

2019 Southeast Bridge Preservation Partnership Meeting

April 16 - 18, 2019



Prepared by:

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FDOT Office of Maintenance

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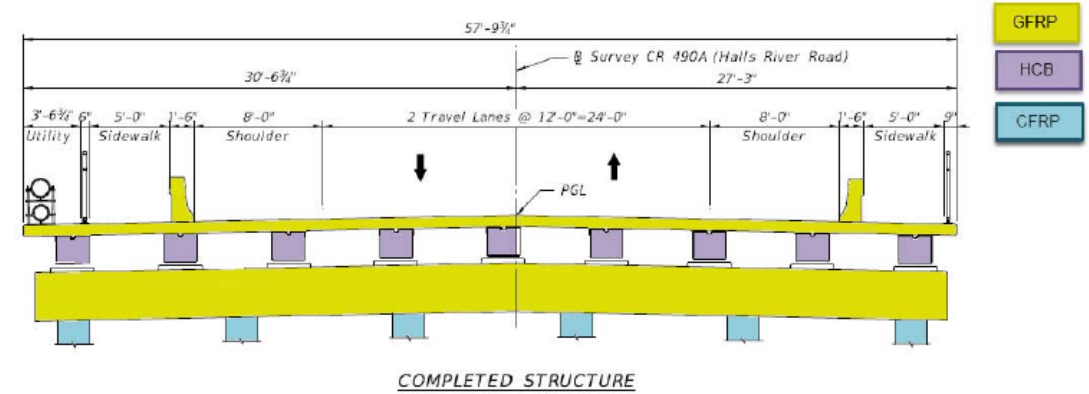
(850) 410-5516

Halls River Bridge Replacement Project

Corrosion Free Design with FRP Composites

Outline:

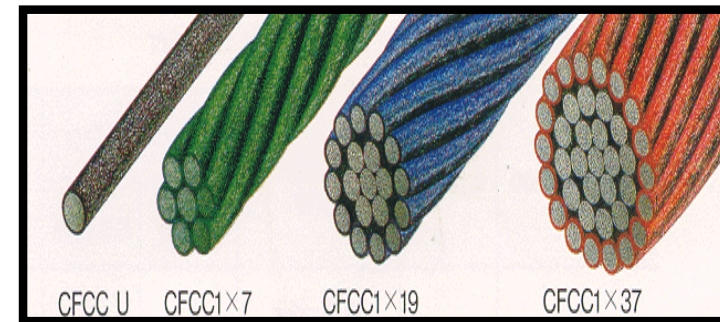
1. Project Overview
2. CFCC Prestressed Piles
3. CFCC Prestressed Sheet Piles
4. Hybrid Composite Beams
5. GFRP Bent Caps
6. GFRP Deck



