

Standards for Green Building: How Do They Relate to C.3 Compliance?



Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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Outline of Presentation

- Brief review of municipal stormwater C.3 requirements
- What are green building standards?
- Comparison of green building criteria with C.3 Requirements
- Future trends
- What can municipal staff do?



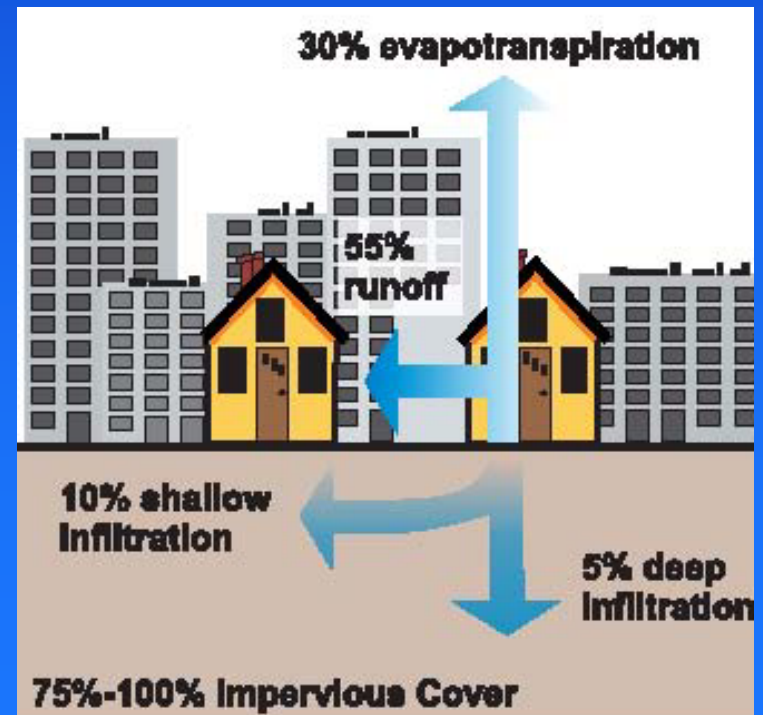
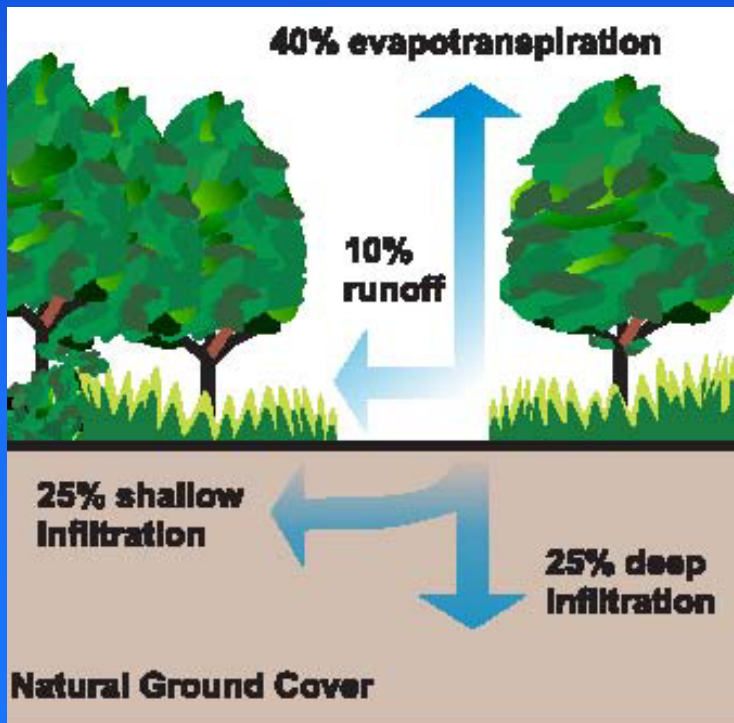
Why Do We Need Provision C.3?

- To reduce pollutants in receiving waters and prevent development-induced erosion.



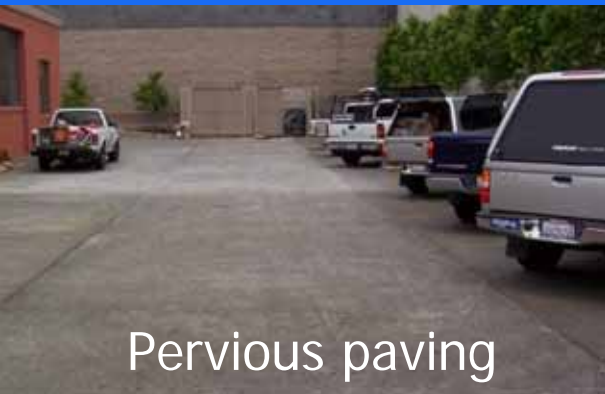
How Can We Reduce Long-Term Development Impacts?

