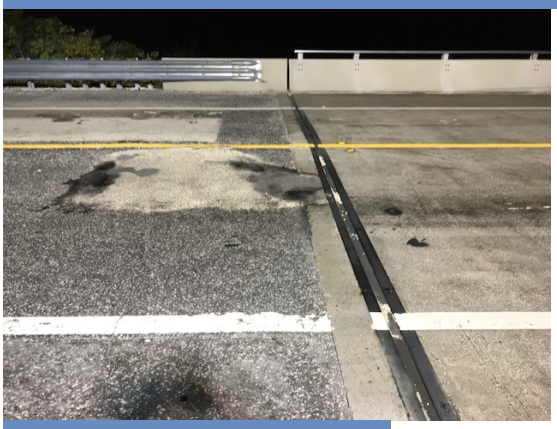
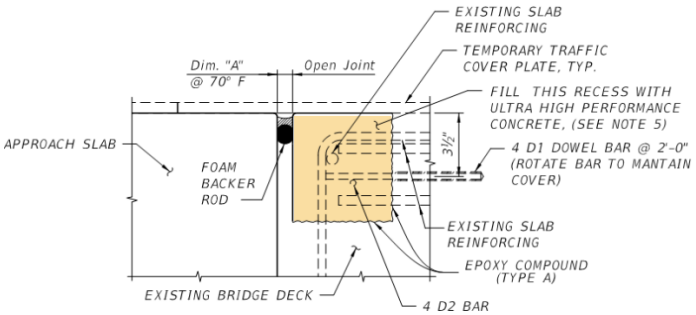
FDOT Transportation Innovation Initiative:

UHPC – Design Innovation





PROPOSED EXPANSION JOINT DETAIL

Fast Facts:

Ultra-High Performance Concrete

Project Location: FDOT District Six
Little Duck Key
Monroe County, Florida

Agency: Florida Department of Transportation

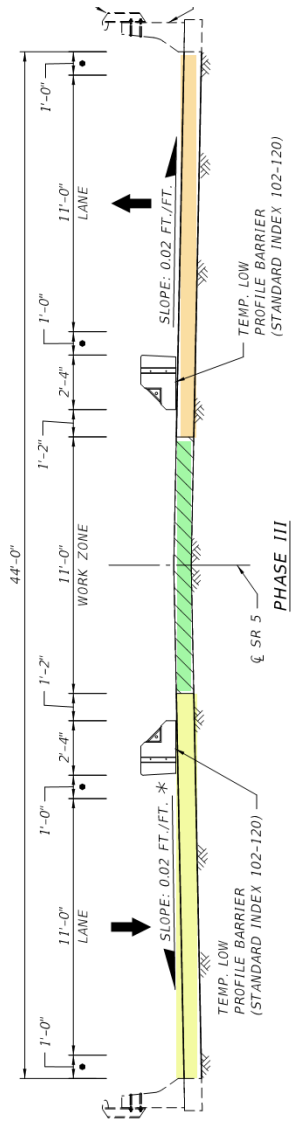
URL: http://www.fdot.gov/structures/innovation/UHPC.shtm

Project Name: SR5 (US-1) over Missouri Little Duck Key Channel
Bridge 900103
FPID: 436344-2-52-01

Project Description: Approach Slab & Expansion Joint replacement.

Project Purpose & Need: SR 5/US 1 is a critical and vital corridor for the FL Keys. The bridge approach slab and transverse expansion joint nosing are being replaced, while maintaining two lanes of traffic. The UHPC is being used to reach adequate strength for the expansion joint nosing on the existing bridge deck in order to expedite opening the lanes to traffic.

Overall Budget/Cost Estimate: $550,000 (Construction)



What was unique about this project? This is one of the first applications of UHPC for expansion joint replacement nosing.

Describe Traditional Approach: A traditional approach requires a polymer concrete nosing.

Describe New Approach: UHPC will be used in the transverse expansion joint nosing, replacing the armor angle or polymer concrete nosing for the poured silicon seal joint.

Top Innovations Employed: UHPC connections will be used for the rapid replacement of a deteriorated approach slab and expansion joint on a US highway hurricane evacuation route.

Primary Benefits Realized/Expected: UHPC connections are more robust and offer a longer service life. An accelerated construction duration will minimize impact to motorists while providing a strong structural solution. Construction will use limited lane closure periods.

Project Start Date/Substantial Completion Date:
June 2020 – October 2020

ITEM NUMBER	ITEM DESCRIPTION	UNIT	43634425201	43634425201 BR# 900103
0110- 3-	REMOVAL OF EXISTING STRUCTURES/BRIDGES 43634425201 900103	(LS)		1.000
0400- 2- 10	CONCRETE CLASS II, APPROACH SLABS	CY		67.700
0415- 1- 9	REINFORCING STEEL- APPROACH SLABS	LB		7828.000
0458- 1- 21	BRIDGE DECK EXPANSION JOINT, REHABILITATION, POURED JOINT WITH BACKER ROD	LF		94.000
0918-349- 4	ULTRA HIGH PERFORMANCE CONCRETE- UHPC, PROJECT 436344-2-52-01	CY		1.200

Affiliations:
PE Consultant: ASA Consultants, Inc.
Construction Contractor: American Empire Builders, Inc.
Construction Engineering Inspection: RS&H, Inc

Project Contacts:
Engineer of Record: Soheila Sadough, P.E.
ASA Consultants, Inc.

FDOT Project Manager: Jason Chang
FDOT District 6
jason.chang@dot.state.fl.us