

#5 Cooperation and consensus

Collaboration makes innovation possible

By Mary Ellen Shoup
Associate Editor

The functionally obsolete, but beloved, U.S. 281 Bridge over the Colorado River located in Marble Falls, Texas, was in desperate need of repair that required a unique approach while keeping aesthetic appeal intact.

U.S. 281 is a major north-south highway that runs from Wichita Falls to San Antonio, Texas, and serves as a crucial evacuation route and emergency services access for the area. The Texas Department of Transportation (TxDOT) needed to consider several factors when selecting a segmental design for the 958-ft-long replacement bridge including the nearest detour located more than 30 miles away, limited site access, active recreational lake traffic and high local regard for the old truss bridge.

There are 24 concrete segments per cantilever, with 48 segments total per span each measuring 14 to 16 ft long and 47 ft wide. The segmental shape forms a tapered boat-hull design in the bottom slab of the bridge, reflecting the community's focus on recreational boat racing.

TxDOT chose Archer Western Contractors/Finley Engineering Group after reviewing its project proposal, which proposed major changes in an effort to save the agency time and money without compromising quality of construction.

"TxDOT was willing to listen to a different idea and different approach to get the

same result and it was a good team-working relationship for a big, complex project like this," Archer Western Project Manager Eric Hiemke told ROADS & BRIDGES.

Modifications included revising the pier table design, segment layout and post-tensioning specifications. The original design called for an even, balanced pier table (extending 30 ft to each side from the centerline column), the Archer Western/FINLEY team proposed a revised unbalanced pier table design (22 ft by 14 ft from the centerline column). This approach required less length of pier tables and, in turn, less falsework, reducing the project timeline by 12 weeks.

The transverse and longitudinal post-tensioning also was modified. The RFP called for three strand transverse tendons at 1- to 2-ft spacing, but the alternate design proposed utilizing four strand tendons with 2-ft 9.5-in. spacing. This modification saved on ducts, heads, grouts, caps and other materials.

Additionally, the original longitudinal post-tensioning design specified 15 strand tendons, while the alternate design specified a combination of 19 strand and 12 strand tendons. This modification allowed for smaller stressing anchors in some areas.

By being open to collaboration and modifications to the original design, TxDOT was able to create an efficient and aesthetically pleasing bridge, which continues to serve as a community focal point to Marble Falls' identity. **R&B**

PROJECT:

U.S. 281 Bridge Over Colorado River

LOCATION: Marble Falls, Texas

OWNER:

Texas Department of Transportation (TxDOT)

DESIGNERS: TxDOT; Alternate

Superstructure Designer and Construction

CONTRACTOR:

Archer Western Contractors

COST: \$28.65 million

LENGTH: 958 ft

COMPLETION DATE: Oct. 9, 2014