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CONNECTING COMMUNITIES

Access. Mobility. Progress.

S.R. 826/Palmetto Expressway and S.R. 836/Dolphin Expressway Interchange Reconstruction

(FIN No.: 249581-1-52-01)

FTBA Structures Session *February 19, 2013*



Project Team

D6 South Miami-Dade Resident Engineer

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Contractor

Community Condotte de Moya Joint Venture

Designer of Record

BCC Engineering/C3TS/Finley

Project Overview

Design Considerations and Challenges

Project Status

Project Overview

History



Palmetto/SR 826 constructed in the 1950's

Project Overview

History



- Originally constructed as a four-lane divided expressway
- 12 foot travel lanes, unpaved shoulders and 40 foot median
- Expanded in the 1970's

Project Overview

History

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- Palmetto reconstruction began in mid 90's as a 12 Section master plan
- Interchange Project (Section 5) is final section



**Aerial view of SR 826/
SR 836 Interchange
looking north**

Project Overview

Section 5



S.R 826/S.R. 836 Interchange Reconstruction Project

- Partnership between the Florida Department of Transportation (FDOT) and the Miami-Dade Expressway Authority (MDX)
- Construction Cost: \$559 million
 - FHWA- \$275.4 mil.
 - MDX- \$196.5 mil.
 - ARRA- \$79 mil. (+\$10 mil CEI)
 - JPA- \$8.1 mil.
- Design-Build awarded in September 2009
- Construction Schedule: Nov. 2009 - 2015*

**Note: Schedule could change because of extreme weather conditions or other unforeseen circumstances.*

Project Overview

Section 5



Project limits: SR 826 (SW 8 St. – S. of NW 25 St.)
SR 836 (NW 87 Ave. - NW 57 Ave.)

Scope of Work

- Reconstruction and adding lanes on SR 826 and SR 836, Doubling capacity. (42.0 – 95.7 lane miles)
- Four level interchange with 45 new bridges, including four segmental direct connection flyovers
- Adding collector distributors with connector ramps
- Reconstruction of interchanges at Flagler & Milam Dairy Rd
- Bridges over NW 7 St and NW 82 Ave for future connections
- Signalization, lighting and landscaping throughout
- New ITS components for real time traffic updates

Project Overview

By The Numbers



- 180,000 tons of asphalt
- 16 miles of bridge beams
- 760,000 square feet of retaining walls
- 35,000 linear feet of guardrail
- 5.7 miles of concrete walls separating traffic lanes
- Longest Span- 266 feet
- Tallest Pier- 81 feet
- 6.8 million tons of dirt moved (300,000 dump truck loads)
- 30 miles of concrete pile 16 miles of drainage pipe
- 8,636 tons of reinforcing steel
- 781 total segments for 4 segmental bridges
- 59 Subs. (95% Florida firms)

Project Overview

Animation

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Project Overview

Design Considerations and Challenges

Project Status

Design Challenges

Horizontal Restrictions

- Limited ROW, constrained work zone
- Maintaining traffic control and transitions
- Placement of bridge piers
- Span lengths
- North Line Canal



Design Challenges

Temporary Traffic Control Plans



- 430,000 daily vehicle trips
- Maintain traffic flow while reconstructing interchange
- Open work zones to provide volume of work to allow completion of the project in reasonable amount of time

Design Challenges

Vertical Restrictions- Profile Issues

- *Interchange in the glide path for MIA runway 9R / 27L*
- *Constrains maximum height of interchange*
- *Temporary traffic plans have to account for vertical curve transitions and overhead clearance limitations on multi-level interchange.*



