Finite element analysis of proposed self-locking joint for modular steel structures

ABSTRACT

The intermodular connection between modules plays a vital role in the overall performance of modular structures. The separation between a column and connection is possible due to the absence of links (welding or bolting) since limited space is available between modules. This study proposed a self-locking joint to be used in a modular steel structure, connecting columns with a connection without need of extra space between modules. The behavior of the proposed connection subjected to monotonic load was evaluated using a finite element approach using ABAQUS software. The influencing factors contributed to the behavior of the self-locking connection and columns observed using a parametric study. The parametric study was conducted by varying beam thickness, bolt pretension force and friction coefficient μ. Results indicate that the proposed connection can be classified as a semirigid connection according to Eurocode 3 and special moment frame (SMF) as recommended by AISC.