

(1) Promotion of improved productivity: In order to deal with labor shortages, etc. at construction sites going forwards, together with regulating items to be considered for optimization of construction production processes of surveying, designing, execution, and maintenance by sharing 3D data, etc., NILIM seeks to improve productivity by optimizing design through introduction of a "load vibration coefficient approach".

(2) Promotion of effective use of existing stock: Based on rapid deterioration of social infrastructure, together with regulating ideas and procedures, etc., regarding appropriate maintenance of facilities, and design of improvements for existing facilities, there is regulation of items requiring consideration when constructing, etc., with the aim of promoting effective use of existing stock.

(3) Strengthening disaster prevention/reduction countermeasures: While the imminence of large-scale earthquakes such as the Nankai Trough Earthquake and the Earthquake Directly Below Tokyo, etc. are being pointed out, NILIM seeks to promote disaster prevention/reduction countermeasures such as improving tsunami-resistant design, etc. based on new expertise from lessons learned from the Great East Japan Earthquake and Kumamoto Earthquake, etc.

(4) Strengthening international competitiveness: NILIM seeks to strengthen international competitiveness by expanding items related to dealing with increased size of vessels and safe port and harbour cargo handling. NILIM also expands contents of overseas development of Standards in mind, and support infrastructure business of



Japanese companies.

(5) Conserving, regenerating and creating ocean environments: In order to conserve, regenerate and create natural environments of ports and harbours, NILIM seeks to establish new regulations relating to structures contributing to environmental conservation and expansion of descriptions of nature regeneration technologies for tidal flats, shoals and seaweed beds, etc., and environmental use of recycled materials, etc., with the aim of creating rich ocean environments.

Details <http://www.ysk.nilim.go.jp/oshirase/press-release20180202.pdf>

● Publications (research achievements) (November 2017 to January 2018)

Download here <http://www.nilim.go.jp/lab/bcg/siryu/index.htm>

TECHNICAL NOTE of NILIM

No.	Title of Paper	Names of Divisions
983	Assessing method for sediment disaster damages due to deep-seated catastrophic (rapid) landslide	Sabo Planning Division
985	Statistical data on the deterioration of road bridges based on the segmental damage extent recordings in bridge inspections	Bridge and Structures Division
987	Landscape and Ecology Division, Annual Research Report (32nd)	Landscape and Ecology Division
988	Study on constantly monitoring system of road bridge using image processing technology	Bridge and Structures Division
989	Examinations of Seascapes in the Keihin Canal of Tokyo Bay – Case Study of Mollusks and Crustaceans –	Marine Environment Division
990	Numerical Simulations on Inundation due to Storm Surge for Port Areas in Osaka Bay	Coastal Disaster Prevention Division
991	Study on Ship Dimensions by Statistical Analysis	Port Planning Division
992	An Analysis of the Scale of Container Terminal Areas	Port Planning Division
993	Development of a Transshipment Port Choice Model of Container Cargo Flow between East Asia and America in order to Assess the Impact of Japanese Port Policy	Port Systems Division
994	Analytical Study of the Bearing Capacity Design Method of Breakwaters Considering Seepage Flow Caused by Tsunami	Port Facilities Division
995	A Study of the Level 1 Reliability Design Method for a Gravity-type Breakwater with a Slope – Performance Verifications of Sliding Failure and Overturning Failure –	Port Facilities Division
996	The Basic Concept of Reformation Construction Method Selection and Reformation Design of Existing Mooring Facilities	Port Facilities Division

● We provide you with research information.

• 2017 Annual Report of NILIM

This web site introduces NILIM activities throughout the year, including research activities and achievements, future initiatives, etc.

Go to this web site <http://www.nilim.go.jp/english/annual/annual2017/ar2017e.html>



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NILIM 国総研ニューズレター

■ Revision of National Institute for Land and Infrastructure Management "Research Policy"

Planning and Research Administration Department

In November 2017, the NILIM revised its "Research Policy" outlining its basic direction.

Since being enacted in 2001, the NILIM "Research Policy" has been revised 6 times, but in recent years there have been remarkable changes in the socio-economic situation and technological progress, and political measures/localities have become more closely linked with research. This revision further clarifies the NILIM's role in line with the times, and aims to share greater awareness of research productivity. For this reason, together with clarifying (1) the characteristics and roles of the NILIM emphasizing bottom-up management and social implementation and (2) specific points to keep in mind for promotion of high-quality research, emphasis has been given to making the contents brief and easy to understand.

