

Seismic Performance of Earthen Architecture is Important for the future of Cyprus Identity



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ABSTRACT

The rapid growth of the world population has increased the demand for housing while also highlighting the need to address environmental concerns. Earthen construction is widely used by nearly one-third of the global population due to its local availability and its ability to provide healthy, ecologically balanced living environments. For this reason, many industrialized countries support research and development in this field.

Since 1978, Istanbul Technical University has conducted continuous research on earthen construction. Early studies focused on improving gypsum-stabilized adobe materials, leading to the construction of a reference adobe building in 1983, which was used as a kindergarten for nine years. These initial efforts aimed to promote adobe as a viable material for mass housing.

The research emphasizes gypsum-Lime Stabilized Earth, Earthquake Safety through Lateral Flexibility, Environmental Resistance, and Industrial Construction Technology. The development of mechanized construction technologies and standardization of gypsum-stabilized earthen materials to enable efficient use in large-scale housing. The study addresses technological, sociological, administrative, and cultural aspects, with the goal of optimizing local materials and labor while conserving natural resources and reducing costs.

Laboratory experiments were conducted to analyze the physical and mechanical properties of material mixtures and their suitability for mechanized construction. Traditional and international adobe production methods were also examined to improve techniques. A prototype building was constructed according to mass housing standards, demonstrating improved durability compared to traditional adobe.

The study recommends advancing from prototype development to full-scale mass production.

KEY WORDS:

Rammed earth structures, Seismic performance, Shaking table test