

Understanding Hurdles to Better Site Designs

Strips, Swales, Sod, and Stormwater— Drainage to Landscaping

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Understanding Hurdles to Better Site Designs

- October 8: *Addressing Fire Dept. and Public Safety Concerns*
- October 29: *Strips, Swales, Sod and Stormwater-- Drainage to Landscaping*
- November 12: *Understanding What May Bungle the Building of Better Buildings*
- December 10: *Better Parking Designs—What's the Stall?*
- January 14: *Assessing the Accessibility of Streets and Sidewalks*
- January 29: *Workshop—Overcoming Hurdles*

Desired Results of Meetings

- Discuss Potential Conflicts
(e.g., PWD Wants Water Piped Offsite)
- Define Underlying Issues to Those Conflicts
(e.g., Damage to pavement)
- Brainstorm Potential Solutions
(e.g., Concrete edging)
- Determine Stakeholders to be Involved in Local Level Decisions (e.g., Public Works, Engineering, Maintenance, Utilities)

Origin of Meetings



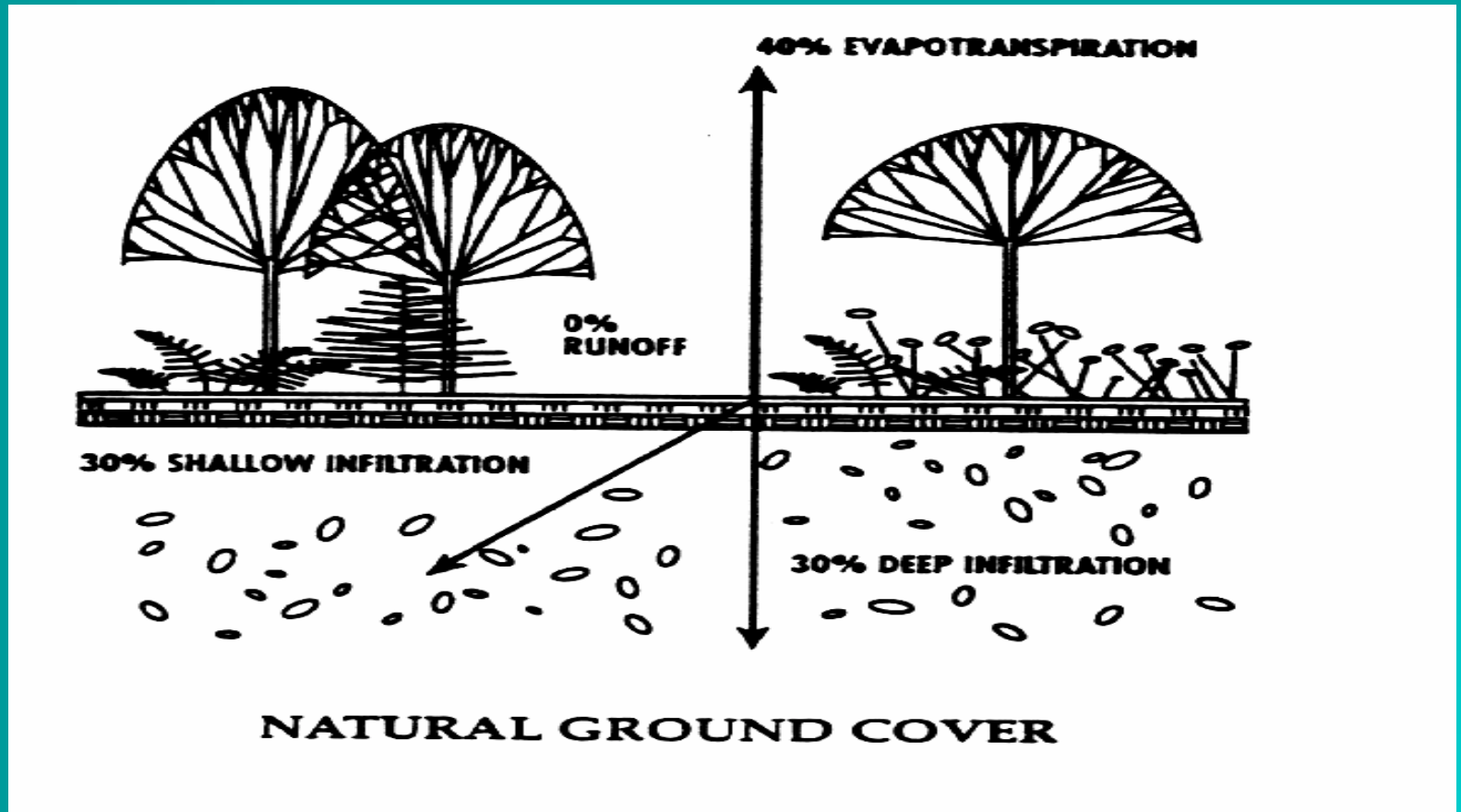
- Development Policies Comparison Project (April 2003)
- SCVURPPP Stormwater Permit Provision C.3.j.
 - Review local design standards/guidance for opportunities to reduce water quality impacts
 - Submit review analysis (Sept. 15, 2003)
 - Incorporate/implement revised standards and guidance (Sept. 15, 2004)
 - Requires public process for input/review

What are Site Design Measures?

