The Tennessee River Bridge Experience

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The History of the Tennessee River Bridge Replacement
TENNESSEE RIVER BRIDGE

- September 1994 – Scoping Study Authorized
- September 1997 – Initial Design Funds Authorized
- February 2004 – Right of Way and Utility Funds Authorized for the substructure contract
- December 2005 – Contract let to construct truss substructure (Piers #6-#8)
TENNESSEE RIVER BRIDGE

- October 2008 – Bulletin for superstructure design was publicized
- May 2009 – A Notice to Proceed for design services was issued to URS, Inc.
- July 2010 – Superstructure Contract was let to the joint venture of Kay & Kay Construction & Haydon Bridge for $66,364,228.26
PROJECT OVERVIEW

EXISTING BRIDGE CHARACTERISTICS

- 2-lane bridge
- Existing structure 20’ wide curb – curb
- ADT: 10,400 (2005)
- Built in late 1920’s & early 1930’s
- Originally a toll bridge
- Designed by Modjeski and Masters Engineers
Future Design Parameters:
- ADT: 15,000 (2023)
- 10% Truck Traffic

New structure approx. 1500 ft. upstream
PROJECT OVERVIEW

17 total spans
3 truss spans
- 500 FT, 400 FT, AND 900 FT

- Modified Warren Truss
- Typical truss span: 4 lane roadway, barrier wall divided
- 1 River Pier
PROJECT OVERVIEW

Phase One: Substructure

Phase Two: Superstructure to Completion

Phase Three: Existing Bridge Demolition
Letting: December 16, 2005
Awarded to CJ Mahan Construction
$28.5 Million
16,600 C.Y. – Class A Concrete
8,700 C.Y. – Class AA Concrete
3.2 million lbs – Steel Reinforcement
Estimated Completion: Nov. 2008
Actual Completion: June 2010
PHASE ONE

DELAYS AND ADVERSITY

- Weathering Steel modifications
- Superstructure evaluation led to changes on existing design
- Seismic issues with existing footing design found during evaluation
  - Interpretation of data based on proximity to New Madrid Fault Zone
- High Water
  - Elev. 306 is C.I. for River pier construction
- Muscle re-location
Indiana Bats – (clear trees between Oct 15th & March 31st)

NTP issued Feb. 28, 2006

Access road to McCracken County side

RR Crossing needed to access McCracken County side of River

Power to McCracken County side – Pier # 6
PHASE ONE

CHANGES TO DESIGN

- Design/Build option for Pier # 7
  - Original Design
  - Similar to Greenville Bridge

Source: www.greenvillebridge.com
PHASE ONE

CHANGES TO DESIGN

- Design/Build option for Pier #7
  - As-Built Design
PHASE ONE

CHANGES TO DESIGN

- Pier #7 Construction
PHASE ONE

CHANGES TO DESIGN

- VE changing steel pile to concrete pile
- VE changing size of footer at Pier # 8
PHASE ONE  
CHANGES TO DESIGN

 Dynamic Load Testing vs. Static Load Testing
 Pile Driving Criteria
PHASE ONE

CHANGES TO DESIGN

- Soil conditions at Piers 8 & 9
- Erosion Control Issues
PHASE ONE
PROJECT COMPLETION

- Project Completion
  - June 2010
PHASE TWO

OVERVIEW

- Letting: July 30, 2010
- Awarded to Kay & Kay Contracting JV W/ Haydon Bridge Company
- $66.4 Million
- 15.3 million lbs of Structural Steel
- 9,000 C.Y. – Class A Concrete
- 8,500 C.Y. – Class AA Concrete
- 2.5 million lbs – Steel Reinforcement
- Actual Completion: October 31, 2013
PHASE TWO

DELAYS AND ADVERSITY

- High Water
PHASE TWO

DELAYS AND ADVERSITY

- High Water
PHASE TWO
DELAYS AND ADVERSITY

- Weight Limit Reduction
PHASE TWO

DELAYS AND ADVERSITY

- Material Delivery
- Weather
- Neither incidents related to controlling item
- Overall schedule not effected
PHASE TWO

DELAYS AND ADVERSITY

- Crane Issues
- Related to controlling item: structural steel
- Delay Time: 4 to 6 weeks
PHASE TWO
OVERALL CONSTRUCTION
PHASE TWO
STEEL ERECTION OF TRUSS
PHASE TWO
STEEL ERECTION OF TRUSS
PHASE TWO
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PHASE TWO
STEEL ERECTION OF TRUSS
PHASE TWO

PROJECT ACCELERATION

- Condition of Existing Structure
- Incentive/Disincentive Option
  - Associated Cost keeping existing structure open
  - Areas of Possible Acceleration
- Accepted Proposal:
  - 3.8 million dollars for 2 lanes of traffic by May 2013
  - 1.9 K disincentive per day after May 1\textsuperscript{st}, 2013
  - Project Completion Date: October 31\textsuperscript{st}, 2013
PHASE TWO

PROGRESS TO DATE
PHASE TWO

PROGRESS TO DATE
PROJECT PHOTOS
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QUESTIONS?