

Fishbeck, Thompson, Carr & Huber, Inc.

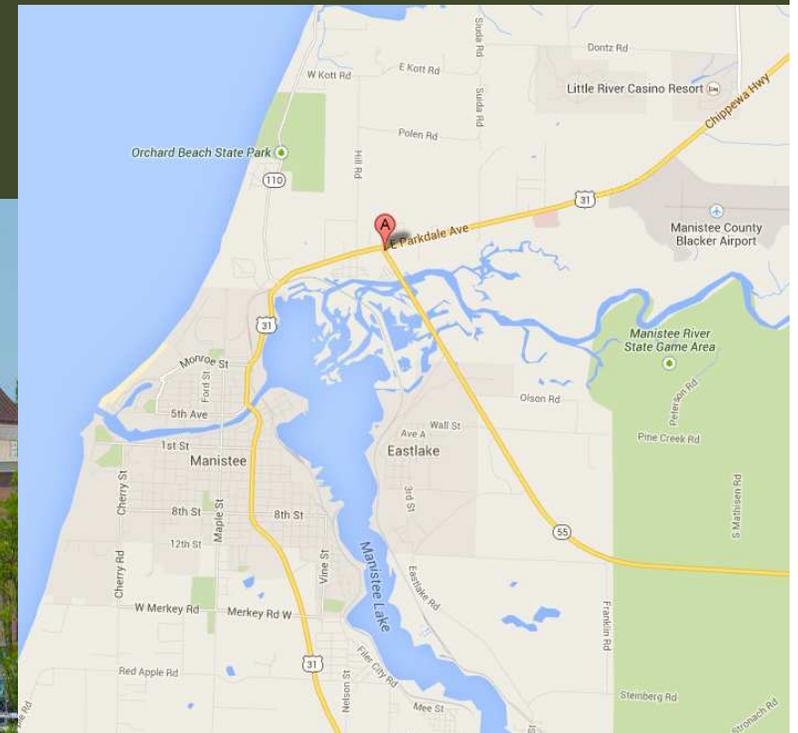
Porous Pavement Up North Meijer – Manistee, Michigan



