



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Accelerated Construction of Pile Foundations by Means of Elimination
University	Iowa State University
Principal Investigator	Justin Dahlberg
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$74,843 Match Funds: \$37,421.5
Total Project Cost	\$112,264.5
Agency ID or Contract Number	ABC-UTC (Project No: ISU-2016-5-01)
Start and End Dates	July 1, 2022- June 30, 2023
Brief Description of Research Project	<p>The advancement of Accelerated Bridge Construction has primarily been through focused effort on deck and superstructure design and construction methods. Further acceleration can be achieved through focused effort on bridge substructures. Ongoing efforts in the State of Iowa may provide benefit to ABC methods by identifying code conservatism. Reducing the total foundation requirements and effort required for substructure construction will result in a reduction of overall construction costs and time.</p> <p>A project recently completed for the Iowa Department of Transportation investigated the contributions of concrete encasements of steel H-piles used for bridges which have historically not been considered in the design process. The initial reason for the project was to determine the remaining capacity of a pile when subjected to scour, leaving bare the uncased portion of a pile. A tool was developed to calculate capacity and a subsequent laboratory investigation was completed to validate the pile capacity assessment tool. The study concluded the pile capacity is greater than what has been otherwise calculated. As a secondary result, consideration has been given to revising the capacity calculations of new piles especially in fully-encased pile bents. This project aims to identify the unbraced height limits of steel H-piles when fully-encased and thus expedite foundation construction by taking advantage of the increased capacities and reducing the total number of required piles. By addressing design code conservatism, construction time may be decreased.</p>

	<p>The objective of this project is to identify the maximum unbraced height of fully-encased piles and to further develop the capacity calculation tool to include monolithic encasement options. Though this information is largely based on the deep foundation design practices in the State of Iowa, the deliverables are applicable to other state practices.</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/accelerated-construction-of-the-highway-steel-overhead-sign-truss-sost-through-the-implementation-of-u-bolt-connections-2/?preview=true</p>