

Stormwater C.3 Guidebook

What's New in the Fifth Edition

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May 23, 2011



Topics

- 👉 Guidebook Objectives and Methods
- 👉 Brief History of Contra Costa's Approach
- 👉 Review of New Features
 - 👉 New Integrated Management Practices
 - 👉 New Specifications and Details for IMPs
 - 👉 New Chapter on Construction of IMPs



Objectives and Methods

- ◆ Objectives
 - ◆ Permit compliance for all projects
 - ◆ Applicants know what they need to submit
 - ◆ Reviewers can determine quickly and with confidence whether a project complies
 - ◆ Projects that work!
- ◆ Methods
 - ◆ Continuous Improvement
 - ◆ Engage the experience and perspectives of developers, designers, builders, and operators



Guidebook History

◆ First Edition—January 2005

- ◆ Based on a manual developed for City of Milpitas
- ◆ C.3 requirements implemented 2/15/2005

◆ Second Edition—March 2005

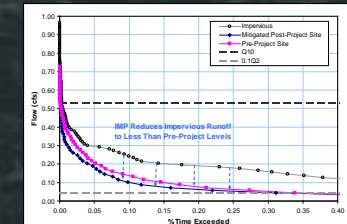
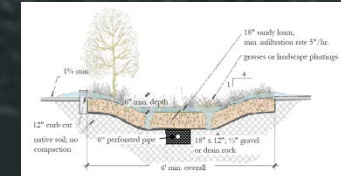
- ◆ Basic format and features of the current edition
- ◆ Emphasis on Drainage Management Areas
- ◆ 4% sizing factor
- ◆ Fact sheets from infiltration feasibility study

◆ Third Edition—October 2006

- ◆ Met obligation to implement the Hydrograph Modification Management Plan (HMP) approved by the Water Board in June 2006
- ◆ More emphasis on Low Impact Development
- ◆ Policies for Phased Projects and Subdivisions
- ◆ New IMP sizing factors for HMP compliance
- ◆ IMP Sizing Calculator

◆ Fourth Edition—October 2008

- ◆ March 2007 design charrette to improve IMP designs
- ◆ Expanded design sheets include many new drawings
- ◆ LID Design Guide (Chapter 4)
- ◆ Consolidated and shortened



What's New – Chapter 1

Impervious Area Threshold	Effective Date	Requirement
All projects requiring municipal approvals or permits	May 1, 2010	Consider site design features. Incorporate Source Controls
Projects between 2,500 and 10,000 square feet requiring approvals or permits	December 1, 2012	Incorporate one LID feature from the stated menu.
Auto service facilities, gas stations, restaurants, and uncovered parking lots over 5,000 square feet	December 1, 2011	Prepare and submit a Stormwater Control Plan. Use the LID Design Guide in Chapter 4, including sizing factors and criteria for “treatment only.”
All projects between 10,000 square feet and one acre†	August 15, 2006	
Projects an acre and larger	October 14, 2006	Prepare a Stormwater Control Plan. Use the LID Design Guide. Incorporate flow control into the LID design if required.



What's New -- Chapter 1

- Alternative Compliance Options
 - No requirement to demonstrate infeasibility of on-site treatment
 - 1:1 substitution of impervious area
 - Must be LID treatment
 - Should be at least as much pollutant loading
 - Can combine on-site and off-site treatment
 - Can also share proportionally in a larger project
- Consideration or acceptance of alternative compliance is at the discretion of the municipality



What's New – Chapter 2

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- ◆ Flow control for projects on sites that are already partially developed *see footnote
- ◆ Selection of Stormwater Treatment Facilities
 - ◆ First, use LID features that minimize runoff
 - ◆ Assess feasibility of harvesting and (re)use
- ◆ Two options for (re)use
 - ◆ Storage for two days or less (same volume as a detention basin)
 - ◆ Seasonal storage (60% of mean annual precipitation)

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What's New – Chapter 3

STORMWATER CONTROL PLAN CHECKLIST

CONTENTS OF EXHIBIT

Show all of the following on drawings:

