Bridge Condition Surveys

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Bridge Division
Construction and Maintenance
“Modification of bridge projects funded by any category may occur only after an analysis of the following:”

- An appraisal of the structural adequacy and condition of the existing structure
- An economic study of replacement versus modification
- A study of the method and handling of traffic during construction
Appraisal of Structural Adequacy

- Load rate existing structure
  - Load rating spreadsheet handles most structure types
  - BAR7 (Bridge Analysis and Rating) for most other structure types
  - Other (we find Risa to work well)

- Minimum HS24 Operating Rating
  - Always Rate Superstructure
  - Rate Substructure if have reason to (distress or non-typical design)
  - Rate Deck in unique situations
Culvert Condition Survey

- **Review NBI Reports**
  - Load rate only if condition show overstressed condition
  - Decide whether or not field inspection required based on review

- **Email (internal) to Indicate Adequacy to Widen**
  - Email from PE to Project Development
  - Summarize reported condition
  - Make recommendations for rehabilitation
    - District personnel will need to determine quantities for repair Items

- **Simple report (external) to Indicate Adequacy to Widen**
  - Method of assessment
  - Recommendations
Bridge Condition Survey

- Inspect Bridge
  - Review NBI Reports at a Minimum
  - Visit Site

- Prepare Report
  - Detail condition of components
  - Make recommendation of suitability for widening/rehabilitation
  - Make recommendations for rehabilitation if applicable
  - Provide cost estimate for rehabilitation if applicable
Bridge Inspection

- NBI Folder Review - AssetWise
- Determine Access Needs
  - Snooper?
  - Boat?
  - GoPro Camera with 20’ Extension Pole
  - Traffic Control (For deck inspection and access needs)
- Type of Inspection
  - Predominantly Visual
  - Hammer Sounding (usually limited)
  - Concrete Sampling (if chlorides suspected-CST/M&P))
  - Paint Samples (prefer for CST/M&P or Consultant to take sample)
Points of Inspection

- Overall Condition (Big Picture)
- Channel/Scour
- Abutments
- Interior Bents
- Superstructure
- Deck
- Approach Slab
- Joints
- Railing (Type, Height, Condition)
- Drains
- Utilities
- Environmental (ie. Nesting Swallows)
Points of Inspection

- Overall Condition (Big Picture)
  - Settlement
  - Alignment
  - Any Structure Modification
Points of Inspection

- **Abutments**
  - Bridge Squeeze (Bkwl Rotation, Wingwall Cracking)
  - Embankment Settlement
  - Bearings
  - Riprap
  - Retaining Walls
Points of Inspection

- **Interior Bents**
  - Stress Cracks Cap
  - Spalls/Delaminations (chloride testing?) (over estimate quantity)
  - Transverse Column Cracking (Bridge Squeeze)
Points of Inspection

- **Superstructure**
  - Girder Condition
  - Bearing Condition
    - Early Elastomeric Pad Design
    - Deteriorated Pads
  - Paint Condition
    - Repaint?
      - Consider Environment
      - Aesthetics
    - Zone paint?
    - Spot paint?
Points of Inspection

- Deck
  - Cracking (map/intersecting)
  - Discoloration/Staining/Efflorescence
  - Surface Condition/Spalling/Delamination
  - Asphalt Overlay Thickness and Condition
Points of Inspection

- **Approach Slab**
  - Is one present?
  - Condition
  - Joint at bridge
  - Joint at end – Is concrete pavement present
Points of Inspection

- Joints
  - Type
  - Condition – Listen from below (banging sound)
  - Seals – Visual and look for staining
  - Debris – Note presence of debris
Points of Inspection

- **Railing**
  - Type – Was it retrofitted?
  - Height
  - Transition
  - Condition
  - Damaged
Other Issues of Interest

- **Railroad Tracks**
  - Location
  - Embankments

- **Utilities**
  - Type
  - Location

- **Environmental**
  - Nesting Swallows
  - Human Presence

- **Time of Inspection and weather conditions**
Report

- Load Rating
- Description of Structure
- Findings
  - Assessment of condition of each component
  - Applicable quantity estimates for repair
- Recommendations
- Cost estimate for rehabilitation
## Rehabilitation Cost Estimate

<table>
<thead>
<tr>
<th>LIST NO.</th>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QTY</th>
<th>UNIT</th>
<th>COST/UNIT</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0446 6028</td>
<td>SPOT CLEAN &amp; PAINT EXIST STR (SPL PROT SYS)</td>
<td>LS</td>
<td>1</td>
<td>$150,000</td>
<td>$150,000</td>
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<tr>
<td>2</td>
<td>0496 2013</td>
<td>REMOVE STR (BRIDGE SLAB)</td>
<td>1</td>
<td>EA</td>
<td>$60,000</td>
<td>$60,000</td>
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<tr>
<td>3</td>
<td>0422 2001</td>
<td>REINF CONC SLAB</td>
<td>4,370</td>
<td>SF</td>
<td>$25</td>
<td>$109,250</td>
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<tr>
<td>4</td>
<td>0450 6004</td>
<td>RAIL (TY T221)</td>
<td>280</td>
<td>LF</td>
<td>$100.00</td>
<td>$28,000</td>
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<tr>
<td>5</td>
<td>0499 6001</td>
<td>ADJUST STEEL SHOES</td>
<td>8</td>
<td>EA</td>
<td>$5,000</td>
<td>$40,000</td>
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<tr>
<td>6</td>
<td></td>
<td>Bridge Widening, 16' wide and 140' long</td>
<td>2,240</td>
<td>SF</td>
<td>$100</td>
<td>$222,400</td>
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</tbody>
</table>

**TOTAL ESTIMATED COST FOR BRIDGE REHABILITATION AND WIDENING: $609,650**

Not including Traffic Control, Mobilization, and Other Incidentals
Request Bridge Division perform Condition Survey

TxDOT

- Submit request for condition survey to Project Management Engineer
- Please allow minimum 4 months to complete
- Provide someone to accompany BRG Staff
- Provide traffic control for deck inspection and potential snooper truck access

Consultants

- Discuss during procurement about work authorization for bridge condition survey.
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ZERO

Questions

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