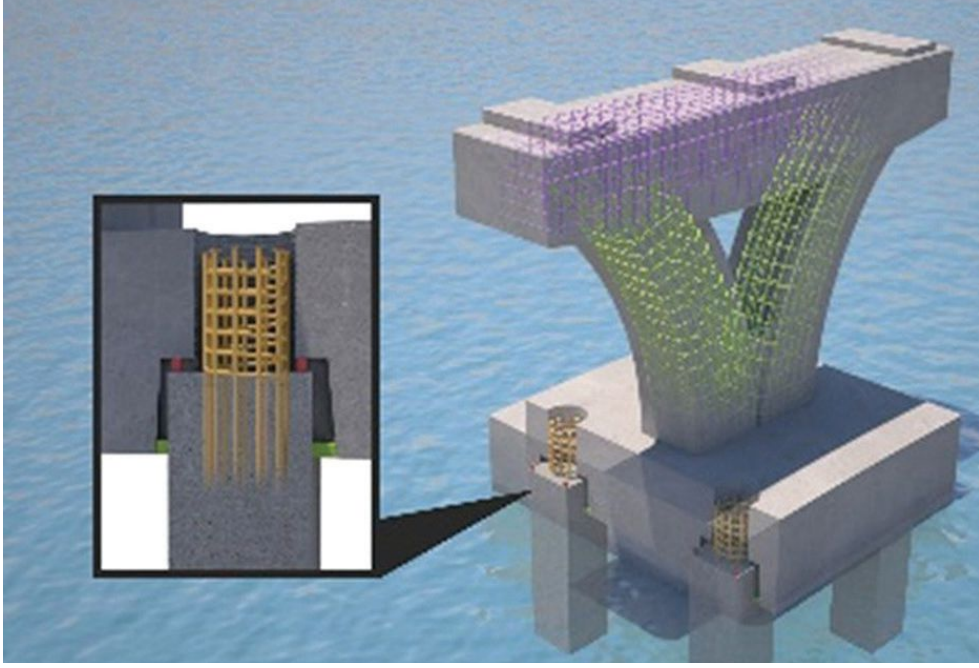
Workers set a shorter V-pier unit, for which the cap, column, and footing were precast as a unit. Photo: WSP USA.



Rendering of a typical shorter V-pier precast unit set on the precast, prestressed concrete piles. The inset shows a detail section through the pile-to-footing connection. Figure: WSP USA.

pour to achieve a very small, highly efficient connection. The pile pocket connection, which partially extends into the footing to extend the pile above the water surface, develops a full flexural-shear connection. The transfer of forces in the system employs a combination of socket- and corrugated-duct-type connections to meet the required loading demands. The desire to use a conventional concrete connection with a reduced embedment depth dictated the use of headed reinforcement; at the time, the contractor determined that ultra-high-performance concrete was not an economical option in this case because of challenges in getting the materials to the site. The shorter, monolithic pier units were used for 91 of the 105 piers on the project.

As the vertical profile increased toward the higher-level section, a taller series of V-piers was designed for efficiency and to achieve a more balanced appearance. Due to the change in foundation demands for the taller piers, the pile groups increased in size as the +5% grade quickly increased member weights too. The pier details and construction process had to be modified to accommodate these changes. On the taller piers, precast concrete bathtub forms were used for CIP footings, which were connected together with a prestressed concrete pile strut. The precast concrete V-pier column and cap were erected on temporary falsework for a pressure concreted closure pour at the column-to-footing connection.

Mock-up Testing

Because of the unique nature of the connections and stringent tolerances needed for proper fit-up, the plans contained specific requirements for precast concrete fabrication and erection tolerances, along with a detailed set

AESTHETICS **COMMENTARY**

by Frederick Gottemoeller

This long, low bay crossing connects downtown Pensacola, Fla., to the islands of Pensacola Bay and their Gulf beaches. The bridge is the centerpiece of the downtown's bayfront views and the views from all the civic buildings along it. No wonder the owner wants to enhance its aesthetics.

The appearance of a long, low bay crossing is typically dominated by rows of multicolumn pier bents marching across the water. These repetitive column lines lack visual interest and stand one behind the other to block both the diagonal views through them and the longitudinal views along the bridge. With this in mind, the curved V-piers of this bridge are a revelation. Instead of the usual five or six columns of a typical pier line, there are only two columns which each split into two pieces that curve outward to meet the cap. With this creative detail, the expanse of the water's surface under the outer edges of the bridge will be open to view.

There is a second revelation: As the piers gain height approaching the navigation channel, the tall piers will have the same shape as the short piers. Only the pier stems will get longer. That consistency will give the bridge unity and openness over its entire length, which in turn will give the entire bay a unity and openness that was lacking with the previous bridge.

Placing the pedestrian and bicycle trails slightly lower than the roadways will give their users a greater sense of separation from the vehicular traffic and should increase their enjoyment of the crossing. This separation also creates the opportunity to change the trails' structural type at the main span. The arches will visually punctuate the midpoint of this over 3-mile-long and mark the channel location for both users of the bridge and observers on shore.