



International Center for Urban Safety Engineering (ICUS)

Annual Report -2007-

Staff Members

(2007)



Sustainable Engineering Division

- Prof. Hiroshi YOKOTA (Visiting Professor)
- Dr. Reiko KUWANO (Associate Professor)
- Dr. Yoshitaka KATO (Associate Professor)

Urban Safety and Disaster Mitigation Division

- Prof. Kimiro MEGURO (Professor)
- Dr. Miho (YOSHIMURA) OOHARA (Research Associate)

Infrastructure Information Dynamics Division

- Dr. Ryozo OOKA (Associate Professor)
- Dr. Sanae MIYAZAKI (Visiting Associate Professor)
- Dr. Shinji TANAKA (Lecturer)
- Dr. Takahiro ENDO (Research Associate)

Project Researchers and Secretary

- Dr. Paola MAYORCA (Project Research Associate)
- Dr. Kawin WORAKACHANA (Project Researcher)
- Dr. Raktipong SAHAMITMONKOL (Project Researcher)
- Ms. Eiko YOSHIMOTO (Secretary)



Research Topics

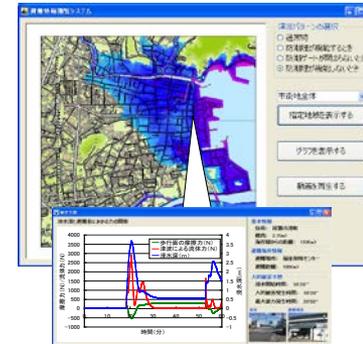
Sustainable Engineering Division

Targets the development of new technologies for maintenance and management and for the evaluation of structural safety, considering deterioration of both material and structure.



Urban Safety and Disaster Mitigation Division

Develops management technologies to ensure the structural safety of urban infrastructure during natural disasters such as earthquake, flood, etc. and their safety for use at the time of a disaster.



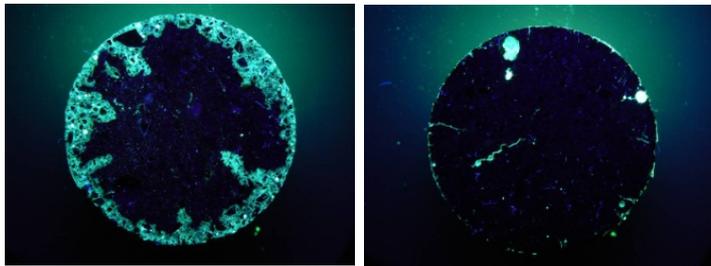
Infrastructure Information Dynamics Division

Develops and evaluates technologies for monitoring information of urban infrastructure, ensuring their safety for daily use and in case of emergency.

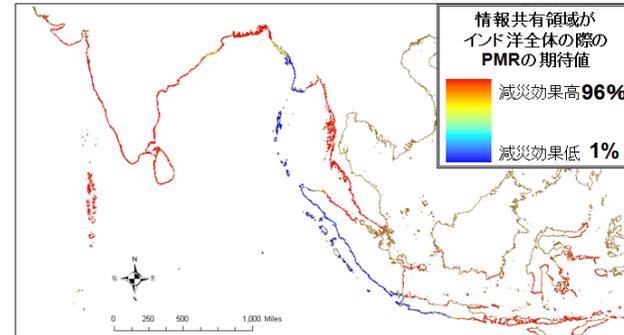


Researches

(2007)



Recovery of cement composite materials damaged by fire (Visualization of damage)



Casualty mitigation effect of multipurpose buoy system for tsunami monitoring and warning



Driving behavior analysis by driving simulator

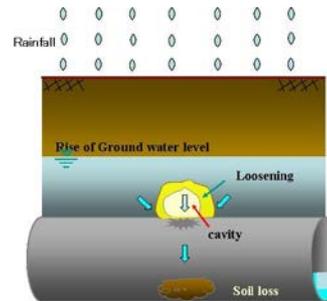


Image of sagging road by damaged sewage pipe

Staff Members

(2007)



