



# International Center for Urban Safety Engineering (ICUS)

Annual Report -2004-

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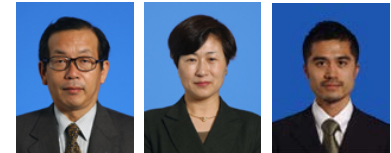


# Staff Members (ICUS)

(2004)

## Sustainable Engineering Division

- Prof. Taketo UOMOTO (Director and Professor)
- Prof. Reiko AMANO (Visiting Professor)
- Dr. Yoshitaka KATO (Assistant Professor)



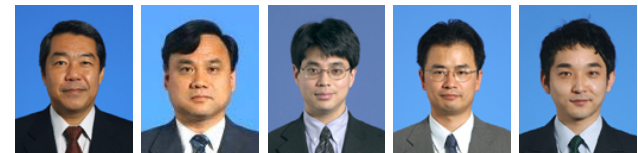
## Urban Safety and Disaster Mitigation Division

- Prof. Kimiro MEGURO (Professor)
- Prof. Shogo HAYASHI (Visiting Professor)
- Dr. Dushmanta DUTTA (Associate Professor)
- Miss Miho YOSHIMURA (Research Associate)



## Infrastructure Information Dynamics Division

- Prof. Yoshifumi YASUOKA (Professor)
- Prof. Masahiro SETOJIMA (Professor)
- Dr. Ryozo OOKA (Associate Professor)
- Dr. Junichi SUSAKI (Assistant Professor)
- Dr. Takahiro ENDO (Research Associate)





# Staff Members (ICUS)

(2004)



# Research Topics of ICUS

(2004)

## Sustainable Engineering Division

- Deterioration mechanism of existing structures
- Nondestructive testing technology for evaluation of deterioration
- Retrofitting and strengthening of structures based on mechanism of deterioration
- Standard specification for design, construction and maintenance
- Maintenance and management plan



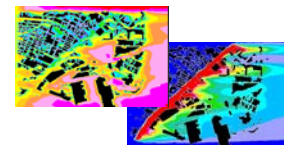
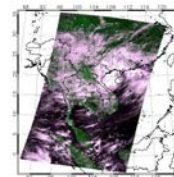
## Urban Safety and Disaster Mitigation Division

- Urban safety and disaster mitigation strategy
- Efficient and economic retrofitting method for masonry structures considering local availability of materials and workmanship
- Disaster countermeasures for urban lifeline systems
- Development of integrated information system for total disaster management



## Infrastructure Information Dynamics Division

- Remote sensing/geographic information system
- Information network of urban infrastructure
- Space data analysis
- Urban warming/comprehensive environmental assessment





# Research Topics (2004)

## - Sustainable Engineering -

- Evaluation of long-term durability performance of concrete using epoxy-coated reinforcing steel bars
- Influence of various factors on deterioration of repaired concrete structures
- Development of monitoring system for existing concrete bridges
- Application of multi-spectral method for chloride detection on concrete surface
- Clarification of mechanism of steel corrosion in BS-concrete
- Study on fracture mechanics of steel bar due to ASR
- Evaluation of quality of existing concrete structures by using thermograph method
- Modeling of mass transport property of cementitious materials
- Value evaluation of inspection information in deterioration diagnosis of concrete structures
- Development of new estimation tool for deterioration of concrete based on environmental simulation
- Water Screen Fire Disaster Prevention System



# Research Topics (2004)

## - Urban Safety and Disaster Mitigation -

- Development of integrated information system for total disaster management
- Next generation manual for total disaster management
- Quick estimation and monitoring of earthquake damage using changes in the power supply
- System for promotion of retrofitting of low earthquake resistant structures
- Numerical simulation of total collapse behaviour 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
- Urban flood risk analysis
- Urban hydrologic cycle
- GIS and RS applications in urban risk management
- Climate change impacts on water resources



# Research Topics (2004)

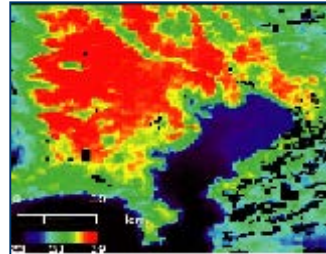
## - Infrastructure Information Dynamics -

- Monitoring of the environment in East Asia using satellite data (TERRA/MODIS), (forest fires, extraction of 3D surface feature, albedo, etc.)
- 3D city and trees modeling using data from airborne laser scanning and high resolution digital matrix camera
- Extraction of a stand tree, height and DBH using data from airborne laser scanning and high resolution digital matrix camera
- Study on the evaluation and measure for urbanization of mega cities in ASIA
- Development of estimation method for water stress condition of crop using hyperspectral remote sensing
- Analysis of urban heat island structure in use of urban meteorological model
- Relaxation effect of urban greening on urban heat island
- Urban fire simulation in aid of CFD method
- Prediction of air pollution by wind tunnel experiment and numerical simulation
- Study on the mechanism of CO<sub>2</sub> emission in urban region

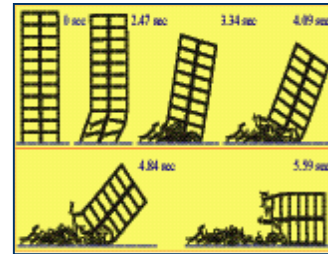
# Research and Investigation (2004)



