Slide LAT

BRIDGE
LATERAL MOVE
TECHNOLOGY

U.S. Department of Transportation
Federal Highway Administration

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

STEP 2

- 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

STEP 8

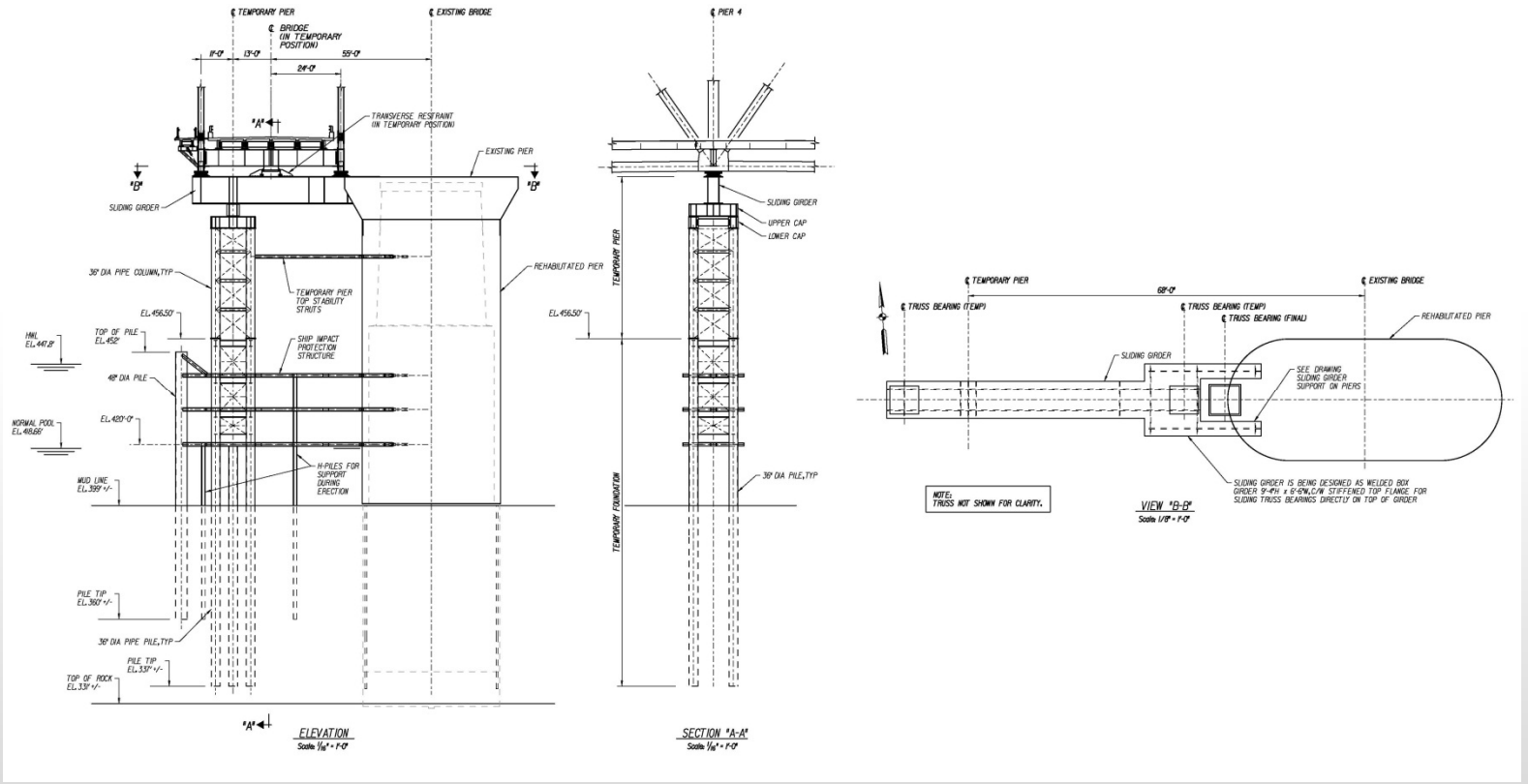
- Bridge closed for slide
- Using PTFE pads, highly polished slide plates, & grease, new truss is slid onto permanent piers
- New Milton-Madison Bridge opens to traffic
- Temporary support structures are removed

