

## INVESTIGATION OF ADEQUACY OF SEISMIC CODE REQUIREMENTS FOR MASONRY BUILDINGS DAMAGED DURING EZGELEH KERMANSHAH, IRAN EARTHQUAKE (2017)

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There are many buildings made by masonry materials in Iran. Different seismic codes have provided a variety of obligatory requirements for masonry constructions. In this study the effect of using the obligatory requirements for masonry constructions was investigated. Therefore, seismic behaviour of some of the masonry buildings damaged in Ezgeleh, Kermanshah earthquake were evaluated and compared by seismic codes. The damage modes observed in the represented buildings were: shear cracks, sliding shear failure, buckling of the ties and crushing of the toe in the walls. Seismic codes including in this study are Iranian code for design and construction of masonry building, TMS 402-11/ACI 530-11/ASCE 5-11 and seismic design code of Iran (2800). Also two masonry buildings damaged during the earthquake investigated analytically by using time history analysis. The results of the research show that applying some of the requirements included in the represented seismic codes do not guarantee the structural elements in the masonry building from damage.



Figure 1. Damaged masonry building of Estesnaie School in Sarpol-e Zahab city in Ezgeleh Kermanshah earthquake.

Table 1. Observed failure modes surveyed in the masonry buildings damaged during Ezgeleh Kermanshah earthquake (2017).

Surveyed buildings	Building characteristics			Failure mode			
	Story	Height	Tie beam & column	Diagonal cracking	sliding cracking	Toe crushing	Tie buckling
Estesnaei School	2	7.3	√	√	-	√	-
Agricultural organization building	1	4.2	√	√	√	-	√



Figure 2. Different damage modes in masonry building.

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