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# Finite Element Analysis of Flush End Plate Moment Connections under Cyclic Loading

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**Abstract :** This paper explains the results of an investigation on the analysis of flush end plate steel connections by means of finite element method. Flush end plates are a highly indeterminate type of connection, which have a number of parameters that effect their behavior. Because of this, experimental investigations are complicated and very costly. Today, the finite element method provides an ideal method for analyzing complicated structures. Finite element models of these types of connections under monotonic loading have previously been investigated. A numerical model, which can predict the cyclic behavior of these connections, is of critical importance, as dynamic experiments are more costly. This paper summarizes a study to develop a three-dimensional finite element model that can accurately capture the cyclic behavior of flush end plate connections. Comparisons between FEM results and experimental results obtained from full-scale tests have been carried out, which confirms the accuracy of the finite element model. Consequently, design equations for this connection have been investigated and it is shown that these predictions are not precise in all cases. The effect of end plate thickness and bolt diameter on the overall behavior of this connection is discussed. This research demonstrates that using the appropriate configuration, this connection has the potential to form a plastic hinge in the beam--desirable in seismic behavior.

**Keywords :** Flush end plate connection, moment-rotation diagram, finite element method, moment frame, cyclic loading
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