



ACI Virginia Chapter Commonwealth Award



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ACI – Virginia Chapter

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Commonwealth Award Details

SUBMISSION CATEGORIES

Low Rise

Mid Rise

High Rise

Infrastructure

Decorative
Concrete

Repair &
Restoration

Flatwork

Bridges

JUDGING CRITERIA

- Architectural & engineering merit
- Creativity
- Innovative construction techniques, solutions, & use of materials
- Ingenuity
- Sustainability & Resilience
- Functionality & end use suitability



Commonwealth Award Winner

I-95 Five Bridge Bundle Rehab
and Replacement

Richmond, Virginia



Project Scope

Superstructure replacement and substructure rehabilitation, joint closures and increasing vertical clearance over I-95:

- 1st Street Bridge
- 4th Street Bridge
- 5th Street Bridge
- 7th Street Bridge
- East Broad Street Bridge



Project Challenges

- Heavy I-95 traffic
- Multiple major utilities required to remain in service
- Constraints of working in urban environment



1st, 4th, 5th, and 7th Street Bridges

- Conventional phased bridge replacement techniques
- Suspending utilities
- Modified lightweight, low shrinkage bridge deck concrete (120 pcf)
- Substructure rehab
 - Crack repair
 - SCC concrete patching
 - Pier cap carbon fiber wrap



East Broad St Bridge – Precast Solution

- Higher volume bridge traffic
- Limited to weekend work
- Bridge sloped at 9% grade
- Accelerated Bridge Construction Practices
- Temporary offsite casting yard at Richmond WWTP
- Deck cast on a level grade in 14 units in a single pour
- Allowed time and ability to precisely build each section for replacement in sections



East Broad St Bridge – Precast Concrete Mix

- Modified VDOT A4 Lightweight Mix
- Meets A4 slump and air content requirements
- 110 pcf unit weight
- Replaced 50% of sand with washed MS16 lightweight fine aggregate
- Higher dose of retarder for large volume, extended pour



East Broad St Bridge – Completion

- Assembled during weekend closures of the Broad St bridge
- Strategic location of new bearing pads and removal of existing deck and beams to avoid conflict
- Precast units were positioned in place with a crane on a 9% grade
- Closure pours between pre-cast units using rapid set concrete



Commonwealth Award Winning Project Team

- **Owner**
 - Virginia Department of Transportation
- **Structural Engineer**
 - Whitman Requardt & Associates
- **Prime Contractor**
 - Kokosing Construction Company
- **Concrete Contractor**
 - Kokosing Construction Company
- **Concrete Supplier**
 - S.B. Cox Ready Mix
 - Heartland Concrete



Thank you

For more information about the ACI Virginia Chapter, please visit our website at www.acivirginia.org



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