

Understanding Hurdles to Better Site Designs

Addressing Fire Department and Public Safety Concerns

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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*

Goals of the Meeting

- Understand Potential Conflicts to Implementing Better Site Designs from a Water Quality Perspective
- Develop Thorough Understanding of the Underlying Issues Behind Those Conflicts
- Begin to Brainstorm Potential Ideas for Addressing the Issues
- Distribute Meeting Notes to Municipalities As Tool to Help Address Issues Locally

Desired Results of Meetings

- Discuss Potential Conflicts
(e.g., Fire Dept.s Want Wider Streets)
- Define Underlying Issues to Those Conflicts
(e.g., Access/Response Time—Fire, Medical)
- Brainstorm Potential Solutions
(e.g., Sprinkler houses; Defibrillators for Police)
- Determine Stakeholders to be Involved in Local Level Decisions (e.g., Fire, Police, Public Works)

Origin of Meetings



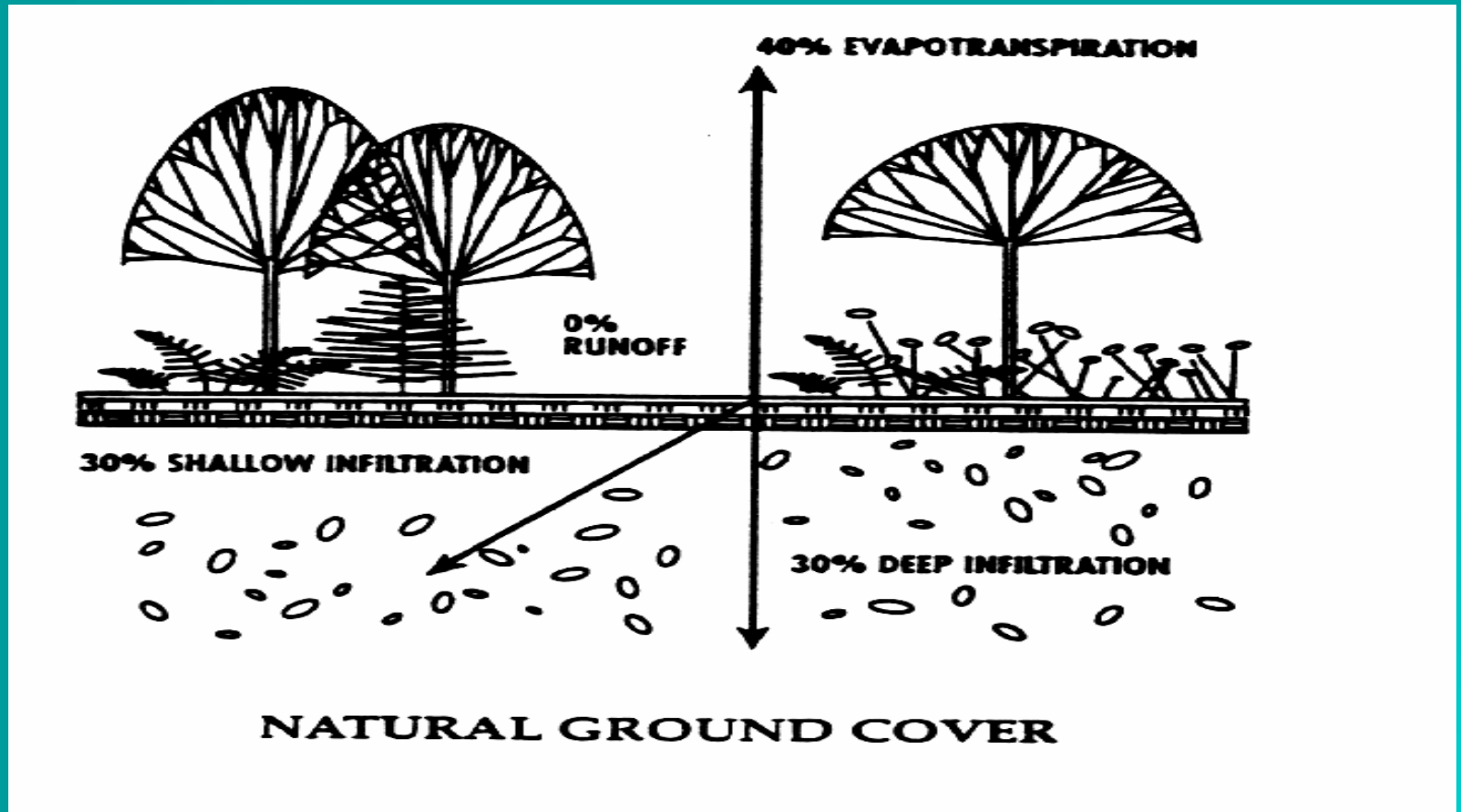
- Development Policies Comparison Project (April 2003)
- SCVURPPP Stormwater Permit Provision C.3.j.
 - Review local design standards/guidance for opportunities to reduce water quality impacts
 - Submit review analysis (Sept. 15, 2003)
 - Incorporate/implement revised standards and guidance (Sept. 15,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

What are Site Design Measures?

