



Spectral Acceleration Amplification Effects on The Ductility Demand of Self Standing R.C. Chimneys

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ABSTRACT

According to construction of industrial structures in developing countries, current research is carried out on Self Standing Reinforced Concrete Chimneys, which are a sort of special structures and is used in several types of factories. For this purpose, the 3D model of an existing Reinforced Concrete chimney of 80.0 m high and a diameter of 4.0 ~5.0 m in Armenia, is modeled and analyzed using spectral analysis procedure according to 4th revision of Iranian 2800 seismic code, taking into account the spectral acceleration level to $S_a=0.4g$. On the next step, the finite element model is analysed by the means of Time History Analysis method, using 3 pairs of accelerograms recorded on each soil categories of Rock ($V_s>750\text{m/s}$), Dense Soil ($375<V_s<750\text{m/s}$) and Loose Soil ($175<V_s<375\text{m/s}$) and Very Loose Soil ($V_s<175\text{m/s}$) respectively, taking into account the spectral acceleration level of $S_a=0.2g \sim 1.0g$. The Modal Pushover Analysis is carried out as well in order to determine the Yielding Displacement Δ_y . Finally the ductility demand for all soil categories are computed.

Keywords:

Spectral Acceleration, Self Standing R.C. Chimneys, Ductility Demand, Time History, Analysis, Yielding Displacement