PP-BAND RETROFITTING TECHNIQUE: AFFORDABLE, ACCEPTABLE AND FEASIBLE METHOD FOR DEVELOPING COUNTRIES

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ABSTRACT

An economically affordable, culturally acceptable, technically feasible and easy-to-use PP-band retrofitting technique for masonry buildings is being developed at Meguro Laboratory, IIS. Two identical brick masonry building models were constructed and one was retrofitted. Both models were tested on a shaking table with similar input motions. It was found that the technique enhanced the seismic capacity of buildings to sustain large base displacements and velocities and could improve the safety of masonry buildings to survive JMA7 earthquakes. It is an optimum solution for developing countries.

Key Words: *Masonry Structures, Seismic Retrofitting, Affordable Technology, Developing Countries, PP-band Technique, Non-engineered Buildings*

INTRODUCTION

Human casualties due to earthquakes in the 20th century are mostly due to structural damage and most of which are from unreinforced masonry buildings (Coburn and Spence, 2002). This has also been seen in recent earthquakes in developing countries India, Iran and more recently in Pakistan. Therefore, retrofitting of low earthquake-resistant masonry structures is the key issue for earthquake disaster mitigation in developing countries to reduce the casualties significantly. Seismic retrofitting not only reduces the damage to buildings during earthquakes, but also the costs of rescue and first aid activities, rubble removal, temporary residence building, and permanent residence reconstruction to re-establish normal daily life (Yoshimura and Meguro, 2004).

An appropriate retrofitting technique for developing countries should consider not only its efficiency in terms of improvement of the seismic resistant characteristics of the structures but also economical affordability, cultural acceptability and material as well as technological availability. An appropriate seismic retrofitting technique, PP-band retrofitting technique for masonry buildings has been developed and different aspects are being researched in Meguro Laboratory, in the Institute of Industrial Science, The University of Tokyo for some years considering these issues (Mayorca and Meguro, 2004). This paper focuses on shaking table experiments which were carried out to understand the dynamic response of masonry buildings, crack propagation, failure behaviour, and overall effectiveness of the newly developed retrofitting technique.

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