Connecticut PCP Bus Pad Replacement Project

Steve Norton

Presentation Overview

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

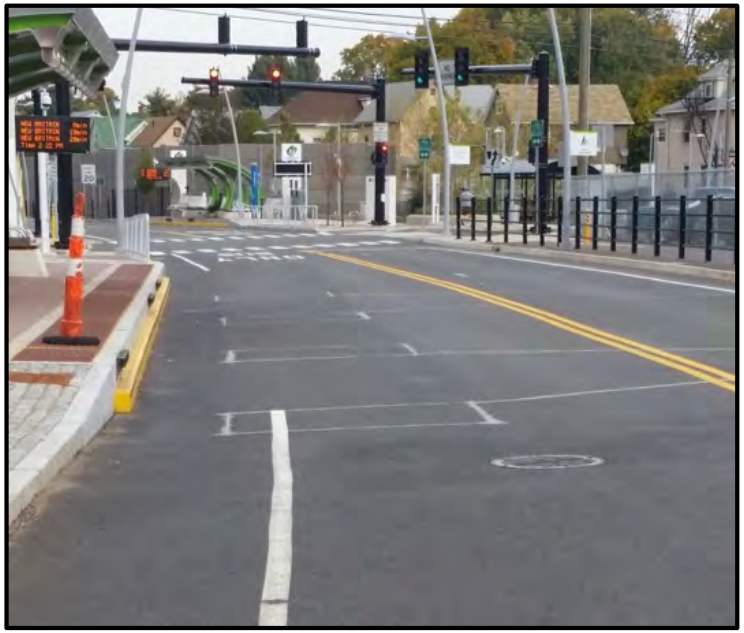
Need for Precast Concrete Pavement

- 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)

Project Selection

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

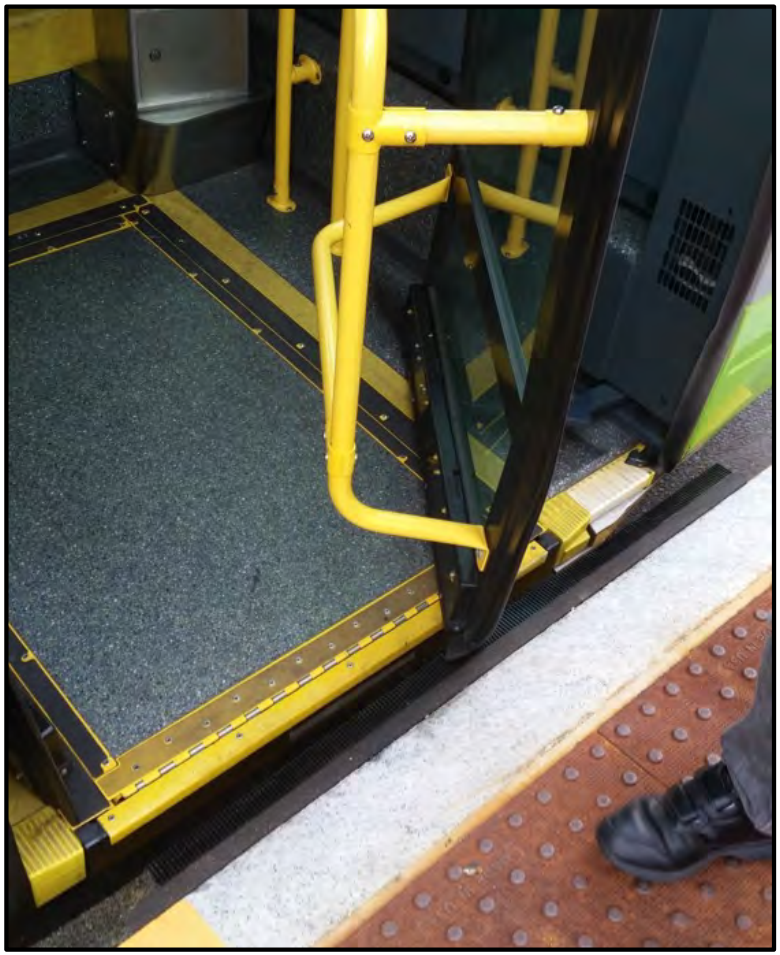


Project Selection (cont.)

