Case Studies - SCDOT

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SCDOT – Office of Materials and Research
Overview

- Background Information
  - SCDOT History with Full Depth Reclamation
  - Keys to a Successful Project
  - Typical Construction Sequence for SCDOT Contractors
- Case Studies / Lessons Learned
  - Failing Pavement
  - Chatter
- Moving Forward
  - Operational / Specification Changes
  - Ongoing Research
  - Training / Partnerships
SCDOT History
Keys to Success

- Compaction
- Moisture Content
- Mixing Uniformity
- Cement Content
- Curing
- Lift Thickness
- Pulverization / Gradation
Typical FDR Construction Sequence

- **Spread Cement**
- **Single Pass**
  - Pulverization
  - Mixing
- **Compaction / Grading**
- **Curing**
  - Chip Seal Single Treatment
- **Surface Plane**
- **Overlay**
Typical FDR Construction Sequence

- Spread Cement
- Single Pass
  - Pulverization
  - Mixing
- Compaction / Grading
- Curing
  - Chip Seal Single Treatment
- Surface Plane
- Overlay
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Case Studies
Case Study I

- **Project Length**
  - 5.68 miles

- **Existing Road Condition**
  - Fatigue Cracking
  - Several Patches
  - Asphalt Depth Ranging from 4-8"

- **Traffic**
  - AADT - 8000
  - Truck Traffic – 7%

- **Pavement Design**
  - 10 " CMRB
  - 400# Asphalt Overlay

- **FDR Mix Design**
  - 9% Cement – 420 psi
  - MDD – 125.2 pcf
  - Optimum Moisture – 8.4%

- **Construction**
  - Started In Fall of 2015
  - Continued in Spring 2016
Case Study I

- Investigation
  - Site Visit
  - Observation of Construction Operations
  - Field Investigation

- Lessons Learned
  - Pulverization
  - Curing / Mix Uniformity / Compaction
Case Study Site Visit
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Case Study Site Visit
Case Study Construction
Observations
Case Study Construction
Observations
Case Study Construction Observations
Case Study Construction
Observations
Investigation
Investigation
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Investigation
Case Study 1 – Final Thoughts

- Preliminary Investigation /Evaluation
- Method Specification vs Test Strip
- Inspector Training vs Contractor Quality Control
- Reinforced deeper mixing of FDR Projects
- Better Understanding of Equipment Capabilities
  - Pulverization
Case Study II
Case Study II
Case Study II
Case Study II
Case Study II
Case Study II
Case Study II – Final Thoughts

- Reducing Chatter
  - End Result
  - Tighter Inspection
- Surface Moisture
- Better Finishing Operations
Moving Forward
Operational Changes

- Preliminary Investigations
  - Determine Existing Asphalt Depth
  - Underlying Subgrade Type
  - Observe Surface Condition
    - Percent Patching
    - Distresses
  - Specification Changes
Specification Changes

- Contractor Quality Control Plan
  - Submitted Annually
- Project Test Strip
  - 1st Load of Cement
- Moisture Control
  - Pan Dry Procedure
- Pulverization
  - Pulverization Pass Required
  - Gradations Relaxed
Ongoing Research

Random CMRB Roadways
Statewide & Various Contractors
High to Low Cement Rates & Design Strengths
Range of Depths
FWD Testing & Core Sampling
Ongoing Research

- Material Characterization Study MEPDG - TCT
  - Elastic Modulus / Modulus of Rupture
  - UCS / Compaction / durability relationships
  - Varies Rap percentages and Subgrade Type
Training / Partnerships

- Understanding Equipment Capabilities
  - Talk about issues with equipment suppliers
- Continued Inspector Training
  - Lessons Learned
  - Specification Changes
- Quality Improvement Committee
  - Industry Members
  - Contractors
  - Department Personnel
End Result
Questions