Glass Fiber Reinforced (GFRP) Bars

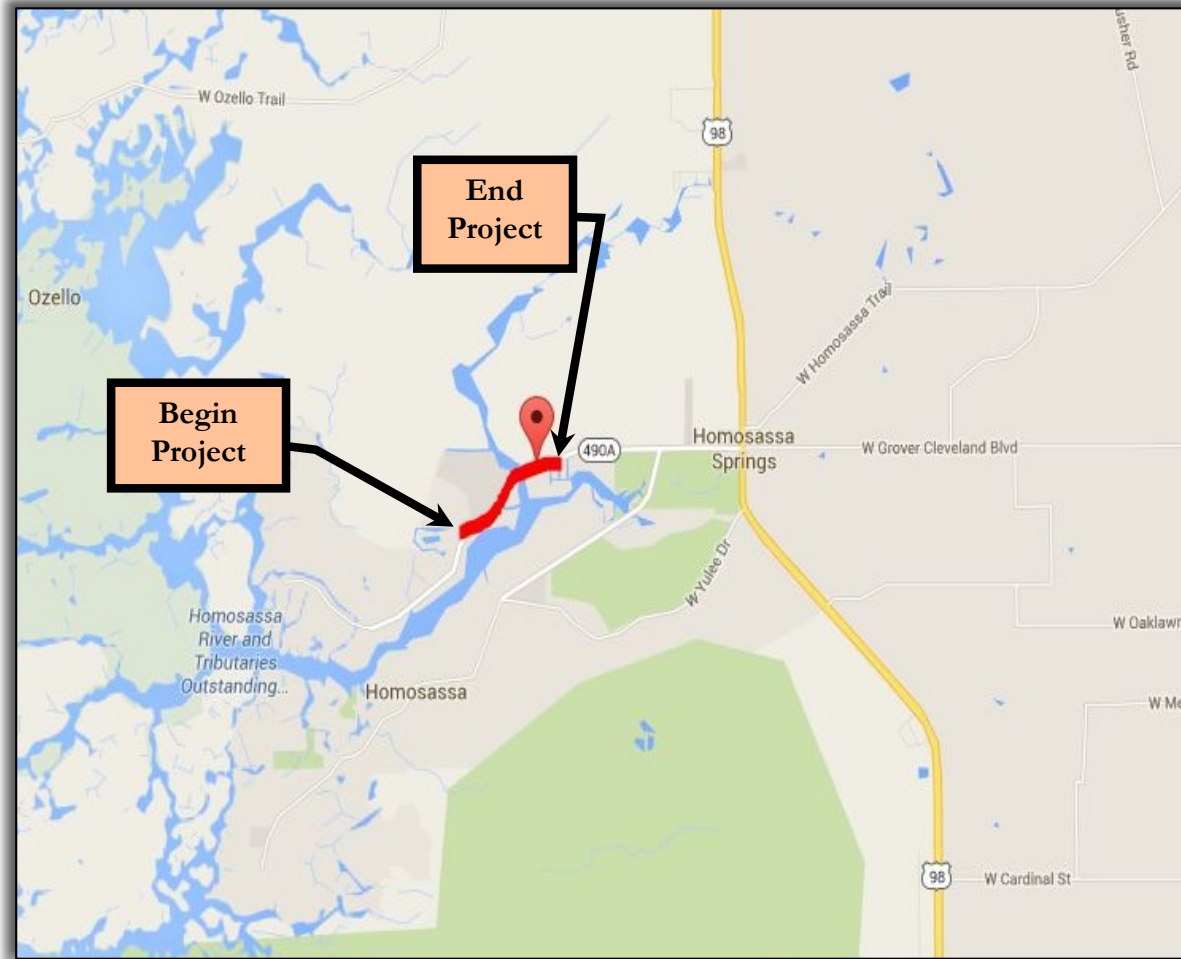
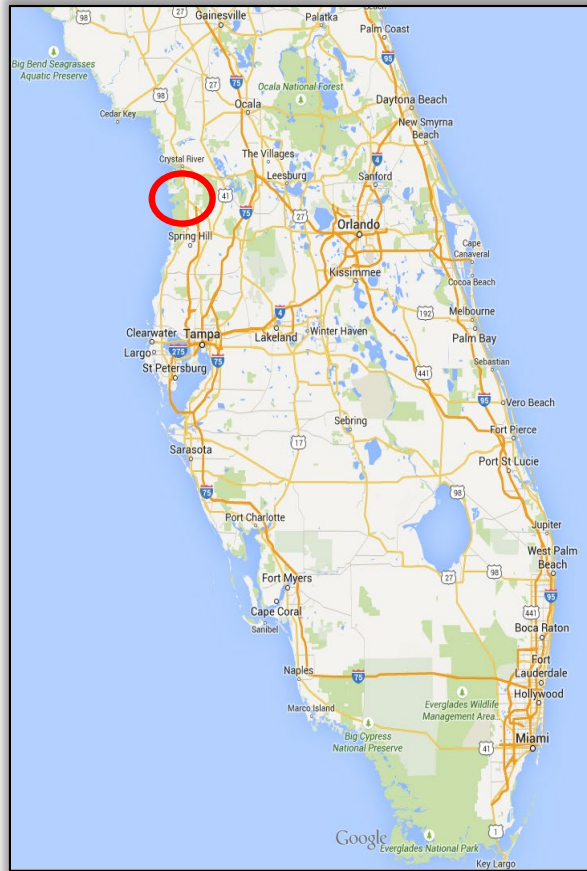


