



SCVURPPP
C.3 Workshop
April 1, 2026

Stormwater Controls for Development Projects

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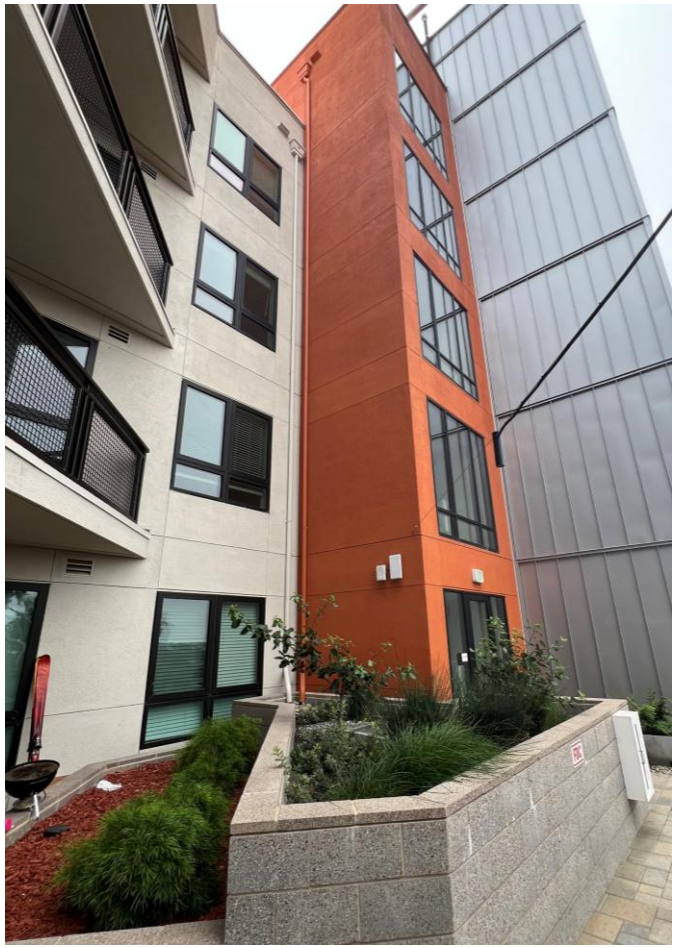
Presentation Overview

- Stormwater Permit Background
- Regulated Project Requirements
  - Terminology
  - Treatment Measures
- Regulated Project Types and Thresholds
  - Parcel-based projects
  - Pavement projects
  - Alternative Compliance Options



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Bay Area Municipal Regional Permit (MRP)

- Regional Phase I stormwater NPDES permit for urban areas (79 permittees):
  - Counties, cities, towns and districts in San Mateo, Santa Clara, Alameda, and Contra Costa Counties; and Fairfield-Suisun & Vallejo
- MRP 3.0 effective July 1, 2022
- Requirements for New/redevelopment controls effective on <u>July 1, 2023</u>

MRP Provisions

- Municipal Operations
- New Development and Redevelopment ("C.3")
- Industrial/Commercial Site Controls
- Illicit Discharge Controls
- Construction Site Controls
- Public Education/Outreach
- Water Quality Monitoring
- Pollutant of Concern Controls
  - Pesticides
  - Trash
  - Mercury
  - PCBs
  - Copper
- Exempted/Conditionally Exempted Non-Stormwater Discharges
- Unsheltered Homeless Populations
- Cost Reporting
- Asset Management

Provision C.3 Basics

- New Development and Redevelopment projects above certain impervious surface thresholds are required to manage stormwater runoff onsite using Low Impact Development (LID) measures or Green Stormwater Infrastructure (GSI).
- Permittees are also required to retrofit existing public streets and parking lots where feasible to treat runoff with LID/GSI measures

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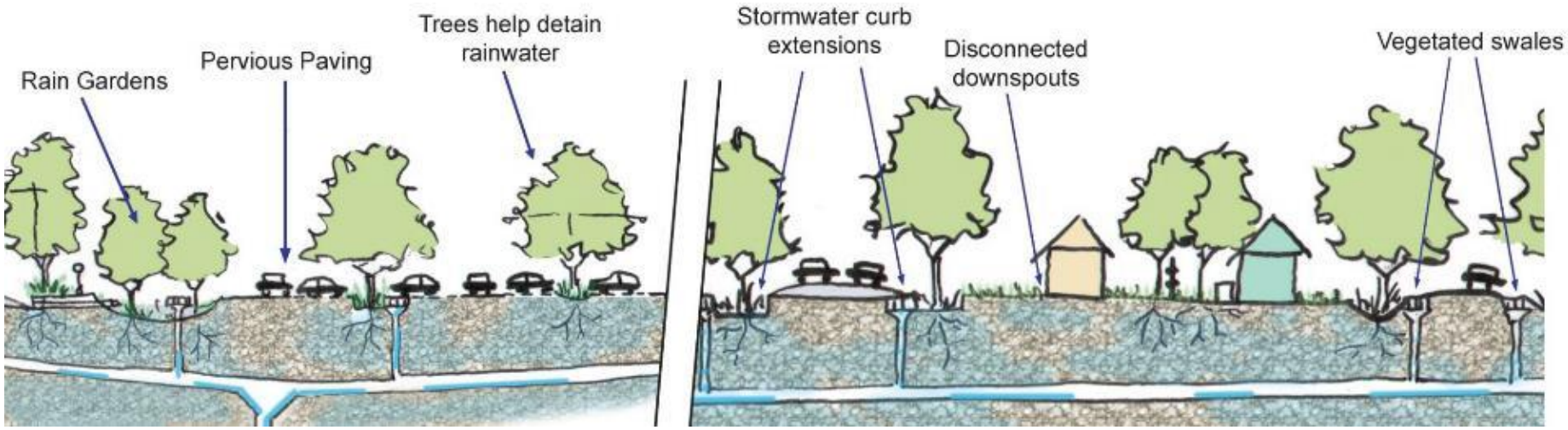
What is Low Impact Development (LID)?

- LID is an approach to reduce runoff and mimic a site's predevelopment hydrology:
  - Minimize disturbed areas and impervious surfaces
  - Retain and treat stormwater runoff using infiltration, evapotranspiration, rainwater harvesting/use or biotreatment



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What is Green Stormwater Infrastructure (GSI)?

