

Pervious Pavement

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LOW IMPACT DEVELOPMENT

Introduction



LOW IMPACT DEVELOPMENT

Introduction



L.I.D. Site Design Techniques

- Geometrics & Layout (i.e., "Narrow Streets")
- Porous Pavements (Permeable Surfaces)
- Bioretention (Raingardens)
- Soil Amendments (Compost Amended Soils)
- Rainwater Collection and Reuse



LOW IMPACT DEVELOPMENT

Introduction

Ways to Mimic Nature...

No Catch Basins & No Curbs

- ✓ Sheet Flow Run-off
- ✓ Retain Water On-Site
- ✓ Porous Surfaces
- ✓ Do not Concentrate Flows



LOW IMPACT DEVELOPMENT

Introduction

Use smaller decentralized solutions
at the source...

Decentralized Approach

(Small Scale Systems)

vs.

Centralized Approach

(Large Scale System)



POROUS PAVEMENTS

Impervious Surface Reduction Strategies

Permeable (Porous) Surfaces

➤ Hardscapes

- Porous Concrete / Asphalt Pavements
- Interlocking Concrete Pavers
- Gravel Cellular Confinement Systems

➤ Softscapes

- Reinforced Grass Surfaces
- Grass Cellular Confinement Systems

➤ Green Roofs



POROUS PAVEMENTS

Some Porous Pavement Design Considerations

■ Soil

- soil infiltration rate
- soil's structural capacity
- soil's susceptibility to swelling
- slope stability / basement flooding

■ Use

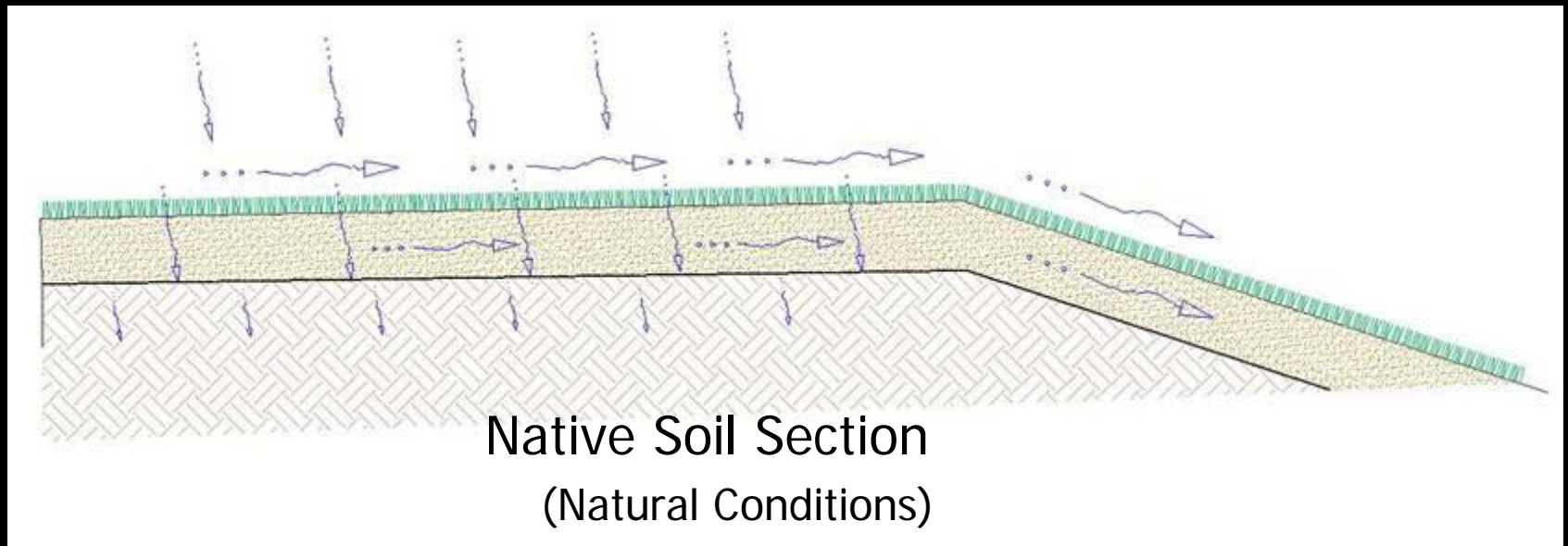
- high or low traffic
- Sources of contamination (i.e. industrial)
- speed
- maintenance
- Striping
- In ROW in Seattle is limited to the planting strip per SDOT



