



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Field Demonstration-Instrumentation and monitoring of Accelerated Repair Using UHPC Shell
University	FIU
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$60,000 Match Funds: \$30,000
Total Project Cost	Total Funds: \$90,000
Agency ID or Contract Number	Accelerated Bridge Construction University Transportation Center (ABC-UTC) 69A3551747121
Start and End Dates	March 2019-April 2021
Brief Description of Research Project	<p>Recently Florida International University (FIU) has developed repair techniques that are capable of repairing damaged bridge elements using Ultra High Performance Concrete (UHPC). Technique is applicable to both flexural and axially dominated bridge elements. U.S. transportation infrastructure consists of more than 60,000 miles of coastal roadways. Significant number of bridges located along these coastal roadways are subject to harsh environment resulting in corrosion and other damages. In addition to bridges located in the coastal areas, other bridges located in-land, also contain damages that need development of accelerated repair techniques. Several methods are currently used by bridge owners for repairing damaged bridge elements that include, wrapping damaged portions of bridge elements with Fiber Reinforced Polymers (FRP), steel jacketing and wrapping using conventional concrete. The Accelerated UHPC shell retrofit technique developed at FIU has many advantages over the existing retrofit techniques: A) UHPC is a very durable material with a very low permeability; B) the high compressive and tensile strength of UHPC strengthen the damaged bridge elements, in fact, the retrofit technique should be referred to as upgrade technique, since the end product could be stronger than even original bridge elements; and C) the properties of UHPC allow tension development of steel reinforcement over a short length, in case some of the reinforcement in the retrofitted areas needs replacement. Extensive investigation has been carried out at FIU to develop retrofitting techniques using UHPC shell concept for both flexural and axial bridge elements. In both cases damaged bridge elements could be repaired using UHPC over damaged elements.</p>

	<p>Additional consideration on the corrosion durability of this retrofitting technique will be considered. Incipient anodes that result in the “Halo” effect is currently being investigated. The main objective of this project is to select an existing in-service bridge with damaged column element, retrofit it using UHPC shell, using cast in place technique, instrument it and monitor it to identify deterioration of the repair and substrate material as well as development of corrosion of steel within the column.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here</p>	<p>The outcomes will be tracked and reported once they are identified.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>The impacts will be tracked and reported once they are identified.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>https://abc-utc.fiu.edu/field-demonstration-instrumentation-and-monitoring-of-accelerated-repair-using-uhpc-shell/</p>