

DOBASHI LAB.

[Realizing a Sustainable Society]

International Centre for Urban Safety Engineering

<http://icus.iis.u-tokyo.ac.jp>

Urban Infrastructure Management Engineering

Realizing a Sustainable Society

Developing a seamless infrastructure management system

Concerning deterioration of urban infrastructure and large-scale disasters, the optimization of infrastructure life cycle and life cycle cost as well as the performance of its function is required through appropriate operation and maintenance in addition to the development of infrastructures. We are evaluating the action and interaction with the ground when a large-scale underground space is constructed by the enlargement method of shield tunnel, which has been employed as a standard method in infrastructure development of urban areas in recent years.

Based on the construction and maintenance database, the strategic management system is studied to achieve timely and accurate maintenance by the appropriate evaluation of structural performance, structural deterioration diagnosis and prediction. The realization of a sustainable society by dealing with the management of the infrastructure as a seamless system through this study, can be achieved.

In order to accomplish the above, the following are to be studied:

- ◆ Rationalization of tunnel technology by shield tunnel enlargement method
- ◆ Newly developed nondestructive testing(NDT) and monitoring technologies
- ◆ Realization of a seamless infrastructure management system

CIM(Construction Information Modeling)

- Database of 3D CAD, materials, etc.
- Information construction using digital data
- **Recording and management of initial data obtained in design and during construction**



Database system for maintenance

- **Integrated management of ledgers and database on GIS map**
- Database of Inspection, repair and reinforcement
- Database of NDT and monitoring
- **Create analysis models and input data**



Appropriate diagnosis, evaluation and timely repair & reinforcement

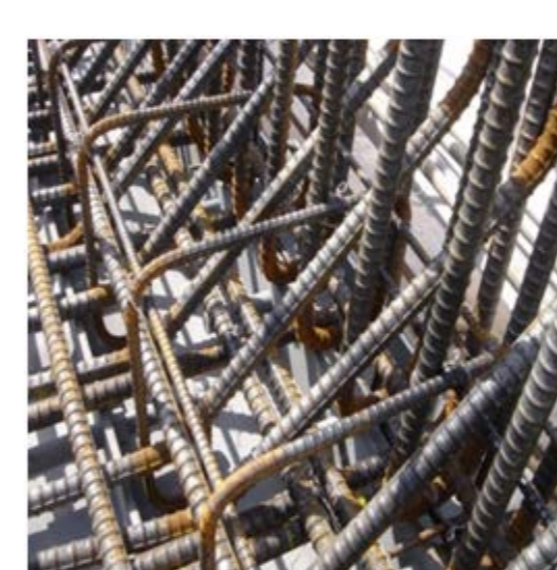
- Integration of analysis model, maintenance and inspection database
- performance evaluation and deterioration prediction, and design of repair and reinforcement
- **Implementation of timely repair, reinforcement**



