Lake Junaluska Dam
Bridge Condition Assessment

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History

- **1913:** Original timber-framed bridge completed
- **1920:** Timber replaced with steel and concrete after inspection by original design engineer J.W. Seaver
- **1976:** Large-scale repair of dam, including repair of concrete bridge abutments and the asphalt deck.
- **1990:** Addition of supplemental beams at 3 spans where severe corrosion was observed.

Summary of Work

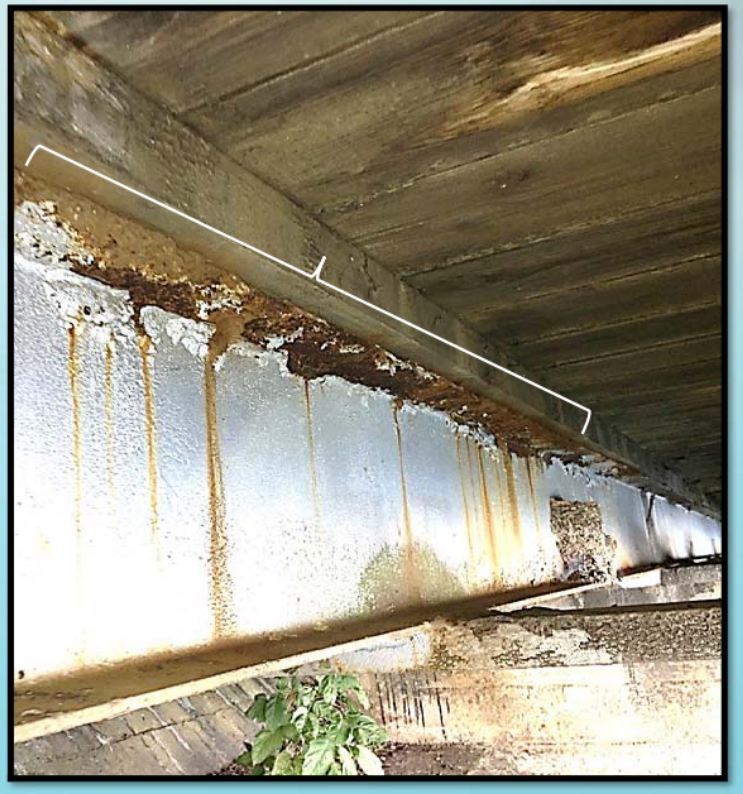
- Visual Condition Assessment
- Engineering Response
- Additional Study
- Evaluation of Cost Impacts of Repair

Intermediate Concrete Bridge Abutments

Bridge Girder to Deck Connections

Corrosion of Bridge Girders

Corrosion of Bridge Girders



Degradation of Concrete at Bearing Locations

Degradation of Concrete Supports

Engineering Response

- Advised Closing the Bridge to Vehicle Traffic
- Recommended Additional Study
- Evaluate Options and Costs

Additional Study

- Inventory the structural steel beams
  - 56 Beams (roughly 36%) require replacement for full repair
- Evaluate the structural integrity of the concrete bridge abutments
  - Average concrete compressive strength approximately 2,100 psi
  - Unknowns below the water surface
- Maintenance Access to the west-end portion


Maintenance Access

Option A

A. Restore Bridge for Both **Vehicular and Pedestrian** Use

a) Remove and replace defective steel beams
b) Repair and refurbish remaining steel beams
c) Remove and replace the roadway and walkway decking
d) Remove and replace the guardrail
e) Unknown – replace or re-use the concrete bridge supports

$1.39 to $1.76 M

(Est. total repair costs)

Option B

B. Restore Current Vehicular Bridge for **Pedestrian Use**

a) Remove existing pedestrian walkway and guardrails
b) Repair and refurbish existing steel beams
c) Remove and replace the main decking for pedestrian-only access
d) Replace the guardrail
e) Restore west-end for maintenance access

$746,000

(Est. total repair costs)

Option C

C. Preserve and Repair Current **Pedestrian** Bridge

a) Remove existing pedestrian walkway and guardrails
b) Repair and refurbish existing steel beams
c) Remove and replace the pedestrian bridge decking
d) Replace the guardrail
e) Restore west-end for maintenance acc

$586,000

(Est. total repair costs)

Option D

D. Close the Bridge to Both Vehicular and Pedestrian Traffic

a) Permanently close pedestrian walkway
b) Permanently close vehicular bridge
c) Restore west-end for maintenance acc 

$290,000

(Est. total repair costs)

Cost Estimate Summary