

Behavior of Unreinforced Masonry Structures During the 1992 Erzincan, Turkey, Earthquake

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Abstract:

The Richter Magnitude 6.8 Erzincan earthquake destroyed 300 buildings and severely damaged 500 others. A large percentage of those buildings was reinforced masonry bearing wall-structures or reinforced concrete frame structures with non-structural unreinforced masonry infills. This paper reports on the seismic performance of each system, with emphasis on the unreinforced masonry component in the latter case. Some typical causes of collapse or severe damage are reviewed. However, it is noted that, in some instances, the behavior of such systems was satisfactory if enough over-strength was present to ensure elastic response. This was observed in older unreinforced masonry buildings with numerous thick walls built with good quality solid brick, and in most of the reinforced concrete frame structures where a large number of closely spaced bearing walls or unreinforced masonry infills were used, adding considerable strength and stiffness to the se systems. Most lessons learned and re-learned from this review are broadly applicable and believed to have direct implications on seismic resistant design practice.

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