Carbon Fiber Composite Cable (CFCC)

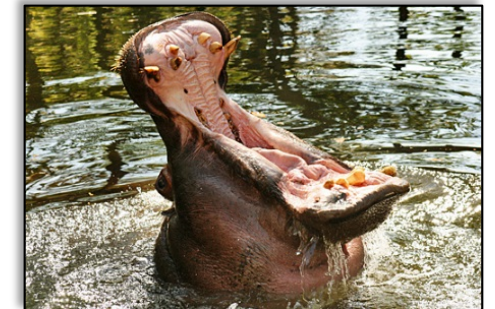


1. Project Overview

Project Overview



Wild Manatees reside in the park year round.



Lu the hippo, honorary citizen of Florida since 1991.

Project Overview

Designer: FDOT District 7 Structures Design Office

Bridge EOR: Mamunur Siddiqui, P.E.

Bulkhead/Seawall EOR: Richard Hunter, P.E. (ACE)

FDOT Developmental Standards EOR: Steven Nolan, P.E.



**Owner &
Maintaining
Agency**



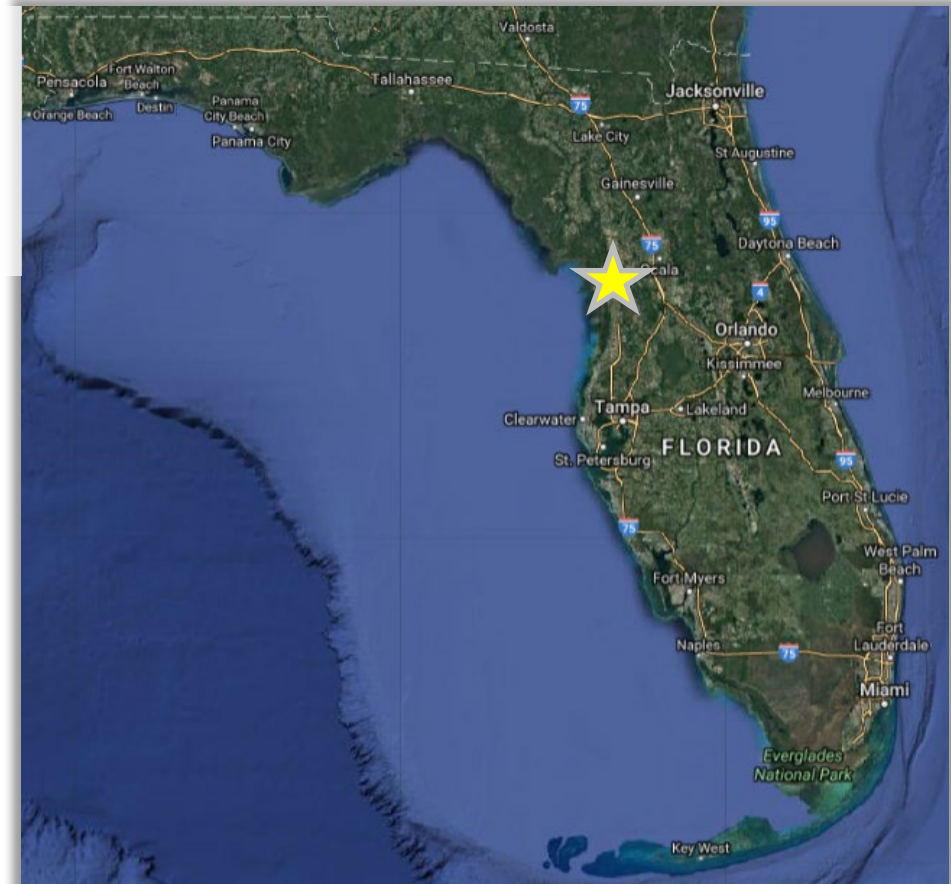
**Collaboration
Research**



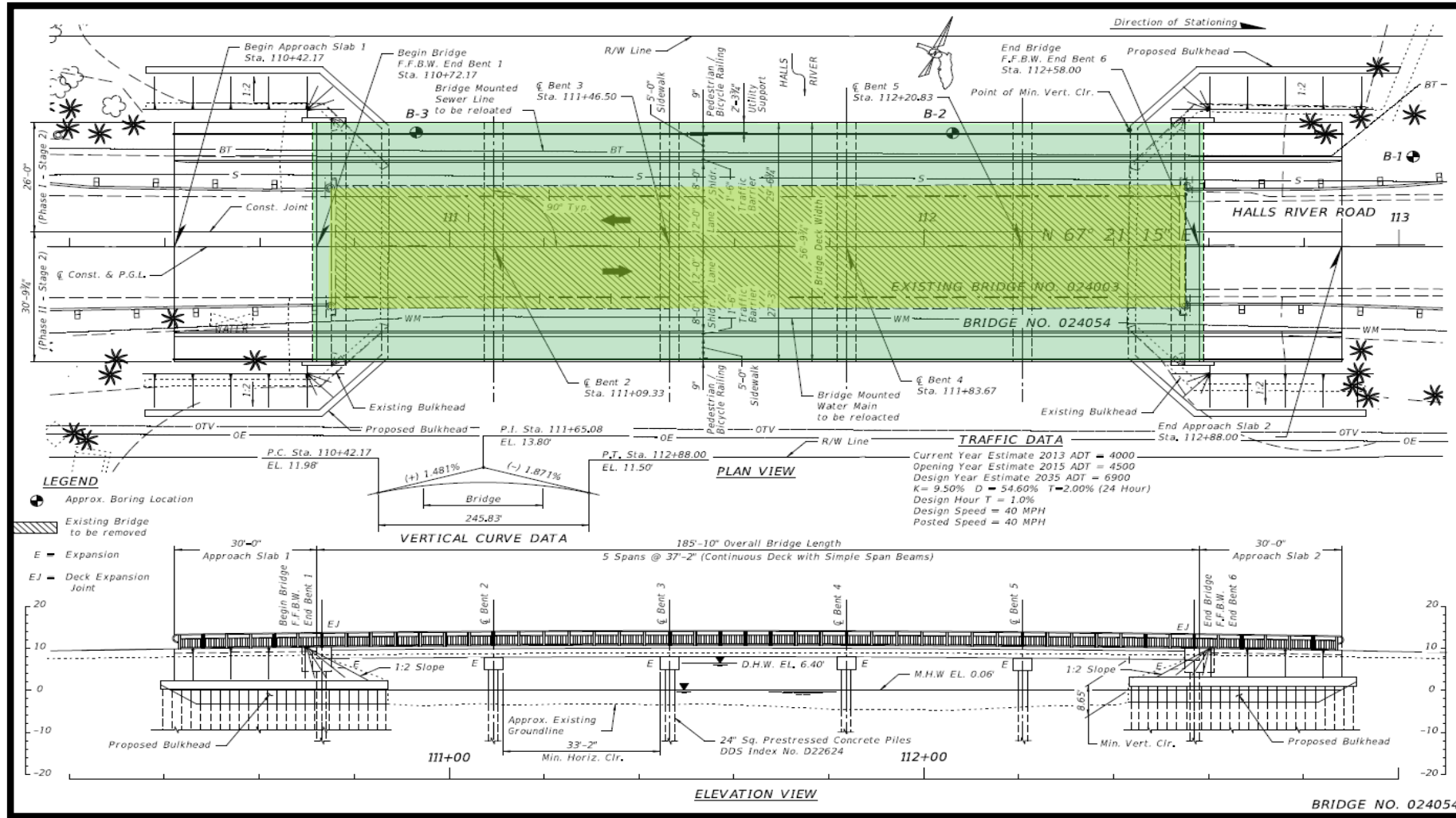
**Design & Bi-Annual
Inspection**



Funding & Oversight



Project Overview



Project Overview



