

## A study on efficiency improvement of diagnosis in maintenance of highway bridge deck

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### Abstract

In order to improve the maintenance and management of the highway bridge deck, a test equipment was developed for grasping the rigidity of the deteriorated deck using the deformation of the deck obtained by the impact load. A soundness evaluation system of the bridge deck using the impact test result has been constructed, and this evaluation system utilizes the curvature of the neighbourhood of the load application point. The degradation degree was evaluated from the relationship between curvature and Young's modulus calculated using deflection. When any abnormality is observed in the periodic inspection of the highway bridge deck, load bearing performance can be evaluated at an early stage by applying this system.

**Keywords:** Highway bridge deck, load test, impact load, curvature, degree of deterioration evaluation.

### 1. Introduction

In Japan, a number of bridges built in the high economic growth period in 1970's have been aging and promotion of their maintenance efficiency, as well as decrease in engineers, has become an important issue. Parts and components of the currently existing bridges which require a large amount of maintenance expenses are bridge deck pavement and expansion devices, painting of steel girders and reinforced concrete slabs (hereinafter called RC slab). In particular, a great deal of social capital is invested for damage measures of RC slabs

constructed based on the past standard in Japan. Inspection of those bridges was made obligatory in 2013 to grasp their present situation and inspection had been based on close visual observation. Based on the results of such inspection, planned damage measures such as repairing and reinforcing for life prolongation have come to be conducted. However, visual observation-based bridge inspection enables to grasp damage degrees while it does not reveal load resistance performance of the bridges. Furthermore, in deterioration of RC slabs, not only