US 90 Bridge over the Bay of St Louis

LTRC Structures Conference

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US 90 Bridge over the Bay of St. Louis
History of Project

• Hurricane Katrina August 29, 2005
• RFP issued November 3, 2005
• Technical proposal due January 13, 2006
• Bid Opening on January 23, 2006
• Contract awarded on January 24, 2006
• Final Design starts January 25, 2006
Aftermath of Hurricane Katrina

Previous Bridge Obliterated by Hurricane Katrina

- Constructed in 1953
- Prestressed Concrete Girder, Concrete Deck
- Supported on Precast Piles
Aftermath of Hurricane Katrina
Aftermath of Hurricane Katrina
Demolition of Bascule Piers
Design of New US 90 Bridge
Overall Plan View

PROPOSED ALIGNMENT ST. LOUIS BAY BRIDGE
Revised Date: 11–04–05

FLIGHT 6 (182–188)
8–30–05
Bridge Design: Superstructure

Bulb Tee 78 Girders:

– 154 foot spans, 11’-5” spacing
– Live Load Distribution Factor = S/13
– CONSPAN software used for beam design
– Creep effects included = time dependent T187 analysis
Typical Section
Live Load Distribution Factor: Risa 3D Analysis
Live Load Distribution Factor: T187 Grillage Analysis
Bridge Design: Superstructure

Spliced Bulb Tee Girders for Navigation Span:

– 200’ – 250’ – 200’ spans

– Longitudinal Post-Tensioning

• 4 x 19k6 tendons

• Stressed in stages
Spliced Bulb Tee Girders at Navigation Span
Haunched Girder Segments
Bridge Design - Substructure

- Pile Bent Design
  - HNTB PIER program used for capbeam design
  - T187 program used for 3D model of pile bents
Typical Trestle Bent Section
T187 Model: Pile Bent
Pile Bent Construction
Precast Caps
Bridge Design - Substructure

• Waterline Footing Bent Design
  – PIER program used for AASHTO loading
  – FB Pier program used for Vessel Impact analysis
PIER Program
FB Pier Model
FB Pier Model
Waterline Footing Bent
Geotechnical Design

• Indicator Pile Program
  – 17 Indicator Piles in the Bay
  – 5 Indicator Piles on land

• The “HOLE”

• Statnamic Load Test
  – Similar to Static Load Test
  – Verify Capacity of Indicator Piles
Statnamic Load Test
Aesthetics

- Barrier Rail
- Pylons
- Bridge Lighting
Barrier Rail
Pylons
Bridge Lighting
Design Effort

Week #

# of FTE
Construction of US 90 Bridge

• Construction Schedule
  – 2 lanes open by May 16, 2007
  – Entire bridge open by November 30, 2007
  – EB lanes built first
Construction of New US 90 Bridge
Concrete Placement for Columns
September 2006
January 2007
February 2007
Questions ?