- Systems using vegetation, soils, and natural processes to manage stormwater that are integrated into new and redevelopment projects, urban streetscapes, parking lots and other urban areas

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Stormwater Control Measures: Construction BMPs vs. GSI/LID Systems

Construction best management practice (BMP) is temporary (construction-phase only)

Post-construction stormwater control measure is permanent (for the life of the project)

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C.3 Requirements in MRP 3

- Description of regulated projects
- LID approach – source control, site design, treatment
- LID sizing and design guidelines
- Alternative compliance options
- Hydromodification management requirements
- O&M verification program requirements
- Site design requirements for small, unregulated projects

LID Requirements

- Source Control Measures - permanent features or practices that reduce pollutant sources
- Site Design Measures – design features that reduce or disconnect impervious surfaces and preserve natural areas
- LID Treatment Measures – infiltration, evapotranspiration, rainwater harvesting/use, and biotreatment/bioretention
- Hydromodification Management Measures – features that control runoff peaks, volumes, and durations where needed to control erosion in creeks

Source Control Measures

- **Structural Source Controls** are permanent design features that reduce pollutant sources:
  - Covered trash enclosures
  - Storm drain labeling
  - Installing Bay-Friendly landscaping with reduced pesticide, fertilizer and water needs
- **Operational Source Controls** are practices to be conducted on an ongoing basis after construction is completed
  - Street/parking lot sweeping
  - Catch basin cleaning
  - Landscape maintenance

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Site Design Measures

- Permanent design features that:
  - Reduce impervious surfaces
  - “Disconnect” impervious surfaces
  - Preserve/protect natural features
- Examples include:
  - Runoff directed to landscaping
  - Pervious pavement

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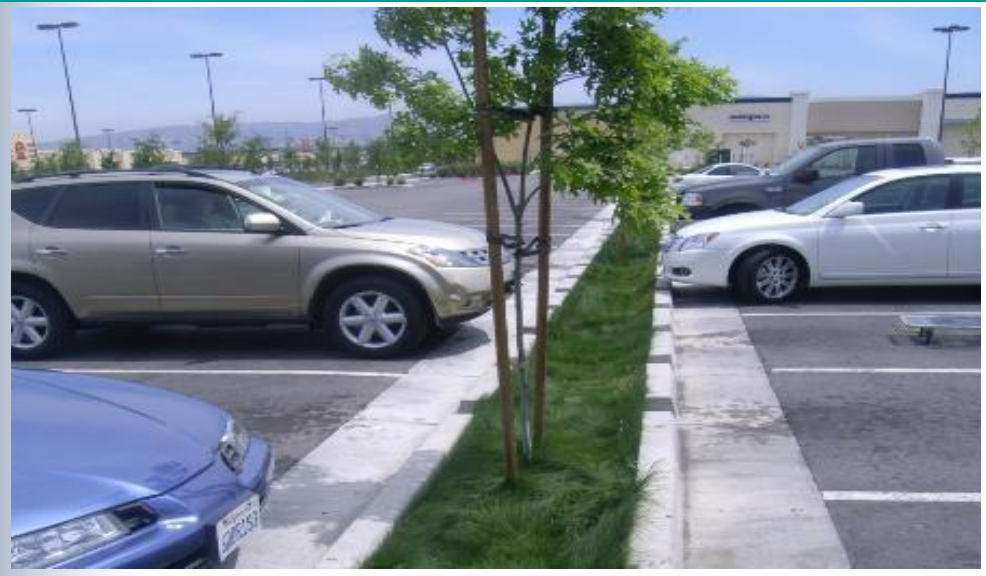
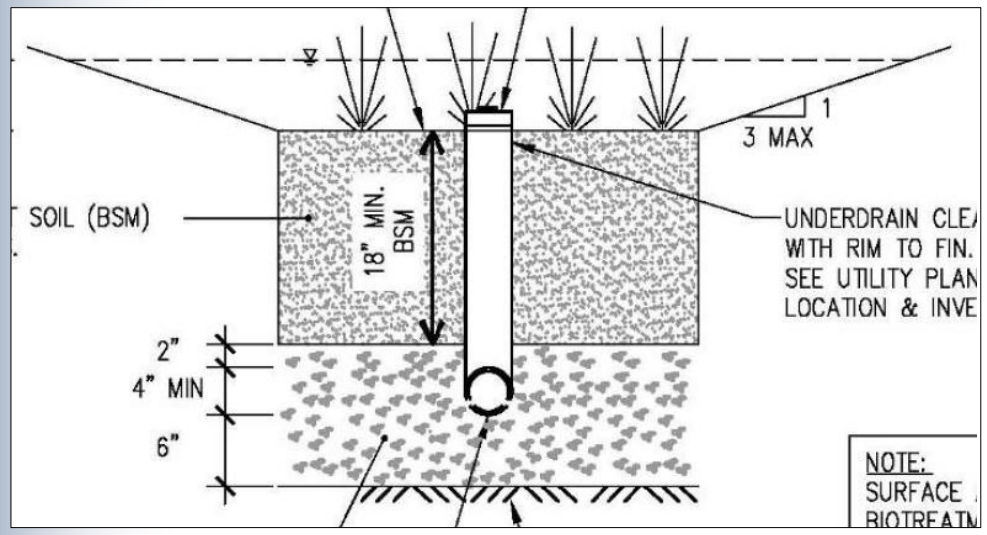
LID Treatment Requirements

- LID treatment methods required since 12/1/11
- LID treatment defined as:
  - Biotreatment
  - Infiltration
  - Evapotranspiration
  - Rainwater harvesting/use
- Non-LID treatment only allowed in certain cases

LID Treatment Measures





- Engineered systems that remove pollutants from stormwater
- Sized to treat stormwater runoff from **frequent, small storm events**
- Provision C.3.d of the MRP specifies numeric sizing criteria for water quality design based on flow and/or volume
- Maintenance assurance required for the life of the project

LID Sizing and Design Guidelines

- C.3.d sizing requirements

  Sizing Worksheets at www.scvurppp.org

  - 80% of average annual runoff (volume-based)
  - Flow of runoff from a rain event of 0.2 in/hr intensity (flow-based)
  - Combination flow and volume approach
- Bioretention design criteria

  C.3 Handbook at www.scvurppp.org

  - Size based on a 5 in/hr surface loading rate
  - Must use an engineered biotreatment soil mix (per spec)
  - Raise the underdrain for maximum infiltration where possible
- Pervious pavement design criteria

