Accelerated Bridge Construction (ABC)

Technical Resources for Implementation

Mary Lou Ralls, P.E., Ralls Newman, LLC

September 17, 2015
ABC Technical Resources

- FHWA
- NCHRP
- SHRP2
- TRB ABC Subcommittee
- Industry
- ABC-UTC
FHWA ABC Website
http://www.fhwa.dot.gov/bridge/abc

Accelerated Bridge Construction

- Project Planning
- Geotechnical Solutions
  - Foundations and Wall Elements
  - Rapid Embankment Construction
- Structural Solutions
  - Prefabricated Elements & Systems
  - Structural Placement Methods

What is ABC?

ABC is a paradigm shift in the project planning and procurement approach where the need to minimize mobility impacts which occur due to onsite construction activities are elevated to a higher priority.

Intrinsic benefits of the ABC approach include improvements in:
FHWA ABC Website
http://www.fhwa.dot.gov/bridge/abc

Project Planning

- Decision Making Framework
  - ABC AHP Decision Making Tool (zip, 64 kb) - A decision making tool based on the Analytic Hierarchy Process (AHP) transportation specialists and decision-makers to determine if ABC is more effective than traditional construction for a given bridge replacement or rehabilitation project.
    - Installation Instructions
      - Save the zip file to your hard drive.
      - Open the zip file and extract the files.
      - Microsoft .NET Framework 4.0 or later is required. If you need that, please see Section 1.3 of the user's manual http://www.fhwa.dot.gov/bridge/abc/dmtool/software_manual.cfm#s1_3
      - To run the AHP Tool, locate the AHPTool icon and click on it. See Section 1.4 of the user's manual http://www.fhwa.dot.gov/bridge/abc/dmtool/software_manual.cfm#s1_4
  - Related Documents
    - Manual
    - Survey Form
Accelerated Bridge Construction Decision Tool
Transportation Pooled Fund Study TPF-5(221)

Completion Date: 2011

Participating DOTs: Oregon (lead), California, Iowa, Minnesota, Montana, Texas, Utah, Washington, FHWA

PI: Toni Doolen, Oregon State University

Project Manager: Benjamin Tang, P.E., Oregon Department of Transportation
ABC AHP Decision Tool

--- Alternatives Utility ---

ABC: 0.599
Conventional: 0.301

--- Criteria Utility Contribution [%] ---

Direct Costs:
ABC: 10.2
Indirect Costs: ABC: 10.2
Site Constraints: ABC: 16 Conventional: 6.9
Customer Service: ABC: 33.5 Conventional: 14.4

--- Synthesized Criteria Weights ---

Direct Costs: 14.6%
Indirect Costs: 14.6%
Site Constraints: 22.9%
Customer Service: 47.9%

--- Goal ---

Direct Costs: 0.146
Indirect Costs: 0.146
Site Constraints: 0.225
Customer Service: 0.479
Prefabricated Bridge Elements and Systems

What is PBES?
PBES are structural components of a bridge that are built offsite, or near-site of a bridge and include features that reduce the onsite construction time and the mobility impact time that occurs when building new bridges or rehabilitating or replacing existing bridges relative to conventional construction methods.

- PBES Definitions

How Does It Work?
1. Components are built outside traffic area(s)
2. Transported to the site
3. Installed rapidly
FHWA ABC Website
http://www.fhwa.dot.gov/bridge/abc
Self Propelled Modular Transporters (SPMTs)

A Self-Propelled Modular Transporter is a combination of multi-axle platforms operated through a state-of-the-art computer-controlled system that is capable of pivoting 360 degrees as needed to lift, carry, and set very large and heavy loads of many types.

SPMTs are motorized vehicles that move at walking speed and are capable of carrying large structures, such as bridges, from offsite locations, positioning them precisely into final position. The SPMT then exits the site, opening the area to traffic possibly within minutes or certainly within a few hours.

What is a Self-Propelled Modular Transporter - or SPMT?

