

Outline of activities of Public Works Research Institute during fiscal year 2007

Fiscal year 2007 is the second year since the second medium-term plan started in fiscal year 2006. During this term, we strived to implement the research policy created for the second medium-term plan, and to promote cooperation between Tsukuba Research Division based in Tsukuba and Civil Engineering Research Institute for cold regions and stable research and development under a new framework of research evaluation system, and to disseminate the outcomes. On the other hand, we actively worked towards establishing organization to take on future research and development.

Following are major activities undertaken in fiscal year 2007 based on the research policy created in fiscal year 2006.

■ Research concept ■

1. Research that can assume the responsibility for society for coming one hundred years
2. Research that is recognized by academia, trusted by local communities and practical engineers
3. Research that respects traditions and has enterprising spirit

1. Research that can assume the responsibility for society for coming one hundred years

Public Works Research Institute is strategically and systematically promoting research with a long-term vision in the light of the fact that civil engineering structures will be used over several decades or centuries. Furthermore, we are flexibly operating the organization in order to undertake research that can reflect the social needs. In fiscal year 2007, we reviewed various research organizations with recent social needs in mind and promoted strong cooperation among them.

●Promotion of systematic researches and prioritization of research and development

In fiscal year 2007, we newly established “Research of policy research” by combining conventional “Prioritized project research”, “Strategy research”, “General research” and “Budding research” so as to promote researches systematically. 69% of budgets were injected to the Prioritized project research and the Project researches that are important researches related to achievements of the medium-term goals.

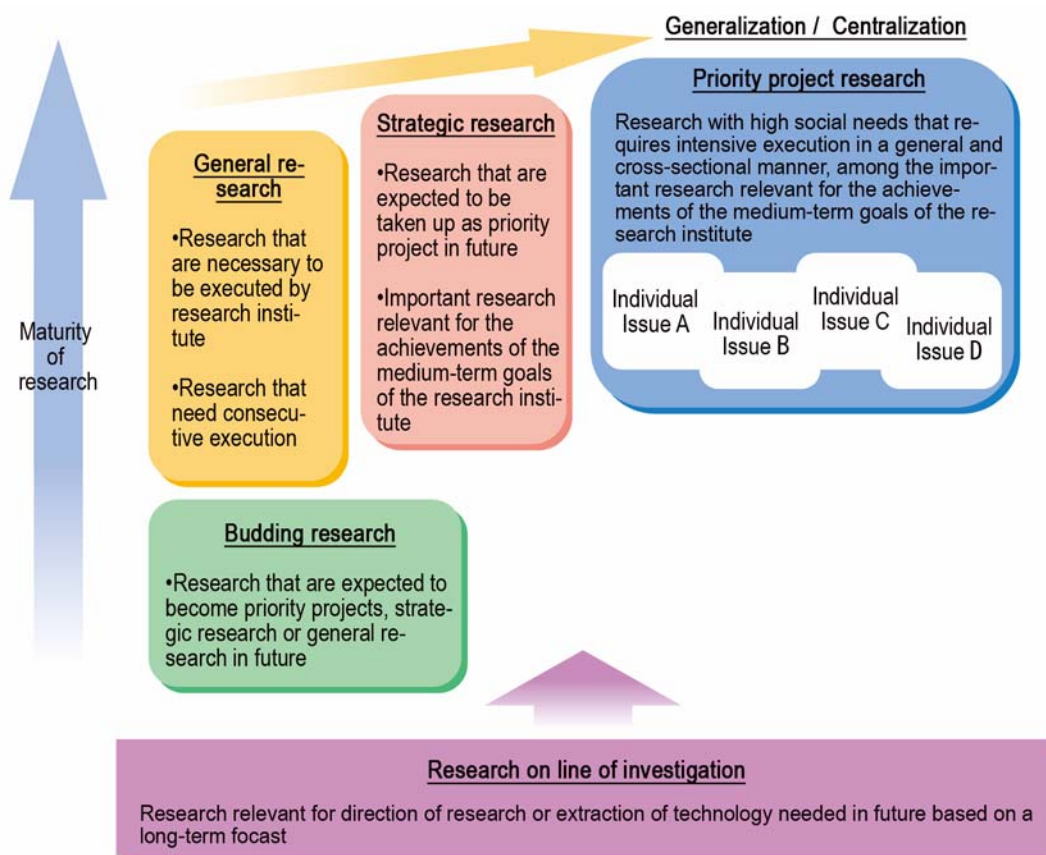
●Approach to system improvement to achieve social missions