Various practices/features to:

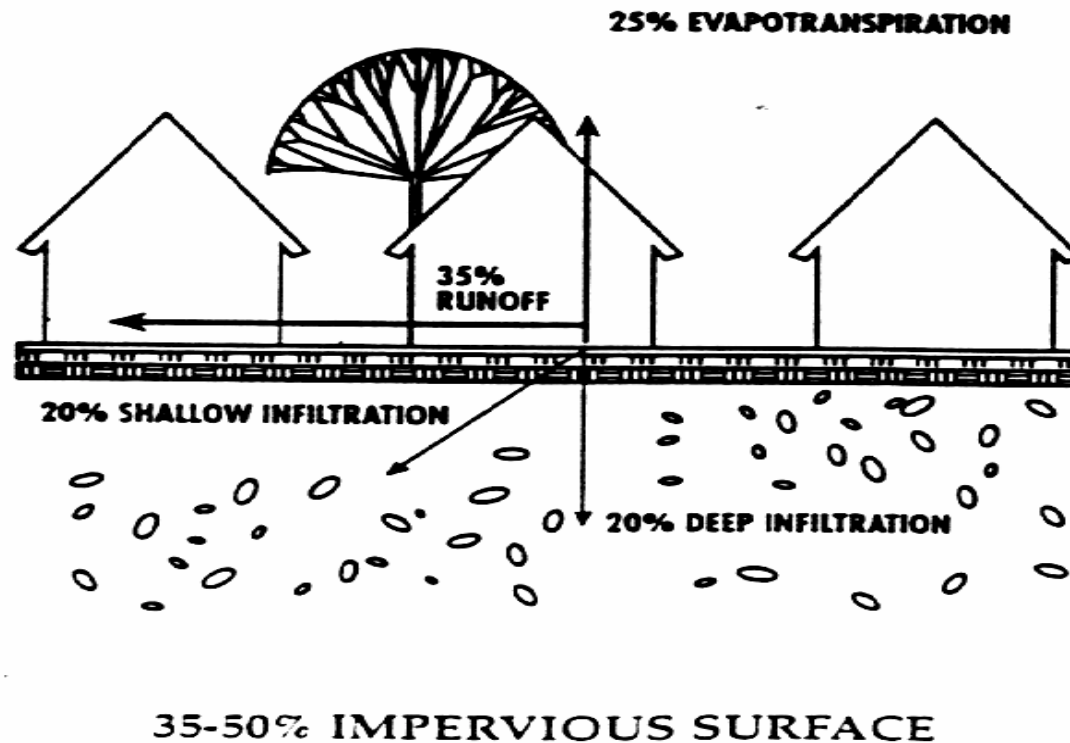
- 🔥 Reduce total impervious (paved) areas;
- 🔥 Reduce velocity of, detain, store, diffuse, infiltrate stormwater
- 🔥 Conserve natural areas
 - minimize land disturbance
 - preserve high quality open space

Drainage Before Development



(courtesy: Olympia WA, 1995)

Drainage After Development



(courtesy: Olympia WA, 1995)

Better Site Design Benefits

- 🔥 Reduce Pollutant Loads
- 🔥 Protect Natural Habitats
- 🔥 Increase Property Value
- 🔥 Help Meet C.3 Requirements
- 🔥 Save Money



