

Provision C.3.h – Stormwater Treatment System Operation & Maintenance and Inspections

Common Problems and Solutions

Private and Public Sites

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Presentation Overview

BMP Types
MRP Requirements
Inspection
Maintenance
Training



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What are the Types of BMPs?

1. Vaults and Ponds
 - a) Hydrodynamic Separators (e.g. CDS)
 - b) Hi-Flow Rate Media Filters (Stormfilter)
 - c) Tree Filter (Filterra)
 - d) Sand Filter
 - e) Detention Ponds
2. Bioretention (LID)
 - a) Standard Bioretention Area (Rain Garden)
 - b) Flow Through Planter
 - c) Stormwater Curb Extension
 - d) Stormwater Sidewalk Planter
 - e) Tree Filter (Underground bioretention)
 - f) Green Roofs



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How are Bioretention landscapes different from others?

1. Grading
2. Plants
3. Biotreatment Soil Mix
4. Underdrains
5. Treatment Function
6. No Synthetic Fertilizers or Pesticides



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What MRP 1.0 requires:

1. Annually inspect at least 20% of installed treatment systems and HM controls
2. Annually inspect at least 20% of installed vault-based systems
3. Inspect ALL installed stormwater treatment systems at least once every five years



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O&M Inspection Prep

1. Contact site manager/property owner
2. If previous inspections have generated maintenance issues you may want to ask that maintenance staff be on hand as well.
3. Bring inspection forms
4. Bring camera or smart phone!
5. Inspect in rainy weather if possible



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Top 10 Items to Check:

1. Biotreatment Soil Condition and Trash
2. Plant Maintenance
3. Mulch, Rock and Netting
4. Flow Spreading
5. Standing Water - Mosquitos
6. Inlets and Overflows
7. Irrigation System
8. Conveyances
9. Erosion
10. Signage and Maintenance Records



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1. Biotreatment Soil Mix

- a) Remove trash
- b) Check compaction with soil probe
- c) Remove accumulated fine sediments
- d) If more soil mix is needed, order from a supplier on the program list:

<http://flowstobay.org/newdevelopment>



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BIOTREATMENT SOIL MIX SUPPLIER LIST

Company	Contact Name	Phone	Address	City, State
American Soil & Stone Products Inc.	Cory Graham	510-292-3038 510-292-3000	Richmond Annex, 2121 San Joaquin St., Bldg. A	Richmond, CA
L.H. Voss Materials, Inc.	Nyoka Corley	925-676-7930	5965 Dougherty Road	Dublin, CA
Lyngsoe Garden Materials, Inc.	Paul Troyts	650-333-1044 650-364-1730 x131	23 Seaport Blvd.	Redwood City, CA
Pleasanton Trucking Inc.	Tom Bonnell	925-449-5400	P.O. Box 11462	Pleasanton, CA
Red-Gro Corporation	Sharon Yen	916-381-6063 800-654-4358	8909 Elder Creek Road	Sacramento, CA
TMT Enterprises, Inc.	Matt Moore	408-432-9040	1395 Oakland Road	San Jose, CA



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Berkeley Sedge
(Carex tumulicola)





2. Plant Maintenance

- Remove dead plants (replace with better choice if conditions have changed)
- Remove excess plants - they fill in and often need thinning after 1 year
- Remove weeds and invasive plants – do not use synthetic herbicides (check OMRI.org)
- Leave some plants near inlets to slow water and filter trash
- If needed, fertilize only with non-synthetic products like worm castings & compost (check for OMRI.org for product listing)



