

Design of removable link beams with perforated web used in EBF

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ABSTRACT

Eccentrically braced frames (EBFs) are used as seismic force resisting system of building and other civil engineering structure for the last two decades. The seismic energy dissipation capacity of EBF is depend on the link beams as the energy is dissipated through inelastic deformation of links. Since the damages are concentrated at the link, the concept of replaceable links come up with to remove the damaged portion without affecting other structural members and the functionality of the building. In order to control the plastic rotation at the link, either the link strength is weaker than the collector beam or it has less cross-sectional area. The later phenomenon have a negative effect during construction of slab. In this study, a replaceable link beam with perforated web was developed where the link has equal cross-section (same depth) with collector beam. The hysteresis characteristics and behavior of proposed link was evaluated using non-linear finite element analysis and the analysis results was verified using quasi-static loading test. Design recommendations was made from the outputs obtained. The result shows that the proposed shear link satisfies the plastic rotation limit recommended in AISC.

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