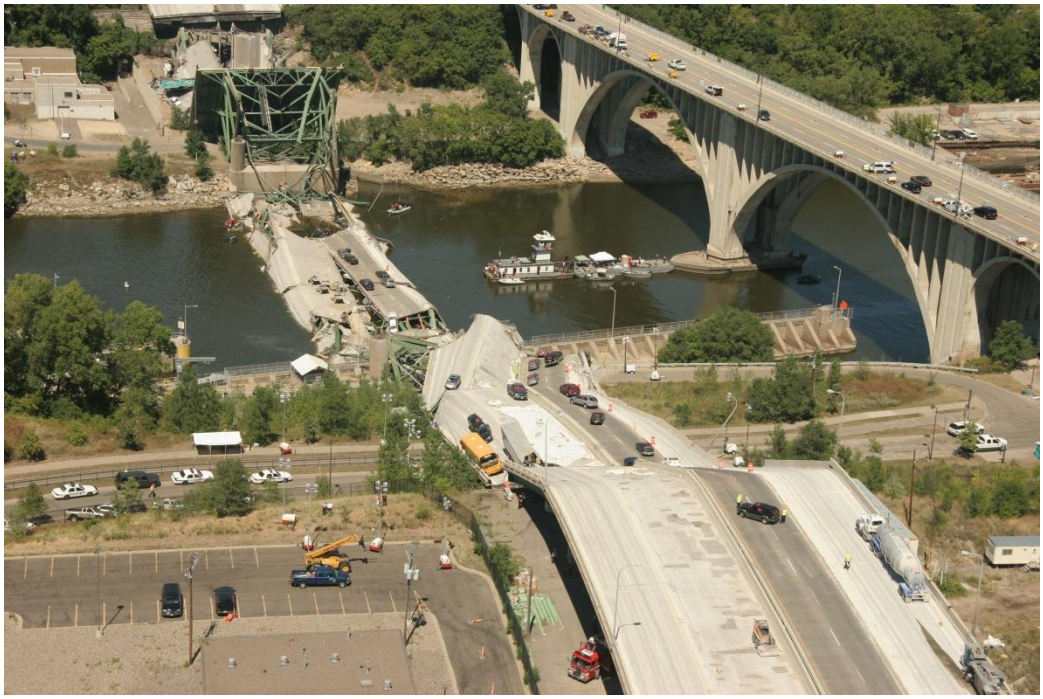
PROJECT PROFILE

I-35W Mississippi River Bridge

Structural Investigation and Collapse Investigation | Minneapolis, MN



WJE led an independent investigation into the collapse of the 1,907-foot-long interstate bridge. Together with the National Transportation Safety Board (NTSB), WJE carefully documented the 1,064-foot-long deck truss, assisted the demolition contractor during removal operations, and oversaw the reconfiguration of portions of the truss in laydown areas.

CLIENT

Minnesota Department of Transportation

BACKGROUND

The I-35W Mississippi River Bridge is an eight-lane steel truss arch bridge that carries Interstate 35W across the Mississippi River in Minneapolis, Minnesota. The bridge contains multi-girder continuous approach spans on both the north and south ends. Completed in 1967, it was one of the busiest bridges in the state, carrying over 140,000 vehicles daily. The bridge catastrophically failed during the evening rush hour on August 1, 2007, collapsing into the river and riverbanks below. As a result, thirteen people were killed and over a hundred were injured.

SOLUTION

WJE engineers worked with the NTSB and the Federal Highway Administration (FHWA) as MnDOT's representative to perform a detailed post-collapse inspection and failure investigation. WJE developed a member identification and marking plan and thoroughly documented removal operations to maintain their integrity for further examination. The team installed monitoring instrumentation to warn of debris movement, developed a laydown area, and assisted the demolition contractor with reconfiguring trusses for additional inspection. WJE also worked with MnDOT surveyors to locate a debris pile using laser scanning equipment.

WJE engineers inspected all tension members for evidence of fatigue cracking and removed concrete cores from the deck and piers to determine concrete properties and deck weights. The engineers developed a detailed finite element model of truss connection to evaluate possible failure scenarios but ultimately determined that the failure was precipitated by the failure of gusset plates connecting the web members to the chord members at one of the nodes of the deck truss.

WJE | ENGINEERS ARCHITECTS MATERIALS SCIENTISTS