IABSE SYMPOSIUM
7-9 October 2020
Synergy of Culture and Civil Engineering
- History and Challenges
IABSE 2020
WROCŁAW POLAND

EVALUATION OF LOAD CAPACITY AND DURABILITY BEARING STRUCTURES OF BRIDGES SUPERSTRUCTURES DUE TO WEAR

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SUMMARY

This article presents the results of a study of long-term degradation processes: corrosion of steel structures and rebar, metal fatigue, loss of pre-stress, which reduce the load capacity and durability of bearing bridge structures.

In addition, the parameters of the probability distribution according to the normal law of the impact on the bridge elements of loads from heavy vehicles, as well as the forecast of the growth of road live loads over time are obtained.

The algorithm for determining the residual life of the durability (pre-repair terms) of bridges is compiled on the basis of probabilistic criteria of limit States.

Keywords: *Bridge, corrosion, endurance, fatigue, probability, rebar, wear.*

1. INTRODUCTION

The problem of reducing the load capacity and durability of bridge structures (hereinafter – bridges) due to physical wear of load-bearing structures does not cease to be relevant for decades.

Objectively, physical wear of bridge structures is inevitable. It is impossible to completely switch it off, but protective measures can slow it down.

This report examines the following most dangerous degradation processes that seriously affect the load capacity and durability of bridges: corrosion and fatigue of steel structures and rebar, as well as the weakening of the tension of high-strength reinforcement used to compress friction joints of composite reinforced concrete spans;

Corrosion wear of structures depends on the nature and extent of harmful man-made and climatic influences.

Fatigue wear is the result of variable magnitude impacts of mobile operating loads.

The drop of forces in the beams of prestressed reinforcement leads to the loss of compression of joints of composite reinforced concrete superstructures and, accordingly, to a decrease in the bearing capacity of joints for shear.

It is necessary to understand the nature of the degradation processes that cause wear of structures and be able to assess their intensity and impact on the strength and durability of bridges to more or less successfully resist these processes.

https://doi.org/10.2749/wroclaw.2020.1189