Various practices/features to:

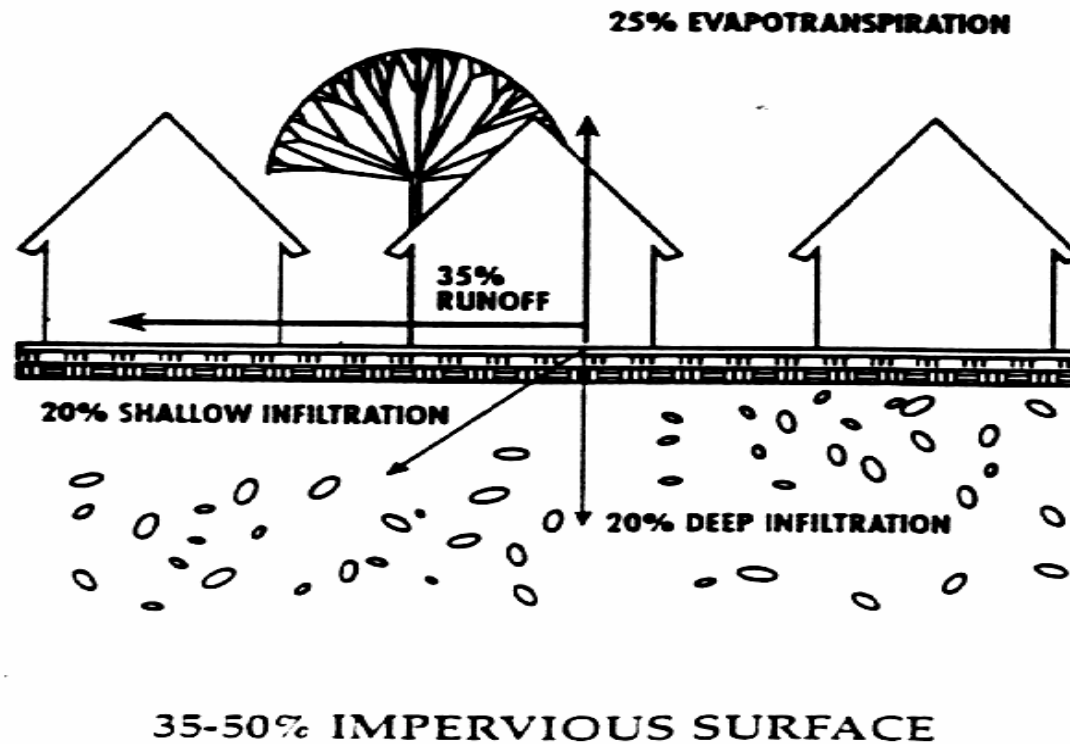
- 🔥 Reduce total impervious (paved) areas;
- 🔥 Reduce velocity of, detain, store, diffuse, infiltrate stormwater
- 🔥 Conserve natural areas
 - minimize land disturbance
 - preserve high quality open space

Drainage Before Development



(courtesy: Olympia WA, 1995)

Drainage After Development



(courtesy: Olympia WA, 1995)

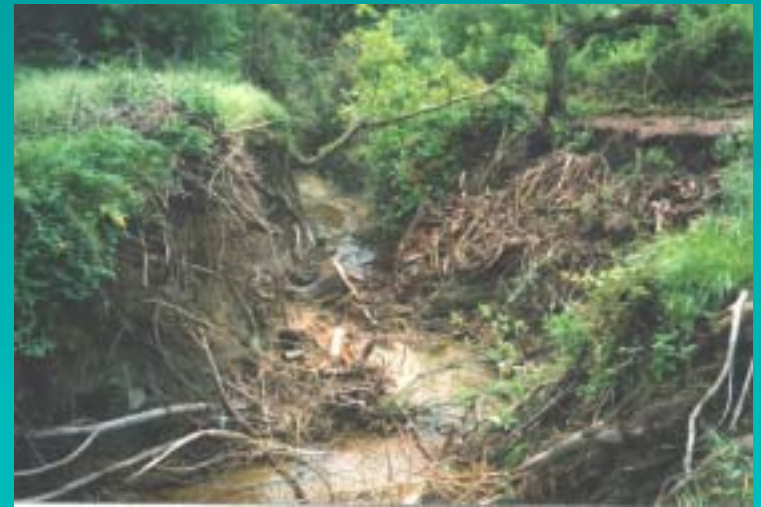
Better Site Design Benefits

- 🔥 Reduce Pollutant Loads

- 🔥 Protect Natural Habitats

 - Reinforce hydrologic cycle

 - Integrate with natural topography



Benefits (continued)

- Increase Property Value



- Help Project Proponents Meet C.3 Requirements

- Save Money



Steps Towards Better Site Design

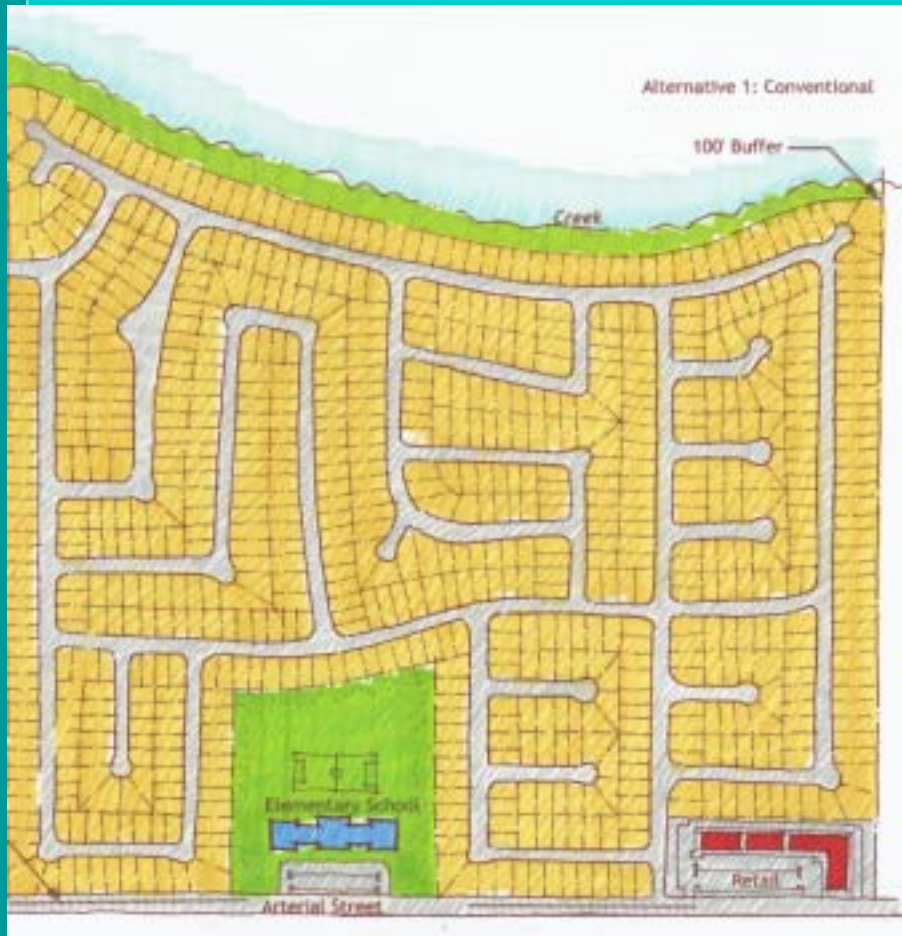
- 🔥 Define Development Envelope and Protected Areas
- 🔥 **Reduce Impervious Surfaces/Minimize Directly Connected Impervious Areas**
- 🔥 **Maximize Permeability**
- 🔥 **Build Narrow Streets**
- 🔥 Maximize Choices for Mobility
- 🔥 Use Drainage as a Design Element