- Implement post-construction controls (that help the developed site mimic pre-development hydrology).



What Does Provision C.3 Require?

- Implement **post-construction controls** in new development/redevelopment projects:
 - Site design measures
 - Source controls
 - Stormwater treatment measures
 - Hydromodification management (HM) measures



Pervious paving



Integrated pest management



Extended detention basin

What is Low-Impact Development (LID)?

- Stormwater management that mimics the **natural hydrologic functions** of a site.
- Distributes **small** site design and landscape features **throughout the site**.
- LID in the Draft Municipal Regional Permit:
 - Source controls
 - Site design measures
 - Stormwater treatment measures

C.3 Requirements

Thresholds for Compliance

- All projects should consider appropriate **site design measures** and **source controls**.
- Projects that create/replace 10,000 sq. ft. or more of impervious surface must include **site design measures, source controls, and treatment measures**.
- Projects that create/replace 1 acre or more of impervious surface in susceptible areas must include appropriate **HM measures**.



What Are Green Building Rating Systems?



- Objective criteria for determining how “green” a project is.
- Increasingly used by municipalities to require or encourage green building.
- The criteria address many issues:
 - Energy efficiency
 - Resource conservation (including water)
 - Indoor environmental quality
 - Outdoor environmental quality (including water)
 - And more...

What Rating Systems Are Available?

- National:
 - Leadership in Energy and Environmental Design (LEED): leading the way
 - National Association of Home Builders' National Green Building Program: new in 2008
 - Energy Star for Homes: energy efficiency focus
- California:
 - Build It Green's "GreenPoint Rated: residential only
 - California Green Builder: residential and industry



ENERGY STAR



Comparing LEED and Build It Green with C.3



- Background on Comparison
 - Applicants want to earn green building credits for stormwater compliance.
 - Co-permittees are using LEED and Build It Green.
 - We looked at:
 - **LEED-New Construction,**
 - **LEED-Neighborhood Development,** and
 - **Build It Green-Single Family Homes**
- Approach
 - We identified criteria that earn points for post-construction controls and construction BMPs.

LEED-NC, LEED-ND, and Build It Green: A Quick Overview

- LEED-New Construction
 - New development of individual commercial and institutional projects
 - National standards
- LEED-Neighborhood Development
 - In pilot phase
 - Neighborhood developments, or individual projects near applicable neighborhoods
- Build It Green
 - Specific to California
 - Criteria for single family and multi-family homes
 - We looked at single family only

Green Points for Site Design

LEED-New Construction



- Preserve 100 foot buffer from wetlands, 50 foot buffer from water bodies.
- Reduce building foot print and/or provide open space to exceed zoning requirement by 25%.
- Parking meets zoning minimum, with preferred parking for carpools/vanpools.
- 50% of non-roof impervious areas are shaded and/or open-grid pavement, OR 50% of parking spaces are covered.
- Green roof (50% roof area)
- Proximity to public transit.



Green Points for Site Design: LEED-Neighborhood Development (Pilot)

- Wetland/water body buffers are put in **land trust**.
- Locate project footprint/construction zone on **previously developed areas**, OR based on project density, preserve 10-20% open land.
- **Limit surface parking** to no more than 20% of development footprint; no parking lot over 2 ac.
- Shade or use open-grid pavement for 50% of non-roof imperviousness, OR cover 50% of parking spaces; **OR green roof** for 50% of roof.
- Proximity to public transit is prerequisite.

Green Points for Site Design: Build It Green: GreenPoint Rated

- Plant shade trees of drought-tolerant, California native and Mediterranean species.



Green Points for Source Control: LEED-New Construction

- Reduce potable water consumption for irrigation by 50% (mid-summer baseline).
- For irrigation, use only captured rainwater, recycled waste water, and/or water treated and conveyed for non-potable use, OR plant landscaping that requires no irrigation.



Green Points for Source Control: LEED-Neighborhood Development

- Same as LEED-New Construction



Green Points for Source Control

Build It Green: GreenPoint Rated

- 75% of plants are native species
- Minimize water for turf:
 - Turf water requirement \leq tall fescue
 - No turf on slopes exceeding 10%
 - Landscaped area is less than 33% turf
 - Landscaped area is less than 10% turf
- Install high efficiency irrigation system
- Use hydrozones (group plants by water needs)
- Mulch all planting beds (2", or more if required)
- 2" of compost in top 6 to 12 inches of soil.





