

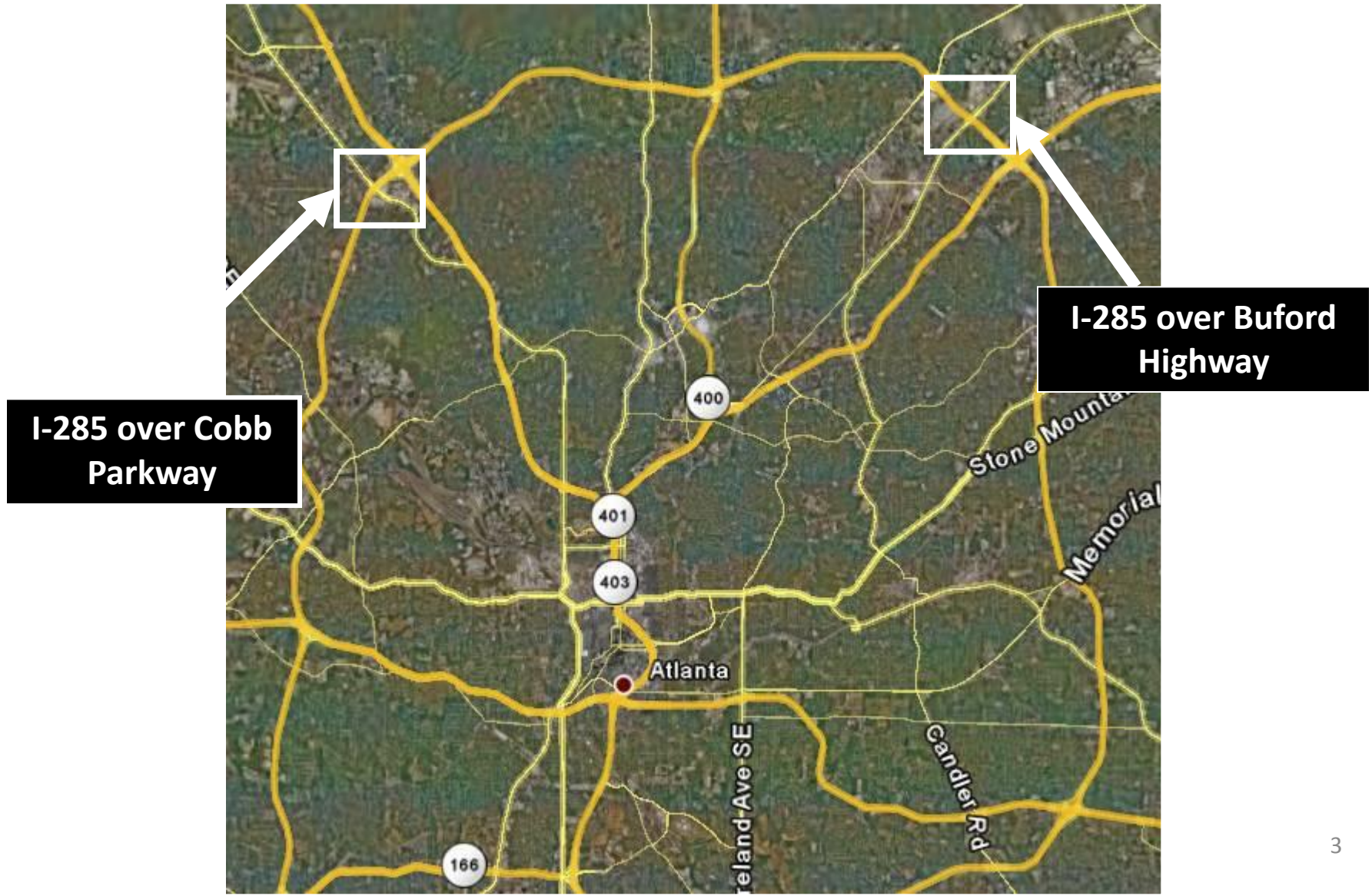
GEORGIA'S RAPID REPLACEMENT UTILIZING FULL-DEPTH PRECAST DECK PANELS WITH UHPC CLOSURE JOINTS SR 211 OVER BEECH CREEK

Bill DuVall, P.E. and Dexter Whaley, P.E.
Georgia Department of Transportation
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