Today's Agenda

- 🔥 Street Width and Cul-de-sac Issues
- 🔥 Cul-de-sacs and Turnarounds
- 🔥 Permeable Pavements/Load Concerns
- 🔥 Covers for Trash and Recycling Bins

Conventional Subdivision

courtesy of CDM



- Total site: 220 acres
- Housing units: 660
- Parks & open space: 0 acres
- Creek setback: 0 feet
- Impervious coverage (streets): 28 ac, 13% of site
- Amount of street relative to conventional: 100%
- Linear feet of pipe: 15,000
- Linear feet of swale: 0
- Width of major streets: 40'
- Width of minor streets: not used

**Figure 2.10 Alternative 1:
Conventional**

“Best Practices” Subdivision

courtesy of CDM



Figure 2.11
Alternative 2: Hybrid/Best Practices

- Total site: 220 acres
- Housing units: 660
- Parks & open space: 12 acres
- Creek setback: 100 feet
- Impervious coverage (streets): 22 ac, 10% of site
- Amount of street relative to conventional: 81%
- Linear feet of pipe: 13,000
- Linear feet of swale: 0
- Width of major streets: 32'
- Width of minor streets: 28'

“New Urban” Neighborhood

courtesy of CDM



- Total site: 220 acres
- Housing units: 660
- Parks & open space: 52 acres
- Creek setback: 500 feet
- Impervious coverage (streets): 15 ac, 10% of site
- Amount of street relative to conventional: 70%
- Linear feet of pipe: 10,000
- Linear feet of swale: 5,000
- Width of major streets: 32'
- Width of minor streets: 28'

Figure 2.12
Alternative 3: Neo-Traditional

Narrow Streets

Vintage Oaks, Menlo Park

Street Trees



One Sidewalk



Parking Pullouts



Hierarchy Street/Loop Road



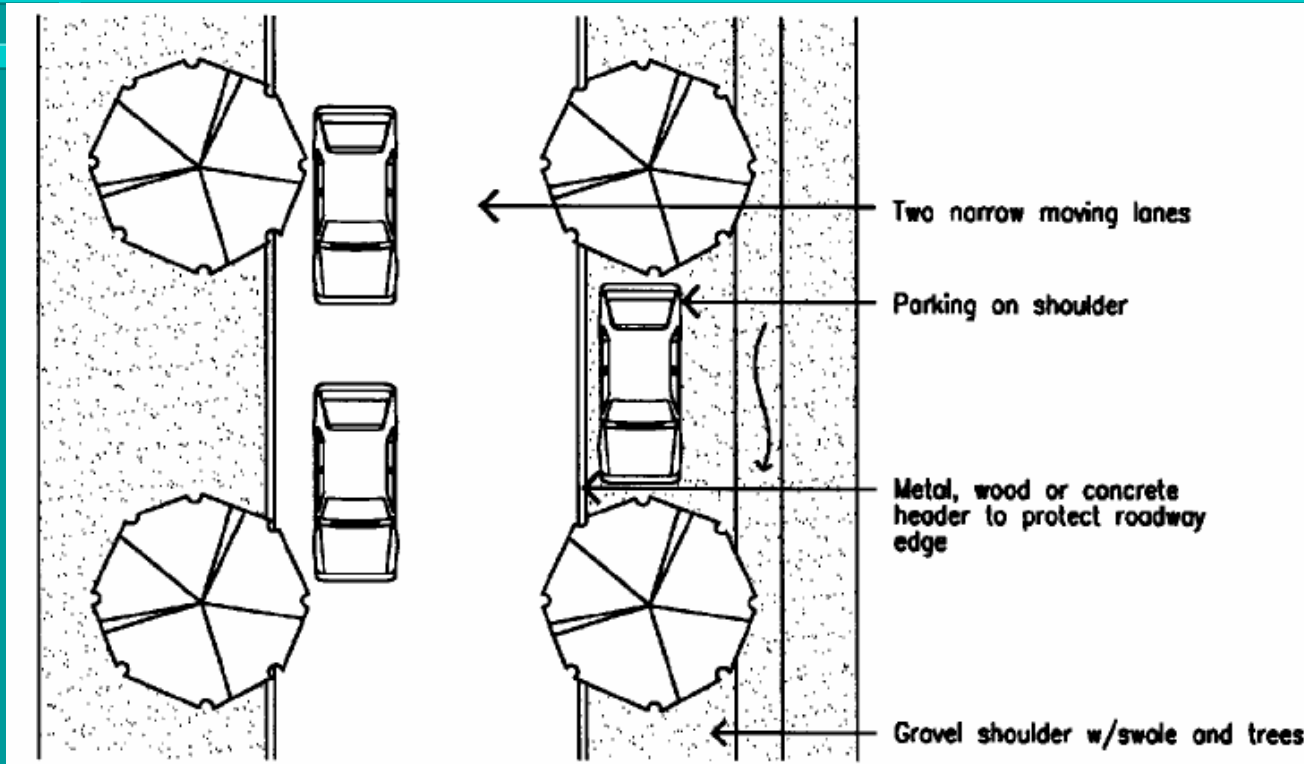
Better Site Designs—Streets

- **Streets/transport-related structures typically = 60-70% total impervious area**
- **24-foot wide streets are safest—Swift and Associates study-Longmont, CO**
- **Water Quality Goals**
 - **Reduce impervious surface area: Size streets to fit transportation demand**
 - **Incorporate infiltration/detention and swales**