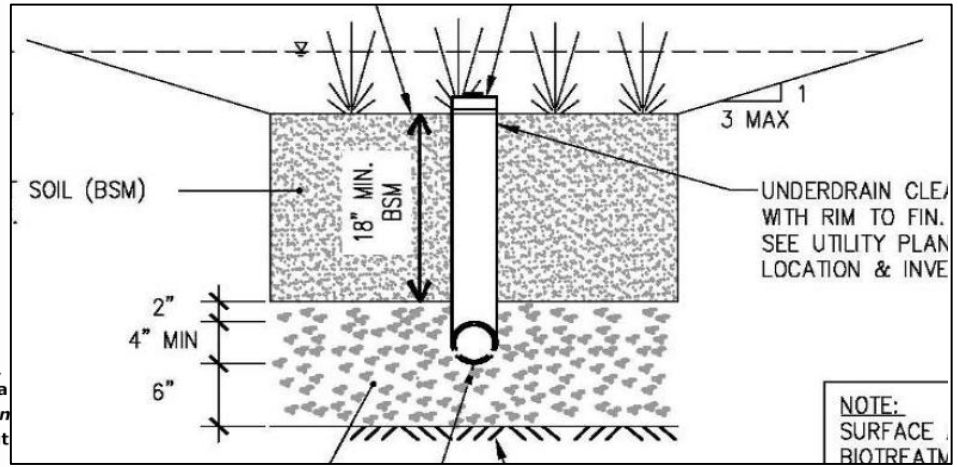
  C.3 Handbook at www.scvurppp.org

  - Volume-based; follow established guidance/specs
  - Aggregate section must be able to store/infiltrate C.3.d volume

Biotreatment Measures

- Most common treatment measures:
  - Bioretention areas/rain gardens
  - Biotreatment
    (aka flow-through planters)
  - Linear biotreatment/bioretention areas
    (aka stormwater planters or
    “bioswales”)

Bioretention Area/Rain Garden



- Concave landscaped area of any shape, with sloped sides
- Engineered biotreatment soil media with specified long-term infiltration rate (5 in/hr)
- Underdrain required if clayey underlying soils
- Raise underdrain to maximize infiltration, if conditions allow

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Bioretention Areas

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Flow-through Planter

- Lined planter box with vertical sides
- No infiltration to underlying soils
- Stormwater filters through specified biotreatment soil mix and released through underdrain at bottom
- OK to place next to building or on podium if waterproofed

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Photo courtesy of City of Burlingame

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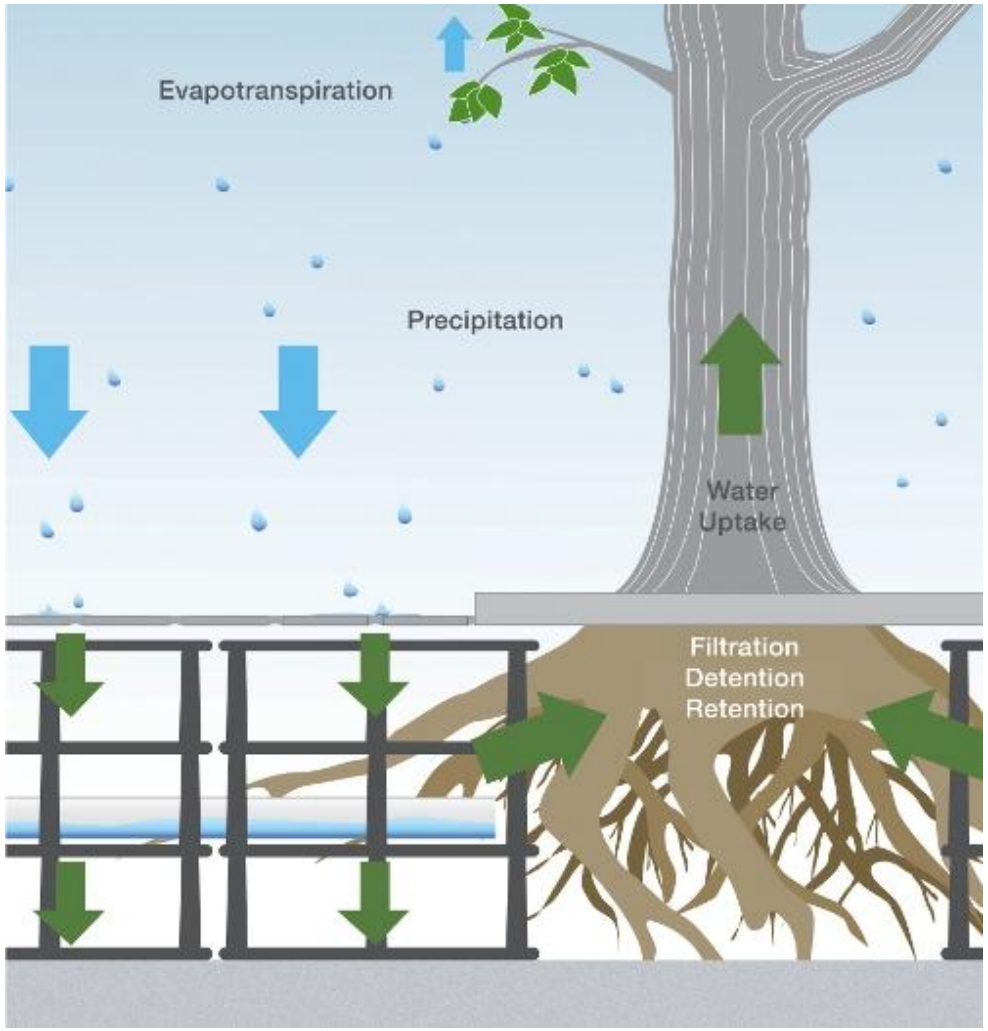
Biotreatment with Trees



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Rainwater Harvesting and Use

- Collected stormwater used for non-potable uses, such as toilet flushing and irrigation
- Need to have a constant water demand year round
- Special sizing methodology considers wet and dry periods
- See C.3 Handbook App. I for sizing curves and tables

Cisterns installed underground

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Rainwater Harvesting and Use

