



**By Daniel Snyder** Contributing Author

## Website addresses bridge site

lowa county uses Internet tool to fix deteriorating span

he Jesup South Bridge in Buchanan County, Iowa, is located on one of the busiest roads in the county.

Constructed in 1947, the old bridge had a sufficiency rating of less than 50. It was narrow and not built to handle the loads it faced in recent years.

As part of the V-65 Jesup South Bridge eSPAN140 Demonstration Project, Buchanan County engineers replaced the existing 22-ft-wide bridge with a modern 40-ft-wide bridge using galvanized-steel rolled beams and galvanized rebar. The demonstration project was a collaborative effort between Buchanan County and the Short Span Steel Bridge Alliance (SSSBA) (www.shortspansteelbridges.org) to demonstrate the benefits of the free, web-based design tool eSPAN140 (www.espan140.com) and the applicability of accelerated design and fabrication practices, including standardized designs with simplified beam selections, cost-effective stiffener and diaphragm options, and bearing details. Nucor-Yamato Steel supplied rolled beams for the girders. Skyline Steel provided H-piles for the integral abutment system. And Azz Galvanizing Services volunteered to galvanize the rolled beams and rebar. BlueArc Stud Welding, D-MAC Industries, Gerdau-Memphis Reinforcing Steel, Nucor Fastener/Ziegler Bolt & Part Co. and St. Louis Screw & Bolt provided additional materials and services.

Buchanan County has about 70 more short-span bridges that need upgrades or replacement, and there are plans to use the eSPAN140 tool.

## Iowa Bridges

Total number: 24,398 Structurally deficient: 5,043

Functionally obsolete: 1,228

Source: FHWA

As the first step in the Jesup South Bridge design, Buchanan County Engineer Brian Keierleber, P.E., entered span length, width and the number of striped traffic lanes into the eSPAN140 tool. Within a few minutes, he received a customized Steel Bridge Solutions book as a PDF download. The solutions book included typical bridge cross sections and roadway widths, travel lanes and shoulders as well as the design/fabrication details for standardized rolled beams with shear-stud locations, slab thickness, girder spacing, bearing elevations and stiffener positions.

Keierleber handed the eSPAN140 preliminary designs to members of the SSSBA, who had volunteered time, materials and expertise to demonstrate how a simply designed short-span steel bridge could move from eSPAN140 to roadway reality in a relatively short time. U.S. Bridge volunteered to fabricate the superstructure and railing materials. Keierleber was able to streamline the design process by utilizing the preliminary plans obtained through eSPAN140. He worked directly with U.S. Bridge to develop a set of finalized plans—in a fraction of the time typically needed.

Based on the plans developed, U.S. Bridge fabricated the beams and sent them to Azz to be galvanized. The beams were delivered to the bridge construction site and set on Oct. 2, 2013, where the bridge was constructed by local crews. The Jesup South Bridge opened to traffic on Nov. 19, 2013—just three months from concept design.

Keierleber said, "This was a great educational project. I've got another bridge that is an excellent candidate for the eSPAN140 accelerated steel-bridge design process. What pleased me most about the project—beyond the efficiency of design and construction—was that we were able to construct the bridge with local crews."

Buchanan County has about 70 more short-span bridges that need upgrades or replacement. Keierleber already is planning to use the eSPAN140 tool to explore steel solutions for future projects. **R&B** 

For more information about this topic, check out the Bridges Channel at www.roadsbridges.com.

Snyder is director of the Short Span Steel Bridge Alliance.