

EXPERIMENTAL STUDY OF MASONRY WALLETTTE MADE OF SHAPELESS STONES RETROFITTED BY PP-BAND MESH

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ABSTRACT

Unreinforced masonry structure is one of the most popularly used constructions in the world, especially in developing countries. It is also unfortunately, the most vulnerable to the earthquake and its damage has caused many human casualties. Therefore, from global viewpoint, retrofitting of low earthquake-resistant masonry structures is essential to reduce the casualties significantly from earthquake disaster.

In developing countries, retrofitting method should be technically feasible and economically affordable, the retrofitting material, accessible, and the workmanship, locally available. Considering these points, PP-band (polypropylene bands, which is worldwide available and cheap material, commonly used for packing) retrofitting technique has been developed and many different aspects have been studied using brick and adobe masonry structures by Meguro Laboratory, Institute of Industrial Science, The University of Tokyo.

In this research, we conducted a series of experiments to verify the suitability of PP-band retrofitting for masonry structures made of shapeless stones. Material tests were conducted to understand the basic parameters of stone masonry, i.e. shear, tension and compression strength. After the material tests, diagonal compression test and out-of-plane test were carried out using masonry walleTTte made of shapeless stones with and without retrofitting. From both test results, it was clear that PP-band retrofitting improved drastically the overall stability and ductility of stone masonry structures made of shapeless stones.
