

Testing Bridges to Failure - Experiences

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Abstract

Four bridges of different types have been tested to failure and the results have been compared to the load-carrying capacity calculated using standard code models and advanced numerical methods. The results may help to make accurate assessments of similar existing bridges. Here it is necessary to know the real behaviour, weak points, and to be able to model the load-carrying capacity in a correct way.

The four bridges were: (1) a one span steel truss railway bridge; (2) a two span strengthened concrete trough railway bridge; (3) a one span concrete trough bridge tested in fatigue; and (4) a five span prestressed concrete road bridge.

The unique results in the paper are the experiences of the real failure types, the robustness/weakness of the bridges, and the accuracy of different codes and models.

Keywords: bridges, testing, assessment, load-carrying capacity, reinforced concrete, prestressed concrete, steel, analysis, codes.

1 Introduction

Assessment of the load-carrying capacity of existing bridges is an important task. Four bridges in Sweden have been tested to failure and assessed using standard code models and advanced numerical methods.

The results may help to make more accurate assessments of similar existing bridges. Here it is necessary to know the real behaviour, weak points, and to be able to model the load-carrying capacity in a correct way.