



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Shake Table Testing of Precast UHPC Bridge Column with ABC Seismic Connection
University	UNR
Principal Investigator	Mohamed Moustafa
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$97,000 Match Funds: \$48,500
Total Project Cost	\$145,500
Agency ID or Contract Number	ABC-UTC (Project No: UNR-2016-5-02)
Start and End Dates	June 1, 2022 to August 31, 2023
Brief Description of Research Project	<p>It is a well-known fact that UHPC is one of the most commonly used or desired solutions for ABC connections nowadays. With more vendors entering the US market and large initiatives for developing non-proprietary UHPC mixes (e.g. ABC-UTC or PCI initiatives), the applications and use of UHPC for ABC will only continue to grow and increase. Some of the emerging applications include full structural members such as bridge girders and full columns. The FHWA is working on mega-girders that would incorporate UHPC and large prestressing strands to reach spans up to 300 ft. Meanwhile, at UNR, several projects have focused on full UHPC columns but mostly under axial loading and only few explored seismic columns. Seismic UHPC columns could provide practical solutions for important bridges in high seismic zones where low-damage designs are desired. ABC seismic connections have been also emerged but yet to be coupled with full UHPC columns. Thus, this project will fill a knowledge gap and investigate the dynamic behavior of full UHPC columns with ABC seismic connections. One or two large-scale columns will be tested at one of the shake tables at UNR under earthquake excitations. The test specimen(s) will consider a full precast UHPC column connected to a conventional reinforced concrete footing using a seismic ABC connections. Two types of connections will be explored to select the most promising one and use for the UHPC column specimens. These are the socket connection and UHPC-filled grouted ducts.</p>

	<p>The specific objectives of this project are to: (1) explore different ABC seismic connection options for precast UHPC columns; (2) design and construct full precast conventional concrete footing and UHPC columns to assemble test specimen(s); and (3) conduct uniaxial shake table testing for test specimen(s), i.e. full UHPC column with ABC connection, to investigate for the first time the dynamic and structural response of such application for future bridge columns.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here</p>	<p>This project is active. The outcomes will be reported once identified.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>This project is active. The impacts/benefits will be reported once identified.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>https://abc-utc.fiu.edu/12639-2/?preview=true</p>