Design Challenges

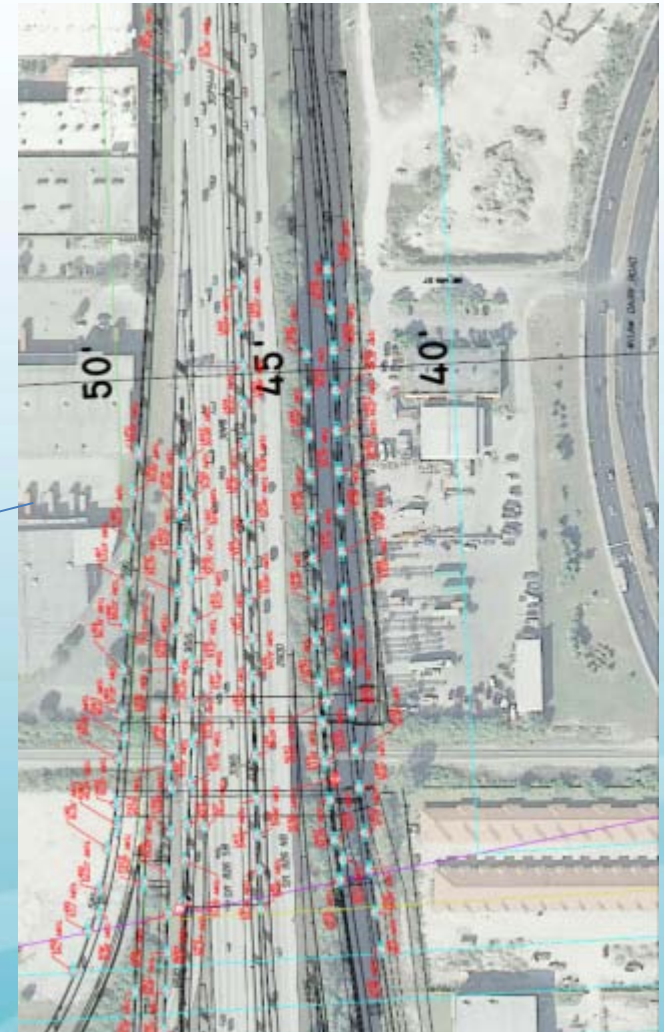
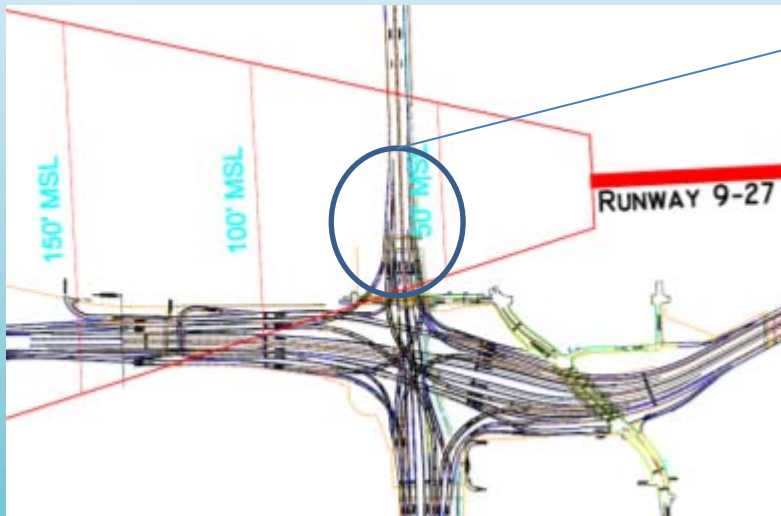
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Proximity to MIA

- *TERPS surface 1:40 slope up from the end of the runway*
- *Required close coordination with MDAD and FAA to evaluate obstructions and obtain approval without impact to airport operations*
- *Constant coordination required during construction.*



Design Challenges

Vertical Restrictions

- Staging operations and crane permit
- Permanent Sign Structure placement and heights
- Permanent Lighting



Design Challenges

Permitting

- South Florida Water Management District
- DERM
- Manatee protection
- Realignment of the North Line Canal- Parallel to 826
- Maintain water flow during construction



Design Challenges

Project Coordination

- Utilities
- CSX Railroad
- Permitting agencies
- FAA / MDAD
- Sub-consultants
- Contractors
- FDOT
- MDX



Design Challenges

Future Projects

- Provide envelope for future MDT Metrorail line crossing SR 826 south of the core of the interchange
- Provide connections for future managed lanes flyovers to / from the south to the east
- Provide possibility for future connections of NW 7th St. under SR 826 and NW 82nd Ave. under SR 836

