Texas' Longest Beams

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Fourteen precast concrete Type VI modified beams that were 164 ft 8 in. long were the longest ever used in the state. All photos: Heldenfels Enterprises Inc.

Texas has a reputation for growing and building things large, and its precast concrete bridge beams are no different. For the recent State Highway 130 project on the Central Texas Highway system, 14 Type VI modified beams 164 ft 8 in. long were fabricated.

The beams were produced for twin bridges over CR-179 on the toll road project, which includes 77 bridges along its 40-mile southern leg. The two bridges are each 385 ft long. The beams' extraordinary lengths were necessitated by the bridges' 47.5-degree skew. Each bridge has three spans of 110, 165, and 110 ft. The Type VI modified beam was the only shape approved by the Texas Department of Transportation that could provide the required span.

The beams were modified by reducing the bottom flange width to 26 in., while also reducing the top flange and web widths. This provided the weight reduction to achieve the span length. The beams were fabricated three at a time and were pretensioned with eighty-eight, ½-in.-diameter, 270 ksi, low-relaxation strands. They were gang-stressed (all at once) to 2728 kips including 38 harped strands, with the greatest harped strand located at 70 in. from the bottom of the beam. The average concrete compressive strength at transfer was 7010 psi and 10,200 at 7 days to meet a minimum design compressive strength of 7127 psi. The average camber at transfer was 1⅞ in.

Each beam weighed 161,400 lb, just under the state's "super-heavy" limits. The beams were delivered on trailers equipped with both self-leveling bolsters to keep the beams level in transit and steerable rear wheels to navigate tight turns.

The components were offloaded and erected by Archer Western Contractors with no disruptions.

As new beam shapes now being introduced are accepted, modifying Type VI beams in this way will prove unnecessary. Even so, it shows the lengths to which designers, precasters, and girders can go to achieve their goals.

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