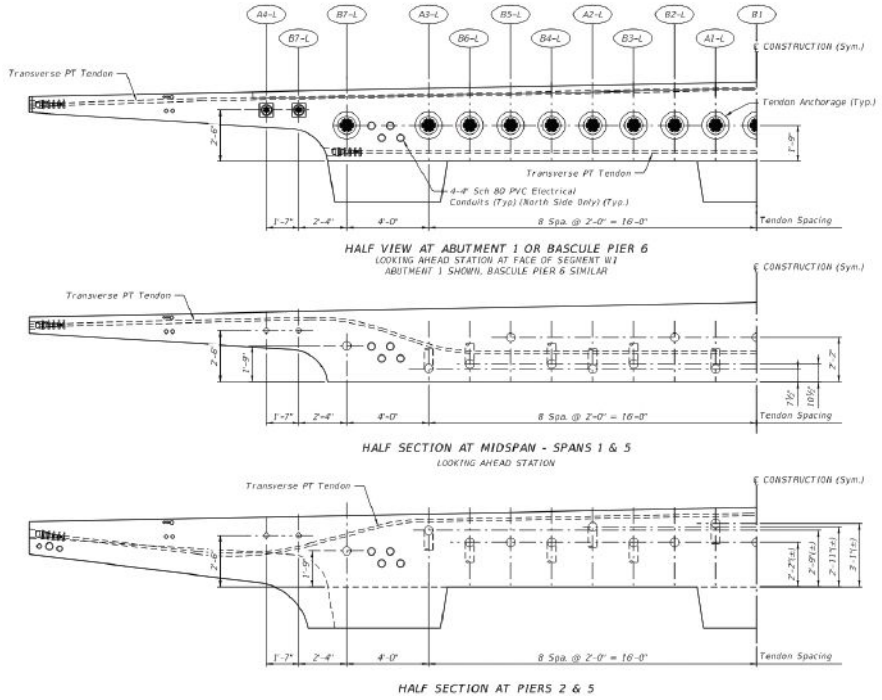

Half sections of the west approach spans showing longitudinal and transverse post-tensioning. Figure: H&H.

the only alternative that could reasonably meet an "extremely critical" importance level and "service immediate" performance level at the strength limit state as described in the American Association of State Highway and Transportation Officials' *AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms*.[1])

- A greater amount of prestressing force, designed to provide net compression across the construction joints under service loading, and bonded reinforcing steel across the construction joints for crack control.
- Improved aesthetics with a visually slender superstructure, clean and uncluttered soffit, no dark shadows between beams, and full aesthetic integration with substructure.

The approach spans were originally designed to be built using the incremental launching construction method, with 36-ft-long segments (equal to half of one span) cast on temporary casting beds in the first and last spans of the bridge and then jacked uphill toward the bascule pier on launching beams. The contractor saw an advantage in constructing 72-ft-long segments (the length of a one span) cast on falsework over water. The contractor proposed this change as a contractor savings initiative (CSI). Although the CSI required a large amount of temporary falsework, it offered the following advantages:

- It maintained all major design features, criteria, and restrictions in the contract documents.
- It reduced the amount of longitudinal post-tensioning through more-efficient design and replacement of bar tendons with more-efficient strand tendons.
- It eliminated the casting beds, including approximately ninety-five 30-in.-diameter driven steel pipe piles, the casting bed concrete slab, and steel beams.
- It eliminated temporary intermediate pile bents and corresponding lateral bracing.
- It eliminated incremental launching equipment and structures.
- It simplified segment formwork.
- It reduced the number of transverse post-tensioning tendons with modified duct routing to achieve greater efficiency.
- It moved construction staging further from active traffic.
- It will reduce future maintenance requirements by having fewer transverse construction joints and post-tensioning hardware.
- It employed a more commonly used construction method.

AESTHETICS **COMMENTARY**

by Frederick Gottemoeller

The civic scene in Palm Beach, Fla., was influenced by Addison Mizner, Florida's leading architect of the 1920s. His Spanish Mediterranean revival style became the architectural signature of the place, creating the ambience that truly transformed the landscape of South Florida. In other words, he was a hard act to follow. Nevertheless, the designers of the Southern Boulevard Bridge were asked to do just that—and they had to do it in the few feet available between the deck of the highway grade and the crests of the salt waves below. They rose to the challenge with both innovative aesthetic features and innovative engineering.

Examining the aesthetic features from the top down, we see that the overlooks offer comfortable locations to pause, rest, and take in the civic scene, while the railing is transparent to drivers and pedestrians alike. Looking below the roadway, the structural system is clear, simple, and shaped to reflect the forces on it. The soffit is flat and reflective, with no dark recesses to harbor birds or debris. The pier columns have a pilaster on their outer faces that reduces their visual mass and makes them look thinner. The column tops flare to accept the bearings, and that flare continues into the slab to visually spread the bearing reaction into the slab. The column pilasters continue onto the slab as brackets that reinforce the overlooks. Even though there is a clear joint between the piers and the slab, they look as if they were conceived as a single shape.

Getting all of that to work in an extremely thin structure, and then building it over water, required numerous engineering innovations. The designers and contractors are to be congratulated on the ingenuity that resulted.

It's probably a stretch to say that Addison Mizner himself would have been proud of the Southern Boulevard Bridge, but I think he well might have been.