Condition assessment of several bridges in Sofia based on visual inspection and as-built drawings

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Abstract

Significant number of bridges in Sofia municipality are in halfway of their exploitation period – they are between 30÷60 years old. At the same time, there is a lack of common methodology for condition assessment of existing bridges (road, railway, pedestrian). Another issue is that there is no Bridge Management Data System, where the information from visual inspections, condition assessments and as-built drawings could be uploaded and used for further operations like regular maintenance activities, prioritization of repair works, planning budget and costs of the relevant authorities. Different structural types of bridge structures in Sofia are described in the paper. The advantages and disadvantages of the considered bridge types with respect to reliability and maintenance are analysed. Several bridges of different types are chosen in order to evaluate their condition based on visual inspection. Possibilities and advantages for implementation of condition assessment rating system based on numerical estimation are discussed.

Keywords: bridges in Sofia Municipality; exploitation problems; structural details; superstructure concepts; durability.

1 Introduction

Significant number of bridges in Sofia municipality is in halfway of their exploitation period – they are between 30÷60 years old. There are over 300 road bridges in Sofia. The absence of working bridge management system is serious problem in order to make adequate from scientific point of view decisions about priority of activities connected with preservation and elongation the exploitation period of particular bridges. This is of great importance for optimal usage of the permanently insufficient funds for bridge preservation.

On the other hand it must be mentioned that in particular bridges details with low reliability as for example Gerber joints were widely used in the past [1]. Such critical detail is shown on Figure 1.

Figure 1. Gerber joint of RC bridge in Sofia, 2008

In these cases, the superstructure is statically determinable, but the robustness level of the detail is low and respectively there is high risk of

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