FDOT Experimental Projects Performance

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Orlando, Florida

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State Materials Office
Topics of Discussion

• Overview

• Projects Performance
  ➢ Pavement Preservation (PP)
  ➢ Crack Relief (CR)
  ➢ High Polymer (HP)
  ➢ Quiet Pavement (FC-Q)
  ➢ Fog Seal (FS)
Overview

• Customers - Districts, Central Office Design and Construction

• Selection of suitable site within FDOT project for the construction of:
  - one or more test sections utilizing the experimental design(s) and/or material(s), and
  - one or more control sections utilizing the standard design and/or material
Overview

Main factors considered in test site selection:

• Adequate truck traffic and pavement design to yield significant results within a reasonable time-frame

• Adequate test/control section length (minimum 1,500 ft per section) with suitable horizontal and vertical alignment

• Uniform subsurface and suitable surface conditions
Overview

Process

Customer
- TIMELY request submission to SMO

SMO
- Review
- Coordination

Customer
- Enters project info into SharePoint

SMO
- Start performance monitoring

SMO
- Project performance updates

SMO
- Final report/publication
## Overview

<table>
<thead>
<tr>
<th>ID</th>
<th>Project</th>
<th>Type</th>
<th>District</th>
<th>County</th>
<th>SR</th>
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**Total Active Projects:** 23

- Active Experimental (E): 6
- Active Special (S): 17
- Total: 23
Projects Performance

Pavement Preservation (PP)
Pavement Preservation (PP)

Evaluate the effectiveness of different pavement preservation techniques to extend pavement life and serviceability
Pavement Preservation (PP)

County: Gulf
Project Number: 51010
Fin No.: 426957-1-52-01
Road Number: SR30/US 98
Completed: 2012
# Pavement Preservation (PP)

<table>
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<tr>
<th>LANE(S)</th>
<th>Test Section No.</th>
<th>Beginning Milepost</th>
<th>Ending Milepost</th>
<th>Description</th>
<th>length (mile)</th>
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<tr>
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</table>
Bonded Friction Course was most effective treatment in controlling cracking.
Pavement Preservation (PP)

FC 9.5 overlays were more effective in controlling rutting
Pavement Preservation (PP)

FC 4 and BFC were most effective in preserving smoothness
Pavement Preservation (PP)

Micro-surfacing treatment had the smallest drop in Friction
Projects Performance

Crack Relief (CR)
Crack Relief (CR)

Evaluate the effectiveness of different crack relief techniques to mitigate reflective cracking of asphalt
Crack Relief (CR)

County: Gadsden
Project Number: 50010
Fin No: 411695-1-52-01
Road Number: SR30/US 98
Completed: 2010
Crack Relief (CR)

- Thermal
  - Horizontal movement of PCC slabs initiates bottom-up reflective cracking
  - Curling of PCC slabs initiates top-down reflective cracking

- Load
  - Differential vertical movement of adjacent joints propagates reflective cracking
Crack Relief (CR)

- R1 and L1 originally constructed with PCC in the 1920’s
- Several rehabilitations and widening
- Experienced significant reflective cracking
Crack Relief (CR)

- Five test sections were built in R1 and L1
- Each section was ~ 1500 feet
- Each section received a different AC overlay type and thickness on top of existing AC and PCC base
Crack Relief (CR)

Not to scale

Section 1 (0.5” Overbuild)
1.0” FC-9.5
1.5” SP-12.5
0.5” Overbuild
AC
PCC

Section 2 (1.5” SP-12.5)
1.0” FC-9.5
1.5” SP-12.5
AC
PCC

Section 3 (2.5” SP-12.5)
1.0” FC-9.5
2.5” SP-12.5
AC
PCC

Section 4 (1.0” OGCR)
1.0” FC-9.5
1.5” SP-12.5
1.0” OGCR
AC
PCC

Section 5 (0.5” ARMI)
1.0” FC-9.5
1.5” SP-12.5
0.5” ARMI
AC
PCC
Crack Relief (CR)

