

FDOT Transportation Innovation Initiative: FRP – Design Innovation

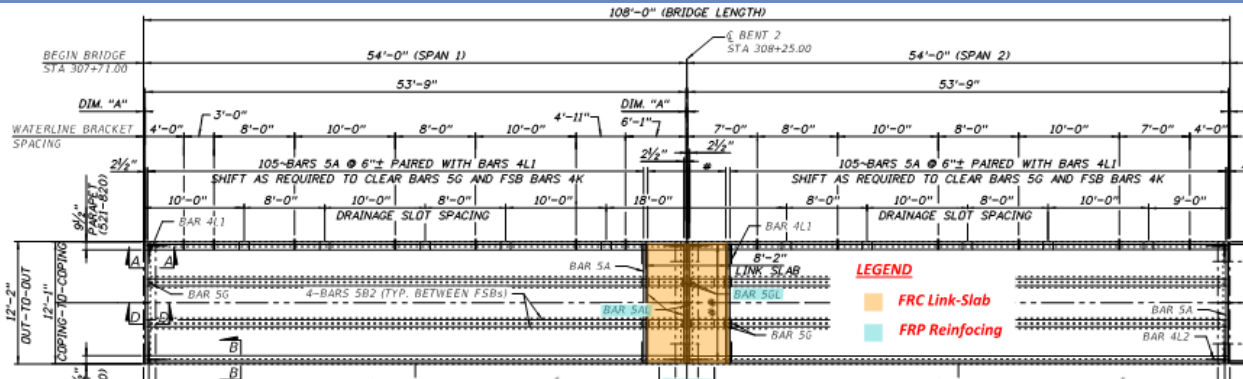


Figure 1: PLAN VIEW AT MORNING STAR WATERWAY

Fast Facts: Glass Fiber- Reinforced Polymer



Project Location:	FDOT District One Charlotte County Port Charlotte, Florida
Agency:	Florida Department of Transportation
URL:	http://www.fdot.gov/structures/innovation/FRP.shtm
Project Name:	SR45 (US41) over Morning Star and Sunset Waterways Bridge No(s). 019003 & 019004 FPID: 435390-1-52-01
Project Description:	Two new Shared-Use Trail FSB bridges with GFRP-FRC and GFRP-UHPC link- slabs.
Project Purpose & Need:	Develop link-slab details for Florida Slab-Beams (FSB), Instrument and Monitor with the use of FRP reinforcing to refine design criteria.
Overall Budget/Cost Estimate:	\$1,133,000 (Bridges) \$3,733,000 (Total)

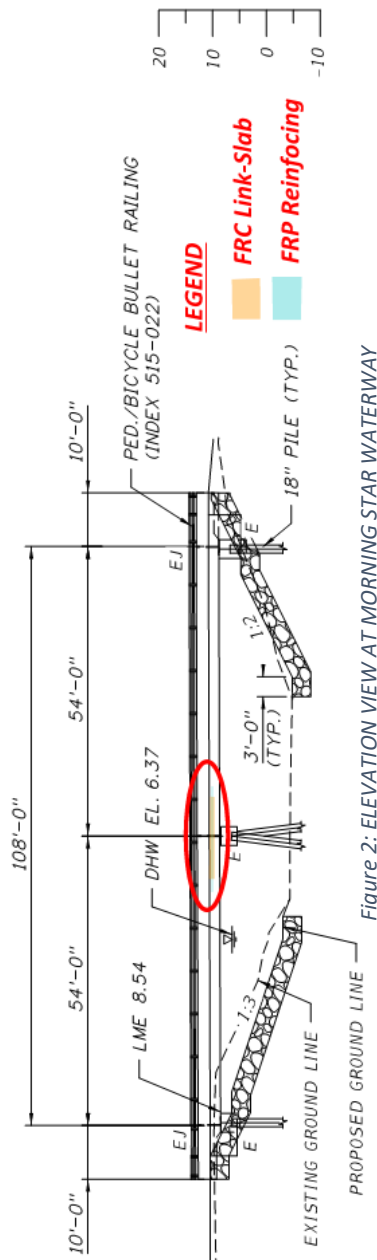


Figure 2: ELEVATION VIEW AT MORNING STAR WATERWAY

What was unique about this project?

First GFRP-FRC link-slab and first GFRP-UHPC link-slab in Florida.

Describe Traditional Approach:

Traditional approach includes an open joint at the end of each FSB span. For slab-on-girder bridges nominal reinforcing using #5's at 6-inch spacing and a transverse tooled or early age saw cut joint used to control crack propagation above the intermediate piers. This was found not to be effective with slab-beam units, presumably due to the high degree of shrinkage restraint.

Describe New Approach:

Utilization of low modulus GFRP bars and fibers in the concrete, with appropriate debonding limits above the prestressed slab interface should improve performance. The UHPC joint will utilize a thin (4") depth to further reduce the rotational stiffness and offset its higher elastic modulus. If cracks do develop, the concern for corrosion is eliminated by the use of FRP reinforcing.

Top Innovations Employed:

Utilization of GFRP bars within fiber-reinforced concrete and UHPC. Adoption of link-slabs to provide lateral load distribution and eliminate intermediate support expansion joints, without significantly restricting superstructure rotation at the support that could otherwise create secondary forces and cracking stresses.

Primary Benefits Realized/Expected:

Longer service life of the bridge deck, elimination of expansion joint maintenance, and better transfer of lateral loads due to deck continuity.

Project Start Date/Substantial Completion Date:

August 2019 – July 2020

Affiliations:

PE Consultant: FDOT District One.
 Construction Contractor: ANZAC Contractors, Inc.
 Construction Engineering Inspection: Target Engineering Group, LLC

Project Contact:

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