POROUS PAVEMENTS

Impervious Surface Reduction Strategies

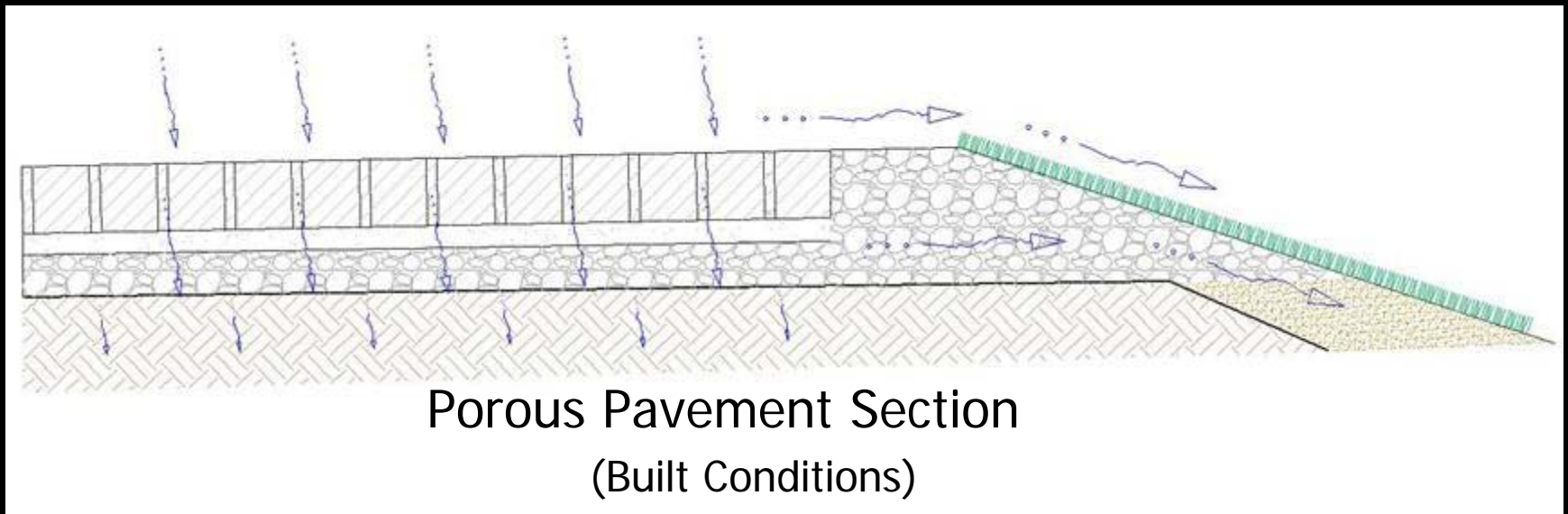
Mimicking Natural Conditions...