TEMPORARY SUPPORT STRUCTURES

Charlie Gannon

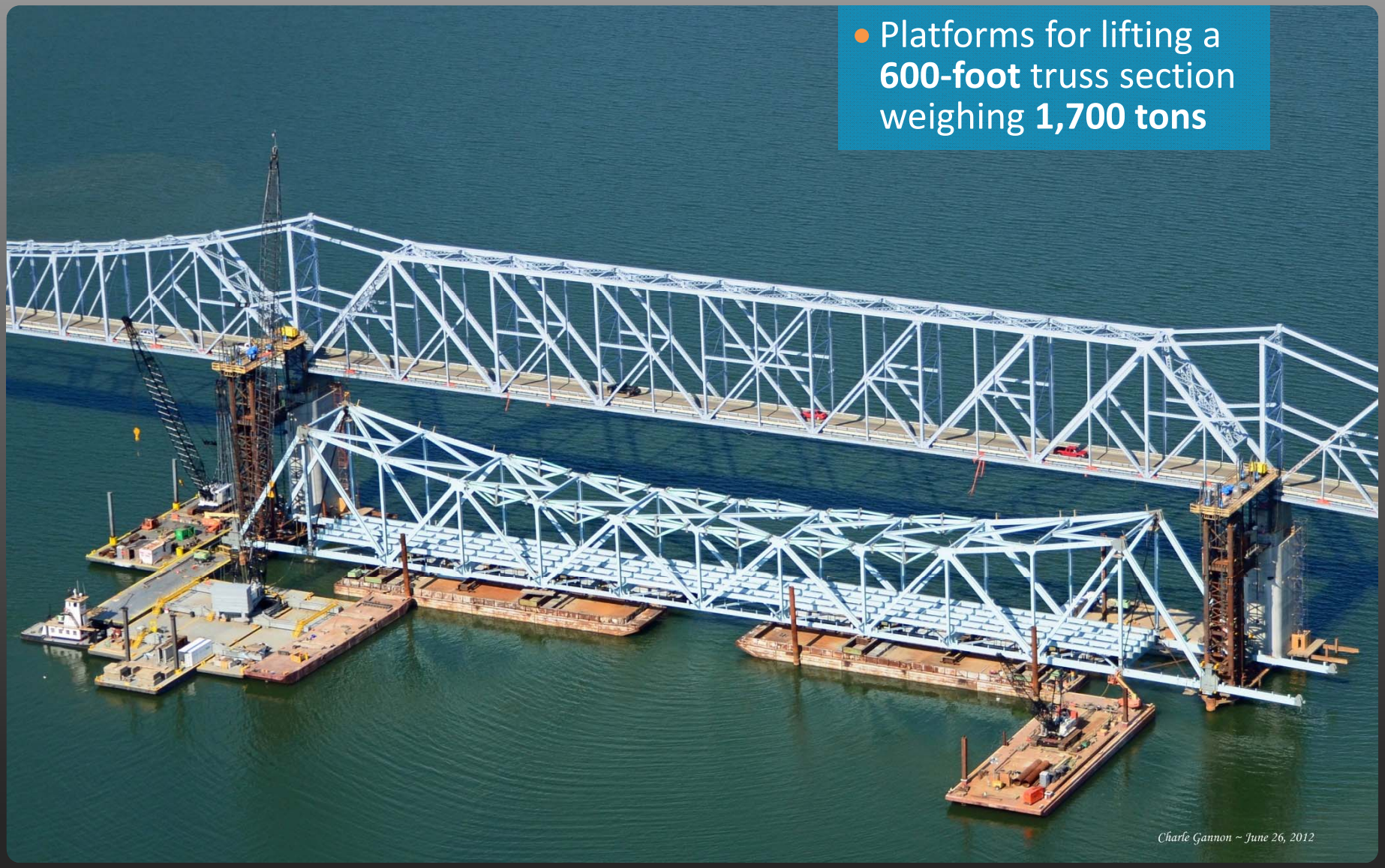
Design Requirements

- **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**
Charlie Gannon – April 10, 2013