The Federal Highway Administration (FHWA) has identified reducing construction-related impacts to the traveling public as a major priority for the nation’s highway program.

The use of self-propelled modular transporter (SPMT) technology provides agencies and contractors with the **ultimate flexibility and speed** in removing and installing bridges.

Introduction
Slide-in Bridge Construction

Slide-in bridge construction (SIBC, more commonly known as "lateral slide") is one of several Accelerated Bridge Construction (ABC) technologies being promoted by the FHWA Every Day Counts program.

This web page links to a variety of key resources from across the country. The focus is on helping owner-agencies, designers, and construction contractors with no experience in SIBC get started in implementing this technology. Read more about SIBC

Quick Links
FHWA ABC Manual
http://www.fhwa.dot.gov/bridge/abc

Accelerated Bridge Construction Experience in Design, Fabrication and Erection of Prefabricated Bridge Elements and Systems

Published November 2011
Available Online
2.5 Fast Track

Contracting

2.5.1.1

Design-Build

[Fig. 2.5.1.1-1]
2.5 Fast Track Contracting
2.5.1.2 CMGC
[Fig. 2.5.1.2-1]
ABC Manual
Chapter 3 – Planning and Scoping Projects

3.2.2 Flowcharts for Determination of Appropriate ABC Methods

Fig. 3.2.2-1
Over Roadway or Land
ABC Manual
Chapter 4 – Implementing ABC in a Transp. Agency

Fig. 4.1-1
Prefabricated Bridge Elements and Systems

What is PBES?

PBES are structural components of a bridge that are built offsite, or near-site of a bridge and include features that reduce the onsite construction time and the mobility impact time that occurs when building new bridges or rehabilitating or replacing existing bridges relative to conventional construction methods.

- PBES Definitions

How Does It Work?

1. Components are built outside traffic area(s)
2. Transported to the site
3. Installed rapidly
How Does PBES Impact ABC?

Use of PBES is one strategy that can meet the objectives to Accelerate Bridge Construction while providing additional benefits beyond those with only reducing on-site construction time:

- ABC improves:
  - Site Constructability
  - Total project delivery time
  - Material quality and product durability
  - Work-zone safety for the traveling public and contractor personnel
- ABC reduces:
  - Traffic Impacts
  - Onsite construction time
  - Weather-related time delays
- ABC can minimize
  - Environmental impacts
  - Impacts to existing roadway alignment
  - Utility relocations and right-of-way take

Publications

- Connection Details for PBES
- Framework for Decision-Making
- Manual on Use of Self-Propelled Modular Transporters to Remove and Replace Bridges
- Prefabricated Bridge Elements and Systems Cost Study: Accelerated Bridge Construction Success Stories
- Prefabricated Bridge Elements and Systems in Japan and Europe
  - Scan Team Implementation Plan

Projects

- Graves Avenue Prefabricated Bridge Project

Archive
Connection Details for PBES

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Printable Version
- PDF (pdf, 32 mb)

Contacts
- Benjamin Boorman
  Resource Center
  404-662-3930
  E-mail Benjamin
- Romeo Garcia
  Office of Asset Management
  Pavements, and Construction
  202-366-1342
  E-mail Romeo
Connection Details for Prefabricated Bridge Elements and Systems

Published June 2009

Available Online

FHWA ABC Website
http://www.fhwa.dot.gov/bridge/prefab/if09010/
FHWA Accelerating Innovation Website

http://www.fhwa.dot.gov/accelerating/innovation.cfm
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## National Cooperative Highway Research Program (NCHRP) Example Research Related to ABC

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## FY 2014 NCHRP Research Related to ABC

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<td>Recommended AASHTO Guide Specification for ABC Design and Construction</td>
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<td>12-105</td>
<td>Proposed AASHTO Seismic Specifications for ABC Column Connections</td>
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**Google search:** NCHRP xx-xxx
Domestic Scan on Best Practices in Accelerated Construction Techniques

