National Capital Planning Commission

NCPC File #7547:

Arlington Memorial Bridge Rehabilitation

Southwest, Washington, DC

Submitted by the National Park Service

Concept Review

May 5, 2016

Project Information

Commission meeting date: May 5, 2016

NCPC review authority: Approval – Federal project in the District of Columbia

Applicant request: Approval of Comments on Concept Design

Delegated / consent / open / executive session: Open

NCPC Review Officer: M. Flis

NCPC File number: 7547

Project summary:

The National Park Service (Department of the Interior) has submitted plans for the rehabilitation of the Arlington Memorial Bridge for concept review. The bridge was designed by the architectural firm McKim, Mead, and White, and opened in 1932. The bridge's draw span closed to operation in 1961.

The proposed Arlington Memorial Bridge project includes the rehabilitation or replacement of the steel bascule space; repairs to the deteriorated portions of the abutments, piers, and concrete arch approach spans; replacement of the concrete bridge deck; resurfacing of the travel lanes; replacement of the concrete sidewalks and refitting of granite curbs; repairs to granite bridge railings; repairs to lamp posts; repairs to access panels; installation of an improved drainage system; and other minor nonstructural bridge improvements.

The Federal Highway Administration regularly inspects the bridge in accordance with generally recognized structural engineering guidelines and standards. These detailed structural inspections and studies have identified significant amounts of corroded steel and deteriorated concrete. The most critical elements needing repair are the concrete arch approach spans and the steel bascule (drawbridge) span. Therefore, the project is needed to address the ongoing corrosion of steel structural members of the bascule span, deterioration of the concrete on the bridge's approach spans, and deterioration of the sidewalks and wearing surface.

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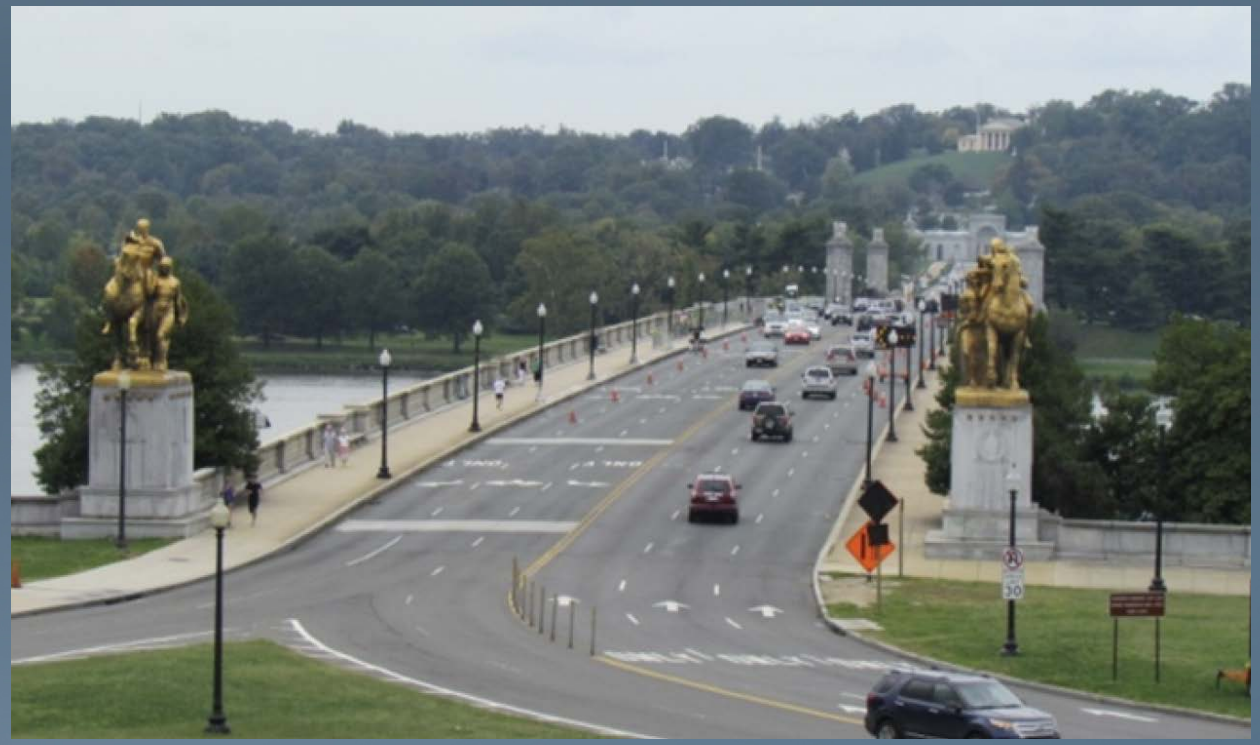
Project Location

