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一种钢管混凝土格构柱极限承载力的快速计算方法

A high-speed calculating method of the bearing capacity of the latticed column of concrete filled steel tube

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英文关键词: [ultimate bearing capacity](#) [computational method](#) [concrete-filled steel tube](#) [latticed column](#)

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中文摘要:

采用半波正弦曲线模拟杆件的变形曲线, 在考虑箍效应力管混凝土应力-应变关系和剪切变形影响的基础上, 建立了杆件中截面的平衡方程, 提出了钢管混凝土格构柱弹性极限承载力数值方法, 并编制了相应的计算程序。该方法不仅适用于两端偏心相等的偏压构件及两端偏心不等的偏压构件的弹性极限承载力的计算, 而且, 其收敛速度很快, 比分段合成数值法更能适用于工程计算。利用提出的计算方法和编制的程序对国内已有两端偏心相同的四肢钢管混凝土格构偏压长柱的试验结果进行了计算, 并与现有规程及分段合成法进行了比较, 结果表明: 规程计算方法结果偏于保守, 计算误差大, 本文方法的计算结果与试验结果吻合良好。

英文摘要:

Based on the stress-strain relationship of the concrete-filled steel tube considering the confinement effect and effects of the shear to the column, the equilibrium equation of the middle section has been established using the half-sinusoid curve to imitate the bar's deformation curve. The numerical method for calculating the elastic-plastic ultimate loads of the concrete-filled tubular laced columns were put forward. And also the corresponding computer program was compiled. This method is not only suitable for calculating the ultimate loads of the eccentricity compression columns with equal eccentric but also the eccentric compression columns with unequal eccentricity. Moreover the convergent speed is very fast. Compared with the integral method, it is more suitable to engineering calculation. Finally, the elastic-plastic ultimate loads of some four-tube concrete-filled steel tubular laced columns with equal eccentricity were calculated by the proposed method, whose results were also compared with the national code. The results illustrate the over conservation and larger computational errors of the existing computational methods and the results of this text are in good agreement with test results.

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