Possum Kingdom Lake
Morris Sheppard Dam
Concrete Assessment

Presented by
Michael McClendon
Upper Basin Regional Manager
&
Mark Stendahl
Engineering Services Manager

Meeting Date: April 25, 2016
Mass Concrete Elements (downstream view)

- Flood gates
- Intake structure
- Buttresses (typical)
- Downstream deck panels
- Power house
Mass Concrete Elements (upstream view)
Morris Sheppard Dam History

- Constructed: 1938 to 1941
- Service Life to Date: 75 Years
- Movement Detected: 1987
- Correction Completed: 1994
  - Relief Wells Installed
  - Ballast Blocks Added
  - Selected Cracks Repaired
  - Stilling Basin Extended
  - Foundation Monitoring Increased
Bay 22 – Downstream Deck Panel with Spalling and Rebar Corrosion
- upstream deck panels
- crack and spall on corbel
- buttresses
Buttress 28 – Close-up of Crack and Spall at Corbel

spall area: 4 x 6 feet; 4 to 9 inches deep
Buttress 28 – Removal of Deteriorated Concrete

Removal of deteriorated concrete

New rebar & zinc anodes

Meeting Date: April 25, 2016
Buttress 28 Repair

Grout pour from man lift

Forms and bracing
Concrete Assessment Program

Actions to Date:
• Hired Peer Review Consultants
• Developed RFP/Reviewed submittals/conducted interviews
• Recommended Wiss, Janney, Elstner Associates as Program Manager
• Negotiated Scope of Work and Not-to-Exceed Fee

Next Steps/Project Schedule:
• Contract with Program Manager (May 2016)
• Perform Assessment/Report Findings (May 2016 – March 2018)
• Contract for Repair Options/Design (TBD)
• Contract for Construction, if necessary (TBD)
Brazos River Authority

Peer Review Experts

CAASLE Program Manager

Three-Dimensional Lidar Surveying
Concrete Defects Database
Reinforced Concrete Condition Survey
Probable Failure Modes Analysis
Failure Consequence Analysis
Risk Reduction Analysis

Structural Assessment
Seismic Assessment
**Program Manager Deliverables**

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Develop a concrete defects database</td>
<td>$ 205,800</td>
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<tr>
<td>Perform destructive and non-destructive testing</td>
<td>$ 1,008,200</td>
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<tr>
<td>Determine the causes of concrete deterioration</td>
<td>$ 655,800</td>
</tr>
<tr>
<td>Develop 3-D structural model</td>
<td>$ 203,700</td>
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<td>Provide repair recommendations based on risk assessment and priority</td>
<td>$ 431,900</td>
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<tr>
<td>Develop implementation plan, budget and schedule</td>
<td>$ 160,900</td>
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<tr>
<td>Provisional testing and modeling</td>
<td>$ 219,600</td>
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<tr>
<td><strong>Budget</strong></td>
<td><strong>$ 2,885,900</strong></td>
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Project Objectives

• Remedial Action Road Map
  – Program Manager develops options
  – Authority selects best option for BRA
  – Program Manager develops an implementation plan, budget and schedule for selected option
  – BRA adopts implementation plan
The following resolution is presented for consideration to the Board of Directors of the Brazos River Authority for adoption at its January 25, 2016 April 25, 2016 meeting:

“BE IT RESOLVED that the Board of Directors of the Brazos River Authority hereby authorizes the General Manager/CEO to negotiate and execute a contract with Wiss, Janney, Elstner Associates Inc. to perform a comprehensive concrete assessment and service life recommendation study for Morris Sheppard Dam in an amount not to exceed of $2,885,900.”