MEASURES TO EXTEND THE SERVICE LIFE OF INTERMEDIATE DEVICES OF BRIDGES

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Annotation: *This article is devoted to a currently relevant problem, namely, One of the important factors in increasing the transport and operational condition of highways and artificial structures includes tasks that a bridge builder must solve to extend the service life of bridge superstructures.*

Key words: *Designs of span structures, limit state, load-bearing capacity, inoperability, reliability factor, design resistance of the material.*

МЕРОПРИЯТИЯ ПО ПРОДЛЕНИЮ СРОКА СЛУЖБЫ ПРОМЕЖУТОЧНЫХ УСТРОЙСТВ МОСТОВ

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Аннотация: *Данная статья посвящена актуальной в настоящее время проблеме, а именно, Одним из важных факторов повышения транспортно-эксплуатационного состояния автомобильных дорог и искусственных сооружений является включает задачи, которые должен решить мостовик для продления срока службы пролетних строений мостов.*

Ключевые слова: *Конструкции пролетних строений, предельное состояние, несущая способность, неработоспособность, коэффициент надежности, расчетное сопротивление материала.*

INTRODUCTION. To perform calculation work, the engineer needs to solve the following tasks:

• determine the dimensions of its parts when creating the design of intermediate devices to absorb given loads - complete the task of designing the structure;

• when determining the ability of intermediate device structures to transmit specified loads, the task is to check the design parts for accuracy;

• the task of determining the load-bearing capacity of the intermediate device structure when determining the maximum load-bearing capacity of the structure, taking into account its actual condition.

The term “limit state” is understood as a state that does not meet the requirements for the structure during operation, does not correspond to the responsibility assigned to it and the work performed by it.

The limit state is divided into 2 groups.

1) capacity or unsuitability;

2) unsuitability for normal use.

MAIN PART. Conditions corresponding to the loading conditions specified in the design are elimination of extreme damage, operation without any restrictions, correct operation.

The design calculation must ensure protection against it, regardless of which of the two limit states affects it.

Any first group of limit states for any part of the structure is not affected, provided that the smallest permissible load Nmax that can be affected does not exceed Fmin.

$$N_{max} \leq F_{min} \qquad (1)$$

The left side of inequality (1) depends on the load applied to the structure, the calculation scheme and the dimensions of the structure, the right side - the strength of the material, the size and shape of the geometric section of the structure. parts. The loads acting on the structure, the strength of building materials, and the geometric dimensions of structural parts are not considered strictly defined dimensions; they have the property of static change.

This is the transition between large and small deviations from the average value. According to the description of the curve, the degree of change in the value under consideration is analyzed: if the curve rises along the length of the ordinate axis (curve 1), then the corresponding size is small, then a transition to quantity will occur, if the curve has a slope (curve 2), then the value under consideration will be highly variable. Values with a static description of the strength of the material and the load acting on the structure are determined by entering their standard and calculated values based on the analysis of the corresponding curves.

Permissible real permanent and temporary loads differ from standard loads. Consequently, the design loads R are equal to the product of the safety factor, which is the negative deviation of the loads Rm from the standard loads. (big or small).

$$R = Rm\ Yf \qquad (2)$$

When calculating the simultaneous load of several loads, their negative impact on the load is taken into account. The equalization coefficient η takes into account the probability of reducing the design loads when they occur simultaneously and is adopted in accordance with Appendix 2 of GNP 2.05.03-12. Calculation of simultaneous loading of several loads, their negative effects on loads are taken into account. The equalization coefficient η takes into account the probability of reduction of calculated loads when they appear at the same time, and is adopted according to Appendix 2 of SHNQ 2.05.03-12. In the calculation according to the first limit state group, the effect of calculated loads is worked out, and in the second - the effect of standard loads is calculated, where Yf=1.

Standard and calculated resistances of materials. The mechanical properties of materials are also statically variable. The guaranteed value of standard resistance should not be less than 0.95,

$$\int_{R_n}^{\infty} f(R)\,dR \geq 0{,}95 \qquad (3)$$

Thus, at least 95% of the tested samples have a resistance equal to Rm.

The design resistance of the material R must be the reliability coefficient of the material with the standard resistance Rm corresponding to each form of stress state γm >1:

$$R = R_n / \gamma_m \qquad (4)$$

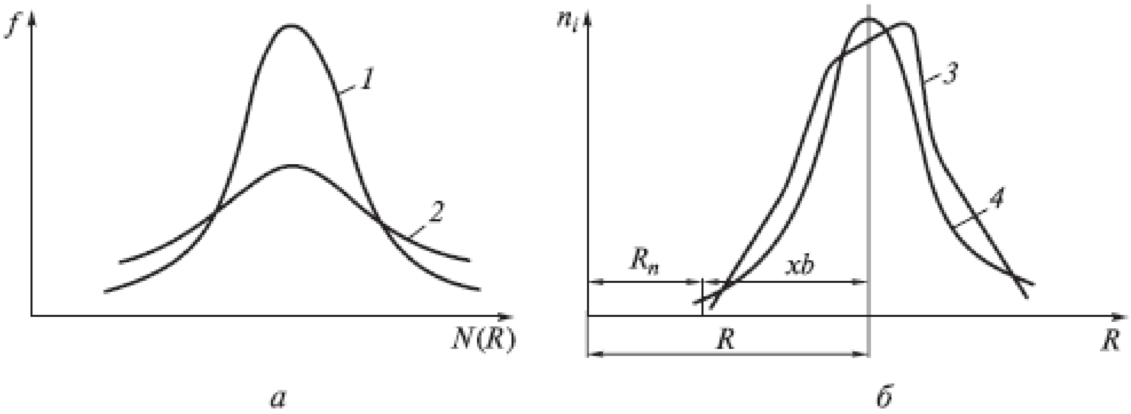

Figure 1. Strength of materials and static load changes

a - load density distribution or type of material strength curve; b-selection of a standard level of material resistance; 1- curve continuing in the direction of the ordinate axis; 2- inclined curve; 3-column table; 4-densely distributed

CONCLUSION. The reliability factor increases by reducing the strength of the material of specific sizes, the dimensions of which differ from the sizes of standard samples. There are such impacts that the deformation and load-bearing capacity of the structure are influenced by factors that were not taken into account when determining and calculating the design description of the material. Such impacts include solar radiation, freezing and thawing in winter, humidity and aggressiveness of the environment, long-term exposure to forces, convergence of design schemes and initial conditions of calculation. Their influence is taken into account in separate coefficients - the working conditions coefficient.

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