Existing Conditions



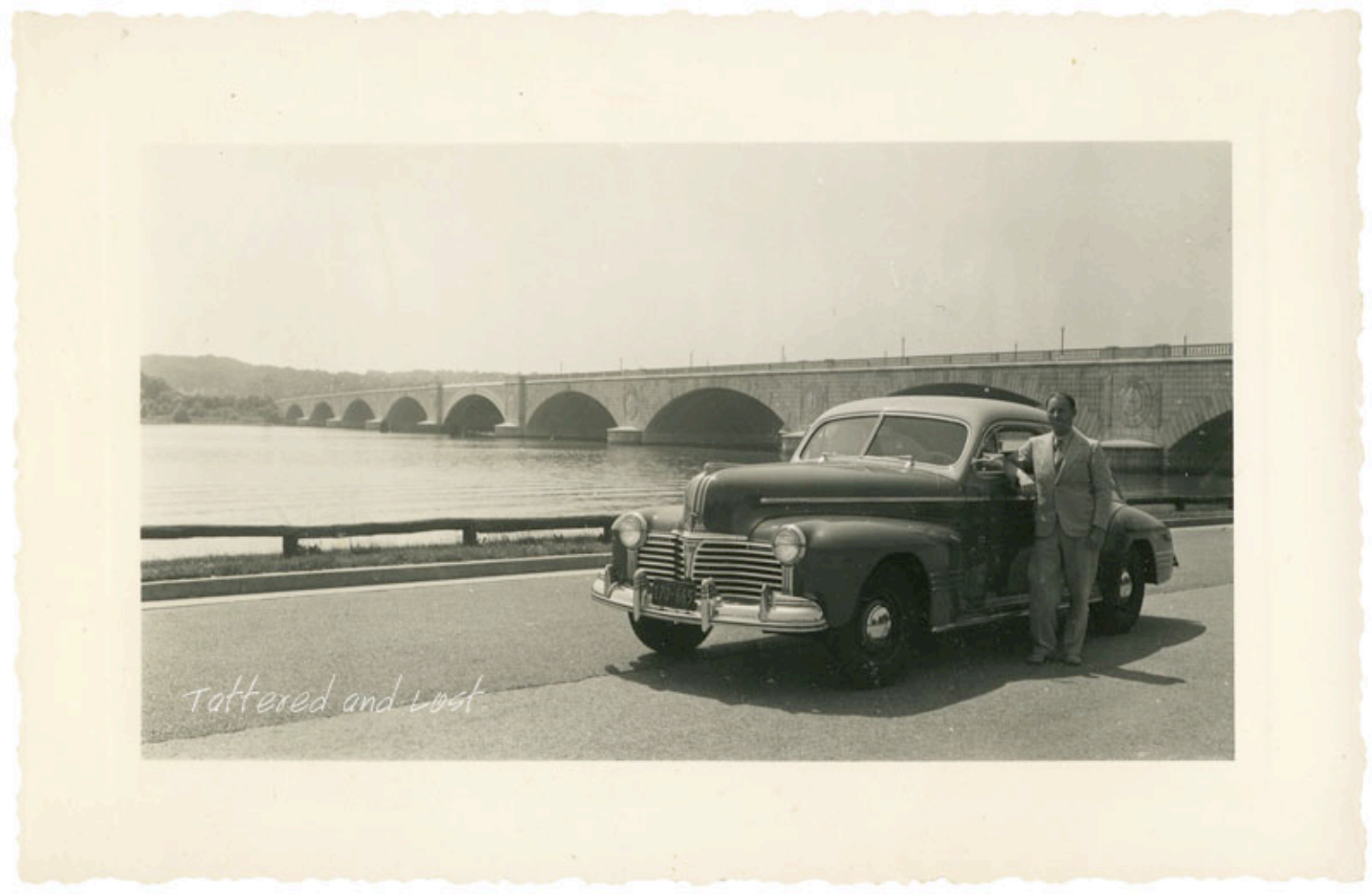
View from Lincoln Memorial

View from Potomac River

Several important roles:

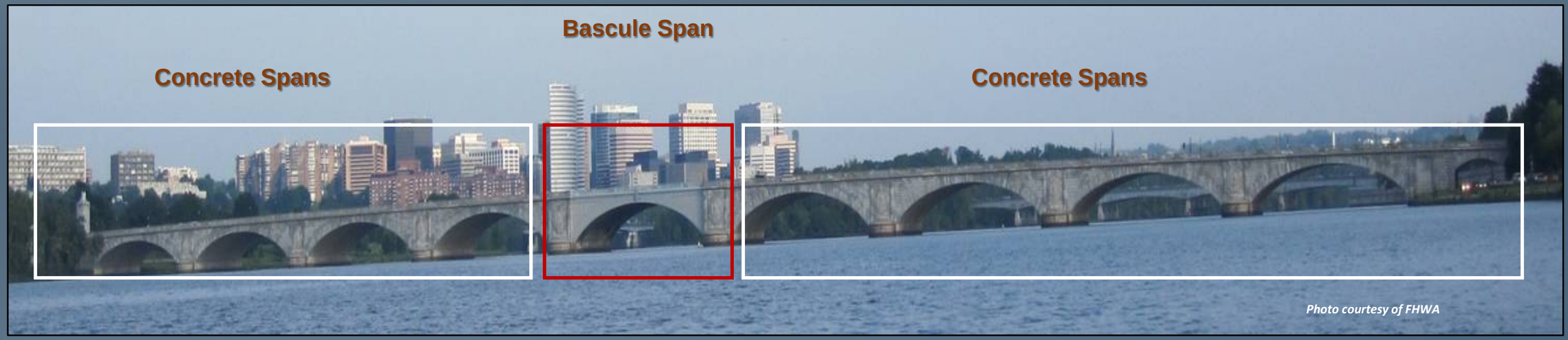
- It serves as a significant vehicle, bicycle, and pedestrian route for commuters, visitors and dignitaries on a daily basis;
- It is part of the National Highway System, carrying more than 68,000 vehicles each day, in addition to thousands of bicyclists and pedestrians; and
- The Memorial Bridge is a vital route identified in the Washington, DC emergency evacuation plan.
- It is one of only five bridges connecting Virginia and the District of Columbia across the Potomac River;
- Symbolic entrance to the Capital and the National Mall; link in series of monuments and civic structures starting with the United States Capitol and extending to Arlington Memorial Cemetery
- Listed on the National Historic Register – example of neoclassical urban design, sculpture, engineering and design

