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Earthquake Damage Characteristics of Earthen-Adobe Houses

Serra Zerrin KORKMAZ[a], Nazım KOCU[a]
Ahmet TURER[b], **Hasan Husnu KORKMAZ[a]**

[a]Selcuk University, Eng.-Architecture Faculty-KONYA
[b]METU, Engineering Faculty-ANKARA

- Email: hhkorkmaz73@hotmail.com

ABSTRACT

Traditional adobe-kerpic construction responds very poorly to earthquake ground shaking. Adobe houses respond to lateral loads with wide cracks in walls, separation of walls at corners, and complete collapse of heavy mass of debris, walls, roofs and floors causing a significant loss of life of residents and property. Most common causes that propitiate failure and modes of failure are; due to bending and overturning of walls, the great height and large unsupported length of wall, great mass of roof or walls, poor connections between intersecting walls or between roof and walls. Seismic deficiencies of kerpic construction are caused by the heavy weight of the structures (due to heavy roof and thick walls), their low strength, and brittle behaviour. During strong earthquakes, due to their heavy weight, these structures develop high levels of seismic forces they are unable to resist, and therefore they fail abruptly.

In this paper, general failure and damage characteristics of adobe-kerpic houses are summarized based on the site visits of the authors.

KEY WORDS :

Earthen houses, earthquake damage, failure characteristics, Sultandagi earthquake, strengthening methods