

COLLAPSE PREVENTION DESIGN CRITERIA FOR MOMENT CONNECTIONS IN MULTI-STORY STEEL FRAMES UNDER EXTREME ACTIONS

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ABSTRACT

The paper investigates the role of beam-to-column connections in mitigation the progressive collapse of multi-story steel frame buildings in case of column loss. On this purpose, a set of moment frames with different beam-to-column connections is designed following seismic design criteria for highly dissipative structures to resist seismic actions. Applied Element Method through nonlinear dynamic analyses is applied to predict the structural response, after the loss of one or more columns. The model was calibrated to match experimental data from full scale tests on bolted end plate connections under bending moment and different levels of tensile axial force.

Keywords: column loss, robustness, tying, moment connection, steel frame, rotation capacity

ACKNOWLEDGMENTS

Partial funding for this research was provided by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI), Romania, under grant PN II PCCA 55/2012 “Structural conception and Collapse control performance based DDesign of multistory structures under aCcidental actions” CODEC (2012-2015), made in the frame of the Partnerships Program Joint Applied Research Projects.