- Severe rutting at New Britain East Main Street station within 6 months

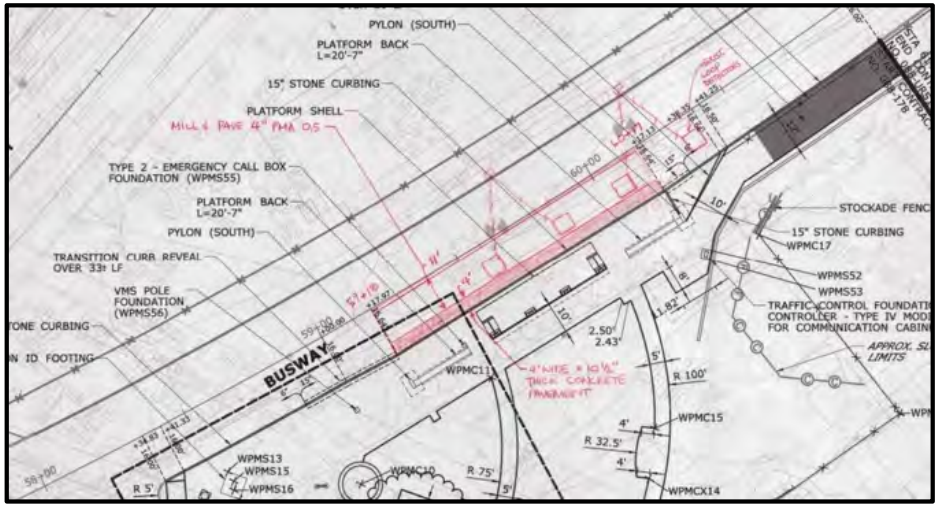
Project Selection (cont.)

