

## Investigating the Behavior of Underground Structures in the Event of an Earthquake

**Authors :** Davoud Beheshtizadeh, Farzin Malekpour

**Abstract :** The progress of technology and producing new machinery have made a big change in excavation operations and construction of underground structures. The limitations of space and some other economic, politic and military considerations gained the attention of most developed and developing countries towards the construction of these structures for mine, military, and development objectives. Underground highways, tunnels, subways, oil reservoir resources, fuels, nuclear wastes burying reservoir and underground stores are increasingly developing and being used in these countries. The existence and habitability of the cities depend on these underground installations or in other words these vital arteries. Stopping the flow of water, gas leakage and explosion, collapsing of sewage paths, etc., resulting from the earthquake are among the factors that can severely harm the environment and increase the casualty. Lack of sewage network and complete stoppage of the flow of water in Bam (Iran) is a good example of this kind. In this paper, we investigate the effect of wave orientation on structures and deformation of them and the effect of faulting on underground structures, and then, we study resistance of reinforced concrete against earthquake, simulate two different samples, analyze the result and point out the importance of paying attention to underground installations.

**Keywords :** underground structures, earthquake, underground installations, axial deformations

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