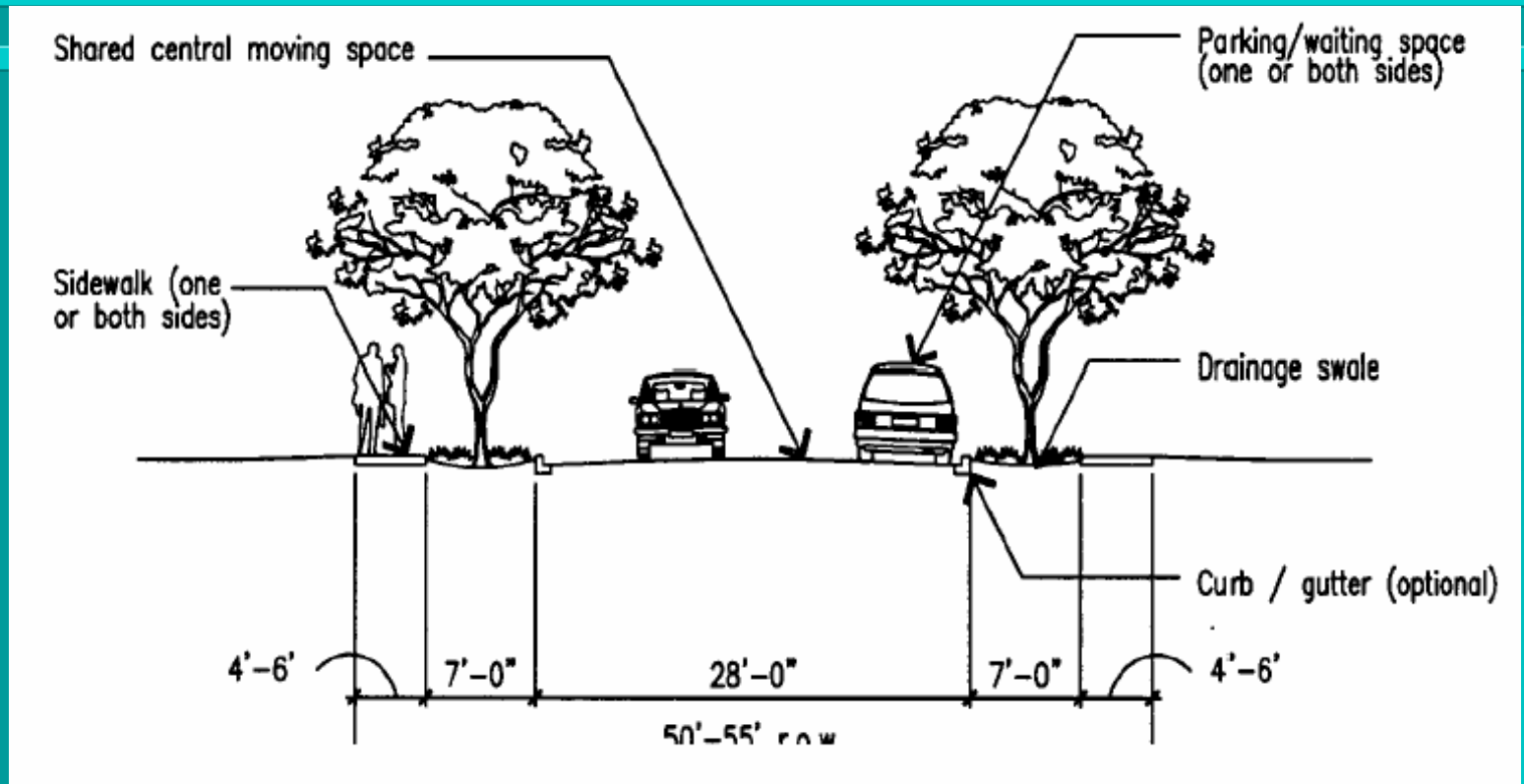
Steps Towards Better Site Design

- 🔥 Define Development Envelope and Protected Areas
- 🔥 Reduce Impervious Surfaces/**Minimize Directly Connected Impervious Areas**
- 🔥 **Maximize Permeability**
- 🔥 Build Narrow Streets
- 🔥 Maximize Choices for Mobility
- 🔥 **Use Drainage as a Design Element**

Today's Agenda

- 🔥 Stormwater Drainage from
 - 💧 Roads to Swales
 - 💧 Parking Lots to Swales/Biofilters
 - 💧 Sidewalks to Park Strips/Swales
- 🔥 Disconnecting Roof Downspouts

Urban Neo-Traditional

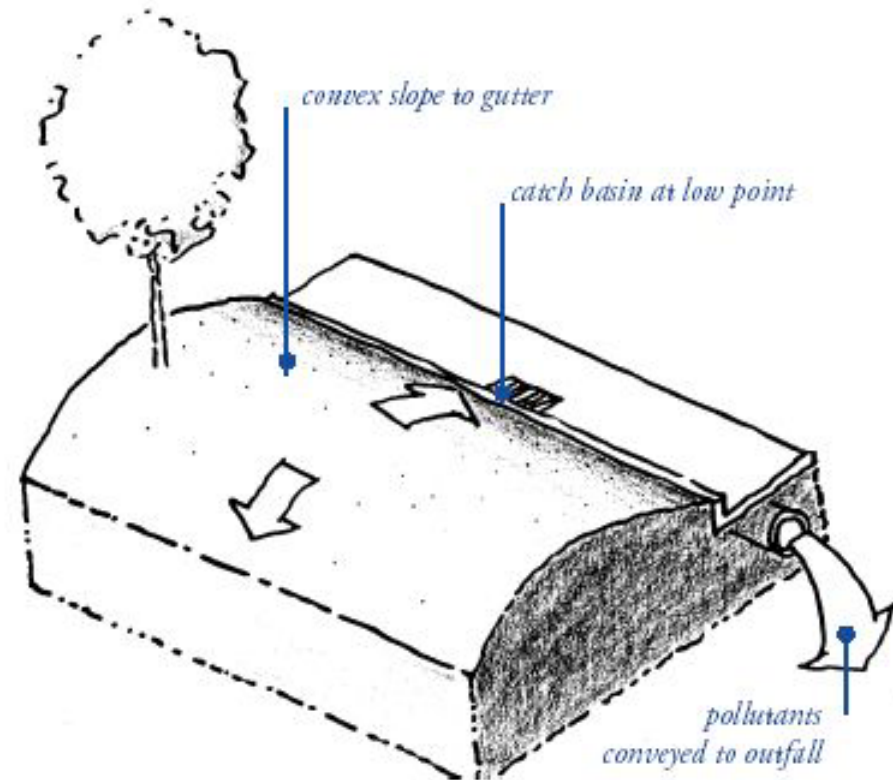
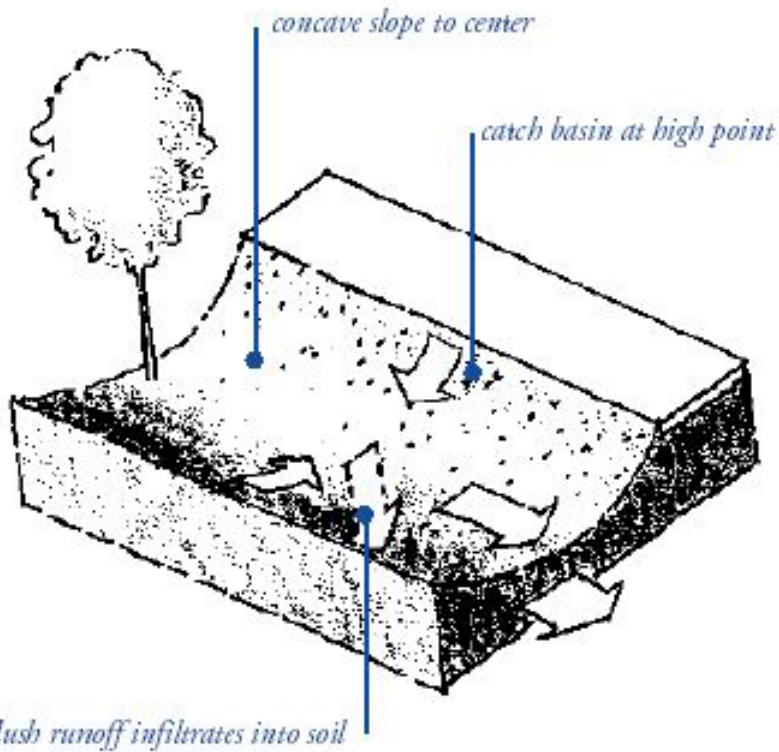


