

Contents

- Survey Report of Housing Damages caused by Tsunami in Banda Aceh city, Sumatra, Indonesia 041226
- Preparation of Manual for Reclaimed Wastewater Quality Criteria
- The 6th Tokyo Bay Symposium
- Japan-Sweden Workshop on Road Science and Technology
- RESEARCH REPORT of National Institute for Land and Infrastructure Management (July, 2004)
- TECHNICAL NOTE of National Institute for Land and Infrastructure Management (July, 2004)
- The English Version of "2005 Annual Report of NILIM" is now on our website

No.14
September 2005

N I L I M

News Letter

ISSN 0389-4150

Survey Report of Housing Damages caused by Tsunami in Banda Aceh city, Sumatra, Indonesia 041226

Research Center for Advanced Information Technology

Just after the earthquake and tsunami disasters struck, the approximate extent of the vast damaged area and severity of damage were detected by high-resolution (0.6-1 m) satellite images, unlike in previous large-scale tsunami disasters. Many images from the site, taken both by professionals and non-professionals, including video clips of the tsunami destroying human settlements, were also quickly transmitted and broadcast. However, detailed information on the characteristics of lost houses, including the structural strength, resources invested and lifestyle needed for re-construction planning was very limited, especially in the most severely damaged city, Banda Aceh, because of the lack of security and total destruction.



Figure 1 Satellite image

In order to obtain on-site data, a field survey was undertaken by several staff members of NILIM with long experience of conducting housing research in Indonesia, from February 28 to March 8, 2005, as members of the Japan Earthquake and Tsunami Team (JETT), when the daily excavation of victims had decreased to 50-100 and as the local atmosphere was changing from sadness to rehabilitation of communities. The objectives of the team were: (1) to identify the major types of houses swept away, (2) to find out why some houses had survived, (3) to distinguish the disaster damage and tsunami damage, and (4) to trace the supply route of major building materials. The target area was Banda Aceh city and nearby coastal fishing villages, focusing on a comparison of the remaining houses and the lost houses.

The major types identified from 35 houses sampled and measured were: (1) Traditional timber house, (2) Colonial timber house, (3) Fisherman's timber house, (4) Confined masonry house and (5) Confined masonry shop house. Several mosques surveyed had served as refuge shelters.

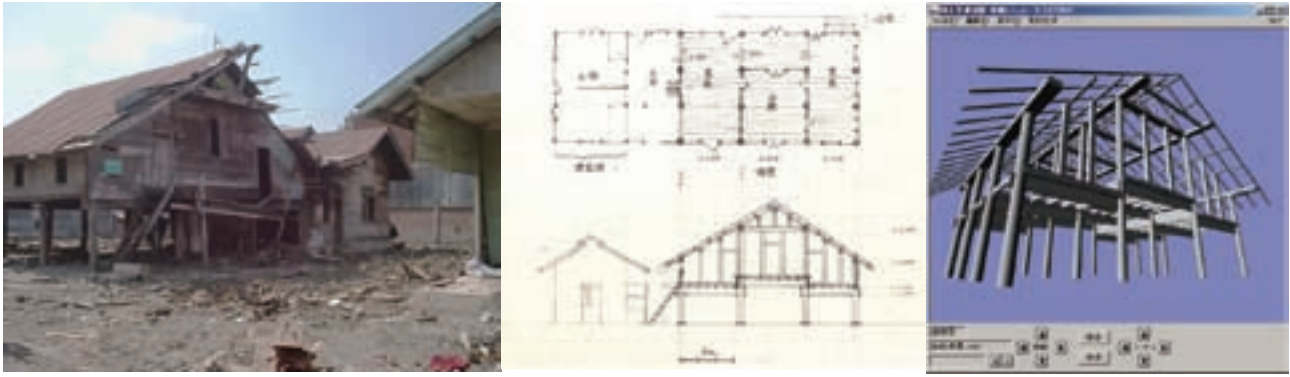


Figure 2 A surviving timber house: photo, drawing & 3D-model

Earthquake damage in areas not affected by the tsunami (inner area of Banda Aceh city) was almost negligible, except for several high-rise RC buildings and brick factories, which were vulnerable to shaking. Houses in these areas are large (> 100 m²) and inhabited by extended families and sub-divided into small spaces. Several good confined masonry houses, with concrete columns (25 cm) with reinforcement rigidly anchored to the foundation withstood the tsunami and survived. Other simple brick houses were swept away, but foundations remained visible on satellite images. Some traditional houses with thick columns (25 cm in diameter, reaching from ground to roof) also survived well, and local people reported that they had learned from a similar disaster 200 years ago.

