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# 预应力内置圆钢管桁架混凝土组合梁的受力性能

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摘要

通过4根预应力内置圆钢管桁架混凝土组合简支梁的试验，得到了试验梁的荷载 跨中挠度曲线、正截面承载力、裂缝分布与展开特征。结果表明：可基于平截面假定计算该类组合梁正截面的承载力，该类组合梁的平均裂缝间距取决于下弦钢管外径及下弦二钢管截面面积之和与截面有效受拉混凝土面积的比值。提出了与试验结果吻合良好的裂缝宽度和刚度计算公式。

关键词 工程力学 内置圆钢管桁架混凝土组合梁 正截面承载力 刚度 裂缝宽度 预应力

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## Mechanical properties of truss concrete composite beam preslressed encased with circular steel tubes

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**Abstract** A truss concrete composite free supported beam prestressed encased with 4 circular steel tubes was tested and its curve of load deflection at mid span, the bending loading capacity, the distribution and development of the cracks were obtained. The results showed that the pure bending region of the beam accords with the plane section assumption from loading to failure, and the average crack spacing depends on the external diameter of the bottom chord tube and the ratio of the sum of the section areas of the two bottom chord tubes to the effective tensile concrete area. The formulas for the bending loading capacity, the stiffness, and the crack width which are in good agreement with the test results of the beam were presented.

**Key words** engineering mechanics truss concrete composite beam prestressed encased with circular steel tubes bending loading capacity stiffness crack width；prestress

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