FDOT Transportation Innovation Initiative:
FRP – Design Innovation

Project Location: Duck Key, Florida
Agency: Monroe County
URL: http://www.fdot.gov/structures/innovation/FRP.shtm

Project Name: Bimini Drive Bridge Replacement
Bridge No. 904603 (Existing)
Bridge No. 904613 (New)

Project Description: Replace bridge and bulkhead seawalls

Project Purpose & Need: Bridge Inspection Reports identified poor condition rating of the substructure, superstructure, and deck due to corrosion. Work activities included roadway approaches, replacement of existing bridge, retaining walls and bulkheads while maintaining the historic character of the bridge. Foundation utilizes CFRP/SS-PC 18” Square Piles as well as a new seawall with a GFRP-RC cap.

Fast Facts:
B/GFRP Reinforcing & CFRP/HSSS Prestressing Strands

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What was unique about this project? FRP reinforcement is used in the bulkhead cap, and CFRP or HSSS in the prestressed concrete piles located in the splash zone, to reduce future maintenance requirements.

Describe Traditional Approach: Traditional approach includes installation of grade 60 steel rebar in a cast-in-place bulkhead cap and precast pile stirrups, and prestressing with ASTM A416 carbon-steel strands.

Describe New Approach: Utilization of GFRP bars in lieu of traditional carbon-steel rebar in the bulkhead cap, and prestressing with CFRP strands or HSSS strands with CFRP or SS spirals, respectively for confinement.

Top Innovations Employed: Utilization of FRP or SS bars and corrosion-resistant prestressing within the splash zone/marine environment.

Primary Benefits Realized/Expected: Longer service life of the bulkhead-seawall and bridge foundation.

Project Start Date/Substantial Completion Date: 1/1/2021 – 7/1/2021 (estimated)

TABLE OF FRP RELATED QUANTITIES:

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAY ITEM NO.</th>
<th>PAY ITEM DESCRIPTION</th>
<th>UNIT</th>
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Affiliations: PE Consultant: KCA
Construction Contractor: TBA
Construction Engineering Inspection: TBA

Project Contacts: Engineer of Record: Austin Black, P.E. KCA

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