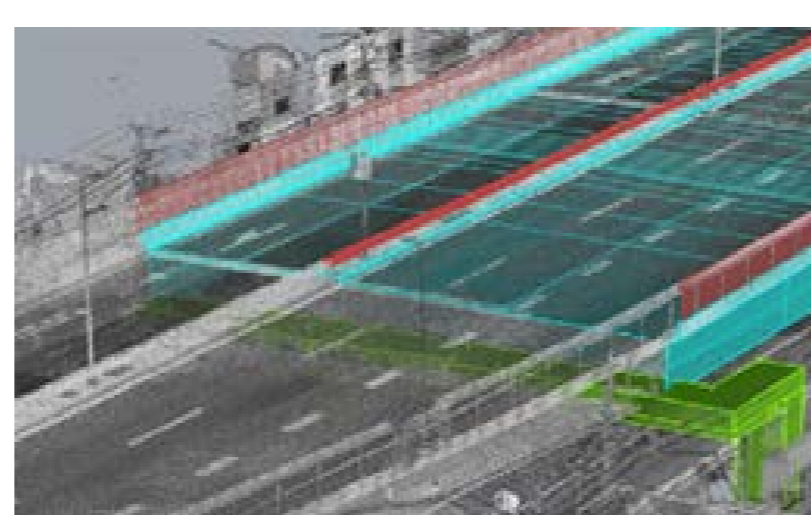
Construction Records



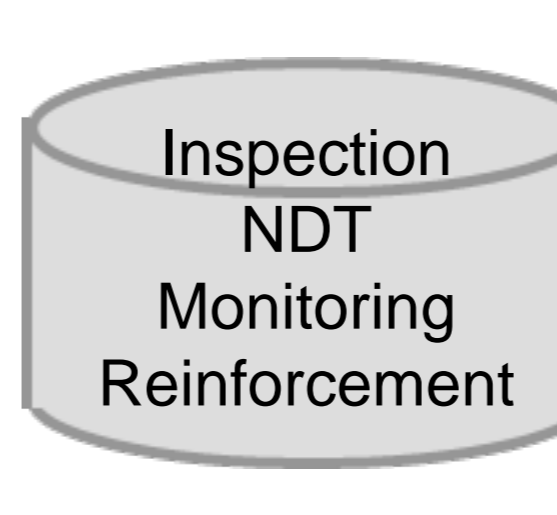
3D Model



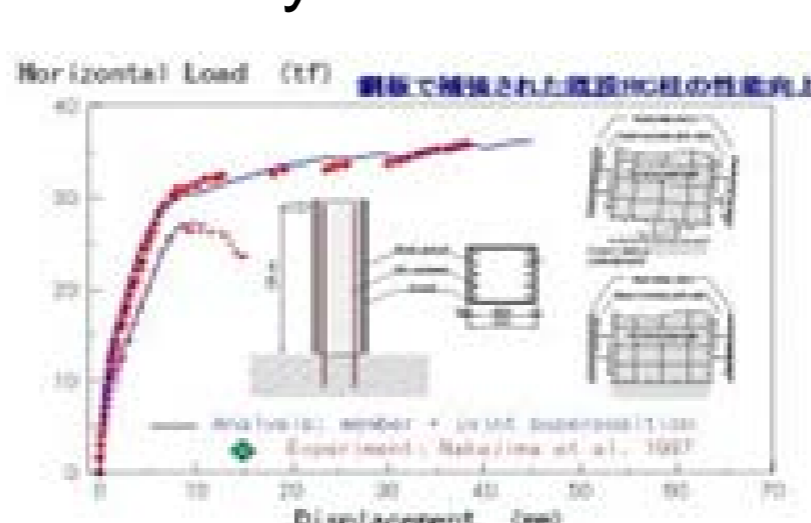
Material Data



Create 3D-Analysis Model



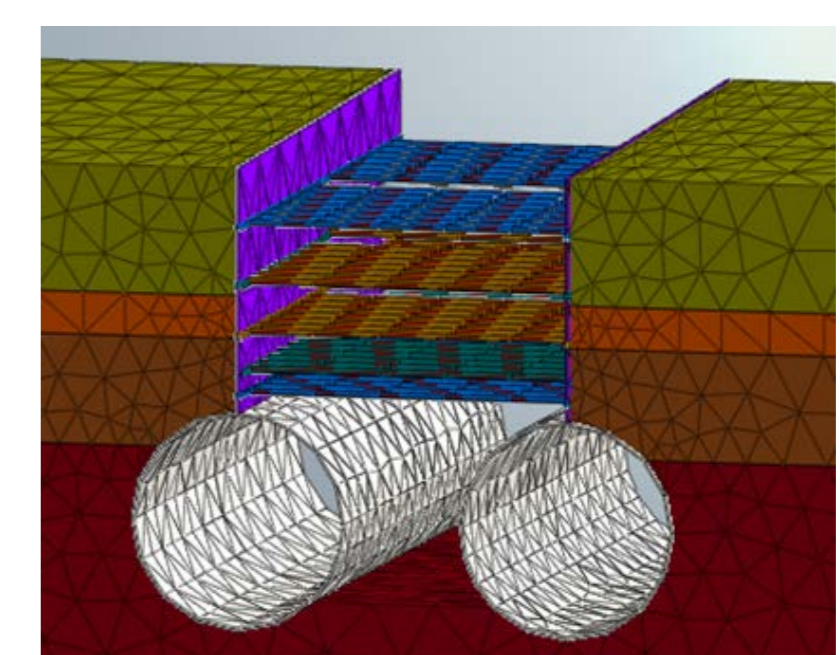
Database



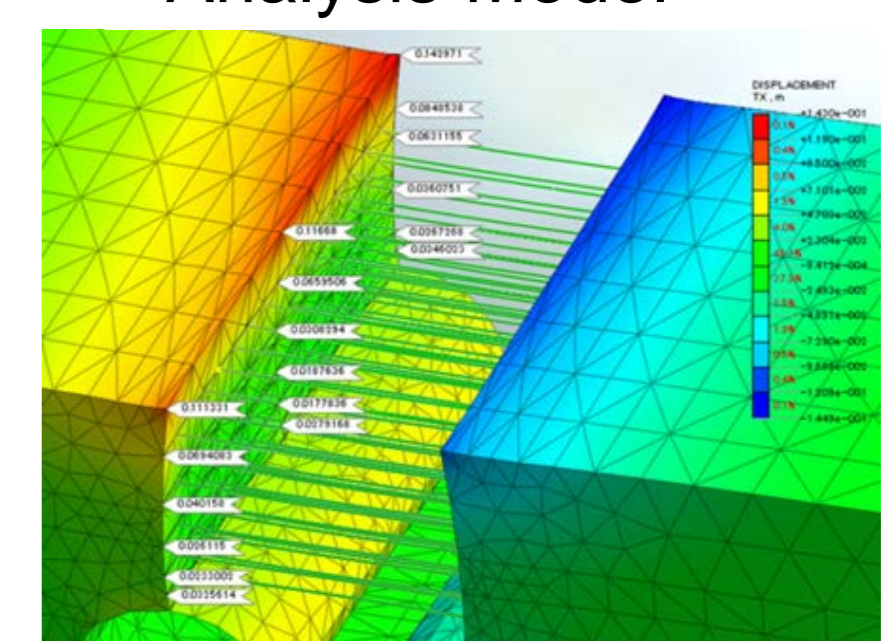
