**(Re)construction of earthquake-resistant earthen buildings**

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**ABSTRACT**

Earthquakes have caused losses in human lives and the destruction of earthen dwellings and historical monuments. Safe earthen construction methods should therefore be developed and implemented in order to protect the lives of millions of people and to ensure the stability of historical constructions during future earthquakes. Researchers at the Pontifical Catholic University of Peru (PUCP) have developed a technique that can be used for rebuilding or retrofitting earthen buildings located in seismic areas. It includes a procedure to *repair* seismic damage by injecting mud grout in the seismic cracks and a system to *reinforce* the earthen buildings with a mesh made of nylon ropes. A full-scale adobe house model was built at the PUCP´s Structures Laboratory and tested on its shaking table, in order to evaluate the efficacy of this technique. The unreinforced model was first subjected to shaking in order to induce extensive wall cracking. The cracks on the walls were then repaired via mud grout injection and, after the grout had completely dried, the walls were reinforced by covering them with an external mesh made of nylon ropes. When the retrofitted adobe model was tested again on the shaking table, the repair and reinforcement technique proved to be effective, as the structural integrity was maintained. An engineered design procedure has been recently been developed and a new shaking table test is being planned to evaluate its effectiveness. It is hoped that the results obtained will be useful for the (re)construction of safe earthen construction around the globe.

**KEY WORDS**

Earthen construction, earthquakes, seismic repair, seismic reinforcement.