Research Topics (2007)

- Sustainable Engineering -



- **Management of technology in construction**
- **Clarification and practical techniques for measurement of corrosion in RC structures**
- **RC structures maintenance planning based on risk evaluation**
- **Development of low cost and ecological repair method for RC structures damaged by fire**
- **Analysis of effective strategies for social movement to accelerate infrastructure development**
- **Study on mass transport properties of polymer-modified mortar**
- **Study on long term behavior of buried structures**
- **Development of rehabilitation techniques for old deteriorated buried pipes**
- **Soil improvement by means of microorganisms**

Projects (2007)

- Sustainable Engineering -



Grant-in-Aid for Scientific Research

- Proposal of economic and rational techniques for construction, renewal and maintenance of buried pipes for minimization of total life cost

Research Promotion Fund

- Influence of crack and environmental conditions on carbonation progress of concrete

Collaborative Researches

- Development of on-site judgment system for concrete volume stability
- Development of safe, easy and emergency repair method for disaster damaged structures

Others

- Time dependency property of macro-cell corrosion in RC structure due to environmental and material non-homogeneity

Research Topics (2007)



- Urban Safety and Disaster Mitigation -

- **Development of integrated information system for total disaster management**
- **Development of next generation disaster management manual for implementation of efficient countermeasures**
- **Development of joint information platform for disaster management**
- **Quick evaluation and monitoring of earthquake damage using the power supply changes**
- **System for promotion of retrofitting of existing low earthquake resistant houses**
- **Numerical simulation of total collapse behavior of structures**
- **Efficient and economic retrofitting method for masonry structures considering local availability of materials and workmanship**
- **Development of human evacuation model for tsunami disaster mitigation**
- **Study on functions of key disaster hospital and its disaster management manual system**
- **Assessment on capability of multipurpose buoy system for tsunami monitoring and warning**
- **Evaluation of seismic capacity of wooden houses based on their dynamic properties obtained from well controlled exciter induced vibrations**

Projects (2007)



- Urban Safety and Disaster Mitigation -

Grant-in-Aid for Scientific Research

- Proposal of integrated tsunami disaster mitigation strategies for long-term maintenance of tsunami monitoring and its application to developing countries
- Development of training simulator for disaster response
- Seismic capacity evaluation of RC building with unretrofitted concrete block walls
- Development of a design tool and educational materials for the promotion of economic retrofitting of low earthquake resistant masonry houses

Research Promotion Fund

- Project for Tokyo inland earthquake disaster mitigation: Study on widespread crisis management and establishment of disaster mitigation

Cooperative Researches

- Development of references of examples of seismic evaluation and retrofitting for local government personnel
- Research project funded by the Japan Bank for International Cooperation: “Proposal of retrofitting technique of masonry structures with PP-band meshes”
- Dynamic and large deformation analysis of railway structures

Others

- Development of disaster management manual system for The University of Tokyo Hospital considering its functions as emergency base hospital

Research Topics (2007)



- Infrastructure Information Dynamics

- **Monitoring of the environment in East Asia using satellite data (TERRA/MODIS), (forest fires, flood, drought, etc.)**
- **3D forest modeling using airborne laser scanning and digital camera data**
- **Estimation of precipitable water distribution over land using NOAA/AVHRR Data and GPS-derived precipitation**
- **Relaxation effect of urban greening on urban heat island**
- **Urban fire simulation using computational fluid dynamics (CFD) method**
- **Prediction of air pollution by wind tunnel experiments and numerical simulations**
- **Study on the mechanism of CO₂ emission in urban regions**
- **Study on the spatial distribution of disaster logistics by GIS**
- **Verification of mixed reality traffic experiment system for driving behavior analysis**
- **Feasibility study of multi-purpose lane in urban arterial street**
- **Evaluation of traffic congestion alleviation policy by temporal demand distribution**
- **Evaluation of inter-green lost-time for appropriate signal control**

