

# Seismic performance of moment connections in steel moment frames with HSS columns

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### Abstract

The use of Hollow Structural Sections (HSS) provides an alternative for steel buildings in seismic zones, with the advantage over WF columns that the HSS columns have similar resistance along both axes and enhanced performance under flexure, compression and torsion with respect to other columns sections. The HSS columns have shown satisfactory performance under seismic loads, such as observed in buildings with steel moment frames in the Honshu earthquake (2011). The purpose of this research is to propose a new moment connection, EP-HSS ("End-plate to Hollow Structural Section"), using a wide flange beam and HSS column where the end plate falls outside the range of prequalification established in the ANSI/AISC 358-10 Specification, as an alternative to the traditional configuration of steel moment frames established in current codes. The connection was researched through analytical, numerical (ELM), and experimental studies. The results showed that the EP-HSS allowed the development of inelastic action on the beam only, avoiding stress concentrations in the column and developing significant energy dissipation. The experiments followed the qualification protocols established in the ANSI/AISC 341-10 Specification satisfying the required performance for highly ductile connections in seismic zones, thereby ensuring satisfactory performance under seismic actions without brittle failure mechanisms.

### Palabras clave

**Palabras clave de autor:** [ductility](#); [performance](#); [bolted connection](#); [end-plate connection](#); [hollow structural sections](#); [moment connections](#); [finite element method](#); [steel structure](#); [yield line](#); [seismic design](#)

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