

Development of next-generation technical standards enabling the utilization of various inspection / monitoring techniques and repair / reinforcement techniques

Road Structures Department

In response to aging of road structures and intensifying disasters, we aim to formulate technical standards for inspection, monitoring, repair, and reinforcement so that road structures can be maintained efficiently while enhancing the reliability of their safety.

Social background and issues

In response to the manifestation of deformation due to aging in road bridges, etc. in the country, requirement of periodic inspection by proximity distance observation of all components every five years was established by law in 2014. In the future, further aging and intensification of disasters are expected to proceed while periodic inspections are continually implemented, and it is required to improve the quality of periodic inspection and to be able to perform safety management timely and continually with less labor and cost.

It is also required to not only conduct inspections but enable rationalization and secure life extension.



Case of requiring improvement of the quality of periodic inspection
(For suspension bridges, it is difficult to grasp the condition of cable under covering only with proximity distance observation)

Study contents

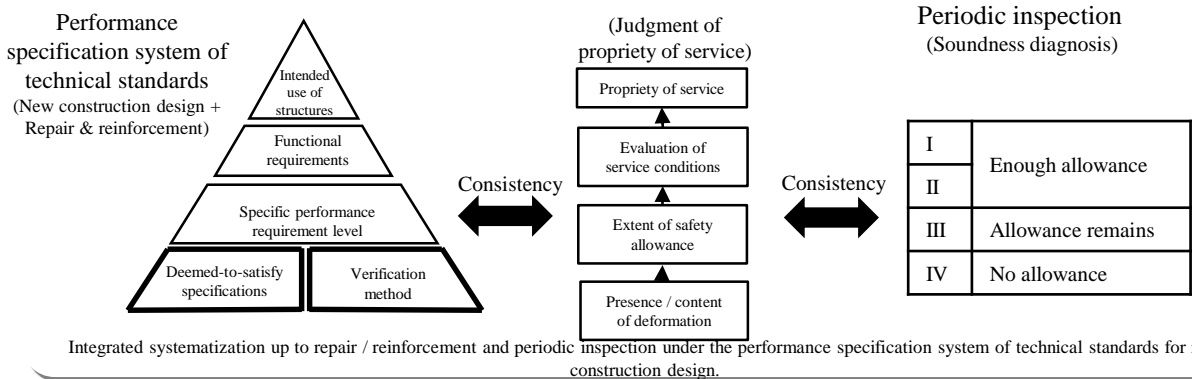
Development of performance evaluation (soundness diagnosis) method for existing structures

■ For next-generation periodic inspection.

We are studying the concept of next-generation periodic inspection procedures, such as customization of inspection methods according to characteristics of each bridge with combination of various sensing techniques, non-destructive inspection techniques, periodical replacement of components, etc. To this end, it is expected to use techniques that can evaluate external force, response, and strength as quantitatively as possible. Hence, we are also studying about systematization of performance evaluation methods concerning non-destructive inspection techniques and monitoring techniques.

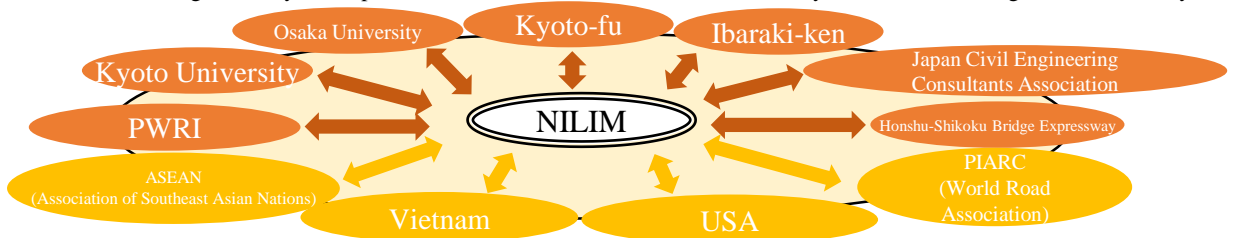
■ For reasonable repair / reinforcement.

For the safety and performance of bridges, we are studying for formulation of technical standards of repair and reinforcement so that reasonable repair / reinforcement can be implemented using various materials and construction methods according to the conditions of individual bridges with utilization of the merits of the partial factor design method and limit state design method, which enable meticulous design. For instance, we are studying about load combination according to changes in the evaluation period, method of setting the partial factors of existing components and repair / reinforcement components, and systematization of performance evaluation methods for new repair / reinforcement components / construction method.



Joint research system at home and abroad

Conducting the study jointly with domestic institutions that play a role in development / management of road structures, including the Japan Civil Engineering Consultants Association, in order to ensure / accelerate dissemination / implementation of study findings. In addition, for the performance evaluation method of sensing technology, repair / reinforcement construction method, etc., we are advancing the study in cooperation with overseas institutions so that it may also be acknowledged internationally.



Achieve both quality improvement of road bridge maintenance and burden reduction