



# New Low Impact Development Requirements

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# Outline of Presentation

- Reminder: What is already required
- New requirements for "Special Land Use Types"
- New requirements for Low Impact Development Treatment
- What kinds of treatment measures are allowed?
- For more information...

# What Is Already Required...

## For **ALL** Development Projects?

- Encourage site design measures



Pervious walkway



"Disconnected" downspout

- Encourage source Control measures



Indoor wash area for restaurant floor mats



Pest-resistant landscaping



# What is already required...

- For projects that create and/or replace 10,000 sq.ft. of impervious surface?
  - Require source controls
  - Require site design measures
  - Require stormwater treatment measures



Pervious walkway



Pest-resistant landscaping



Bioretention area/  
Rain garden

# What is already required...

- For projects that create and/or replace 1 acre of impervious surface?
  - Determine if the project:
    - Is located in an area where creeks are subject to development-induced erosion, and
    - Increases the area of impervious surface over the pre-project condition.
  - If both conditions exist,  
**hydromodification management** is required.



# New Requirements Effective December 1, 2011

- New requirements for “Special Land Use Categories”
- New Low Impact Development treatment requirements
- LID treatment reductions for “Special Projects” (DRAFT)
- Requirements to use new specifications:
  - Biotreatment Soil Specifications
  - Green Roof Specifications

December 2011						
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# New Requirements for Special Land Use Categories

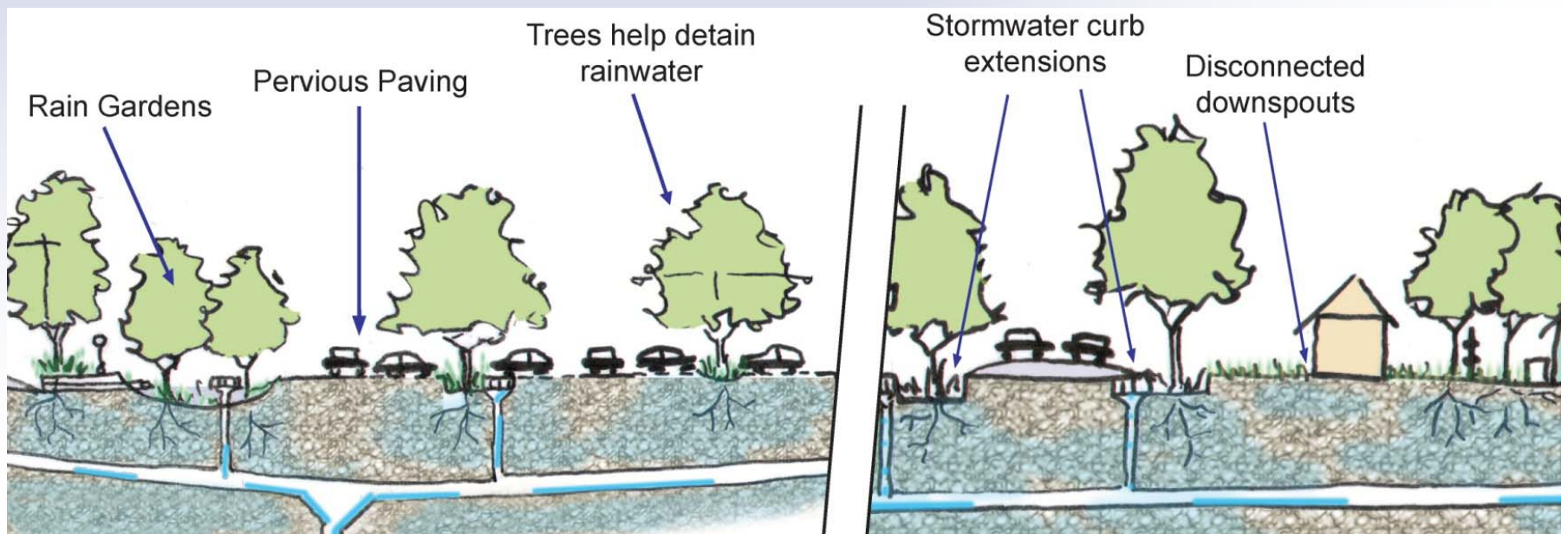
- “Special land use categories”:
  - Retail gasoline outlets
  - Auto service facilities
  - Restaurants
  - Uncovered parking lots (stand alone or part of other use).
- Projects that create and/or replace **5,000 sq. ft.** or more of impervious surface must implement:
  - Stormwater treatment measures,
  - Site design measures, and
  - Source control measures.





