

论文

迭代优化算法在大跨拱桥线形控制中的应用

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摘要:

针对某大跨径钢管混凝土拱桥的斜拉扣挂系统,将迭代优化算法应用于拱肋吊装的线形控制和索力计算.应用一次张拉到位的思想,通过设置合理的优化变量、约束条件和目标函数,将索力优化分散到各个施工阶段单独进行,依靠循环迭代实现总体线形的控制.该算法用于拱桥吊装施工的模拟,考虑了扣索垂度等非线性影响后,一轮优化得到的预抬高和扣索索力即可基本满足线形控制的要求.

关键词: 钢管混凝土拱桥 迭代优化算法 函数逼近 线形控制 索力优化

Application of the iterative optimum method in alignment control of long-span arch bridge

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Abstract:

Aiming at the cable stay system of one long-span CFST(concrete filled steel tubular) arch bridge, the iterative optimization method was introduced into alignment control and cable-force calculation of the erection stage. With the appliance of the once-tension idea, cable-force optimization was separated into parts that performed in every construction stage via reasonable design variable, constraints and optimization objective set up, and the overall alignment control was implemented by iterative loops. Using this method in simulation of arch bridge erection, the precambers and the cable forces ascertained in the first round optimization can basically meet the demand of alignment control after taking nonlinear effect like droop of cable into account.

Keywords: CFST arch bridge the iterative optimum algorithm function approximation alignment control cable force optimization

收稿日期 2007-11-03 修回日期 1900-01-01 网络版发布日期 2008-06-16

DOI:

基金项目:

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