Project Overview

Design Considerations and Challenges

Project Status

Project Status

Schedule

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Construction Start:

November 30, 2009

Anticipated Completion:

July 2015

Elapsed Time:

56.14%/ 1148 out of 2045 days

Amount Earned:

61.27%/ \$342,620,239 of \$558,181,029

As of January 2013 Estimate

Project Status

Demolition



- *Milam Dairy Bridge over SR 836 and small bridge over NW 8th.*
- *Flyover- Westbound SR 836 to southbound SR 826 bridge*
- *Other minor bridges*
- *A total of 20 bridges will be demolished*



Project Status

Foundations

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- 144 out of 212 foundations completed- 68%
- 1827 out of 2427 piles driven to date- 75%



Project Status

Columns & Caps

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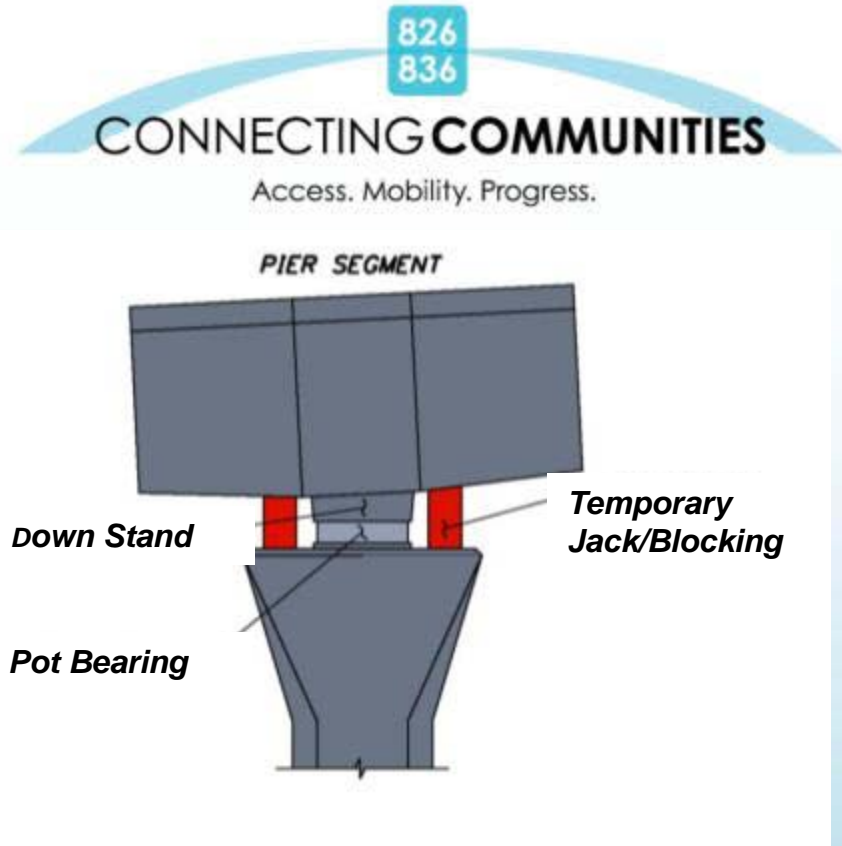
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- *Columns solid from base to 1st pour*
- *Polystyrene from 1st pour to below cap*
- *Solid Cap-Flared to eliminate false work*
- *Loop tendon and pier segment tie down contained within cap*

