Connecticut PCP Bus Pad Replacement Project

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Presentation Overview

- Need for Rapid Pavement Repair Solutions
- Project Selection
- Project Details and Fabrication
- Construction Sequence
- Panel Installation
- Lessons Learned / Future Plans
Need for Precast Concrete Pavement

- Numerous high volume roads with composite pavement in Connecticut
- Many JRCP roads built in the 50s and 60s falling into a major rehab category
- Need a rapid joint repair strategy for high volume areas with limited work hours
- Need long lasting repairs (get in, get out, stay out)
CTfastrak Bituminous Bus Pad

- High profile project – first bus rapid transit system in CT
- Busway opened in Spring 2015
- Directly connects Hartford to New Britain
- Operates almost around the clock
Project Selection (cont.)

- Severe rutting at New Britain East Main Street station within 6 months
• Rutting caused bus doors to become inoperable
• Discussions began for temporary and permanent repair strategies
Project Selection (cont.)

- Emergency bituminous paving performed as temporary fix
- CT applied for and received $75,000 in SHRP2 user incentive funds
- CT also received $150,000 as lead adopter
- Funds used to develop permanent PCP repair and advance the technology
Project Details

- Typical Panel Dimensions: 9’ long, 15’ wide, 10” thick
- Total length of each bus pad: 106’
- Included use of Gracie Level Lifts - 4 per panel
- 14” long dowel bars, 1.25” diameter, spaced at 1’ apart
- Bottom dowel slots
- Undersealing grout distribution channels
- Foam gasket lining for grout containment
- Epoxy Coated Steel Reinforcement
Project Details

- **Dowel slot grout:**
  - 4,000 psi at 28 days (2,500 psi before opening to traffic), rapid non-shrink

- **Bedding grout:**
  - 4,000 psi at 28 days (500 psi before opening to traffic), rapid set and free flowing, capable of 1,400 psi at 25 minutes

- **Concrete:**
  - 5,000 psi at 28 days
Panel Layout
Project Cross Sections
Precast Pavement Fabrication

Fort Miller Co. Schuylerville, NY
Proposed Construction Sequence

• Construction during 48 hour weekend closure
• Ship panels from Fort Miller and store panels nearby prior to construction
• Sawcut existing asphalt into sections prior to weekend closure
• Friday night set up traffic MPT, and remove rub-rails
• Remove asphalt, grade and compact base
Proposed Construction Sequence (cont.)

- Set Precast Concrete Panels
- Drill and grout rub-rail and anchor bolts
- Set panels to final elevation using leveling lifts, and install dowel grout
- Install bedding grout, and reinstall rub-rails
- Saw and seal joints, and mill and pave approaches
- Open busway to traffic for Monday morning, or sooner
Installation – Bedding Layer

- Incorrect material used for bedding layer
- Material was open graded and could only be loosely compacted
- Material should have been well graded processed aggregate
- Material was intended only for very minor base correction
- It was determined that the contractor over excavated and used material not meeting specifications
Installation - Bedding Layer

- Replaced 6’ either end with processed on North bus pad due to time schedule
- South bus pad replaced entire bedding layer with processed
Installation - Bedding Layer
Installation - Panel Placement
Installation - Panel Placement
Installation - Panel Placement
Installation - Panel Placement
Installation - Leveling Lifts
Installation - Grout
Installation - Paving/ Sealing
Finished Product
Lessons Learned

• Need generic PCP system for competition
• Need to identify standard sizes for joint repairs
• Use simplified approach placed with minor grading and no leveling lifts
• Possibly incorporate shims
• More preconstruction training
• Incorporate critical item checklist
• Need to refine grouting process
Future Plans for PCP Use

• Develop details and specifications for generic PCP system

• Identify projects with exposed concrete to implement a generic system

• Identify projects with composite pavement to implement a generic system
Thank You

Questions?