The "Research Policy" consists of 5 items. (Fig.)
 To begin with, the policy states the NILIM's "Mission", "Basic stance" and "Activities forming basis" as items for NILIM personnel to also be aware of in learning "What is the NILIM?". Research for policy and on-site support have always been important activities, but greater emphasis is now given to things connected to implementation of results and on-site technological strength including capable personnel. This followed by descriptions of "Preparedness for research", specifying points to be kept in mind at each stage of research, and "Environment maintenance supporting research", which is to be tackled as an organization, with improvement of the NILIM's research management in mind.
 The NILIM uses the "Research Policy" as tool for consideration by individual staff members when proceeding with research, and from the perspective of advice for management when confirming

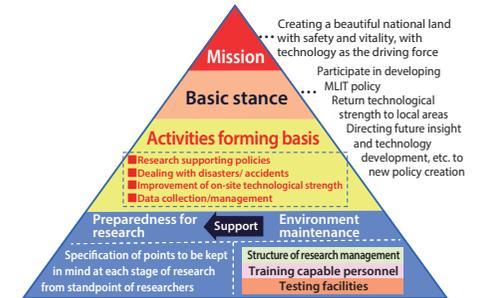


Fig. 1 Composition of NILIM Research Policy

the progress of research and making plans for the next fiscal year. The NILIM is also proceeding with construction of various research management structures. Going forwards, we will gradually proceed with initiatives based on the "Research Policy" in order to improve the research environment not only for our own activities, but for the housing/infrastructure field as a whole.

Details <http://www.nilim.go.jp/lab/bcg/busyukai/kenkyuhoushin/00index.htm>

■ Revision of Guideline for Disaster Prevention Parks

Research Center for Infrastructure Management Landscape & Ecology Division

The NILIM has compiled and published a revised and enlarged edition of the Guideline for Disaster Prevention Parks particularly with enriched contents for management and operation, based on the actual use of town parks, etc. in the 2016 Kumamoto Earthquake.

The NILIM has produced the Guideline for Planning and Design of Disaster Prevention Parks (enacted in August 1999, revised September 2015), in cooperation with the Ministry of Land, Infrastructure, Transport and Tourism, in order to promote maintenance of town parks (disaster prevention parks) that form places of refuge and bases for disaster prevention activities in times of earthquake disaster.

However, in order for disaster prevention parks, etc. to play an adequate role in times of disaster, it is important to carry out initiatives for management and operation including preparation in normal times. In fact, even in the Kumamoto Earthquake that struck in April 2016, while the disaster prevention parks, etc. maintained thus far did play their role as places of refuge and bases for disaster prevention activities, certain issues in use were noticed. Thus, the Guideline for Planning, Design and Management of Disaster Prevention Parks (2nd revised edition) was published in September 2017 to further outline basic thinking on the management and operation to be carried out by park managers in normal times and in times of disaster.

We have also published a "How to use urban parks for disaster prevention" (see Figure) aimed at local residents as a reference material for the Guideline, outlining daily preparations and actions to be taken in times of disaster.



Figure: Extracts from "How to use urban parks for disaster prevention" (English version)

Going forwards, we will work diligently on publicity to ensure that many local public bodies use the new Guideline.

Details <http://www.nilim.go.jp/lab/bcg/kisya/journal/kisya20170929.pdf>
 Details <http://www.nilim.go.jp/lab/bcg/siryu/tm/tnn0984.htm>
 Details http://www.nilim.go.jp/lab/ddg/english/how_to_use_urban_parks_for_disaster_prevention.pdf

■FY2017 NILIM Lecture Meeting held

Planning and Research Administration Department Planning Division

The main theme of this year's Lecture Meeting was "Productivity Revolution". The meeting featured a special address by SophiaBank think-tank representative Kumi Fujisawa and a panel discussion, which is the first such initiative to be held at a Lecture Meeting.

The FY2017 NILIM Lecture Meeting was held on Wednesday 6th December, 2017 at the Japan Education Center (Hitotsubashi Hall) in Hitotsubashi, Chiyoda-ku, Tokyo.

The NILIM Lecture Meeting is held every year with the aim of introducing the NILIM's initiatives broadly to the general public through comprehensive addresses and reports regarding the NILIM's recent research results and research-related issues/trends. This year's meeting was a great success, with a total of 517 participants from private companies, local public bodies and related corporations, etc. centering on public works and construction.