Bridge History



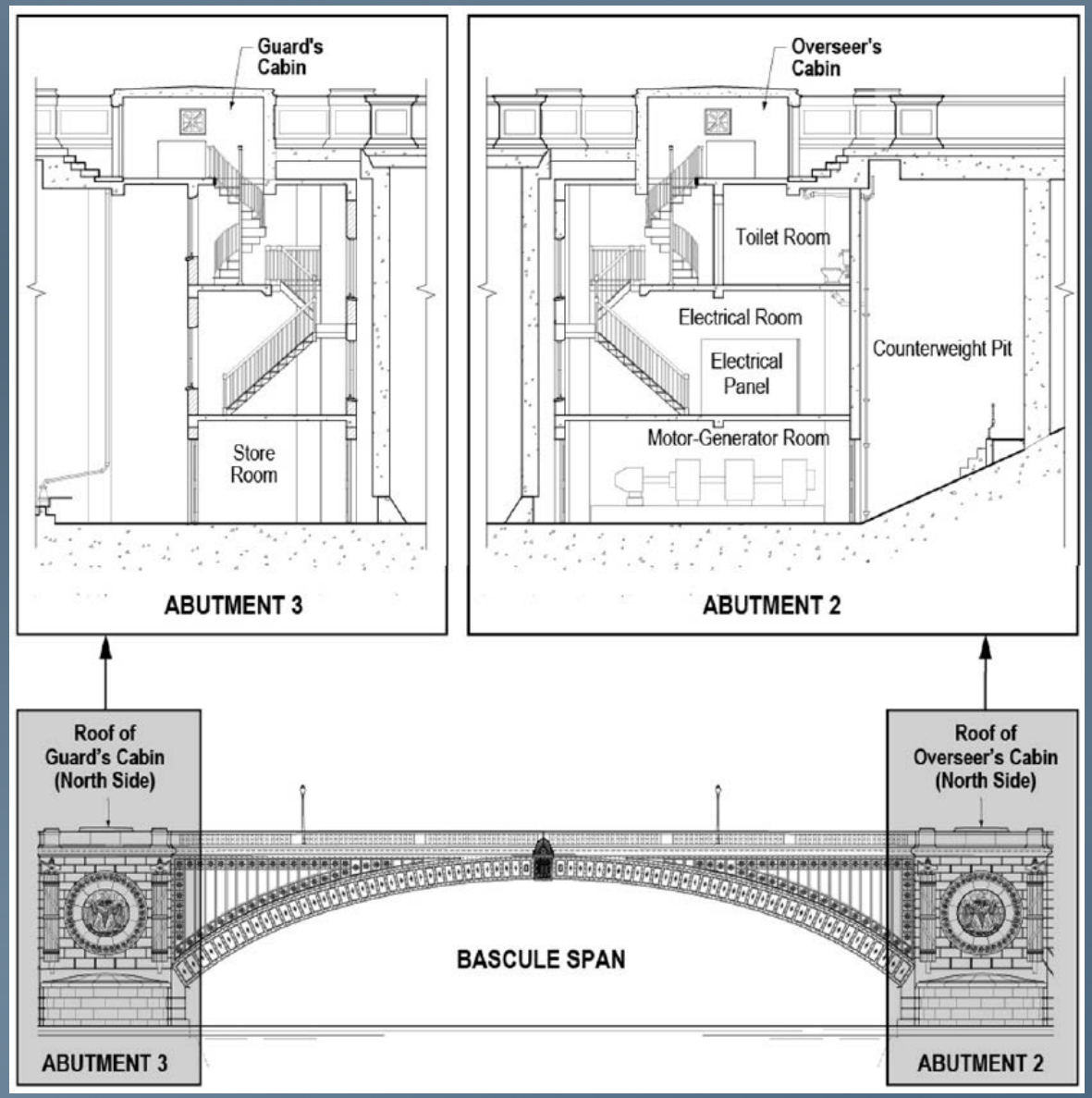
- A bridge in this location was first proposed in the 1830s
- McMillan Commission ultimately developed the Senate Park Commission Plan of 1901 and included a memorial bridge in the location that the Arlington Memorial Bridge was ultimately constructed
- Architects McKim, Mead & White were selected in early 1923
- Bridge completed in 1932
- Symbolically links North and South in its alignment between the Lincoln Memorial and Arlington House, the Robert E. Lee Memorial
- Placed on the National Register of Historic Places in 1980