March 2009

NCHRP Domestic Scan Program

Domestic Scan on Best Practices in Performance of ABC Connections in Bridges Subjected to Multi-hazard And Extreme Events

October 2012

Strategic Highway Research Program 2 (SHRP2) – Renewal: Bridges

http://shrp2.transportation.org/Pages/Bridge-Designs-for-Rapid-Renewal.aspx

SHRP2 R04: Innovative Bridge Designs for Rapid Renewal

ABC Standard Concepts: The Lateral Slide Addendum Report
**TRB Committee on General Structures (AFF10)**  
**Subcommittee on Accelerated Bridge Construction (AFF10-3)**

Approximately one-fourth of the Nation's 600,000 bridges require rehabilitation, repair, or total replacement. The construction-related work used to address these needs can have significant impact to the surrounding area including mobility, safety, and other social-economic related impacts. Throughout the U.S., owner agencies are realizing that the results of using ABC strategies not only help address onsite related constraints, but can also improve how a bridge program is delivered when used in a more routine, programmatic manner.

**Scope:** The TRB Accelerated Bridge Construction (ABC) Subcommittee supports research, technology transfer, and implementation to advance ABC technologies related to policy, planning, procurement, design, materials, construction and contracting. The *objective* of the subcommittee is to expand the knowledge and expertise to foster the implementation of ABC related technologies.

**Road Map:**  
The Subcommittee will...

1. Stay informed on the current state of practice/art.  
2. Identify, prioritize and prepare research needs statements (RNS).  
3. Collaborate RNS with State DOTs, FHWA, and AASHTO groups.  
4. Support research projects.
Industry ABC Resources

Precast/Prestressed Concrete Institute (PCI)
http://www.pci.org
Industry ABC Resources

PCI Northeast
http://www.pcine.org (Bridge Resources)
ABC University Transportation Center (ABC-UTC)

USDOT Tier 1 UTC Award Announcement: September 2013

Consortium of Universities:
- Florida International University (FIU)
  - Atorod Azizinamini (lead)
- Iowa State University (ISU)
  - Brent Phares & Terry Wipf
- University of Nevada, Reno (UNR)
  - Saiid Saiidi
Accelerated Bridge Construction
University Transportation Center
(ABC-UTC) – http://abc-utc.fiu.edu/
2015 Accelerated Bridge Construction Conference

The 2015 National ABC Conference, co-sponsored by State DOTs, the Federal Highway Administration and industry partners, will be held on December 7-8, 2015 in Miami, Florida. Attendees are expected from Department of Transportation engineers and other bridge professionals.

Read More.

September 24, 2015

Oklahoma Department of Transportation ABC Bridge Replacement on SH-51 over Cottonwood Creek

by Randle White, P.E., Division Engineer, Field Division 8, Oklahoma DOT; and Jason Langhammer, P.E., Senior Project Manager, Garver

In 2014, the Oklahoma Department of Transportation completed its first fully accelerated bridge construction project on SH-51 over Cottonwood Creek. The old six-span 270-ft-long structurally deficient bridge over Cottonwood Creek was replaced with a widened three-span 26...

Read More.

November 17 - 18, 2015

SHRP2 R04 Regional Peer-to-Peer Exchange Workshop - Atlanta, GA

December 6 - 8, 2015

2015 National Accelerated Bridge Construction Conference - Miami, FL

December 14, 2015

Call for Award Nominations - Submission Deadline - NSBA 2016 Prize Bridge Competition

March 1 - 5, 2016

2016 PCI Convention and National Bridge Conference at The Precast Show - Nashville, TN

April 13 - 15, 2016

World Steel Bridge Symposium - Orlando, FL

About Us

Welcome

The ABC-UTC has assembled an experienced, knowledgeable, and engaged group of bridge academics and engineers who collectively will provide the transportation industry with the tools needed to effectively and economically utilize the principles of ABC to enhance mobility, and safety and produce safe, environmentally friendly, long-lasting bridges.

