

DIXIE CONTRACTOR



Community/Condotte/de Moya, JV

Tackles the \$560M Dolphin
Expressway-Palmetto Expressway
Interchange Reconstruction

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Dolphin Expressway-Palmetto Expressway Interchange Reconstruction Creates Safer Travel for Vital Miami Corridor

By Debra Wood



Editor's Note: Due to the size and scope of the Dolphin Expressway-Palmetto Expressway Interchange Redesign, we have dedicated two features to the project. Please refer to the June issue for information on the complicated engineering of this project.



"This is one of the most heavily congested interchanges in the area. We have 430,000 vehicles traveling through the interchange every day."

Oscar Gonzalez, Spokesman for the Florida Department of Transportation (FDOT).

The \$560 million reconstruction of the Dolphin Expressway-Palmetto Expressway interchange will create safer and less congested travel for drivers on this vital corridor in Miami. "This is one of the most heavily congested interchanges in the area," says Oscar Gonzalez, Spokesman for the Florida Department of Transportation (FDOT). "We have 430,000 vehicles traveling through the interchange every day. In order to keep up with the demand, we had to undertake this project."

The airport sits at the northeast quadrant of the interchange, and the interchange serves the Port of Miami. By 2035, FDOT estimates 530,000 vehicles will drive through the interchange daily.

A joint venture among Community

Asphalt Corp., Condotte America and The De Moya Group, all of Miami, lead the design, build, finance team responsible for the reconstruction. The team will provide gap financing from the time the project is complete in 2016 until the state has the funds available, anticipated in 2017.

"The state doesn't have all of the money, so we will finish the job," says Enrique Espino, Chairman of Community / Condotte / de Moya, JV. "The state has always paid its bills, so we feel it wasn't that much of a risk of not getting paid. It was the cost of the money until the state paid us."

Gonzalez further explains that project funding is not always available when FDOT wants to construct a project. Therefore the public-private partnership process is used, so that the contractor funds a por-

tion of the project costs until the funds are available.

The reconstruction began in 2009 and is expected to be complete in the first quarter of 2016.

The 46 bridges on the project include four segmental bridges, now complete. Four contain steel girders and the balance use precast concrete Florida I-beam girders. The bridges are set on driven concrete piles.

"The concern in Miami-Dade is the foundations become deep and get underwater," Espino says. "But we knew how to work through those problems. Most of the time, you have to build a coffer dam and a concrete seal before you build the foundation."

Multiple cranes, from 100-ton to 300-ton, were used to construct the traditional bridges. Crane placement took into consideration the Miami International Airport glide paths.

"We had to use smaller cranes," Espino says. "It was another restriction, besides traffic."

Throughout the project, the construction team has maintained traffic by shifting vehicles from one area to another.

"One of the most challenging things was maintaining those 430,000 vehicles traveling while we are making these improvements," Gonzalez says.

The team created two casting yards. The one in Hialeah, about 10 miles from the site, was used for the segmental construction. With two casting cells, the crews were able to fabricate about eight segments each week. The other one was located on the job site and used for prestressed concrete bridge girders, piles and wall panels.

"It's a big benefit because we can transport these things within the project work zone and not hinder traffic," Gonzalez says.



Building the Segmental Bridges

The precast segments were fabricated by Rizzani De Eccher of Bay Harbor Islands, Florida, in 10-foot sections and trucked to the site, explains Craig Finley, Managing Principal of FINLEY.

"It allows you to have factory-like conditions to make the segments, and then you bring them to the site," Finley says. "It reduces the amount of work done at the construction site."

Constructing the segmental bridges required casting and erecting 783 bridge segments, each weighing between 60 and 85 tons. Most of the erection work took place at night.

Twenty-four-inch prestressed concrete pile foundations support the segmental bridges. Some of the foundations were installed early in the schedule to minimize traffic disruptions later in the job.

The team decided to use a 460-foot-long, 475-ton, self-launching, overhead gantry manufactured by DEAL in Italy, to construct the cantilevers for the segmental bridges. The gap between the cantilevers was filled with cast-in-place concrete, which joined the two cantilevers together.

"The gantry sits on top of the bridge it





the construction site."

The post-tensioning was later de-stressed.

The segmental bridges represented \$120 million of the project budget.

"It gets a lot of focus, but there is a lot more project and a lot of good things to be said about the other elements," Finley said. "It was a team effort. There are a lot of people who pushed each other to be as good as we could be on this job."

Collaborating with Other Entities

The construction team has worked closely with the airport and the Federal Aviation Administration to avoid any conflicts with airplane flight paths. The project also required coordination with the CSX rail company in regard to active rail lines running through the project and with utility companies to move electrical transmission and distribution lines, cable and natural gas lines.



is building," Gonzalez says. "The bridge grows from the center and spreads out on each side."

Using the gantry allowed the construction team to build over the completed portions of the road and bridges, explains Finley. The longest span cleared 275 feet, and typical spans were 240 feet. Finley says balanced cantilevers are the most efficient method for building spans of that length.

During construction, with the tight radiuses, the curved bridges wanted to roll, Finley explains.

"To stabilize and have the bridges perform as if they were straight, we put vertical post-tensioning from the deck through the piers during construction," Finley says. "It allowed us to put in a counter balancing force. This helped minimize the erection stresses and any temporary supports into

Design-Build Team

- Owner: Florida Department of Transportation (SR 826)/Miami-Dade Expressway Authority (SR 836)
- Contractor: Community Asphalt Corp., Condotte America, The De Moya Group, JV, Miami, Florida
- Prime Design Consultant: BCC Engineering, Miami, Florida
- Segmental Bridge Design and Construction Engineer: Finley Engineering Group, Tallahassee, Florida
- Other Design work: Stantec, Coral Gables, Florida, APCT Engineers, Doral, Florida, FR Aleman & Associates, Doral, Florida
- Overhead Gantry and Casting Machines: DEAL, Bay Harbor Islands, Florida
- Bearings and Expansion Joints: The D.S. Brown Company, North Baltimore, Ohio
- Casting and Erecting Segments: Rizzani De Eccher, Bay Harbor Islands, Florida
- Post-Tensioning Contractor: VSL, Hanover, Maryland
- Construction Engineering & Inspection: AIM Engineering & Survey, Inc., Lehigh Acres, Florida

The contractors also took on an \$8 million joint participation agreement with Miami-Dade Water and Sewer Department to upgrade its infrastructure within the project footprint, including a new 3,000-foot long, 48-inch diameter force line.

Crews also had to reroute the North Line Canal, conveying portions of the canal through culverts.

The decks of the bridges are concrete and the approaches asphalt.

The team completed the segmental bridges in the spring. The entire project remains on budget and is scheduled to wrap up early in 2016.

"We were able to create a good and efficient team of contractors who usually fight among themselves for projects to come together on peaceful terms and build this project successfully," Espino says. 🌟