Projects (2007)



- Infrastructure Information Dynamics

Grant-Aid for Scientific Research

- Road plan and design based on hierarchical network structure

Research Promotion Fund

- Development of hybrid heat pump system for air and ground water source
- Study on human thermal physiological response to urban heat island effect
- Research using integrated traffic simulator for dissemination of advanced ITS services

Collaborative Researches

- Numerical prediction of thermal energy for geothermal heat pump system
- Effect of heat and pollutant release on urban climate
- Proposal of new model house design with energy efficiency for Riyadh in Saudi Arabia
- Deployment research of sustainable ITS
- Development of advanced ITS measurement vehicle

Memorandum of Understandings (2007)



- **Asian Institute of Technology** (Thailand)
- **National Centre for Earthquake Engineering** (Bangladesh)
- **Bangladesh Earthquake Society** (Bangladesh)
- **Indian Institute of Technology Kanpur** (India)
- **College of Engineering, Nanyang Technological University** (Singapore)
- **Protective Technology Research Centre, School of Civil Environmental Engineering, Nanyang Technological University** (Singapore)
- **Dept. of Civil Engineering, National University of Singapore** (Singapore)
- **LCM Research Center, The Port and Airport Research Institute** (Japan)
- **Dept. of Civil Engineering, Bangladesh University of Engineering and Technology** (Bangladesh)
- **Siridorn International Institute of Technology, Tammasat University** (Thailand)
- **Dept. of Civil Engineering Shibaura Institute of Technology** (Japan)
- **Global U-City Construction & Information, Hub Dept. of Civil Engineering, Han Yang University** (Korea)
- **Dept. of Construction Engineering, National Kaohsiung First University of Science and Technology** (Chinese Taipei)
- **Center for Public Safety Research, Tsinghua University** (P.R.China)
- **School of Applied Sciences and Engineering, Monash University, Gippsland Campus** (Australia)

