



I-95 Bridge Restoration Project

Virginia Concrete Conference
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Baker

Project Background

- Restore 11 bridges
- Richmond I-95 Corridor
- Concrete: 9,500 cy
or...17 football fields 4”
deep
- Total of 234 PCUs
- Update: 157 PCUs Cast
- 99 PCUs Installed



Casting Yard

- ❑ 25-acre site
- ❑ Mi-jack gantry cranes
- ❑ Casting beds
- ❑ Actual field substructure geometry
- ❑ PCU storage



Preconstructed Composite Units (PCUs)

- ❑ LW concrete 9 inch slab
- ❑ Fabricated plate girders
- ❑ 2 or 3 girder components
- ❑ Transverse PT bars
- ❑ Cast-in-place closure pours
- ❑ Continuity bars



Concrete Challenges

- ❑ LW Concrete Aggregate Moisture
- ❑ Finishing lightweight concrete
- ❑ PT Grouting
- ❑ Work time for closure pours
- ❑ SCC wet weight and effects on formwork
- ❑ Shotcrete



Substructure Concrete Work

- Surface Repairs/Shotcrete
- Crack Injection Repairs
- Drilled Shafts
- Footing Extensions
- Abutments
- Pier Caps
- In-Fill Walls (SCC)
- Electrochemical Chloride Extraction (ECE)
- Sacrificial Cathodic Protection (CP)

Substructure: Challenges



Substructure: Drilled Shafts



Substructure: Surface Repairs



Substructure: Shotcrete



Substructure: Pedestal Repairs



Existing Bridge: Joint Repairs



Substructure: New Pier Caps



Substructure: Self-Consolidating Concrete



Substructure: Infill Walls - Lombardy



Superstructure Concrete Work

- Lightweight concrete decks
- Grout PT ducts
- Closure Pours
- Continuity Joints
- Parapets/Median Barrier

Superstructure: Test Slabs



Superstructure: Deck Pours



Superstructure: Pump or Dump



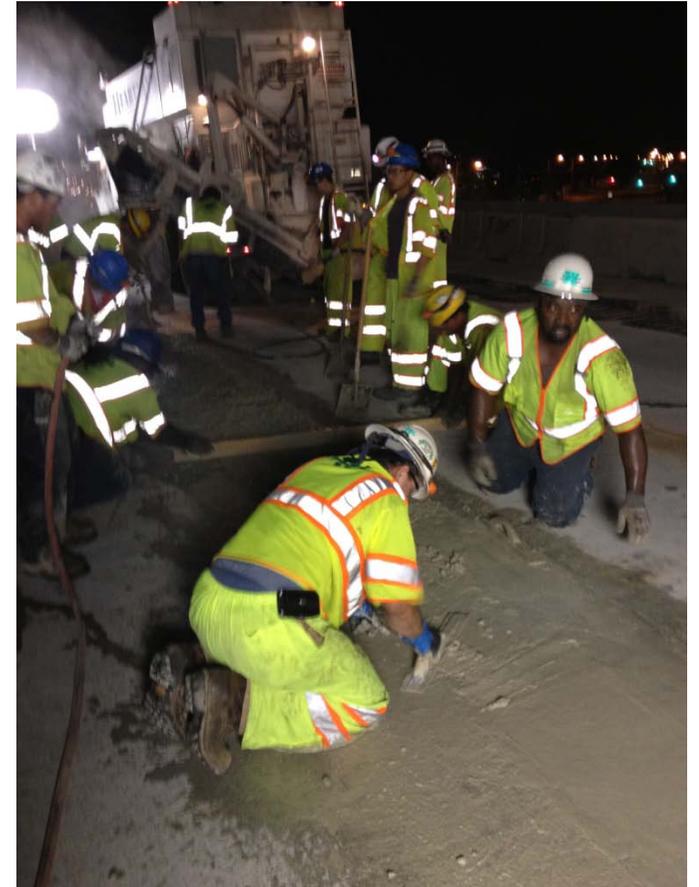
Superstructure: Moving PCUs



Superstructure: On Site



Superstructure: Closure Pours



Superstructure: Grouting Continuity Bars



Roadway Walls – RW3 CIP Wall



Roadway Walls – MSE Wall



Lessons Learned

- ❑ Non-production Test Slabs are Important!!!
- ❑ LW Concrete Aggregates – Moisture
- ❑ LW Concrete Finishing – Fogging
- ❑ LW Concrete Finishing – Bunyon Screed Speed
- ❑ Avoid unreinforced “knife edges” for skewed bridges
- ❑ Multiple Concrete Suppliers



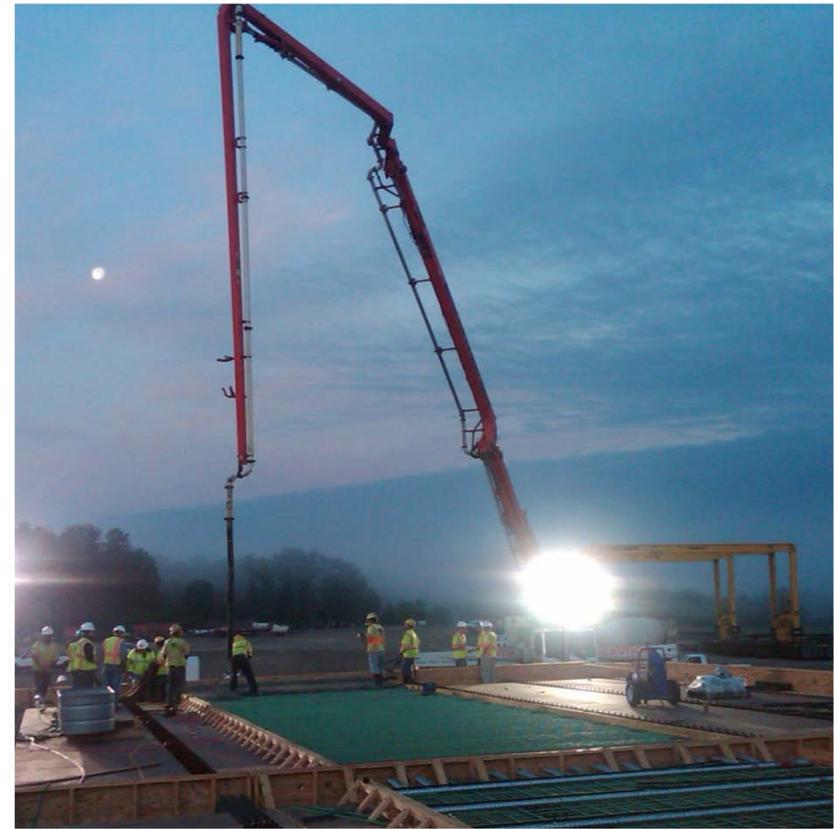
Lessons Learned

Cones make for great temporary supports!!!



Acknowledgements

- **Owner:**
Virginia Department of Transportation (Richmond District)
- **CEI Consultant:**
Michael Baker Jr., Inc.
- **Engineer:**
URS Corporation
- **General Contractor:**
Archer Western Constructors, LLC





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