SEISMIC RESISTANCE & FAILURE MODES IN UNREINFORCED MASONRY SHEAR WALLS - A COMPARISON OF EXPERIMENTAL AND ANALYTICAL RESULTS

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ABSTRACT

An experimental study on unreinforced brick masonry (URBM) shear walls is presented in detail. In-plane shear-compression tests were carried out on four series of walls using quasi-static cyclic loading. Experimental work indicated that the walls with medium to high aspect ratios failed in diagonal tensile shear failure mode while squat walls exhibited both sliding shear and diagonal shear cracks. The results of experimental work were compared with simplified mechanics based equations being commonly used in practice. The comparison of results indicated that simplified equations conservatively estimate the lateral strength of URBM walls. However, the simplified equations do not predict the correct shear failure mode in all the cases and a correction factor is recommended for a better estimation of correct shear failure mode.

KEYWORDS: Unreinforced Masonry, Shear Strength, Ductility, Drift, Energy Dissipation, Performance Levels