- Existing natural hydrologic features (depressions, watercourses, relatively undisturbed areas) and significant natural resources. (Step 1 in the following step-by-step instructions)
- Existing and proposed site drainage network and connections to drainage off-site. (Step 3)
- Layout of buildings, pavement, and landscaped areas. (Step 3)
- Impervious areas proposed (roof, plaza/sidewalk, and streets/parking) and area of each. (Step 3)
- Entire site divided into separate Drainage Management Areas, with each DMA identified as self-treating, self-retaining (zero-discharge), draining to a self-retaining area, or draining to an IMP. Each DMA has one surface type (roof, paving, or landscape), is labeled, and square footage noted. (Step 3)
- Locations and sizes of proposed treatment and flow-control facilities. (Step 3)
- Potential pollutant source areas, including refuse areas, outdoor work and storage areas, etc. listed in Appendix D and corresponding required source controls. (Step 4)

CONTENTS OF REPORT

Include all of the following in a report:

- Narrative analysis or description of site features and conditions that constrain, or provide opportunities for, stormwater control. Include soil types (including Hydrologic Soil Group), slopes, and depth to groundwater. (Step 2)
- Narrative description of site design characteristics that protect natural resources. (Step 3)
- Narrative description and/or tabulation of site design characteristics, building features, and pavement selections that minimize imperviousness of the site. (Step 3)
- Evaluation of the feasibility of storage and use, infiltration, and evapotranspiration. (Step 3)
- Tabulation of DMAs, including self-treating areas, self-retaining areas, areas draining to self-retaining areas, and areas tributary to Integrated Management Practices (IMPs), in the format shown in Chapter 4. Output from the IMP Sizing Calculator may be used. (Step 3)
- Sketches and/or descriptions showing there is sufficient hydraulic head to route runoff into, through, and from each IMP to an approved discharge point. (Step 3)
- A table of identified pollutant sources and for each source, the source control measure(s) used to reduce pollutants to the maximum extent practicable. See worksheet in Appendix D. (Step 4)
- General maintenance requirements for infiltration, treatment, and flow-control facilities. (Step 5)
- Means by which facility maintenance will be financed and implemented in perpetuity. (Step 5)
- Statement accepting responsibility for interim operation & maintenance of facilities. (Step 5)
- Identification of any conflicts with codes or requirements or other anticipated obstacles to implementing the Stormwater Control Plan. (Step 6)
- Construction Plan C.3 Checklist. (Step 6)
- Certification by a civil engineer, architect, and landscape architect. (Step 6)
- Appendix: Compliance with flow-control requirements (if using an HMP compliance option other than Option 2, Integrated Management Practices).

1. Assemble Info
2. Identify Constraints and Opportunities
3. Prepare and Document Your LID Design
4. Specify Source Control BMPs
5. Describe Stormwater Facility Maintenance
6. Complete Exhibit and Report



What's New – Chapter 4

- 👉 Overall LID Design Approach is retained
- 👉 Addition of a *fifth* LID Strategy:
 1. Optimize the site layout
 2. Use pervious surfaces or surfaces that retain runoff
 3. Disperse runoff on to adjacent pervious surfaces
 4. **Store runoff and use it later**
 5. Direct drainage from impervious surfaces to IMPs