# New LID Treatment Requirement

- Stormwater treatment must consist of **Low Impact Development (LID) treatment** (with limited exceptions for high density and transit oriented “Special Projects”)





# New LID Treatment Requirement

- Beginning 12/1/11  
“treatment” is
  - Rainwater harvesting/reuse,
  - Infiltration,
  - Evapotranspiration,
  - Or, **if these are infeasible**,  
biotreatment.



Harvesting for rainwater for  
indoor toilet flushing

# Runoff from Frequent, Small Storms Must be Treated



- Projects must treat runoff from 100% of project as follows:
  - 80% of the average annual runoff (for volume-based treatment measures), OR
  - Flow of runoff from a rain event of 0.2 inches per hour intensity (flow-based treatment measures)
- This is called the **“C.3.d amount of runoff.”**

# Use Site Designs to Reduce the Amount of Runoff that Must be Treated

- Self-Treating Areas
- Self-Retaining Areas
- Tree Credits



Pervious walkway



"Disconnected" downspout

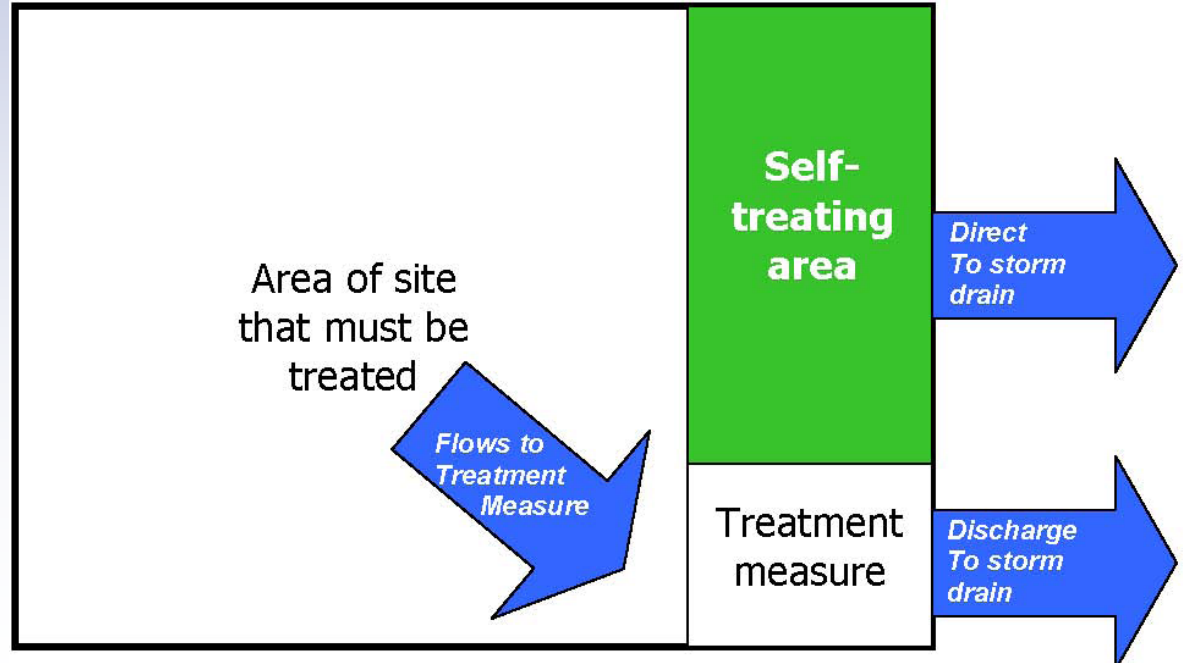


Tree planting or preservation



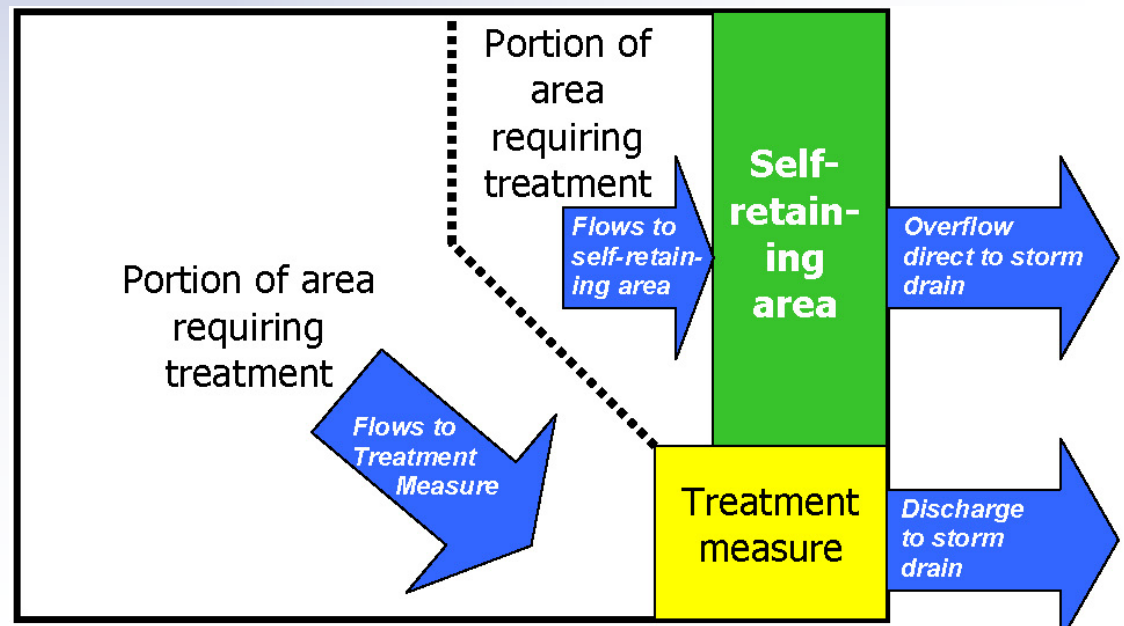
# Self-Treating Areas Reduce the Area that Requires Treatment

- Stormwater from **pervious** portions of the project can flow directly to the storm drain (no mixing with runoff from impervious areas):
  - Landscaping
  - Green roof
  - Properly-designed pervious paving



# Self-Retaining Areas Reduce the Area that Requires Treatment

- Concave area of landscaping that retains runoff from adjacent impervious surface (e.g, roof)
  - Sized at 2:1 ratio (area of tributary impervious surface: area of landscaping)
- 3-inch ponding depth
- No special soils required



# “Interceptor” Tree Credits

- Credit is allowed based on interception of rainwater by tree canopy
- This will be addressed in revision of the Program’s C.3 Technical Guidance





# "Interceptor" Tree Credits

Type of Tree Planted or Preserved	Square footage deducted from area requiring stormwater treatment
Evergreen: new planting	200 sq.ft. per tree
Deciduous: new planting	100 sq.ft. per tree
Preserve existing trees (either evergreen or deciduous)	Square footage beneath canopy

# Rainwater Harvesting and Use Feasibility Is Addressed in Separate Presentation



Rainwater harvesting

- In most cases, it will be infeasible to harvest and use the full C.3.d amount of runoff
- This is due to insufficient demand for nonpotable uses, such as:
  - Irrigation
  - Toilet flushing