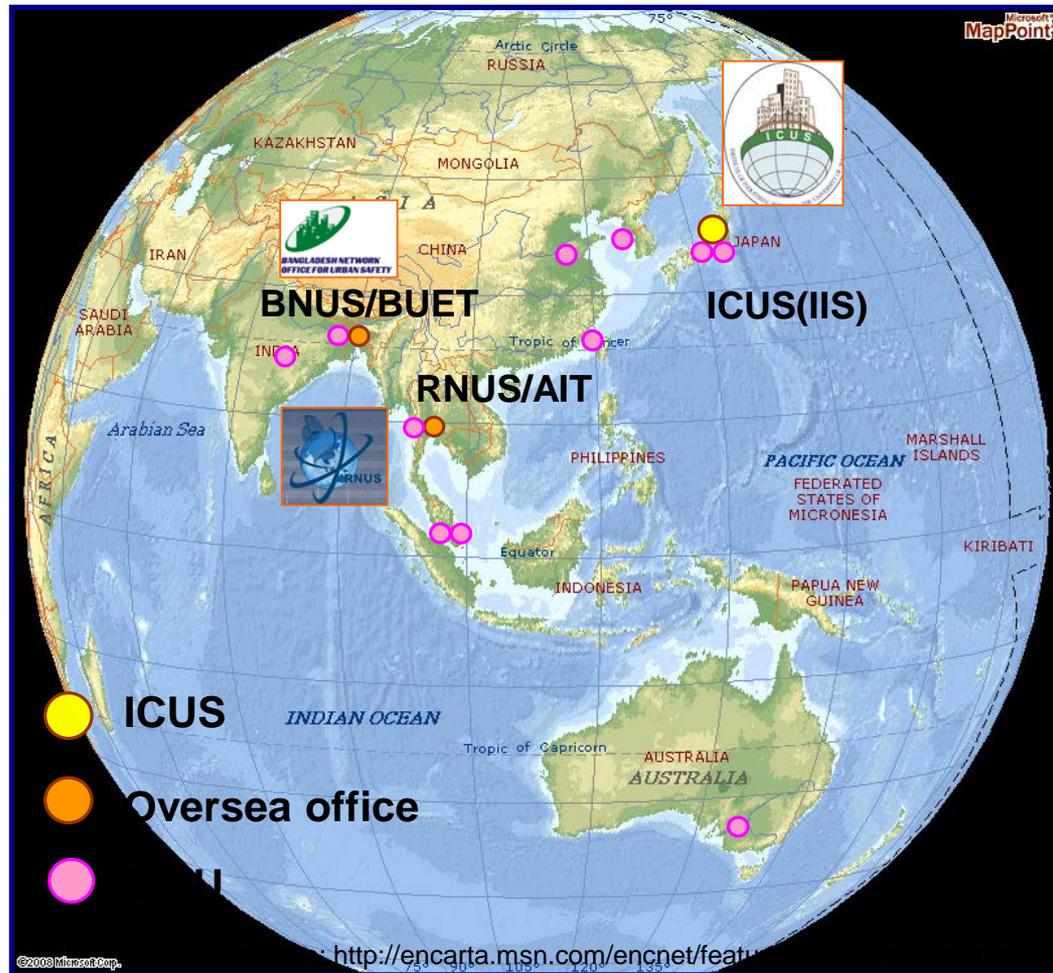
Global Network

(2007)



Overseas Offices

- **RNUS at AIT, Thailand**
(Regional Network Office for Urban Safety)
- **BNUS at BUET, Bangladesh**
(Bangladesh Network Office for Urban Safety)



International Activities (RNUS) (2007)



Projects

- Seismic hazard and vulnerability mapping of Dhaka, Chitagong & Sylhet city corporation
- Master plan for earthquake and building collapse hazard prevention and mitigation (phase 1)
- Feasibility study on the application of expansive concrete to alleviate the cracking problem of RC structure in Thailand

Seminars

- Seminar on “Ultrasonics and its application for cement-based materials”
- Seminar on “Toward a partnership on disaster management and remote sensing/GIS Technologies”
- Short Seminar on Transportation at Chulalongkorn University
- Invited lecture on mini-project and workshop on application of remote sensing and GIS

Activities

- ICUS and RNUS participated in Thailand Science and Technology Fair 2007
- Inspection of fired factory facility in Rayong province
- RNUS and GIC donated a forest fire monitoring system with remote sensing to GISTDA in Thailand
- RNUS, Geoinformatics Information Center (AIT), Kyoto University and The University of Tokyo carry out a field survey together in Thailand

International Activities (BNUS) (2007)



Projects

- School Earthquake Safety Program (SESP) in Old Dhaka, Bangladesh
- Earthquake evacuation plan for Old Dhaka, Bangladesh

Seminars and workshops

- Seminar on “Sharing knowledge on disaster warning: Community-based last-mile warning system”
- “International Symposium on New Technologies for Urban Safety of Mega Cities in Asia”

Activities

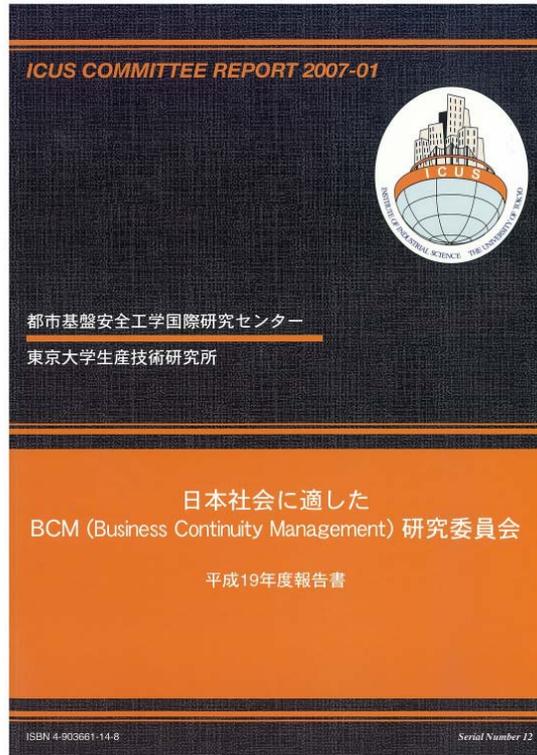
- Conducted school earthquake safety program
- Monitoring earthquakes through strong motion accelerographs
- Undertook collaborative research with different institutes
- Develop evacuation plans for different wards of Dhaka city
- Evaluation of buildings against cyclone and tsunami in the coastal areas
- Development of earthquake and tsunami preparedness program for coastal areas
- Development of training manuals for masons
- Participated in the 60 years celebration of engineering education in Bangladesh