Read More.
2015
NATIONAL ACCELERATED BRIDGE CONSTRUCTION CONFERENCE
December 7 and 8, 2015
Workshops December 6, 2015
Hyatt Regency, Miami, Florida

http://www.2015abc.fiu.edu/

Join us and learn more about ABC:

Your Name

Your E-mail

Submit

2015 National Accelerated Bridge Construction Conference

The 2015 National Accelerated Bridge Construction Conference will be held on December 7 and 8, 2015, at the Hyatt Regency Hotel, in downtown Miami, Florida. The 2014 National Accelerated Bridge Construction Conference
The ABC Center at FIU has offered free monthly webinars since March 2011. The ABC-UTC is continuing this series and maintaining an archive of the past events. The intended audience of these webinars includes engineers and other bridge professionals with content ranging from design issues to construction and contracting. These webinars attract an average of 4,000 participants each month.

The archive of past webinars is being transitioned to the new website. Click “Webinar Archives” on the left vertical menu to access past webinars transitioned to date.

Thursday, September 24, 2015 (1:00 - 2:00 pm Eastern)

Oklahoma Department of Transportation ABC Bridge Replacement on SH-51 over Cottonwood Creek
Accelerated Bridge Construction University Transportation Center (ABC-UTC)
Development of Manual for Enhanced Service Life of ABC Projects

Background
The nationwide application of ABC in bridge design and construction is at its early stages. Nevertheless, a few ABC projects are decades old, and the number of ABC projects is rapidly increasing. It is essential to observe the performance of ABC projects in service, at the national level, and develop a manual that assists designers and owners in best design, construction and maintenance practices that are capable of enhancing service life of ABC bridges.

Objective
The main objective of this project is to develop a manual devoted to service life performance of ABC projects.

Scope
The development of the document will consider the ABC projects nationwide. It will include case studies, examples, design, inspection and maintenance information. It will be flexible and accommodating to the addition of new information as it becomes available. Tools will be developed to assist the user to navigate through the information and make the document user friendly. The general framework for the document will be similar to that described in the Guide for Design of Bridges for Service Life.
Technology Transfer: Monthly Webinar Archives

Thursday, August 20, 2015 (1:00 - 2:00 pm Eastern)

PennDOT Replacement of Route 581 Bridge during Weekend Closures
by Tom Macioce P.E., Chief Bridge Engineer, PennDOT; Harivadan Parikh P.E., District Bridge Engineer, PennDOT District 8.

Description: In June 2015 the Pennsylvania DOT replaced the three-span Route 581 Bridge in the borough of Lemoyne in Cumberland County. With 86,000 vehicles a day traveling across the bridge, ABC was used to limit closures to several weekends instead of the typical 1.5 years that would have been required to replace this bridge using conventional methods. The superstructure spans were...

Read More

Thursday, July 23, 2015 (1:00 - 2:00 pm Eastern)

Emerging ABC Connection Details for High Seismic Areas
by M. Saiid Saiidi Ph.D., P.E., Professor, University of Nevada, Reno; Sri Sritharan Ph.D., Professor, Iowa State University.

Description: Which connection details has research proven to work well for prefabricated bridge elements in high seismic areas? ABC offers some useful details and connections for design and construction...
Technology Transfer: National ABC Conferences

Dec 6 - 8, 2015
2015 National Accelerated Bridge Construction Conference - Miami, FL
Co-sponsored by 30 State DOTs, FHWA, TRB, NCBC, & NSBA.

Dec 3 - 5, 2014
2014 National Accelerated Bridge Construction Conference
Co-sponsored by 26 State DOTs, FHWA, TRB, NCBC, NSBA, IABMAS, & ASCE.