# Infiltration Feasibility Is Addressed in a Separate Presentation



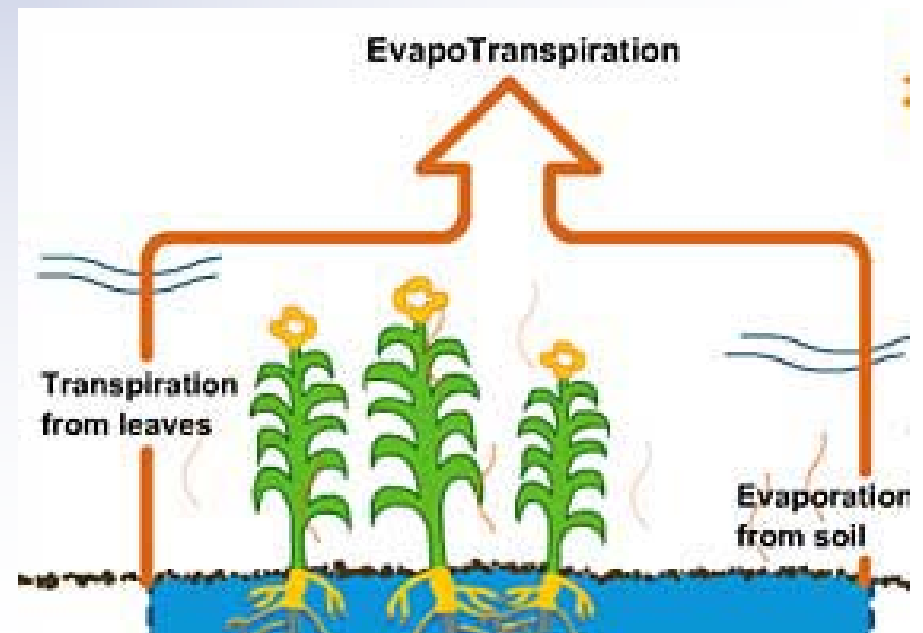
Bioretention areas can be designed to infiltrate the C.3.d amount of runoff.

- In most cases it will be infeasible to infiltrate the full C.3.d amount of runoff into the soil.
  - Native soils lack sufficiently high infiltration rates.
  - Modeling assumed an underlying, 12"-deep rock layer for storage.



# A note about evapotranspiration

- Evapotranspiration:
  - The combined effect of evaporation and the transpiration of water from plant leaves.
  - We are not specifically evaluated evapotranspiration because it is assumed to occur in all landscape-based treatment measures.



# What Are Biotreatment Measures?

- Must filter stormwater through “biotreatment soil”
  - Long-term infiltration rate of 5 to 10 inches per hour
  - Soil must be suitable to support plant health
- Must be large enough in surface area to
  - Have a surface loading area of at least 5 inches per hour.



Bioretention/Rain Garden

# Types of Biotreatment Measures

Treatment measure Type	Flow-Based or Volume-Based
Bioretention area/rain garden	Either flow- or volume-based
Linear bioretention area/bioretention swale	Either flow- or volume-based
Flow-through planter	Either flow- or volume-based
Vegetated buffer strip (less common)	Flow-based