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

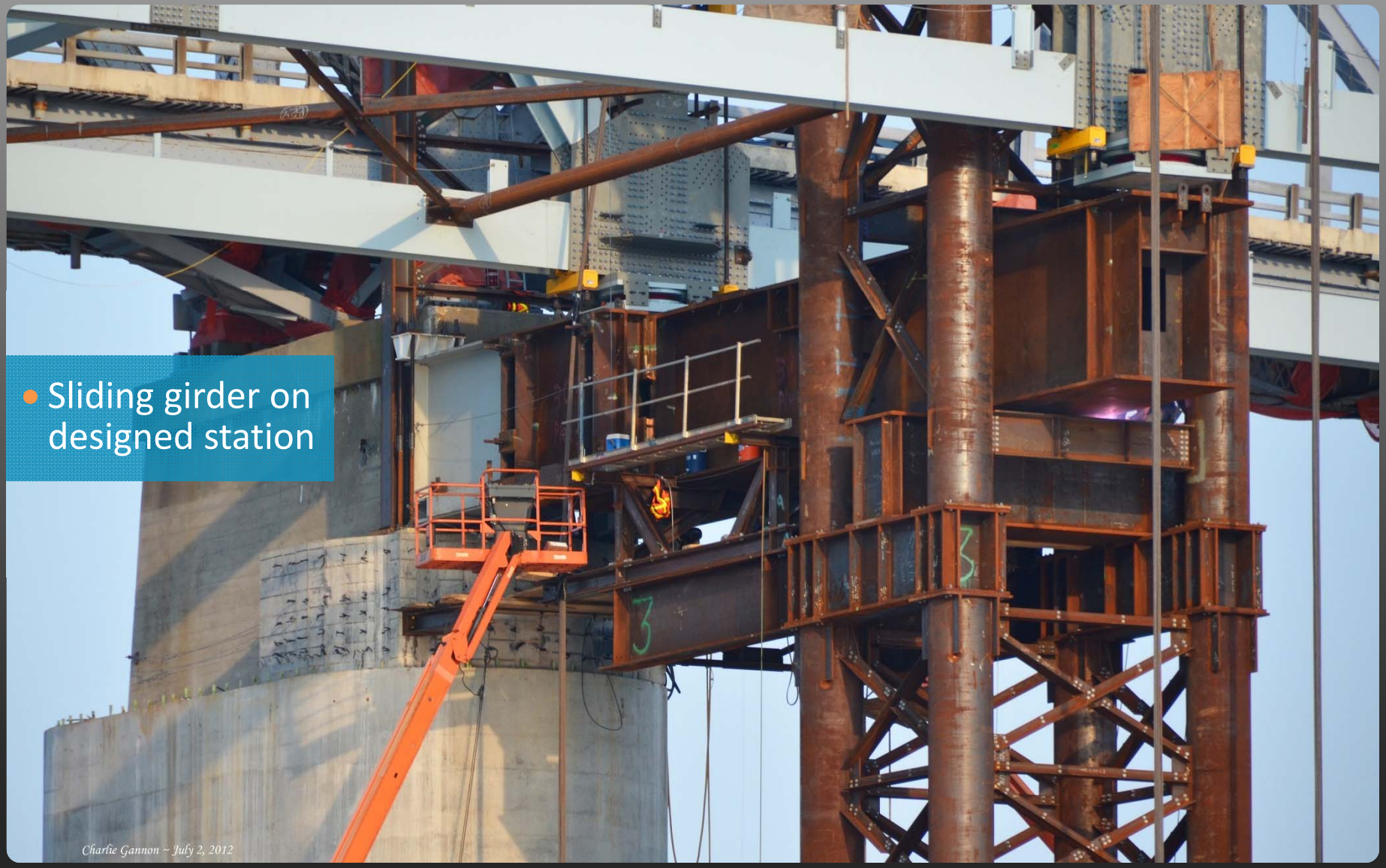
- Pile installation
- Tower fit-up
- **Sliding girder pedestal**

- Sliding girder pedestal reinforcing

Temporary Support Installation

- Pile installation
- Tower fit-up
- Sliding girder pedestal
- **Sliding girder installation**


BAMBI
305A
Pier 4
302A
Pier 4
LOCALS #1
MAKING HISTORY
GIT-ER DONE
CHEVROLET
GROVE
Charlie Gannon ~ July 1, 2012