Rural/Urban Neo-Traditional Access Street Standards

- 🔴 Suitable if traffic volume \leq 500-750 ADT, 15-25 mph
- 🔴 May not be suitable:
 - 🔴 long cul-de-sac streets
 - 🔴 hillsides w/o alt. route

Rural Access Street Standard



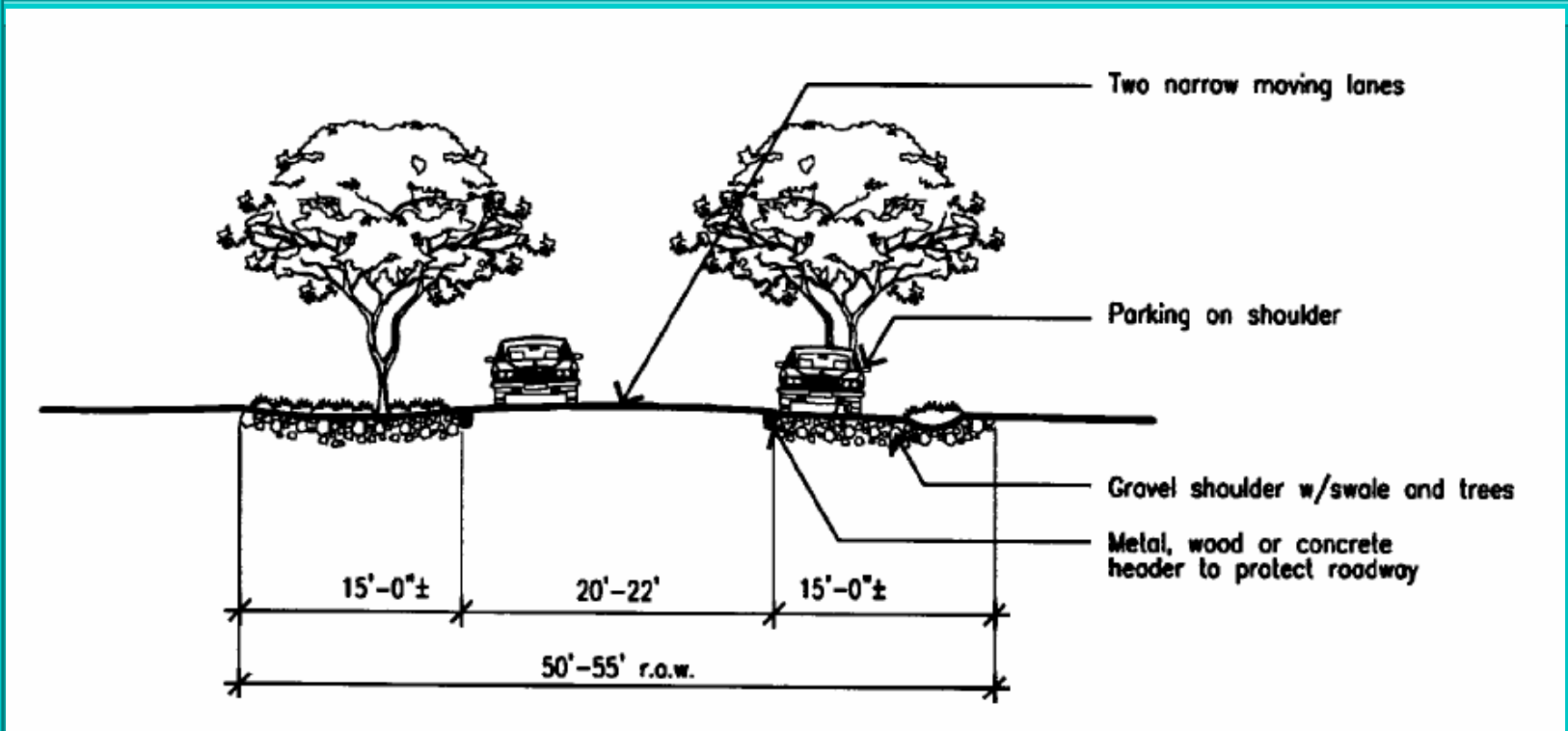
Paved
Roadway:
18-22 feet

(Typical
streets: 36-
40' pavement)