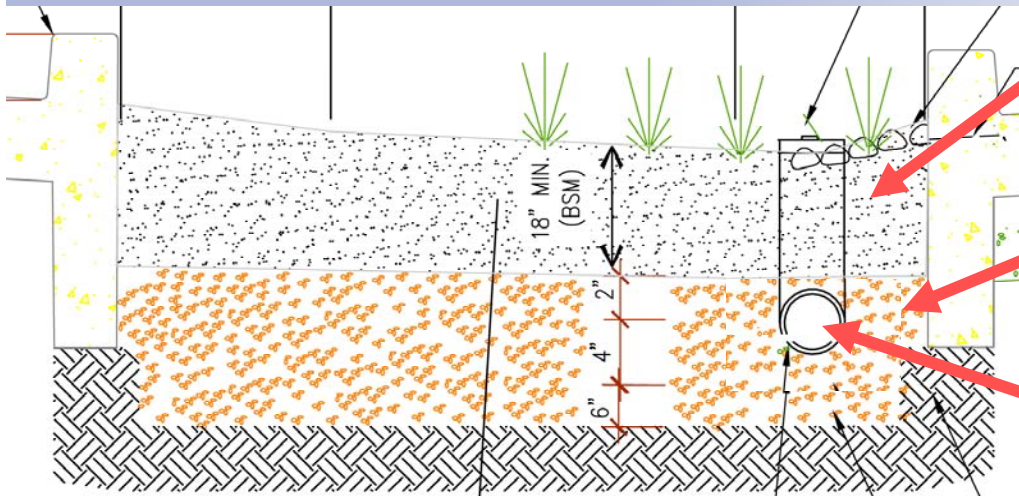


# When Is a Bioretention Area Considered “Biotreatment”?

- It is BIOTREATMENT when
  - Soil is too clayey to infiltrate C.3.d amount of runoff, and
  - An underdrain is provided.
- Unless hazards exist, biotreatment should maximize infiltration,
- Use the SAME DESIGN that is used in locations where it is feasible to infiltrate the C.3.d amount of runoff



# Maximize Infiltration in Biotreatment Areas, if conditions allow



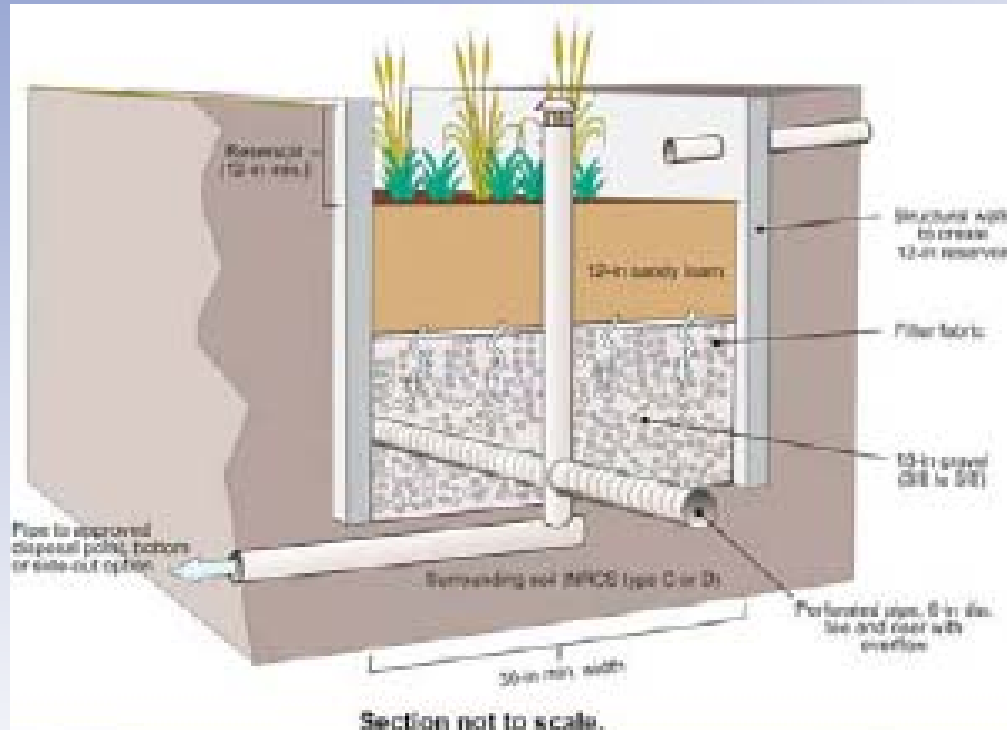
18 inches of biotreatment soil

12-inch layer of Class 2 permeable Rock

Underdrain positioned near top of rock layer

- Bioretention and Bioinfiltration design is the same, except for situations where hazards to infiltration exist.