Link to 2014 proceedings
Resources: State DOT Websites

Iowa DOT
- Accelerated Bridge Construction
- Innovative Bridge Research and Construction/Deployment (IBRC/IBRD) Program

Massachusetts DOT
- Accelerated Bridge Program
- LRFD Bridge Manual, Part III - Prefabricated Elements

Oregon DOT
- Bridge Design & Drafting Manual, Section 3.24, ABC Guidelines

Texas DOT
- ABC online standards include prestressed decked slab beams, prestressed slab beams, prestressed box beams, precast bent caps, and prestressed partial-depth deck panels

Utah DOT
- “ABC is not separated anymore. It's just part of doing business.” 2015 quote from Carmen Swanwick, Chief Structural Engineer, Utah DOT
- Structures Design and Detailing Manual (SDDM), Chapter 20 - Accelerated Bridge Construction
- The following include ABC items
Precast Concrete Bent Cap Option
– posted on TxDOT bridge standards website

http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm
Guide to Bridge Standard Drawings includes:

Decked Slab Beam (ABC)
- 20-in. & 23-in. depth
- 6.5-ft, 7.5-ft, & 8-ft beam widths
- 24-ft, 28-ft, & 30-ft roadway widths
- 30-ft to 60-ft span lengths

http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm
Resources: SHRP2 Implementation

SHRP2 implementation information is available on AASHTO's SHRP2 Solutions website.

SHRP2 R04, “Innovative Bridge Designs for Rapid Renewal”

Regional Peer-to-Peer Exchange Workshops

The SHRP2 Solutions R04 Team is hosting two regional peer-to-peer exchange workshops in fall 2015. Owner agencies are invited to both days, with consultants and contractors invited to the second day.

- September 16-17, 2015 - Minneapolis, MN
- November 17-18, 2015 – Atlanta, GA

For additional information as it becomes available, check AASHTO's R04 website, or contact Jennifer.Smoker@ch2m.com

- The R04 Toolkit describes standardized approaches to designing and constructing complete bridge systems for rapid renewal.
- For general information on the original research project, see TRB’s R04 web page.

SHRP2 R07, “Performance Specifications for Rapid Renewal”

- The research final report and implementation guidelines are available.
Resources: TRB ABC Subcommittee

The Transportation Research Board (TRB) ABC Subcommittee functions under the TRB AFF10 General Structures parent committee.

- Membership includes representation from the following TRB committees:
  - AFF10, General Structures
  - AFF20, Steel Bridges
  - AFF30, Concrete Bridges
  - AFF50, Seismic Design and Performance of Bridges
  - AFH40, Construction of Bridges and Structures
  - AHD30, Structures Maintenance
  - AHD35, Bridge Management

- TRB ABC Subcommittee website: http://www.trbaff103.com/
- Information posted from 2015 TRB Annual Meeting's ABC paper session, workshop, and subcommittee meeting can be viewed by selecting "2015" from the "Annual Meetings" tab.
- You are invited to participate in the "rate the research topic ideas or RTI" that is posted under the "RTI" tab.
- You can download the National ABC Research spreadsheet under the "Research Projects" tab. The spreadsheet includes approximately 120 ABC related research projects related to ABC topics.
- To receive updates on the Subcommittee’s activities, sign up as a "subcommittee friend" by visiting the TRB site.

Upcoming Events:

September 24 - 25, 2015
SHRP2 R046 - Bridge Design to Peer Exchange Workshop
Duluth, MN

September 28 - 30, 2015
Call for Awards
- Extended Deadline - September 30, 2015
ABC Conference

October 15 - 16, 2015
2015 PCI Foundation Days and Manufacturing Conference

November 9 - 11, 2015
SHRP2 R044 - Peer Exchange Workshop
Baton Rouge, LA
Resources: FHWA

FHWA ABC Contact: Benjamin Beerman, benjamin.beerman@dot.gov

Links to FHWA ABC Resources:
- ABC Manual
- Connections Manual
- SPMT Manual
- Decision-Making Framework
- PBES Case Studies
- Highways for LIFE Summary Reports

FHWA ABC website - “ABC is bridge construction that uses innovative planning, design, materials, and construction methods in a safe and cost-effective manner to reduce the onsite construction time that occurs when building new bridges or replacing and rehabilitating existing bridges.” More information ...