POROUS PAVEMENTS

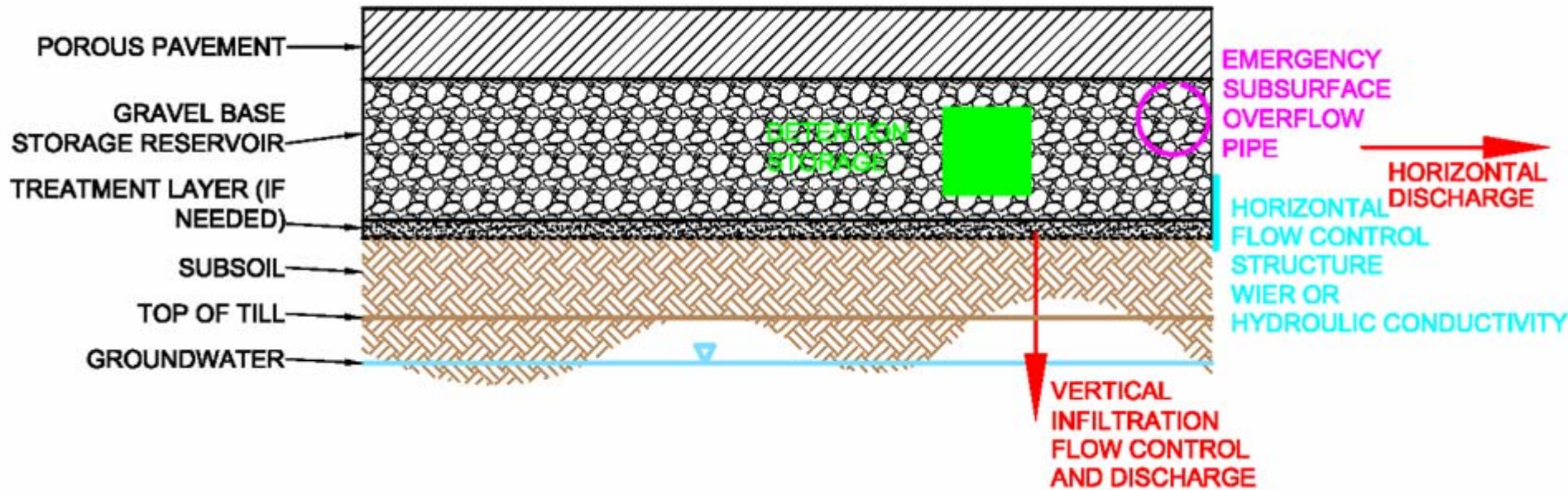
Impervious Surface Reduction Strategies

Mimicking Natural Conditions...



POROUS PAVEMENTS

Conceptual Summary Section



Concepts shown, not all will be present on each design...



INTERLOCKING CONCRETE PAVERS

Types of Pavers



SF-RIMA



UNI ECOSTONE



TURFSTONE

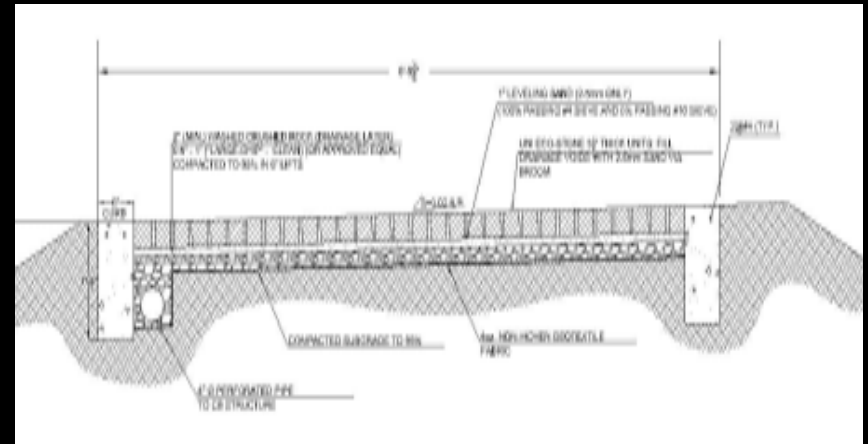


INTERLOCKING CONCRETE PAVERS

Example Project



Residential Driveway, Bellingham, WA



POROUS GRAVEL PAVEMENT

"Gravel Pave 2"