■ Preparation of Manual for Reclaimed Wastewater Quality Criteria

Water Quality Control Department

1. Background and objectives

Treated wastewater will increasingly be reused in cities to make the best use of precious water resources, and so the importance of appropriate reuse will grow.

However, damage to people's health caused by pathogens in drinking water and foods has recently become a social issue in Japan, arousing interest in the safety of water, and so safety must be ensured when reusing treated wastewater.

With this background, the Sewerage and Wastewater Management Department of the City and Regional Development Bureau, Ministry of Land, Infrastructure and Transport and the National Institute for Land and Infrastructure Management established a "Committee on Reclaimed Wastewater Quality Criteria" (Chair: Visiting Professor Mitsumi Kaneko of Ritsumeikan University), and in April 2005 prepared and published the "Manual for Reclaimed Wastewater Quality Criteria". The manual stipulates new criteria to ensure hygiene, appeal, acceptability, and smooth facility operations, and also considerations for reusing treated wastewater.

Table New criteria on reusing treated water

	Flushing toilets	Sprinkling	Landscape use	Recreational use
E. coli	Not detected ¹⁾	Not detected ¹⁾	See note ²⁾	Not detected ¹⁾
Appearance	Not unpleasant			
Turbidity	Not exceeding 2 (control goal)			Not exceeding 2
Color			Not exceeding 40	Not exceeding 10
Odor	Not unpleasant			
pH	5.8~8.6			
Residual chlorine (control goal)	Free chlorine of at least 0.1 mg/L or combined chlorine of at least 0.4 mg/L ³⁾	Free chlorine of at least 0.1 mg/L or combined chlorine of at least 0.4 mg/L ^{3) 4)}	⁵⁾	Free chlorine of at least 0.1 mg/L or combined chlorine of at least 0.4 mg/L ^{3) 4)}
Treatment	Equivalent to or better than sand filtration			Equivalent to or better than coagulation basin + sand filtration
Notes	1) The amount of water to be inspected shall be 100 mL (by the specific enzyme substrate culture method). 2) The former criteria are temporarily used (total coliform 1,000 CFU/100 mL). 3) When chlorine is added at the site where the water is used, the amount can be separately decided by individual agreements. 4) Need not be applied when the long-term effect of disinfection is unnecessary. 5) No regulation is set since the water is not touched by people and treatments other than chlorination may need to be taken to protect the ecosystem.			

2. Scope of the criteria

The standards apply to the unrestricted use of reclaimed wastewater distributed directly from wastewater treatment plants for flushing toilets, sprinkling on greenbelts, lawns, road surfaces, ground, landscape use (environmental water that is assumed not to be touched by people), and recreational use (environmental water that is assumed to be touched by people). For the time being, large-scale cascades or waterworks that produce aerosols are to be handled provisionally as recreational water.

3. New criteria on reusing treated water

The new criteria are shown in the table for each type of use.

4. Considerations for reusing treated water

The manual also mentions the need to take: 1) measures for keeping the appropriate chlorine concentration during the supply process, 2) measures for preventing cross connection, such as by marking pipes and facilities for reclaimed wastewater and inspecting connections, 3) measures for preventing accidental intake, and 4) measures to be taken when abnormalities occur, such as deterioration of the quality of reclaimed wastewater, although no standards are set.

■ The 6th Tokyo Bay Symposium

Marine Environment Division

The 6th Tokyo Bay Symposium was successfully held on June 2, 2005 at Yokohama Symposia with 215 participants.

The Tokyo Bay Symposium is a series of symposia that have been hosted by NILIM since 2001. The major topics are: environmental problem identification in Tokyo Bay (1st, 2nd), international and domestic case studies for environmental restoration projects (2nd, 4th), techniques for numerical modeling and assessment for bay-wide issues (2nd, 3rd, 4th), evaluation of and efforts toward habitat restoration (2nd, 3rd, 4th), and software approaches toward environmental countermeasures including environmental studies (5th).

The theme of this Symposium was highlighted by the keynote speech on “The Future of Environmental Countermeasures in Port Construction and Management” by Mr. Kawakami who is an assistant director of the Environment and Engineering Division, MLIT. This was followed by talks on “Research Outputs for the Restoration of Tokyo Bay” by the Marine and Coastal Division, River Division, Water Quality Control Division, and Environment Division.