Every Day Counts (EDC) - “EDC is designed to focus on a finite set of initiatives. Teams from FHWA work with state, local, and industry partners to deploy the initiatives and develop performance measures to gauge their success.” More information ...

FHWA Incentive-Based Funding - Three incentive-based funding mechanisms are available for owner agencies who are looking to implement innovations such as prefabricated bridge elements and systems and other ABC related strategies into their program/projects.
FHWA ABC Resources

http://abc-utc.fiu.edu/index.php/resources/fhwa
Resources: Industry

Concrete Bridges
- National Concrete Bridge Council (NCBC)
- Precast/Prestressed Concrete Institute (PCI)
- PCI Northeast (Bridge Resources)

Steel Bridges
- National Steel Bridge Alliance (NSBA)
- Short Span Steel Bridge Alliance (SSSBA)

Composite Bridges
- American Composites Manufacturers Association (ACMA)
- Composites Product Suppliers

Bridge System Moves
- Self-Propelled Modular Transporter Contractors
All Events

Event: Sep 16 - 17, 2015
SHRP2 R04 Regional Peer-to-Peer Exchange Workshop - Minneapolis, MN
Sponsored by AASHTO, FHWA & TRB SHRP2 Program

Event: September 25, 2015
Call for Award Nominations - Extended Submission Deadline - 2015 National ABC Conference - Miami, FL

2015 PCI Fall Committee Days and Membership Conference - Louisville, KY

Monthly Webinar: Sep 24
Oklahoma Department of Transportation ABC Bridge Replacement on SH-51 over Cottonwood Creek

Search

Upcoming Events

September 16 - 17, 2015
SHRP2 R04 Regional Peer-to-Peer Exchange Workshop - Minneapolis, MN

September 25, 2015
Call for Award Nominations - Extended Submission Deadline - 2015 National ABC Conference - Miami, FL

October 15 - 18, 2015
2015 PCI Fall Committee Days and Membership Conference - Louisville, KY

November 17 - 18, 2015
SHRP2 R04 Regional Peer-to-Peer Exchange Workshop - Minneapolis, MN

Sponsored by the

National Events

International Events

ABC UTC
ACCELERATED BRIDGE CONSTRUCTION UNIVERSITY TRANSPORTATION CENTER

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Florida International University

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Example ABC-UTC Research Projects

- FIU’s Compilation of ABC Bridges, and International Database of ABC Research
- ISU’s Development of Prefabricated Concrete Bridge Railings
- FIU’s Compilation of Available Short- to Medium-Span ABC Systems
- FIU’s Extending Application of Simple for Dead & Continuous for Live Load Steel Bridge System to ABC Applications in Seismic Regions- Phase I- Numerical Study
- FIU’s Development of Manual for Enhanced Service Life of ABC
Compilation of ABC Solutions

Objective

To compile information on existing accelerated bridge technologies and present the information in a manner useful to designers
How to access the database?

On the current ABC-UTC server
Clicking on either database link will take you to the database server

To be available soon!
How to access the database?

On the current ABC-UTC server
Clicking on little icon will take you to Project Database
ABC Database

• Starting point was FHWA ABC Projects Database
• Created online database to host the information
• Created website and front end to:
  – Navigate database
  – Present database entries
  – Allow for user input
Navigating the Database
Project Submission

• Develop means for project submittal from users
• Create system in which projects and documents can be uploaded
• Create system which allows for projects to be fully vetted before official entry into database
FIU’s International Database of ABC Research

Objective
To develop a comprehensive database of published, ongoing and planned research related to ABC; linked to projects database.
ABC Research Database

