

土木工程

双轴对称不锈钢受弯构件残余变形的影响因素分析

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摘要:

为了研究对称截面不锈钢受弯构件的残余变形和抗弯强度设计方法,参考Mazzolani等人提出的控制残余挠度不超过梁长1 / 1000的方法,对340根梁进行了参数化有限元分析,并且确定了构件的截面塑性发展系数。通过有限元计算,指出了塑性发展系数与构件几何形状、材料性能等影响因素之间的关系,以有限元结果为基础,提出了对称截面不锈钢受弯构件强度和变形的的设计方法。结果表明:通过限制截面塑性发展系数可以有效控制受弯构件的残余变形,从而满足不锈钢受弯构件强度和变形的要求。

关键词:

Influencing factors analysis of residual deformation of doubly symmetric stainless steel flexural members

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Abstract:

In order to investigate residual deformation and strength of doubly symmetric stainless steel flexural members, influencing factors analysis was presented by adopting the residual displacement method suggested by Mazzolani. With finite element analysis (FEA), 340 stainless steel I-beams were computed and the plastic adaption coefficient was suggested, which controlled the residual displacement less than 1 / 1000 of the beam span. The relationship between the plastic adaption coefficient and the geometry of members and material property was deduced. Design methods based on the FEA results were also proposed. The results indicated that the plastic adaption coefficient is the best way to control the residual deformation and ensure the requirements of the strength and deformation of stainless steel flexural members.

Keywords: stainless steel flexural members residual deformation finite-element analysis design method

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