Deterioration Prediction



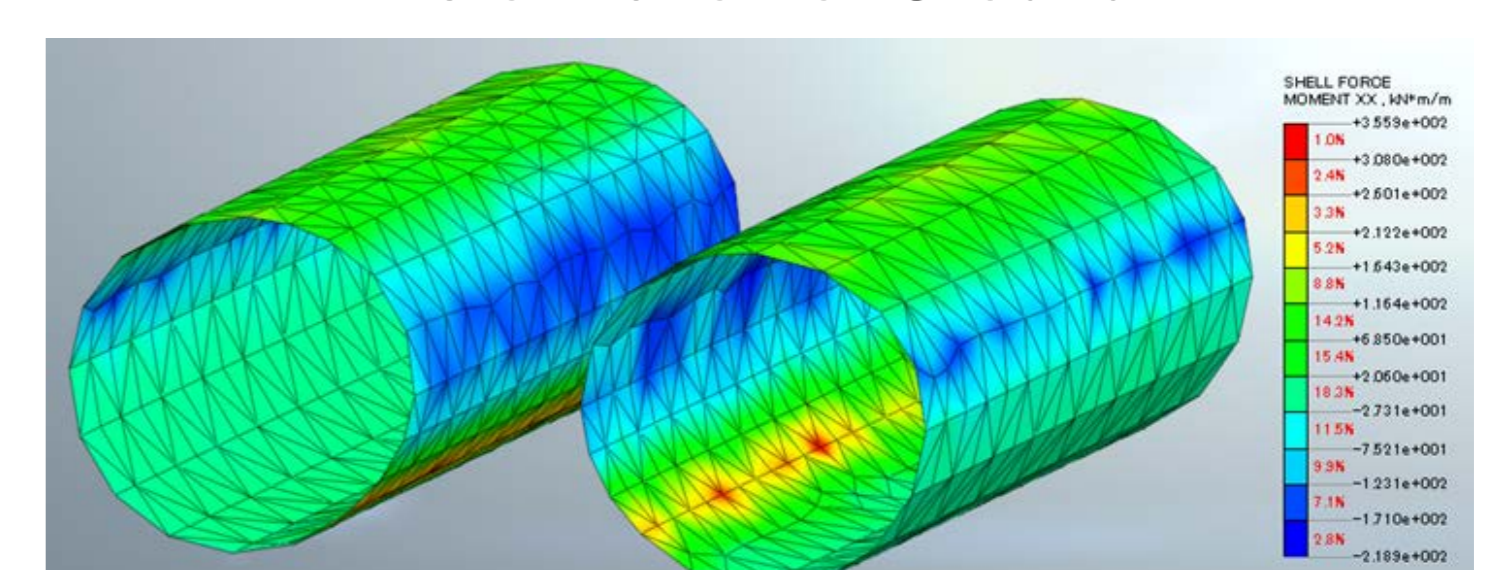
Repair and Reinforcement



Analysis Model



Deformation of Ground



Bending Moment of the Segment
Fig.2 Evaluation of Action and the Interaction with the Ground

Fig.1 Seamless System of Infrastructure Management