2. CFCC Prestressed Piles

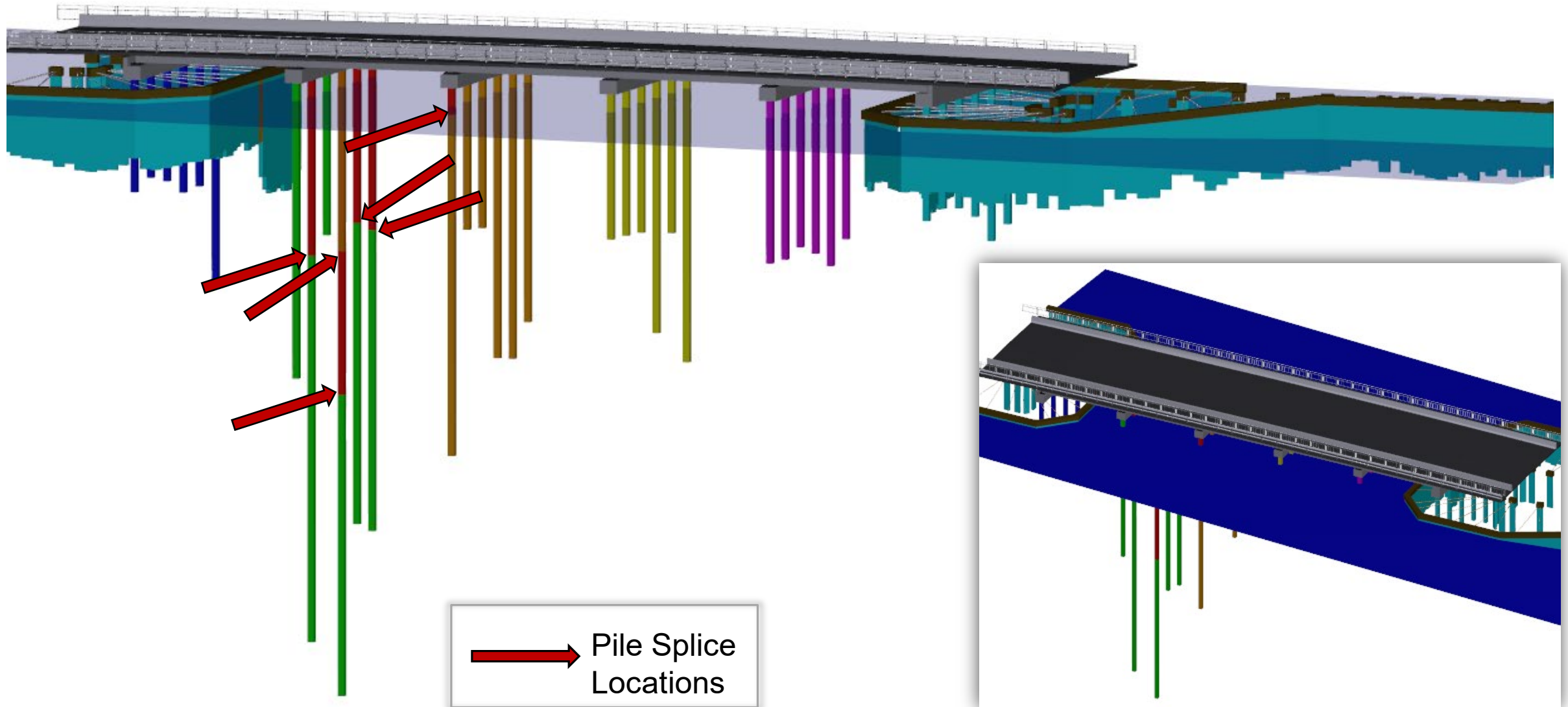
CFCC Prestressed Piles



CFCC Prestressed Piles

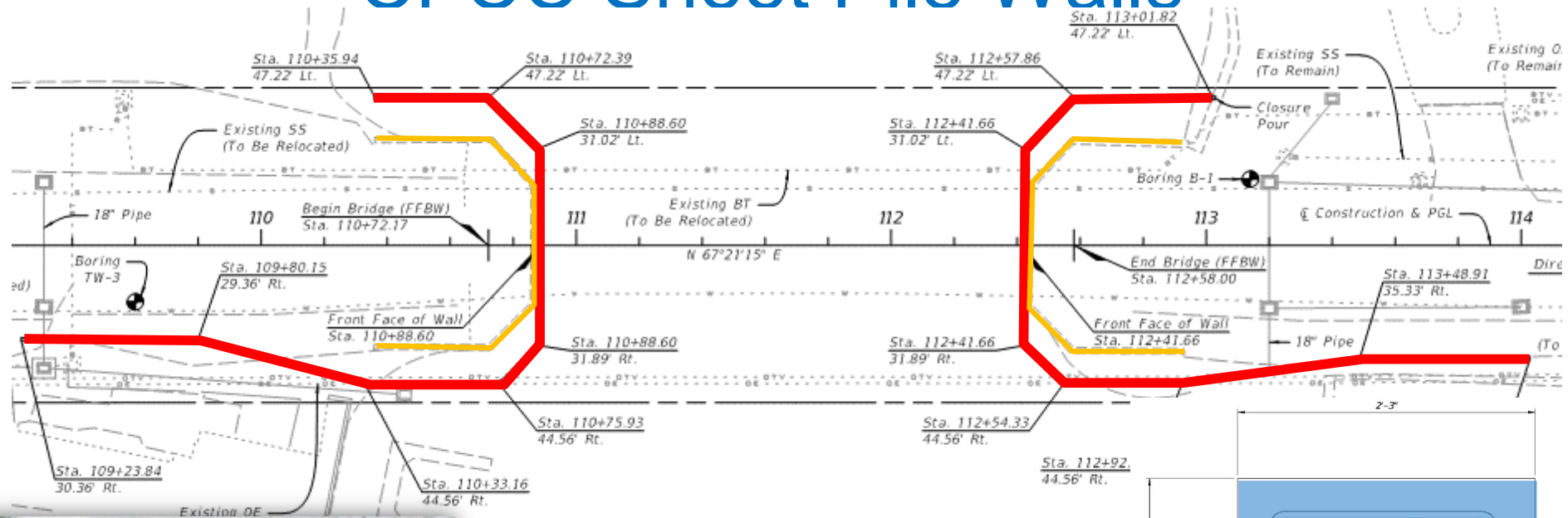


Final Prestressed Piles As-Built

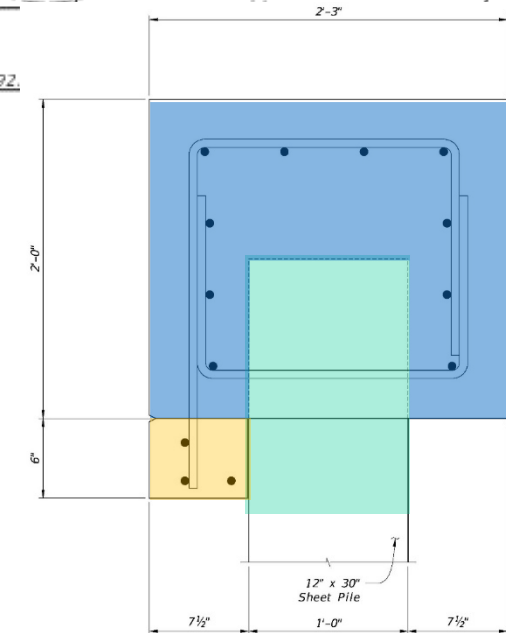


3. CFCC Prestressed Sheet Piles

CFCC Sheet Pile Walls



CFRP/GFRP SHEET PILE WALL LAYOUT



SECTION A-A

GFRP

