# Preventing seismic pounding of adjacent structures using viscous wall damper device

## ABSTRACT

Today, a number of researchers are broadly studying the effective implementation of supplemental seismic energy dissipation systems to improve seismic behavior of structures during earthquakes. The current article studies the impacts of employing Viscous Wall Damper devices to couple two adjacent structures on seismic response of the new system. An exclusive finite element algorithm capable of modeling and analyzing structures equipped with special damper systems was used in order to perform a nonlinear time history analysis subjected to seismic excitation. Two ten-story RC framed structures are modeled adjacently in 11 different cases, each representing existence or damping coefficient of the Viscous Wall Damper device. A parametric study has been conducted in each case to assess the effectiveness of implementing Viscous Wall Damper devices on improving seismic behavior of the coupled structure. The considered metrics include rotation and displacement amplitude, plastic hinge formation, and induced element forces. It has been proved that the proposed damper system substantially diminishes and dissipates induced seismic response of the system. Also, it is indicated that the extent to which Viscous Wall Damper device contributes in mitigating seismic responses is highly correlated with the damping coefficient.

**Keyword:** Viscous wall damper; Passive control; Adjacent structures; Seismic response mitigation; Finite element