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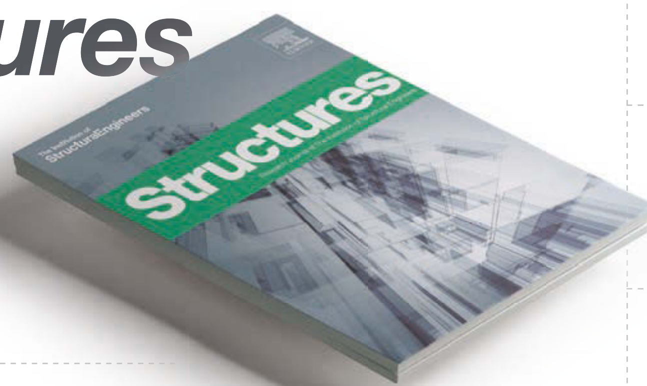

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The Featured Article for Volume 55, chosen by Associate Editor Lin-Hai Han, covers investigations into slip-critical blind bolts anchored in concrete-filled steel tubes.

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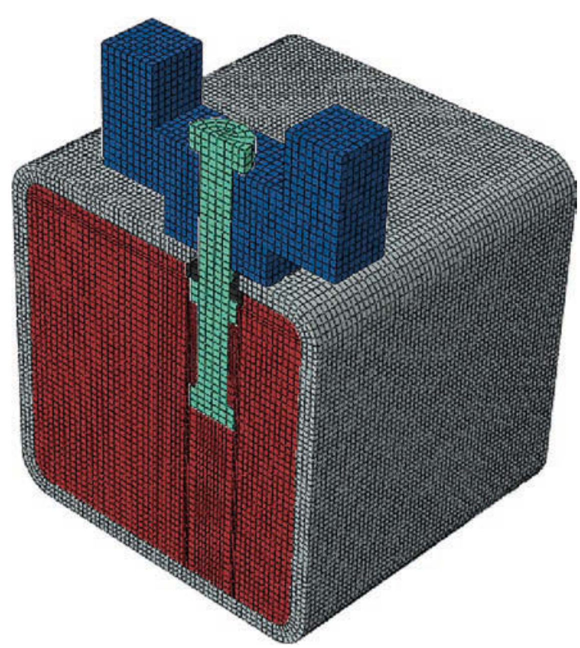
Editor's Featured Article

Experimental and numerical investigations of tensile behaviour of slip-critical blind bolts anchored in concrete-filled steel tubes

Xing Gao[a,b], Wei Wang[a,b] and Lip H. Teh[c]
[a] State Key Laboratory of Disaster Reduction in Civil Engineering, Tongji University, Shanghai, China
[b] Dept. of Structural Engineering, Tongji University, Shanghai, China
[c] School of Civil, Mining & Environmental Engineering, University of Wollongong, Wollongong, Australia

This paper presents experimental and numerical investigations of a concrete-anchored slip-critical blind bolt (CASCBB) system, which can be used to connect a steel beam to a concrete-filled steel tube column to form a rigid moment connection. A series of pull-out tests of CASCBBs embedded in concrete-filled steel square hollow section (SHS) is conducted with varying parameters such as with or without concrete infill, types of bolts, threaded or non-threaded anchor stud, tube thickness and bolt edge distance. A connection with a sufficiently thick SHS flange benefits significantly from its direct contribution to the total resistance even well before the anchorage failure. If the tube flange is too thin, the connection will possess no ductility as the concrete cone failure mode governs and dominates. A finite element methodology that resolves the difficulties of modelling the behaviour of infill concrete housing an anchored bolt is able to closely replicate the experimental responses. It is found from the finite element analysis that the contribution of the steel tube's flange is independent of its thickness-to-width ratio but is a function of its thickness and the bolt edge distance. Placing the anchored bolt close to the SHS web can double the stiffness compared to placing it in the middle of the flange due to the greater contribution of the steel tube. It can also increase the maximum load-carrying capacity significantly. The finite element analysis results suggest that threading the anchor stud does not have noticeable effects on the anchorage failure load and the connection's stiffness, in contrast to the apparent test results. In order to enable the plate separation to take place (at a load slightly higher than the bolt pretension), the column wall must be sufficiently thick. The wall thickness controls the maximum tensile capacity, the elastic stiffness and the ductility, but does not affect the initial stiffness.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2023.06.041**



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