CFCC /
CFRP

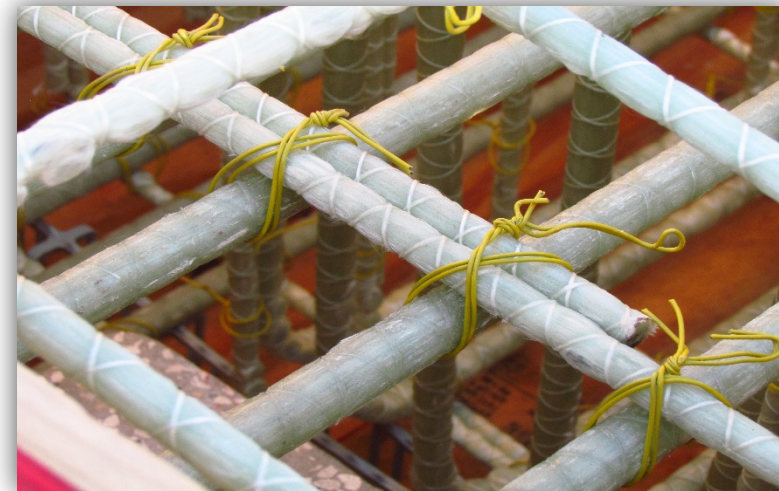
Test
Block

CFCC Sheet Pile Walls



5. GFRP Bent Caps

GFRP Bent Caps

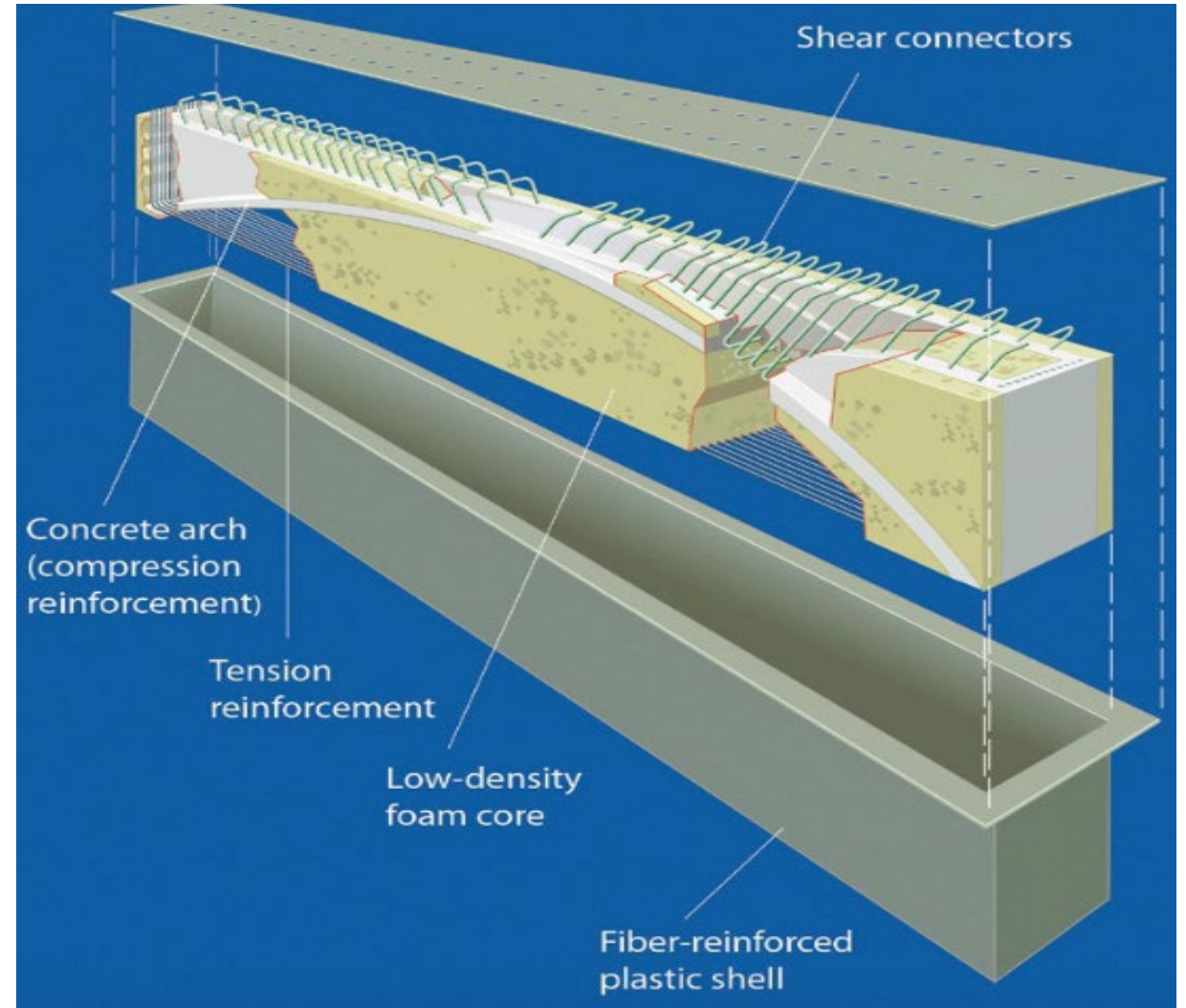
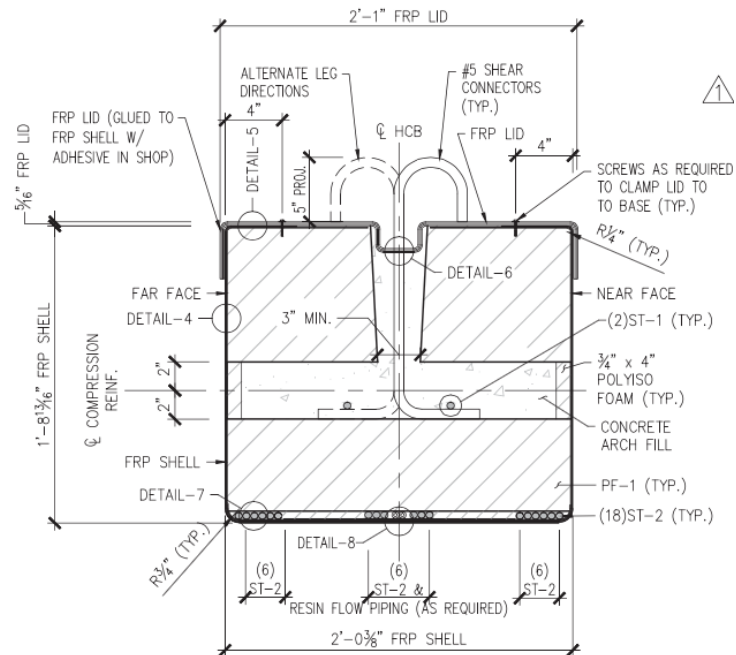


4. Hybrid Composite Beams

Hybrid Composite Beams

HCB Components

- i. Wings vs. No wings
- ii. CIP compression arch
- iii. GFRP Shell
- iv. Strands
- v. Shear connectors



Hybrid Composite Beams



6. GFRP Deck

GFRP Deck



GFRP Deck



Summary

Experimental Project with Innovative Materials – First in Florida

- Superstructure: Hybrid Composite Beams; GFRP Bars: Deck, Barriers & Approach Slabs
- Substructure: CFRP Pre-stressed Piles; Bent Caps: GFRP Bars
- Sheet Pile Walls: CFRP Sheet Piles; Wall Cap: GFRP Bars

Contractor Bid Cost - \$6.1 Million (Structures = \$3.7 Million)

- Bridge Cost = **\$221 / sq. ft.**
(Conventional Construction = **\$166 / sq. ft.**)

Accelerated Construction

- Lighter Materials – Beams and Rebar
- Faster Transportation and Delivery – reduced construction time

Questions ?

