

Integrated control of maintenance information for bridges using three-dimensional models

AOYAMA Noriaki, Senior Researcher

TANIGUCHI Hisatoshi, Researcher (Dr. Information Science)

FUJITA Rei, Guest Research Engineer

SHIGETAKA Koichi, Head

Information Technology Division, Research Center for Advanced Information Technology

(Key words) CALS/EC, bridge, three-dimensional data, maintenance

1. Introduction

The NILIM is conducting research on three-dimensional data standardization technology and visualization technologies to be used for computerized execution or at the maintenance stage in order to advance and increase the efficiency of public works.

This research is the study of methods of performing integrated control of bridge maintenance information, as part of the construction of an infrastructure for the smooth distribution and utilization of three-dimensional data in public works.

2. Prototype of the system

Bridge maintenance accumulates records of inspections and repairs at the maintenance stage in addition to various kinds of information generated at the design and construction stages. The system that is proposed here will, with a three-dimensional model prepared at the design stage as its platform, centrally control information useful for maintenance by entering and linking this information. The use of the three-dimensional model will simplify the clarification of the spatial positions of each structural body and member of the entire bridge, permitting information control with superior traceability and searchability.

The figure shows a prototype of the proposed system.

The system consists of a rough three-dimensional model to confirm the surrounding topography and the bridge shape, detailed three-dimensional models of each member and structural body, and an external file server to store information of various kinds. The external file server can, in order to simplify its introduction and operation, be prepared using market software and hardware not used by specialized systems, and various kinds of information inside each three-dimensional model and the external file service are controlled by linking with hyper-links.

The system has the ability to centrally control the history of information by clarifying data renewal sequence based on the folder structure inside the external file server and on naming rules, in order to insure traceability of the various kinds of information used at the maintenance stage.

3. Conclusions

In the future, we will study integrated control of information with, as the platforms, two-dimensional screens or simple three-dimensional models considering links with existing related databases and use for maintenance of existing bridges.

Figure. Prototype of the Maintenance Information Control System Using a Bridge Three-dimensional Model

