**Starting Over With the Colorado River Bridge**

**Building New Requires Innovative Formwork.**

The busy highway of US-281 in Marble Falls, Burnet County, Texas, travels over the Colorado River on a steel-deck truss bridge built in 1936 and rehabilitated in 1975. The growing population in Burnet County along with bridge inefficiencies are the driving forces behind a construction plan to replace the obsolete Colorado River Bridge.

**Bridge Design**

The bridge replacement project consists of the demolition of a steel truss bridge that will be replaced with twin cast-in-place segmental bridges. The bridges will each be three-span variable depth cast-in-place segmental structures. The spans of the bridge will be 274 ft., 410 ft. and 274 ft., with a bridge deck width of 47 ft. The structure is to be built using the balanced cantilever construction method with end spans constructed on falsework. The box depth will vary from 23 ft. at the interior piers, to 9 ft., 6 in. at the end spans, and have a variable super elevation of up to 5.5 percent.

The proposed bridge’s unique geometry called for careful advance coordination between Doka and Archer Western Contractors.

The distinctive feature on this project is the overall V shape of the bridge. The bottom of the bridge starts with a deep V shape that tapers to a very flat V shape at the apex or center span. This required a form that was flexible in all directions, as no two segments were the same.

**Formwork Solution**

The major challenges for the formwork were truly the design itself. Doka had to create forms that were flexible from start to finish. For this reason Top 50 formwork panels were selected by the contractor. Top 50 panels were easily customizable to almost any configuration in the preassembly yard or on the jobsite. Top 50 allowed the contractor to use less labor, meet onsite requirements economically, and improve safety with walkway brackets.

To meet the complicated geometry of this bridge in cost-efficient manner, Doka began by supporting the pier table with the Staxo high performance shoring system and using Top 50 formwork panels for the lower soffit, walls, and upper soffit (or road deck). Staxo provided Archer Western with high shoring capacity, versatility, and quick and easy assembly using integrated couplers.

The pier table was poured in three separate steps. The formwork mostly stacked on itself so that shoring and form removal was kept to a minimum. When the pier table was complete, the traveler was set and the segment formwork was put in place. Doka will also be supplying the backspan formwork and shoring. Staxo shoring and Top 50 formwork will again be used. Like the pier table, this will be a three-step process as well.

Due to the detailed geometry of this structure there was a great deal of engineering and coordination that had to occur prior to the first custom form being built. The different span lengths at varied box depths required flexible formwork to accommodate the many wide-ranging needs.

**Formwork Advantages**

The ability of the formwork products to integrate with each other, simplified the process when more than one product was needed. Additionally, since this project had innovative elements to the design, ingenuity and inventive thinking were required of the form supplier. For example, all of the forms from the pier table to the traveler had to allow for not only geometry changes, but also field changes. This required flexibility that could not have been accomplished with the use of the traditional steel forms. The greatest advantages these systems offer Archer Western are customization and flexibility.

“The thing that I liked most about the Doka forms on this project is that the formwork hinges when stripped,” said Mike Wood, Archer Western Project Superintendent. “With a steel form, we would have had to take it apart each time, but with the Doka forms they always stay together. This makes it fast and easy to strip and reset.”

The outcome for the owner will be a beautiful, well-constructed bridge that will serve the community for years to come without the constant maintenance required by the current steel bridge.

**About DOKA**

With 50 years experience in formwork engineering, Doka serves customers in more than 65 countries and has participated in construction of some of the world’s best known structures including the world’s tallest skyscraper (Burj Dubai), the Hoover Dam Bypass Bridge, along with many other projects of all sizes. From wall and slab formwork systems to automatic climbing technology and superior safety solutions, Doka can deliver any type of formwork needed for residential, industrial, commercial, transportation, infrastructure as well as stadium and sports arena projects. For more information about how Doka's safe, fast and efficient solutions can aid in your next project, please visit [www.dokausa.com](http://www.dokausa.com), or call 877-DOKA-USA.

**The Facts**

**Jobsite:** US 281 – ColoradoRiver Bridge

**Location:** Burnet County, TX

**Square Footage:** Approximately 12,000 sq. ft.

**Customer:** Archer Western Contractors

**Products Used:** Load-bearing tower Staxo100, Top 50 Gang formwork





**US-281 Colorado River Bridge02.JPG -** Load-bearing tower Staxo 100 provided Archer Western with high shoring capacity, versatility, and quick and easy assembly using integrated couplers.

**US-281 Colorado River Bridge03.JPG** - The ability of the formwork products to integrate with each other, simplified the process when more than one product was needed.