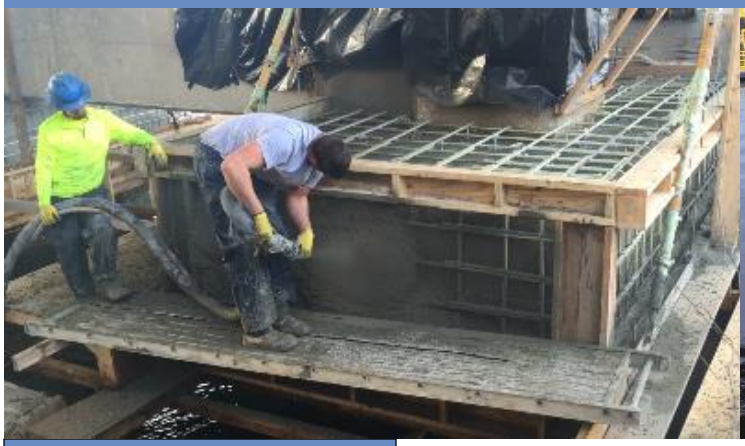
FDOT Transportation Innovation Initiative:

FRP – Design Innovation



Fast Facts:

Glass Fiber Reinforced Polymer

Project Location:	FDOT District Two Duval County Jacksonville, Florida
Agency:	Florida Department of Transportation
URL:	http://www.fdot.gov/structures/innovation/FRP.shtm
Project Name:	US-17 (SR-5) Over Trout River Bridge No. 720011 FPID: 426169-1
Project Description:	Bridge Substructure Rehabilitation
Project Purpose & Need:	Bridge Inspection Reports identified concrete deterioration in the substructure. Work activities included removal of existing Pile Jackets and installation of new Pile Jackets and Pier Footing Jackets with Impressed Current Cathodic Protection (ICCP). Glass Fiber Reinforced Polymer (GFRP) dowels and reinforcement were used in select locations.

Overall Budget/Cost Estimate: $2,759,262.00 (Construction Contract)

What was unique about this project?

No. 4 GFRP bars with epoxy were embedded into existing Pier Footings 9 and 10 to attach the new Footing Jacket to the existing Pier Footer. The Pier 10 Footing Jacket included No. 6 GFRP reinforcement.

Shotcrete (pneumatically applied concrete), was used to apply concrete to Pier 9 and Pier 10 Footings to form the Pier Jacket. However, due to problems with concrete quality issues, the shotcrete was removed from the Pier 10 footing and the process of forming the jacket and pouring concrete was used. This provided an opportunity to explore removal of concrete from FRP bars. Below are the list of pilot projects incorporated:

- GFRP bars used in conjunction with Shotcrete
- GFRP bars used in the splash zone
- GFRP bars used with traditional pour in place construction methods

Describe Traditional Approach: Traditional approach includes installation of grade 60 steel rebar in conjunction with cast-in-place concrete.

Describe New Approach: Utilization of GFRP bars in lieu of traditional grade 60 steel rebar in a variety of settings, including in conjunction with Shotcrete; in the splash zone; with traditional pour in place construction methods; and removal of concrete from GFRP bars.

Top Innovations Employed: Utilization of GFRP bars within the splash zone/marine environment

Primary Benefits Realized/Expected: Lifted the restrictions on use of GFRP bars within the splash zone/marine environment. The restriction was in place due to reaction of GFRP bar resin with chlorides

Project Start Date/Substantial Completion Date: 5/4/2014 – 3/26/2016

Affiliations:	PE Consultant:	Stantec Consulting Services Inc.
	Construction Contractor:	Coastal Gunite Construction Company
	Construction Engineering Inspection:	JEA Construction Engineering Services
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