Drainage swale between road and sidewalk

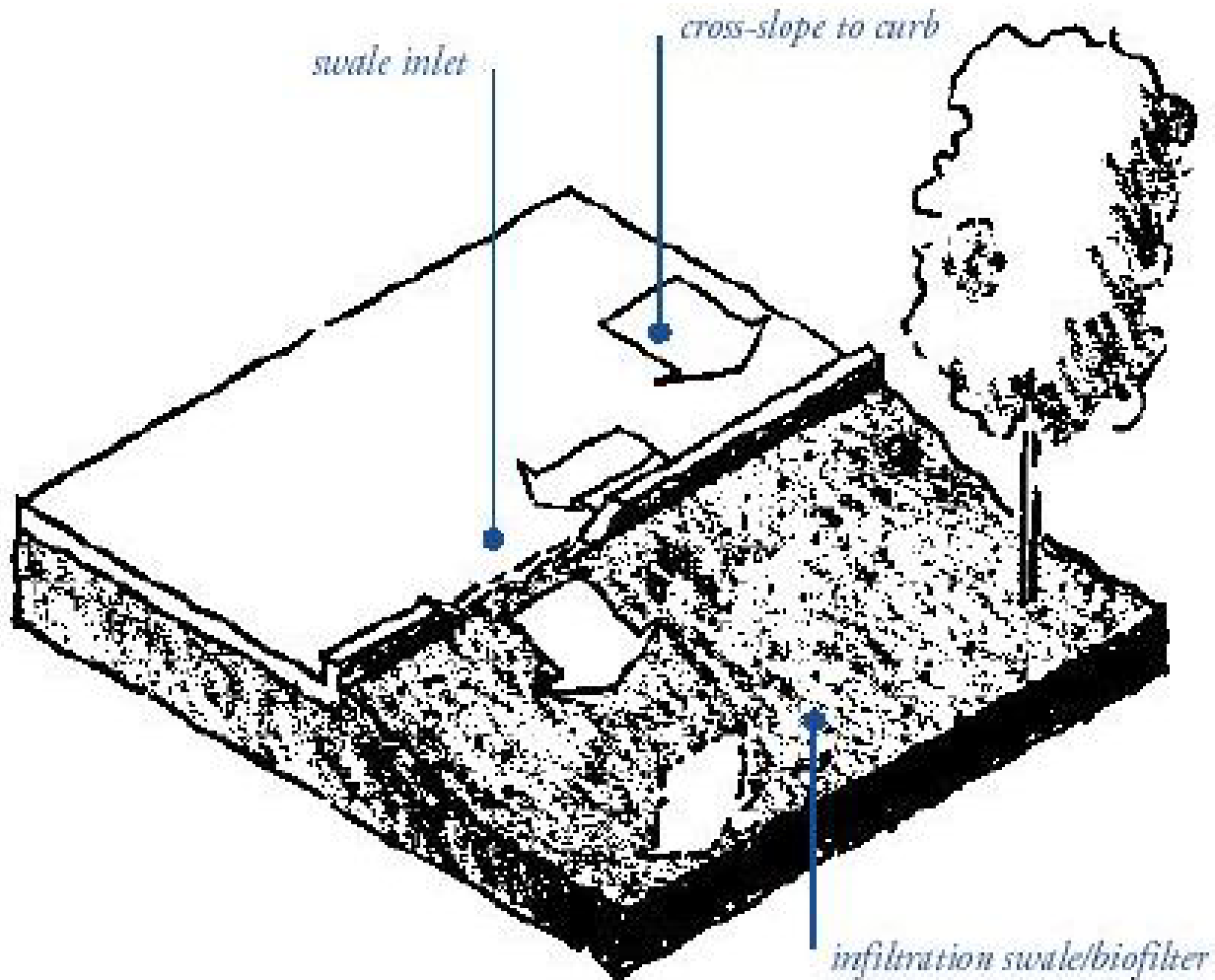
Rural Access Standard allows gravel parking/swale

