Efficient Cycling in Forming Over 150 Bents
El Paso, Texas

Providing an Alternate Route
When completed, the Boarder West Expressway will provide an alternate route for I-10 on the west side of El Paso near the University of Texas El Paso (UTEP) and will address needed improvements to safely guide the region’s growth and development. The $500 million project, which broke ground in spring of 2015, is a joint venture with J.D. Abrams, L.P. and Kiewit Infrastructure South Co.

Efficiency Was Paramount
With over 150 interior bent caps on this project, Abrams-Kiewit made it clear they were looking for cap forming solutions that would give them the ability to cycle formwork efficiently while also reducing the number of ties and consumables required for each cap.

Hands-on Training
After an initial jobsite meeting, a few key members of the Abrams-Kiewit structures team came to EFCO’s Concrete Construction and Forming Institute in Des Moines in 2015. There, they were able to get an up-close view and hands-on training with the EFCO equipment they would be using on their project.

Keys to Cycling Efficiency
One of the key products that helped with cycling efficiency on the project’s multi-column caps was EFCO’s heavy-duty outside corner hinge. Over half of the 150+ interior bent caps poured on the project utilized the hinge soffit design.

The other key product used on this project was EFCO’s Tension/Compression (TC) form. Used in combination with EFCO’s PLATE GIRDER® panels, Abrams-Kiewit was able to span greater column-to-column distances while also eliminating the need for additional shore towers. This was especially important on Bridge 17 which was located between multiple heavily used train tracks and the Rio Grande River where the terrain is steep and very sandy.

EFCO all-steel PLATE GIRDER® panels can be bolted together to provide a self-spanning, self-supporting pier cap, eliminating foundations for temporary shoring support.

Forming the Large Caps
EFCO designed a forming system for the large hammerhead caps (15 in total) that were supported entirely on EFCO’s SB-250 column-mounted support brackets. With each cap weighing in at over 700,000 lb (31,750 kg) and 84’ (25.6 m) in overall length, Abrams-Kiewit used stacked 8R (2400R) panels with TC forms that when fully loaded, deflected less than 1/2” (13 mm) on the ends of the cap forms!

By far, the most challenging cast-in-place caps on this project were bents 2 – 8 on Bridge 17. Not only were the bridge caps massive (6’ x 9’ x 150’ (1.8 m x 2.7 m x 45.7 m) on average), they were also located directly above rail lines that could not be impacted for any reason. With each cap weighing in at more than 1 million lb (450,000 kg) and with very little vertical clearance room...

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above the tracks to work with, in some cases less than 3’ (900 mm), EFCO designed a spanning soffit set-up using face-to-face 8R PLATE GIRDER panels, TC forms and EFCO’s giant erector set, SUPER STUD® beams, enabling Abrams-Kiewit to span over the rail lines.

The contractor was able to pick large sections of pre-assembled soffit at once which significantly reduced the amount of time working above the tracks. Once all soffit sections were flown into place, Abrams-Kiewit could safely tie rebar, install post-tension ducts and place concrete.

Tony Chiappetti,... Construction Manager
Josh Nitz.................. Structures Manager
Joe Hernandez ............ Segment Manager
Cesar Velador........... Structures Superintendent
Rob Broderick........... Structures General Superintendent
Andrew West, Structures Field Superintendent
Jacob Goecke............... TSCD Manager
Mario Carbajal......... Structures Engineer
Paul Drey............... EFCO Territory Manager
Nick Mojica............... EFCO Engineer

Because of the repetition of the caps on this job, we were looking for a cap system that required very little reconfiguration time from cap to cap.

Even on some of our larger multi-column caps (125’ (38 m)), a four-man crew was able to strip and clean an entire cap set in a single 10-hour shift.

Andrew West
Structures Field Superintendent

> 67,000 yd³ (51,225 m³) of concrete for columns and caps
> 1.5 Million yd³ (1.15 Million m³) of dirt hauled
> 350,000 yd³ (268,000 m³) of concrete for paving
> 28 miles (45 km) of precast girder beams
> 853,000 ft² (79,250 m²) of MSE walls
> 31 miles (50 km) of C.I.P. barrier poured