S2 (1.5” SP 12.5) had the least transverse cracks; S5 (1.5” SP 12.5 + 0.5” ARMI) had the most cracks
Crack Relief (CR)

S1 (1.5” SP12.5) had the highest smoothness
Projects Performance

High Polymer (HP)
High Polymer (HP)

County: Gadsden
Project Number: 50030
Fin No: 422151-1-72-60
Road Number: SR10/US 90 (Midway)
Trucks: 9.2%
Completed: 08/2015
High Polymer (HP)

- Westbound outside travel lane (L2) at I-10 interchange
  - Located between two truck stops
  - Rutting over 2 inches in some areas

- Programmed to be reconstructed with PCC
- Resurfaced top 2.5” with single lift of FC12.5 containing HP
- PCC reconstruction was postponed
High Polymer (HP)

Source: H. Moseley - US 90 HP Pilot Project
High Polymer (HP)

HP binder was effective in controlling rutting
Projects Performance

Quiet Pavement (FCQ)
Quiet Pavement (FCQ)

County: Levy
Project Number: 34050
Fin No: 210376-3--52-01
Road Number: SR55/US19
Completed: 2010
Quiet Pavement (FCQ)

- FDOT has been actively involved in the FHWA Quiet Pavements Pilot Program

- Two FCQ sections were designed to produce less tire/pavement noise than the traditional FC5

- FCQ is essentially a FC5 surface with different aggregate characteristics
# Quiet Pavement (FCQ)

<table>
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<tr>
<th>Beginning Milepost</th>
<th>Ending Milepost</th>
<th>Test Section</th>
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<td>26.798</td>
<td>27.598</td>
<td>FC5 CONTROL</td>
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<td>27.598</td>
<td>28.393</td>
<td>FCQ ARB-12</td>
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<td>28.393</td>
<td>29.229</td>
<td>FCQ PMA</td>
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</table>
FCQ with ARB-12 is more effective in reducing tire-pavement noise
Projects Performance

Fog Seal (FS)
Fog Seal (FS)

County: Polk
Project Number: 16030, 16170
Fin No: 197647-3-52-01, 197368-3-52-01
Road Number: SR 35/US17, SR25/US27
Completed: 2009
FS Placement: 04/2013
Fog Seal (FS)

- The functional purpose of an OGFC is to reduce hydroplaning by increasing pavement texture and porosity.

- The porous texture of an OGFC exposes the thin film of asphalt on the aggregate to heat, air, UV radiation and moisture, causing the binder to oxidize and harden.

- This oxidative hardening makes the binder more brittle, and less fatigue resistant, which ultimately results in cracking and raveling.
Fog Seal (FS)

- Application of a fog seal (FS) can prevent an OGFC from raveling by increasing the binder film on the aggregate particles and subsequently reduce the oxidative hardening.

- FDOT placed three (3) different FS test sections on two projects in Polk County to evaluate the potential of this preventive maintenance technique.
# Fog Seal (FS)

<table>
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<tr>
<th>Test Section</th>
<th>Description</th>
<th>Spread Rate (gal/yd²)</th>
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<td>SR35/US17</td>
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<tr>
<td>CNTRL 1</td>
<td>FC5 (no FS treatment)</td>
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<tr>
<td>FS E</td>
<td>emulsion with polymer, rejuvenator and emulsifier</td>
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<tr>
<td>FS A</td>
<td>clay stabilized, mineral filled emulsion</td>
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<td>maltene based emulsion of petroleum oils and resins</td>
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<td>FC5 (no FS treatment)</td>
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Fog Seal (FS)

FS E treatment has the best overall cracking performance
No difference in raveling among FS and control sections
Fog Seal (FS)

FS E treatment had the least impact on friction
Thank You!
For additional information contact:

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Abdenour. Nazef @dot.state.fl.us
(352) 955-6322