

# ILM – FAN TA’LIMDA INNOVATSION YONDASHUVLAR, MUAMMOLAR, TAKLIF VA YECHIMLAR

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**EVALUATION OF SEISMIC STRENGTH OF CAR BRIDGES UNDER  
VIBRODYNAMIC EFFECTS**

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**Annotation:**

It is important to build and operate bridges in our country. In this article, we discuss the relevance and relevance of the topic of assessing the seismic strength of road bridges under vibrodynamic influences.

**Key words:**

Vibrodynamic effects, dynamic effects, road bridges, seismic strength, load-bearing capacity

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Enter. With the development of countries of the world, the increase in traffic intensity and speed on highways requires the construction of new highways adapted to modern conditions and modernization of existing ones.

In the last 5 years in our country, in the field of architecture and bridge construction, the head of state issued PD-3309 “Improving the system of construction and use of highway bridges, overpasses and other artificial structures” on “Construction, reconstruction and capital repair of highway bridges, overpasses and other artificial structures in the Republic of Karakalpakstan, regions and the city of Tashkent in 2018-2022” Decisions No. PD-3632 “On Approval of the State Program” and No. PD-4545 “On Measures to Further Improve the Road Sector Management System” have been signed and the implementation of decisions in these areas is being ensured.

The main part. As a result of demographic growth in our republic, people naturally use cars to meet their needs. This causes traffic jams at highway intersections, as well as various unfortunate accidents. This situation complicates the normal use of artificial structures located on highways, that is, it causes new defects and damages that are not foreseen in the main load-bearing structures of bridges built on the basis of old design standards on roads, leading to will come. In order to eliminate these shortcomings, construction works of road overpasses are being carried out in our country. At present, there are more than 14,300 automobile bridges in our republic, and exploitation works are being actively carried out in order to extend the life of artificial structures.

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Most of the territory of Central Asia is considered to be seismically dangerous. Regardless of the great achievements in the design, calculation and operation of various structures in seismic regions, the theory of earthquake resistance of bridges is far behind the general theory of earthquake resistance. The existing recommendations for the design of calculation schemes for the calculation of seismic effects of bridges do not take into account the new constructions used to increase the earthquake resistance of bridges based on the principles of multi-level design, seismic isolation and seismic damping that have occurred in the last 15 years. In the process of wide use of various seismic protection devices, the research work on the selection and justification of the most optimal seismic isolation indicators of bridges has not been sufficiently studied until now. World experience shows that many problematic issues in the field of earthquake resistance of bridges have not been resolved to date. The methods of calculating the seismic strengthening of bridges in the existing normative documents do not fully ensure their earthquake resistance, durability and reliability.

The study of the consequences of catastrophic earthquakes serves as one of the main sources of data analysis of seismic effects related to the theory of earthquake resistance.

The analysis of bridge damage shows that the collapse of intermediate structures occurs as a result of earthquakes of more than 9 points. In order to adopt the most optimal engineering solutions, damage to bridges during earthquakes should be analyzed. As a result of this analysis, it becomes possible to identify weak nodes in load-bearing structures, determine constructive anti-seismic measures, and determine theoretical calculations.

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Computational models of bridges are accepted based on the accumulated experience in earthquake-resistant construction.

According to the analysis of a lot of data on seismic damage of transport structures, the most common types of damage in girder bridges among bridge structures can be divided into three groups:

- relatively less damaged intermediate devices are pushed or fall from their supports
- failure or severe damage to the support and supporting devices, which causes the bridge to collapse completely or partially;
- displacement and collapse of bridge supports, which are the most common damages.

Until now, Sh. Okamoto, G.N. Karsivadze, A.M. Uzdin, G.S. Shestoporov and other scientists studied the damage of bridges during strong earthquakes in detail and identified the main characteristics of seismic vibrations of bridges.

These features include::

- the size of the length of the building;
- the non-linear nature of the influence of intermediate devices on each other and on the supports;

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– the presence of a temporary moving load that is different in comparison to residential buildings, characteristics of interaction with the ground (small foundation area and large pressures falling along the support), etc.

In the development of measures against earthquakes, damage of the same type, which is characteristic of certain types of structures and is observed very often, is studied.

Currently, assessment of the technical condition of bridge structures is carried out without taking into account the world experience in this field. Assessment of the strength, reliability and durability of girder bridges, a detailed review of the laws of the vibration process of intermediate devices under the influence of dynamic loads, which objectively reflect the level of possibility of bridge structures absorbing existing dynamic effects requires. Consideration of these dynamic effects allows to determine the reduction of the load-bearing capacity of the structure, defects and damage. Taking into account the above, the development of a method for determining the seismic strength of bridges with intermediate devices on highways using vibrodiagnostics is considered one of the current issues.

Based on the analysis of the consequences of recent earthquakes in the world, on the basis of the identification of the most characteristic damage of bridges and the study of their causes, on the basis of the analysis of modern methods of technical condition assessment, using modern measuring devices, computers and software the main task is to improve the methods of measuring the dynamic characteristics of bridge structures, to develop a method of assessing the technical condition of bridges using the determined dynamic parameters. Based on the determined



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dynamic indicators of the real bridge structure, its stress-deformation state and seismic stability assessment is carried out. The developed method makes it possible to assess the technical condition of bridge structures and clarify its load-carrying capacity, to pre-estimate the level of damage during possible earthquakes.

The conclusion Through studies and research on the topic "Assessment of the seismic strength of automobile bridges under vibrodynamic effects", a rational methodology for assessing the seismic strength of existing bridges and overpasses in our republic will be developed. At the same time, recommendations for assessing the technical condition and seismic strength of bridge structures will be developed, implemented in practice, and we will prevent possible disappointments and financial losses in the field of bridge construction.

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