

A Simplified Method to Predict the Full-Range Moment-Rotation Behavior of Bolted Endplate Connections

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1 Abstract

The behavior of beam-to-column bolted connections can be predicted by means of the component method included in the Eurocode 3. Essentially, the method consist of three basic steps: accurately identification of the active components (representing a specific part of a joint that makes a contribution to joint behavior) for a given joint; then, described the load-deformation response of the active components; finally, assemble all components into a mechanical model made up of springs and rigid links to derive the joint behavior. The current research of component method could predict the joint behavior up to complete failure. However, the proposed method may rather cumbersome. In this paper, a simplified method to predict the full-range moment-rotation relationship of bolted endplate connections is proposed. The obtained expressions can be applied for tracing connection nonlinear behavior up to complete failure in a step-by-step procedure. The moment-rotation curves obtained by the proposed method are compared with published connection test result. The proposed method was demonstrated to be able to describe the full-range moment-rotation behavior of bolted endplate connections with relative accuracy.

Keywords: component method, Full-range moment-rotation behavior, end-plate connections.