APPLICATION OF THE FINITE ELEMENT METHOD TO THE SEISMIC DESIGN AND ANALYSIS OF LARGE MOMENT END-PLATE CONNECTIONS

by

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(ABSTRACT)

Due to problems associated with welded moment connections uncovered after the Northridge earthquake, large bolted connections are becoming a much more attractive alternative for design in seismic regions. However, stringent design requirements established by the *AISC Seismic Provisions for Structural Steel Buildings* (1997) make current moment end-plate configurations and design procedures inadequate for multi-story buildings. This dissertation first examines and critiques current seismic design philosophies as applied to moment end-plate connections. Next, the finite element method is used to develop much-needed design procedures for large moment end-plate connections, and to improve the understanding of the role of geometric parameters (e.g., bolt pitch and stiffener locations) in the response of these connections. Finally, single-story and multi-story frames incorporating large moment end-plate connections with known moment-rotation characteristics are considered under seismic loading to determine the effectiveness of these systems in dissipating energy caused by the ground motion.

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