CORPUS CHRISTI HARBOR BRIDGE SHORT COURSE 2017
Overview, CDA Management, and Project Progress

October 11, 2017
Project Needs and Objectives
Project Needs

- **Long-Term Maintenance**
  - Existing steel bridge built in 1959 has high maintenance costs
  - Maintain long-term operation of a US 181 crossing of the Corpus Christi Ship Channel

- **Safety**
  - Eliminate risks caused by existing design deficiencies
  - Improve horizontal sharp curve
  - Vertical geometry steep grades
  - Add shoulders
Project Objectives

- Local Connectivity
- Economic Development Opportunities
Project Overview – Design Build (CDA)

- Design, construct, and maintain a total project length of 6.44 miles
- New location six-lane Harbor Bridge
- Multi-level interchange with intersection improvements
- Six-lane section of US 181
- Reconstruction on IH-37
- Reconstruction on SH 286
- Demolition of existing Harbor Bridge
- 25 year operation and maintenance
Operations & Maintenance (O&M)
Operations and Maintenance (O&M)

- O&M during construction
- 25-year maintenance (O&M) after substantial completion
- Developer responsible for all elements within ROW, except minor exclusions
  - Bridge
  - Drainage
  - Structural elements (Foundation, towers, cable stays)
  - Gantry-mounted overhead signs
  - Lighting
  - Roadways
  - Pavement, Joints in concrete, Curbs
  - Pavement Markings, Object Markers, Barrier Markers and Delineators
  - Fences, Sound walls and Abatement
  - Earthworks, Embankments and Cuttings
  - ITS Equipment
  - Handback requirements—Maintenance Transition Plan

Readiness requirements

- Baseline condition evaluation report
- Staffing and supervision organization
- Stakeholder communication
- Training
- Equipment
- Systems and materials
Developer
Flatiron/Dragados, LLC

- Equity Owner: Flatiron Constructors, Inc.
  Dragados USA, Inc.

Major Non-Equity members and other team members*:

- Figg Bridge Engineers, Inc.
- AIA Engineers, Inc.
- Iridium Concesiones de Infraestructuras, S.A. (through ACS Infrastructure Development)
- DBI Services, LLC
- Austin Bridge & Road, LP
- AZTEC Engineering Group, Inc.
- Beton Consulting Engineers, LLC
- Blanton & Associates, Inc.
- D.H. Griffin of Texas, Inc.
- IEA, Inc.

- Kellogg, Brown & Root Services, Inc.
- KCI Technologies, Inc.
- M2L Associates, Inc.
- PaveTex Engineering & Testing, Inc.
- Pinnacle Consulting Management Group, Inc.
- Professional Services, Inc.
- Randy Burkett Lighting Design, Inc.
- RJ Rivera Associates, Inc.
- The Boundary Layer Wind Tunnel Laboratory
- Ware & Associates, Inc.

*At time of award
Project Execution Timeline
<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue RFQ</td>
<td>March 26, 2014</td>
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<tr>
<td>CDA executed (Flatiron/Dragados USA, JV)</td>
<td>September 28, 2015</td>
</tr>
<tr>
<td>NTP 1 – Design</td>
<td>February 16, 2016</td>
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<tr>
<td>NTP 2 – Construction (Phase 1)</td>
<td>July 19, 2016</td>
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<td>Substantial Completion (Phase 1) – Anticipated</td>
<td>May 25, 2020</td>
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<tr>
<td>Substantial Completion (Phase 2) – Anticipated</td>
<td>June 14, 2021</td>
</tr>
<tr>
<td>Final Acceptance- Anticipated</td>
<td>October 12, 2021</td>
</tr>
<tr>
<td>O&amp;M Period</td>
<td>October 12, 2046</td>
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</tbody>
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Project Administration
US-181 Harbor Bridge Replacement Project
Project Controls
TxDOT Project Management System—Sharepoint® CM Platform

- TxDOT developed over last 8 years, collaborative, document storage, sustainability
  - Single resource for storage of all project communication
  - Automated workflow for processing submittals
  - All documentation time stamped when received and sent
  - Dashboard (below) provides each user a heads up display
Developer Internal Controls System—aconex
Developer Field Documentation—Fieldwire

- Developer document management tool for released for construction products
- Uploaded and instantly accessible by tablet, laptop, & phone

- Documentation shared with QA and Owner in real time
Non-Compliance Events
Non-Compliance Events

- General Background
- Noncompliance Events
  - During Construction
- Administrative tool
- Harbor Bridge is first TxDOT construction project application
- Past projects, O&M on Concessionaire Projects
Design Oversight
Initially formal review with comments and responses
Close out generally over-the-shoulder, with formal documented concurrence
Early Start of Construction

- A means to progress design work product in advance of final design package
- Early construction and long lead items, examples:
  - Drill shafts
  - Piles
  - Footings
  - Precast segments
  - Early traffic phases
- TxDOT has sole discretion to accept or disallow
- Contractor has greater freedom to advance work product
Certificate of Compliance

