16058 - Shake table testing of simple and practical securing solutions for face loaded unreinforced masonry walls

The purpose of the proposed experimental shake table program is to collaborate with industry representatives to develop and experimentally validate the performance of simple and cost effective systems as seismic securing solutions to improve the out-of-plane performance of unreinforced masonry (URM) walls. There is a significant lack of experimentally validated retrofit techniques that consider viability of retrofit interventions for existing buildings in terms of overall associated cost, practicality, impact on the building tenants, aesthetics and heritage building fabric. The proposed research will be focused on developing and experimentally validating simple, practical, cost effective, and minimally-invasive seismic securing techniques for URM walls when loaded out-of-plane, with a main focus on practical applications in real buildings. It is proposed that component based proof of concept testing are undertaken first, followed by testing five full scale retrofitted URM walls on a shake table. Details of the resultant design methodology will be disseminated to practicing engineers in order to fast-track into adoption and implementation stages in the rapidly undergoing nationwide seismic retrofit efforts of URM building stock. The proposed 2016 study is conceived as a multi-year plan with follow-on research aiming to enhance understanding of global response of retrofitted buildings where best practice retrofit solutions have been implemented.