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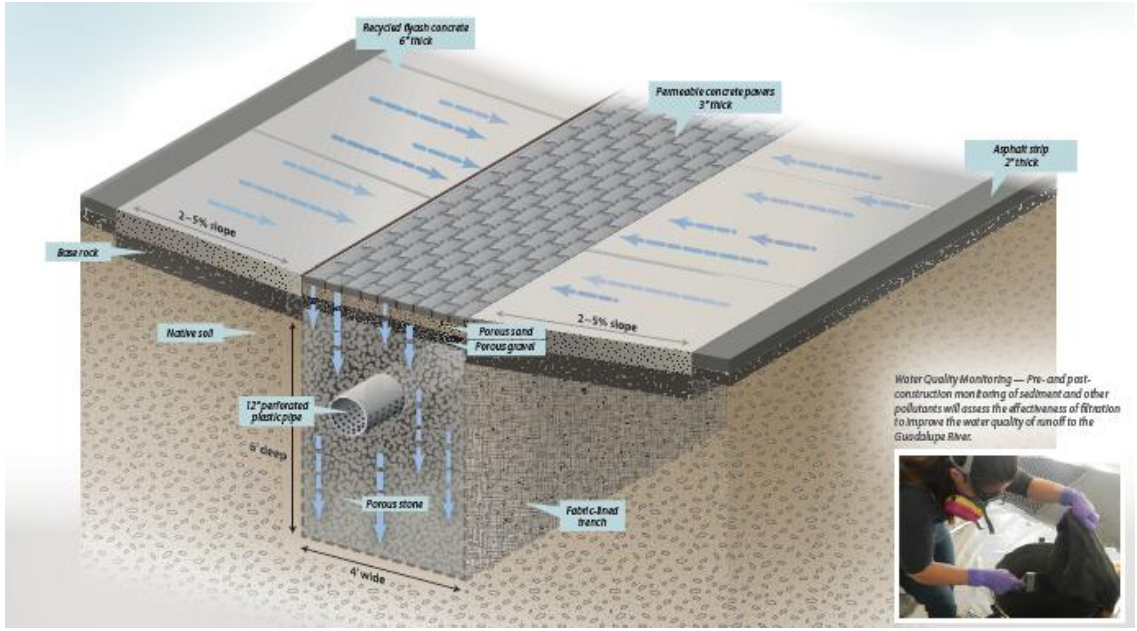
Infiltration Trench

- Store water in void space of drain rock, allowing it to infiltrate to native soils
- Requires well-draining soils (>0.5 in/hr)



Martha Gardens Green Alleys Project, City of San José

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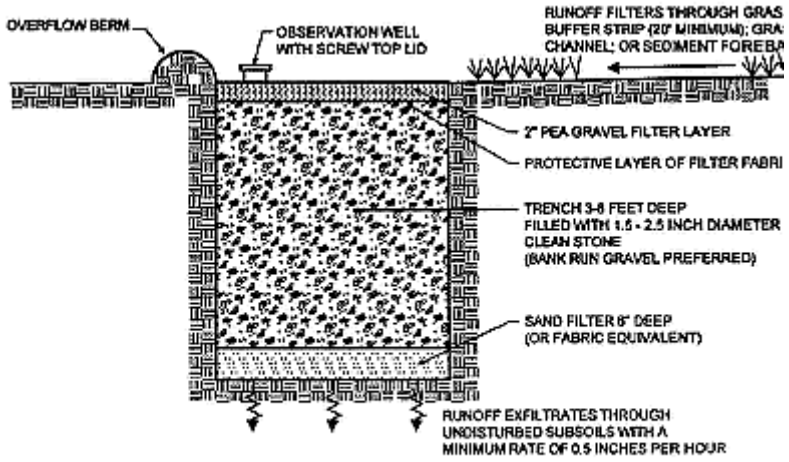
Infiltration Trench



A schematic of an infiltration trench (Source: MDE, 2000)

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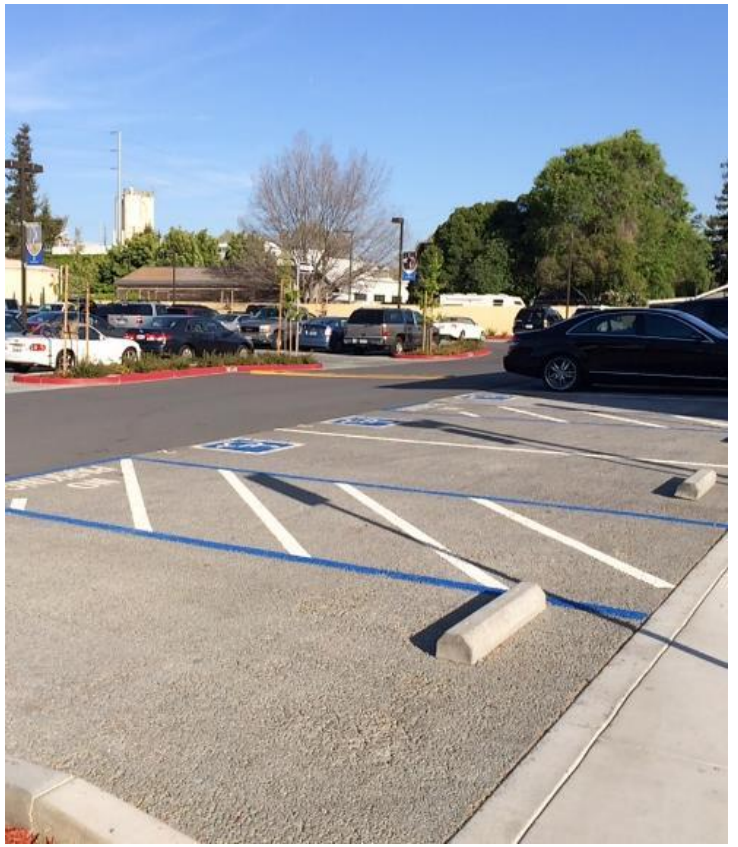
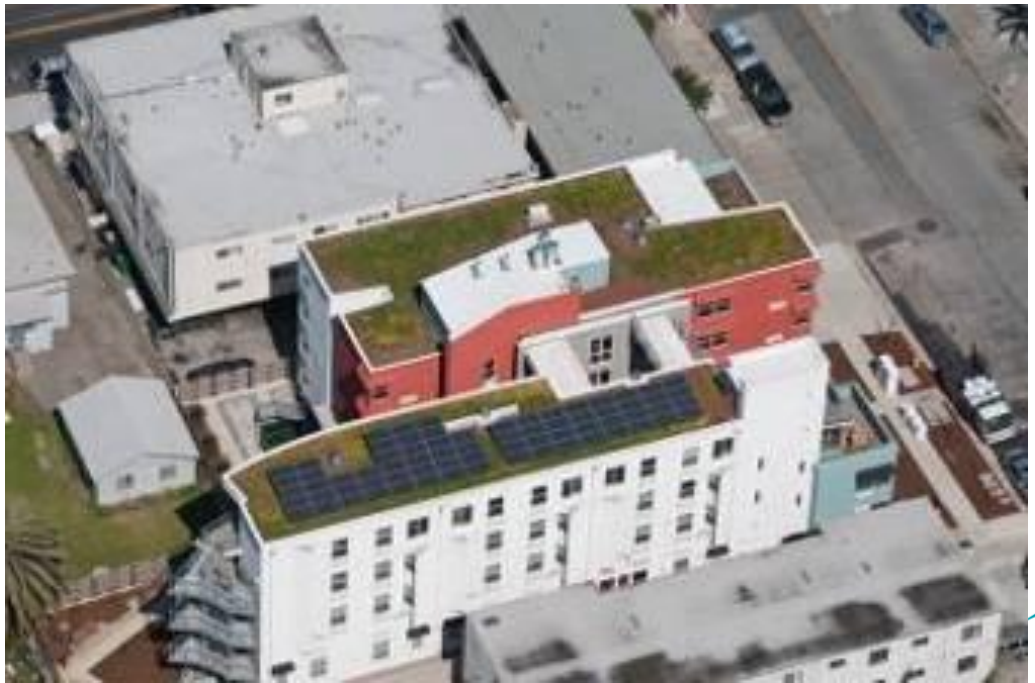
Pervious Pavement



