SLIDE IN BRIDGE CONSTRUCTION (SIBC) FROM THE CONTRACTOR/CONSTRUCTION PERSPECTIVE

June 12, 2014; 11:00am MST
SIBC Webinar Series

- Owner/Policy Maker Perspective
  - November 2013 (complete)
  - 2nd session scheduled later in year

- Engineer/Designer Perspective
  - January 2014 (complete)
  - April 3, 2014 (complete)
  - 3rd session scheduled later in year

- Contractor/Constructor Perspective
  - March 2014 (complete)
  - June 12, 2014 (Today: Milton-Madison Bridge)
  - 3rd session scheduled later in year
Webinar Agenda

- Featured Presentation: Contractor/Construction Perspective (~40 min.)
  - Walsh Construction Company, Chicago, IL

- Questions & Answers (~15 min.)

- Next Steps (~3 min.)
MILTON MADISON BRIDGE DESIGN-BUILD

Walsh Construction Company
Presentation Outline

- Project Procurement, Charlie Gannon
- Project Overview, Charlie Gannon
- Temporary Truss Supports, Charlie Gannon
- Truss Demolition, Charlie Gannon
- Bridge Slide, Will Banik
- Lessons Learned, Will Banik
PROJECT PROCUREMENT

Charlie Gannon
Design-Build Procurement

- Five teams provided technical and price proposals
- Winning team includes Walsh Construction with designers Burgess & Niple, Inc. and the truss designer, Buckland & Taylor.
- A+B bid; A=base price; B= # closure days x $25,000
- Original owner expectation of a 365-day closure with a ferry boat for motorists
- By using both the exiting bridge and the new bridge as temporary river crossings, Walsh’s bid included only 10 days of closure and an earlier completion date.
- The DBT as well as the owners all agree that this method ultimately lessened the economic impact to the surrounding communities.
PROJECT OVERVIEW

Charlie Gannon
Replace 80-year-old truss bridge...
...with a new truss bridge.
STEP 1

- Existing bridge remains open to traffic
- Temporary ramps built from Vaughn Drive and KY Hwy 36
- Pier strengthening and widening begins
Bridge closes to traffic for five days
Temporary ramps are connected to existing truss
Existing truss reopens to traffic
Pier strengthening work continues
STEP 3

Downstream temporary support towers are constructed
STEP 4

- Existing truss remains open to traffic
- New truss superstructure is erected on downstream piers
- Permanent approaches are built
STEP 5

- New truss is connected to US 421 via transition spans
- Traffic is rerouted onto new truss
STEP 6

Existing bridge is demolished
STEP 7

- Traffic remains on new truss
- Temporary ramps are removed
- Pier strengthening and widening is completed
Bridge closed for slide
Using PTFE pads, highly polished slide plates, & grease, new truss is slid onto permanent piers
New Milton-Madison Bridge opens to traffic
Temporary support structures are removed
TEMPORARY SUPPORT STRUCTURES

Charlie Gannon
Design Requirements

- Although considered temporary, the supports were designed to meet the demands of a permanent pier, except service life.
Design Requirements

- Designed to support strand jacking operations
Platforms for lifting a 600-foot truss section weighing 1,700 tons
Platforms for lifting a 700-foot truss section weighing 1,900 tons
Design Requirements

- Designed to support strand jacking operations
- Designed to carry completed truss
• Support weight of **fully completed truss** (deck, guardrail, etc.) including seismic considerations
• Designed for load rating of 75% LRFD
Design Requirements

- Designed to support strand jacking operations
- Designed to carry completed truss
- Designed to provide a slide platform
- Handle lateral forces to move 15,260 tons 55 feet
Lateral bracing also used to protect towers against barge impact
Temporary Support Installation

- Pile installation
36”Ø 1” thick walled pipe piles driven to bedrock using a D100-13 diesel hammer with a minimum capacity of 2900 kips.
- Pile alignment given special attention
Temporary Support Installation

- Pile installation
- Tower fit-up
• Installed square and center to the pier
Temporary Support Installation

- Pile installation
- Tower fit-up
- Sliding girder pedestal
- Sliding girder pedestal reinforcing
Temporary Support Installation

- Pile installation
- Tower fit-up
- Sliding girder pedestal
- Sliding girder installation
Sliding girder on designed station
Temporary Support Installation

