

## Seismic Response and Sensitivity Analysis of Circular Shallow Tunnels

**Authors :** Siti Khadijah Che Osmi, Mohammed Ahmad Syed

**Abstract :** Underground tunnels are one of the most popular public facilities for various applications such as transportation, water transfer, network utilities and etc. Experience from the past earthquake reveals that the underground tunnels also become vulnerable components and may damage at certain percentage depending on the level of ground shaking and induced phenomena. In this paper a numerical analysis is conducted in evaluating the sensitivity of two types of circular shallow tunnel lining models to wide ranging changes in the geotechnical design parameter. Critical analysis has been presented about the current methods of analysis, structural typology, ground motion characteristics, effect of soil conditions and associated uncertainties on the tunnel integrity. The response of the tunnel is evaluated through 2D non-linear finite element analysis, which critically assesses the impact of increasing levels of seismic loads. The finding from this study offer significant information on improving methods to assess the vulnerability of underground structures.

**Keywords :** geotechnical design parameter, seismic response, sensitivity analysis, shallow tunnel

**Conference Title :** ICMSE 2015 : International Conference on Materials and Structural Engineering

**Conference Location :** Kuala Lumpur, Malaysia

**Conference Dates :** August 24-25, 2015