



ACCELERATED BRIDGE CONSTRUCTION  
UNIVERSITY TRANSPORTATION CENTER

<b>UTC Project Information</b>	
Project Title	Numerical Investigation of the Impact of Vertical Ground Motions on ABC Girder-to-Cap Connections in the Near-Field
University	University of Nevada, Reno
Principal Investigator	Floriana Petrone
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Funds: \$48,000 Match Funds: \$24,000
Total Project Cost	\$72,000
Agency ID or Contract Number	ABC-UTC (Project No: UNR-2016-5-01)
Start and End Dates	May 2022 – June 2023
Brief Description of Research Project	<p>State-of-the-art research on the impact of vertical motion effects on ordinary highway bridges and evidence from past earthquakes have revealed the potential for a significant increase of the demands at the girder-to-cap face. While this is not of major concern for ordinary bridges whose moment capacity at the face of the bent cap is typically adequate to resist the increased demands due to vertical effects, the impact of vertical ground motions on ABC connections is yet to be thoroughly investigated. Very few studies have been carried out to characterize the shear and moment capacity of girder-to-cap connections. Experimental works have primarily looked at the seismic response of precast concrete girder-to-cap connections subject to horizontal excitation, while numerical studies have utilized only conventional simplified approaches for vertical ground motions estimates and modeling. This project will perform a comprehensive series of numerical simulations to assess the seismic performance of bridge systems that incorporate typical ABC girder-to-cap connections. This will be accomplished by utilizing validated 3-D arrays of near-field motions generated from physics-based wave propagation models.</p> <p>The proposed research will be exclusively based on detailed modeling and advanced numerical simulations of the nonlinear dynamic response of bridge structures that incorporate ABC connections. The structural modelling part will be addressed with a two-level approach.</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"><li>• Reports</li><li>• Project website</li></ul>	<p><a href="https://abc-utc.fiu.edu/numerical-investigation-of-the-impact-of-vertical-ground-motions-on-abc-girder-to-cap-connections-in-the-near-field/?preview=true">https://abc-utc.fiu.edu/numerical-investigation-of-the-impact-of-vertical-ground-motions-on-abc-girder-to-cap-connections-in-the-near-field/?preview=true</a></p>