- 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



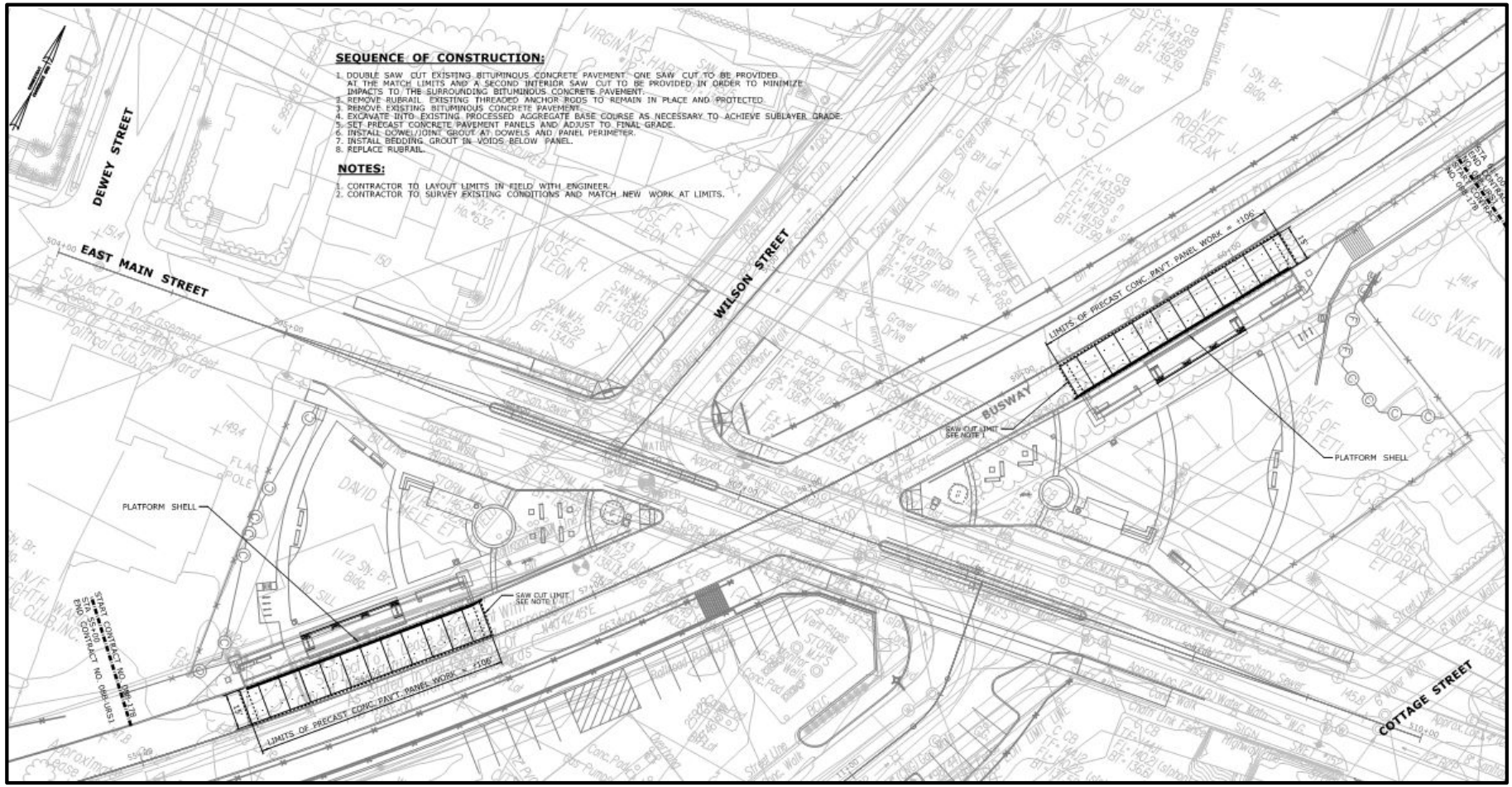
Project Details

- 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

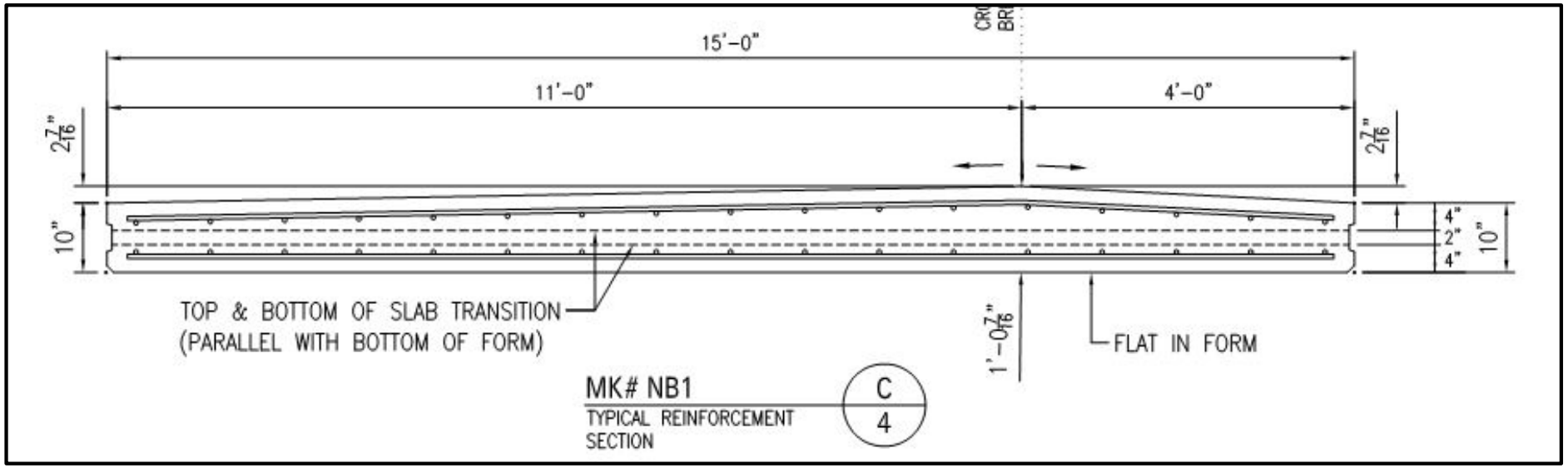
Project Details

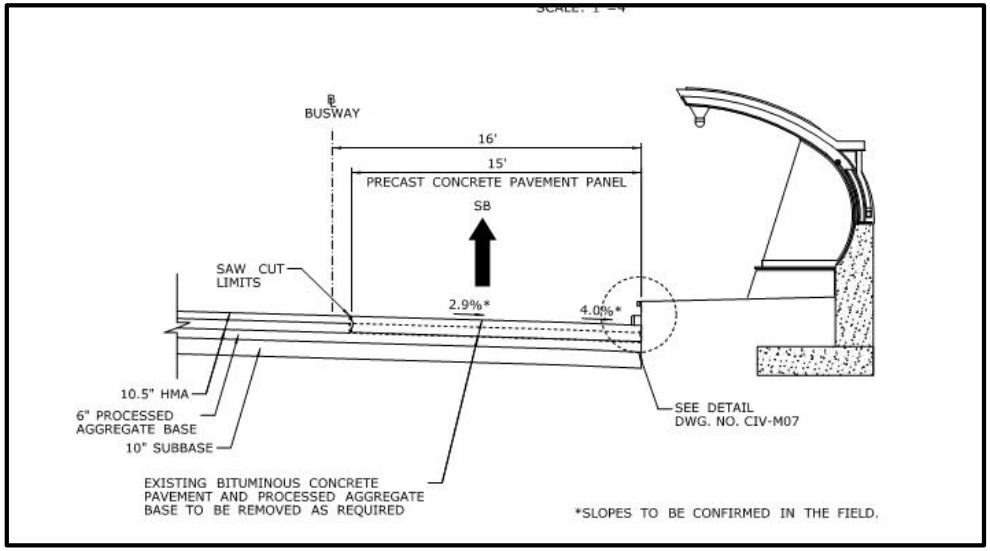
- Dowel slot grout:
  - 4,000 psi at 28 days (2,500 psi before opening to traffic), rapid non-shrink
- Bedding grout:
  - 4,000 psi at 28 days (500 psi before opening to traffic), rapid set and free flowing, capable of 1,400 psi at 25 minutes
- Concrete:
  - 5,000 psi at 28 days