- 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**

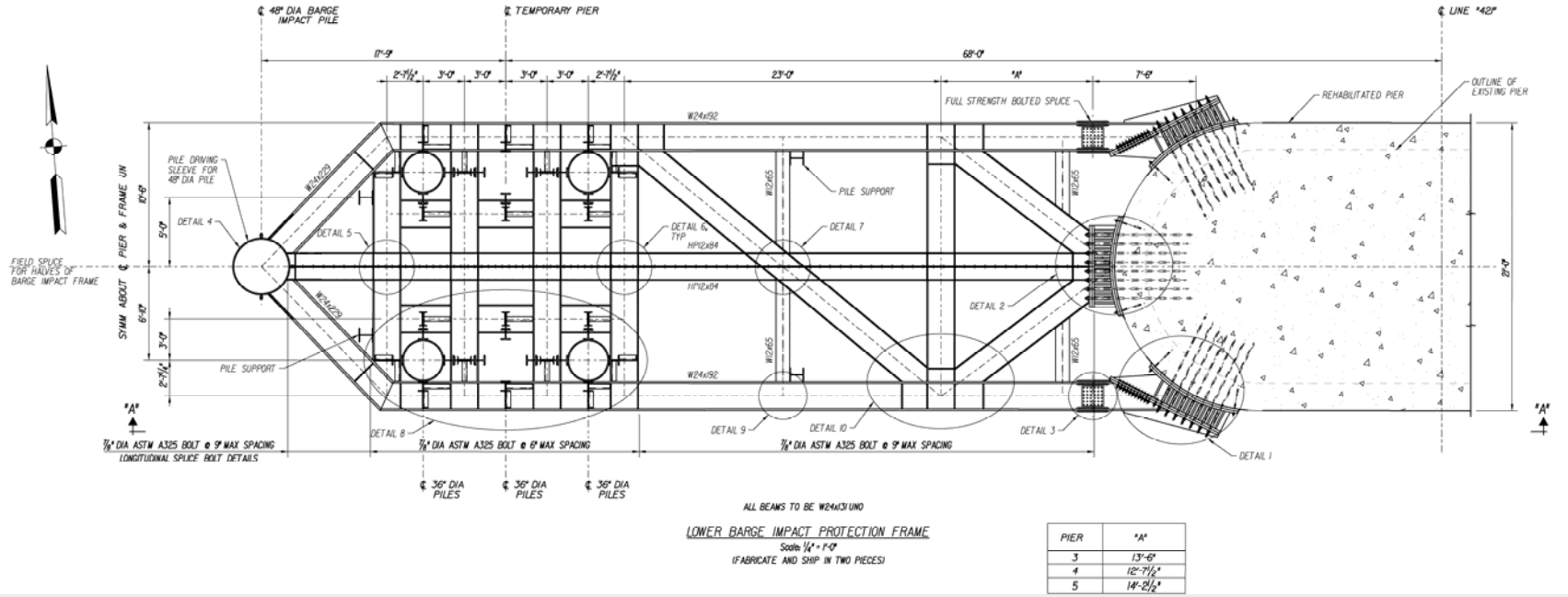
- Positioned correctly to allow strands to work properly

- 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



PIER	"A"
3	13'-6"
4	12'-7 1/2"
5	14'-2 1/2"

