UTC Project Information	
Project Title	Benchmarking and Safety Assessment for Modified Lateral Spreading Design Procedure Using Three-Dimensional Nonlinear Finite Element Analysis
University	Washington State University
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Funding Source(s) and Amounts Provided (by each agency or organization)	
Total Project Cost	$40000.00
Agency ID or Contract Number	
Start and End Dates	Start: 01/01/2016 End: 12/31/2016
Brief Description of Research Project	The purpose of this proposed project is to verify the safety of bridge foundations designed with an improved/modified lateral spreading design procedure using nonlinear 3D finite element models. The current design procedures used for liquefaction-induced lateral spreading are often overly conservative due to the simplifying assumptions involved in their use. A modified design procedure (Martin et al., 2002; Zha, 2004; Boulanger et al., 2006; Ashford et al., 2011) that is part of the focus of this proposed work has been developed as a means to more appropriately consider the relevant aspects of the laterally-spreading bridge-foundation-soil system. This procedure has been shown to be effective in its intended purpose of reducing some of the excessive conservatism associated with more simplified design approaches, however, there has only been limited testing and analysis to verify and benchmark the relative safety of the resulting design solutions for a wide range of bridges, foundations, and soil conditions. Bridges are critical lifelines for numerous areas in the Pacific Northwest, and prior to the adoption of this modified design approach by local agencies for use in future design applications, it is important to verify the safety of the resulting bridge and foundation designs for conditions typical to the region, and to develop a database and benchmarking framework that can be used for future evaluations of this nature. Once

	verified, use of the modified lateral spreading design approach will not only lead to potential cost savings during design and construction of future bridges, but will increase public safety by reducing the potential for bridge collapse and minimizing the time associated with lost bridge service immediately following a lateral spreading event, thus increasing access for emergency vehicles and critical infrastructure assessment following an earthquake.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project Website	
Project Type (basic, applied, advanced, etc)	Applied