Milton Madison Bridge Replacement

Tom Bolte, Burgess & Niple
Murray Johnson, Buckland & Taylor
One of two Ohio River bridges between Cincinnati and Louisville

- I-65 Bridge - 46 miles
- Markland Dam - 26 miles
- I-275 Bridge – 65 miles
Bridge History

- Built in 1929 by J. G. White, National Toll Bridge Company
  - $1 Million
  - Tolled until 1949: 5¢ for pedestrians, 45¢ for vehicles

- Purchased by Kentucky in 1939; half interest sold to Indiana in 1970s
Bridge in 2008

Weight Limit 15 tons

Sufficiency Rating 6.5 out of 100
Transportation Investment Generating Economic Recovery

American Recovery and Reinvestment Act of 2009

“Stimulus Act”

$20 Million Awarded to Milton Madison Project
(Estimated Total Project Cost $130 Million)

Tiger Grant Constraints
• Completion in 2012
• No Right-of-Way Acquisition
Late 2009: Decision to Replace Superstructure
Use design-build

Late 2009 – June 2010: Prepare procurement documents

June 2010 – Advertisement by INDOT
Bid Documents

Existing Bridge

Proposed Bridge
Bid Documents

**Existing Bridge**

- Milton, KY
- Madison, IN

- Pier 2
- Pier 3
- Pier 4
- Pier 5
- Pier 6

**Proposed Bridge**

- 600’
- 600’
- 727’-3”
- 254’
- 150’

- New Pier Cap
- Strengthen Existing Pier
- New Pier
Bidding Formula

\[ A + B - \text{Adjustment} \]

\[ A = \text{construction cost (including ferry)} \]
\[ B = \text{closure days} \times \$25,000/day. \]
\[ \text{Adjustment} = \$3.75 \text{ million for early opening} \]

\[\$25,000 \times 365 = \$9.1 \text{ Million}\]

Design Alternate Meetings

- Two during bidding period
- Confidential
Maintenance of Traffic:

240 vehicles per hour from 5 AM to 9 PM

We’re gonna need a bigger boat!
Bid Opening – September 22, 2010

› Five Contractors submitted bids
› Awarded to Walsh Construction:
  › Cost to construct project  $103 Million
  › Length of bridge closure  10 days
Design Concept:
1. Drill holes into existing unreinforced caisson
2. Grout rebar into caisson
3. Add stem reinforcement
4. 2’ thick encapsulation
5. Pier cap reinforcement
6. Form and cast new pier cap
Pier Strengthening
Pier Strengthening
Main Spans: Construction Sequence

Float in Span 2

Lift Span 2

Cantilever Span 1

NOTE: Existing structure not shown for clarity.
Main Spans: Construction Sequence

Float in & Lift Span 3

Cantilever Span 4

Slide Completed Bridge Laterally
Main Spans: Construction Sequence

- Completed New Spans Slid into Final Position
- Sliding Girder Inserted
- New Truss Span Float in on Barges
- New Truss Span Lifted by Strand Jacks
- Truss Span Set Down on Sliding Girder
- Existing Bridge
- New Pier Cap
- Temporary Pier
- Ship Impact Protection
Temporary Pier Connection to Pier
Barge Impact
Barge Impact Protection Frames
Sliding Girders
Sliding Girders
Sliding Girders
Span Lifting
Span Lifting
Span Lifting
Sliding Girder Installation
Sliding Girder Installation
Sliding Girder Installation
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Sliding Girder Installation
Sliding Girder Installation
Sliding Girder Installation
Sliding Girder Installation
Temporary Restraints
Temporary Pier Complete
Side Span Cantilever Construction

Courtesy of Walsh Construction

Charlie Gannon - Dec 8, 2012
New & Old Bridges
New Pier Caps
New Pier Caps

Charlie Gannon – November 16, 2013
Sliding
Truss Sliding

Pulling
Truss Sliding
Truss Sliding
Truss Sliding
Truss Sliding
“Span D” KY Sliding Span

Courtesy of Walsh Construction

Charlie Gannon - December 14, 2012
Span D"
Kentucky Sliding Span
Span D Slide
Span D Slide
Temporary Sliding Bearings

3” Conduit for Pulling Strand
Sliding Main Spans

The Numbers:

• 2433 Feet Long
• 4 Spans Continuous
• 15,260 Tons
• Lateral Move 55 Feet
Sliding Main Spans

Plan View

Elevation View
Sliding Surface
Sliding Bearings
Strand Jacks for Sliding
Sliding Runways
Pulling Frames
Pulling Frames
Bearing Sliding Harnesses
Bearing Sliding Harnesses
Bearing Sliding Harnesses
Slide Control
Slide Control
Slide Control
Sliding
Slide Complete
Time-Lapse Video of Main Spans Slide
Questions?

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