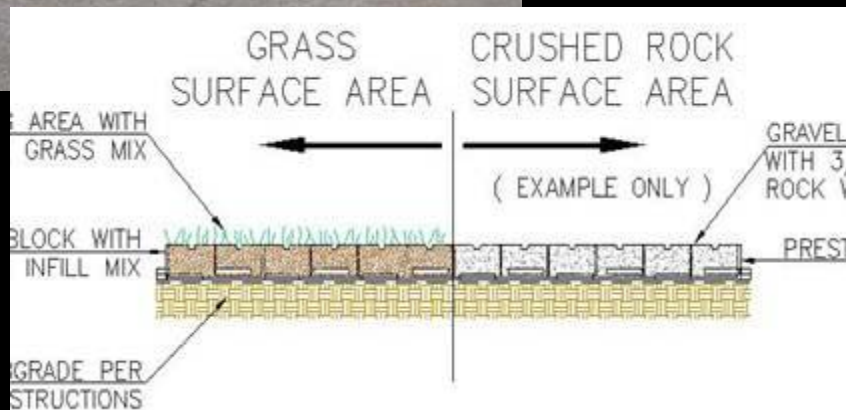


ADA Assessible Trail



REINFORCED GRASS PAVEMENT

Example Project



Bayview Corner, Whidbey Island, WA



REINFORCED GRASS PAVEMENT

Example Project



Boundary Bay Brewery, Bellingham, WA



LOW-IMPACT DEVELOPMENT

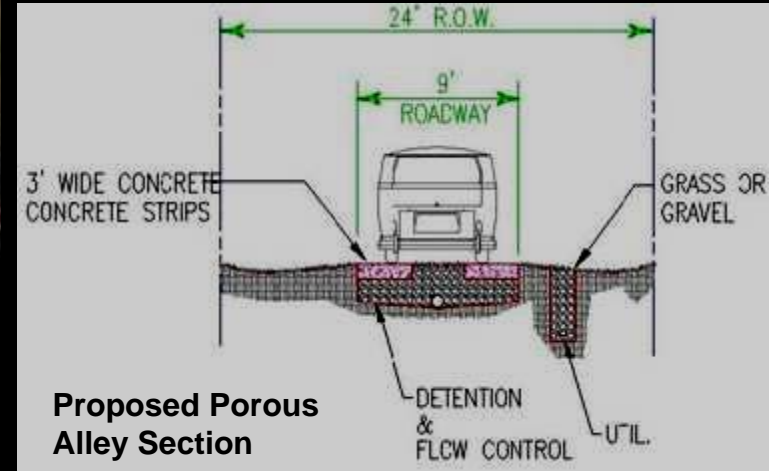
Example "Country Lane" sections



City of Vancouver BC Country Lane Alley Program



Residence, Bellingham, WA



Proposed Porous Alley Section



REINFORCED GRASS / PERVIOUS CONCRETE PAVEMENT

Hybrid Pervious Pavement Example Project (2006)



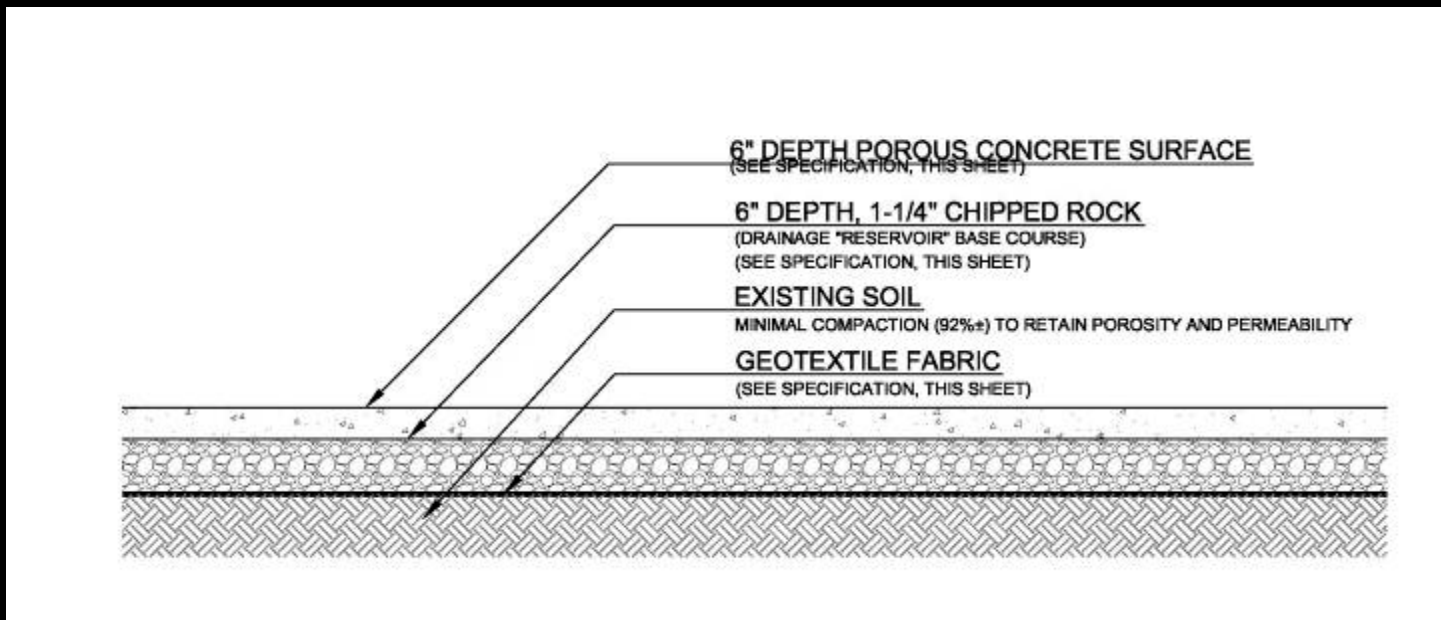
Dan Godwin Center, Bellingham, WA



LOW-IMPACT DEVELOPMENT

Pervious Cement Concrete Pavement

Stormwater Treatment, Detention/Retention and Flow Control are built into the section...

