Pervious Concrete

Specifications and Design

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Puget Sound Concrete Specification Council

Specifications

- ACI 522.1-13
  - American Concrete Institute
  - National Industry standard specification
  - NRMCA Pervious Concrete Contractor Certification
- City of Tacoma Specification Working Group
  - ACI 522.1-13 as basis
  - Changes to clarify and format – APWA and WSDOT

Specification elements

- Applicable specifications and test methods
- Lock in proposed mix
- Establish acceptance/rejection criteria
- Test Panel

Expectations

- Set expectation targets
  - Materials
  - Appearance
    - Test Panel
    - Surface and tolerances
  - Performance
    - Infiltration/Permeability
  - Construction
    - Timing
    - Jointing
  - Curing
  - Opening and Use

Remedies

- Check Batch ticket for compliance with mix design
  - Reject load if not the same
- Check Thickness
  - Do not place if insufficient
- Visual Appearance
  - Stop, remove if not uniform or not the same as test panel **Before It Gets Hard**.
- Permeability
  - Pour water on plastic concrete, correct before it gets hard

Tests

- Thickness
- Density, plastic and hardened
- Permeability

Remove and replace

- Appearance
- Don't let problems get hard – Correct during placement
- Last resort

Pavements

- Concrete is a rigid paving material
  - High modulus of elasticity
- Pervious Concrete is Concrete
- The surfacing course is the pavement structure

First Steps

- Ask for help and information…
- Your design decisions will dictate the cost of the project
- I am available to assist you with all phases of design, specification and details for pervious concrete.
- Learn from what others have done.
- …don't re-invent the wheel…

Design

- Information
  - Soil Support Value
    - Weakened condition
    - Rigid Pavements are insensitive to soil support value
    - Assume poor
  - Loading
    - Heavy Single Axle loads will drive the design
    - Need to quantify axle weights and numbers
    - ESAL's are not applicable to rigid pavement design
  - Design Life

Design Process

- Quantify Loading
- Quantify Soil Support Value
  - Assume poor if data not available
- Materials Properties
  - For Pervious, MR = 375, E = 2.5 million
- End of life condition
  - Ride and % cracked slabs

StreetPave

- I suggest using StreetPave
  - American Concrete Pavement Association
  - Free Trial available on line
  - Simple, fast and conservative
- AASHTO is not applicable
- Others might work

What's New…

- Heavy Metals Removal
  - Washington Department Of Ecology
  - Washington State Ferries
  - Research by Dr. Liv Hasselbach
  - Cu and Zn removals > 90% in < 1 sec. in runoff through pervious concrete
  - Data suggests > 20 yr. lifespan of removal
  - Project to be constructed Vashon Island Ferry Terminal Summer 2015

What's New…

- Internal Curing
  - Use of polymers to retain water in paste fraction
  - May reduce or eliminate need for covering with Plastic
  - Curing continuous, no delay
  - May facilitate sawcutting joints in pervious concrete
  - 39th St. in Puyallup

Pervious Concrete

- Pervious Concrete is the preferred permeable pavement of the Washington Department of Ecology
- Permeable pavements are, or soon will be required in Puget Sound region jurisdictions
- Millions of square feet of pervious concrete surfaces have been built and are in service in the region
  - Residential, Commercial and Industrial applications

Tulalip Q Casino,
Marysville, WA

6 acres, pervious concrete

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First Industrial, Lacey, WA
Loading Dock Ramps
80,000 SF in 3 buildings

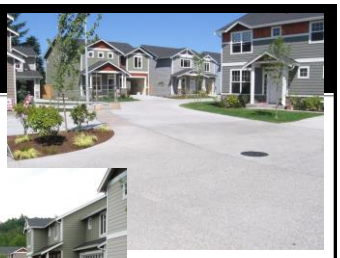
SeaTac Headquarters Fire Station
All paved surfaces
21,000 SF

Miles Sand and Gravel
Kent Plant

Pinehurst Safeway, Seattle, WA

1.6 acres plain and colored pervious concrete

Stratford Place, Sultan, WA



All paved surfaces are pervious concrete - Roadway, driveways and sidewalks

Lacey Thurston Athletic Complex

Over 42,000 Sq. Ft. Pervious Concrete - Pedestrian area and emergency vehicle access

Contact

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