



PROJECT PROFILE

Wabash Memorial Bridge

Structural Survey, Analysis, and Repair Recommendations | Mount Vernon, IN



CLIENT

Indiana Department of Transportation (INDOT), Vincennes District

BACKGROUND

Built in 1956, the one-mile-long Wabash Memorial Bridge is a two-lane structure crossing the Wabash River between Indiana and Illinois. Its main structure is a three-span, tied arch through-truss bridge flanked by six plate girder approach spans on each side. The remaining structure is a multiple-span, conventional steel bridge over a floodplain. This structure has thirty-six spans of wide flange girder superstructure set on hammerhead piers, which constitute over one-half the bridge length.

WJE was retained to perform a baseline condition survey of the structure and to make long-term maintenance recommendations. Because of the bridge's proximity to the New Madrid fault zone, seismic vulnerability for this important river crossing link was also of concern to INDOT.



SOLUTION

WJE's field investigation assessed the existing systems and included a fracture-critical inspection of the upper steel truss members, floor beams, and stringers; and a condition survey of the concrete, deck, steel girders, diaphragms, bearings, and piers. Select concrete cores were removed for laboratory study and petrographic examination. WJE performed a delamination survey of the entire bridge deck and evaluated the overcoat paint system. Gravity, fatigue, scout, and seismic structural analyses were conducted on various elements, and load tests were used to assess actual stress ranges in Category C and E fatigue details.

Onsite inspection and laboratory analysis identified causes of distress and led to effective repair recommendation strategies. WJE presented the following recommendations to extend the bridge's service life:

- Address existing concrete deterioration on piers
- Plan for ongoing monitoring of fit-up tack welds and other fracture critical details
- Options for seismic retrofit and deck replacement
- Strategies for coating maintenance and repainting
- Development of Inspection and Maintenance Manual for INDOT