Source: BASMAA *Start at the Source*, 1999

Convex vs. Concave Landscaping

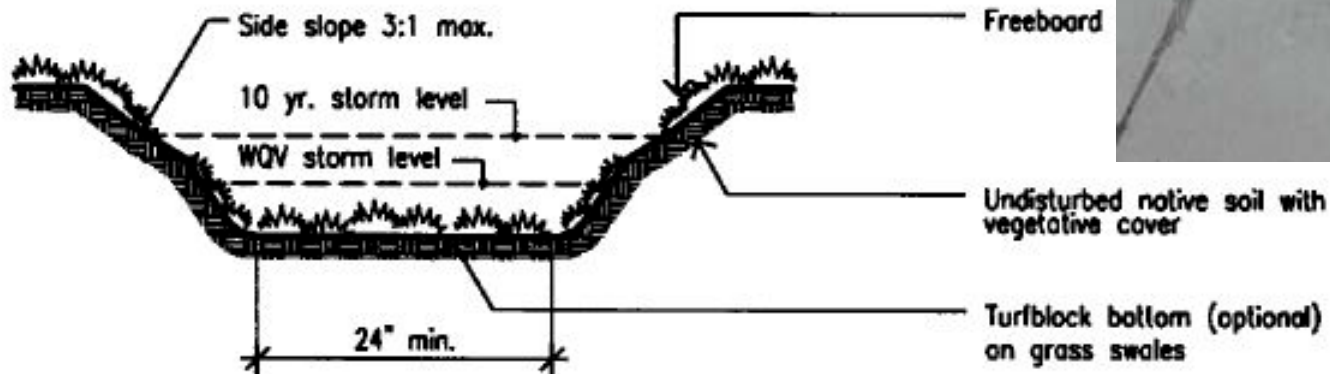


Roadside Swales



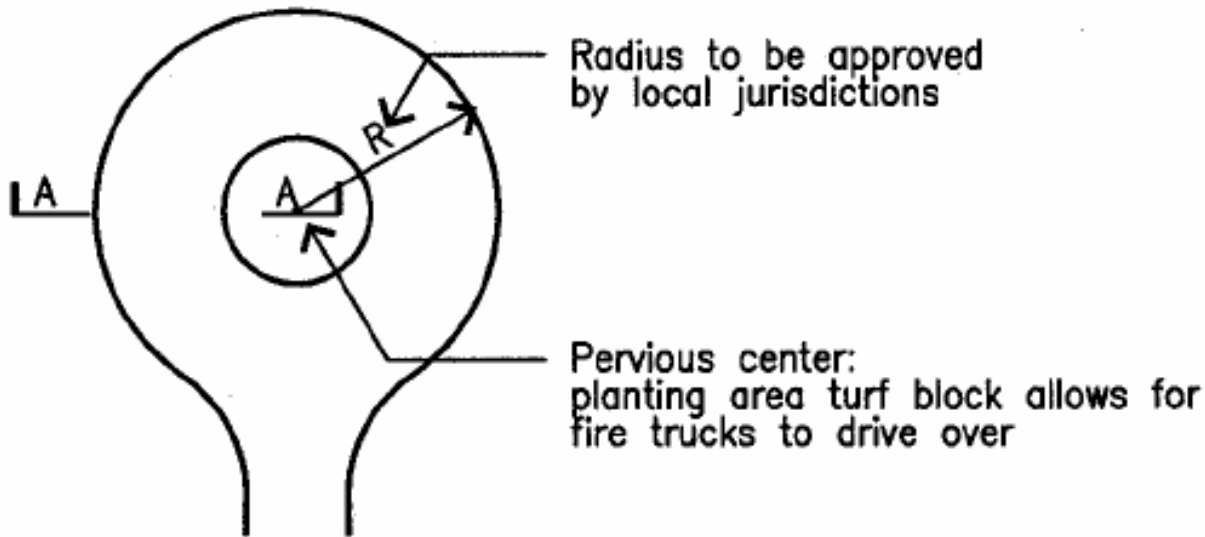
Roadside Swale

Sand Hill Road
Palo Alto, CA



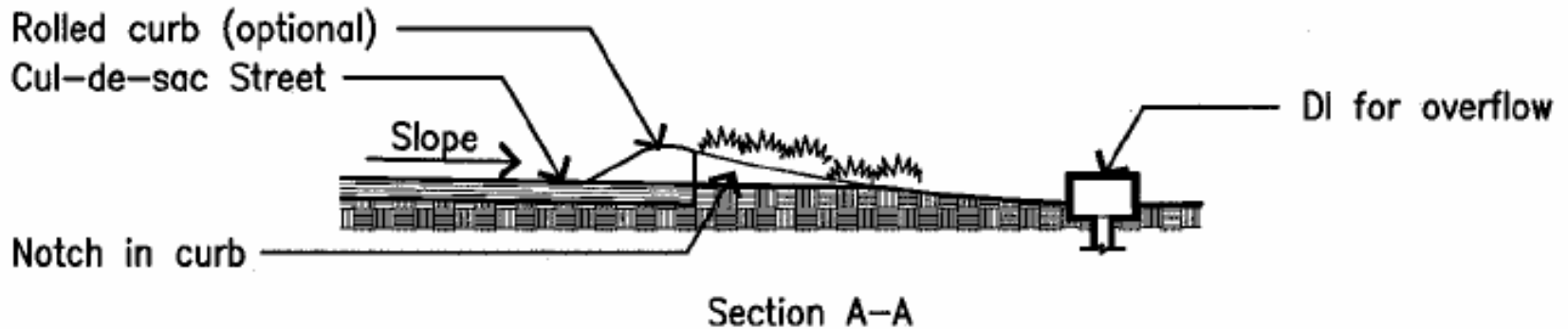
Typical Section

Cul-de-sacs: Pervious Center



Landscaping in center can reduce imperviousness 30-40%

--36' inside radius



Source: BASMAA *Start at the Source*, 1999

Fire Road

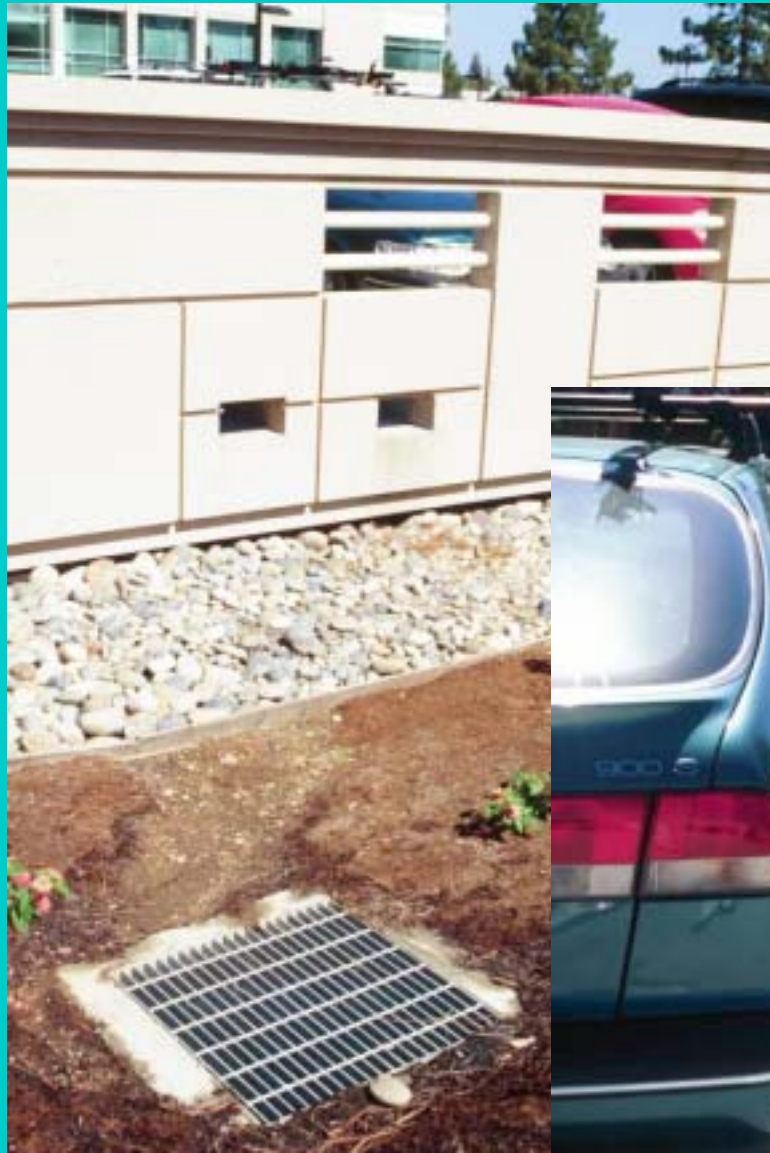
- SCU
- Turf block



Drainage From Parking Lots



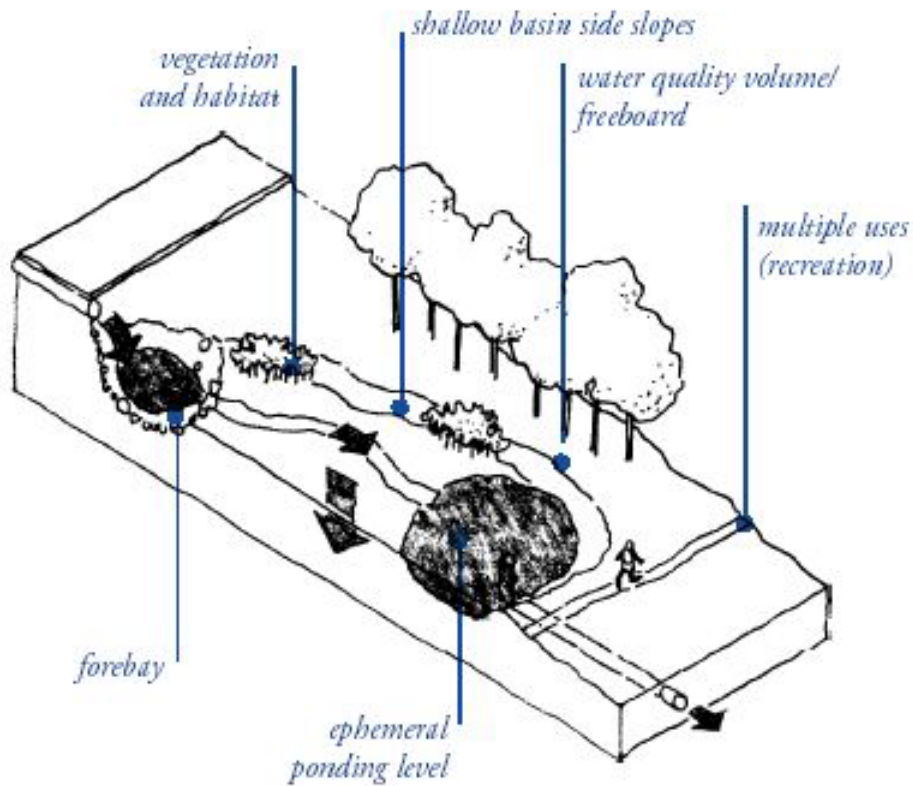
Parking Structure



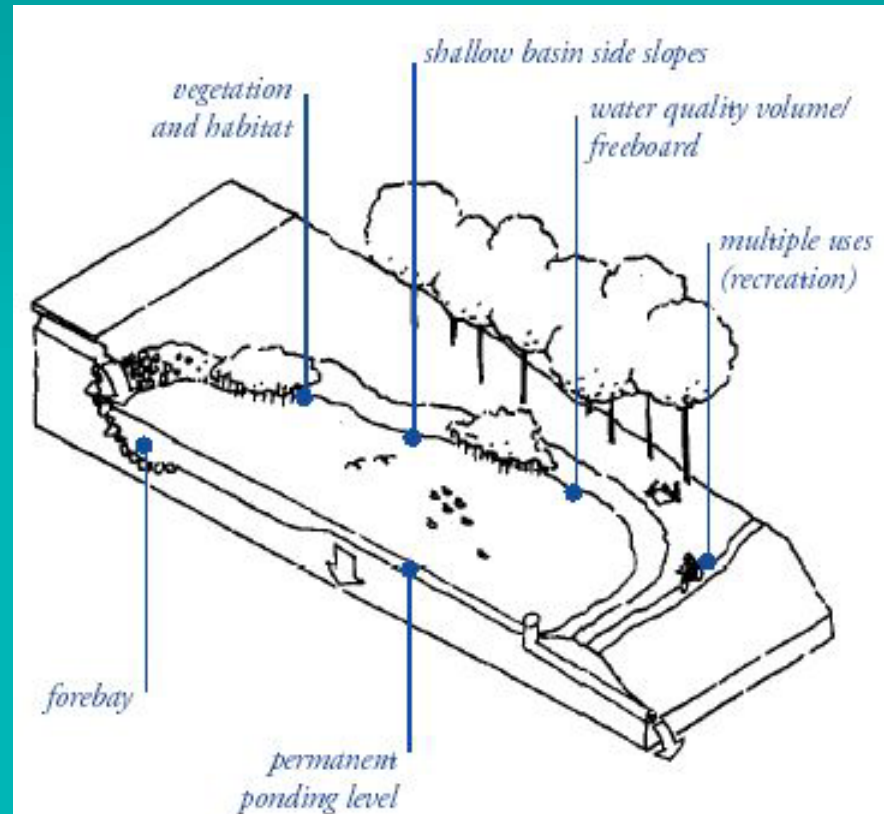
Drainage From Sidewalks



Landscaping Options



Extended Detention
(Dry) Pond



Wet Pond

Disconnected Roof Gutters

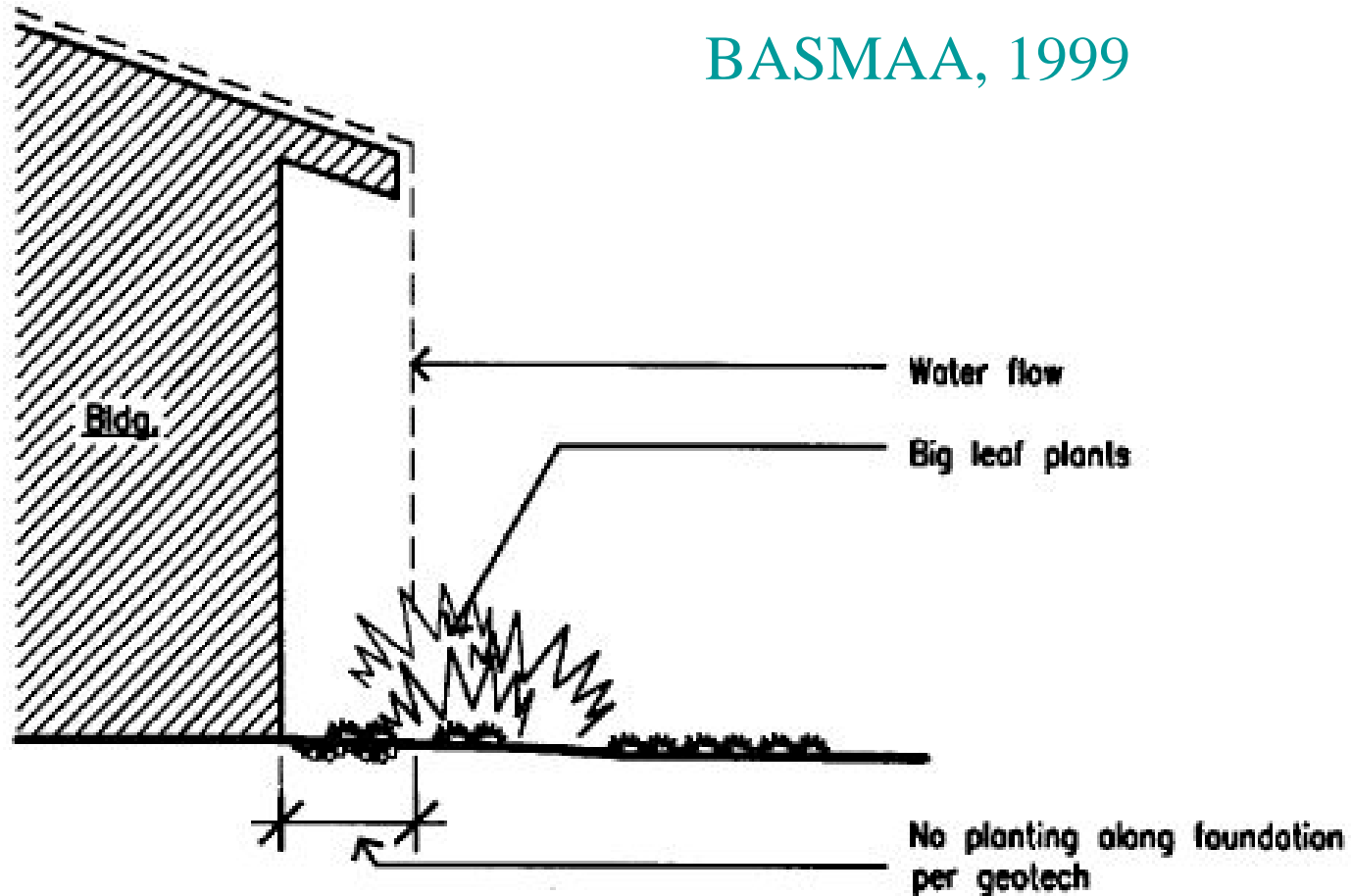


SCVWD

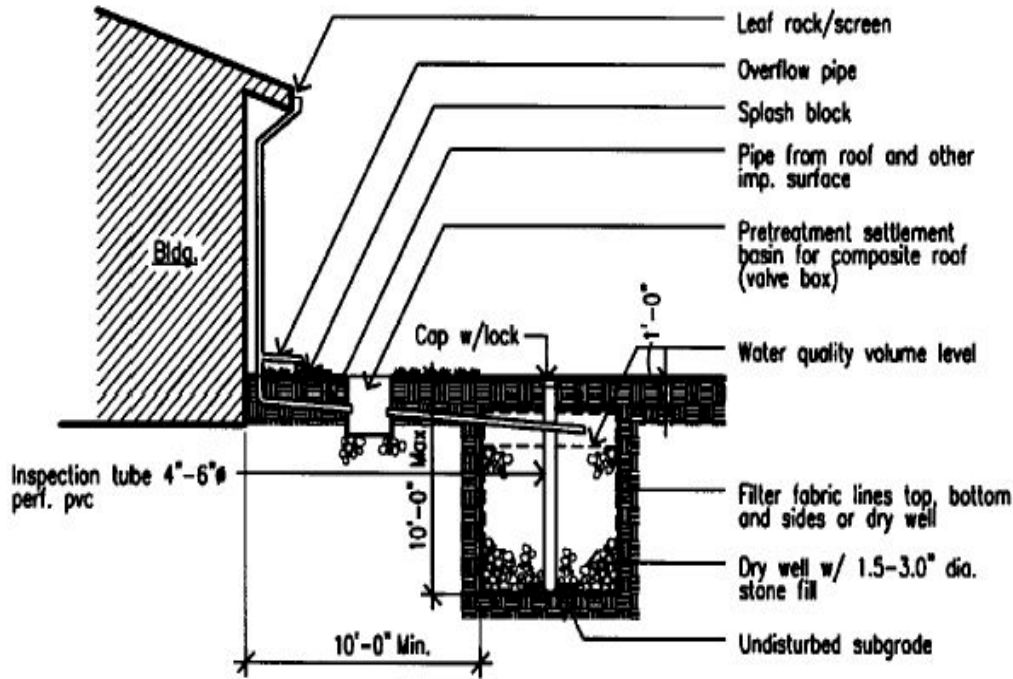


Foundation Planting

