



2007 – I-10 Bridge over Escambia Bay (Replacement Spans)

Description

Meta Fields

Abc Construction Equipment : High-capacity crane on barge

Miscellaneous Prefabricated : Pocket connection (in precast substructure)

Prefabricated Bridge Elements : Precast pile caps; Precast footing(s)

Contracting : A+B bidding; Warranty; Lane rental; Incentive / disincentive clause

Project Delivery : Design-build

Site Procurement : Early environmental clearance & permitting

Longitude : -87.1455536

Latitude : 30.5177784

Nbi # : 480213 (EB) / 480214 (WB)

State Id # : 480213 (EB) / 480214 (WB)

Construction Equipment : Other ABC Method

Total Bridge Length Ft : 13728

Max Span Length Ft : 250

Beam Material : Concrete

Spans : One-span

Location : Rural

Owner : State

State : FL

Year Abc Built : 2007

Contract Plans : 1

Funding Source : Federal Only

Costs : The low bid was \$243 million. There were three shortlisted bidders. ABC techniques saved an estimated \$48.5 million (\$133,000 x 365 days) in delay-related user costs.

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Construction Method : To make efficient use of the high-capacity cranes on barges, the precast piles, pile caps, footings, and girders were approximately the same weight, with a maximum of 80 tons each. Most of the substructures consisted of a precast pile cap supported directly on five piles. These piles were 3-ft-square with a 22.5-inch-diameter void except for the 4-ft-long solid section at the bottom tip. The pile cap-to-pile connection was made by inserting a reinforcement cage into the top 10 ft of the pile in the length above the pile plug and into the pile cap pocket, and filling the pile void and cap

pocket with concrete. The other typical substructure type was piers with waterline footings. These footings became larger as they approached the navigation channel. For most of these piers, two precast footings each rested on three piles. The footings had pockets to accept the pile reinforcement cages, and had reinforcement extending from the top surface for connection to the cast-in-place pier columns. Movable cofferdams were used to install the precast footings below sea level. The cap pocket were filled with concrete. The contract included A+B bidding and a \$10 million bonus for early completion, as well as a \$133,000 per day disincentive. Lane rental days were included to minimize inconvenience to the traveling public. Also included was a 5-year warranty for deck expansion joints, coatings, bearings, lighting and electrical systems, and drainage systems. FHWA designated the project as a Type 2 Categorical Exclusion. The joint venture received the \$10 million bonus when the new eastbound bridge opened 11 days early in December 2006. The width of the eastbound bridge allowed it to temporarily carry four 12-ft-wide traffic lanes, two in each direction, separated by a median barrier. Less than a year later the new westbound bridge was opened to traffic.

Replacement Or New Bridge : The replacement bridge is aligned to the south of the existing bridge and is curved near the beginning and end of each approach. It was built higher than the original bridge to better resist storm surges. Its height above mean tide level ranges from 25 ft for typical spans to 65 ft over the navigation channel. The bridge has a total of six 12-ft traffic lanes (three eastbound and three westbound) and 10-ft inside and outside shoulders. The cross-section of all but the main span unit consists of five 6.5-ft-deep bulb-tee girders spaced at 12.5 ft, with an 8.5-inch-thick cast-in-place 5,500-psi reinforced concrete deck. Precast trestle pile caps were used for low-level piers, and precast waterline footings were used for high-level piers.

Existing Bridge Description : The existing bridge consisted of twin structures, each with two 12-ft-wide traffic lanes and 6-ft-wide shoulders. Built in 1968, the bridge was typically only 12 ft above mean tide level. It was heavily damaged during Hurricane Ivan in 2004. The bridge was temporarily repaired to maintain a total of two lanes of traffic pending construction of the replacement bridge.

Traffic Management : Traffic management alternative, if constructed conventionally: extended use of 130-mile detour

Average Daily Traffic At Time Of Construction : 21750

Dimensions : 2.6-mile-long and 59-ft-wide 102-span twin bridges, each with pretensioned bulb-tee girder spans (60-ft to 138-ft-long span range typical) at piers and pile bents, and with a 616-ft-long 3-span spliced post-tensioned haunched girder unit (200 ft – 250 ft

Primary Drivers :

- reduced onsite construction time – I-10 is the only east-west interstate in the southern region of the US
- reduced traffic impacts – the existing I-10 eastbound bridge could only carry one lane of interstate traffic, creating significant delay and interstate traffic backups
- improved work-zone safety
- improved site constructability – eliminated time-consuming cast-in-place construction on the water; also allowed the contractor to use two precasters
- improved material quality and product durability

Impact Category : Tier 1 (within 1 day)

Mobility Impact Time :

- ABC: Twin bridges completed in 2 years and 8 months
- Conventional: Additional year

Project Location :

Interstate 10 over Escambia Bay in Escambia County in northwestern Florida