

SEISMIC RESPONSE OF TALL BUILDING WITH UNDERGROUND STOREY USING DAMPERS

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ABSTRACT

As the seismic load acting on a structure is a function of the self-weight of the structure, these structures are made comparatively light and flexible, which have relatively low natural damping. Results make the structures more vibration prone. New generation high rise building is equipped with an artificial damping device for vibration control through energy dissipation. A tuned mass damper is a device consisting of a mass, a spring, and a damper that is attached to a structure in order to reduce the dynamic response of the structure. The frequency of the damper is tuned to a particular structural frequency, so that frequency is excited, the damper will resonate out of phase with the structural motion. Energy is dissipated by the damper inertia force acting on the structure. This research investigates the seismic response of building structures with underground stories and embedded dampers. The main response parameters are tip deflection and tip acceleration of the structure. This building has been modeled as 3D Space frame model with six degrees of freedom at each node using SAP 2000 software for simulation of behavior under gravity and seismic loading. Tuned mass dampers are considered and used for different locations of the structure. Time history method of dynamic analysis is used by SAP2000 software.

KEYWORDS: dampers, dynamic response, flexibility, frequency, spring, Time history, Tuned mass