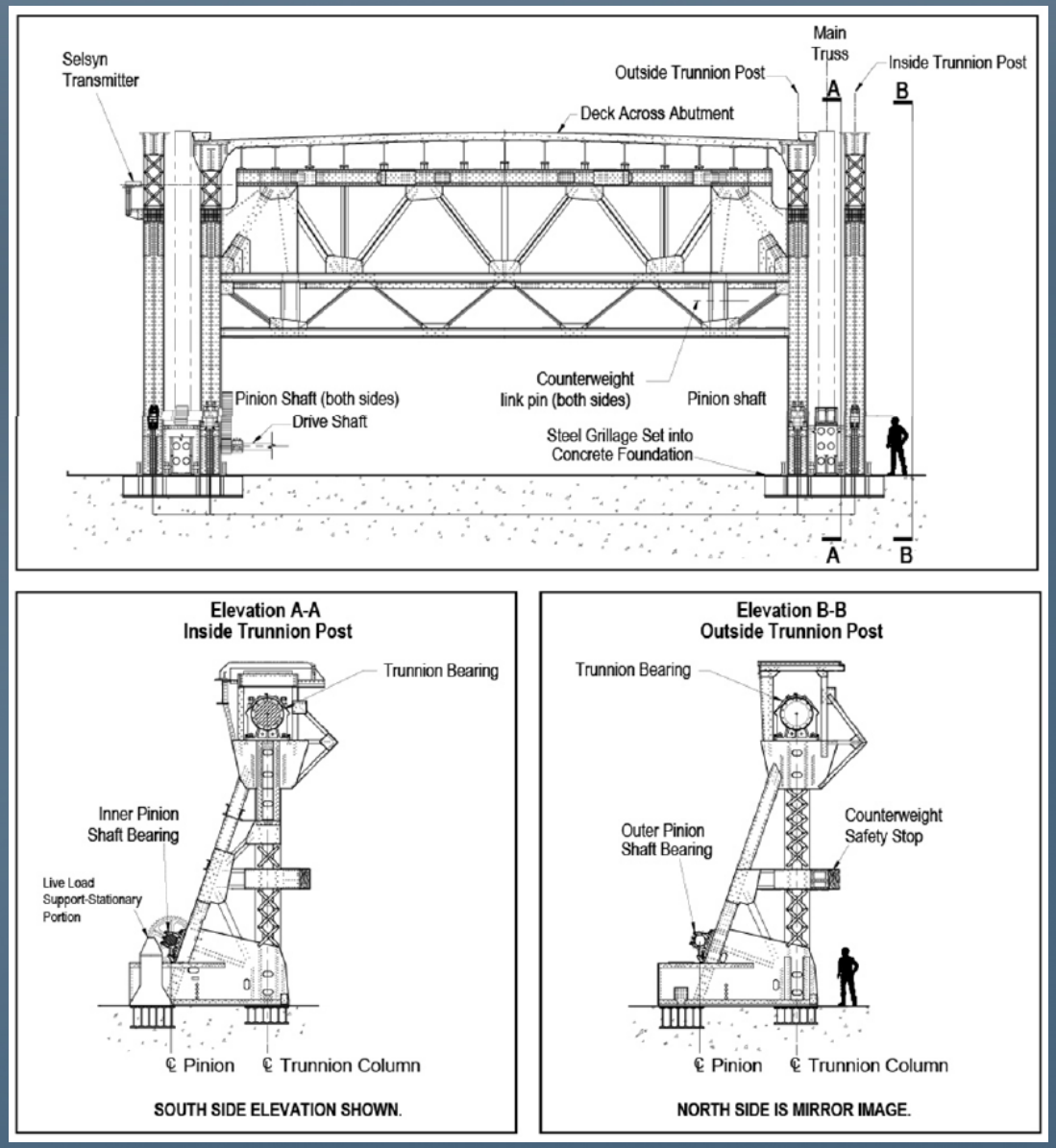
Bridge Elements



- Bridge is 2,163 feet long and 94 feet wide;
- Consists of ten reinforced concrete arch approach spans and a double leaf bascule span at the bridge's center. Eight of the 10 approach spans convey the Potomac River under the bridge; and
- Two smaller concrete arches span the GWMP and Ohio Drive, SW at each end of the bridge.