BASMAA, 1999



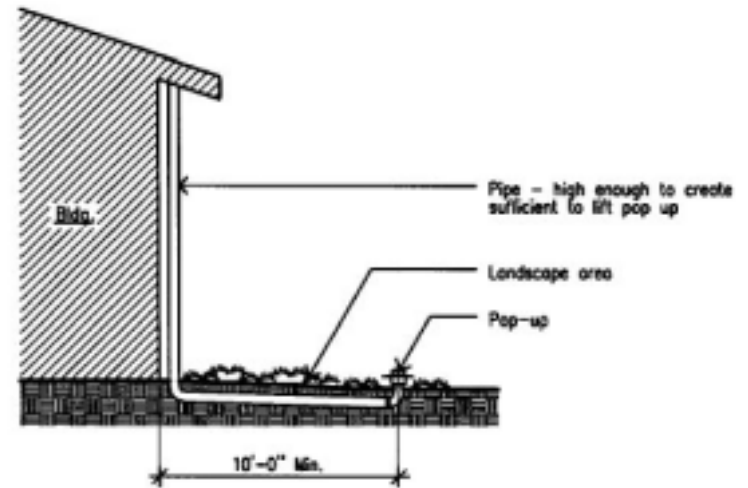
Roof Options



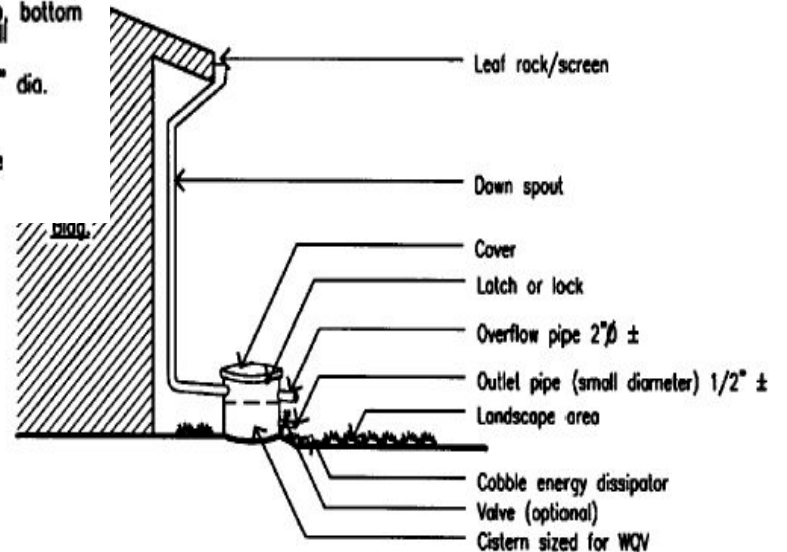
Dry Well

Cistern

BASMAA, 1999



Pop-up Emitter



Guidance on Site Design Techniques

- 🔥 BASMAA's *Start at the Source*, 1999
 - 💧 Under “new” at www.scvurppp.org
- 🔥 California Stormwater BMP Handbooks, 2003
New Development and Redevelopment
 - 💧 www.cabmphandbooks.com
- 🔥 Center for Watershed Protection
 - 💧 www.cwp.org

Questions?



PG&E Installation Requirements

- Electric and Gas Service Installation Requirements (Greenbook):
 - http://www.pge.com/002_biz_svc/002b4b_green_bk.shtml
- Contact: Helen Santoro, PG&E
(408) 299-1097 HMM2@pge.com

Drainage from Streets and Parking Lots

- Why do we not see more curb cuts and roadside swales?
- What is needed to protect street pavement from undermining and water damage?