- 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

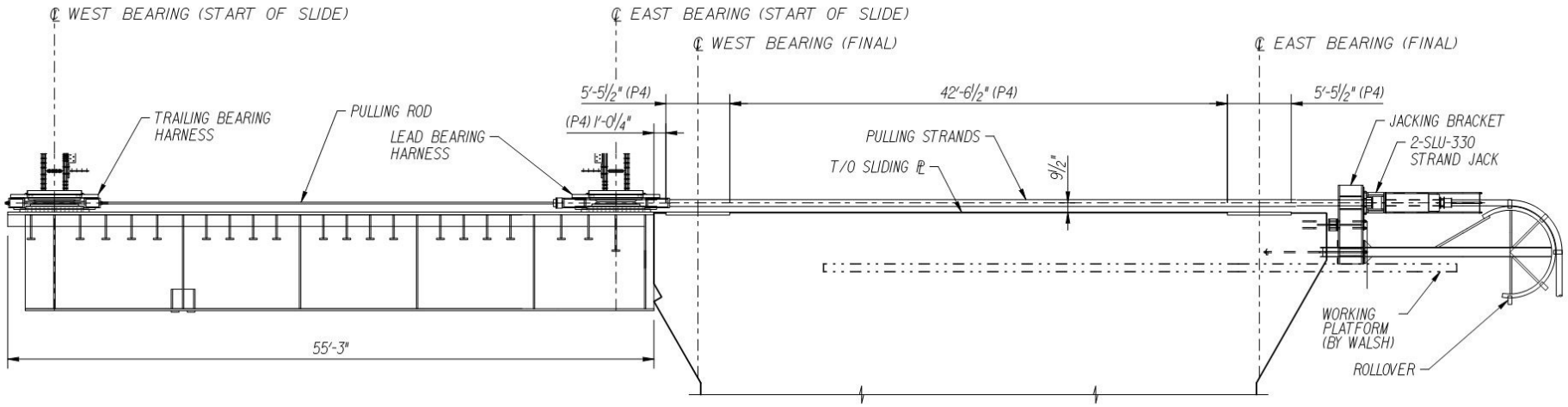
By the numbers…

- 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



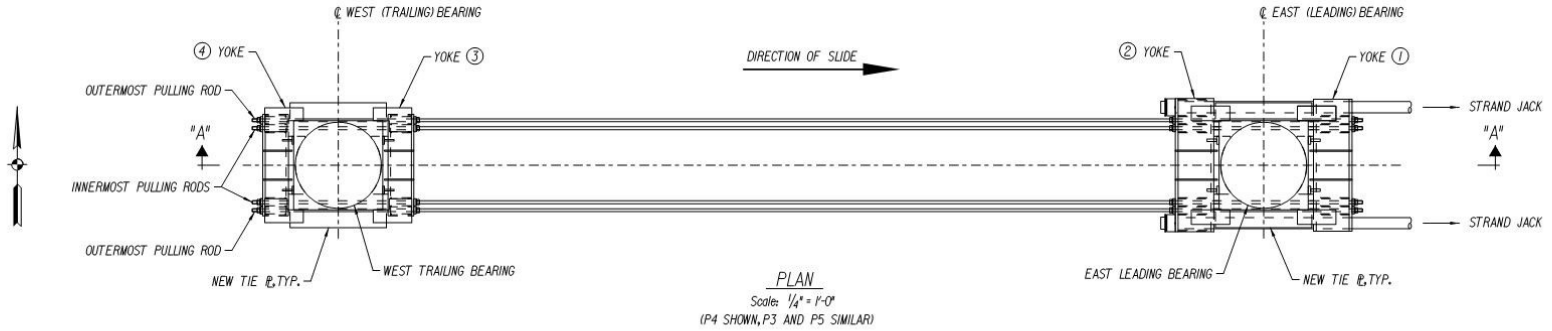
- SLU-330/550 strand jacks at Pier 4

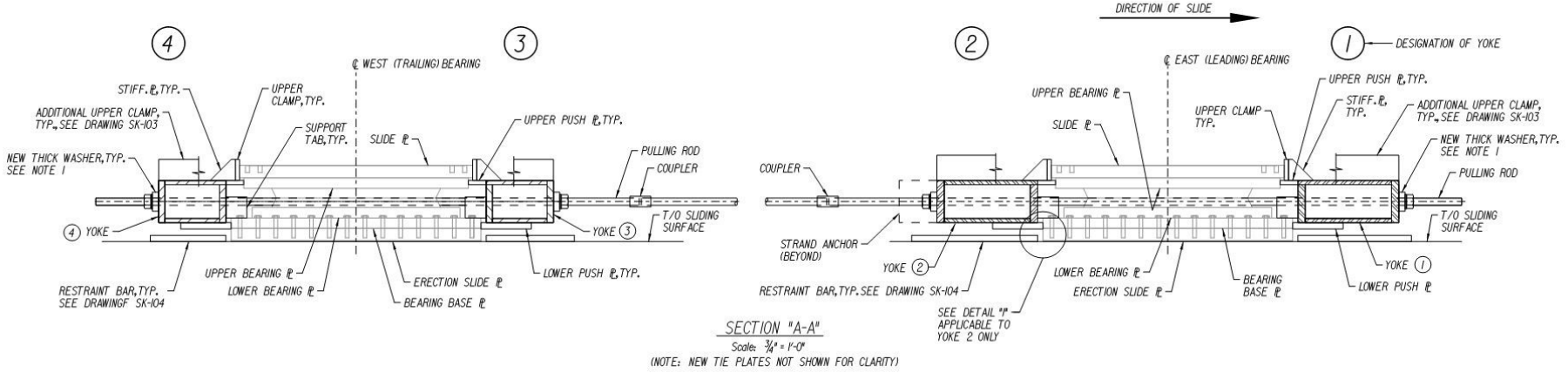
- PTFE on underside of permanent truss bearings

