soil is unstable
- Requires irrigation
- Susceptible to clogging, especially if installed prior to construction site soil stabilization

Soil and Drainage Considerations Specific to Flow-through Planters

- Waterproofing should be installed as required to protect adjacent building foundations.
- An underdrain system is required for flow through planters.
- The biotreatment soil should have long term minimum permeability of 5 inches per hour (although the initial permeability may exceed this to allow for a tendency of the permeability to reduce over time.) Soil specifications are provided in Appendix K. Check with municipality for additional requirements.
- The biotreatment soil should be at least 18 inches deep.
- Provide 3-inch layer of mulch in areas between plantings.
- To avoid excess hydraulic pressure on subsurface treatment system structures:
  - 1. The depth to seasonal high groundwater level should be at least 5 feet from the bottom of the structure.
  - 2. A geotechnical engineer should be consulted for situations where the bottom of the structure is less than 5 feet from the seasonal high groundwater level.

Remember

Soil and Drainage Considerations for All Biotreatment Systems

- Soils used in the planter must meet biotreatment soil specifications included in Appendix k of this Handbook. The minimum long term permeability for the biotreatment soil is 5 inches per hour although initial permeability may exceed this to allow for tendency of permeability to reduce over time.
- Filter fabric should not be used in or around underdrain trench.
- The underdrain should include a perforated pipe with cleanouts and connection to a storm drain or discharge point. Clean-out should consist of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 4 inches and a watertight cap fit flush with the ground.
- The underdrain trench should include a 12-inch thick layer of Caltrans Standard Section 68-1.025 permeable material Class 2, or similar municipality-approved material. A minimum 4-inch diameter perforated pipe should be placed within the backfill layer. To help prevent clogging, two rows of perforation may be used.
- There should be adequate fall from the underdrain to the storm drain or discharge point.

Consistency/Cross-Referencing Updates

- Added references to GIDG and coordinated content for overlapping topics:
  - Added references to the “Building and Parking Lot” design guidance from GIDG Chapter 3 to C.3 RPG Chapter 6 sections
  - Added references to hardscape, landscape, plant and mulch design guidance from GIDG Chapter 3 to C.3 RPG Appendix A

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Consistency/Cross-Referencing Updates

- Overlapping topics, continued:
  - Operation and maintenance of systems
    - —C.3 RPG Chapter 8: added references to GIDG Chapter 6 (hardscape and landscape O&M) and C.3 RPG Appendix A, and differences between regulated and non-regulated project monitoring and maintenance requirements
    - —C.3 RPG Appendix G: updated the O&M templates and referred to the maintenance information/ checklists in GIDG Chapter 6 and Appendix 5
    - —C.3 RPG Appendix F (Mosquito Control O&M):
      - – add references to GIDG Chapter 6

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Technical Updates

- Expanded discussion of alternative compliance options
- Discussion of design of LID for trash capture
- Clarification of special case C.3 exemptions and interpretations
- Better explanation of how to apply the interceptor tree credits
- Discussion of biotreatment soil media installation

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Schedule

- Complete draft updates to C.3 RPG by end of June
- Provide draft C.3 RPG to New Development Subcommittee for review
- Comments due by NDS meeting (Aug. 13)
- Finalize and post C.3 RPG by end of August

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Questions?

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