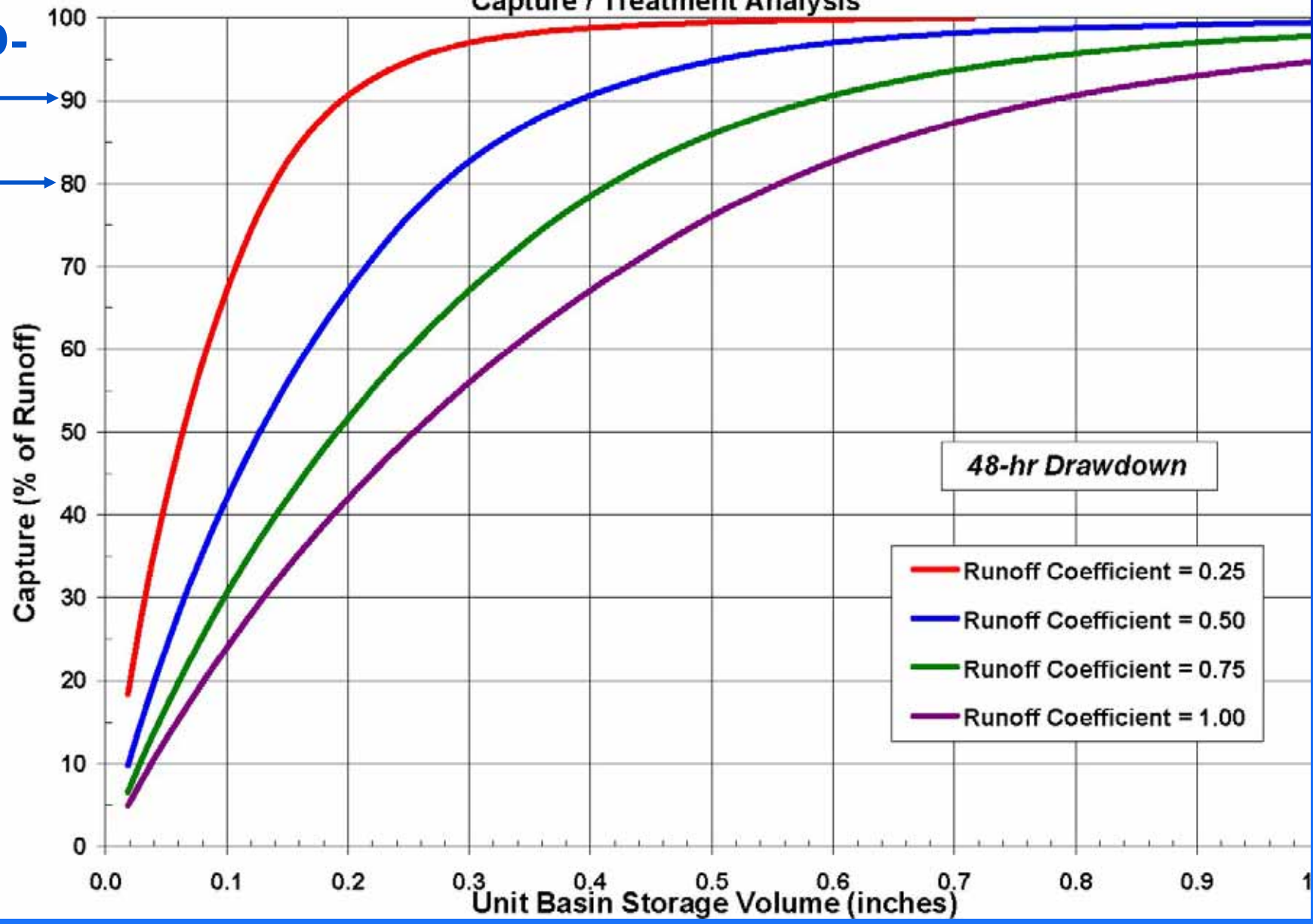
Green Points for Treatment

LEED-New Construction

- Reduce imperviousness, promote infiltration, and treat runoff from 90% average annual rainfall with BMPs that remove 80% average annual post-development total suspended solids.
 - Does NOT match C.3 hydraulic sizing criteria!
 - BMPs approved for use in New Jersey or western Washington State meet the TSS criterion.
 - Examples: Bioretention, detention basin, swales (especially if designed for infiltration)
 - Use volume-based criterion of 90% capture, instead of the 80% capture criterion in Provision C.3.d.

