MAINTENANCE of OGFC PAVEMENTS

THE NORTH CAROLINA EXPERIANCE

2014 MPPP ANNUAL MEETING

&

R-26 WORKSHOP

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- Project History
- Issues Faced
- Project Design
- Initial Results
- Current Status
Project History

- I-40 near Wilmington, NC
- OGFC Placed in 2001
- Other Sections Failed
  - Severe Raveling
  - Poor Surface Friction
  - OGFC Removed & Replaced
- Similar Pattern Beginning
Issues Faced

- OGFC Raveling
- Lower Surface Friction
  - Wet crashes increasing
- Needed Attention
- Funding Not Available to Replace
- DOT Seeking Options
Issues Faced

- Pavement Preservation not Possible
  - Well past the “top of the curve”
- When Will It Fail?
- Can Failure be Delayed?
- What Options Exist?
- How to Fund?
- Some Action Required Soon
Issues Faced

- How to Extend Life Until Funds Available?
- How to Restore Friction and Reduce Wet Crashes?
How can issues be addressed?

- Texturing solves friction, but not raveling
- Rejuvenation may retard raveling, but decreases friction (at least temporarily)
- Combination of technologies may solve both issues
Project Design

- Performance Specification
  - Outflow Meter (ASTM E2380) Results average 10 seconds or less per lot
  - Recovered Binder Exhibit 20% Viscosity improvement two weeks after treatment (AASHTO T 316)
  - Friction Testing (ASTM 274) Required
    - No limits set

- First time used in Combination
  - Some risk involved
Project Design Concerns

➢ Texturing
  • May break aggregate bond
  • Will not prevent future polishing

➢ Rejuvenating
  • First use on OGFC in NC
  • Net friction improvement should be positive
  • Highly oxidized Polymer Modified Binder
Project Design

- Five Sections, 18.6 Lane Miles
- Retain Existing Pavement Markings
  - Texturing between markings
  - Rejuvenator will not discolor markings
- Testing By Contractor
  - Outflow Meter by Contractor, observed by DOT
  - Viscosity testing by independent lab
  - Friction testing by independent consultant (and DOT)
Project Sequence

- Pre construction viscosity readings
- Initial Outflow and skid readings
- Texturing (two tandem units)
- Outflow and skid readings taken
- Rejuvenator application
- Outflow and skid readings taken
- Opened to traffic within 30 minutes
- Post construction viscosity readings taken 2 weeks later
Initial Results

- Performance Requirements Met
  - OGFC Outflow improved 39%
  - Dense graded Outflow improved 73%
  - Viscosity improved 32.4%
  - Skid number improved ~30%
Texturing

Before Texturing

Post Texturing
Post Construction

Current Status

- Accident Data analyzed by DOT
- No visible raveling of aggregates
- Surface Aggregates Polishing
After 1.5 years compared to previous 3 years (as reported Feb. 20, 2014)

- 14% Decrease in total crashes
  - Range -83% to +33%
- 72% Decrease in wet crashes
  - Range -100% to -35%
- 16% Decrease in lane departure crashes
  - Range -78% to +35%
- 75% Decrease in lane departure wet crashes
  - Range -100% to -35%
Observations & Current Status

- Project a Success
- Skid Numbers Near Original Readings
  - Texturing may still be providing surface drainage on individual aggregate particles
- Rejuvenation Reducing Brittleness of Binder
  - Aggregates not raveling
Observations & Current Status

- Project Should Extend Service Life
  - Until funding becomes available for replacement
  - Resolved urgency of action
- DOT Continues to Monitor Accidents
- Track Pavement Condition Survey Data
- Technique Seems Appropriate for Pavement Preservation (earlier during the service life)
Project Cost

- Approximately $2.20 per Square Yard
  - Including Pre and Post Construction testing
Questions?