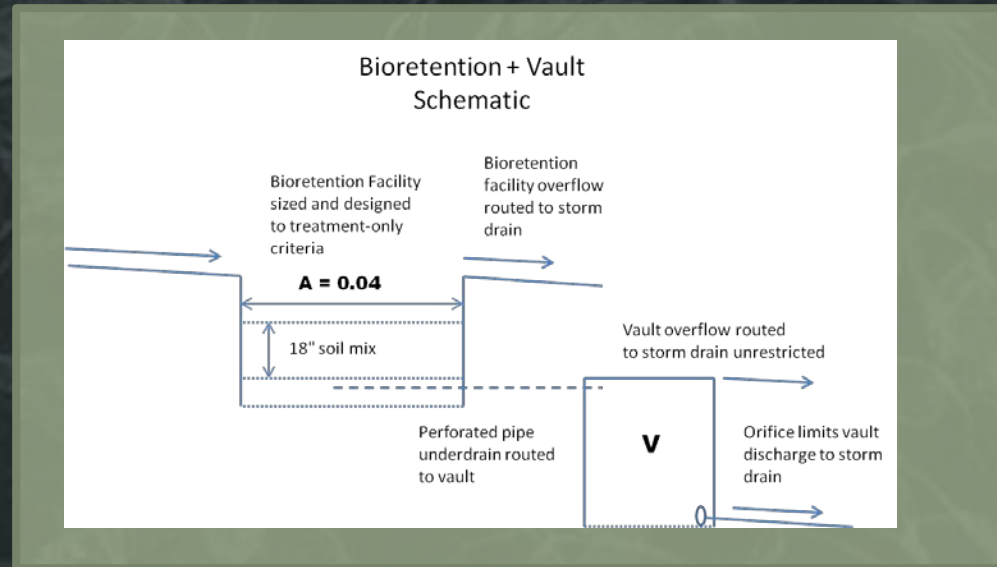
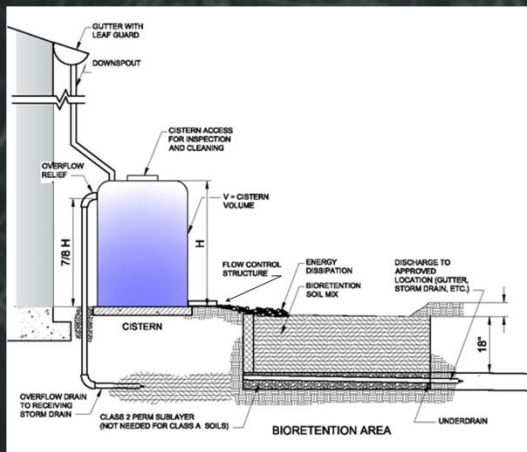
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What's New – Chapter 4

- Two New IMPs (from 2009 supplement)
 - Bioretention facilities
 - Flow-through planters
 - Cistern + bioretention facilities
 - Bioretention + vault facilities
 - Dry wells and other infiltration facilities

