

Ramp "I" Over I-75 and the Florida Turnpike Extension

This curved, eleven span precast prestressed segmental box girder bridge forms the third level of an interchange between two major expressways in Dade County, Florida. The 2134 ft 6 in. (651 m) superstructure was erected by the balanced cantilever method using 174 single-cell precast box segments without interrupting traffic on the lower level expressway. The transverse post-tensioning used to allow cantilever construction also ensured a strong, durable roadway deck.

The bridge is curved over 80 percent of its length, having a radius of 2006.89 ft (611.70 m) and a superelevation of 0.063 ft/ft (m/m). Curvature also occurs in the vertical plane with up and down gradients of +3.18 and -2.23 percent, respectively, connected by a 1060 ft (323 m) vertical curve. Pier placements were selected to provide the requisite openings for the lower, intersecting expressways. Additionally, the median of the north-south expressway had to be free of piers so that space could be provided for a future rapid transit system.

The use of precast, prestressed concrete boxes provided a rugged, torsionally strong superstructure having clean, simple lines, a particularly appropriate solution for this curved fly-over. In addition, the single box with inclined webs allowed the use of piers having minimum width transverse to the longitudinal bridge direction, simplifying span layout and eliminating skewed piers. Furthermore, the use of

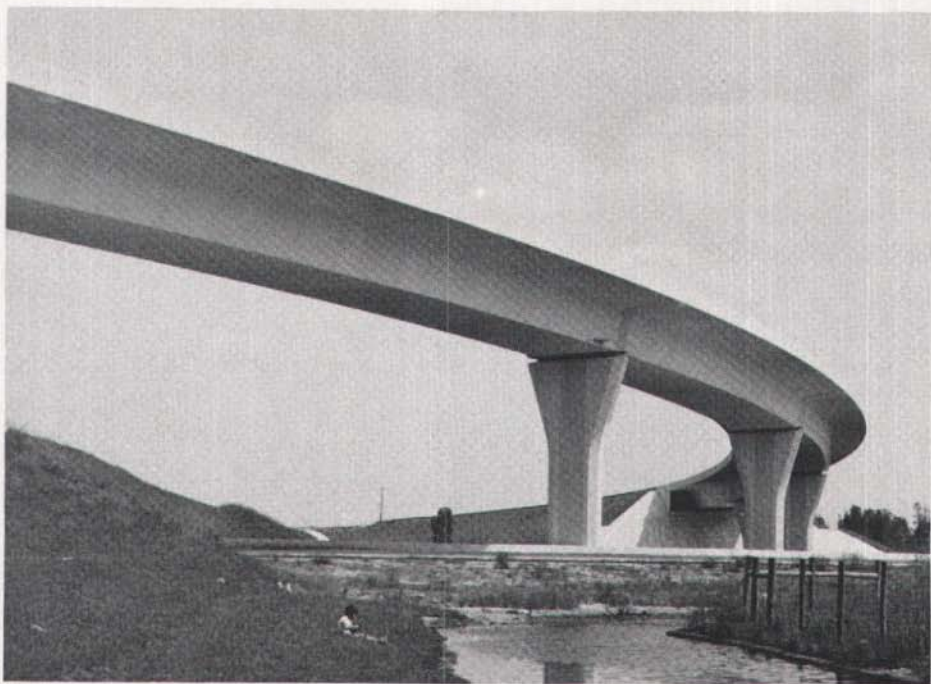


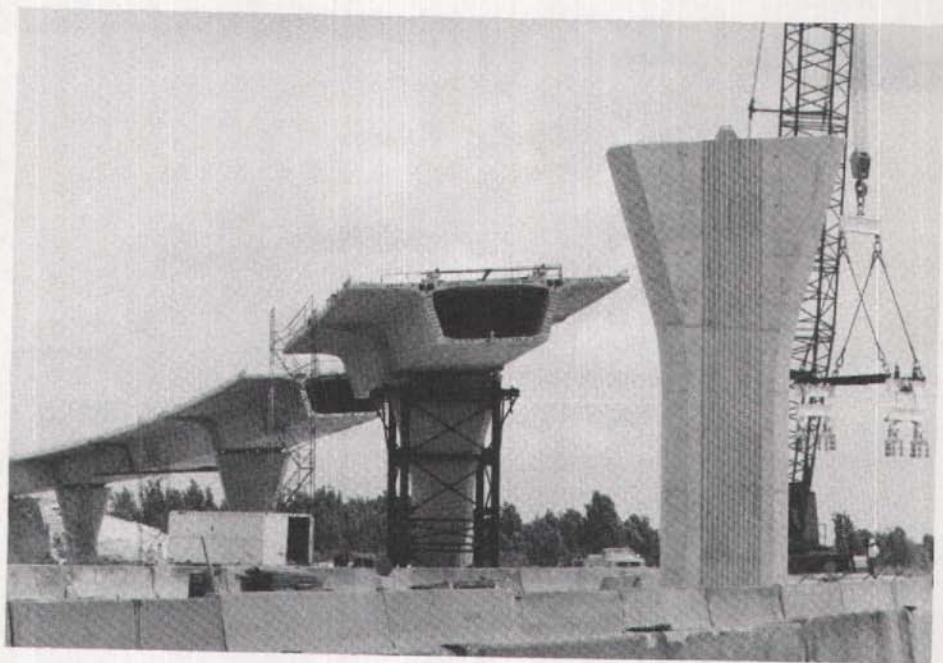
Precast post-tensioned construction provided high quality, plant produced prestressed concrete elements that easily met high strength and exact geometry requirements for this highway interchange bridge in Dade County, Florida.

