



## Investigation of the Strength of Cold-Formed Steel C-Section in Compression

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**Abstract:** Cold-Formed Steel (CFS) may be considered as one of the excellent construction materials because it exhibits efficient load carrying capabilities in combination with its lightweight characteristics. However, there is a dearth of knowledge about the structural performance of locally-produced CFS in the Philippines and yet it is used for structures by just simply following foreign standards and guides. The objective of this study is to verify experimentally and computationally the performance of C-shaped Cold-Formed Steel (CFS) when subjected to concentric axial compression load considering buckling. The experimental aspect subjects the CFS members with compressive loads using hydraulic jacks and load cell. For the computational aspect, provisions found in the NSCP were used to determine the strength in compression of the members based on the actual dimensions, thicknesses and lengths of the member together with the material properties of the steel. This was done to a total of 126 samples with 1 section shape, 6 different lengths and 5 different thicknesses. It was found that the strength calculations for both distortional buckling failure and torsional-flexural buckling failure given by the NSCP provisions were not consistent with the results of the compression tests. For shorter lengths, distortional buckling prevailed as the main failure while for longer lengths, torsional-flexural buckling occurred. All of the predicted strength were highly conservative and well below the experimental value.

**Key Words:** Cold-Formed Steel; Compression Members; Light-gage steel channel