

عنوان مقاله:

Cyclic Behavior of Steel Beam-to-Column Moment Connections Using Different Sizes of Flange Plates and Reinforced by a Single Rib Plate

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خلاصه مقاله:

This paper presents a numerical study on the behavior of connection between steel I-beam and H-column when are affected by cyclic loading. The connection used the flange plates to connect the beam flanges to the column flange. They were welded to the top and bottom flange plates and created a welded flange plate (WFP) connection. Specimens were six models of WFP connections with different beam geometry and flange plate sizes which were modeled and their cyclic behavior were investigated using finite element analysis in ABAQUS program. Three of them were reinforced by a vertical triangular top and bottom rib plates, and others remained unreinforced. The results showed that reinforcement with a vertical triangular rib plate attached to the top and bottom flange plates can improve cyclic behavior of WFP connections. By using a rib plate, the equivalent plastic strain was increased and showed better plastic hinge formation compared to those with no vertical rib plate. Those models with IPB beam sections had the best cyclic behavior compared to those with IPE beam sections and satisfied the acceptance criteria of AISC seismic provisions for intermediate and special moment frames. We concluded that those WFP connections which did not satisfy the criteria of AISC seismic provisions for special moment frames, can be upgraded by a vertical triangular rib plate in order to be used in special moment frames.

کلمات کلیدی:

Welded Flange Plate Connection; Steel Moment Connection; Reinforcement; Rib Plate; Finite Element Analysis

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