

FDOT Transportation Innovation Initiative: FRP – Design Innovation



Fast
Facts:
Glass
Fiber
Reinforced
Polymer

Project Location: FDOT District Five
Flagler Beach, Florida

Agency: Florida Department of Transportation

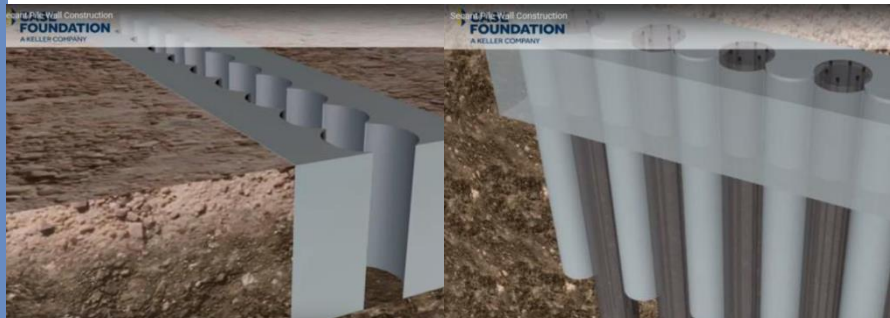
URL: <http://www.fdot.gov/structures/innovation/FRP.shtm>

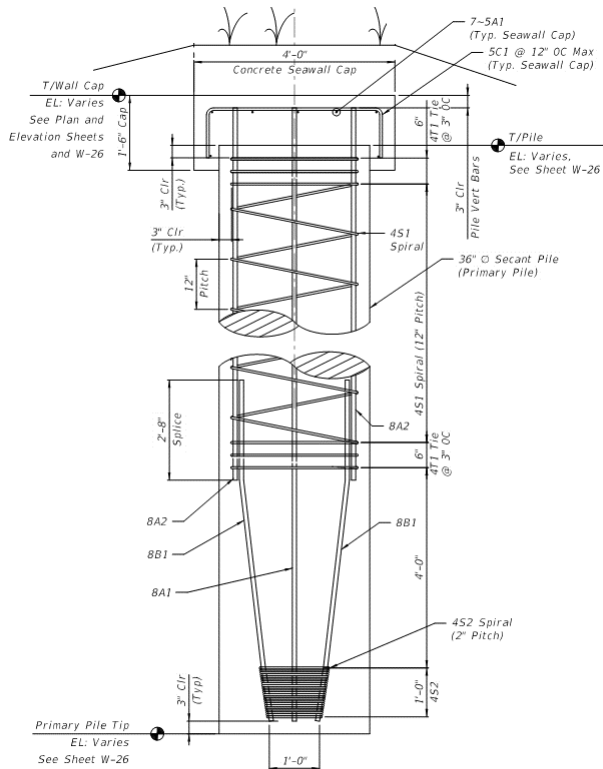
Project Name: SR A1A – Flagler Beach Seawall
FPID: 440557-7-52-01
Contract: T5641

Project Description: Construction of secant pile seawall behind beach dunes to protect SR A1A

Project Purpose & Need: Severe corrosion damage of existing steel sheet pile bulkhead and extensive damage and erosion of adjacent sand dune systems, most recently from hurricane Matthew, which undermined SR A1A.

Overall Budget/Cost Estimate: \$12,000,000





PRIMARY PILE & CAP SECTION (SHOWN)
(INTERMEDIATE PILE SIMILAR WITH SINGLE CENTER BAR ONLY)

Project Start Date/Substantial Completion Date:
2/4/2019 – Oct. 2019

What was unique about this project?

- 4920’ length of Secant Pile seawall with GFRP reinforcement long-term durability and additional corrosion protection in an extremely aggressive environment.
- First FDOT project with greater than one million linear feet of GFRP reinforcing bar.

Describe Traditional Approach: Traditional approach includes installation of Grade 60 steel rebar with supplemental cementitious material or ternary blends for additional concrete durability.

Describe New Approach: Utilization of GFRP bars in lieu of traditional Grade 60 steel rebar in the secant pile which are tipped in a high chloride content sand and water table, and periodically exposed to salt spray when exposed.

SUMMARY OF WALLS

WALL NO.	PAY ITEM NO.	PAY ITEM DESCRIPTION	LOCATION STA. TO STA.	SIDE	UNIT	QUANTITY	
						P	F
W1 Thru W11	0400-4-11	Class IV Concrete (Retaining Wall Cap)		Rt	CY	864.0	
	415-10-5	Fiber Reinforced Polymer Bars, #5			LF	61892.0	
	455-112-6	Pile Auger Grouted, 36" Diameter			LF	51724.0	
		#5 GFRP Reinforcing Bars	approx.		FT	300,000	
		#8 GFRP Reinforcing Bars	approx.		FT	960,000	

PAY ITEM NOTES

455-112-6 Include Cased Continuous Flight Auger, FRP Reinforcing, Guide Wall Install and Removal, and Soil Removal.

Innovations Employed: Utilization of GFRP bars within a coastal marine environment.

Primary Benefits: Longer service life of the secant pile wall.
Realized/Expected

Affiliations:

PE Consultants:	RS&H, Mott MacDonald Florida, LLC
Construction Contractor:	Superior Construction Southeast
Drilling Contractor:	Malcom Drilling Co., Inc.
Construction Engineering Inspection:	Atkins
Project Contacts: Seawall Engineer of Record:	Lowry J. Denty, P.E. (Mott MacDonald Florida, LLC)
FDOT Project Manager:	Ty Garner (HNTB) FDOT District Five Ty.Garner@dot.state.fl.us



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