

Improving Inelastic Capacity of Cold-Formed Steel Beams Using Slotted Bolted Connection

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Abstract : The focus of this paper is to incorporating the slotted bolted connection into the cold-formed steel (CFS) beams with aim of increasing inelastic bending capacity through bolt slip. An extensive finite element analysis was conducted on the through plate CFS bolted connections which are equipped with the slotted hole. The studied parameters in this paper included the following: CFS beam section geometry, the value of slip force, CFS beam thickness. The numerical results indicate that CFS slotted bolted connection exhibit higher inelastic capacity in terms of ductility compare to connection with standards holes. Moreover, the effect of slip force was analysed by comparing the moment-rotation curves of different models with different slip force value. As a result, as the slip force became lower, there was a tendency for the plastic strain to extend from the CFS member to the connection region.

Keywords : slip-critical bolted connection, inelastic capacity, slotted holes, cold-formed steel, bolt slippage, slip force

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