# Avoid infiltration if hazards to infiltration exist

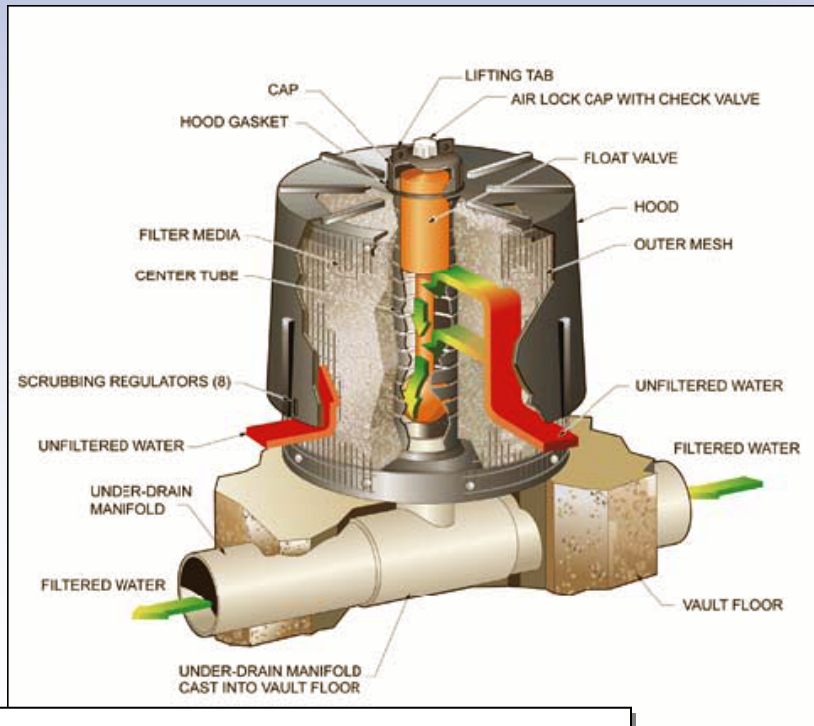


- Hazards to infiltration include:
  - Steep slopes
  - High groundwater table
  - < 10 feet from building foundation
  - Subsurface contamination

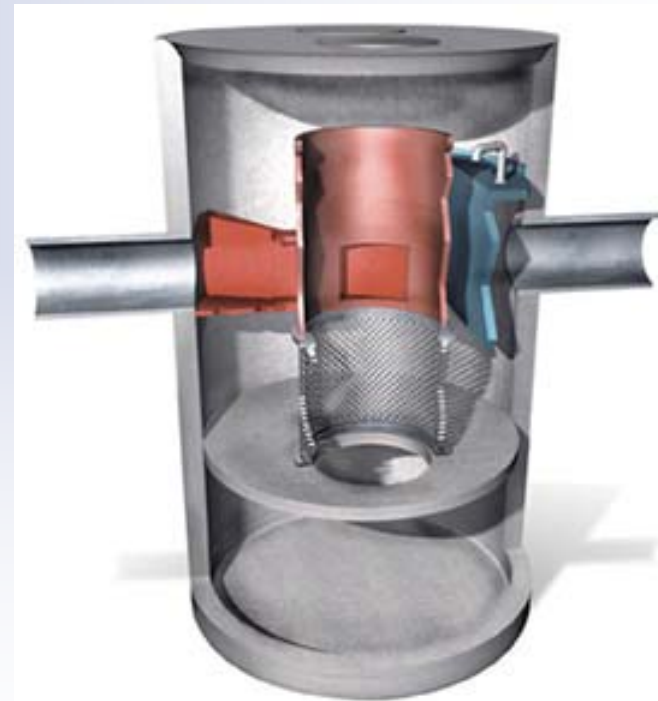
Flow through planter has concrete-lined sides and bottom.

# Vault Systems Will Be Restricted

- Beginning December 1, 2011, mechanical, vault-based stormwater treatment systems will not meet LID treatment requirements.