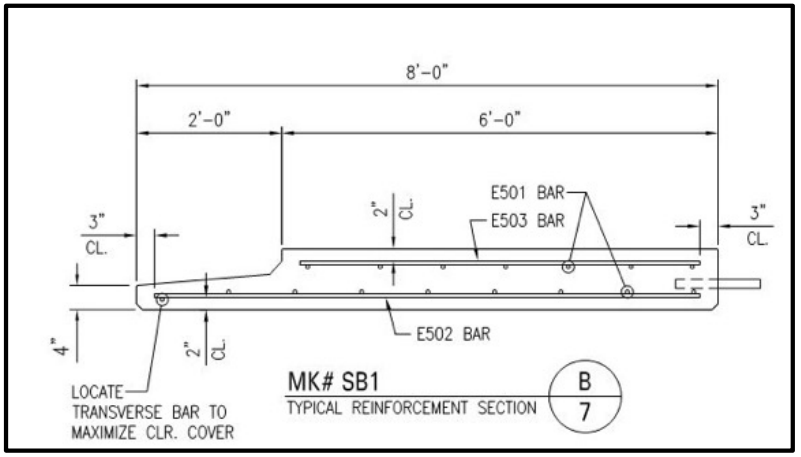
Panel Layout



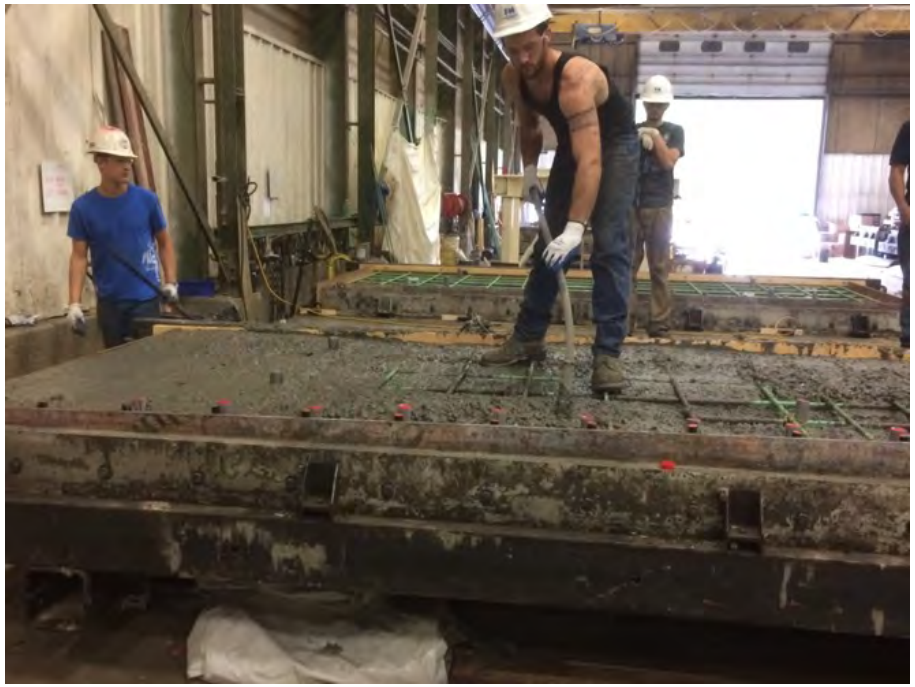
Project Cross Sections







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

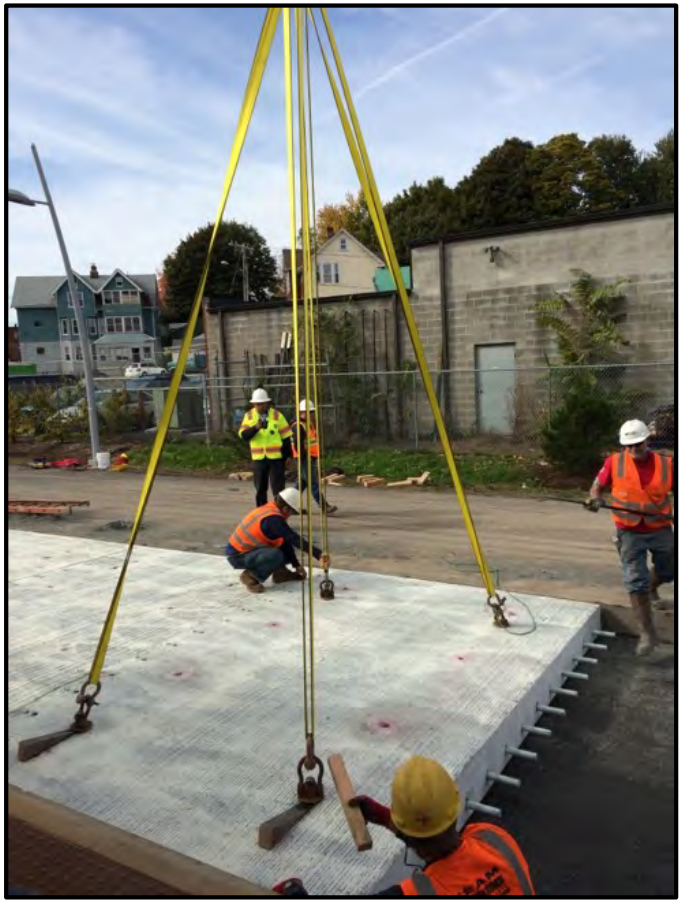
- South bus pad replaced entire bedding layer with processed