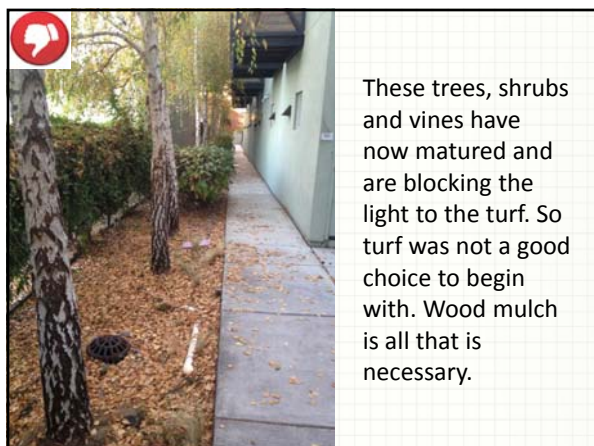
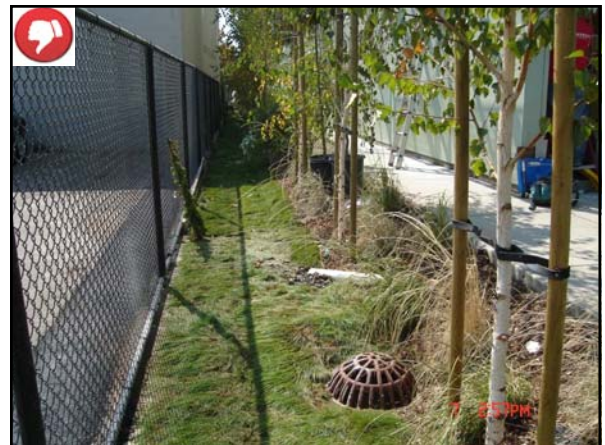
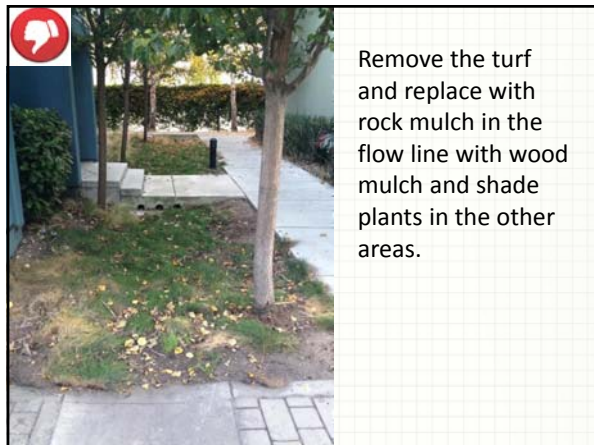
Plants:

- Right Plant, Right Place
- Use Appendix A (Plant List) in the C3 Tech. Guidance on the SMCWPPP Website:
www.flowstobay.org/newdevelopment
- Consider irrigation needs/availability
- Choose to minimize pruning at maturity
- Perennials like: Rushes, Sedges, Fescues, Bunch Grasses and Sedums.
- No Turf: The Drought!
- Avoid the use of invasive species** - Check www.cal-ipc.org, the California Invasive Plant Council list.



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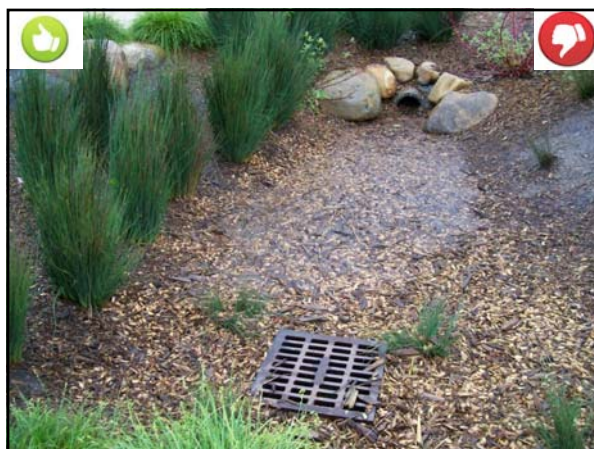
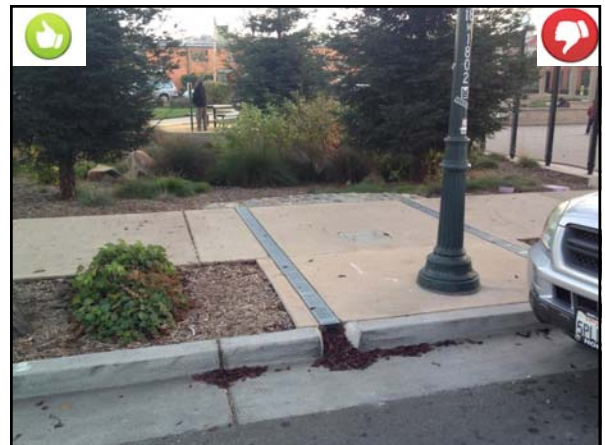




3. Mulch (wood, rock or netting)

- a) Use 3" of composted arbor mulch, gravel, cobble or jute netting depending on design
- b) Needs to be replenished annually
- c) Cover all bare soil areas except within 12" of tree trunks
- d) May need a screen on the overflow – look for "Bathtub ring"
- e) Remove weeds and then replenish mulch
- f) Mulch supplier spec/list being developed



