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BENDING CAPACITY OF COLD-FORMED LIPPED C-CHANNEL WITH INTERMEDIATE STIFFENERS

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ABSTRACT

This paper describes a four point bending test to determine the bending capacity of cold-formed steel (CFS) beams with intermediate stiffeners. As established by researches all around the world, the load-carrying capacity and the buckling behaviour of compression components of CFS sections can improve considerably with the addition of intermediate stiffeners. However, when the dimensions of the actual intermediate stiffener do not fulfil the required minimum moment of inertia recommended in the design standard, the load-carrying capacity of the member has to be determined either on the basis of a flat element disregarding the intermediate stiffener or through tests. In this study, grade G550 lipped C-channels with intermediate web stiffeners were tested to determine the additional capacity provided by the stiffeners as compared to lipped C-channels without intermediate web stiffeners. The sections were tested in the major bending axis where the stiffened web element experienced a stress gradient. The experimental ultimate moment (M_T) obtained was compared with the theoretical elastic bending moment (M_e) and the design capacity according to Australian/New Zealand Standard ($M_{AS/NZS}$).

KEYWORDS: Cold-Formed Steel, Lightweight, C-Channel, Bending Capacity, Stiffeners