I-64 Widening / Reconstruction
VDOT Experiences with Imported FDR

Brian Diefenderfer, PhD, PE
Thomas Tate, PE

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Overview

• Recycling background
• Performance examples
• I-64 project background
• Imported FDR concept
• Specifications
• Field testing
• Future applications
Pavement Recycling

• A set of cost-effective and environmentally sensitive techniques for pavement rehab
  – CIR, CCPR, FDR

• Benefits
  – Reduced emissions
  – Lower costs
  – Reduced virgin materials use
  – Utilize stockpiled materials (e.g., RAP)
FDR Performance Examples

- Since 2008, VDOT has completed 15 FDR projects
  - Two of which are on high traffic volume facilities
  - I-81 (2011) and NCAT Test Track (2012)
  - Both used CCPR over an FDR foundation

- To date, these projects have carried more than 15 and 21 million ESALs, respectively
  - Excellent performance
FDR Performance Examples

I-81
I-64 Widening / Reconstruction Project

• In 2015, VDOT awarded a contract to reconstruct and widen a portion of I-64 near Williamsburg
  – Segment II, 7.1 miles in each direction

• Final design includes CCPR over FDR (similar to I-81 and NCAT)
  – But how do you FDR material that doesn’t exist yet?
I-64 Widening / Reconstruction Project

- **New lanes (inside)**
  - Contractor imported foundation material to be stabilized using an FDR process
  - RAP or crushed concrete were allowable

- **Existing lanes (outside)**
  - Once existing concrete was removed, the underlying material was reclaimed using FDR
  - Produced a stabilized foundation
I-64 Construction Sequence

• Existing median was cleared and graded
• New lanes added to the inside in both directions
• Traffic shifted to new lanes
• Existing lanes reconstructed
• At completion, 3 traffic lanes and 2 12ft shoulders
Imported FDR, I-64 Segment II

- Why cement stabilized subbase (i.e., imported FDR)
- What was in RFP
- What specifications were used
- Field checks
Why Cement Stabilized Subbase

• VDOT wanted a consistent platform for the pavement
• Wanted to incorporate recycled materials
• Pavements perform better when placed on a cement stabilized subbase
Project RFP

• Minimum pavement sections were specified in the project’s Technical Requirements (TRs)
• Both flexible and rigid pavement sections included 12 inches of cement stabilized subbase
• Bidders were instructed to assume 6 percent cement for estimating
Specifications

• Went back to Section 307, Hydraulic Cement Stabilization and the FDR (full depth reclamation) specifications
• Gradation
  – 100 percent passing 2” sieve
  – 55 percent minimum passing 3/8” sieve
Specifications

- Compressive Strength at 7 days (ASTM D 1633)
  - Minimum 250 psi
  - Maximum 450 psi
Mix Designs

- Could use crushed concrete or recycled asphalt pavement (RAP)
- Multiple sources for each material were proposed
- Most cement stabilized subbase was made using crushed concrete
- Cement contents ranged from 3 to 5 percent depending on source
Field Testing

- **Density**
  - Followed VTM – 10
  - Minimum 97 percent of modified proctor from mix design
  - Density based on Lots. Lots based on 5,000 linear feet of paving, with five sublots
  - Two density measurements taken per subplot
Field Testing

• Thickness
  – Followed VTM – 38
  – Two thickness measurements per lot
Differences Between Imported and Traditional FDR

• Any?
Future Applications

- Process is well suited to lane additions or new alignments
- Could also be used to blend with existing materials for a “semi-imported” FDR
- I-64, Segment III
  - 8.3 miles, 2018-2021
Thank you!

brian.diefenderfer@vdot.virginia.gov
thomas.tate@vdot.virginia.gov