



Evaluation Methods for the Existing Infrastructure in Germany

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Abstract

In the past decades much has been undertaken in Germany in the field of sustainable bridges in Germany. Every infrastructure has to be inspected regularly, so it can be classified according to its condition. Furthermore, the infrastructure has to be recalculated and evaluated. On the basis of these two criteria – the results of the inspection and the evaluation of the recalculation, as well as aspects of sustainability – the structure will be retrofitted or renewed. This strategy has been applied in Germany for many years with great success. This procedure is explained in the paper using two examples.

Keywords: Bridges; sustainability; inspection; recalculation; retrofitting.

1 Introduction

In the past decades much has been undertaken in Germany for existing highway and railway infrastructure. Due to the limited natural and financial resources. Many repair and strengthening strategies have been developed and applied successfully. In addition, sophisticated evaluation methods have been established which take into account the current state of the structure, the results of the recalculation as well as the experience with existing structures.

The current state of a structure can be evaluated based on an inspection according to the German code DIN 1076 [1] for highway bridges and the German railway code Ril. 804, module 8001 – 8004 [2] for railway bridges. These inspections take place every three years. The first inspection is a simple one and the following is a complete one. Every structural

element has to be viewed from close up, so it can “be touched”. A new addition to this close inspection are drones, which carry not only cameras but additional technical equipment as well. According to the particular construction elements of the bridge, the focus lies on different aspects. For reinforced concrete elements the existence of cracking, hollow sounding areas, chipping, moisture areas, defect joints, efflorescence, discoloration and corroded areas have to be checked. If such defects exist, further inspections and lab tests have to follow using non-destructive as well as light destructive methods. If necessary, specialists are engaged and even advanced technology methods or methods under development might be applied. For steel or timber elements, for bearing, joints, drainage system, etc. other aspects need to be checked. In addition to the structural safety, the traffic safety and the durability have to be evaluated