

ABC-UTC 2020 In-Depth Web Training

Tuesday, September 8, 2020 – 11:00 a.m. to 3:00 p.m. (Eastern Time)

Design and Construction of Common ABC Technologies Using the 2018 AASHTO LRFD Guide Specifications for Accelerated Bridge Construction

The 2020 in-depth web training features the design and construction of common ABC technologies using the *AASHTO LRFD Guide Specifications for Accelerated Bridge Construction, 1st Edition, 2018*. The web training is four hours in length and consists of six modules, each a 30-minute presentation followed by a 10-minute Q&A session. The first five modules cover the design of precast full-depth deck panels, adjacent modular decked beams, precast abutment and pier elements, self-propelled modular transporter (SPMT) bridge systems, and lateral slide bridge systems. Several worked examples are presented to give participants experience with the actual design for ABC. The workshop concludes with an in-depth look at the development of construction specifications for ABC projects.

Workshop Organizer and Presenter:

Michael P. Culmo, P.E., CHA Consulting, Inc.

Mike is a Bridge Engineer with over 36 years of experience in the design of steel, concrete, prestressed concrete and timber bridges. He has special expertise in the field of accelerated bridge construction technologies and constructability engineering. He is the principal author of numerous publications in the field of ABC, including the *2018 AASHTO LRFD Guide Specifications for Accelerated Bridge Construction*. He is a licensed professional engineer.



Modules:

1. Precast Concrete Full-Depth Deck Panels:

Description:

Precast concrete full-depth deck panels represent a common ABC technology. The *AASHTO Guide Specifications for ABC* cover all aspects of deck panel design. This module includes a fully worked design example for a precast concrete full-depth deck panel bridge. The example covers two different methods of connecting panels. The first method is cast-in-place concrete closure joints reinforced with hooked bars. The second method is reinforced closure joints filled with ultra-high-performance concrete (UHPC). The module concludes with typical calculations for handling panels.

Sample Photograph:



Precast Concrete Full-depth Deck Panels – Longitudinal Configuration
Commonwealth Avenue Bridge Project, MassDOT

2. Adjacent Modular Decked Beams:

Description:

Adjacent modular decked beams provide a means to replace or install superstructures very quickly. A feature common to all modular decked beams is that the deck is integral to the supporting beams. This eliminates a difficult process of making a concrete deck composite. This module covers the design and detailing of adjacent modular decked beams, including both steel and prestressed concrete options. Topics covered include the design requirements for the beams, management of profile geometry, the design of deck-level closure joints, designing for live load continuity, and span-by-span construction with link slabs.

Sample Photograph:



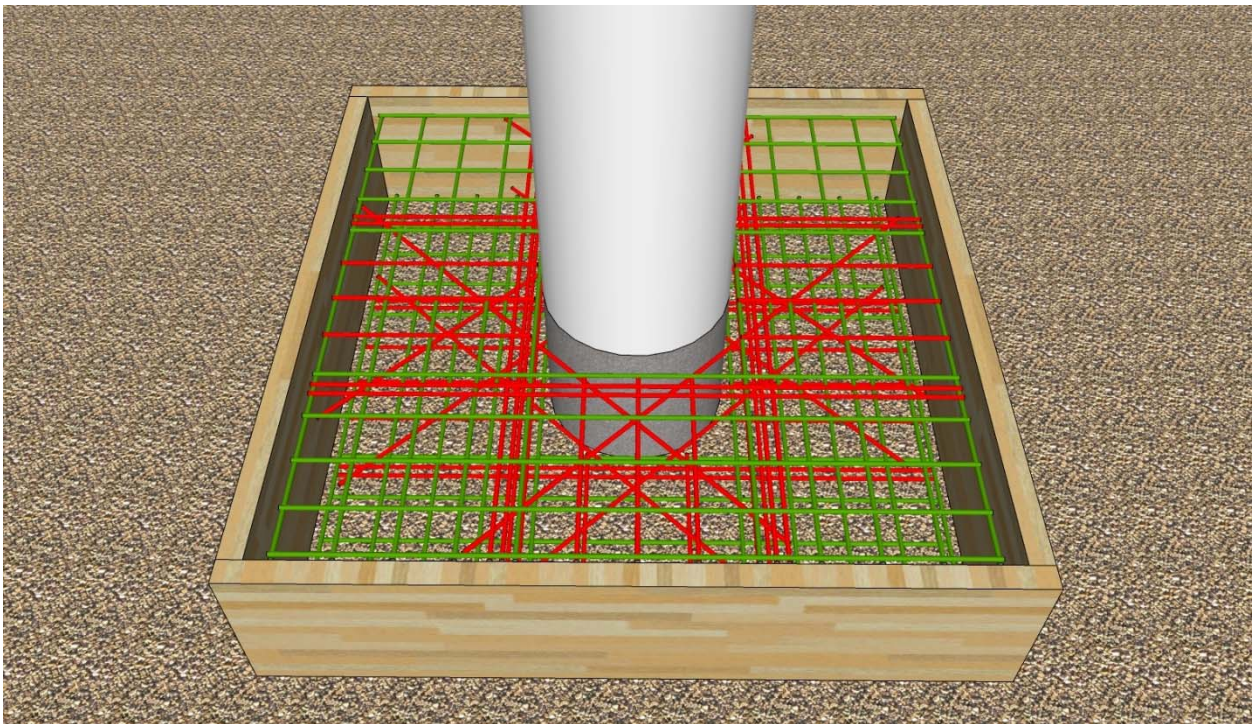
Modular Decked Beams with Steel Girders
MassDOT

3. Prefabricated Substructures:

Description:

Prefabricated substructure elements are becoming more common in the ABC world. It is feasible to prefabricate all types of substructure elements. This module covers the design of common prefabricated substructure elements, including integral abutments and cantilever abutments. The module also includes the design of open-frame pier bents.