Bridge Elements





Bridge Elements

- The bridge has sidewalks on each side measuring 14 feet each
- The roadway and sidewalks are illuminated at night by 40 electric street lamps, four on each river span and two on each roadway span.
- Roadway measures 60 feet from curb to curb, providing six 10-foot-wide vehicle travel lanes
- Carries more than 68,000 vehicles each day

Current Conditions & Challenges

Elements Common to All Alternatives

- Repair of Bridge Piers, Foundations, and Bearings
- Repair of Concrete Arch Spans
- Restore and reinstall metal facia
- Replacement of Bridge Deck and Expansion Joints
- Replacement of Sidewalks and Repair of Curbs
- Repair of Non-Structural Elements such as balustrades
- Stone will be repointed and cleaned; replaced if required

Existing Conditions

Existing Conditions

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Alternative 1A – Replace Bascule Span with Concrete Beams

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Alternative 1B – Replace Bascule Span with Variable Depth Girders

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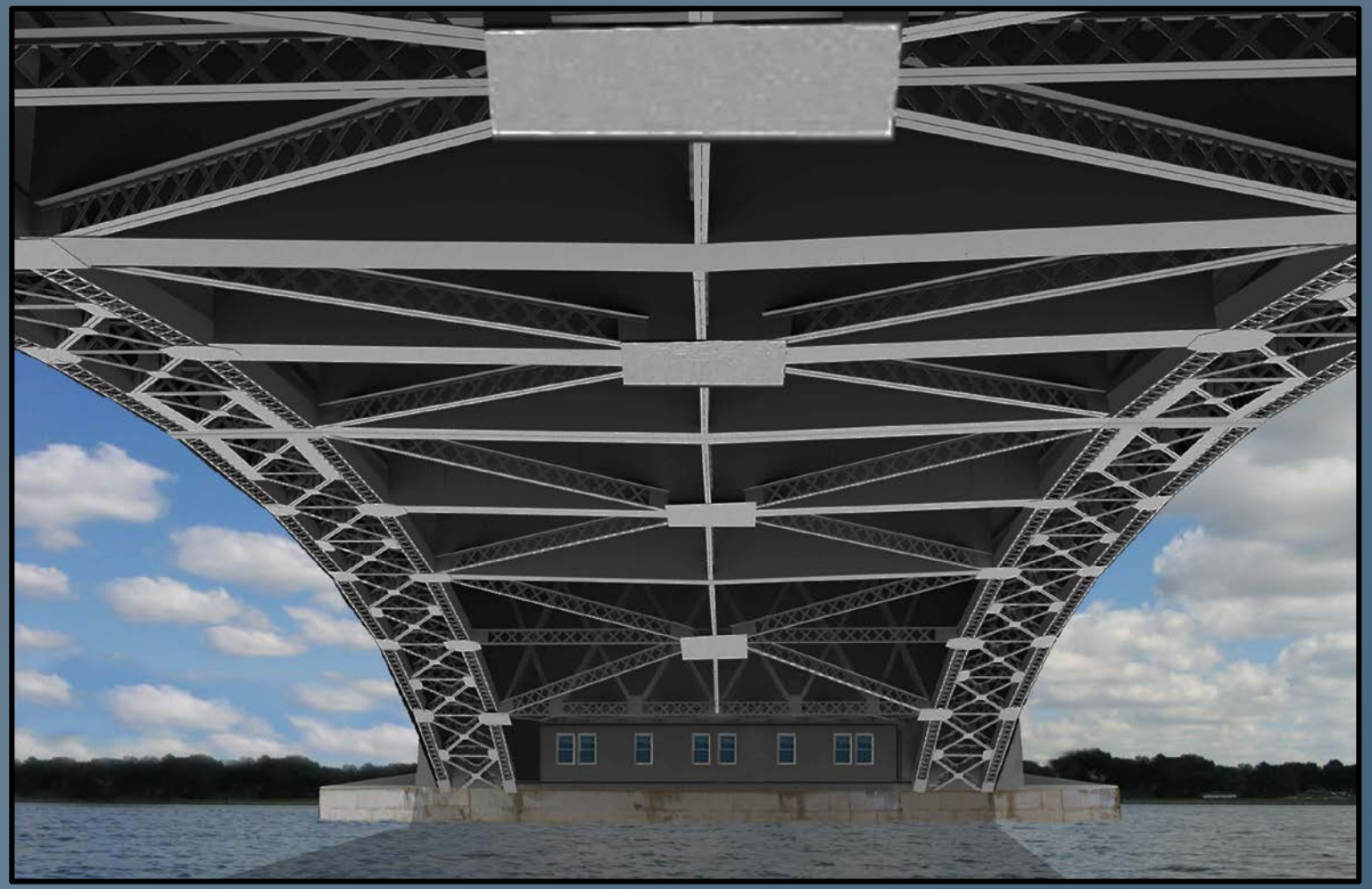
Alternative 2 – Replace Bascule Span with Fixed Steel Truss