Activities (2007)



- Industry-University Joint Research-

The Research Committee 58 (RC58) was established to investigate Business Continuity Management (BCM) systems truly suitable for Japan. The RC58 focuses on BCM for the public and private sector against natural and man-made disasters and accidents.



Research Committee Report 2007-01

Special Lecture at RC58 meeting

Activities and Events (1) (2007)



Domestic

- 12th ICUS Open Lecture (April 25, 2007) IIS
“ICUS Activities to Achieve a Safer Urban Environment
-Past achievements and future directions- ”
- SEIKEN Open House (May 31- June 2, 2007) IIS
- Delegation from Tsinghua University visits ICUS
(June 29, 2007) IIS
- 13th ICUS Open Lecture (October 2, 2007) IIS
“Crisis management and disaster control based on intelligence”
- Chiba Experimental Laboratory Open House (November 9, 2007) IIS, Chiba
- Research Committee 58 (RC58) Meeting (5 times/year) IIS
- Research meeting on disaster management considering
various fields of expertise (3 times/year) Tokyo

International

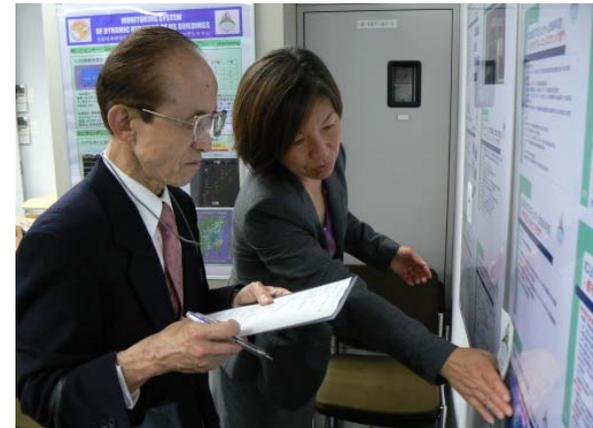
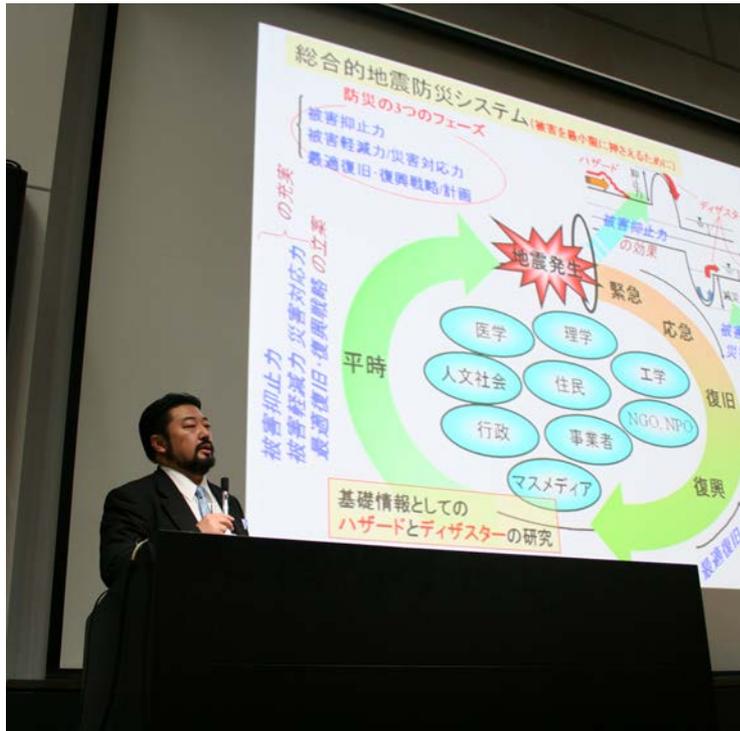
- National Science and Technology Fair 2007 in Thailand
(August 10- 20, 2007) Bangkok, Thailand
- 6th International Symposium on
New Technologies for Urban Safety of Mega Cities in Asia
(December 9-10, 2007) Dhaka, Bangladesh