In fiscal year 2007, Tsukuba and Civil Engineering Research Institute for Cold Region

collaboratively shared three issues focusing on the Prioritized project research, and chose eleven particular subjects for collaborative issues and exchanged information of research results and promoted mutual use of research facilities. And also, we attempted to unify organization management despite the distance between Tsukuba and Civil Engineering Research Institute for Cold Region by utilizing teleconference system.

Furthermore, we decided to unify budget management between Tsukuba and Civil Engineering Research Institute for Cold Region, and to set up “Special reserves by Chief Executive” which concentrates research budget in international and social researches which Public Works Research Institute should take up a leading position, and in research initiatives contributing to unification of Tsukuba and Civil Engineering Research Institute for Cold Region. In addition, we chose research works on measures against aging structures, evaluation of structural health, assessment policy and prevention/alleviation of water disasters as objective issues under a special category in fiscal year 2008.

In addition, we prepared an organizational system in accordance with incorporation of operations such as technology development being undertaken at Hokkaido Regional Development Bureau and its staff members into Public Works Research Institute. We also reviewed the medium-term plan to respond to the operations that will be incorporated.



Research promotion system in Public Works Research Institute

● **Approach to evaluation of civil engineering structures health and establishment of operation and maintenance technologies**

In Japan, many civil engineering structures such as bridges and so on built during the high economic growth period and now these structures are aging all together. Recently, the expressway bridge in Minneapolis, State of Minnesota in U.S was collapsed. In Japan also, key structures of the Kiso River bridge on the Route 23 national highway and the Honjou bridge on the Route 7 national highway were broken. On December 24 2007, “Consolidation and rationalization plan for independent administrative agencies” was submitted during the Cabinet meeting based on the above facts. It was decided that existing research organizations will be merged and consolidated by 2009, and new research organizations that can meet new social needs such as proper maintenance of existing structures would be established. To respond to this decision immediately, Public Works Research Institute decided to start evaluation of health of the structures, and development of operation and maintenance technologies by experimental study. PWRI also established “Center for Advanced Engineering Structural Assessment and Research (CAESAR)” which will nurture engineers from 2008 onwards. In fiscal year 2007, we did the necessary groundwork and incorporated it in the medium-term plan.

2. Research that is recognized by academia, trusted by local communities and practical engineers

Public Works Research Institute aims to improve civil engineering technologies by undertaking various studies, tests, R&D of civil engineering technologies in the field of construction technologies and technologies relating to office works of Hokkaido Regional Development Bureau. Through instruction of technologies and research results, it also aims to contribute to efficient infrastructure improvement and promotion of development of Hokkaido.

Our academic approach in research was highly appreciated. We contributed both domestically and internationally through proactive initiatives such as research regarding technical issues referring to conditions at civil engineering sites, which were consigned by Regional Development Bureau and Hokkaido Regional Development Bureau, and through formulation of various technical standards, proactive participation in review, organizing seminar at sites, technical assistance and dissemination of research results.

● **Contribution to international measures against water disaster**

Public Works Research Institute is taking initiatives to prevent water disaster including disasters in other countries, mainly by International Center for Water Hazard and Risk Management (ICHARM). At the first Asia Pacific Water Summit (APWS) held in Beppu city in Oita from December 3 to 4 in 2007, ICHARM contributed to the development of proposals which include

major proposal of the summit, as a leader of “water-related disaster management” which is one of three major topics of APWS.

