



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Large-scale Implementation of Semi-proprietary UHPC with virgin and recycled fibers for full precast bridge columns
University	UNR
Principal Investigator	Mohamed Moustafa
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Funding Source(s) and Amounts Provided (by each agency or organization)	\$100,00(ABC-UTC) \$50,000 (Matching Fund)
Total Project Cost	\$150,000
Agency ID or Contract Number	69A3551747121
Start and End Dates	May 1, 2023 - May 31, 2024
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 buildings columns under axial loading and only few explored bridge or seismic columns. On the other hand, none of our previous work or any other large-scale research work has considered actual precast facilities for construction scale UHPC implementation nor considered practical UHPC mixtures such as semi-proprietary UHPC with local sand and cement. Overall, 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, which is the focus of an ongoing ABC UTC project at UNR from cycle 5. Thus, this project will extend the ongoing exploratory project and provide a significant collaboration with a CA bridge precast facility to implement semi proprietary UHPC using local CA sand and cement at a construction scale for bridge columns fabrication. Two types of steel fibers will be used: virgin and recycled tires fibers in an attempt of also providing a green</p>

	<p>and economic UHPC solution for structural applications. The fabricated columns will be grouped into two categories: (1) axial circular columns with varying confinement details to be tested at the 4000-kip facility at UC Berkeley, and (2) seismic bridge columns with ABC connections and varying steel fibers to be tested at UNR</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>Large-scale Implementation of Semi-proprietary UHPC with virgin and recycled fibers for full precast bridge columns Accelerated Bridge Construction (fiu.edu)</p>