World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:16, No:06, 2022

Contribution of the SidePlate Beam-Column Connections to the Seismic Responses of Special Moment Frames

Authors : Gökhan Yüksel, Serdar Akça, İlker Kalkan

Abstract : The present study is an attempt to demonstrate the significant levels of contribution of the moment-resisting beam-column connections with side plates to the earthquake behavior of special steel moment frames. To this end, the moment-curvature relationships of a regular beam-column connection and its SidePlate counterpart were determined with the help of finite element analyses. The connection stiffness and deformability values from these finite element analyses were used in the linear time-history analyses of an example structural steel frame under three different seismic excitations. The top-story lateral drift, base shear, and overturning moment values in two orthogonal directions were obtained from these time-history analyses and compared to each other. The results revealed the improvements in the system response with the use of SidePlate connections. The paper ends with crucial recommendations for the plan and design of further studies on this very topic.

Keywords : seismic detailing, special moment frame, steel structures, beam-column connection, earthquake-resistant design
Conference Title : ICCASED 2022 : International Conference on Computer-Aided Structural Engineering and Design
Conference Location : San Francisco, United States
Conference Dates : June 02-03, 2022

Open Science Index, Civil and Architectural Engineering Vol:16, No:06, 2022 publications.waset.org/abstracts/150106.pdf