Green Roof

- Green roofs are considered site design measures that remove runoff largely through plant evapotranspiration processes
- Planting media needs to be sufficiently deep to:
  - Provide capacity within the pore space of the media for the water quality design volume (typically < 3”)
  - Support the long-term health of the vegetation selected for the green roof, as specified by a landscape architect or other professional



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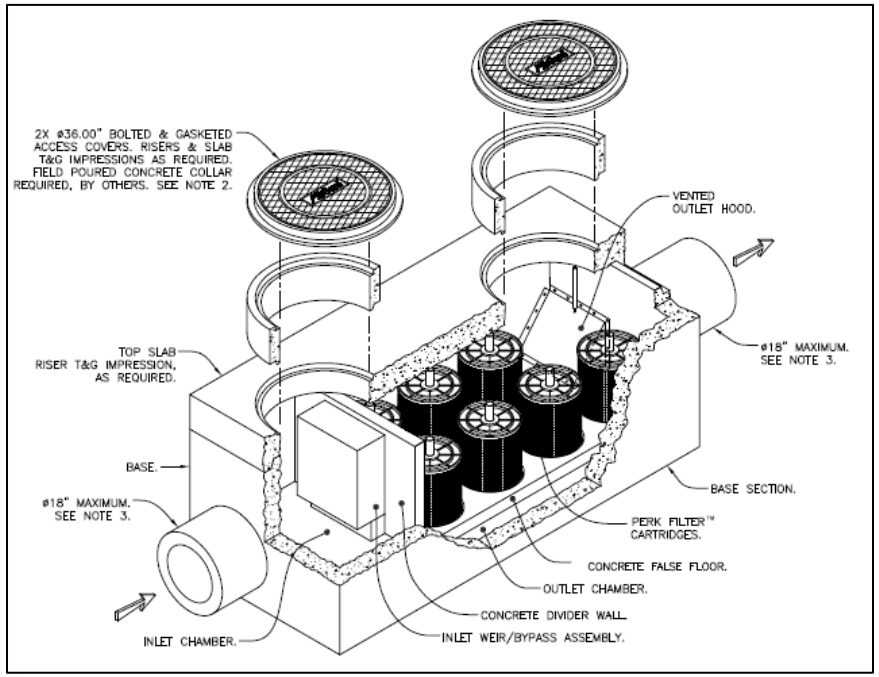
Green Roof

Special Projects

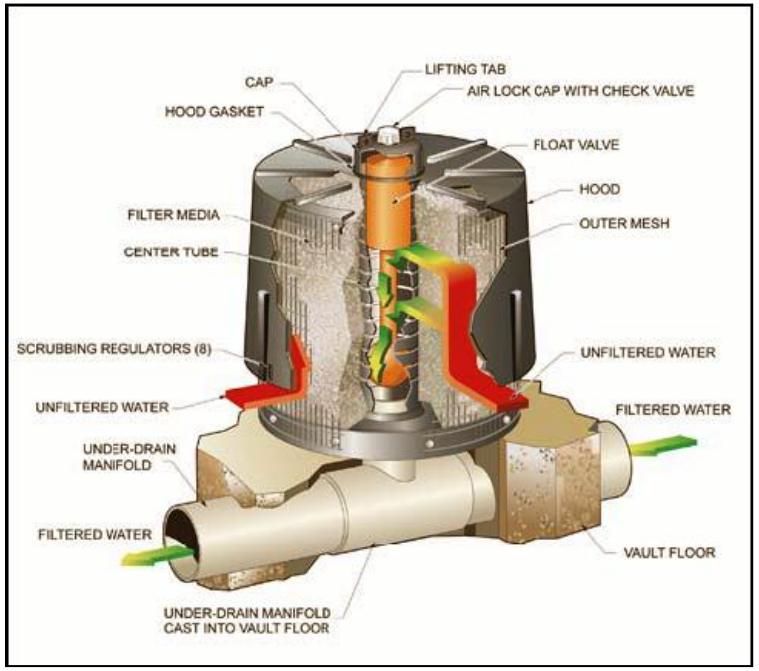
- Special Projects are high density and affordable housing projects that may receive LID treatment reduction credit, i.e., allowed limited use of “non-LID” treatment measures
- Amount of credit is based on size of project, lot coverage, density, amount of surface parking, and amount and income levels of affordable housing units
- Non-LID measures are currently limited to tree box-type or vault-based high flowrate media filters

Non-LID: High Flowrate Media Filters

(Limited use ONLY in Special Projects)



- Media cartridges installed in manholes or in vaults
- Vaults designed to allow settling of large particles before water enters the filter
- Fine particles are filtered by filter media (see example cartridge at right)



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Non-LID Tree Well Filters

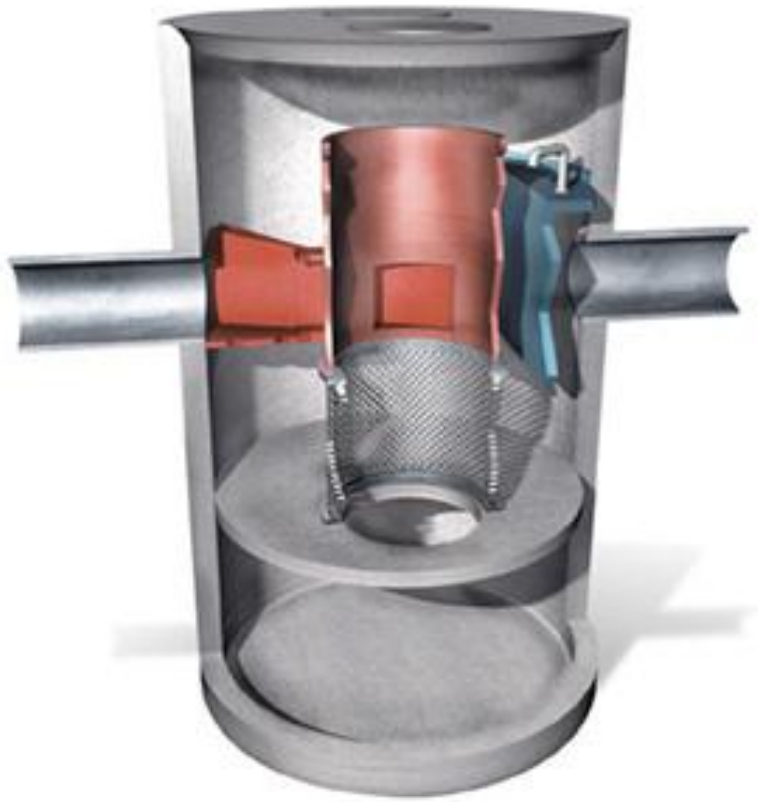
(Limited use ONLY in Special Projects)

