论文

断裂力学法分析铆焊桥梁的安全性(英文)

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摘要： 本文介绍了一个分析铆焊桥梁安全性的简化方法根据新的有限元计算法，推导出一个含裂缝的桥梁的断裂负荷公式，从1890年至1930年间建造的铆焊桥梁材料中取样测定了400多个强度与断裂力学数据，做为断裂力学分析的原始输入数据.从长期服役的桥梁上以及未服役现代结构钢材（屈服强度350－890MPa）上取样，进行了大尺度样品测试，以评估该方法的正确性.

关键词： 断裂力学 有限元法 铆焊桥梁安全性

SAFETY ANALYSIS OF RIVETED BRIDGES BASED ON FRACTURE MECHANICS

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Abstract: A simplified method of safety analysis of riveted bridges based on fracture mechanics is presented in this paper First a new formula for the calculation of the fracture load of a brjdge member with an assumed crack. has been derived from new FEM-calculations.Second. a population of more than 400 experimental strength and fracture mechanic values derived from material taken from riveted bridges build between 1890 and 1930has been evaluated statistically to derive characteristic distributions as a basis for the material input data of the fracture mechanic concept. Third, large scale tests with oldbridge plates using the plane plate geometries described above bearing artificially pro-duced cracks have been carried out to verify the proposed method by comparing pre-dicted with experimental results. Fourth the new formula has been applied for modern structural steels with yield strength from 350 t0 890 MPa and large scale tests per-formed on the large sale testing machine at the Institute of Ferrous Metallurgy in sever-al research projects have re-evaluated to find out the quality of this approach.

Keywords: fracture mechanics   finite element simulation   safety of riveted bridge

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