Project Status

Columns & Caps

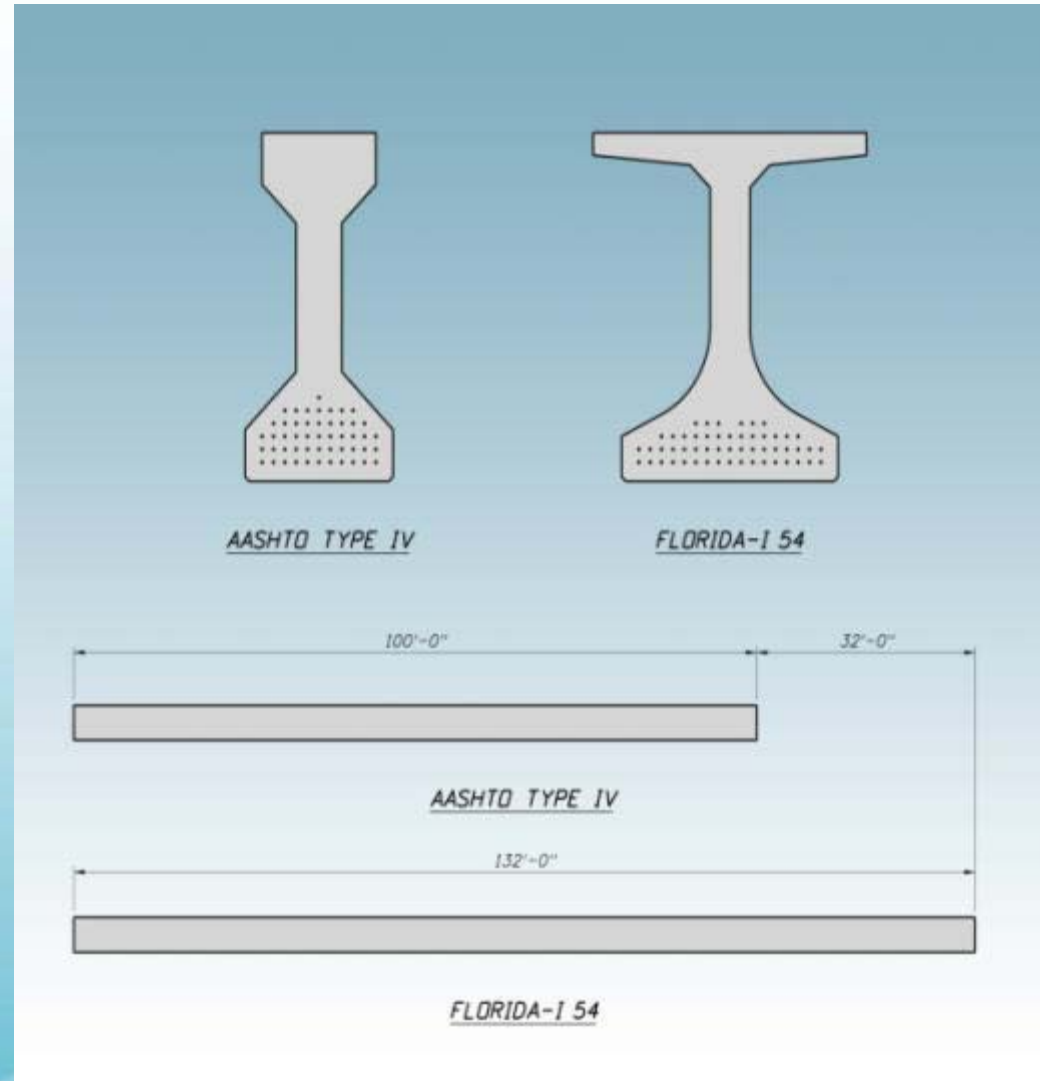


*81 out of 120 columns
completed – 67.5%*

Project Status

Florida I-Beams

- *Introduced to the FDOT Standards in 2009*
- *Various types of FIB sizes used: FIB-36", 45", 54", 63", 72" & 78"*
- *Allows for longer spans, lower profiles and/or elimination of beam lines compared to their AASHTO counterparts*
- *More stable during fabrication, shipping and construction*



Project Status

Florida I-Beams

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178 feet – Longest FIB used (Bridge # 20)

Project Status

Steel Beams

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*Total of four steel bridges,
two placed to date*

Project Status

Bridge Decks



*To date:
461,881 SF of bridge
decking out of 1,085,367
completed- 42.6%*

Project Status

MSE Walls

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*430,228 SF of MSE wall out
of 738,958 constructed-
58.2%*