Two lanes, no curb, no gutters;
Gravel shoulders for drainage/parking

Source: BASMAA *Start at the Source*, 1999

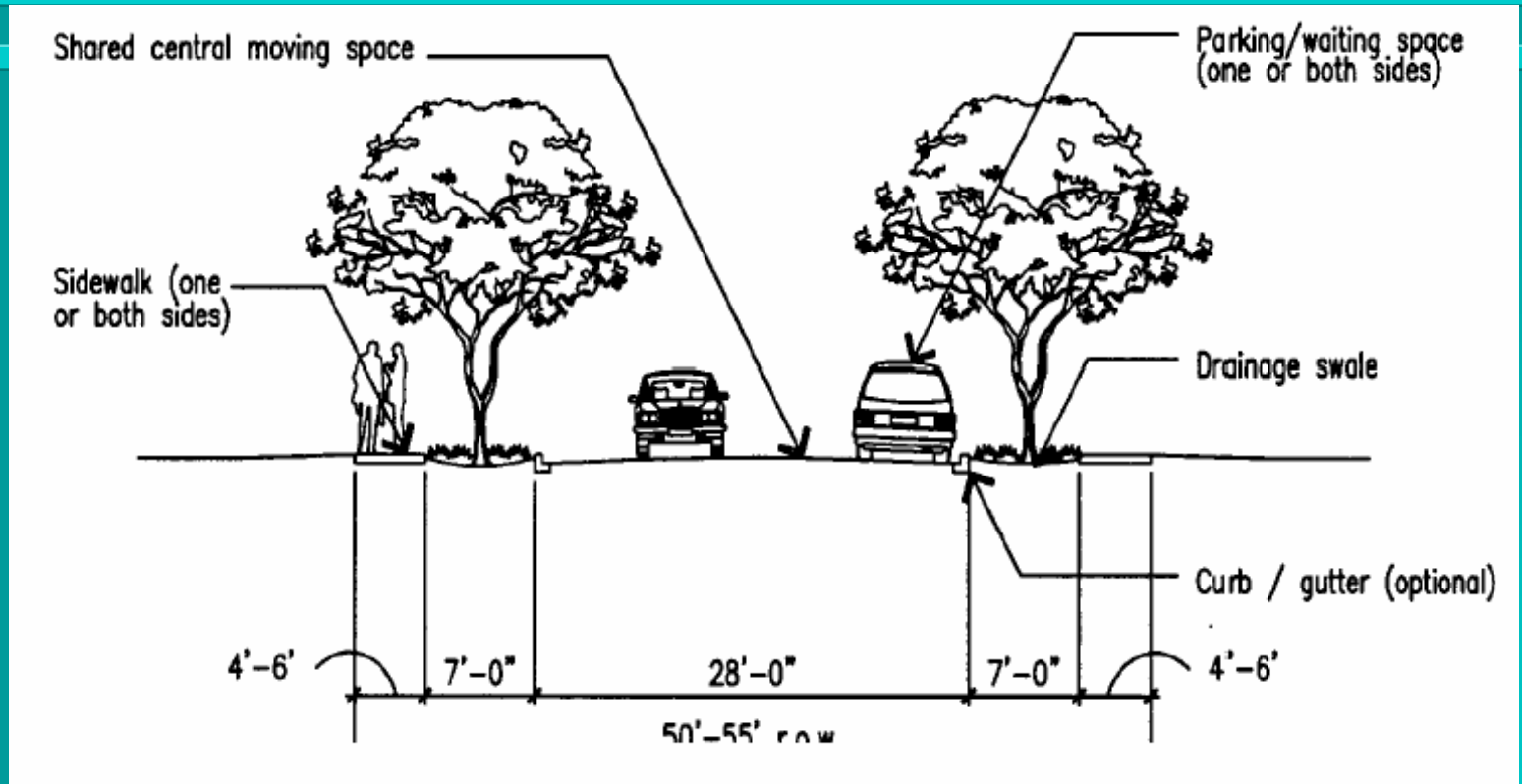
Rural Access Street Standard



Not suitable—long cul-de-sac streets/hillsides w/o alt. route

Source: BASMAA *Start at the Source*, 1999

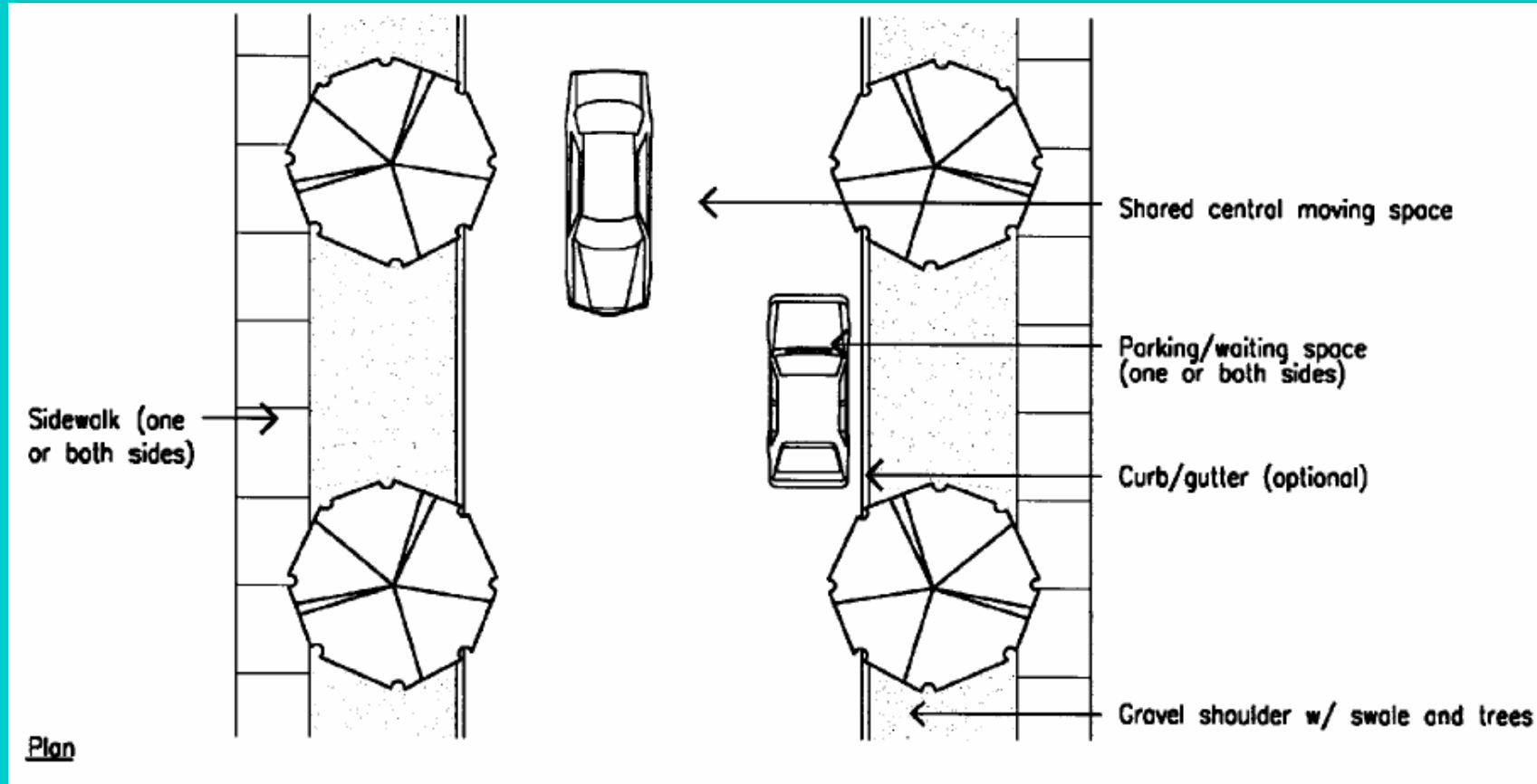
Urban Neo-Traditional



Typical Width: 20-30' for vehicles to move/park
(Conventional streets: 36-40' of pavement)

