

Lifting A 60 Year Old Bridge While Traffic Flows Above



Aerial view of the Beardstown truss bridges

For the past 60 years, the Beardstown Bridge has carried a steady stream of traffic across the Illinois River in Beardstown, IL. But six decades of rain, road salt and heavy traffic have taken their toll on the steel truss bridge.

A recent inspection discovered that the rocker bearings, those structural elements that let the steel structure expand and contract with the temperature, had seized. In cold weather, as the truss bridge tried to thermally contract, the built up stress was causing fractures in steel beams, connections and gussets. A more detailed examination turned up significant deterioration from corrosion in the beams and other vital connections.

That the bearings had to be replaced was clear. What was less clear was how to lift the ends of a rusting, 2,100-foot long truss bridge, repair the corroded steel, and install new bearings — all while allowing traffic to continue flowing.

After examining numerous approaches, the engineers of WHKS developed a complex solution. Powerful jacks were inserted under the bridge structure and were set on sliding surfaces to allow thermal expansion of approximately two inches. A complex strengthening system was designed and bolted to the existing structure to ensure the hundreds of tons could be lifted straight up without any tipping or twisting. Bolting the new strengthening system to the seriously corroded bridge and jacking the structure proved challenging and the structural team had to remain in contact with the bridge contractor continuously to modify and fine-tune the calculations and details.

They say that rust never sleeps and the 60-year-old Beardstown Bridge is scheduled for replacement in the coming years. In the meantime, the creative work of WHKS engineers has given the venerable structure a new lease on life and made it safe again.



Jacking system under the end floorbeams



Floorbeam and truss strengthening system