- Interfaces similar to the projects database are being created for ABC Research database
ISU’s Development of Prefabricated Concrete Bridge Railings

Objective

To begin the process of developing crash-tested prefabricated bridge railings that have durable anchorage details

Note: A separate follow-on project will crash test bridge railings developed in this project
Prefabricated Bridge Railing Test Plan

• Test plan will include quasi-static testing of two barrier connection concepts
• Hydraulic actuator will apply loads cyclically
• Include adequate instrumentation - linear variable differential transformers (LDVTs), strain gauges, and load cells
• Include ponding tests for durability
Lab Test Set-up

- Precast Barrier
- Actuator Support
- Bridge Deck
- Beam to Support Bridge Deck
- Anchored to Lab Floor
3D Model of Lab Set-up with Applied Load Locations
Construction and Test Sequence

• Two segments, each 12 feet in length
  – U-bar connection & stainless steel bar connection
  – Test each segment individually for design load (locations 2 and 5)

• Establish the connection between 2 barriers

• Test segments while connected
  – Apply 54 kip force at joint to measure force distribution (locations 3 and 4)

• Ensure that achieve selected failure mechanism (i.e., connection failure)
Precast Barrier 1

Connection using U-bar

**Steps**
1. Pour concrete deck with access pockets for U-bar insert.
2. Place precast concrete barrier on deck with grout pad between deck and barrier.
3. Insert U-shaped rebar with spacer wheels from bottom of bridge deck.
4. Seal bottom of deck pocket.
5. Grout from inlet until it comes out of outlet.
6. Seal outlet and pour grout until it fills all the way to the top of inlet.

**Diagram:**
- Precast Barrier
- U-bar insert
- Rebar spacer wheels
- Rebar bars (top and bottom)
- Bridge deck
- Concrete deck with access pockets for U-bar insert

**Dimensions:**
- 9" height
- 3 3/8" width
- 42" length
- 20d = 12 1/2"
- 3" depth
- Rebar bars: #5 @ 4 3/4" C-C
- Rebar spacer wheels: Ø 3 3/4"
Precast Barrier 2

Connection using stainless steel bar with threaded end

**Steps**
1. Pour concrete deck with bar splicer and wood block to position bar splicer
2. Place precast concrete barrier on deck with grout pad between deck and barrier
3. Insert stainless steel bar with threaded end into barrier and bar splicer
4. Grout from inlet
5. Seal outlet

**Diagram**
- Precast barrier
- #8 stainless steel bar with threaded end
- #5 @ 4 3/8" C-C
- #4 @ 9 1/2" C-C
- #4 longitudinal bars (top)
- Wood block
- Bridge deck
- Threaded end
- Bar splicer
Barrier-to-Barrier Connection
FIU's Compilation of Available Short to Medium Span ABC Systems

Objectives

- To compile information on existing ABC technologies that target the short- to medium-span range, approx. to 140 ft; including details suitable for ABC and using UHPC
- To present the information in a manner useful to designers; information will be incorporated into the ABC projects database
FIU’s Extending Application of Simple for Dead and Continuous for Live Load Steel Bridge System to ABC Applications in Seismic Regions - Phase I - Numerical Study

Objectives: To conduct combination experimental and numerical work to develop details and design provisions for extending the application of the SDCL bridge system to highly seismic areas.
Objective

To develop a manual devoted to service life design of ABC projects
ABC-UTC Upcoming Events

• Monthly webinar – Thurs., Sept. 24
  – Case Study: Oklahoma DOT’s ABC Bridge Replacement on SH-51 over Cottonwood Creek

• 2015 In-depth web training – Tues., Nov. 10
  – Indiana/Kentucky Milton-Madison Lateral Slide

• 2015 National ABC Conference – Dec. 7-8
  – Miami, FL
  – Pre-conference Workshops – Dec. 6
  – Early Bird Registration Deadline: Oct. 9

ABC-UTC website: www.abc-utc.fiu.edu
Thank You