RAPID DECK REPLACEMENT



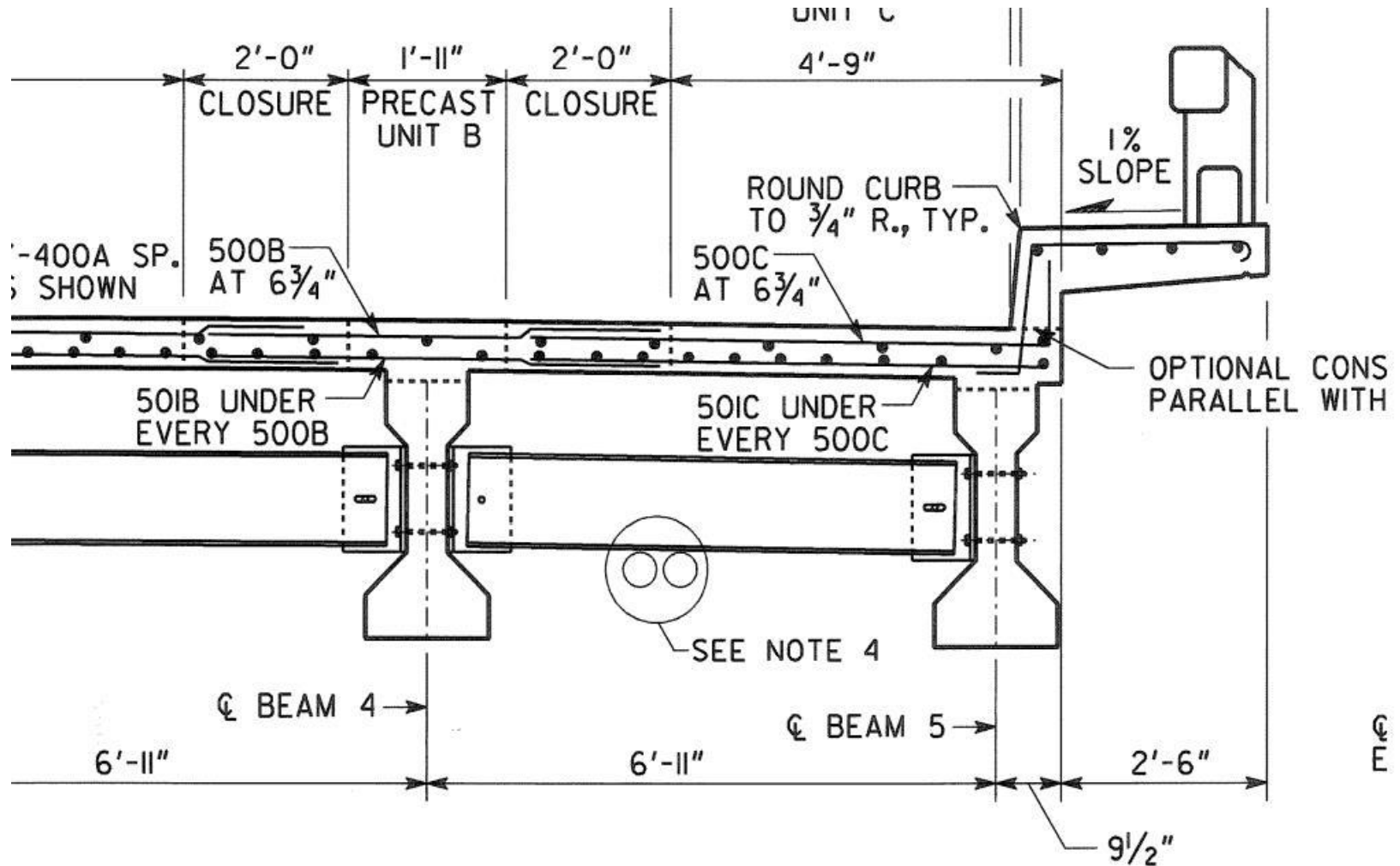
EXODERMIC DECK PANELS



RAPID SPAN REPLACEMENT



RAPID SPAN REPLACEMENT



SECTION THRU DIAPHRAGM

PRECAST BRIDGE ELEMENTS



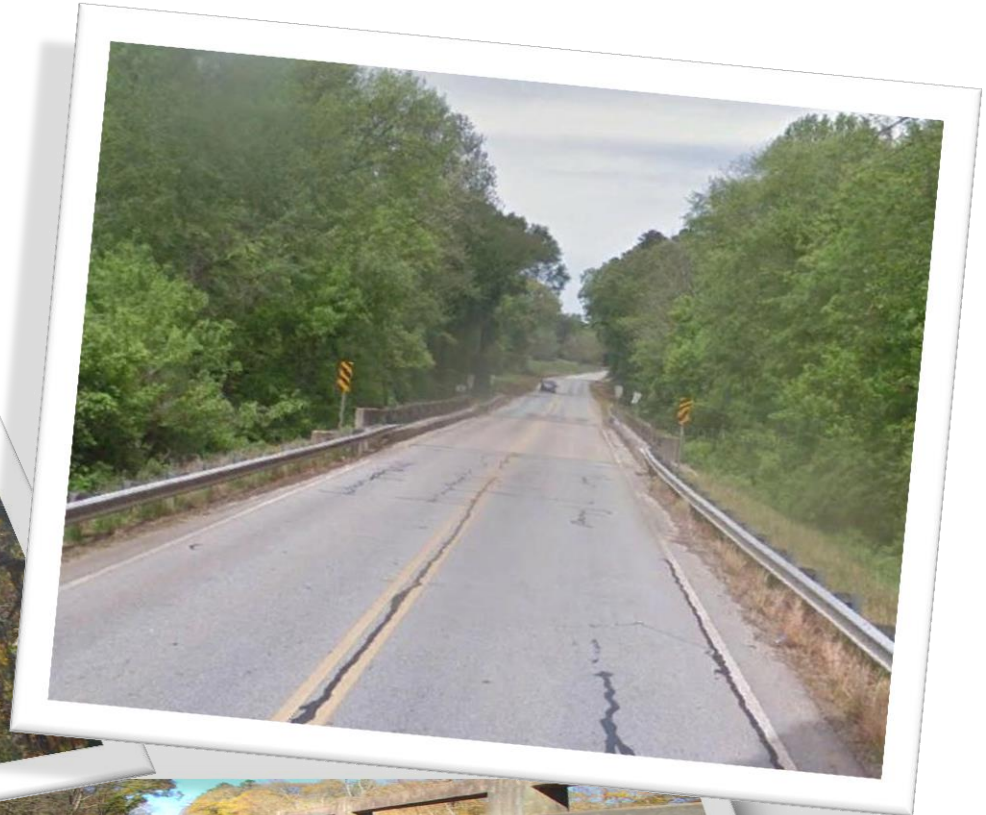
PRECAST SUBSTRUCTURE



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 1st
- 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

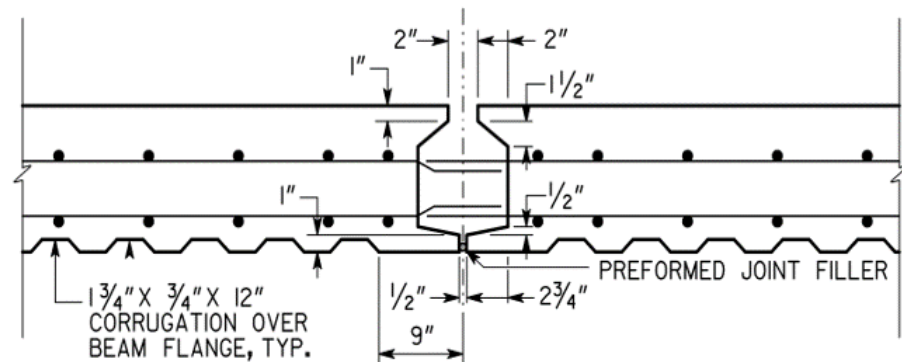


FULL DEPTH PRECAST PANELS

- 4500 psi Concrete
- 8 ¾" Depth
- #5 Bars
 - 6" T&B, Trans
 - 12"/6" T&B, Long
- 8'/9' x 21'-5"



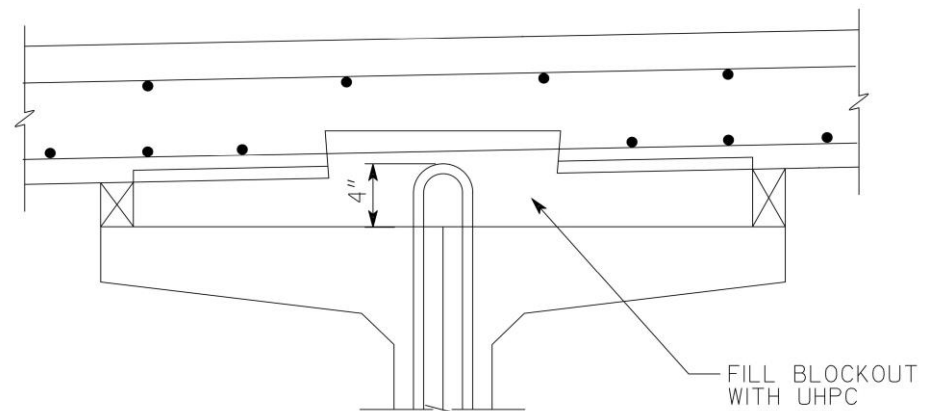
- 2" Joint Top Opening
- 5" Bar Lap
- Why UHPC?



TRANSVERSE JOINT DETAIL

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

Lawrence Kahn, Ph.D., P.E. – Georgia Institute of Technology

Ben Graybeal, Ph.D., P.E. – Federal Highway Administration

FUTURE PROJECTS

- Elliott Road Bridge Replacement
 - Precast Deck Panels
- Blackhall Road Bridge
 - Decked Bulb-T's
- Courtland Street Bridge Replacement
 - Anticipate Incremental Launching

CONTACT INFORMATION

Bill DuVall, P.E.

bduvall@dot.ga.gov

404-631-1985

Dexter Whaley, P.E.

dwhaley@dot.ga.gov

404-631-1909