

Design of Reduced Links for Link-to-Column Connections in Eccentrically Braced Frames

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Abstract : Link-to-column connection in eccentrically braced frames (EBF) has been a critical problem since the link flange connected to the column fractured prior to the required link rotation. Even though the problem in link-to-column connection still exist, the use of an eccentrically braced frame (EBF) is increasing day by day as EBF have high elastic stiffness, stable inelastic response under repeated lateral loading, and excellent ductility and energy dissipation capacity. In order to address this problem, a reduced web and flange link section is proposed and evaluated in this study. Reducing the web with holes makes the link to control the failure at the edge of holes introduced. Reducing the flange allows the link to control the location at which the plastic hinge is formed. Thus, the failure supposed to occur in the link flange connected at the connection move to the web and to the reduced link flange. Nonlinear FE analysis and experimental investigations have been done on the developed links, and the result shows that the link satisfies the plastic rotation limit recommended in AISC-360-10. Design equations that define the behavior of the proposed link have been recommended, and the equations were verified through the experimental and FE analysis results.

Keywords : EBFs, earthquake disaster, link-to-column connection, reduced link section

Conference Title : ICAST 2017 : International Conference on Advanced Structural Technologies

Conference Location : Miami, United States

Conference Dates : March 09-10, 2017