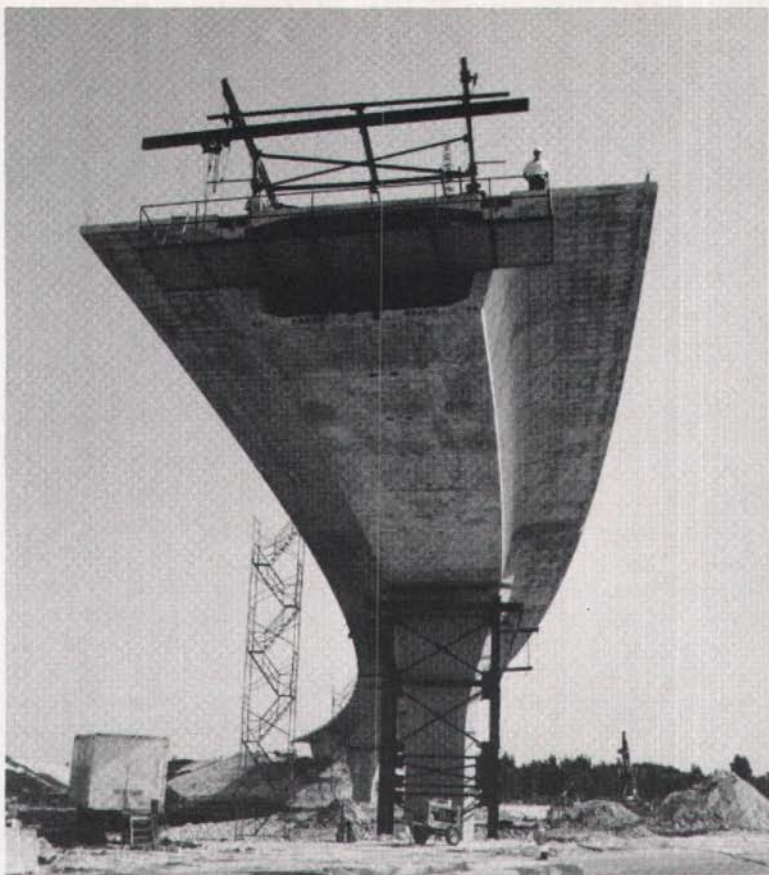
precast post-tensioned construction provided high quality, plant produced concrete elements easily meeting the requirements of high strength and exacting geometry.

To eliminate unsightly piping and down spouts, the roadway drains are located in the pier segments and carried inside the columns. Drop sections are required in the low, side wings to provide space for the roadway drains and lateral pipe leads. This "minus" was made into an architectural "plus" by providing the drop section on both low and high wings and continuing these sections as pilasters down the sides of the boxes and the transverse edges of the flared pier shafts. The drain pipes embedded in the superstructure discharge into unobtrusive funnels inside the pier shafts. In addition, these beveled edges were further accentuated by forming rustication grooves in the pier faces to break up the large, flat expanse of concrete.

The superstructure rests on laminated elastomeric bearing pads of minimum height. Interior shear keys on the centerline of the bridge maintain transverse







alignment and transfer forces from the superstructure to the foundations. The reinforced concrete piers rest on footings supported on 18 in. (457 mm) square precast prestressed concrete piles of 75 ton capacity.

This elegant structure was completed in April 1984 at a total cost of \$4,970,000. It is interesting to note that the bridge was bid in competition with a steel box girder design and was 18 percent lower in cost.

Credits

Owner: Florida Department of Transportation, Tallahassee, Florida.

Designer: Beiswenger, Hoch and Associates, Inc., North Miami Beach, Florida.

Construction Engineering: DRC Consultants, New York, New York.

General Contractor and Precast Prestressed Concrete Manufacturer: Capeletti Brothers, Inc., Hialeah, Florida.

Prestressing Steel Manufacturer: Dywidag Systems International, Greenville, South Carolina.