

STRUCTURAL BEHAVIOUR OF BLIND-BOLTED T-STUB TO OCTAGONAL TUBE CONNECTIONS USING NORMAL AND HIGH-STRENGTH STEELS

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Abstract: *Structural behaviour of blind-bolted T-stub to octagonal tube connections is evaluated in this study experimentally and numerically. Two T-stub connections with different width-to-thickness ratios were tested under axial tensile loading. The finite element (FE) models were developed and validated against the test results. Based on the established FE models, the parametric studies were performed to further investigate the effects of the width-to-thickness ratio, material property and boundary condition on the failure mode, deformation and strength of the connections. In the test, the locally-enlarged tube hole and fracture of split-washers following with the pull out of the bolts were observed. The ultimate state of two test specimens was governed by the ultimate deformation limit, i.e. 3% of the width. Based on the parametric study, the width-to-thickness ratio could significantly affect the tube-wall deformation thus caused some effects on the failure mode and ultimate strength of the connection. Meanwhile the length of the octagonal tube had influence on the global bending deformation of the tube-wall. Furthermore, in the case of high-strength steel tube, the connection capacities were significantly improved for these failed at tube-wall yielding following with the split washer failure.*

Keywords: Blind-bolted connection; Octagonal tube; Width-to-thickness ratio; High strength steel

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