Installation – Bedding Layer

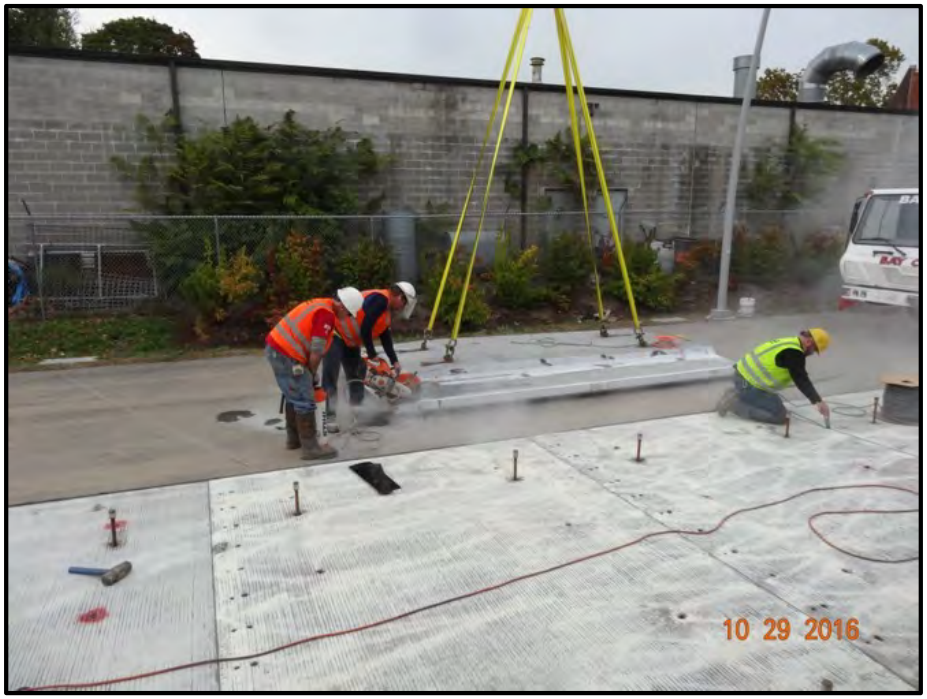
Installation – Panel Placement

Installation – Panel Placement

Installation – Panel Placement

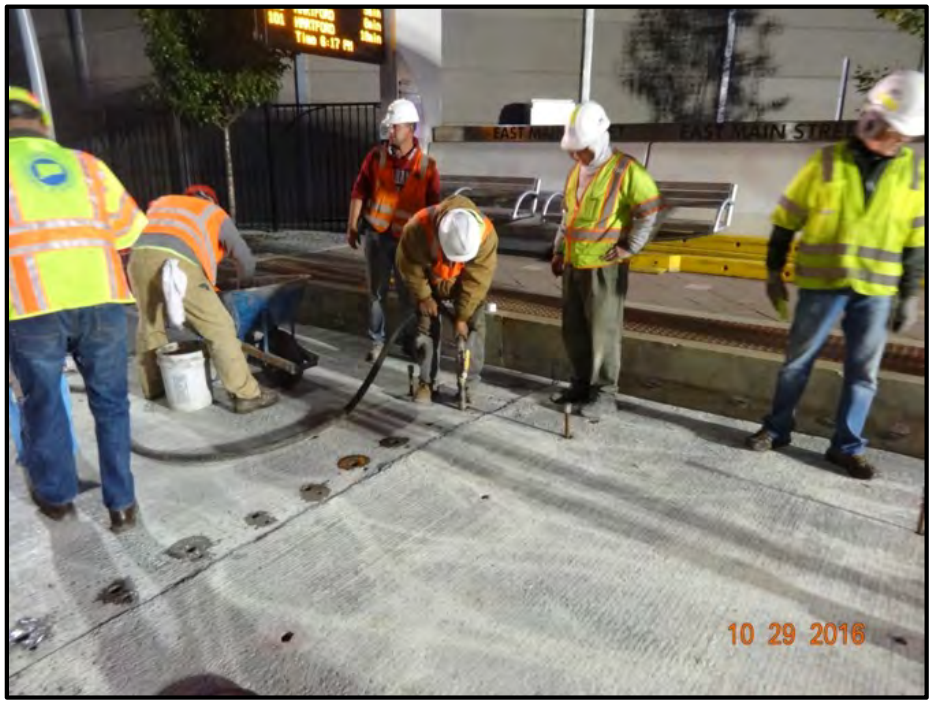


Installation – Panel Placement

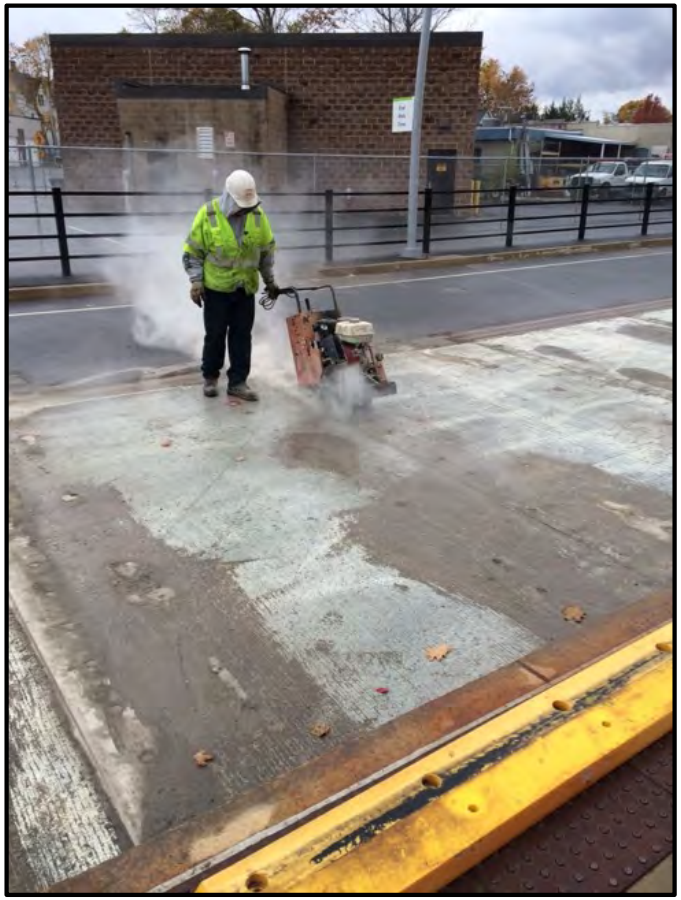


Installation – Leveling Lifts

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?