fTC&h

Northern Michigan
Green Infrastructure Conference

Project Location – Manistee



Project Site Looking East



Project Site Looking East

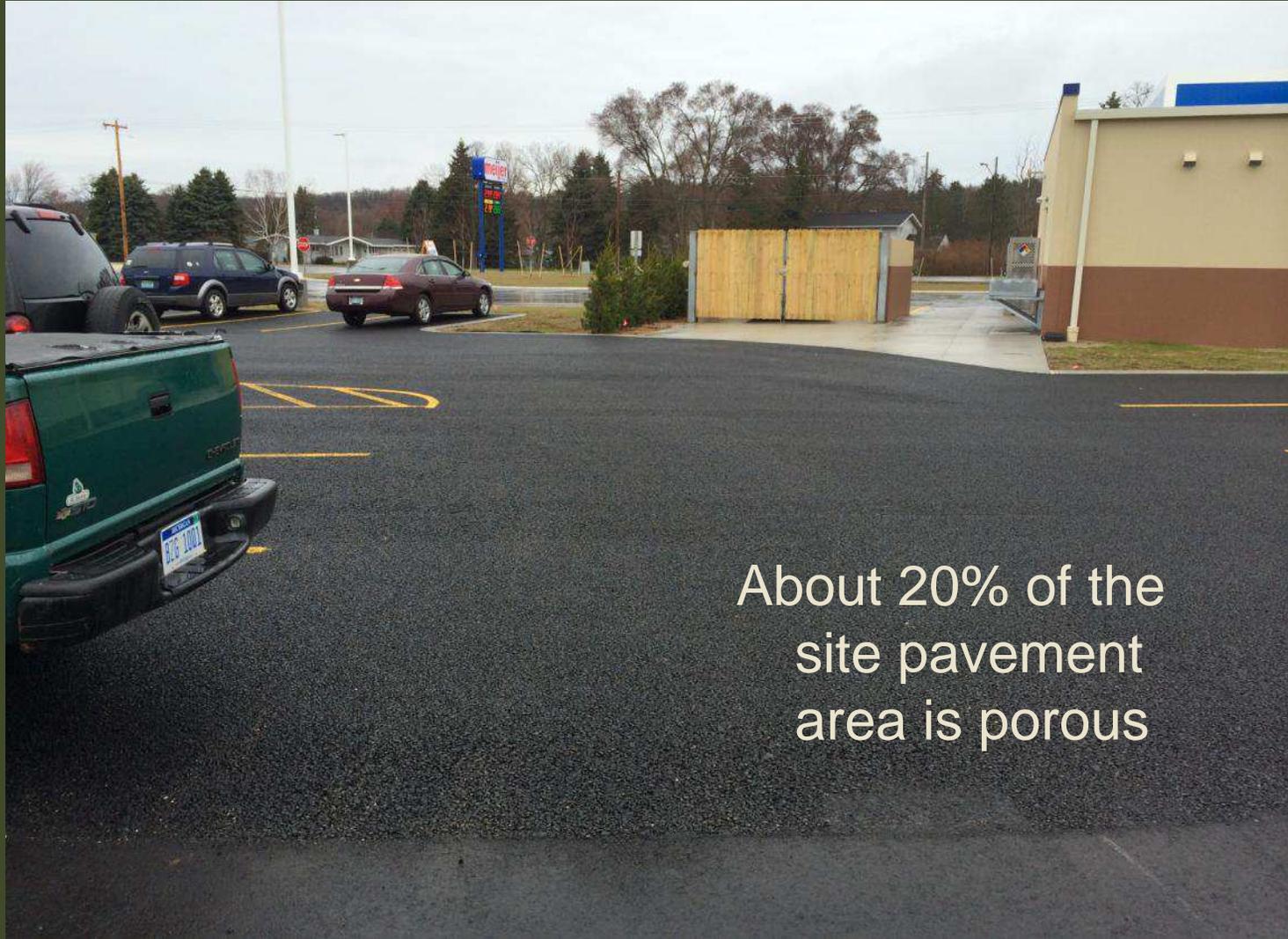


Design Focus: Stormwater Quality

- Porous paving
- Catch basin sediment sumps
- Mechanical sediment removal
- Infiltration basins
- Low-velocity discharge
- Maintenance plan



North Team Member Parking Area



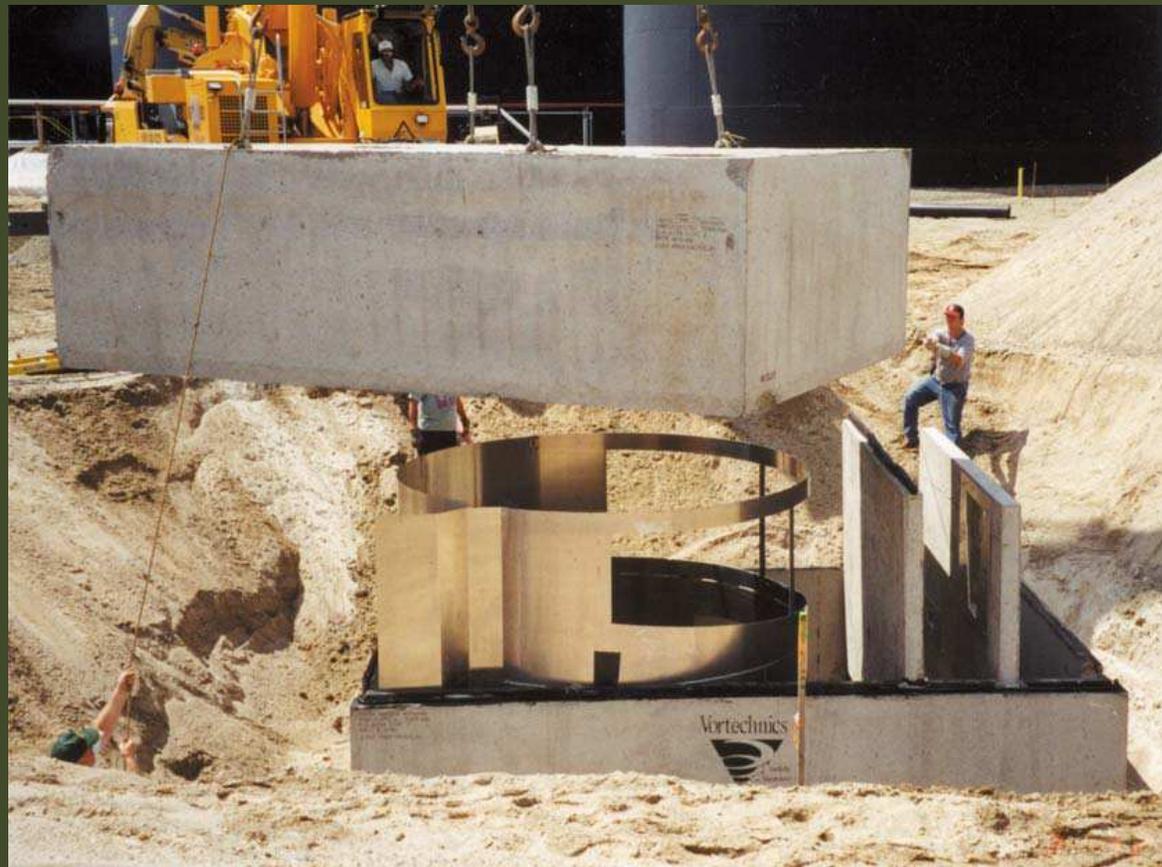
About 20% of the
site pavement
area is porous

