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Seismic lessons from the full-scale testing of SidePlate: An innovative steel moment frame connection

An innovative special moment frame connection using the SidePlate moment connection technology was developed and tested at the Powel Laboratories at the University of California, San Diego (UCSD). This connection uses two interconnecting parallel plates that sandwich and connect the beam(s) to the column and features a physical separation, or gap, between the face of the column flange and the end of the beam. The load is transferred from the beam to the column through a series of connecting plates and angles all of which are welded in the shop and then bolted in the field. The tested connections comprised of Wide-flange, Built-up Box and HSS (Tube) Columns and rolled and built-up wide-flange beams with three different configurations, namely Standard, Narrow, and Tuck. The test specimens were loaded in a displacement control mode using hydraulic actuators in accordance with the Chapter K of the AISC 341-16, Seismic Provisions for Structural Steel Buildings. Tested connections exhibited predictable, ductile behavior and met the established AISC's requirements for special moment frame (SMF) connections with average 50% additional deformation capacity. The following techniques were employed and lessons were learned in the development of the connection and the successful conduction of the tests.

Biography

Behzad Rafezy is the director of R&D Department at SidePlate Systems, Inc. He has more than 20 years of combined industrial and academic experience in structural engineering. Behzad is frequently invited to give technical presentations on structural engineering topics at universities and conferences and has published more than 60 technical papers and multiple patents. He is the co-inventor of the panel zone EEZ model presented at the SEAOC 2014 Convention. His experience as a lead structural designer for over 100 structures enables him to bring both innovative and practical solutions to the industry.

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