Source: BASMAA *Start at the Source*, 1999

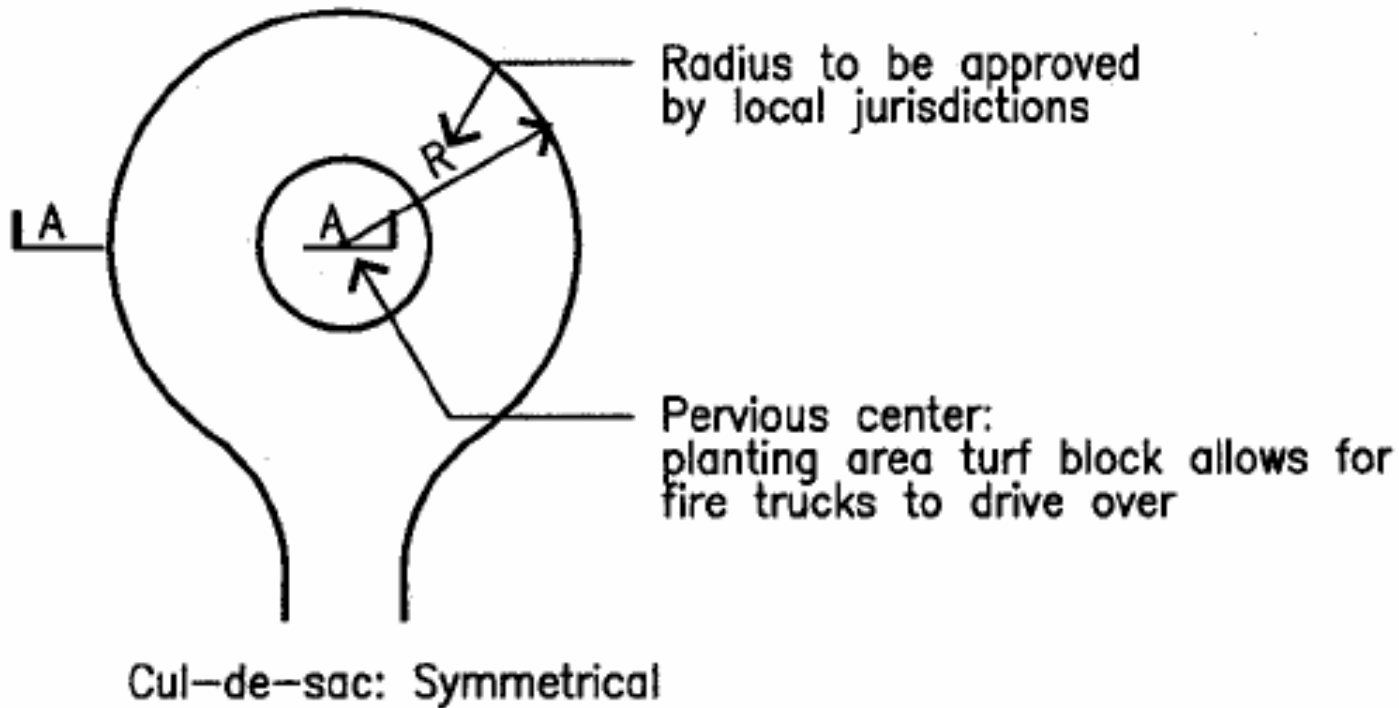
Urban Neo-Traditional



Reduces imperviousness by up to 50%

Source: BASMAA *Start at the Source*, 1999

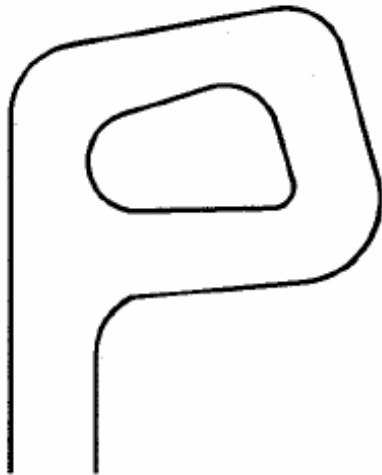
Cul-de-sacs: Pervious Center



Landscaping in center can reduce imperviousness
30-40%

Source: BASMAA *Start at the Source*, 1999

Cul-de-sac Options

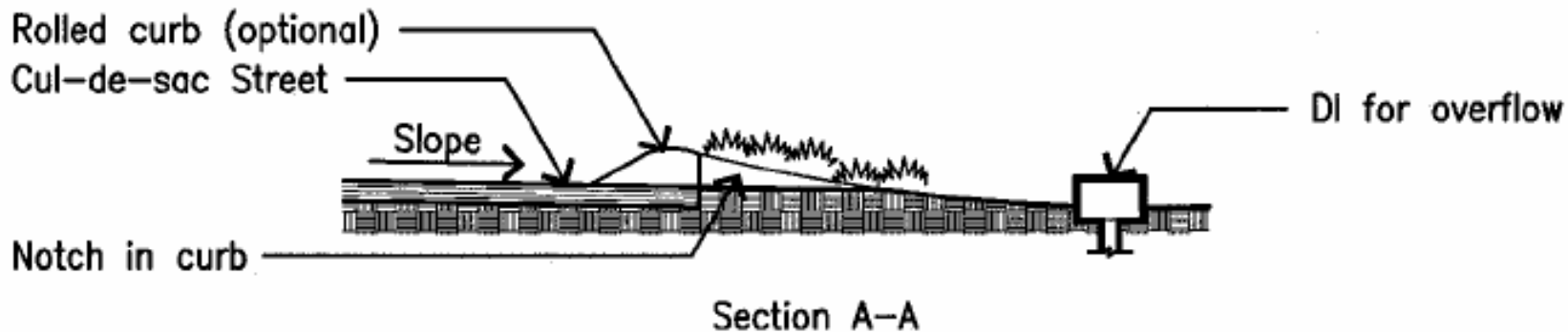


Cul-de-sac: Asymmetrical