- Pile installation
- Tower fit-up
- Sliding girder pedestal
- Cap beam and sliding girder installation
- Installation and modification of jacking platforms
Positioned correctly to allow strands to work properly
• Designed to be modified and reused
Temporary Support Installation

- Pile installation
- Tower fit-up
- Sliding Girder Pedestal
- Cap beam and sliding girder installation
- Installation and removal of jacking platforms
- Barge impact frame/stability strut installation
Barge Impact Frame Design
Alignment – Distance – Bracket Location
• Connection to tower legs for stability
BRIDGE DEMO

Charlie Gannon

(NOTE: A link to the MM Bridge Span 9 Demo Video will be provided on the SIBC training project website following this webinar.)
The explosive cutting of the channel span
• South Span Ignition
• With only 15’ between trusses, it was essential that the old truss follow a straight path downward.
BRIDGE SLIDE

Will Banik
By the numbers...

- 2,427-foot-long, 4-span, continuous truss bridge
- Total weight approximately 15,260 US tons
- 55-foot lateral slide distance
- 95 feet above the Ohio River at normal pool
Truss Slide

- Dimpled PTFE on polished, greased, carbon steel
  - Permanent bearings utilized for sliding
- 1” thick slide plate, varied from 37” to 78” wide
  - Flatness of slide path critical
- Guided at only one pier (P4)
- BRAVO laser control system
- Bearing harness system
- Eight 350-ton strand jacks
• General Slide Overview
• SLU-330/550 strand jacks at Pier 4
- PTFE on underside of permanent truss bearings
• P4 slide plate complete with guide angle
• Pier 5 slide plate
• Bearing harness detail
• Truss Bearings
- Lead bearing harness
• BRAVO System
• Command Center
• Truss slide “braking” system
Halfway home...
~ 1-MINUTE TIME-LAPSE VIDEO
LESSONS LEARNED

Will Banik
Lessons Learned

➤ Don’t get “sticker shock”
➤ Be mindful of clearances (vertical & horizontal)
➤ Respect the design-build process
QUESTION & ANSWER PERIOD

Travis Boone/Kevin Thompson, URS Moderators (~15 minutes)
Q&A Panel

➤ Charlie Gannon, Walsh Construction Company
317.714.8654, cgannon@walshgroup.com

➤ Will Banik, Walsh Construction Company
317.557.9338, wbanik@walshgroup.com

➤ Nedim Alca, Buckland & Taylor
604.986.1222, na@b-t.com

➤ Kevin Hetrick, Indiana Department of Transportation
317-232-5162, d30hetri@indot.in.gov
NEXT STEPS

Travis Boone, URS (~3 minutes)
Websites/Resources

➤ SIBC Webinar Training Project Website
  – www.slideinbridgeconstruction.com
  – Webinar registration, a recording of today’s webinar, presentation slides, video, and Q&A results will be posted within 10 business days

➤ Interim Every Day Counts (EDC) Representative
  – Mr. Romeo Garcia, MN Division Bridge Engineer, 651-291-6125, romeo.garcia@dot.gov
  – FHWA backfilling Tim Cupples’ position

➤ FHWA SIBC Website
  – SIBC Implementation Guide now available
  – Many other resources, case studies, etc. also available
FHWA SIBC Technical Services Support Center (TSSC)

- Request personal, professional answers to questions via TSSC
- Download topical resources
- Learn about instructor-based training courses

www.fhwa.dot.gov/construction/sibc/

or

search “FHWA slide”
Future SIBC Training

- Owner/Policy Maker Perspective
  - Tentatively set for August 2014

- Engineer/Design Perspective
  - Tentatively set for September 2014

- Contractor/Construction Perspective
  - Tentatively set for October 2014

- Web-based Training
  - 3 Modules: SIBC Part 1, Part 2, and Part 3
  - Each goes “live” with the associated webinars above
FIU ABC Center Training

Next Webinar
Thursday, June 19, 2014 (1:00 – 2:00 p.m. Eastern)

Featured Presentation
Precast Substructures, Part 2 – Comparison of Non-Seismic and Seismic Connection Details
by
M. Lee Marsh, Ph.D., P.E., President and CEO, BergerABAM

To register, visit: www.abc.fiu.edu
THANK YOU FOR YOUR PARTICIPATION!

For issues or questions regarding this training or the www.slideinbridgeconstruction.com website, please e-mail sibc@urs.com