

## Highlights

- **Public Works Bridge Team visits New Ringling Bridge**
- **The FDOT Sarasota Bridge Replacement Attracts Interest**
- **Design Build Pre - cast Segmental Project has variant**

## Items

- 1 Diagram of Bridge Construction Sequence**
- 2 How the Bridge goes together**
- 3 Guest Commentary**

# SPANS



Public Works Department

*The Quarterly Newsletter of Inspired Bridge Technologies*

*Volume 1, Issue 1; January, 2003*



Mainland view of the new Ringling Bridge under construction in Sarasota, FL 11/21/02

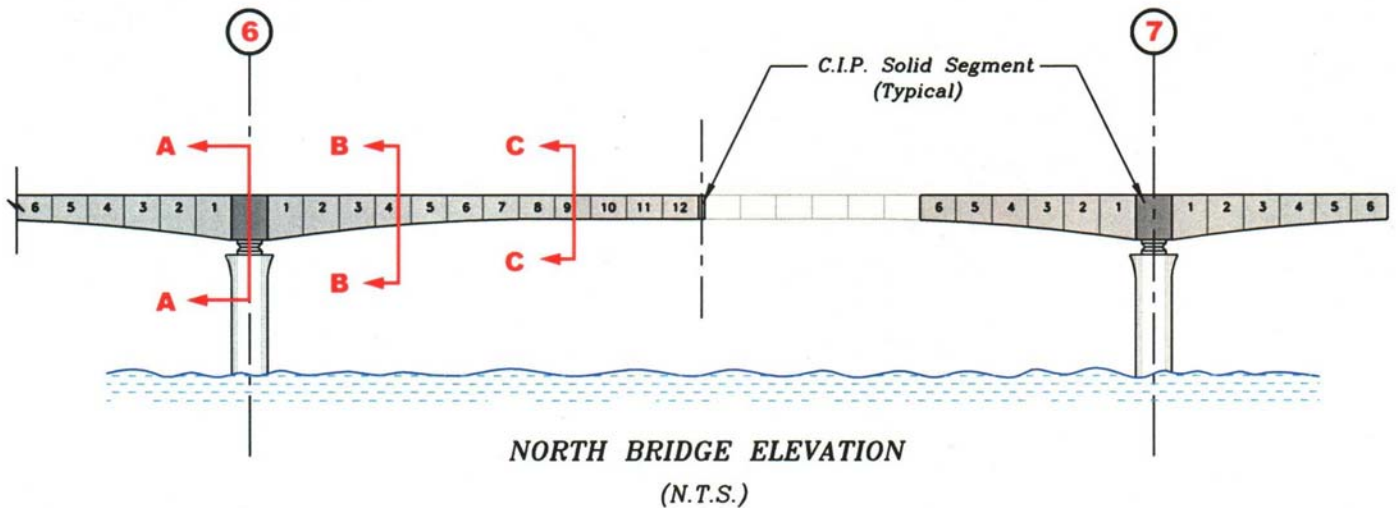
*This replacement structure provides four traffic lanes and full shoulders, traffic barriers, sidewalks, and hand rails symmetrical about the centerline for a 106 foot wide structure. There are twelve spans rising from grade to a maximum clear height of 60 feet and reaching a total length of 3,300 feet.*

The Design and Engineering Support Section (DESS) of the Hillsborough

County Public Works Department, made the one hour drive south on Interstate 75 from Tampa to Sarasota, Florida, on November 21, 2002. Eight county employees loaded a single van for the trip to the bridge site just north of the still operational bascule bridge. Subsequently, on the return trip, they drove up US 41 to the project casting yard, located near Port Manatee. They were guests of the Consulting

Engineering firm, T. Y. Linn International who were hired to perform the construction engineering services for the Design Build team of PCL, Contractors and JMI, Engineers.

The owner is the Florida Department of Transportation (FDOT) and the low bid was \$58 million, but, with owner requested revisions, the total cost was consequently boosted to \$60 million or, \$174 PSF.



The typical 106 foot wide, three cell, variable depth, pre-cast segments weighed in between 120 to 200 tons. To facilitate lifting and transporting by barge from Port Manatee to the Sarasota site the segments were cast in two increasing the number of pieces from 240 to 480, reducing the weights of these pieces to a low of 60 tons and a high of 100 tons.

This expedient move did necessitate other cost increases in the sequential lacing together of these pieces with post tensioning cables and anchorages and the introduction of temporary struts, spacers and tie downs.

