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Vibration Control of Building Using Multiple Tuned Mass Dampers Considering Real Earthquake Time History

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Abstract : The performance of multiple tuned mass dampers to mitigate the seismic vibration of structures considering real time history data is investigated in this paper. Three different real earthquake time history data like Kobe, Imperial Valley and Mammoth Lake are taken in the present study. The multiple tuned mass dampers (MTMD) are distributed at each storey. For comparative study, single tuned mass damper (STMD) is installed at top of the similar structure. This study is conducted for a fixed mass ratio (5%) and fixed damping ratio (5%) of structures. Numerical study is performed to evaluate the effectiveness of MTMDs and overall system performance. The displacement, acceleration, base shear and storey drift are obtained for both combined system (structure with MTMD and structure with STMD) for all earthquakes. The same responses are also obtained for structure without damper system. From obtained results, it is investigated that the MTMD configuration is more effective for controlling the seismic response of the primary system with compare to STMD configuration.

Keywords : Earthquake, multiple tuned mass dampers, single tuned mass damper, Time history.
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