

I-64 Widening / Reconstruction

VDOT Experiences with Imported FDR

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Virginia Concrete Conference

March 1, 2019

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)



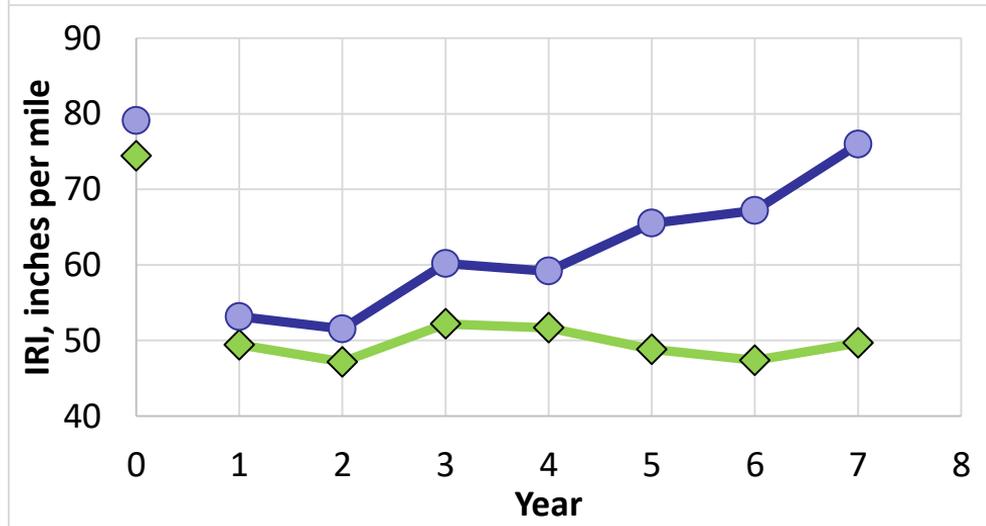
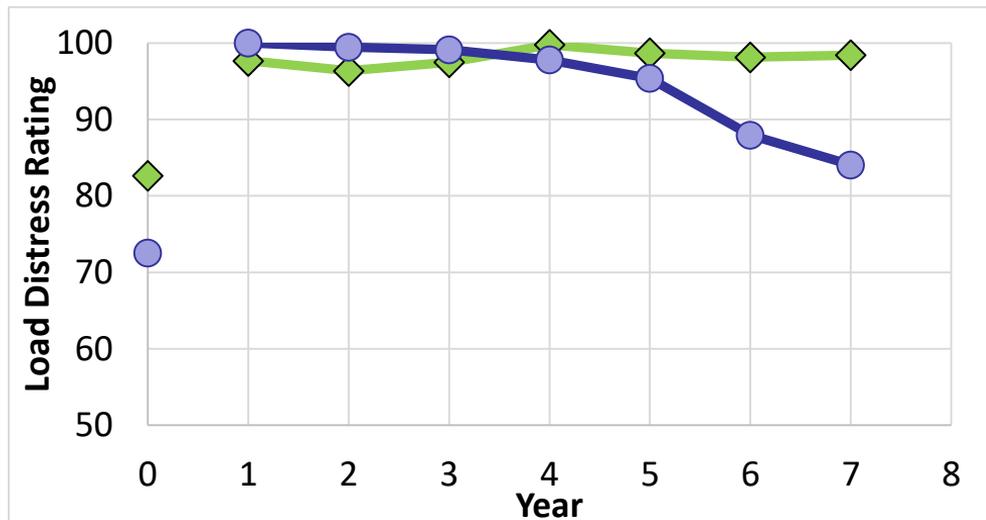
FDR Performance Examples

- 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 sublot



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!

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