



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Envisioning Connection detail for Connecting Concrete Filled Tube (CFT) columns to cap beam for High Speed Rail Application
University	FIU
Principal Investigator	Azizinamini, Atorod
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$50,000 Match Funds:\$25,000
Total Project Cost	Total Funds: \$75,000
Agency ID or Contract Number	Accelerated Bridge Construction University Transportation Center (ABC-UTC) 69A3551747121
Start and End Dates	March 2019- June 2021
Brief Description of Research Project	<p>American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specification, through AASHTO SCOBS T-14 committee (Steel Bridges) have recently developed design provisions for use of Concrete Filled Tube (CFT) columns for bridge elements, such as columns in substructure. In the case of High Speed Rail (HSR), about 60 to 70% of the HSR infrastructure consists of elevated bridge structures. In one recent case in California, a segment of the High-Speed Rail (HSR) consists of elevated bridge structures with spans of about 110 to 150 ft. with columns, ranging in height from very short to as tall as 100 ft. Use of pre-fabricated sub-structure elements could significantly reduce cost and expedite the HSR project delivery. U.S. DOT has identified the use of HSR as a strategic area for addressing mobility challenges. Development of an efficient substructure system for HSR is therefore urgent and will result in significant savings. The recent adaptation of CFT columns by AASHTO LRFD Bridge Design Specification is a first step. Development of efficient substructure system for HSR using CFT columns, demands development of cap beam system and their connection to CFT columns. This project is a joint investigation with University of Washington. The FIU project will concentrate on development of a connection capable of connecting cap beam system to CFT column, while University of Washington will concentrate on developing a pile cap system that could be utilized in conjunction with CFT columns. Together, these two projects, combined with existing</p>

	<p>information about CFT columns, will provide an economical substructure alternative system for HSR that will be presented to HSR authority for additional development and implementation. The main objective of this project is to develop a sufficient amount of data and proof of concept test, for system(s) that could be used to connect the cap beam to CFT columns. The project will involve numerical, experimental and analytical approaches. California HSR Authority will be asked to serve on the advisory committee of the project and be involved in the project from the outset.</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>Research output included in upcoming 2nd Edition of <i>PCI State-of-the-Art Report on Seismic Design of Precast Concrete Bridges</i> (1st Edition in 2013).</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>https://abc-utc.fiu.edu/envisioning-connection-detail-for-connecting-concrete-filled-tube-cft-columns-to-cap-beam-for-high-speed-rail-application/</p>