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J Steel Struct Constr 2018, Volume 4
DOI: 10.4172/2472-0437-C2-012

Investigation on effect of flexibility of base plate connections of steel moment frame structures

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Because of the fact that base plate connections at the base of structure bear significant gravity loads, investigation of their behavior can be so important. Preliminary research findings indicate that even the smallest column bases provide a rotational stiffness and the pinned assumption is very conservative when evaluating frame drift due to lateral loads, which can significantly increase the cost. Therefore, there is a need to quantify the rotational stiffness of the column base-plate connections in low-rise metal buildings. In this study, effect of flexibility of base plate support on structural responses has been evaluated. For this purpose, four type steel moment frame structures with 2, 5, 8 and 12 stories are analyzed by using nonlinear time history analysis in OpenSees software. The results of the analysis showed that the floors displacement is strongly correlated with the restraining of base plates and the floor displacement responses can affect the more than the story shear.

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