Alternative 3 – Rehabilitate Existing Bascule Span

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Alternative 1B – NPS Preferred Alternative

Alternatives Comparison

- 1A – Replace Bascule Span with Concrete Beams
  - Substantially different visually; different material
  - Allows for partial or full bridge closures

- 1B – Replace Bascule Span with Variable Depth Girders (Preferred)
  - Some visual similarity to existing bridge
  - Simpler maintenance (fewer elements)
  - Lower construction and maintenance costs than #3
  - Allows for partial or full bridge closures
  - Trunnion posts/counterweight removed

- 2 – Replace Bascule Span with Fixed Steel Truss
  - Visually similar to existing bridge
  - Numerous small elements create same maintenance challenges as current bridge
  - Requires full closure

- 3 – Rehabilitate Existing Bascule Span (Previously Preferred)
  - Would visual recreate existing design
  - Requires full closure
  - Higher construction and maintenance costs than #1B
  - Trunnion post repaired, but full replacement possible

Alternative 1B – NPS Preferred Alternative

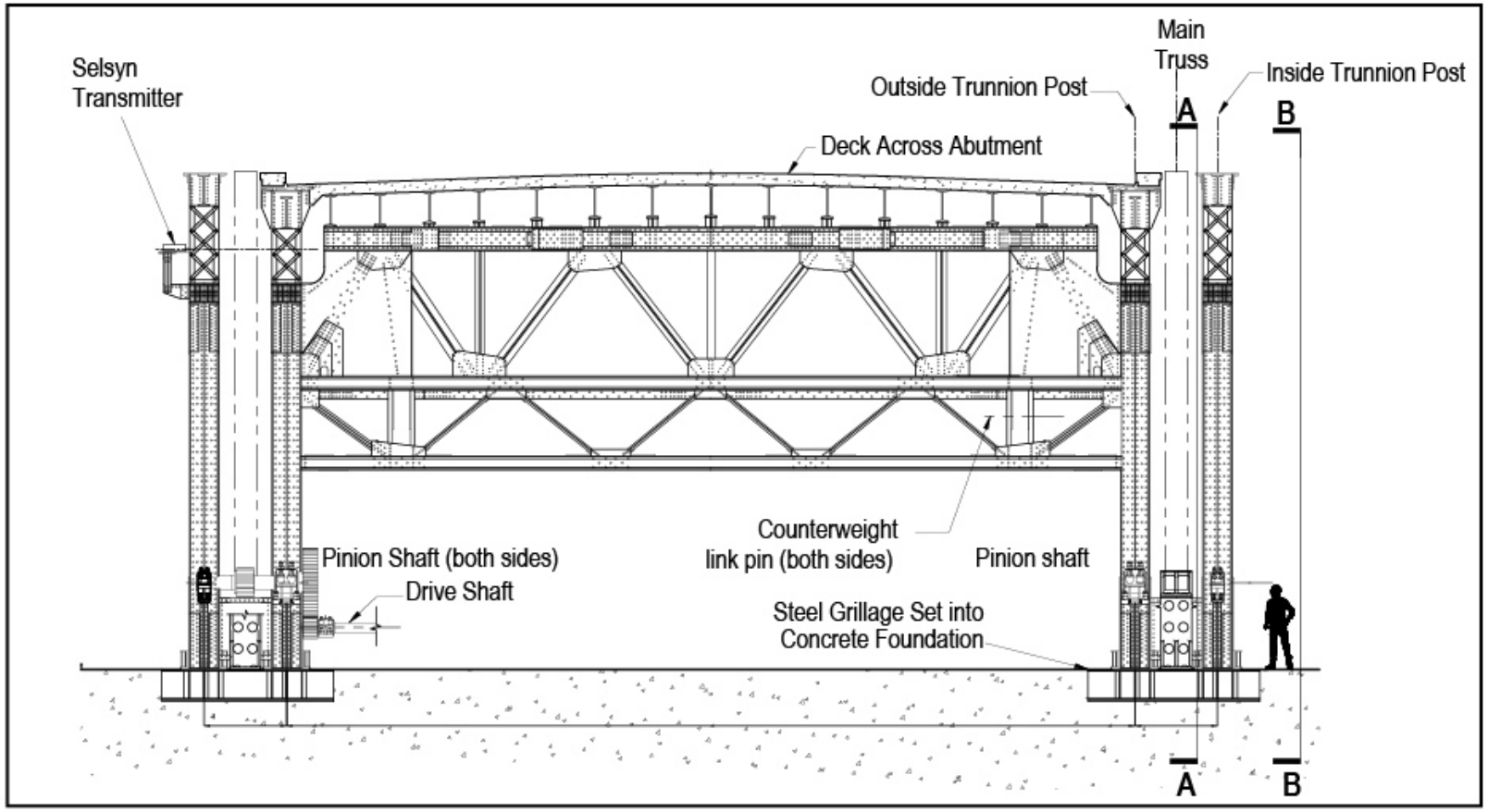
Character Defining Features Retained in Alternative 1B

