

Test survey on earthquake resistant limit state design for whole systems of bridge which considers reliability

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In this research, we aimed at establishment of a method to evaluate seismic performance of whole systems of bridge based on reliability theory, and at proposing of resistance structures and hierarchical coefficient of bearing capacity based on the capacity design which is foundation of the evaluation method, and also aimed at proposing of performance evaluation analysis method based on displacement-based design.

We evaluated seismic reliability of reinforced concrete (RC) which satisfies seismic performance level 2 specified in the present specifications for highway bridges, RC bridges-bearing and upper structures with a simultaneous consideration of multiple limit states, then analyzed sensitivity of partial factors, and proposed hierarchy of bearing capacity necessary for inducing damages on bridges. And also, we proposed a method to set equivalent damping factors and equivalent stiffness for improvement of accuracy of presumption of maximum response displacement by assuming that equivalent linearization method is applied when designing bridges based on displacement-based design method.

Keywords: limit state design, reliability theory, displacement-based design method, equivalent linearization method