- Documentation that a complete design deliverable for a section of the project has been delivered
- A Final Design Package clearly delineated for a portion of work
- Must include:
  - Complete Design Drawings
  - Design Calculations
  - All Associated Design Reports
  - Comprehensive Specifications
  - Electronic Deliverable for Project Files
  - Acquisition of all ROW
  - Governmental Approvals
  - Utility Owner Approvals
- Accompanied by TxDOT written concurrence
- Developer is still at risk for design and construction
Public Information
Public Information Officer
Stakeholder Relations

Hillcrest/Washington-Coles Neighborhoods

North Beach Neighborhood
Traffic Advisories

- Posted on www.harborbridgeproject.com
- HBP social media sites
- Developer responsibility rather than TxDOT District

For Immediate Release
Friday, June 2, 2017
Contact: Lorette Williams, Public Information Coordinator (361) 446-9542 (mobile)

Lane closure affects West Causeway Blvd. (US 181 southbound frontage road)

Upcoming Harbor Bridge Project lane closure affects West Causeway Blvd. (US 181 southbound frontage road)

Traffic Advisory
June 21, 2017

Upcoming Harbor Bridge Project shoulder closures to affect West Causeway Boulevard (Joe Fulton Corridor)

CORPUS CHRISTI The northbound lanes of West Causeway Boulevard (Joe Fulton Corridor) will be affected by shoulder closures from June 23 through June 30 as part of the Harbor Bridge Project. The closures will be from 7 a.m. to 7 p.m. each day. All work is weather permitting.

WEST CAUSEWAY BOULEVARD (Joe Fulton Corridor)
The northbound lanes of West Causeway Boulevard (Joe Fulton Corridor) will have various shoulder closures between Burleson Street and Breakwater Avenue.

Motorists are urged to be aware of the lane closures, to consider using alternate routes, to follow all traffic control devices, and to slow down in the work zones.

For information about all current and upcoming lane closures related to the Harbor Bridge Project, visit www.harborbridgeproject.com.
US 181 Harbor Bridge

Unique Bridge Elements
Unique Project Elements

- Longest cable-stayed, concrete segmental bridge in the North America
- Completely spans the ship channel bank-to-bank
- Concrete structure with 170 year design life
- Support cables located down the middle
- LED lighting
- Shared use path with mid-span Belvedere
- Existing main span = 620’
- Existing vert. clearance = 138’
- Existing truss = 243’
- New main span = 1661’
- New clearance = 205’
- New tower height = 528’
Selected Main Span Unit
Sustainability
- Partnering with FHWA

- Platinum Rating during design and construction
  - Recycled materials, low emission equipment, warm-mix, etc.

- Platinum Rating during operation and maintenance
  - Renewable energy, low energy lighting, natural low maintenance vegetation, etc.
Aesthetic Components
Public Participation—Design Charette

- Public input provided on final aesthetic elements
- Post award
- To be used for final detail design

- Public votes on choices of refined concepts
North Plaza & Trailhead Concept

- NORTHBOUND FRONTAGE ROAD
- SOUTHBOUND FRONTAGE ROAD
- PARKING
- BRIDGE COLUMN
- BIKE RACK
- SHARED USE PATH TO BRIDGE
- NORTH ABUTMENT
- NORTHBOUND FRONTAGE ROAD
North Plaza & Trailhead Concept

NORTHBOUND FRONTAGE

TO BRIDGE

TO PARKING

RECYCLED CONCRETE LANDSCAPING UNDER BRIDGE
South Plaza Concept

- NORTHBOUND FRONTAGE ROAD
- PARKING
- SOUTHBOUND FRONTAGE ROAD
- NORTH ABUTMENT BRIDGE COLUMN
- BIKE RACK
- SHARED USE PATH TO BRIDGE
- BIKE RACK
- WATER FEATURE
- XERISCAPE
South Trailhead Concept
Shared Use Path
Belvedere
Shared Use Path & Belvedere
View from the Belvedere

USS LEXINGTON

TEXAS STATE AQUARIUM ART MUSEUM

AMERICAN BANK CENTER
Landscaping Design – Coastal Beauty
LED Lighting
Aesthetic Approach Substructure and Segmental Superstructure
View from Whataburger Field
Project Worksites

- Robstown (Precast Yard)
- North Port (Warehouse)
- Shoreline (Core Office)
- Flato Rd. (Concrete Batch Plant)
Robstown Casting Yard
Web and wing side forms mounted on frame with lateral and vertical adjustments

Match Cast Segment

Fixed Bulkhead

Core Form Carrier Beams

Folding Core Form
Mold Layout
Mold Layout
Rebar Jig
Rebar Cage, Placing into Formwork
Segment Production
Transporting Segment Within Casting Yard
Pile Driving

- 16” to 24” Piles in groups for most bridge structures other than main piers
Cofferdam Construction

- Required for footings placed below water table
- Utilizing driven sheet piling
Main Pier Drilled Shafts and Foundations

Drilled shafts (each)
- 650 CY per shaft
- 10-foot diameter,
- 210-foot deep drilled shafts

Tower foundation (each):
- 132’ x 72’ x 18’
- 6400 CY
- Size of 2 basketball courts
Drilled Shaft Installation
Ultimate Goal!

Hint: Go to the video...