Activities and Events (2) (2007)

- Open House and Open Lecture -



“SEIKEN Open House”



“12th ICUS Open Lecture”

April 25, 2007

May 31- June 2, 2007

Activities and Events (3) (2007)



- Symposium -

6th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (Dec. 9-10, 2007) , Dhaka, Bangladesh



Participants : 77 persons (Japanese : 23 persons)

Publications

(2007)



ICUS Newsletter

Volume 7, Number 1- 4

ICUS Report

2007 - 01 – 2007 - 07

“Report on Inspection of Marine Reinforced Concrete Structures in Thailand”

“Report on the Deterioration of Short-Span Traffic RC Bridges in Bangkok Metropolitan Area - A Preliminary Study-”

“BNUS Annual Report - 2007”

“Report on the 12th ICUS Open Lecture”

“Report on the 13th ICUS Open Lecture”

“Proceedings of the 4th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia”

“Report on the Development of Disaster Management Manual System for The University of Tokyo Hospital Considering its Functions as Emergency Base Hospital”

ICUS Research Committee Report

2007 - 01

“Report on the Business Continuity Management truly suitable for Japan Society”

Annual Report

ICUS Newsletters were sent to about 1,500 network members from over 150 countries, such as, foreign embassies, consultants, researchers, engineers and practitioners. The newsletters can be freely downloaded from

“<http://icus.iis.u-tokyo.ac.jp/>”.

Research Papers

(2007)



	Sustainable Engineering Division	Urban Safety and Disaster Mitigation Division	Infrastructure Information Dynamics Division
IIS Bi-monthly Research Report (SEISAN KENKYU)	7	9	9
Books/Translated Books	2	4	1
Reviewed Papers/Journal Papers	9	14	27
Conference Papers (International)	5	12	31
Conference Papers (Domestic)	7	35	42
Survey Reports	2	1	0
Others	0	12	6
Total	32	87	116