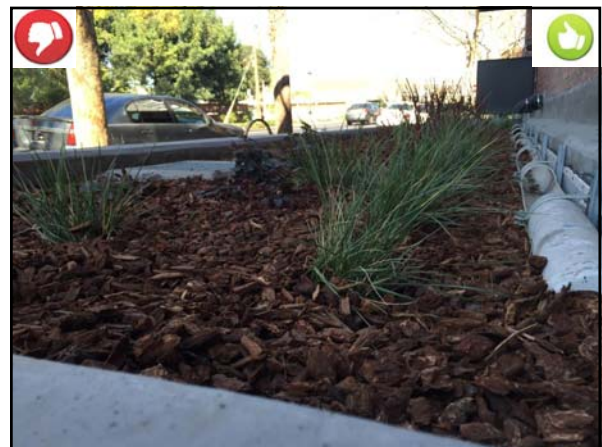






4. Flow Spreaders & Hi-Flow Bypass

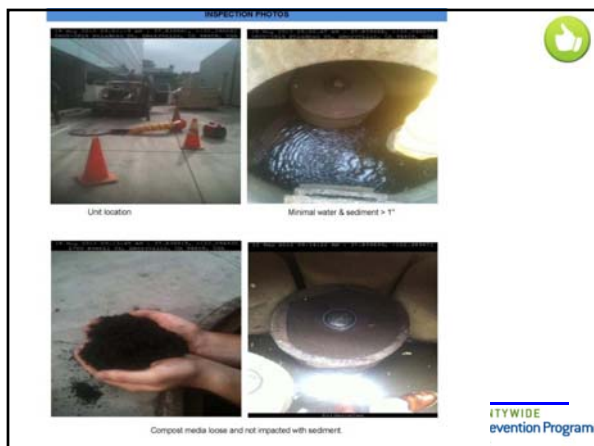
- a) Flow spreaders maximize the treatment capacity and can help with undersized and/or long and narrow systems, but they can get dislodged and clogged.
- b) Hi-Flow Bypass can be improperly graded allowing too much flow to avoid treatment.

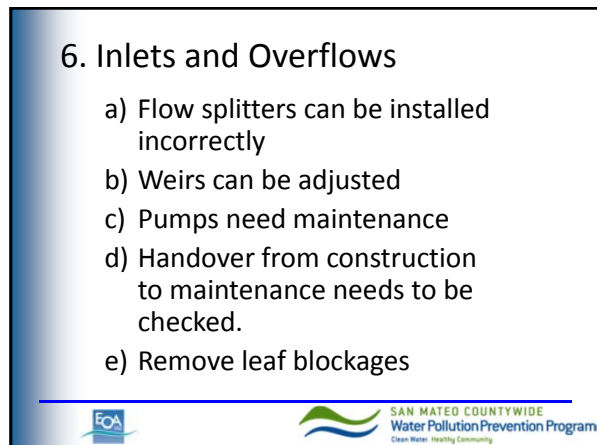
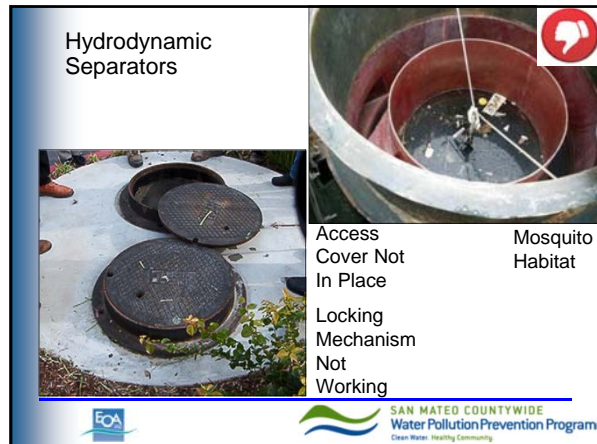




5. Standing Water -> Mosquitos

- a) Out of sight, out of mind
- b) Neglected sites
- c) Change in ownership
- d) Vault maintenance







7. Irrigation System

- a) Lack of mulch can expose lines.
- b) Vandalism
- c) Kids!
- d) Don't grade side slopes too steeply



8. Conveyances

- a) Curb Cut width
- b) Trench Drain width and length
- c) Valley gutters
- d) Manhole sealing
- e) Pipe blockages
- f) Pumps need to be tested annually





9. Erosion

- a) Use splash blocks, rock, flow spreaders and mulch to prevent erosion
- b) Compacted soils
- c) Excessive Hardscape Features
- d) Large outlet pipes (recommend a maximum of 6")





10. Signage and Maintenance Manuals

- a) Identifying system
- b) Identifying Intent
- c) Identifying Maintenance BMPs
- d) Contact Info
- e) Check Maintenance Records
and O&M Agreements



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Operation & Maintenance (OM) Manual v01

filterra
Bioretention Systems
A Growing Tide in Stormwater Filtration

AMERICAST
Filtration & Stormwater Management Systems
1st Floor (200) 349-3458 / 1st Floor (200) 349-3458 / 1st Floor (200) 349-3458 / 1st Floor (200) 349-3458

Recommends 2/year maintenance and after every storm event with over 1" of rain.

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Additional Training:



Bay-Friendly Landscaping and Gardening Coalition
www.bayfriendlycoalition.org

Bay-Friendly Qualified Professional
www.bayfriendlycoalition.org/Landscapeprofessional.shtml






Additional Training:

Bay Area Eco Gardens
<http://bayareaecogardens.org/>
 Calendar of Events
<http://bayareaecogardens.org/Events/#>





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