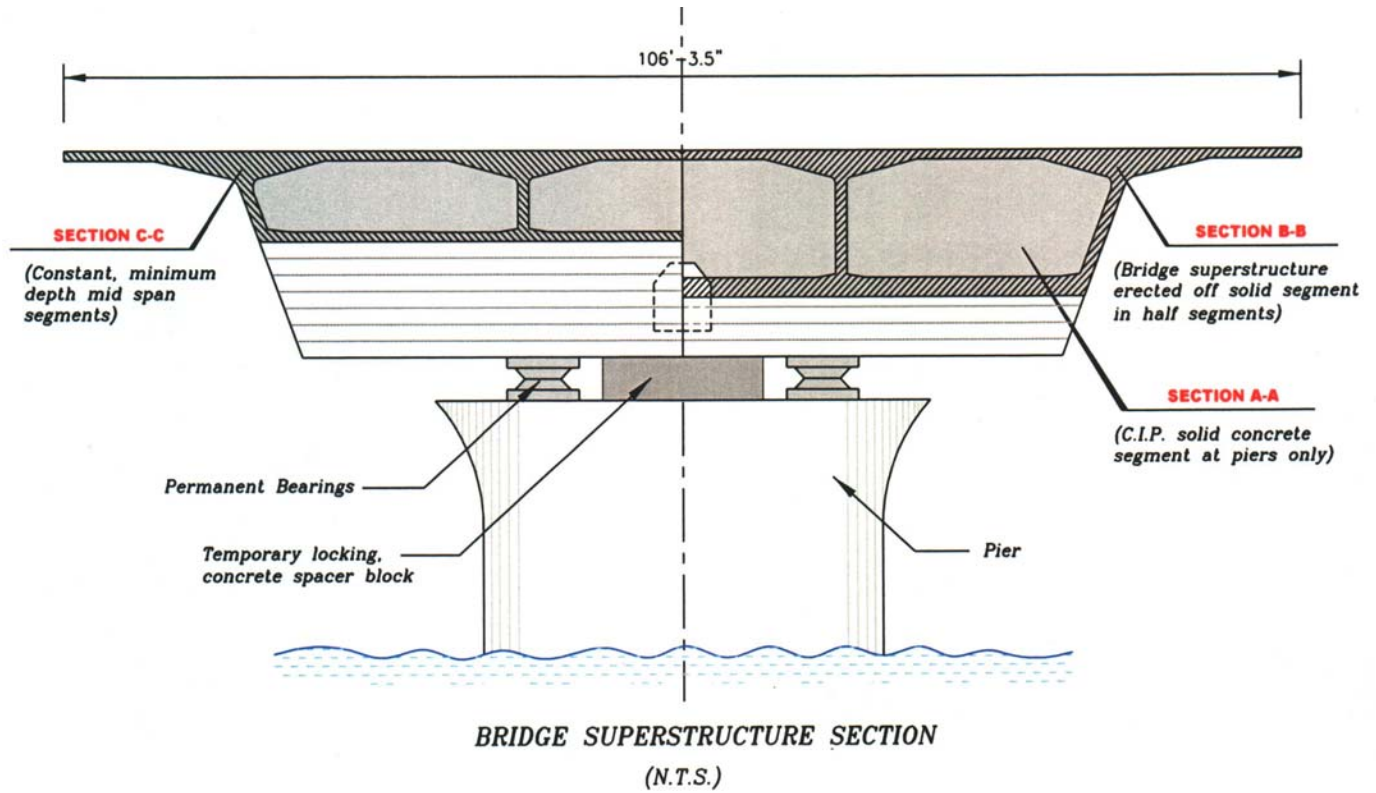
*Erection sequence.* Refer to the North Bridge Elevation above and you will see pier line 6 and pier line 7 with the fully balanced 12 segments about pier 6 and the progressing, balanced cantilever segments about pier 7, reaching segments stage number 6. The cantilever length from pier 6 to the free end, near mid span, is 150' (one half of a football field in length). Stabilizing this diving board is the condition where the 300' span between piers 5 and 6 is closed and continuous.

Correspondingly, the balancing act at pier 7 continues until the arms are fully extended, 12 segments each side

of pier 7, but freely balanced having no continuity with the rest of the superstructure. At this point, the two cantilever ends are clamped together with steel collars and formed, reinforcing set, and concrete placed, joining these two ends into a continuous beam. This process leapfrogs pier to pier until all ten 300' spans are closed and made continuous. The two end spans at each abutment are still 150' cantilevers which will be extended and landed on the two abutments, closing this 3300' long box girder superstructure.