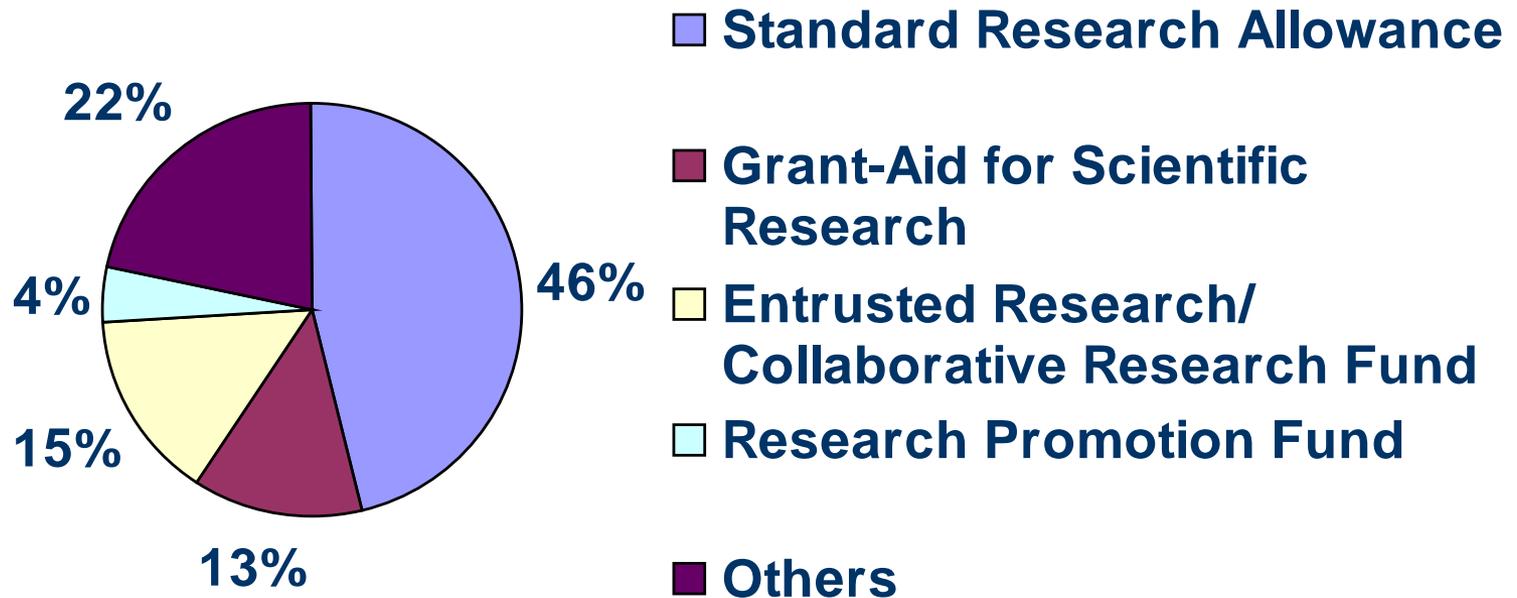
ICUS Activities Recognized (2007)



Kimiro Meguro	May, 2007	Continuing International Contribution Award	Japan Society of Civil Engineers	Meguro Lab.
Ryozo Ooka	June, 2007	Award of Excellency in Research	The Organizing Committee of SB07 SEOUL–the International Conference on Sustainable Building Asia	Ooka Lab.
Michael Ward Henry	September, 2007	Furuichi Award (Best Master Research)	Civil Engineering Department, The University of Tokyo (UT)	Kato Lab.
Ruta Ireng Wicaksono	September, 2007	Best Presentation Award	Japan Society of Civil Engineers	Kuwano Lab.
Naomi Nakajima	September, 2007	Best Presentation Award	Japan Society of Civil Engineers	Meguro Lab.
Miho (Yoshimura) Oohara	September, 2007	Best Research Award	Japan Society for Natural Disaster Science	Meguro Lab.
Navaratnarajah Sathiparan	September, 2007	Best Research Award	Japan Society for Natural Disaster Science	Meguro Lab.
Navaratnarajah Sathiparan	September, 2007	Mondialogo Engineering Award	UNESCO&Daimler AG	Meguro Lab.
Ryozo Ooka	November, 2007	Best Research Award	Taiwan Society of Sustainable Built Environment	Ooka Lab.
Miho (Yoshimura) Oohara, Sanae Miyazaki, Kimiro Meguro	December, 2007	University of Tokyo President's Award	UT	Meguro Lab. Miyazaki Lab.
Ryozo Ooka	January, 2007	Best Poster Award	The AGS (The Alliance for Global Sustainability)	Ooka lab.
Tetsuro Fujita	March, 2007	Tanabe award (Best Graduate Research)	Civil Engineering Department, UT	Kato Lab.



Budget (2007)





**International Center
for Urban Safety Engineering (ICUS)
Institute of Industrial Science, The University of Tokyo**

4-6-1 Komaba, Meguro-ku

Tokyo 153-8505, Japan

Tel: (+81-3) 5452-6472

Fax: (+81-3) 5452-6476

E-mail: icus@iis.u-tokyo.ac.jp

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