The Symposium also featured a forum on “Towards the Restoration of Tokyo Bay”. This was coordinated by Dr. Hosokawa who is an executive director of the PARI, with panelists from the governmental regional development bureau (Mr. Sato, Yokohama Port and Airport Research Office), local government (Mr. Ebata, Port Construction Office of Tokyo Metropolitan City), fisheries (Dr. Kakino, Chiba Prefectural Fisheries Research Center), and an NPO (Mr. Kimura, Umibe-tsukuri Research Group). The ground design of the Tokyo Bay environment was also presented by NILIM and improvements were discussed in the forum.

The outputs of this Symposium will be published on the NILIM web page (<http://www.nilim.go.jp>).

*MLIT: Ministry of Land, Infrastructure and Transport

*PARI: Port and Airport Research Institute



Photo 1 A presentation at the Symposium



Photo 2 A forum session at the Symposium



Photo 3 The 6th Tokyo Bay Symposium

Japan-Sweden Workshop on Road Science and Technology

Advanced Road Design and Safety Division

The 4th Japan-Sweden Workshop on Road Science and Technology was held on May 23 and 24, 2005, at the Osaka International Convention Center. The workshop is held alternately in Japan and Sweden based on an agreement between the two countries on research cooperation in the field of road science and technology. This time, themes such as bridges, intelligent transport systems (ITS), procurement, tunnels, and porous elastic pavement (PERS) were discussed.

14 people from Sweden (the Swedish Road Administration and Swedish National Road and Transport Research Institute) and 40 people from Japan (National Institute for Land and Infrastructure Management, Public Works Research Institute, Civil Engineering Research Institute of Hokkaido, Kinki Regional Development Bureau and so on) attended the workshop. Presentations were given and active discussions held on themes such as methods for maintaining bridges, development and implementation of ITS technologies, and methods for purifying the air in tunnels.

During the workshop, participants from both countries reconfirmed the importance of mutual cooperation in research and agreed to hold the next workshop in Sweden in two years.



Photo 4 Workshop participants

RESEARCH REPORT of National Institute for Land and Infrastructure Management (July, 2004)

No	Title of Paper	Names of Divisions
17	Wind Controlled Intrusion of Kuroshio Warm Water into Sagami Bay, Japan	Marine Environment Division
18	An Analysis of Economic Loss due to Bottlenecks in Domestic Land Transportation Network for International Maritime Container Cargo	Port Systems Division

TECHNICAL NOTE of National Institute for Land and Infrastructure Management (July, 2004)

No	Title of Paper	Names of Divisions
69	Improvement of the Riverbed Fluctuation Model For the Prediction of Sediment Transport -In the Case of Hinuma River-	River Division
75	Flood Risk Assessment Method in National Flood Insurance of U.S.A	Flood Disaster Prevention Division
81	Annual Research Report 2001 of Road Environment Division	Road Environment Division
106	Floodplain Management of Today in the United States	Flood Disaster Prevention Division
168	Methods of Evaluating Effects of Wooden Barrier on Buffering of Soil Collapse Impacts	Erosion and Sediment Control Division
169	Seasonal Variation of Residence Time of Sea Water in Tokyo Bay during 2002	Marine Environment Division
170	Turbulent Structure of Downward Burst Beneath Micro-breaking	Coastal Zone Systems Division
171	Verification of Wave Forecasting Model, SWAN, by Experimental Results with Wind Wave Flume	Coastal Zone Systems Division
172	Characteristics of Wind-driven Current with Fully Developed Wind Waves	Coastal Zone Systems Division
174	A Quantitative Analysis of Transport Route Choice Factors of International Air Cargo Transport in Japan	Airport Planning Division
175	An Analysis of Aircrafts Proportion and Operation Characteristic in the East Asia Aviation Network	Airport Planning Division
176	Full Reutilization of Pavement Construction Wastes in Airports	Airport Facilities Division
177	Study on Performance and Test Methods of Asphalt Mixtures for Airport Pavements	Airport Facilities Division
184	A Study for the methodology of effective knowledge management at local offices of MLIT	Information Technology Division
185	Annual Report of Road-related Research in FY 2003	Road Department / Research Center for Advanced Information Technology

The English Version of "2005 Annual Report of NILIM" is now on our website

We publish the English version of "2005 Annual Report of NILIM" to show our research activities and accomplishments, and you can see all of its contents on our website, www.nilim.go.jp.



National Institute for Land and Infrastructure Management
 Ministry of Land, Infrastructure and Transport
 Asahi 1, Tsukuba, Ibaraki, 305-0804, Japan
 (Tachihara) Tachihara 1, Tsukuba, Ibaraki, 305-0802, Japan
 (Yokosuka) Nagase 3-1-1, Yokosuka, Kanagawa, 239-0826, Japan
 TEL:+81-29-864-2675 FAX:+81-29-864-4322

No.14
 September 2005