

Ultimate Stress of the Steel Tube in Circular Concrete-Filled Steel Tube Stub Columns Subjected to Axial Compression

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Abstract : Concrete-filled steel tube column achieves the excellent performance of high strength, stiffness, and ductility due to the confinement from the steel tube. Well understanding the stress of the steel tube is important to make clear the confinement effect. In this paper, the ultimate stress of the steel tube in circular concrete-filled steel tube columns subjected to axial compression was studied. Experimental tests were conducted to investigate the effects of the parameters, including concrete strength, steel strength, and D/t ratio, on the ultimate stress of the steel tube. The stress of the steel tube was determined by employing the Prandtl-Reuss flow rule associated with isotropic strain hardening. Results indicate that the stress of steel tube was influenced by the parameters. Specimen with higher strength ratio f_y/f_c and smaller D/t ratio generally leads to a higher utilization efficiency of the steel tube.

Keywords : concrete-filled steel tube, axial compression, ultimate stress, utilization efficiency

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