- P4 slide plate complete with guide angle

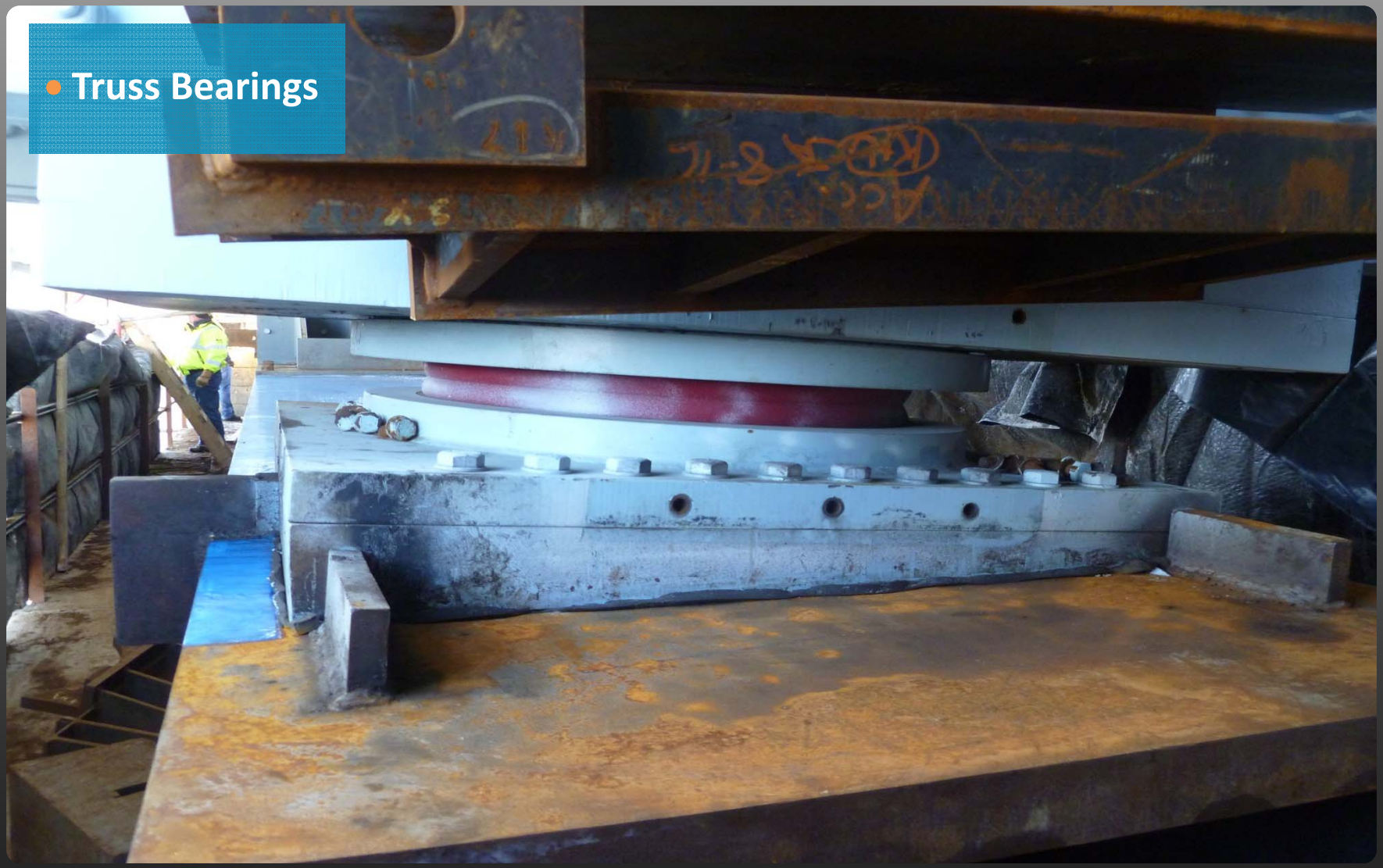
- Pier 5 slide plate

Bearing harness detail





- Truss Bearings

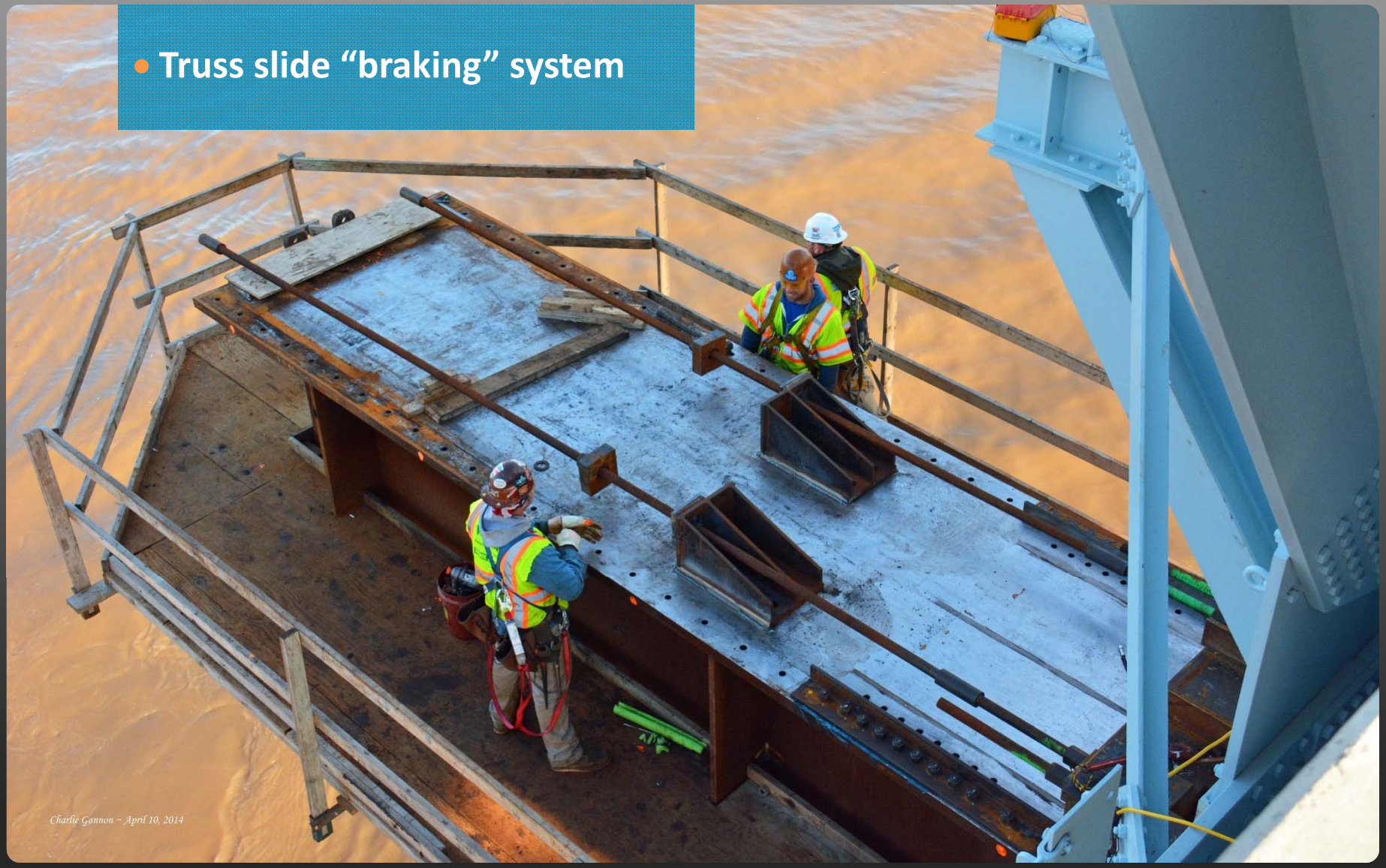


- Lead bearing harness

- **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
  - http://www.fhwa.dot.gov/construction/sibc/
  - 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

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THANK YOU FOR YOUR PARTICIPATION!

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