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Seismic Retrofitting of Structures Using Steel Plate Slit Dampers Based on Genetic Algorithm

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Abstract : In this study, a genetic algorithm was used to find out the optimum locations of the slit dampers satisfying a target displacement. A seismic retrofit scheme for a building structure was presented using steel plate slit dampers. A cyclic loading test was used to verify the energy dissipation capacity of the slit damper. The seismic retrofit of the model structure using the slit dampers was compared with the retrofit with enlarging shear walls. The capacity spectrum method was used to propose a simple damper distribution scheme proportional to the inter-story drifts. The validity of the simple story-wise damper distribution procedure was verified by comparing the results of the genetic algorithm. It was observed that the proposed simple damper distribution pattern was in a good agreement with the optimum distribution obtained from the genetic algorithm. Acknowledgment: This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF-2017R1D1A1B03032809).

Keywords : slit dampers, seismic retrofit, genetic algorithm, optimum design
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