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标题: Local Buckling of Concrete Filled Rectangular Steel Tube with Longitudinal Stiffener under Axial Compression

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摘要: Width-thickness ratio was an important parameter for designing Concrete Filled Rectangular Steel Tube (CFRST). Welding longitudinal stiffener on the internal wall of steel pipe could delay the local buckling, which increased the limit of width-thickness ratio. If there was not enough stiffener and its sectional dimension was too small, the local buckling of steel pipe would occur, inducing its bearing capacity seriously. If the stiffener sectional dimension was too large, concrete filled in steel tube would be broken up, which reduces its bearing capacity. To solve that problem, this paper studied local buckling of CFRST with longitudinal stiffener under axial compression and design of longitudinal stiffener. It established buckling analysis model, simplified local buckling analysis as calculating buckling load of thin plate clamped on loading side and unloading side under axial force. It deduced buckling load and buckling coefficient based on the principle of energy. The results showed that buckling mode depended on stiffening rigidity. Therefore, it put forward minimum stiffening rigidity ratio that controlled the stiffener design. This paper also came up with a formula to calculate minimum stiffening rigidity ratio. It provided guidance on designing number, sectional dimension and material performance.

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