Sample Photograph:



Socket Connection – Precast Column with CIP Footing

4. Bridge Systems with Self-Propelled Modular Transporters (SPMTs):

Description:

Installation of bridge systems using Self-Propelled Modular Transporters (SPMTs) was one of the early methods of ABC system moves used in the United States. These machines can be used to move entire bridge superstructures from an offsite staging yard to the bridge site, resulting in very fast construction that can be of significant benefit for high traffic volume locations. They can also be used to remove existing structures. This module covers the design of bridge systems installed with SPMTs. The roles and responsibilities of the designer and the contractor are outlined. The design of the bridge to accommodate the move is also covered, including a study of the dynamic effects imparted on the bridge and falsework during the move.

Sample Photograph:



SPMT Bridge System
Utah DOT

5. Bridge Systems with Lateral Slides:

Description:

Lateral slide bridge systems have recently become quite popular in the United States. They can be a low-risk option for bridge system moves and provide significant benefit for bridges over waterways or over low traffic volume locations. This module covers the design of bridge systems installed using the lateral slide technique. The roles and responsibilities of the designer and the contractor are outlined. The design and detailing requirements for the bridge are also covered.

Sample Photograph:



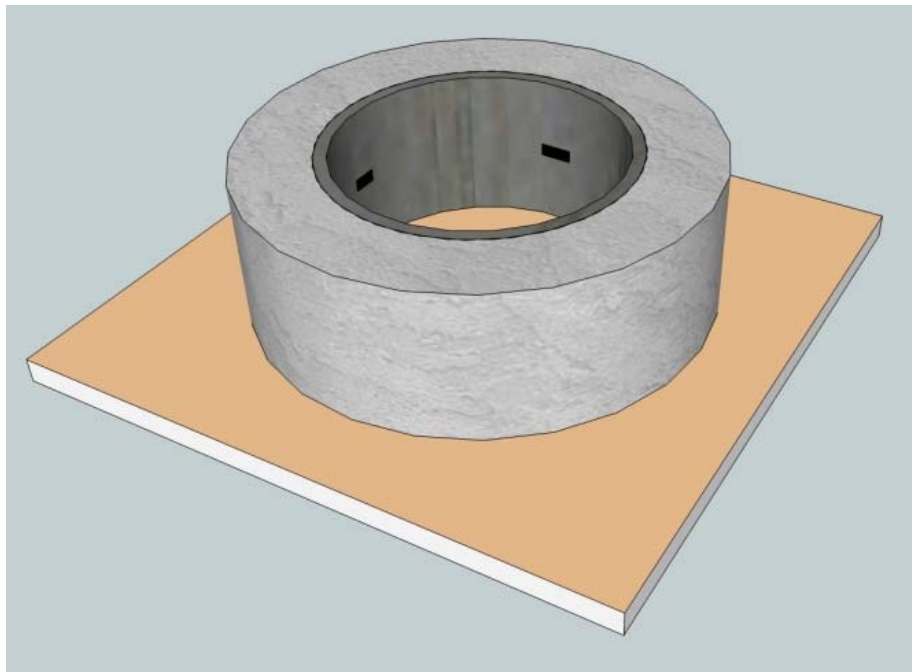
Lateral Slide System
Rhode Island DOT

6. Construction Specifications:

Description:

The *AASHTO Guide Specifications for ABC* include significant guidance on construction specification development for ABC projects. This module covers construction specifications for all forms of ABC, including quality control, assembly planning, and specialized materials such as non-shrink grouts, high-early-strength concrete, and ultra-high-performance concrete (UHPC).

Sample Photograph:



Confined Shrinkage Test Set-up

Agenda:

Module	Time		Description	Duration (minutes)
1	11:00 AM	11:40 AM	Precast Concrete Full-Depth Deck Panels Design Considerations Example Closure Joint Options Example: Closure Joint Connection with Concrete Example: Closure Joint Connection with UHPC Lifting and Handling Example	0:40
2	11:40 AM	12:20 PM	Adjacent Modular Decked Beams Types of Adjacent Decked Beams Steel Prestressed (NEXT Beams) Design Requirements Live Load Distribution Deck Level Connections Simple for DL Continuous for LL Link slabs	0:40
3	12:20 PM	1:00 PM	Prefabricated Substructures Abutment Examples Precast Integral Abutment Precast Cantilever Abutment Pier Examples Grouted Coupler Connection Socket Connection	0:40
4	1:00 PM	1:40 PM	Bridge Systems with SPMTs Designer/Contractor Responsibilities Design of the Bridge Preliminary Layout Dynamics	0:40
5	1:40 PM	2:20 PM	Bridge Systems with Lateral Slides Designer/Contractor Responsibilities Preliminary Layout Recommended Details Example: RIDOT Bridge Project	0:40
6	2:20 PM	3:00 PM	Construction Specifications Fabrication and Assembly Planning Quality Specifications Non-Conformance Repairs Materials Specifications Non-Shrink Grout High-Early-Strength Concrete UHPC	0:40