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## **Nebraska's U.S. 75 Bridges Adopt Non-Traditional Steel Design**

In an effort to save tax dollars, the Nebraska Dept. of Roads (NDOR) has designed a pair of bridges that require no bolted or welded girder connections in the field.

NDOR is replacing a pair of steel bridges on U.S. 75 south of Macy—one built in the 1930s, the other built in the 1950s. Per the design, engineers call for a total of 116 tons of steel used in the superstructures (the girders, the separators between girders and the studs).

The girder design for the U.S. 75 bridges is called “simple for dead load and continuous for live load.” That means the four lines of W36 beams from Nucor Yamato Steel on each bridge (three beams in each line) will not be continuous over the piers. Instead, crews will lift a span and set it on supports (simple span configuration). There will be a gap between the beams with steel plates attached to the bottom as a compression block. Once erected, crews will pour concrete diaphragms at the interior supports and add additional epoxy-coated reinforcing bars in the deck over the piers, making the girders continuous for composite loads.

CCI Construction, the project contractor, believes the design will make erection easier. It will need just one 75-ton crane rather than the two it would normally take to pick up longer spliced girders.

The simple-made-continuous concept has been used in other bridge projects in Nebraska and across the country. For instance, in 2004, NDOR widened a four-span bridge to six lanes using the simple-made-continuous design, saving about 33% in the steel superstructure erection as compared to conventional methods.

“By removing the bolted and welded field splices on these bridges, and the time involved to do that,” says Scott Milliken, an NDOR engineer, “we think it will make the steel alternative more competitive with concrete to try and save tax dollars.” The U.S. 75 project is scheduled for completion in fall 2010.