Credit: Filterra

- Manufactured tree well filter with proprietary planting media
- Planting media has extremely high infiltration rate (50-100 in/hr)
- Unit now available with biotreatment soil to meet LID requirements (but treats smaller area).

Non-LID: Hydrodynamic Separators

(NOT a stand-alone treatment measure)



- Vault system
- Settling or separation unit to remove sediments
- Effective for trash and large particles
- Not designed to remove finer particles

Non-LID: Vegetated Swale
(NOT a stand-alone treatment measure)

- Linear, shallow, vegetated channel
- Filters stormwater as it flows through dense vegetation on the surface
- Relatively short detention time prior to discharge into storm drain inlet
- Not as effective as a linear bioretention system

Non-LID: Detention Basin
(NOT a stand-alone treatment measure)

- Basin with specially designed outlet to detain stormwater for at least 48 hours
- Used to be allowed to treat stormwater by settling out solids/sediments
- OK if used for storage upstream of LID measure or hydromodification control

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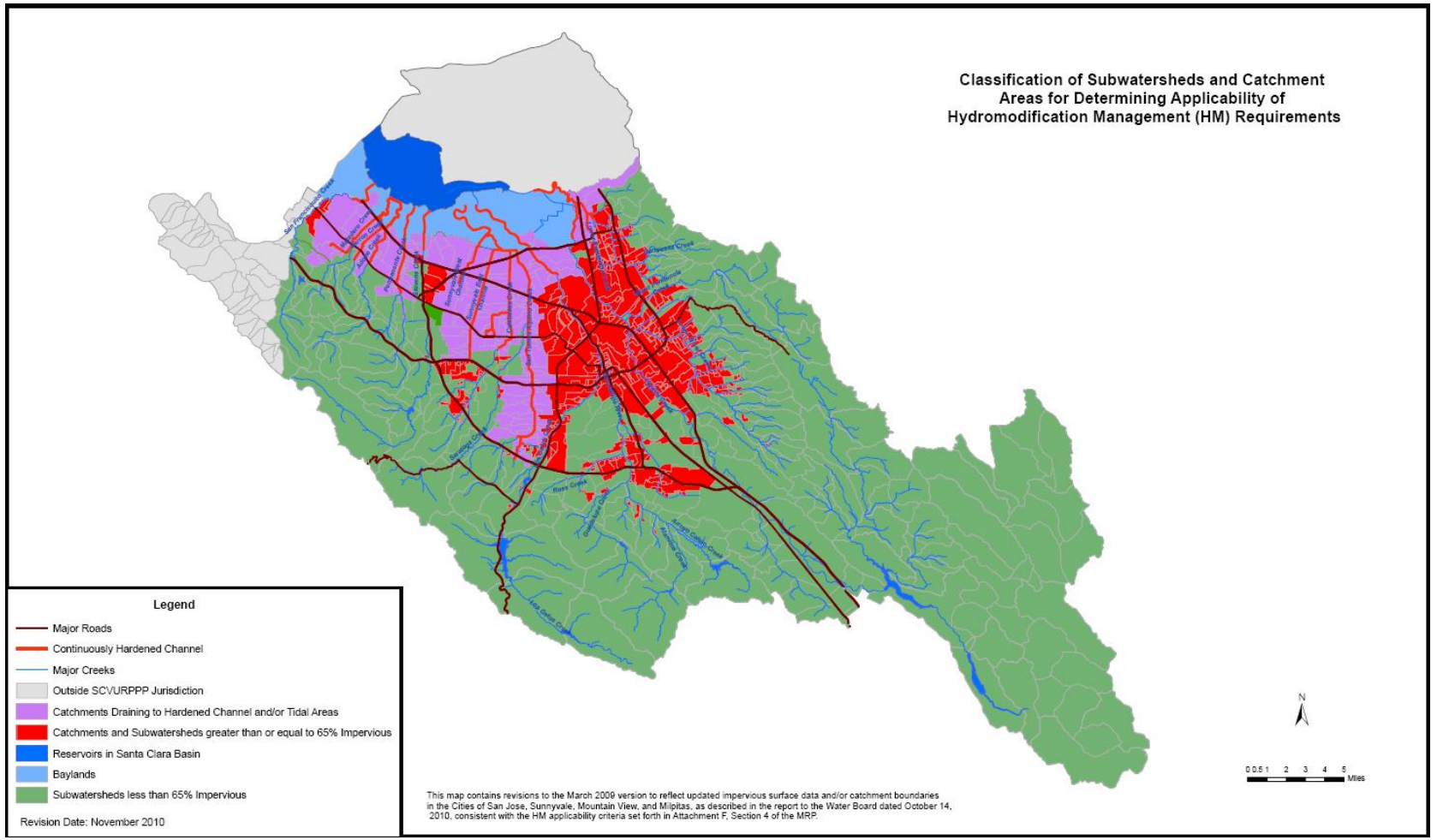
Hydromodification Management

- Purpose: Reduce erosive flows in creeks
- Goal: Match post-project runoff rates, volumes and durations to pre-project condition for a range of storms.