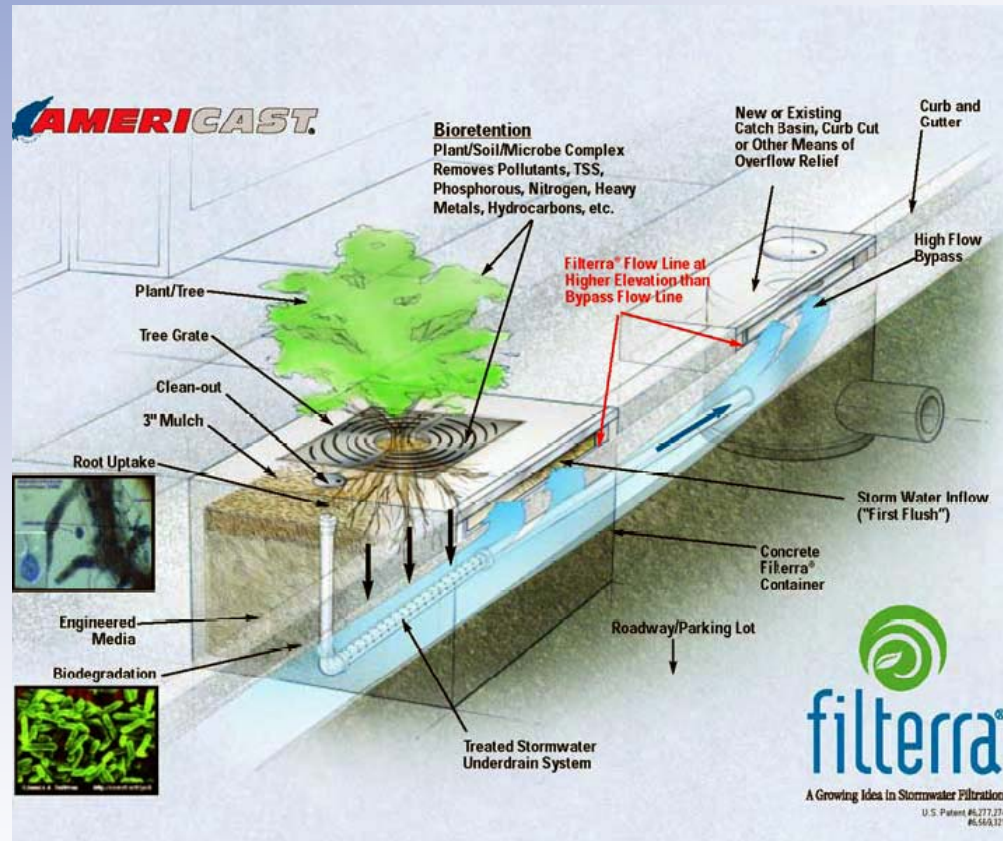
Media Filter Cartridge



Hydrodynamic separator



# Manufactured Tree Well Filters Will Be Restricted



- Example of Manufactured Tree Well filter
- Infiltration rate exceeds biotreatment requirement

# Limited Use of Media Filters and Tree Well Filters in “Special Projects”

- Special Projects are high density and transit oriented development projects that will receive LID treatment reduction credit
- Water Board December is scheduled to adopt Special Projects criteria on November 9, 2011.



Transit Oriented Development, Redwood City

# “Special Projects” Category A Infill Projects

- Located in central business district or comparable pedestrian oriented district.
- Built as part of objective to preserve or enhance pedestrian-oriented environment.
- Creates or replaces ½ acre or less of impervious surface.
- No surface parking except for emergency access, ADA or loading requirements.
- 85% of lot is covered by buildings; remaining 15% is for safety access, trash/recycling, public uses, etc.
- 100% LID treatment reduction credit.



# “Special Projects” Category B High Density Projects

- Located in central business district or comparable pedestrian oriented district.
- Built as part of objective to preserve or enhance pedestrian-oriented environment.
- Creates or replaces  $> \frac{1}{2}$  acre, but no more than 2 acres, of impervious surface.
- No surface parking except for emergency access, ADA or loading requirements.
- 85% of lot is covered by buildings; remaining 15% is for safety access, trash/recycling, public uses, etc.
- Graduated system of LID treatment reduction credit.





