



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Use of UHPC in Conjunction with Pneumatic Spray Application and Robotic for Repair and Strengthening of Culverts- Phase I
University	FIU
Principal Investigator	Dr. Atorod Azizinamini
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$30,000 Match Funds: \$15,000
Total Project Cost	Total Funds: \$45,000
Agency ID or Contract Number	Accelerated Bridge Construction University Transportation Center (ABC-UTC) 69A3551747121
Start and End Dates	2021/01/01- Active
Brief Description of Research Project	<p>Many Culverts are in need of replacement or repair. Developing an approach for strengthening these structures without interrupting traffic, will greatly assist State DOTs. This project is Phase I of an initiative to develop a method and means for repair and strengthening of existing substandard culverts using ultra high performance concrete (UHPC) and automation, through robots and utilizing pneumatic spray application in order to reduce the need for excessive labor and human intervention which will lead to an accelerated repair technique. Phase I is limited to developing information, identifying parameters and factors, needed consideration and developing the roadmap and paving the way to conduct future phases of the investigation. The scope of this project will be limited to understand the problem in detail and developing a roadmap for conducting systematic research in phases that could ultimately lead to the development of an effective and automated method for strengthening existing substandard culverts. Among the issues to be understood, before undertaking detail research in future phases are: (1) Major types of culverts that need to be strengthened. Concrete, steel, and aluminum culverts will be studied in terms of the bond between the culvert material and UHPC. The main target for this proposal will be concrete pipe culvert. (2) Identifying properties of UHPC needed for strengthening culverts. This should lead to the development of UHPC more suitable for culvert strengthening application and could reduce the cost. (3) Identifying methods and means for field application of UHPC in the field that could involve pneumatic spray application and automation.</p>

<p>Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here</p>	<p>This is an active research project. Upon completion, outcomes will be reported.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>Vermont AOT expressed interest in using outputs of this research to address deficiencies of multiple VT culverts that lack upgrade alternatives.</p>
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project website	<p>https://abc-utc.fiu.edu/research-projects/fiu-research-projects/use-of-uphc-in-conjection-with-pneumatic-spray-application-and-robotic-for-repair-and-strengthening-of-culverts-phase-i/</p>