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WHKS Designs Complex I-29 Bridges

The first caveman who preferred to keep his feet dry threw a log across the stream and created a bridge. The bridges that take the north and southbound traffic of Interstate 29 over Mosquito Creek in Pottawattamie County, Iowa aren't nearly so simple.



The complexities began with the design of a northbound exit ramp that forced the bridge to be simultaneously curved and forked. The intricate girder geometry uses both straight and curved beams that are, in places, discontinuous because of the varying width of the bridge deck. In fact, 'non-standard design' became the standard as the curving, bifurcated layout resulted in complex girder cross-bracing and forced the use of unconventional disc bearings at the load points to allow for both lateral and rotational movement.

But the complexity didn't end there. The fact that the bridge crosses a river levee forced the pier foundations to be drilled shafts because pile driving would have damaged the integrity of that earthen structure. And construction staging delayed the drilling of some piers until very late in the game because of how close the newly constructed bridge was to the old alignment.

And, as if even more moving parts were needed, the bridge also spans a railway right-of-way, requiring the design of wrap-around mechanically stabilized earth abutments to avoid conflicts with the railroad right-of-way and the levee.

These bridges are part of a major corridor improvement in the region and will be completed in 2017.