Can use turf block, etc. in center to accommodate fire trucks

Source:

BASMAA Start at the Source, 1999



Section A-A

Permeable Pavement



Palo Alto, CA

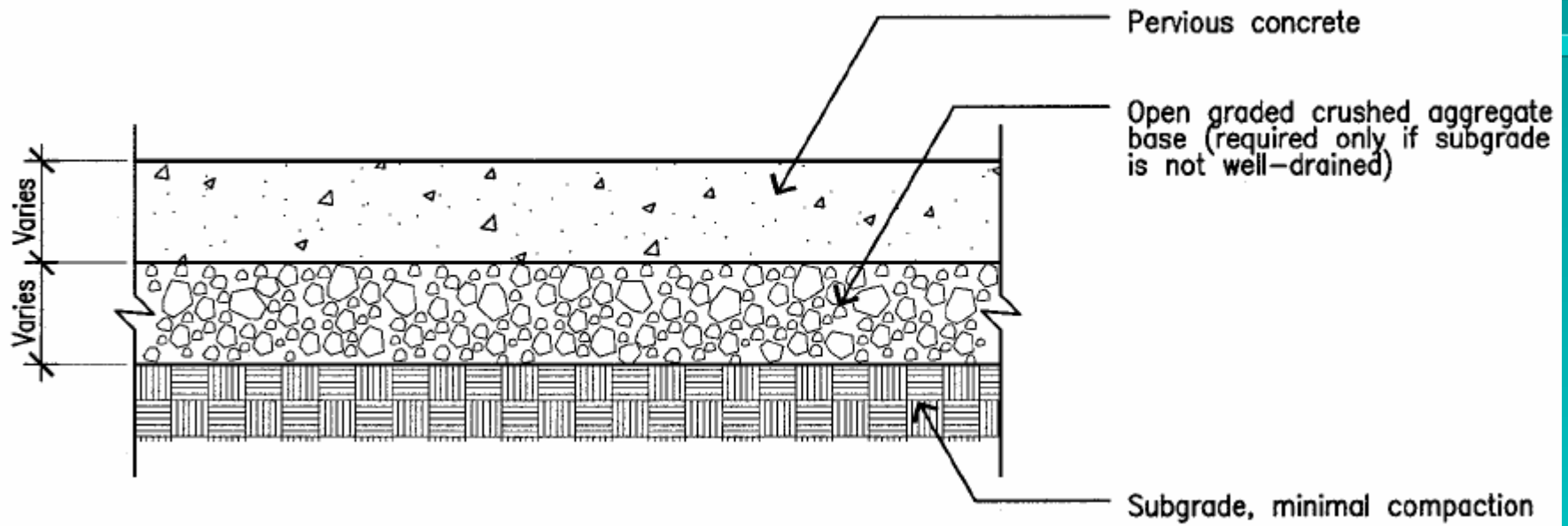
Water Quality Goals:

- Reduce impervious land coverage
- Provide stable load-bearing surface
- Infiltrate runoff to soil
- Allow same intensity of use

Permeable Pavement Applicability

- Flat sites (<5% slope)
- Low traffic volume
- Not for gas stations, truckstops
 - (HC leaching)

