

FHWA ABC-PBE Research: Status Update 2018

Ben Graybeal

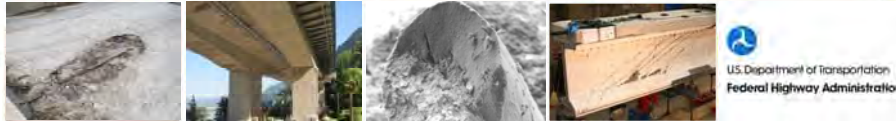
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Presentation to:

Joint Subcommittee on Accelerated Bridge Construction, TRB 2018



Current Areas of Emphasis

1. Adjacent Box Beam Connections
2. UHPC Materials Characterization
3. Connection Materials Research
4. UHPC Design and Construction Guidance
5. Novel Deck-to-Girder Connections
6. UHPC For Bridge Deck Overlays

Adjacent Box Beam Connections

- **TechBrief Published**
(FHWA-HRT-17-094)
- **Report with Publisher**
(Spring 2018)



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UHPC Material Characterization

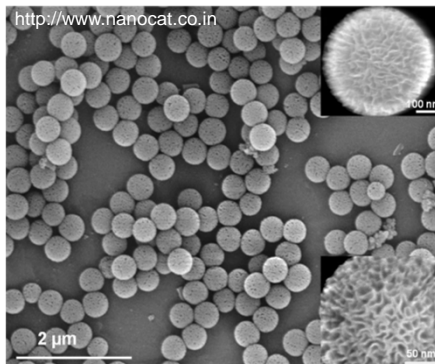
- **5 UHPCs Studied**
- **16 Tests Completed Per Material**
- **Published Findings:**
 - Aspire, Spring 2017
 - 2017 ABC Conf.
 - ASCE J. of Bridge Eng.
- **Final Report**
 - Final Draft Ready, in FHWA Review.



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Connection Materials Research

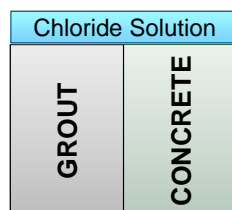
Using Nanotechnology Technology to Enhance Bond in PBE Connections



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Connection Materials Research

Chloride Ion Transport & Corrosion Potential Within Connections

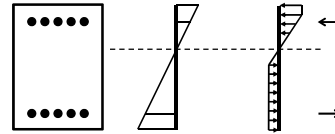


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AASHTO Guide Specification for UHPC

- Section 1: Introduction
- Section 2: Material Specifications
- Section 3: Design Specifications

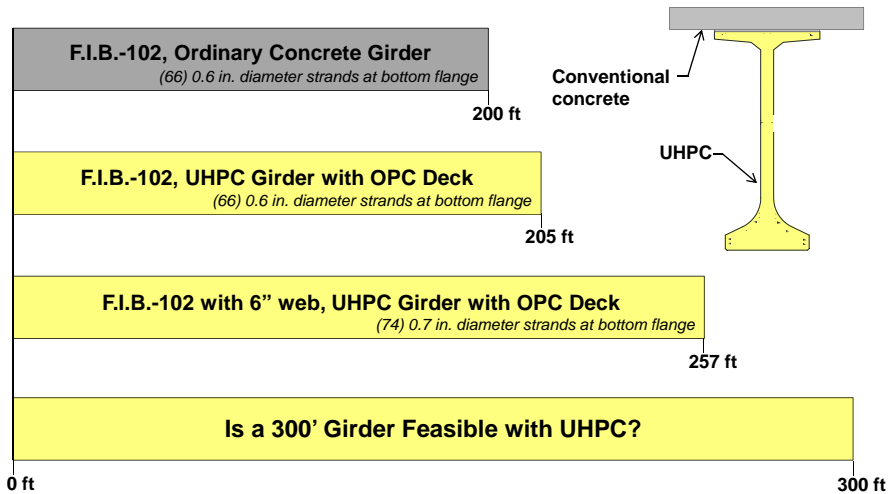
- 3.1 Scope
- 3.2 Definitions
- 3.3 Limitations
- 3.4 Notation
- 3.5 Material Models
- 3.6 Limit States and Design Methodologies
- 3.7 Design for Flexure and Axial Force Effects
- 3.8 Design for Shear and Torsion
- 3.9 Prestressing
- 3.10 Reinforcement
- 3.11 Durability



Cross-Sectional Flexural Analysis

- Section 4: Construction Specifications
- Section 5: Promising Applications

What's Possible?



Novel Deck-to-Girder Connections

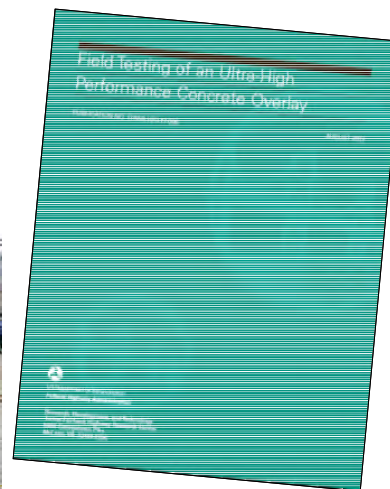
- Simplified Design
- Small- & Large-Scale Testing
- Published Findings:
 - 2017 ABC Conference
- Status
 - 3 large-scale tests remain



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UHPC For Bridge Deck Overlays

- Used on recent PBE project in DE.
- Field Testing Report
(FHWA-HRT-17-096)
- TechNote Coming Soon
(FHWA-HRT-17-097)



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