

Messages from Departments and Centers of NILIM

Establishment of a new research center

KOBAYASHI Masanori, Director
Research Center for Land and Construction Management

(Key words) Disaster prevention, maintenance, building construction management, information infrastructure, landscape, ecology

1. New research center

On April 1, 2014, the Research Center for Land and Construction Management will begin operating as a new organization inside the NILIM. Originally, research centers of the NILIM were established to conduct interdisciplinary research on rivers, roads, buildings and other areas. Until this year, there were three research centers at the NILIM: the Research Center for Land and Construction Management, Research Center for Advanced Information Technology, and Research Center for Disaster Management. The three research centers will be abandoned, then the new research center will be established to organize the contents to be addressed by an interdisciplinary method, to respond to changes in social conditions and meet the expectations of the people concerning the development of infrastructures, including the preparation for disaster prevention and disaster mitigation in response to Great East Japan Earthquake, the importance of maintaining infrastructure in response to the Sasago Tunnel accident, and the effective form of construction systems, such as the information infrastructure and public procurement etc that supports these infrastructures.

Thus, its configuration will be diverse, a large organization including 6 divisions: the Construction System Division, Construction Economics Division, Construction Management Division, Disaster Prevention Division, Maintenance and Information Technology Division, and Landscape and Ecology Division. It will be led by a Center Head and three Research Coordinators.

2. Scope of the new research center

(1) Disaster prevention related

Disaster prevention related research is undertaken by several departments; flooding by the River Department, sediment disasters by the Sabo Department etc. There are, however, issues that span various disciplines; Disaster Prevention Division will conduct research on such issues including preparation for the Nankai Trough Earthquake or the Tokyo Metropolitan Earthquake and accompanying tsunami.

For example, immediate damage estimation technology will be developed to support the initial

responses of facility to administrators shortly after an earthquake, when there is little information on the damage to facilities. In addition, earthquake motion information will be collected from strong motion observation facilities installed at civil engineering structures such as river levees or bridges throughout Japan. The information will then be stored and managed in a database and provided upon request. These data are also used for research on design earthquake motion.

(2) Maintenance related

While facing many problems including the deterioration of public capital facilities, falling birth rate and aging of society, growing shortage of technicians, and financial restrictions, continuing appropriate maintenance of public capital will be important for Japan in the future. Research on individual technologies used for maintenance will be done by departments specializing in various disciplines, but the new Research Center will aim to abstract and organize common evaluation matters related to stock management in order to be able to continue the PDCA cycle of maintenance related to "Research on Methods of Improving Sustainability of Maintenance Including the Perspective of Risk Management", which will begin as new project research in 2014 under the leadership of the Research Coordinator for Construction Management.

In addition, maintenance related research will also be conducted in the Maintenance and Information Technology Division and the Landscape and Ecology Division.

(3) Civil construction system related

The new research center will be called the Research Center for Land and Construction Management, but another major activity of the center will be research on civil construction systems Procurement methods change along with changing social conditions, and it is necessary to organize systems to reflect the current social background. Estimation has changed as totaling based on productivity has been replaced by the execution package method based on execution units. The tendering system has also changed from the invitational tender method to the more competitive open tender method. To prevent the negative effect of competition based on the price only approach, the Act

on Promoting Quality Assurance in Public Works (Quality Assurance Act) has come into force, permitting the application of the Overall Evaluation Method, which evaluates both price and technical quality. At the same time, a variety of issues of tendering for maintenance have recently been raised.

For reasons such as this, the Construction System Division will conduct research on estimation methods for maintenance work, an area in which serious challenges have appeared: expanding and following up execution package work categories for more efficient estimation, speeding up change of execution methods to keep pace with technology development by increasingly diverse execution conditions and execution contents, rationalizing estimations or reducing labor required for estimations.

The Construction Management Division will perform research on tendering and contracting systems, for example, on the improvement of Quality and Cost Based Selection, in which issues have appeared in the period since it was introduced, or on design build (DB) or construction management (CM) etc.

But because of inadequate understanding of public capital, there is a deep rooted disbelief in the necessity of public works among the people. The Construction Economics Division will, therefore, study methods of effective expression in order to clarify and reveal in easily understood terms the latent roles and effectiveness of providing and managing public capital in various aspects of the lives of the people.

(4) Information infrastructure related

The Ministry of Land, Infrastructure, Transport and Tourism collects information to be shared from databases in various fields, in order to build a public capital information platform that facilitates the prompt, interdisciplinary use of information. This platform would be useful for improving efficiency in facility management, and providing facility information in the event of a disaster.

As well as supporting the development of this information platform, the Maintenance and Information Technology Division conducts research on information infrastructure for GIS, road communication standards and so on, where information necessary for national land management can be accumulated and managed efficiently, so it can be shared across various application fields. Also, the division has been working on standardizing 3D design data, so it can be utilized in construction management using a total station, as well as in computerized execution. In parallel, they continue to research applications in facility management, and to measure the degree of distortion and deformation of structures after being struck by a disaster such as an earthquake.

(5) Landscape and ecology related

When people hear “public capital maintenance” they tend to imagine bridges, tunnels, sewage

treatment systems, dams, sluice gates and other civil engineering structures, but it is also necessary for urban green trees, along streets, in parks, and elsewhere. Consideration for biodiversity, necessary when providing public capital is, in a certain sense, maintenance of the ecosystem.

The Landscape and Ecology Division aims to set evaluation criteria to reconsider revegetation policies and to establish conservation and reclamation methods required by this policy, so that roadside trees with maintenance problems can fulfill their greenery function. And it will also research the conservation of ecosystems and of greenery.

3. Conclusions

Organizations must change to keep pace with changing social conditions. For this reason, we are carrying out a sweeping reorganization including this research center.

So no one will say that this is just a change of names or a change of affiliation, we wish to continue to conduct research that society demands to meet the expectations of the people, including past initiatives and new initiatives, so please give the new Research Center for Land and Construction Management your full support.