Porous Pavement in Public ROW, Puyallup’s Experience

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What is Porous Pavement?

- Pavement section designed to pass stormwater through it and infiltrate into subgrade versus standard pavements which shed stormwater to collection & treatment systems.

Examples of Porous Pavements

- Porous Gravel (shoulders, alleys)
- GravelPave®/GrassPave®
- Permeable Interlocking Pavers
- Porous Asphalt
- Pervious Concrete
Why Should I Use Porous Pavement in Public ROW?

- Porous Pavement systems have evolved significantly over the last 20 years
- Initial costs can be less expensive when stormwater requirements are considered
- Life Cycle costs can also be much less

Porous Asphalt Evolution

- Important changes
  - Use of Polymer modified PG 70-22 asphalt
  - Use of higher percentage of asphalt
  - Establishment of compaction standard
  - Adoption of APWA Local Agency GSPs
    - [http://www.wsdot.wa.gov/partners/apwa/Division_5_Page.htm](http://www.wsdot.wa.gov/partners/apwa/Division_5_Page.htm)
  - Asphalt Treated Permeable Base
  - Use of Porous Warm Mix Asphalt
Porous Asphalt Evolution Ahead

• Look at the use of Aramid fibers to further enhance the durability and rut resistance
• Further research into testing protocols for porous asphalt

Pervious Concrete Evolution

• ACI specification is base for current APWA GSP approved for FHWA jobs
• Establishes certification requirements for installers
• Typically uses fibers for additional contact points
• Bunyon Screed provides quick screed and compaction
Pervious Concrete Evolution Now

• Not in current APWA GSP’s but used in several City of Puyallup recent projects:
  – Use of HydroMax\textsuperscript{®} additive
    • Extends working time, plastic cover not required, standard curing compound
    • Can use saw cut joints versus tooled joints
    • Sealing of saw cut joints with asphalt
  – Use of manhole isolation, crack control

Initial Cost Comparison

• 39\textsuperscript{th} Ave SW, 11\textsuperscript{th} St SW to 17\textsuperscript{th} St SW
  – Initial cost estimate for HMA project vs. pervious concrete project
  – On eventual $3.3M project, pervious concrete was about $217k less than HMA
  – Primary cost savings was from elimination of construction and ROW purchase for stormwater pond
Life Cycle Cost Comparison

• Porous pavements working with nature, not against it
• Standard HMA pavement is continual battle against water intrusion
  – Crack Seal
  – Chip Seal
  – Asphalt Overlay

Life Cycle Cost Comparison

• HMA periodic maintenance:
  – Increasing levels of expenditure
  – Repeated interruptions of residents, commuters and business
  – City of Puyallup expends about $1.1M/year on this type of maintenance
  – In addition, about $1M/year on major overlay project
Life Cycle Cost Comparison

• Porous Asphalt/Pervious Concrete Maintenance:
  – Regular Regenerative Air Sweeping (which is done for ALL streets)
  – Watching for pavement degradation/raveling
  – Potential for light seal coating and/or grind/overlay if needed*

*Jessica Knickerbocker, City of Tacoma has first hand experience with this.

Life Cycle Cost Comparison

• For every porous pavement road built:
  – One less road that will require regular “waterproofing” maintenance
  – Frees up that money for more porous road construction
  – Frees up money to acquire ROW to meet new stormwater regulations for reconstruction projects
  – Eventually get to a potentially financially sustainable road network
8th Ave NW LID Retrofit, 2012
Coming Soon

• In partnership with the WSU Stormwater Center: study on the cost effectiveness of porous pavements for municipal streets

In Closing

• There are many lessons learned in porous pavements which can’t be shared here due to time limitations
• I’m available to provide technical assistance for those looking to use porous pavements in their ROWs.
• Best way to contact me is via email
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  – (253) 435-3606
City of Puyallup Porous Pavement projects

• The following slides can be included in the packets for participants but won’t be part of the presentation

Corporate Yards South Entrance, 43rd Ave SW, 2014
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Wilson Loop Road, 2013
6th Ave SW, 2013

8th Ave NW Alleys, 2016
Permeable Paver Driveway, 2010

Porous Gravel Alley, 2013
Clarks Creek Pervious Maintenance Road, 2013

Jeb III Link Trail, 2014
NE Neighborhood Streets, 2016

Robbins Hollow, 2016
39th Ave SW, 11th to 17th, 2016

2015 Sidewalk Link
Coming Soon

- **Shaw Road, 23rd Ave SW to Manorwood** - pervious concrete road with porous asphalt shared use path
- **WSU LID Frontage Improvements, Phase 1** - 1st Puyallup project using PATB and geogrid with PHMA
- **WSU LID Frontage Improvements, Phase 4a & 4b** - same as Phase 1
- **2016 Sidewalk Link Program** - pervious concrete sidewalks