

学术论文

薄壁钢管再生混合短柱轴压性能试验研究

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摘要:

通过20个薄壁钢管再生混合短柱的轴压试验, 分析了废弃混凝土类型、废弃混凝土混合比、新旧混凝土强度差等因素对试件荷载-变形曲线的影响。对比分析了国内外相关公式预测试件轴压承载力的有效性; 在横截面积和用钢量相同的情况下, 对比了钢筋混凝土短柱与试件的轴压承载力。研究表明: 混合比相近时, 节段型钢管再生混合短柱的轴压承载力大于块体型钢管再生混合短柱; 块体型钢管再生混合短柱的混合比在25%~35%之间变化时, 其轴压承载力变化不大; 节段型钢管再生混合短柱的混合比在35%~50%之间变化时, 其轴压承载力变化不大; 强度差小于15MPa时, 块体型和节段型钢管再生混合短柱在上述各自混合比范围内, 具有与全现浇钢管混凝土短柱相近的轴压承载力。

关键词: 薄壁钢管再生混合短柱 静力试验 轴压承载力

Axial behavior of thin-walled steel stub columns filled with demolished concrete segment/lump

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Abstract:

Twenty thin-walled steel stub columns filled with demolished concrete segment/lump(DCS/L) or cast-in-situ concrete(CC) were tested under axial loading. The influence of such factors as type of demolished concrete(DC), mix ratio of DC, and strength difference between CC and DC, on measured load-deformation curves of the specimens were investigated. According to domestic and foreign formulas for concrete filled steel tubular column, the axial load bearing capacities of the specimens were calculated and compared with the test results. A comparison was conducted between the axial load bearing capacities of the specimens and those of reinforced concrete stub columns whose sectional dimensions and steel ratios were the same as those of the specimens. Test results show that: a) the axial load bearing capacity of the column filled with DCS is larger than that of the column filled with DCL when their mix ratios of DC are similar. b) the mix ratio of DC within the range of 25%-35% has little effect on the axial load bearing capacity of the column filled with DCL. c) the mix ratio of DC within the range of 35%-50% has little effect on the axial load bearing capacity of the column filled with DCS. d) within the ranges of mix ratio mentioned above, the axial load bearing capacities of the columns filled with DCS/L are close to those of the columns filled with CC when the strength difference between CC and DC is less than 15MPa

Keywords: thin-walled steel stub column filled with demolished concrete segment/lump static test axial load bearing capacity

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