The main theme of this event was "Productivity Revolution", and SophiaBank think-tank representative Kumi Fujisawa was welcomed to give a special address entitled "Productivity Revolutions will open up the future – but why productivity revolutions now?" Attendees' impressions included the following statements: "Speaking from experience as a manager made this easy to understand" ...

"It gave me motivation for thought regarding how a company ought to act in terms of vision and training personnel, etc."

This year also saw a first at the NILIM Lecture Meeting in the form of a panel discussion entitled "Infrastructure productivity revolutions through ICT application – what we are looking for now." Attendees spoke highly of this discussion, including the comment that "The discussion followed 3 keywords – roads, harbors, and management – and it was easy to grasp examples of application in each of these fields."

Aside from the above, there were addresses on a total of 9 themes in general sessions on "Preventing and mitigating disasters, and crisis management" and "Continuous management of infrastructure."

Details ■ FY2017 "National Institute for Land and Infrastructure Management Lecture Meeting"
<http://www.nilim.go.jp/lab/bbg/kouenkai/kouenkai2017/kouenkai2017.htm>



Photo: Special address by representative Kumi Fujisawa

■"Cardboard Bridge-building Contest" held

Planning and Research Administration Department Planning Division

A "Cardboard Bridge-building Contest" was held, and 676 productions were received from 791 students of 33 elementary schools in Tsukuba City. The awards ceremony for excellent productions was held at the venue for "DOBOKU-no-hi (Open to the Public)".

The "Cardboard Bridge-building Contest" has been held since 1994 with the aim of helping Japan's future-leading elementary school students to "learn about the importance of public works infrastructure such as bridges, etc. supporting our lives through manufacturing" – this year the 24th contest was held.

The contest is for 4th and 5th grade elementary school students in Tsukuba City, with guidance given in June through Tsukuba City Board of Education, and the participating children working on their productions during summer vacation. This year, 791 children (producing 676 works) from 33 elementary schools in Tsukuba City participated (equivalent to 20% of all 4th and 5th grade students in the city).

Since last year, the contest has been expanded to cover not only 5th grade students but also 4th grade students. This change was made in order to let more children participate and enable participation not only in a single contest, but also in a second contest where the children can participate based on repeated bridge construction and learning from other productions and their own experiences of planning and making productions. The number of participants has roughly doubled since expanding the participating school years, and approximately 70% of students who took part in the 4th grade last year also participated this year, so the results are more or less in line with our aims.

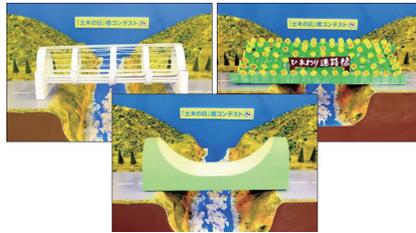


Photo 2 The best productions

There are strict production requirements for pieces in this contest – namely the use of up to 2 pieces of handcraft cardboard as the main material of the bridge, suspending a bridge over a 30cm-wide river, and supporting a load of 1kg – yet most submissions satisfied these requirements. Inspections are made in 3 areas – "sense of stability as a bridge", "beauty of design and finish", and "creativity (individuality)" – with excellent works in each of these areas respectively given awards for "structural design", "artistic design" and "effort" (5 pieces are awarded in each of these categories), and together with awarding a "Best prize" to works excellent in all of these items (3 works as shown in Photo 2), "School encouragement awards" were given to 6 schools with the highest rates of participating students. Also, a "Special chief examiner's prize" was awarded to one work that particularly stood out to the chief examiner.

An awards ceremony for these prizes (see Photo 1) was held at the venue for "DOBOKU-no-hi (Open to the Public)" on Saturday 18th November along with a display of all submitted works. The best productions are on display in the lobby at the NILIM building, so please take a look.

Next year will mark the 25th year since the start of the contest. We are hoping to implement additional plans to make the "Cardboard Bridge-building Contest" more exciting.

