FHWA Bridge Research: Status Update 2015

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AASHTO SCOBS — April 2015
Bridge and Structures R&D

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To shape the future of transportation as the Nation's premier center for highway research and innovation.

**Innovation Engine**

Challenges/Opportunities    Research-Based Solutions
LIGHTWEIGHT CONCRETE: FROM RESEARCH TO BALLOT

- Experimental research with an long-view and sustained resources
- 2007 to present
- Testing, compiling, analyzing, reporting
- Agenda Items #5 and #9

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Shear Studs for Composite Action: Toward a Refined Design Concept

- Stud placement geometry
- Limits prefabricated systems
- Is 24” spacing appropriate?
- Experimental study underway

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Shear Studs for Composite Action: Toward a Refined Design Concept

Thoughts:
• Likely, 24” spacing limit may increase
• Fatigue design might relax (shallower slope)

Still working on CAFT

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WELDING R&D:
ADVANCED TECHNOLOGY AND MATERIALS

- Electroslag...for HPS70W, FCMs
- Thick plate welding processes
  - Homopolar generator
  - Hybrid laser arc
- Welding ASTM A1010 steel
- Training and Expertise Development
UHPC Connections for PBE: Innovation in Bridge Construction

- Ultra-high performance concrete
- EDC3: UHPC w/ ABC
- Decade of research is bearing fruit with deployments
- Further research underway:
  - Additional UHPCs
  - Additional connections
  - Best practices for construction

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ADJACENT BOX BEAM CONNECTIONS: ROBUST ECONOMICAL SHORT SPANS

- Built for better performance
- Connections are the key
- Interface surface preparation
- Grout dimensional stability

- Conventional grouts can work
- UHPC solutions allow for elimination of PT

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GEOSYNTHETIC REINFORCED SOIL: A FOUNDATIONAL TECHNOLOGY

- Geotech focus on soil improvement techniques
- GRS deployment in EDC3
- Research continues:
  - In-service monitoring
  - Long-term dead load “creep”
  - Open-graded aggregates

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LTBPP

- Clusters & Corridors
  - Legacy Data Mining
  - Inspection/Evaluation of Bridges
- Bridge Portal
  - Beta testing underway
  - Working to transfer to FHWA
  - Release expected later in 2015
- D³M²
  - Data-Driven Deterioration Modeling Methodology
- Non-Destructive Evaluation
  - Automated Assessment Tools
  - NDE Web Manual
SCOUR: MODELING AND PREDICTION

Visual

CFD

Sonar

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SCOUR: FROM FIELD TEST TO PREDICTION

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