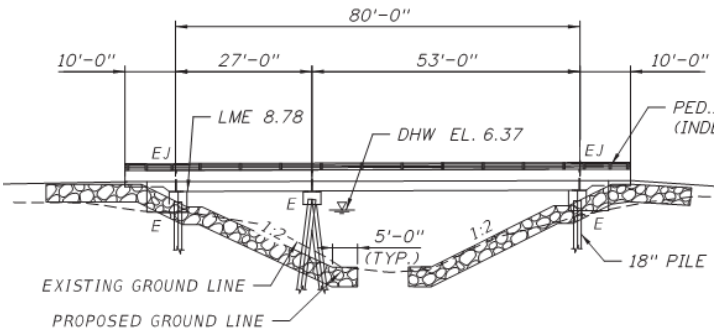
FDOT Transportation Innovation Initiative:

UHPC – Design Innovation



Fast Facts:

Ultra-High Performance Concrete

Project Location: FDOT District One
Port Charlotte
Charlotte County, Florida

Agency: Florida Department of Transportation

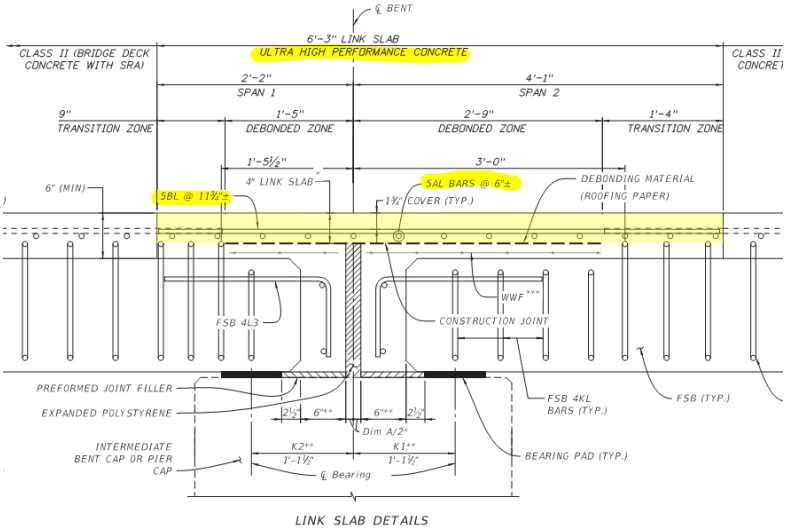
URL: http://www.fdot.gov/structures/innovation/UHPC.shtm

Project Name: US 41 Pedestrian Bridge over Sunset Waterway
Bridge No. 019004
FPID: 435390-1

Project Description: UHPC-GFRP reinforced link-slab for two-span FSB pedestrian bridge.

Project Purpose & Need: Current FDOT FSB details require simple span construction with expansion joints at intermediate foundation supports, due to the prevalence of uncontrolled localized deck cracking. The use of a thinner UHPC link-slab will result in less rotation restraint under live load and less visible cracking resulting in a more robust and durable connection. GFRP reinforcement provides less rotational stiffness and avoids corrosion concerns across cracks that may occur.

Overall Budget/Cost Estimate: $4,200,000 (Construction Contract)
$ 10,000 (GFRP-UHPC Link-Slab)



918 349	ULTRA-HIGH PERFORMANCE CONCRETE		CY	2.00
400 2 47	CONCRETE CLASS II, CIP TOPPING WITH SHRINKAGE REDUCING ADMIXTURE		CY	33.00
415 1 4	REINFORCING STEEL-SUPERSTRUCTURE		LB	6750.00
415 10 5	FIBER REINFORCED POLYMER BARS, #5		LF	470.00

What was unique about this project? First use of UHPC with GFRP rebar, and first FSB UHPC link-slab for FDOT.

Describe Traditional Approach: For slab-on-girder and PSU bridges, the deck was cast continuously over the simply supported precast units with prescriptive reinforcing requirements. No bond breaker is used at the ends of the precast units. Currently FSB's must use expansion joints at each support, due to significant cracking observed with the previous PSU intermediate support details.

Describe New Approach: Continuous decks will be permitted with the use of a link-slab incorporating UHPC with GFRP rebar and debonding details.

Top Innovations Employed: Utilization of UHPC connections for robust continuous decks without intermediate expansion joints.

Primary Benefits Realized/Expected: Longer maintenance-free service life from UHPC connections; elimination of unnecessary expansion joints; and load sharing of lateral and longitudinal forces for increased foundation design efficiency.

Project Start Date/Substantial Completion Date: 08/27/2019 – August 2020

Affiliations:	PE Design:	FDOT District One
	Construction Contractor:	TBA.
	Construction Engineering Inspection:	TBA
Project Contacts:	Engineer of Record:	Andra Diggs, P.E. (FDOT)
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