



Comparison between Seismic Response of CSPSW and SPSW to Nonlinear Excitations

Mahdi Chavoshi ^{1*}, Ramin Ketabforush Badri ²

^{*1} M.Sc. student, University of Bonab, Bonab, Iran

(m.ch.civil.eng@gmail.com)

² Assistant professor, Department of Civil Engineering, Azarshahr Branch, Islamic Azad University, Azarshahr, Iran

(Date of received: 10/03/2020, Date of accepted: 15/05/2020)

ABSTRACT

Recently, the application of Composite Steel Plate Shear Walls (CSPSWs) and Steel Plate Shear Walls (SPSWs) as lateral load-resisting systems has been developed. These systems should be resistant enough, ductile, and stiffened to support against different types of excitations. In this work, the seismic performance of these two systems is investigated under different near- and far- field inputs. Strip elements are employed to model the CSPSW and SPSW in SAP2000. An experimental result of CSPSW is first verified. A six story building frame equipped with both systems is then modeled and six different far and near field seismic records are applied to the building frame. Nonlinear Time History Analyses (NTHAs) are conducted based on different maximum ground acceleration levels. Based on the results, appropriate seismic performance of CSPSWs can be clearly observed. CSPSW are also able to decrease relative story displacements more than SPSW. More precisely, CSPSWs experience Life Safety (LS) performance level or at least Collapse Prevention (CP) performance level while SPSWs fully collapse.

Keywords:

Composite Steel Plate Shear Walls, Steel Plate Shear Walls, seismic performance, performance level, pushover analysis.