

Title: Severe loading assessment of modern and new proposed beam to column connections

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Abstract: The performance of two different steel beam to column connections known as SidePlate™ and a new proposed connection by seismic loading and progressive collapse were investigated in this research. Seismic performance evaluated included consideration of interstory drift angles and flexural strengths based on 2010 AISC Seismic Provisions while investigation of progressive collapse was conducted through satisfaction of acceptance criteria by rotational capacities of the connections provided in UFC 4-023-03 guideline. The results indicated that both SidePlate and the new proposed moment connection were capable of achieving adequate rotational capacity and developing full inelastic capacity of the connecting beam. Also, an excellent performance was exhibited by the connections in terms of keeping the plastic hinges away from the connection and exceeding interstory drift angle of 0.06 rad without fracture developments in beam flange groove-welded joints. Based on results, it was concluded that the SidePlate and the new proposed connection possess sufficient stiffness, strength and ductility to be classified as rigid, full-strength and ductile connections.