

The Effect of Connections Form on Seismic Behavior of Portal Frames

Authors : Kiavash Heidarzadeh

Abstract : The seismic behavior of portal frames is mainly based on the shape of their joints. In these structures, vertical and inclined connections are the two general forms of connections. The shapes of connections can make differences in seismic responses of portal frames. Hence, in this paper, for the first step, the non-linear performance of portal frames with vertical and inclined connections has been investigated by monotonic analysis. Also, the effect of section sizes is considered in this analysis. For comparison, hysteresis curves have been evaluated for two model frames with different forms of connections. Each model has three various sizes of the column and beam. Other geometrical parameters have been considered constant. In the second step, for every model, an appropriate size of sections has been selected from the previous step. Next, the seismic behavior of each model has been analyzed by the time history method under three near-fault earthquake records. Finite element ABAQUS software is used for simulation and analysis of samples. Outputs show that connections form can impact on reaction forces of portal frames under earthquake loads. Also, it is understood that the load capacity in frames with vertical connections is more than the frames with inclined connections.

Keywords : inclined connections, monotonic, portal frames, seismic behavior, time history, vertical connections

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