Innovative uses of Precast Concrete in Accelerated Short Span projects

2017 Statewide Conference on Local Bridges

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Bridges Today
Rehabilitation of Bridges
Precast Concrete Short Span Bridges

- Types
  - Single of two-piece arch
  - 3 or 4 sided box culvert
  - Beam
  - Prestressed
Precast Bridges
Precast Bridges
Precast Bridges
Precast Bridge Elements
Erosion Control Mats
I-35W Bridge Minneapolis
Gateway Monument
Accelerated Bridge Construction
Traffic
Accelerated Bridge Construction

- The Federal Highway Administration defines ABC as “bridge construction that uses innovative planning, design, materials, and construction methods in a safe and cost-effective manner to reduce the on-site construction time that occurs when building new bridges or replacing and rehabilitating existing bridges”
Accelerated Bridge Construction

ABC projects throughout the country have resulted from the initiative, including work in

- Arizona
- California
- Kentucky
- Maine
- Missouri
- Rhode Island
- Wisconsin
- Michigan
- Pennsylvania
Accelerated Bridge Construction

Pittsburgh, PA – SR 288 Project
Accelerated Bridge Construction

Grand Rapids, MI – I-96 and SR 50

Schedule / Milestone Dates

- Award date: 3/12/2014
- Project start date: 3/17/2014
- Demolish existing bridge: 8/1/2014
- Traffic shifted to temp. alignment: 8/4/2014
- Expected Slide Weekend: 10/17/2014
- Final Completion: 11/21/2014
Accelerated Bridge Construction
Composite Systems
Advances in Precast Concrete Manufacturing
Concrete Manufacturing

- Automation
- Aggregate Bins
- Conveying Systems
- Mixers
- Admixture Metering
Concrete

Cementitious Materials

- Portland Cement
- SCM’s
- Blended Cements
Concrete

Admixtures and Additives

- Air Entrainers
- WaterReducers
- Set Accelerators and Retarders
- Corrosion Inhibitors
- Coloring
- Many others
Concrete

- Reinforcing
  - Epoxy coating
  - Galvanized
  - Fiberglass
  - Fiber reinforcing
Concrete

- Concrete Mixes
  - SCC
  - UHPC
  - Lightweight
Finishes

- Exposed aggregates
- Acid treatments
- Formliners
- Coloring
Resiliency
Hurricanes and Tropical Storms
PDH Questions

1. Name three (3) types of precast elements used in short span bridge construction?

2. What components other than superstructure units are able to be precast?

3. According to FHWA - “bridge construction that uses innovative planning, design, materials, and construction methods in a safe and cost-effective manner to reduce the on-site construction time that occurs when building new bridges or replacing and rehabilitating existing bridges” is known as?
QUESTIONS?
THANK YOU!

Ronald Thornton, PE