East Team Member Parking Area



Stormwater Treatment Unit

Vortech: 80% sediment removal
of first 1-inch rainfall



Infiltration Areas

Two infiltration areas infiltrate 1.5- to 2-inch rainfalls



Level Spreaders

Reduce discharge velocity to wetlands

Discharge
velocity
< 1fps



Porous Mix Design is Critical

- Stone gradation
- Removal of all fines
- Smaller crushed stone in pavement (1/2-inch)
- Larger crushed stone in reservoir (3/4-inch)
- Modified binders and anti-strippers in pavement to prevent drain down and raveling
- Asphalt content (5.5 to 6.5%)
- Air voids (18 to 22%)



Preconstruction Test Strip

Installed at Elmer's Traverse City office

- Reviewed mix design
- Tested reservoir stone gradation
- Determined rolling temperature
- Determined rolling pattern and roller size
- Compaction density targets
- Testing requirements



Preconstruction Test Strip

Infiltration testing:

- ASTM C1701 test requires 150"/hour
- Results: 270"/hour

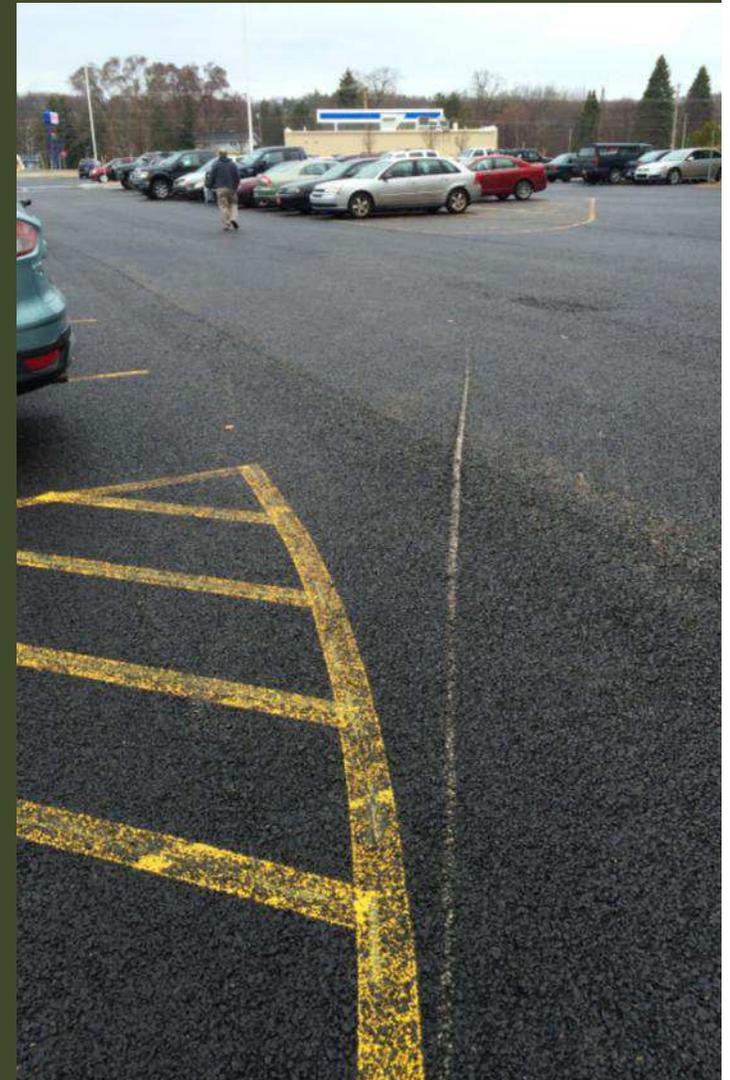


Benefits of Porous Pavement

- Infiltration of stormwater
 - ▣ Less discharge to surface waters (volume and quality)
 - ▣ Recharge groundwater
- Water removed from pavement structure
 - ▣ Much less cracking or potholing in pavement
 - ▣ Reduced ice/slip problems
 - ▣ Reduced salt application in winter
- Fewer stormwater inlet structures in parking lot
- Fewer and smaller storm sewers on project
- Possible elimination of detention ponds on sites

Maintenance

- Maintenance staff education
- Sediment clogging
- Snow plowing



Questions?



ftch

Thank You!

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