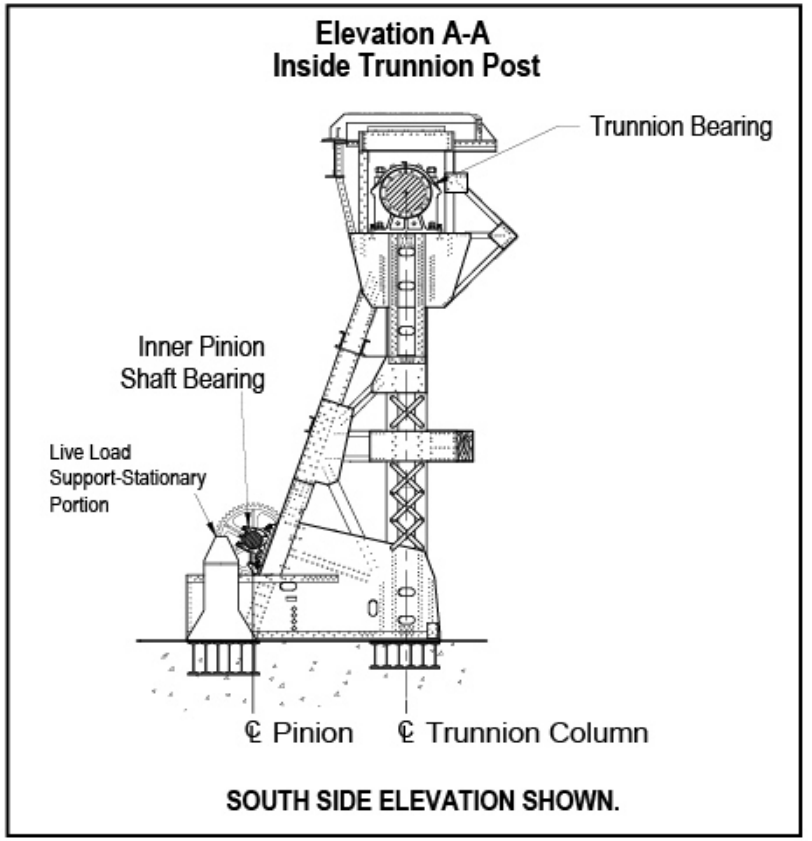
Guard and Overseer Cabins, Store Room, Operators Room, Mechanical Room

Alternative 1B – NPS Preferred Alternative

Character Defining Features Removed

Steel Trusses, Bascule leaves, Counterweights, Trunnion Posts, Drive Shafts





Source: NPS

Identification of Preferred Alternative

Existing Bascule Span

NPS Preferred Alternative