Here we see the half segments in the storage yard. The segments are hoisted and delivered by a travel-lift to the twelve axel, flat bed truck for delivery to the barge at Port Manatee. From there to the construction site in Sarasota, the segments are waterborne.



*The variant:* Refer to the Bridge Superstructure Section above, right and the attendant notation. Section AA is taken at the centerline of Pier 6 and reveals a solid, cast in place, full foot print of the maximum bridge superstructure cross section. This slice of the bridge beam (section AA) is cast in place upon two permanent bearings and is structurally clamped to the pier through a temporary locking concrete spacer block (Bridge Superstructure section, above).

The variant is that these exceptionally wide segments are split in two, reducing the lifting weight to the barge mounted cranes which lift the half pieces to be sequentially attached to the preceding, erected, full segment (slice). The first segment is cast-in-place (CIP) atop each pier and the other segments are pre-manufactured (pre-cast) in Port Manatee and barged to the site in Sarasota for balanced cantilever erection (as shown about pier 7). Section BB indicates the progression

of variable depth half segment erection and Section CC depicts the shallow, constant depth, midspan sections. The midspan closure pour marries the now free ends of the cantilevers between Piers 6 and 7 providing full continuity. This process leapfrogs from the east and west shores until final closure is achieved at the middle span of the entire bridge.

Mr. Phillip Lang, P.E. Assistant Technical Director for T.Y. Linn International made arrangements for the County Engineering Staff to visit the site. Interestingly, this type of construction is soon to make its debut in incorporated Hillsborough County on the LeRoy Selman Expressway.



Names of attendees seen here are (from left to right): Walt Davis, Phillip Lang and Bob Patterson of T.Y.Lynn, Mara Nelson, Richard Sanders and Dee Nguyen on the back row and kneeling are Alex Piran, Nils Olsson, Felix Perez, all of Hillsborough County.

## Guest Commentary

### Comments about SPANS

Congratulations to the Bridge Team for your decision to start publishing your newsletter, SPANS. The article on the new Ringling Bridge in this Issue was very interesting and well presented. I look forward to future articles about the bridges around Hillsborough County.

Ever since I can remember, I have had a love affair with bridges. However, growing up in Atlanta, we had very few bodies of water large enough to require a bridge to cross. The single exception was the Chattahoochee River, which wound its way through the foothills on the North side of town. It was rich with Civil War history, and must have represented a formidable boundary separating the two armies. Over time, as population increased, they began to construct bridges for the major roads that crossed the river. Many of these roads were named after the owners of the ferries which previously had been the only way to cross the swift flowing Chattahoochee.

When my wife and I moved to Tampa in 1966, and discovered all the long bridges in the area, I thought I had died and gone to Heaven. Wow! I never thought they could build bridges so long. In Georgia we measured the length of bridges in feet. Here they seem to be measured in miles. I'm fascinated with all of them. However, the Old Gandy Bridge is my all time favorite. In fact, for the first year we lived in Tampa, about the only entertainment we could afford was to drive across the Gandy Bridge at day's end to see the sunset. As many times as we have driven across the Tampa bay in the thirty years since, I have never grown tired of it.

I'm sure that many of the bridges around Hillsborough County are rich with history, and I look forward to learning more about them. Also, maybe because I spent part of my career as an engineer, I really look forward to learning more about how bridges are designed and built.

Fact is, bridges are vital to the residents and visitors of Hillsborough County, yet most of us know very little about them. Future articles in SPANS will help all of us to become more aware of these valuable community assets.

Best Wishes,  
Earl Grantham

### Coming Issues:

- Hillsborough County Bridge Team Members' Profiles
- Description of County's 241 Bridges
- A profile of the 1926 Platt Street Twin Bascule Bridge
- A Profile of the 1926 Columbus Drive Swing Span Bridge
- Streetcars and Bridges

*This newsletter was produced by:*

Bridge Team  
Design and Engineering Support Section  
Public Works Department  
601 E. Kennedy Blvd. 23<sup>rd</sup> Floor  
Tampa, FL, 33701  
Phone number: (813) 272-5912



*Editor:*  
Nils Olsson, P.E., Bridge Team Leader  
Phone number :(813)-307-1844  
E-mail: [OlssonN@hillsboroughcounty.org](mailto:OlssonN@hillsboroughcounty.org)

*Assistant Editor:*  
Mara Nelson, E.I., Bridge Team

*Art/Technical Director:*  
Dee Nguyen, Bridge Team

**A Special Thanks to our  
Guest Commentator:**

**Earl Grantham**  
Property Manager  
Real Estate Department  
Hillsborough County