San Jose (7821) - Santa Clara County, California
Capture / Treatment Analysis

LEED-
NC →
C.3 →



From CASQA New Development Handbook, Appendix D

Green Points for HM

LEED-New Construction



- For sites with existing imperviousness less than 50%:
 - Peak post-development discharge rate and volume must match pre-development rate and volume for 1- and 2-year, 24-hour design storms
 - OR -
 - Implement stormwater management plan with stream channel protection strategy and quantity control strategies (i.e. C.3 HM requirements?)

Green Points for HM

LEED-New Construction (continued)



- For sites with existing imperviousness greater than 50%:
 - Achieve 25% decrease in [pre-project?] runoff volume for 2-year, 24-hour design storm.
- Does NOT match the C.3 HM requirement!
 - Applies to all sites in all locations
 - For sites < 50%, can use HMP criteria
 - For sites > 50%, use landscaping, pervious paving to get runoff volume decrease

Stormwater Management

LEED-Neighborhood Development



- Implement stormwater management plan that infiltrates, reuses, or evapotranspires rainfall from the developed footprint*, as specified in the following table.
- *Developed footprint = Impervious surfaces + any pervious paving planned

Stormwater Management

LEED-Neighborhood Development



Points for Runoff Reduction	Arid Watersheds	
	Previously developed sites	All other sites
1 point	0.15"	0.30"
2 points	0.30"	0.60"
3 points	0.45"	0.90"
4 points	0.60"	1.2"
5 points	0.75"	1.5"

Stormwater Management

LEED-Neighborhood Development



- More points available than in LEED-NC
- Range of points allows projects to receive credit at lower thresholds
- Does NOT match C.3 hydraulic sizing or HM requirements!
 - No credit for treatment alone, only volume reduction
 - Can get credit for LEED-NC certified buildings in the “neighborhood”
 - Must submit Stormwater Management Plan to get credit



Green Points for Erosion Control

LEED-New Construction

- Erosion/sediment control plan is a prerequisite.
- Options for limiting disturbance:
 - Maintain specified distances from project features (40 ft. from building, 10 ft. from parking areas, etc.)
 - For previously-developed site, restore or protect 50% of site with native/adapted vegetation.

Green Points for Erosion Control

LEED-Neighborhood Development



- Erosion/sediment control plan is a prerequisite (same as LEED-NC).
- Options for limiting disturbance:
 - Maintain specified distances from project features (same as LEED-NC)
 - For previously-developed site, restore or protect 50% of site with native/adapted vegetation (same as LEED-NC)
 - **New option: Preserve trees** (100% of Heritage or Champion, 75% of larger non-invasives, etc.)

Green Points for Erosion Control

Build It Green

- Limit construction footprint for maximum protection (beyond local minimums)
- Grading protects horticulturally suitable topsoil.



LEED-NC and Stormwater In a Nutshell



- Site Design – points earned from:
 - Specified buffers from wetlands and water bodies
 - Exceed open space requirement by 25%
 - Shade /open grid pavement /covered parking
 - Green roof (50% of roof area)
 - Proximity to public transit
- Source Control – points earned from
 - Reduce potable water for irrigation
 - Landscaping that requires no irrigation
- Treatment and Hydromodification
 - Share goals with C.3 but different criteria
- Points for erosion control

LEED-ND and Stormwater In a Nutshell



- Similar to LEED-NC, but more generous in some ways:
 - Simplified treatment/HM criterion (range of points)
 - Credit for building on previously developed area OR for open space based on project density
 - Credit for tree preservation
- In some ways stricter than LEED-NC:
 - Wetland/water body buffers in land trust
 - No points for simple proximity to public transit
 - Credit for green roofs OR shade /open grid pavement /covered parking
 - Tougher threshold for reduced parking

Build It Green and Stormwater In a Nutshell

- Lots of green landscaping points (source control)
- Tree planting credit (site design)
- Points for construction erosion control
- No points for treatment or HM (not required for individual SF homes under C.3)



Future Trends?

- LEED 2009 revisions:
 - Consistency of credits and prerequisites among LEED rating systems.
 - Clarify language.
 - Recognize regional environmental priorities (e.g., bonus points for credits considered most important for defined regions).
- Build It Green rating system for existing home remodels: July 2008.

What Can Municipal Staff Do?



- Educate policy makers that green building criteria are compatible with C.3 requirements, but do not meet C.3.
- Educate project applicants that meeting C.3 requirements can also earn green building points.
- Stay tuned for more developments...

Questions?