In addition, ICHARM started “Disaster-prevention program, Water disaster risk management course” from October, 2007 in collaboration with Japan International Cooperation Agency and National Graduate Institute for Policy Studies in order to nurture specialists who can deal with water-related disasters in the developing countries. Goals of this program are to produce general plan for reducing damages caused by water disasters and train human resources who can participate in practical activities with specialized knowledge. The course has been actively accepting engineers and others who are involved in management activities related to the development and maintenance of land, water and city. In addition, master’s degree will be given to all who earned the required credits after completing one year course.



Mr. Takeuchi, Executive Director: He is hosting the section meeting relevant to “Water-related disaster management” of Asia Pacific Water Summit



Opening ceremony of the “Disaster-prevention program, Water disaster risk management course” started in October, 2007

● Technical support at the time of disaster

In fiscal year 2007, we actively did site investigations and offered technical support for disasters such as road collapses caused by heavy rains, landslides or ocean wave, and for earthquake disasters including Noto Hanto Earthquake and Niigata-ken Chuetsu-oki Earthquake by entering the sites immediately after the disaster so that we could contribute to the early restoration. Furthermore, we offered technical assistance and advice on analysis of causes of the disasters and on construction measures to be taken against the rock slide disaster at Oshoro coast in Otaru city and for the construction-collapse disaster caused by Typhoon No.9 at Seisho bypass.



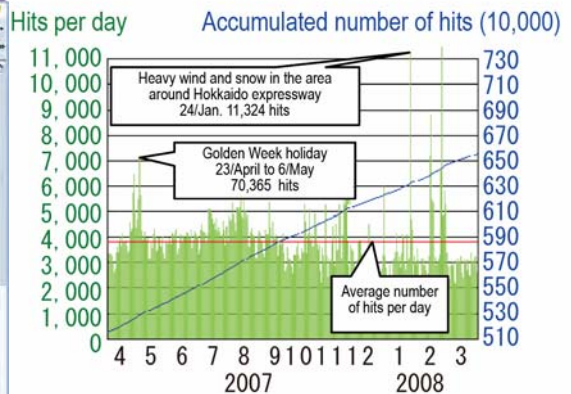
● **Research works that are trusted by local communities**

Public Works Research Institute is aiming to be trusted by local communities by returning research results to the local communities and addressing the needs of the local communities.

Civil Engineering Research Institute for Cold Region is researching about methods to provide information on safe and fine road routes by combining road information and community information, and by developing information-providing system according to each situation. As a part of these researches, we are operating a web-site, “Northern Road Navi”, which gives road-related information including weather information in multiple languages to the public in collaboration with road administrators. The site is broadly contributing to local communities by offering support for car-drive tourism, and it received more than 1.4 million hits in fiscal year 2007. When the heavy wind and snow had hit the area in January, 2008, the site contributed to the disaster prevention of road users by providing images of the roads. We regarded the access logs and the web survey results as a precious data of the needs of road users, and they were fed back to our research.



Top page of the "Northern Road Navi"



The number of hits on the site

Information provided by the web-site, "Northern Road Navi"

● Recognition of research results

As a result of active attempts to publish research results at academic conferences and other occasions, many of our research papers and development technologies have received the awards. Especially at Japan Venture Awards 2007, Public Works Research Institute received the highest honor, Prime Minister prize, for the technology (coating film removal method responsive to steel constructions including steel bridges, environment) developed in collaboration with private companies.



Awards ceremony at Japan Venture Awards: A researcher of Public works research institute (second from the left) is next to the then-Prime Minister Mr. Abe.