Project Status

Segmental Bridges

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Segmental Details:

- 360,718 square feet of deck area
- 7,763 linear feet of bridge
- Longest span 266' and tallest pier 81 feet
- Number of segments 781

Bridge 9 – 2,310 feet long, 46 feet wide

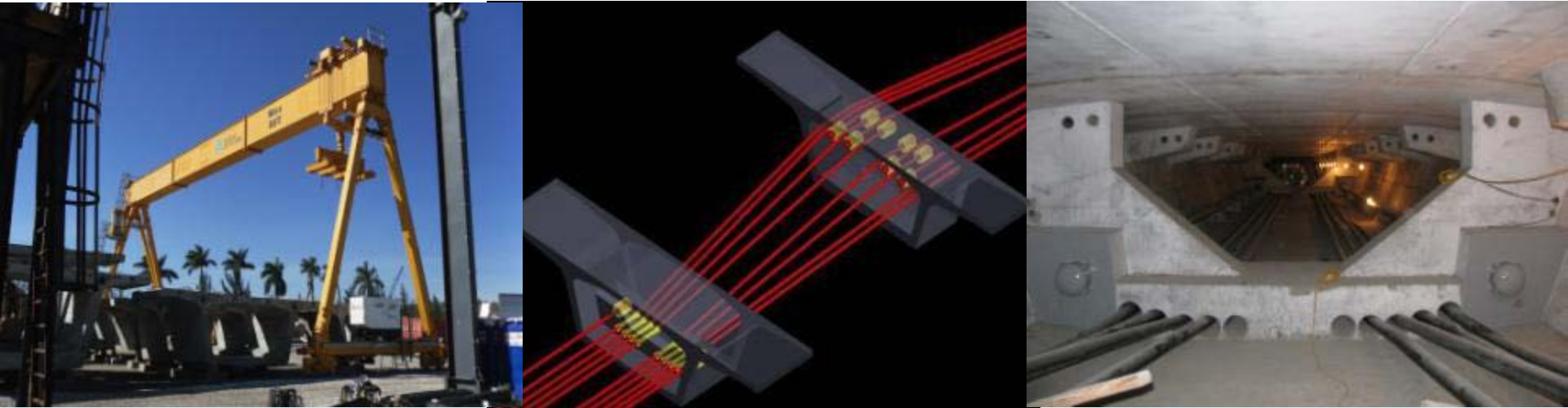
Bridge 15 – 1,100 feet long, 46 feet wide

Bridge 11 – 1,785 feet long, 46 feet wide

Bridge 19 – 2,540 feet long, 46 feet wide

Project Status

Segmental Bridges



- *Variable depth segments (haunch girders) allows for:*
 1. *Keep maximum ceiling lower for FAA/MDAD glide path*
 2. *Reduces weight/Increases span length*
 3. *Box Depth varies from 9 to 12 feet*
- *Height restrictions for transportation of segments*
- *Weight restrictions – 90^T (due to existing casting yard segment handler)*
- *Diabolos used to eliminate sharp/hard points on tendons (First in Florida)*
- *External continuity post-tensioning (lighter segments)*

Project Status

Segmental Precast Yard

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A total of 520 of 783 segments have been cast to date

Project Status

Segmental Bridges 11 & 15

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- *Two of four Segmental bridges fully erected*
- *Bridge 11 opened to traffic on January 18, 2013*

Project Status

Segmental Gantry

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Launching gantry- 460 feet long, 475 tons

Project Status

Segmental- Gantry

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Aerial Pictures

Casting Yard- *Beam, Wall Panel and Pile*

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Aerial Pictures

Flagler Interchange

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Aerial Pictures

NW 7 Street Corridor

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Aerial Pictures

Milam Dairy Interchange

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Aerial Pictures

SR 836 Bridge (#2) over CSX Rail

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Aerial Pictures

SR 836 West- Bridges over 82 Ave.

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Aerial Pictures

Interchange Core- Bridge 11

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Aerial Pictures

Interchange Core- Bridges 12, 15 & 20

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QUESTIONS?