- Required for projects that:
  - Create/replace 1 acre of more of impervious area
  - Increase impervious area over pre-project condition, AND
  - Drain to creeks susceptible to erosion

HM Applicability Map for Santa Clara Valley

- Applicable areas (with creeks susceptible to erosion) shown in green
- See SCVURPPP website for tool to find project location on the map



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Hydromodification Management Control Measures

- Hydrologic source controls
  - Site design measures to reduce imperviousness
  - LID treatment measures
- Flow duration controls
  - Pond, detention basin, tank or vault
  - Specialized outlet to control rate and duration of flow

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Project Types and Thresholds

Requirements – Parcel-Based Projects

- Parcel-based development or redevelopment
  - Threshold for impervious surface (IS) created or replaced is 5,000 square feet (SF) for most projects
  - Threshold for large, detached single-family homes (not part of a larger plan of development) is 10,000 SF of created or replaced IS
  - Includes renovation of public/private parking lots and other pavement (down to top of base course)
  - Must include any IS created or replaced in public ROW as part of project (e.g., sidewalk, street frontage)

Parcel-Based Project Requirements

Project Type/Description	Threshold Area	MRP 3.0
Parcel-Based Projects		
Detached single-family home not part of larger plan of development	Cumulative	**10,000 SF**
Public/private development	Cumulative	**5,000 SF**
Public/private redevelopment project	Cumulative	**5,000 SF**
Renovation of existing public/private parking lots or other pavement	Cumulative	**5,000 SF**

Project Frontage Requirements

- Off-site improvements in the public ROW that are required for a parcel-based project must be included as part of the project
  - Areas count toward thresholds
  - Areas must be treated if the project is regulated
- Example redevelopment project:

Development site boundary
Sidewalk replacement
Road improvements
Project boundary

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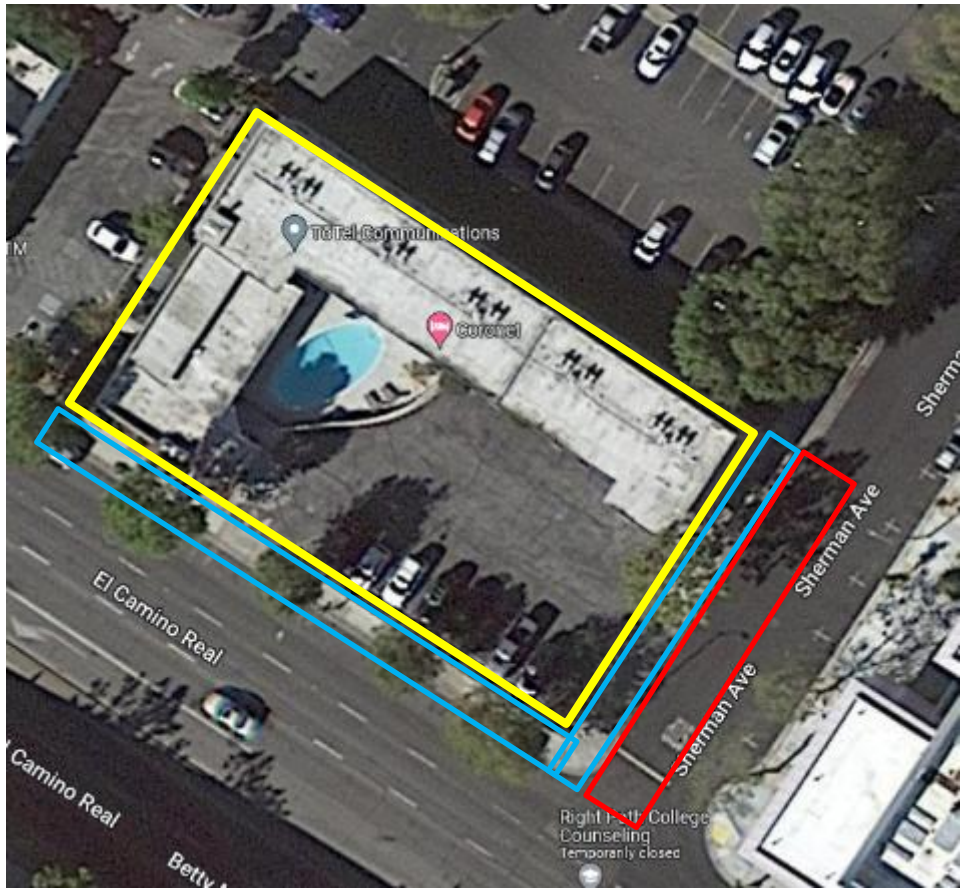
Stormwater Treatment in the Project Frontage

- Sidewalk replacement area
  - Drain toward new landscaped strip (self-retaining area)
  - Pervious pavement
  - Suspended pavement system + trees
- Side street trenching/repairs
  - Bioretention or pervious pavement
    - Check drainage management area (DMA) size, flow direction and low point
    - Look for feasible location near that point
    - If infeasible, consider alternative compliance (AC) at another location
    - Consider including sidewalk area as part of impervious area treated via AC



Parcel-based Projects and the "50% Rule"

- Where a redevelopment project alters ≥ 50% of the impervious surface of a previously existing development, runoff from the entire project (i.e., all existing, new, and/or replaced impervious surfaces) must be treated.
- Where a redevelopment project alters < 50% of the impervious surface of a previously existing development, only runoff from the new and/or replaced impervious surface of the project must be treated.
- The calculations in the scenarios above must include portions of the public right of way (e.g., frontage) that are developed or redeveloped as part of the Regulated Project.
  - Tip: Define project boundary to include parcel boundary plus just the offsite impervious surface that is being altered.

Regulated Pavement Project Categories

- Roads
  - New or widened
    - includes sidewalks and bike facilities
  - Trails (impervious surface)
    - Under 10 feet in width
    - 10 feet or more in width
  - Major maintenance
    - Reconstructed roads (including sidewalks and bike facilities)
    - Significant sidewalk or intersection work
  - Utility trenching
  - Extending roadway edge
- Parking Lots
  - Major maintenance
    - Reconstructed

Requirements – Regulated Pavement Projects

- Roads, sidewalks and trails
  - Threshold is 5,000 SF of contiguous impervious area for:
    - New roads, including sidewalks and bike lanes
    - Adding traffic lane to an existing road
    - New stand-alone trail projects ≥ 10 feet wide or ≤ 50 feet from creek bank built with impervious surface*

*Gravel is considered an impervious surface unless constructed like pervious pavement.

