



ACCELERATED BRIDGE CONSTRUCTION  
UNIVERSITY TRANSPORTATION CENTER

<b>UTC Project Information</b>	
Project Title	More Choices for Connecting Prefabricated Bridge Deck Elements
University	
Principal Investigator	Mohamed Moustafa
PI Contact Information	mmoustafa@unr.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$80,000 Match funding:\$40,000
Total Project Cost	\$120,000
Agency ID or Contract Number	69A3551747121
Start and End Dates	01/2018-08/2020
Brief Description of Research Project	<p>Prefabricating bridge elements and systems (PBES) offers major time savings, cost savings, safety advantages, and convenience for travelers. According to the FHWA, the use of PBES is also solving many constructability challenges while revolutionizing bridge construction in the US. In the past decade, innovative PBES connections have been evolved and many of these connections used Ultra-High performance concrete (UHPC). UHPC has superior mechanical properties and durability. However, some of the limitations associated with UHPC wide spread use include: the very expensive price tag, the expertise needed to work with UHPC, it is labor intensive, and most of the robust mixes are currently proprietary. Several DOTs see the proprietary nature of UHPC leads sometimes to sole-sourcing and in turn, bidding issues. Thus, there is a growing interest nowadays to find other alternatives and choices for PBES connections. The goal of this project is to identify potential alternatives to replace UHPC in prefabricated bridge deck elements and ABC seismic and non-seismic connections. These alternatives can include special or advanced grout, polymer concrete, fiber concrete, etc. One selected material or alternative will be tested for at least two different prefabricated bridge deck elements or ABC connection types. The research objectives of this study are: (1) collect and select potential alternative materials (e.g. polymer concrete) to replace UHPC in prefabricated bridge deck element connections; (2) characterize the material and mechanical properties of selected alternatives; (3) conduct large-scale testing to study the response of the alternative materials as</p>

	used in structural ABC applications (mainly for joining deck panels as an implementation case study).
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	<ul style="list-style-type: none"> <li>• Research project results on use of polymer concrete were provided per request of east coast bridge owner</li> <li>• Transpo Industries provided polymer concrete for research project</li> </ul>
Impacts/Benefits of Implementation (actual, not anticipated)	The impacts will be tracked and reported once they are identified.
Web Links <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project website</li> </ul>	<a href="https://abc-utc.fiu.edu/research-projects/unr-research-projects/more-choices-for-connecting-prefabricated-bridge-elements-and-systems-pbes/">https://abc-utc.fiu.edu/research-projects/unr-research-projects/more-choices-for-connecting-prefabricated-bridge-elements-and-systems-pbes/</a>