RESEARCH ON EARTHQUAKE RESISTANCE OF BRIDGE STRUCTURES

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ABSTRACT

Destruction of Bridges in heavy earthquakes hampers transportation of rescue teams to the damaged areas, rendering first aid to the population, anti-fire measures and supply of restoration means. Therefore, worthwhile concern should be given to securing the earthquake resistance of bridge structures. For the last 10 years special investigation has been carried out in this field in the USSR. The present paper deals with some results of these investigations.

A separate chapter in construction standards and regulations in the USSR is devoted to designing earthquake resistant road structures, and bridges in particular. The chapter contains basic directions on selection of expedient types of bridge structures as well as recommendations on constructive measures. At the same time, the carrying structures of bridges should be specially designed for seismic loads. Since 1962 the standards have been providing for carrying out the above-mentioned designs on the basis of dynamic method (method of spectral curves) which was legalised in the USSR as far back as 1957 for civil and industrial buildings.

Topics covered.

Idealized multispan bridges are defined and their natural periods and mode shapes calculated.

Field tests were made on over 20 arch bridges. The measured natural periods and the important bridge dimensions are given in a table. Mode shapes were determined from tests on models.

A study of the longitudinal vibrations of girder and arch bridges is in progress.

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