

Seismic response evaluation of RC tower connected to short rigid buildings.

ABSTRACT

In urban construction with the presence of tall buildings adjacent to short buildings, civil engineers have tried to connect low-rise rigid buildings to tall buildings in order to enhance the rigidity of the towers and decrease seismic response induced by earthquake excitation. From recent developments in earthquake energy dissipation systems, the application of viscous dampers for coupling of parallel and adjacent buildings to reduce earthquake effect has been considered by civil engineers, and many investigations have been conducted. In the present study an attempt has been made to evaluate the effect of connecting reinforced concrete towers to short rigid building through viscous damper devices. For this purpose, a 10-story RC tower connected to two short RC buildings by viscous damper was modeled and analyzed under Elcentro (1940) earthquake record excitation by using the finite element technique. In addition, the effect of various viscous damper damping coefficients on seismic response of the tower was evaluated by analyzing the aforementioned tower with various damper damping coefficient to the short building. The results showed improvement of seismic response of the tall building which was supported by short RC buildings through viscous damper device during earthquake. Moreover by increasing damper damping coefficient response of the tower structure the displacement was effectively reduced.

Keyword: Adjacent building; RC building; Seismic response; Viscous damper