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What's New – Chapter 4

- 🍃 Incorporated into the IMP Sizing Calculator
- 🍃 New Design Sheets

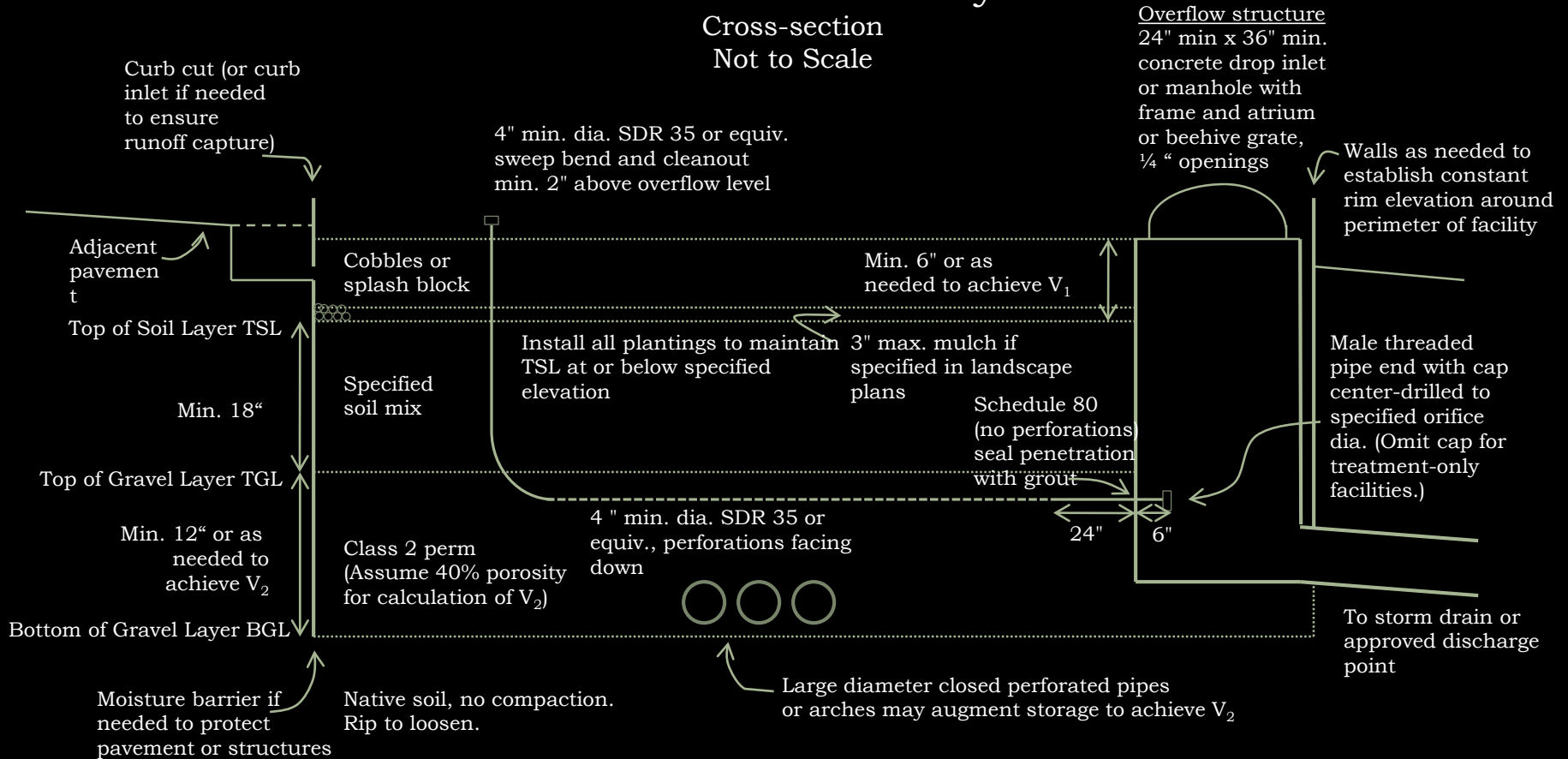
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The screenshot shows the 'Integrated Management Practice Calculator [Commercial.xml]' window. It features a 'Project Information' section with fields for Project Name (Commercial), Location (Base of Slope), APN (000-00-0000), Total Area (30530 sq ft), and Mean Annual Precip (19 in). A 'Design Goal' section has radio buttons for 'Treatment Plus Flow Control' (selected) and 'Treatment Only'. Below this are tabs for 'Drainage Management Areas (DMAs)', 'Integrated Management Practices (IMPs)', 'Calculation Warnings(0)', and 'Summary Report'. The 'DMAs' tab is active, showing a table with columns for ST-1, SR-1, SR-2, LS-1, PAVE-1, PAVE-2, PAVE-3, PAVE-4, ROOF-1, ROOF-2, ROOF-3, and ROOF-4. The first row (ST-1) is expanded to show fields for DMA Type (Self-Treating), Drainage Area (11600 sq ft), NRCS Soil Group, Post-project Surface Type, and IMP (Please select). A note states: 'NOTE: The DMA can drain only to IMPs with the same soil type.' At the bottom of the form are buttons for 'Add New DMA', 'Remove Current DMA', and 'Rename Current DMA'. A summary table at the bottom left shows: Total Area (Calculated) 30530 sq. ft., Drainage Management Areas 29445 sq. ft., Integrated Management Practices 1085 sq. ft., and Total 30530 sq. ft.



Bioretention Facility

Cross-section
Not to Scale



Notes:

- No liner, no filter fabric, no landscape cloth.
- Maintain BGL, TGL, TSL throughout facility area at elevations to be specified in plan.
- Class 2 perm layer may extend below and underneath drop inlet.
- Preferred elevation of perforated pipe underdrain is near top of gravel layer.
- See Appendix B for soil mix specification, planting and irrigation guidance.
- See Chapter 4 for factors and equations used to calculate V_1 , V_2 , and orifice diameter.

What's New – Chapter 5

- Based on growing experience with design and construction of bioretention facilities
- Construction of Integrated Management Practices
 - What to show on construction plans
 - Where to call out elevations
 - Use cross-sections
 - Show how runoff moves
- Construction checklist



What's New – Appendix B

- ◆ Soils, Plantings, and Irrigation for Bioretention Facilities
- ◆ Originally published as a separate addendum in January 2009
- ◆ Soil specification to be implemented throughout the Bay Area
 - ◆ Mix of “concrete sand” (ASTM C33) and compost
- ◆ Useful guidance on soil and plant installation and plant maintenance
- ◆ Plant list