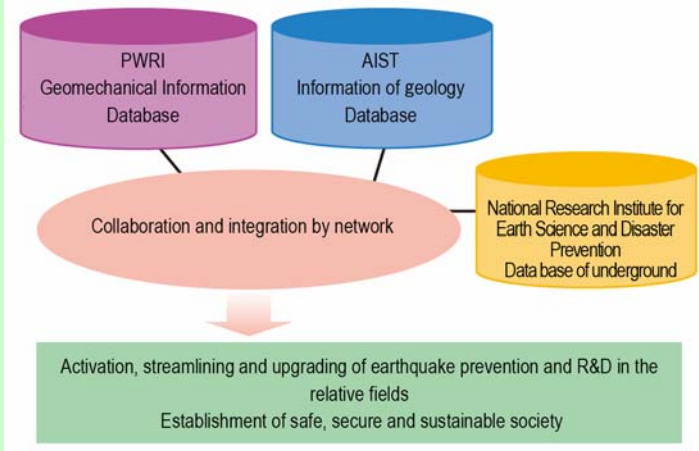
Environment-responsive coating film removal method which received Japan Venture Award

3. Research that respects traditions and has enterprising spirit

Public Works Research Institute has more than 80-years of history, and it has accumulated various researches during these years. Our institute is expected to maintain these high quality researches on civil engineering technologies and to respond flexibly to the needs of nation and society. We exchange information and opinions as well as cooperate with other research institutes in Japan and overseas. We also collaborate with private companies for various research initiatives and integrate our research with research in fields other than civil engineering, and actively cooperate and collaborate with Hokkaido Regional Development Bureau and local public bodies to improve the quality of our research work.

●Promotion of integration of different fields in R&D

Public Works Research Institute and National Institute of Advanced Industrial Science and Technology (AIST) signed a Collaboration and Cooperation Agreement on July 26 2007, with the aim of contributing to the promotion of academic and industrial technologies and establishing safe, secure and sustainable society.

	
<p>Mr. Yoshikawa, President of AIST and Mr. Sakamoto, Chief Executive of Public Works Research Institute shaking hands at the signing ceremony</p>	<p>Picture of integrated data base of underground structure Collaboration and integration by network</p>

Under this agreement, PWRI and AIST are collaborating and cooperating in various fields, especially in geology, geo-technology, material engineering, environmental studies, information technology and biology by exchanging their strong points and areas of specialty, and also promoting mutual use of research facilities and equipments and exchanging of researches by researchers. For example, we decided to promote the “Research of Integrated data base of underground structure”

which had been proceeded before in collaboration which integrates information of geology and geo-technological mechanics, and systematically matches each other's research themes. In future, we will promote various collaborations further to produce an unprecedented high-grade innovation and contribute to the generation of new innovation from Tsukuba by merging various fields.

●**Participation in innovative research and acquisition of external funds**

PWRI is actively trying to acquire external funds such as competitive research funds. In fiscal year 2007, ICHARM's "Evaluation of flood risk effects on the whole world and specially- vulnerable areas caused by climate change and measures to reduce disasters" is approved as a program of Ministry of Education, Culture, Sports, Science and Technology. The Innovative Program of Climate Change Projection for the 21st Century has also received funding. In addition, this program will be conducted on the basis of the third phase of the Science and Technology Basic Plan as a Five-year Plan of the ministry from fiscal year 2007, by objecting to the contribution for envisaged IPCC Fifth Assessment Report and production of scientific fundamental for measures against climate change.

●**Research on research direction based on long-term forecast**

In fiscal year 2007, we focused on eleven issues in the newly established research category, "Research on research direction". Many of these researches are based on researchers' original ideas, which are very non-conventional. Some of them are expected to grow as a full-scale research category.

Regarding that issues that we should research as a civil engineering institute and their promotion, group leaders have discussed about them as a "Large-scale research" continuously from fiscal year 2006. In the discussion, we shaped up directions and decided to examine research areas that should be undertaken as a mission of the institute with a long-term forecast and unconventional idea, and to give the results to researchers and to set up research issues and to promote priority project with consideration of research seeds and researchers' motivations.