Details ■ Cardboard Bridge-building Contest website
<http://www.nilim.go.jp/lab/bbg/event/buridgecontest/2017/2017bridge2.html>



Photo 1 Commemorative photograph with winners at awards ceremony

■Support for revision of seismic design criteria for highway bridges in Chile

Road Structures Department Earthquake Disaster Management Division

Chile's Ministry of Public Works has enacted new seismic design criteria for bridges based on technical support from the NILIM and the PWRI. Seismic technologies developed in Japan, which are keys for enhancing seismic performance of bridges, are incorporated into the design criteria.

The Chilean Ministry of Public Works had been working on revision of the seismic design criteria for highway bridges since the 2010 Chile earthquake (M8.8) had caused extensive damage to bridges. Japan International Cooperation Agency (JICA) had initiated a technical cooperation "Seismic Design Criteria for Highway Bridges" for supporting the revision work. National Institute for Land and Infrastructure Management (NILIM) and Public Works Research Institute (PWRI) have provided technical support in coop-

eration with industrial and academic experts of earthquake engineering based on the request from Chilean government through JICA.

Japan has experienced many earthquake disasters and developed technical criteria based on cumulative lessons learnt from the experience and various research results on seismic technologies. We have discussed how to apply the made-in-Japan seismic technologies to Chilean design criteria and reached a conclusion that it is effective for improving seismic safety of bridges in Chile to incorporate Japanese seismic technologies such as the design methods against liquefaction and the unseating prevention system; the seismic design criteria for highway bridges in Chile was revised taking account of these technologies on June 2017.

Commending contribution by the technical cooperation, the Chilean Ministry of Public Works complemented the specialists of NILIM and PWRI with diplomas.

During this technical cooperation, technical support on wide range of seismic technologies was provided including revision protocol of earthquake ground motion, bridge monitoring guideline, standard testing method of anti-seismic bearings, and so on. In order to reach these goals, further investigation is necessary taking account of differences in available data and instruments in Chile and Japan. We will continue our support for formulating related guidelines and manuals based on the results from this technical cooperation through discussion and providing information on Japanese cutting-edge seismic technologies.

Details ■ NILIM website (Press Release, December 1st, 2017)
http://www.nilim.go.jp/lab/bcg/kisya/journal/kisya20171201_2.pdf



Discussion between experts from Japan and Chile (February 2017)

■The 6th Japan-Korea Joint Workshop on Urban Policies

Urban Planning Department

On January 18th of this year, in Sejong City, Korea, the 6th NILIM-KRIHS joint workshop was held, resulting in an agreement to cooperate from now on in joint researches of smart cities, etc.

The NILIM entered into a memorandum of cooperation with the Korea Research Institute for Human Settlements (KRIHS) in November 2012, and since then there have been continuous research exchanges on the field of urban policies together with periodic reciprocal visits. This time, the 6th joint workshop was held with a first visit to the new KRIHS government office building, which was moved into and where work started in January of last year, in the Administrative City, Sejong, constructed for the transfer of central government offices approximately 160km south of Seoul.

The meeting focused on urban regeneration, which is of great interest to both parties, with lively discussions featuring publication of the latest researches and evaluation of both countries' political measures, etc. on themes of "urban development making best use of stock of town areas" and "urban transport development". Also, since this year marks the 5th year since entering into the agreement,

an activity plan for the next 5 years was discussed in the second half of the meeting, and it was agreed that there should be new joint researches looking at smart cities, etc. and that the next meeting would be held in Japan in 2020 followed by a subsequent meeting in Korea in 2022, with both parties confirming their intentions to further deepen their exchanges going forwards.



Photo Scene of research presentation



Photo Opening greeting

■Revision of "Technical Standards for Port and Harbor Facilities"

Administrative Coordination Department Planning and Coordination Division Port and Harbor Department Port Facilities Division

For the first time in 11 years, the "Technical Standards for Port and Harbour Facilities" are being drastically revised, with the aim of promoting improved productivity, dealing with rapid deterioration of social infrastructure, and strengthening disaster prevention/reduction countermeasures based on lessons learned from the Great East Japan Earthquake, etc.

The "Technical Standards for Port and Harbour Facilities" (Technical Standards) are provided in Article 56-2(2) of the Port and

Harbour Act, demanding conformance in terms of construction, improvement and maintenance of port and harbour facilities.

The Technical Standards are generally revised every 10 decade, and the NILIM plays a central role at each stage of the PDCA cycle in extracting, understanding and regulating issues related to application of the Technical Standards, deciding on revision policy, and supporting the enforced Standards.

The main contents of the present revision are the following 5 points.