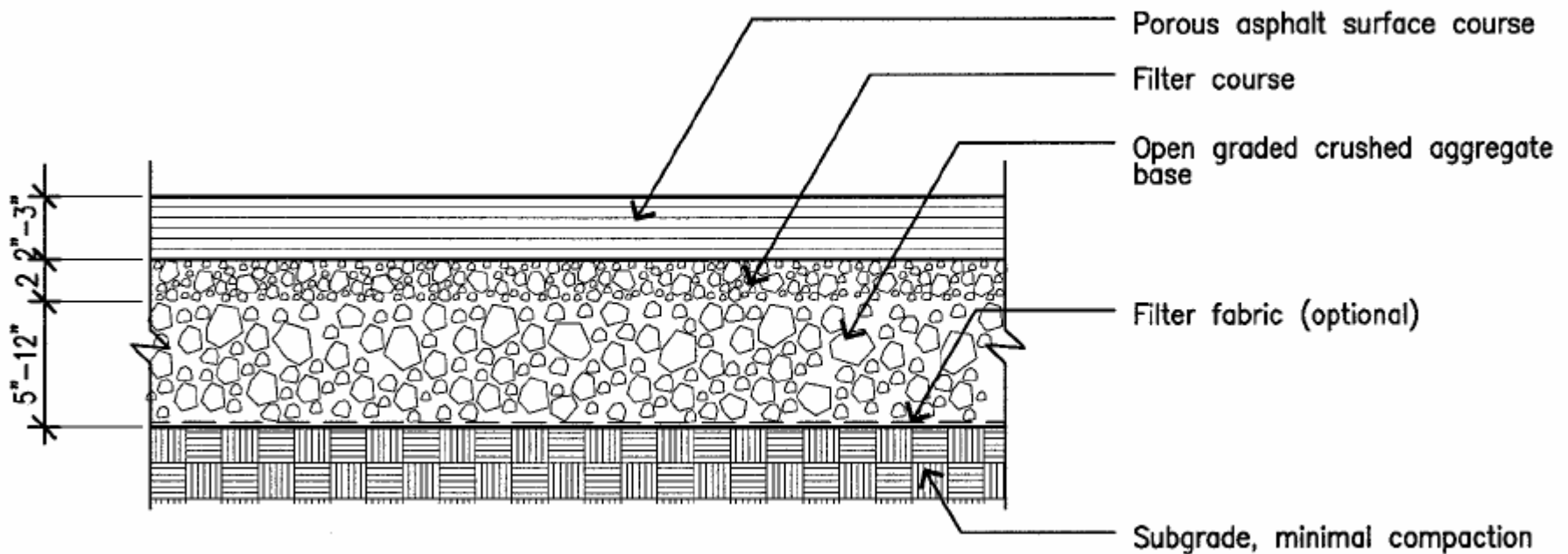
Pervious Concrete



Mixture of coarse aggregate, hydraulic cement, admixtures, water, other cement-type material—

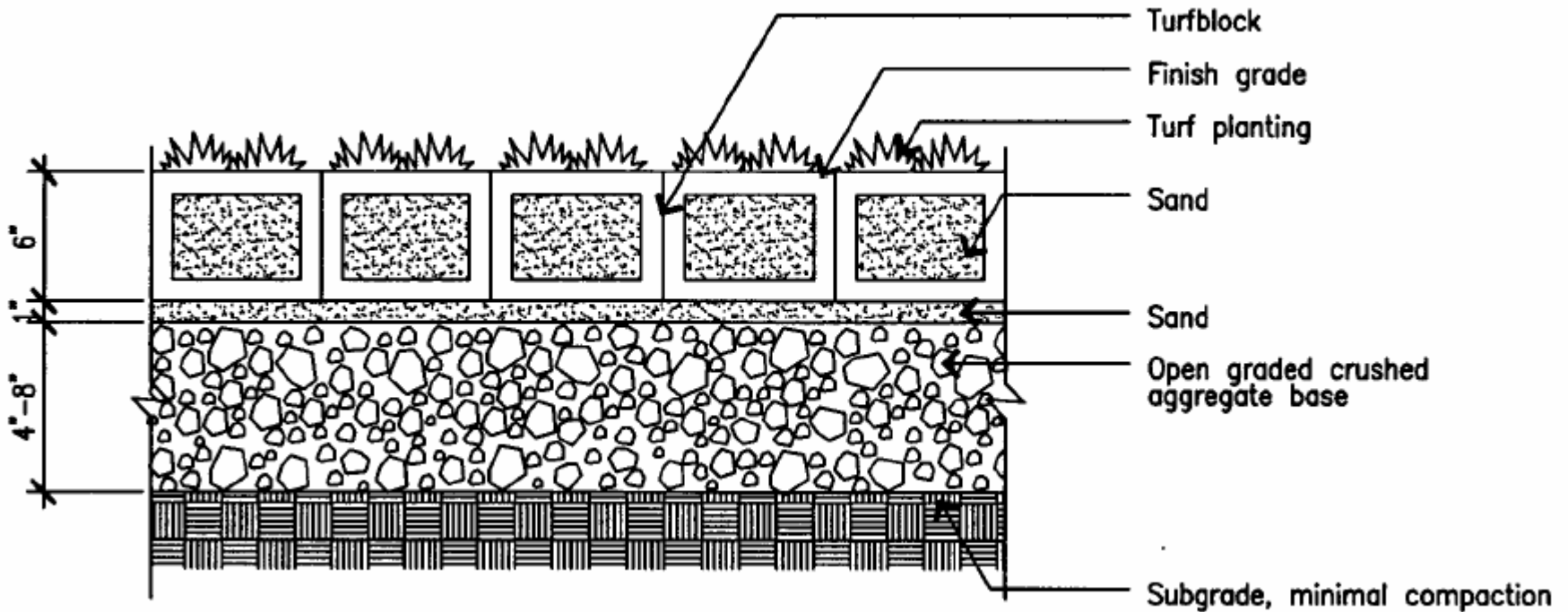
Surface-void content: 15-25%

Porous Asphalt



Source: BASMAA *Start at the Source*, 1999

Turf Block



Source: BASMAA *Start at the Source*, 1999

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
- Tualatin Valley Fire & Rescue—
Neighborhood Street Design Guidelines, 2000
 - <http://www.tvfr.com/Dept/fm/brochures/index.htm>

Questions?



Street Widths—Fire Dept.

- What width street is required for access and why?
- What is the response time goal?
- What other measures could improve public safety (e.g., sprinklers in homes)?

Street Widths

- What is VTA promoting with regard to street widths and why?
- What requirements do buses need?
- What concerns to pedestrians have?

Cul-de-Sacs

- What are the preferred radius standards for cul-de-sacs and why?
- Under what conditions would you object to a landscaped median for a cul-de-sac and why?

Permeable Pavements

- Why are permeable and porous pavements not in more use in the Bay Area?
- What are the load bearing issues? Is this just a question of proper design?

Permeable Pavements

- For pedestrians/bicyclists, what are the concerns regarding accidents with respect to void space?
- What are the liability concerns?
- Where should permeable pavements be best used and why?

Covering Trash & Recycling Areas

- Do you allow covered trash and recycling areas—why or why not?
- What are the fire concerns?
Potential solutions?
- What are the access issues?