- Are there differences between acceptability of roadside swales versus concave median strips?

Street and Parking Lot Swales— Access Issues

- Are there any pedestrian access or liability concerns for swales/biofilters?
- Is driving over swales/concave medians a problem? How would you prevent this?

Street/Parking Swales—Soils

- Is contaminated soil in swales/biofilters a concern? If so, for what types of locations?
- Do swales work with clay soils?
- Are there utility concerns (erosion uncovering lines)?

Drainage & Water Conservation

- Are park strips/swales a problem from a water conservation or other perspective?
- Are there technologies to prevent overspray/water waste?

Landscaping for Water Quality— Plants

- What type of plants do you recommend for park strips/filters/swales? What criteria should we look for?
(e.g., inundation of water, low water use, pest resistant, low maintenance; low waste loads; aesthetically pleasing; evergreen; able to withstand pollutant loads)

Homeowner Issues

- Why do homeowners pave over parkstrips/fill in swales?
- How significant is the problem?
- What are the liability/regulations related to drainage to private property? Are there exceptions to the requirements (e.g., planned unit development or HOAs)?

Residential Swales

- How would swales fit into a planned unit development, taking into account narrow streets, access issues, and utility needs?

Wet Ponds/Detention Basins

- Can wet ponds inadvertently become habitat for endangered species covered under additional regulatory requirements?
- Vector issues?

Disconnecting Roof Downspouts

- Will roof downspouts placed close to building result in damage to the building?
- How far must downspouts be to ensure protection of building?
- Are mushy lawns a problem?