

# US 181 HARBOR BRIDGE PROJECT

## Monthly Status Report



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### CALENDAR EVENTS:

December 15:  
HBP Presentation  
Corpus Christi Port Commission

### **Rebar Cages Create the Backbone for Approach Columns**

The Harbor Bridge Project (HBP) North and South Approach substructure piers have a combined total of 529 column lifts. In November, we reached the ninety (90) percent milestone or 475 out of 529 lifts completed. Each lift's skeletal structure is referred to as a cage and built with precision that conforms to exact dimensional specifications. The multi-step process to construct the cage, install, and pour concrete to create the lift takes two days and accurate timing for each one.

**Technique:** Each lift on the column except for the starter lift is 14.5-feet tall and contains an outer and inner cage initially assembled horizontally on the ground. The outer cage for our most common Type II and III columns use #11 or 1 3/8-inch rebar, and the inner cage is built with #9 or 1 1/8-inch rebar. The rebar in both cages is fastened with hooks and hairpins, and secured with three 10-feet by 12-feet hexagonal-shaped internal crush rings placed 6-feet apart from the center to support the inside of the rebar form. About sixty percent of the cage is tied or secured on the ground. Once ground assembly is complete, the cage is tilted vertically and "flown up" with a hydraulic or lattice boom crane to the next column lift and aligned with the dowel rebar extending from the previous lift. The vertical rebar is then secured to a tie bar every 1-foot to the inner and outer rebar cage. When the outer cage is securely tied, the crush rings get removed. Craft technicians continue to secure the cage while adjusting the hooks and hairpins to align the rebar for inspection. Inside and outside concrete forms or panels are then placed, and plastic slab bolster devices are used on the lift to ensure there is exactly 3-inches of clearance throughout from the concrete form to the rebar cage on both the inner and outer concrete faces. Once the concrete is poured, the completed Type II and III column lift walls are 1-foot/3-inch thick from top to bottom per TxDOT and Design specifications. It takes approximately eight hours to construct cages on the ground and about ten hours to fly them up, secure, inspect alignment, and remove the crush rings. After the concrete is placed inside the forms, crews immediately start tying the rebar for the next lift on the same day while allowing 24 hours for the curing process. Only the bravest craft workers are willing to fasten hundreds of hooks and hairpins while harnessed to a cage many feet above the ground!



### **'Home School by the Sea' Visits the Harbor Bridge Project**

One of our favorite events is to host educational opportunities for student groups. In November, we utilized the new Lake Street Sidewalk to safely showcase the Gantry Crane and South Approach construction area for a local home school coalition. HBP safety personnel were on hand to brief the students about the necessity of wearing the proper gear and constantly analyzing their surroundings for hazards. Project engineers answered questions about the Gantry Crane, Salt Flat Channel drainage improvements, academic backgrounds, and details about the concrete segments and Approach spans. Our Public Information team looks forward to working with more scholars in the coming months.



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