# "Special Projects" Category B

## Graduated credit system

LID Treatment Reduction	Land Use	Density
50%	Commercial or Mixed Use	Floor Area Ratio 2:1
50%	Residential	50 dwelling units/acre
75%	Commercial or Mixed Use	Floor Area Ratio 3:1
75%	Residential	75 dwelling units/acre
100%	Commercial or Mixed Use	Floor Area Ratio 4:1
100%	Residential	100 dwelling units/acre

# “Special Projects” Category C Transit Oriented Development Projects

- Prerequisites
  - Must be a non-auto oriented project. (No stand-alone surface parking lots, car dealerships, auto and truck rental facilities with onsite surface storage, etc.)
- If it is a commercial or mixed use project, a minimum floor area ratio of 2:1 is required.
- If it is a residential project, a minimum density of 25 dwelling units/acre is required.
- Graduated system of LID treatment reduction credit.
  - Location credit
  - Density credit
  - Minimize surface parking credit



# “Special Projects” Category c Location Credit System

LID Treatment Reduction	Location
50%	Within ¼ mile radius of existing or planned transit hub
25%	Within ½ mile of radius of existing or planned transit hub
25%	Within a planned Priority Development Area (designated by ABAG/MTCA)



# "Special Projects" Category C

## Density credit system

LID Treatment Reduction	Land Use	Density
10%	Commercial or Mixed Use	Floor Area Ratio 2:1
10%	Residential	30 dwelling units/acre
20%	Commercial or Mixed Use	Floor Area Ratio 4:1
20%	Residential	60 dwelling units/acre
30%	Commercial or Mixed Use	Floor Area Ratio 6:1
30%	Residential	100 dwelling units/acre



# "Special Projects" Category C

## Minimize surface parking credit system

LID Treatment Reduction	Location
10%	10% or less of the total post-project impervious surface is dedicated to at-grade surface parking
20%	No surface parking except for emergency vehicle access, ADA accessibility, and loading zones



# Biotreatment Soil Specifications

- Long term infiltration rate of 5 in/hr
- Soil media for biotreatment systems designed to sustain healthy, vigorous plant growth and maximize stormwater runoff retention and pollutant removal
- Consist of the following mixture:
  - 60%-70% Sand
  - 30%-40% Compost
- Specifications provided for each component



Bioretention Area,  
Serramonte Library,  
Daly City

# Green Roof Specifications

- Planting media shall be sufficiently deep to:
  - Provide capacity within the pore space of the media for the water quality runoff volume
  - Support the long term health of the vegetation selected for the green roof, as specified by a landscape architect or other professional



Casa Feliz Green Roof, San Jose

# How Do the New Requirements Phase In?

- For permit applications deemed complete before 12/1/09
  - If applicant “diligently pursues” the project, the new requirements do NOT apply.

<b>December 2009</b>						
<b>Mon</b>	<b>Tue</b>	<b>Wed</b>	<b>Thu</b>	<b>Fri</b>	<b>Sat</b>	<b>Sun</b>
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<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>			



# How Do the New Requirements Phase In?

- For permit applications deemed complete on or after 12/1/09

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- If final discretionary approval is received **before** December 1, 2011, the new requirements will **NOT** apply.
- If final discretionary approval is received **on or after** December 1, 2011, the new requirements **WILL** apply.

# For More Information...



- Municipal Regional Stormwater Permit  
[www.flowstobay.org/ms\\_municipalities.php](http://www.flowstobay.org/ms_municipalities.php)
- San Mateo Countywide New Development Page  
[www.flowstobay.org/bs\\_new\\_development.php](http://www.flowstobay.org/bs_new_development.php)
  - Download Provision C.3 tools (including those in the workshop folder)
  - Download C.3 Stormwater Technical Guidance



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