

عنوان مقاله:

Assessing the Effectiveness of Viscous Damper in Enhancing Steel Frame Performance Level

محل انتشار:

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خلاصه مقاله:

This study aimed to investigate the effectiveness of a viscous damper in reducing the dynamic responses of a building structure while enhancing its performance level per FEMA regulations. The research paid particular attention to the placement of the viscous damper in different openings in the building frame, and to achieve this, they designed a 6-story building frame nonlinearly in the Opensees software, considering the connection spring and equipped with a viscous damper. The viscous damper was placed in two different ways in the building frame to study its impact. The research used three classifications of earthquake acceleration to analyze the structure dynamics, which are classified based on the maximum acceleration of the ground to the maximum velocity of the ground ratio. The viscous damper's parameters were optimized using the meta-heuristic algorithm. The study's results show that the viscous damper, with optimal parameters, effectively reduces the story drift ratio, increasing the structure's performance level. Specifically, the viscous damper placed in the side openings of the building frame reduced the maximum story drift by 90%, while the one set in the middle spans reduced it by 70%.

کلمات کلیدی:

Viscous Damper, Story Drift Ratio, Meta-heuristic Algorithm, Nonlinear Dynamic Analysis, Performance Level

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