Cement Stabilized Full Depth Reclamation
Rte. 30 – King William County, Virginia

October 25, 2017
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Virginia Department of Transportation (VDOT)
Assistant District Administrator for Construction
The Project Team

Lee Hy Paving – Prime Contractor/Paving

Slurry Pavers – Full Depth Reclamation

ECS Mid-Atlantic, LLC – Mix Design and QC Testing
Project Location
Project Length – 4.4 Miles
Pavement/Roadway Condition

- Existing pavement section ranged from 7 to 14 inches of full depth Asphalt Concrete. Average of 8.5 inches
- 12’ Lanes with 1’ Paved Shoulder, Variable gravel width beyond paved shoulder
- Asphalt consisted of multiple overlays with significant stripping to variable depths
- No base aggregate
- Subgrade soil predominantly Silty Sand
- Very narrow 1ft shoulder
- Extensive fatigue cracking
## Pavement Condition

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Pavement Condition
Pavement Condition
Pavement Condition
Rehabilitation Options

- **Mill and overlay.**
  - Minimal life expectancy.
  - Does not address stripping at depth

- **Complete Reconstruction**
  - High Cost
  - Long construction duration
  - Difficult MOT

- **Full Depth Reclamation (Portland Cement Stabilization)**
  - Low Cost
  - Addresses deep asphalt stripping
  - Short construction duration
Pavement Design

18-kip ESALs Over
Initial Performance Period: 3,009,425
Initial Serviceability: 4.2
Terminal Serviceability: 2.8
Reliability Level (%): 85
Overall Standard Deviation: .49
Roadbed Soil Resilient Modulus (PSI): 8,700
Stage Construction: 1

Calculated Design Structural Number: 4.01

Specified Layer Design

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Pavement Design

- Mill 2” AC to lower roadway grade
- Full Depth Reclamation to 12” (250 psi to 450 psi in 7 days)
  - Contract assumes 5% cement for bidding purposes. Contractor to provide final mix design
- Stabilized 12’ lane with 4’ stabilized and paved shoulder
- 4” Asphalt Concrete
  - 2” SM-12.5-D
  - 2” IM-19.5-D
Mix Design Sample Locations
Sampling Bit
Sample Collection
Full Depth Reclamation Mix Design
Reclamation Begins!
Precutting
Preparation for Checking Cement Application Rate
Placing Cement
Checking Cement Application Rate
Blending and Hydrating Cement
Finish Grading

The most important person on the jobsite!
Finish Rolling
Chip Sealing Surface of Stabilized Material
Final Asphalt Placement
The Finished Product!
Construction Schedule

08/21/14 – Began Milling 2” of Existing Pavement

08/25/14 – Began Full Depth Reclamation

10/8/14 – Completed Full Depth Reclamation

Averaged 2,500 square yards per day over 33 days
Post Construction FWD

Falling Weight Deflectometer Testing was performed June 2016

Back Calculated Structural Coefficient
- Min = 0.17
- Max = 0.42
- Ave = 0.30

Required Structural Number = 4.01

Final Structural Number based on revised Structural Coefficient = 5.36
Lesson’s Learned

Better coordination between Materials, Construction and Maintenance during development of the contract.

• Original contract required all nighttime operations. This was changed during the bid period. (Lesson’s Learned on Rte 10 in Richmond)
• Original contract assumed daily paving with HMA. Contract changed to surface treatment.
• Dust Control during Surface Treatment (Chip Seal)
Thank You

Questions?