

Title:

LOCAL BUCKLING STRENGTH OF UNIFORMLY COMPRESSED OCTAGONAL THIN WALLED SECTION MEMBERS

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Abstract

Cold-formed steel members are widely applied in columns and other axial members in steel structures. One of the key issues in design of cold formed steel is local buckling strength under axial compression. As a mean to avoid premature local buckling, we have paid an attention to the application of octagonal section members. In this paper, we conducted numerical analyses (Finite Strip Analysis and Finite Element Analysis) and stub column tests, to investigate both the elastic and the post buckling strengths of octagonal section members including those where the adjacent plate elements have different width-thickness ratios. These tests and numerical analysis results indicated that the post buckling strengths of the plate elements were affected by the restraining effect from the adjacent plate elements. However, the overall strengths of the members were in line with those estimations by the traditional effective-width method, where simply supported conditions were assumed. This was caused possibly by a trade-off effect between the adjacent plate elements on their local buckling strengths.