Numerical Study of Cold-Formed Steel Built-Up Battened Columns Under Axial Compression

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Abstract : The Cold-formed steel members such as Beams and columns are recently used in nowadays in large scale in order to achieve light weight, cost economical, durable & speedy construction process. This section has the property of Post-buckling behavior which can't be there in Hot rolled steel section. However, there is no specific method of design for predicting the Cold-formed steel sections behavior under axial compression. This paper presents the numerical investigation results of the pin ended cold-formed steel built-up battened lipped channel columns under axial compression. The finite element model was developed using the finite element software ABAQUS 6.10. Comparison of finite element analysis results with the test results available in the literature shows that the analysis model can simulate the buckling behaviour and ultimate capacity of cold-formed steel built-up columns. Two types of sections were selected based on the limitations provided in AISI -2007 for prequalified sections for single lipped channel. Spacing between the chords was chosen such that moment of inertia about major axis equals the moment of inertia about minor axis. The parametric study has been carried out by varying the slenderness ratio and number of battens. The ultimate loads were obtained from FEA. At the end design condition is recommended by FEA to evaluate ultimate strength of the lipped channel built-up battened columns.

Keywords : Cold-formed Steel, Battened column, Built-up column, lipped channel, Direct Strength Method, etc.

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