GEORGIA’S RAPID REPLACEMENT UTILIZING FULL-DEPTH PRECAST DECK PANELS WITH UHPC CLOSURE JOINTS SR 211 OVER BEECH CREEK

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Office of Bridge Design
ABC TECHNIQUES IN GEORGIA

- SR 211 / Beech Creek
- Rapid Deck Replacement
- Rapid Span Replacement
- Use of Precast Elements
- Ongoing and Future Work
EXODERMIC DECK PANELS
RAPID SPAN REPLACEMENT
RAPID SPAN REPLACEMENT

SECTION THRU DIAPHRAGM
PRECAST BRIDGE ELEMENTS
PRECAST SUBSTRUCTURE
SPMT
SR 211 / BEECH CREEK
PROJECT OVERVIEW

- 148’ Single Span Bridge
- 40’ Gutter to Gutter
- Ultra High Performance Concrete (UHPC) for Joint Connections
- Full Depth Precast Deck Panels
- 60 Day Road Closure
DEMOLITION

- Clearing & Grubbing
- Work Bridge
- Demolition – June 1\textsuperscript{st}
- 4 Days
END BENTS

- HP 14 x 102 Piles
- 3500 psi 24hr Accelerated Concrete
- Cast In Place
- 7 Days
BEAMS

- 72” Bulb Tees
- 10,000 psi Concrete
- Steel Diaphragms
- 2 Days
FULL DEPTH PRECAST PANELS

- 4500 psi Concrete
- 8 ¾” Depth
- #5 Bars
  - 6” T&B, Trans
  - 12”/6” T&B, Long
- 8’/9’ x 21’-5”
• 2” Joint Top Opening
• 5” Bar Lap
• Why UHPC?
SHEAR CONNECTION

- #5 Bar Hoop – 4”
- 2” Minimum Depth
PLACING PANELS

- 20 Minutes per Panel
- 2 Days
UHPC MIXING PLANTS

- 2 Mixers
- Continuous Pour
- Batch about 15 Minutes
- LaFarge Personnel On-site
- 2 Days
UHPC COMPONENTS

- Cement - 1 Bag
- Steel Fibers – 4 Bags
- Safety Gear Required
  - Tyvek Suits
  - Respirators
  - Gloves
UHPC COMPONENTS

- Water/Ice – 130 lbs
- P150 Super Plasticizer – 33.6 lbs
- Digital Scale
TESTING UHPC
PLACING UHPC
CONSTANT HEAD PRESSURE

- Chimneys
- Covered Joints
FORMWORKS

- Wood
- Steel?
- 8 Days
ENDWALLS

- Forming Endwalls
- Backfilling
- Approach Slabs
- Barriers
- 9 Days
FINISHING TOUCHES

- Paving
- Bridge Grooving
- Final Grading
- Striping
- 3 Days
OPEN TO TRAFFIC

59 DAYS!
LESSONS LEARNED

- Experience Using UHPC
- Larger Joint Openings
- Cost vs. Benefit
- Tolerances
- 30 Day Road Closure
CONTRACT INFORMATION

Award: July 31, 2015

Bid Amount: $2,681,640.30

E.R. Snell Contractor, Inc.

Structural Engineering Solutions, LLC
SPECIAL THANKS

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FUTURE PROJECTS

• Elliott Road Bridge Replacement
  – Precast Deck Panels

• Blackhall Road Bridge
  – Decked Bulb-T’s

• Courtland Street Bridge Replacement
  – Anticipate Incremental Launching
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