Requirements – Regulated Pavement Projects

- Public works improvement projects (C.3.b.ii.(3))
  - Projects in the public right-of-way that disturb ≥ 5,000 SF of contiguous impervious surface (down to top of base course)
  - Small discontinuous projects like sidewalk gap closures, sidewalk replacement, and ADA curb ramps are typically not regulated unless associated with a parcel-based project
    - If associated with a Regulated Project, these improvements must be added to the cumulative impervious surface total of that project and treatment provided

Requirements – Regulated Pavement Projects

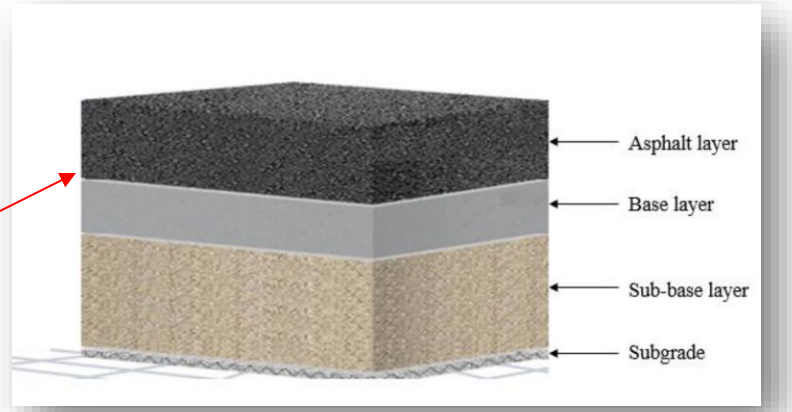
- Road maintenance/reconstruction projects – regulated at 1 acre of contiguous* impervious surface
  - Reconstruction of public roads (and adjacent sidewalks and bike lanes) down to top of base course
  - Extending the pavement edge of an existing road (e.g., paving gravel shoulders)
  - Utility trenching projects which are ≥ 8 feet wide on average, over the entire length of the project

*Project areas interrupted by cross streets or intersections are considered contiguous

Pavement Maintenance vs. Reconstruction

- Surface treatment such as applying a top layer or sealant on existing impervious surface without disturbing the base course is <u>not regulated</u>
  - Base course = layer of material (typically aggregate) located above subbase and subgrade course, and below the surface layer
- Reconstruction (disturbing below top of base course) is <u>regulated</u>

Top of base course



- Upgrading from dirt to gravel* or from dirt/gravel to chip seal, asphalt, or concrete pavement is <u>regulated</u>

*Gravel is considered an impervious surface unless constructed like pervious pavement.

Pavement Maintenance Requirements

- Pavement maintenance on Roads
  - Included practices – regulated at ≥ 5,000 SF (cumulative)
    - Upgrade from dirt to gravel (exempt if built to spec for pervious pavement)
    - Upgrade from dirt/gravel to chip seal, asphalt, or concrete pavement
    - Removing/replacing asphalt or concrete to top of base course or lower
    - Repair of pavement base (i.e., base failure repair)
    - Extending the pavement edge or paving graveled shoulders
  - If these practices are part of a Road Reconstruction Project, the threshold is 1 acre of contiguous impervious surface created/replaced.

Unregulated Pavement Maintenance

- Excluded pavement maintenance practices (C.3.b.ii.(1)(b)(ii)-(iv))
  - Pothole and square cut patching
  - Overlay gravel on existing gravel
  - Overlay asphalt/concrete on existing asphalt/concrete (no increase in area)
  - Apply bituminous surface treatment (e.g., “chip seal”) to existing asphalt or concrete (no increase in area)
  - Upgrade from chip seal to asphalt or concrete (no increase in area)
  - Shoulder grading
  - Reshaping/regrading drainage
  - Crack sealing and pavement preservation that does not expand road prism

Road Reconstruction and the “50% Rule”

- Where a reconstruction project disturbs ≥ 50% of the existing impervious surface of the road, the entire road surface must be included in the treatment system design.
- Where a reconstruction project disturbs < 50% of the existing impervious surface of the road, only the new and/or replaced impervious surface of the road project must be included in the treatment system design.
  - However, if the runoff from that portion of the road cannot be separated from runoff from the rest of the road, the runoff from the entire surface draining onto the reconstructed portion must be treated.
  - This may also be an issue with regulated utility trenching projects that disturb a portion of the road but need to treat runoff from larger drainage areas
  - Can consider alternative compliance options to minimize the treatment area

Types of Bioretention in the Streetscape

Stormwater Planter

Stormwater Curb Extension

Tree Well Filter/
Pervious Pavement

Credit: ICPI

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Types of Bioretention in the Streetscape

Two-way, raised, separated bikeway with stormwater planter (Emeryville, CA)

Stormwater curb extension in Safe Routes to School improvements (San Mateo, CA)

Types of Bioretention in the Streetscape

Tree Well Filter (Silva Cells)

Credit: DeepRoot Green Infrastructure

Suspended Pavement System with Silva Cells under Pervious Pavement (Palo Alto, CA)

Tree Well Filter - Box

Credit: StormTree

Open box tree well filter (StormTree)

Tree Well Filter - Open

Suspended Pavement System with Structural Soil under sidewalk (Emeryville, CA)

Pervious Pavement in the Streetscape

Stormcrete Pre-cast Pervious Concrete
(Berkeley)

Permeable Interlocking Concrete Pavers
(San Jose)

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Summary of Regulated Project Requirements

Project Type/Description	Threshold Area	MRP 3.0
Roads, Sidewalks, and Trails		
New roads, including sidewalks and bike lanes	Contiguous	**5,000 SF**
Adding traffic lanes to an existing road	Contiguous	**5,000 SF**
New stand-alone trail projects ≥ 10 feet wide with impervious surface	Contiguous	**5,000 SF**
Sidewalk gap closures, sidewalk replacement, ADA curb ramps not associated with a parcel-based project	Contiguous	**5,000 SF**
Road Maintenance/Reconstruction Projects		
Reconstructing existing roads, including sidewalks and bicycle lanes	Contiguous	**1 acre**
Extending roadway edge	Contiguous	**1 acre**
Utility trenching projects with average trench width ≥ 8 feet	Contiguous	**1 acre**

Alternative Compliance

- Alternative Compliance (AC) is an option in Provision C.3.e that allows flexibility in meeting C.3 requirements for regulated projects
- The options for AC include:
  - LID treatment of equivalent impervious surface in another location off-site
  - Payment of in-lieu fee for off-site or regional project treatment
- AC projects must be in same watershed (defined broadly) and achieve a net water quality benefit (not defined)
- AC projects must be completed within 3 years of regulated project completion (up to 5 years with Water Board approval)

Road Reconstruction AC Example

Road, bike lane and gutter replacement boundary (Regulated treatment area)

Sidewalk replacement (Regulated treatment area)

Project boundary (Regulated treatment area)

Possible alternative compliance treatment area

Possible alternative compliance treatment area

Parking lot contributing runoff

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For More Information:

- SCVURPPP New and Redevelopment Resources Webpage
  https://scvurppp.org/newdev/
- SCVURPPP C.3 Stormwater Handbook
  https://scvurppp.org/2024/10/28/c-3-stormwater-handbook-2024/
- SCVURPPP GSI Handbook
  https://scvurppp.org/swrp/gsi/
- SCVURPPP Stormwater Treatment Measure Data Portal
  https://scvurppp.org/gsi/
- Municipal Regional Stormwater Permit (MRP 3.0)
  www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/MRP/mrp5-22/R2-2022-0018.pdf

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Questions?

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