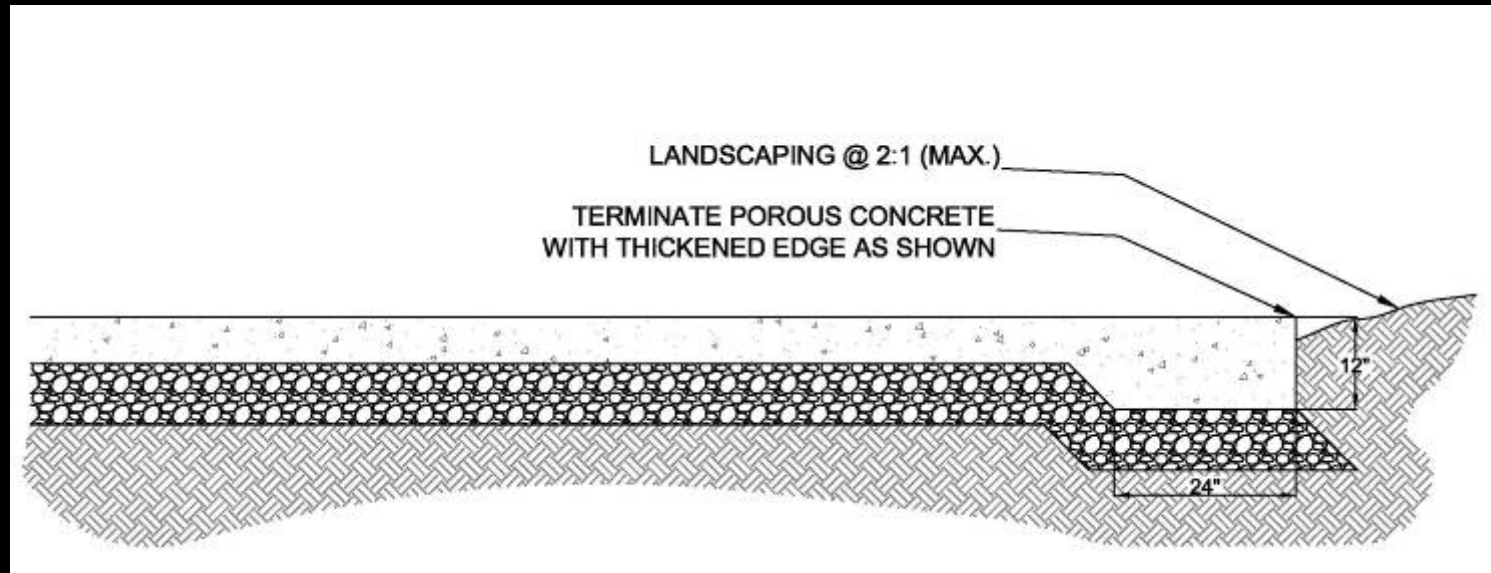


6" Pervious cement Concrete Pavement over 6" depth of 1 1/4" chipped rock, (deleted the fabric)



LOW-IMPACT DEVELOPMENT

Pervious Cement Concrete Pavement



Provided thickened edge where curb is not present

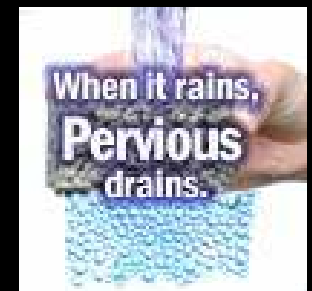


LOW-IMPACT DEVELOPMENT

Pervious Cement Concrete Pavement

Mix Design and Installation Changes

- Required a National Ready Mix Concrete Association (NRMCA) certified pervious concrete placer.
- Contractor used a Bunyan Power Screed for placing pervious concrete very smoothly
- Refined the mix design to use a finer 1/4" aggregate with certain admixtures to work really well with the Power Screen approach



LOW-IMPACT DEVELOPMENT

Pervious Cement Concrete Pavement

New Finer Aggregate Mix



LOW-IMPACT DEVELOPMENT

Pervious Cement Concrete Pavement

New Power Screen Placement Approach



LOW-IMPACT DEVELOPMENT

Pervious Cement Concrete Pavement

Jointing, Edging, and Covering



POROUS CONCRETE PAVEMENT

Example Project



Public Alley, Bellingham, WA



POROUS CONCRETE PAVEMENT

Example Project



Bayview Corner, Whidbey Island, WA



LOW-IMPACT DEVELOPMENT

Example Project (Municipal Community Center)

- 75,000 sf community center on 10.5 acres
- 100,000sf of porous concrete
- Raingardens
- Infiltration of roof water
- No curbs
- No catch basins
- Pool-water re-use for toilet flushing



LOW-IMPACT DEVELOPMENT

Example Project (Municipal Community Center)



POROUS CONCRETE PAVEMENT

Construction Photos



Firstenburg Community Center, Vancouver, WA



PERVIOUS CONCRETE PAVEMENT

Cover and Protect



THANK YOU...

Questions



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