

BII 09 An economic technique for seismic retrofitting of existing masonry dwellings in Sri Lanka

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Un-reinforced masonry (URM) buildings are the most popular type of buildings in Sri Lanka as well as worldwide, although they are most vulnerable to earthquakes. A considerable number of minor tremors have been frequently occurred in and near Sri Lankan region since December, 2004. There is no practicing of retrofitting techniques for URM buildings in Sri Lanka. It reveals that the development of proper retrofitting technique for masonry buildings in the country is essential. This study aimed to develop a simple, economical and efficient retrofitting method using Bamboo strips mesh. Bamboos are grown worldwide, so that, people could be able to have the material with no or little cost. In order to verify the suitability of the proposed retrofitting technique, the structural performance of a wall retrofitted with bamboo mesh was compared with that of non-retrofitted specimen and two retrofitted walls using almost available retrofitting technique; one with PP-band mesh and one with diagonal steel bracings. All four specimens were subjected to diagonal shear test to investigate the structural behaviour. Walls retrofitted with bamboo mesh, PP-band mesh and steel bracings showed increment of in-plane load carrying capacity of 81%, 142% and 180%, respectively, compared to non-retrofitted specimen. Non-retrofitted wall and wall with steel bracings showed a catastrophic brittle failure. Both retrofitted walls; with bamboo mesh and with PP-band mesh were not collapsed at end of test. Wall with PP-band mesh lost its load carrying capacity at end of test while wall with bamboo mesh kept its stability throughout the experiment. Therefore, bamboo strip mesh retrofitting technique can effectively be used to retrofit existing masonry structures and the method is economical.

Keywords: bamboo reinforcing, burned clay bricks, diagonal bracing, PP-band mesh, seismic retrofitting