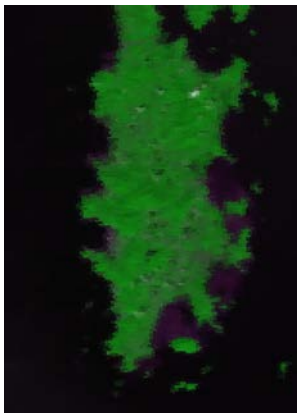
**Degradation structure investigation**



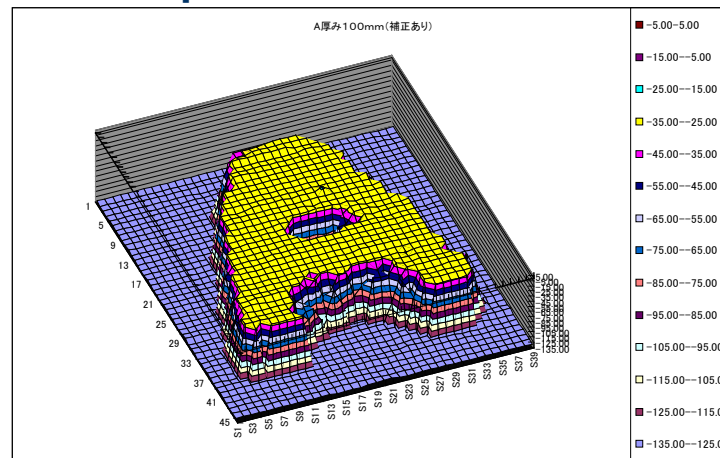
**Heat island monitoring  
Earthquake disaster simulation**



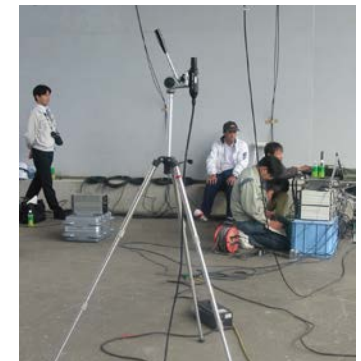
**Earthquake disaster investigation**



**Tsunami damage monitoring**



**Nondestructive testing analysis**



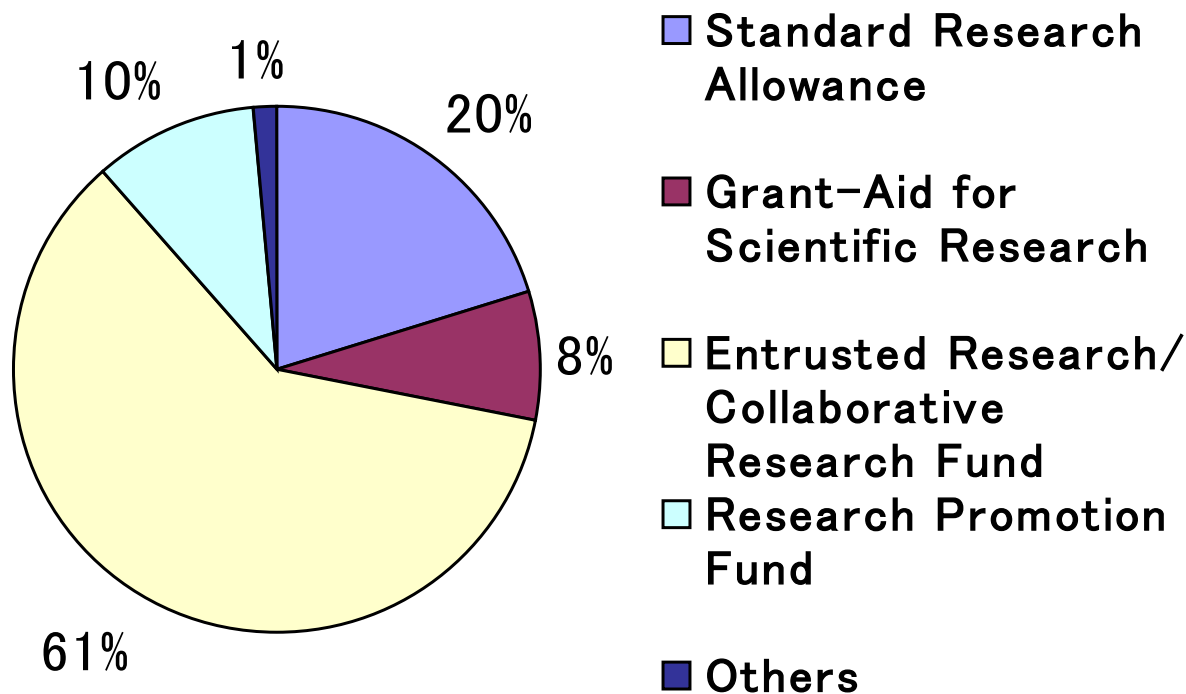
**Existing structure investigation and analysis**





# Budget of ICUS

(2004)





# Projects (2004)

## - Sustainable Engineering -

### **Grant-Aid for Scientific Research**

- Development of High Performance Repair System for Concrete Structures based on Environmental Simulation

### **Collaborative Research with Industry**

- Study on the Evaluation of Repair Materials for Concrete Structures
- Development of New Techniques of Non-Destructive and Non-Contact Test for Inspection of Concrete Structures
- Monitoring System for Existing Concrete Bridges
- Study on Fatigue Properties of Concrete Beams
- Study on NDT for Inspection of Concrete Structures
- Modeling of Mass Transport Property of Concrete Considering Spatial Properties of Composition Materials
- Effect of Chemical Admixtures on Quality of Concrete
- Study on Earthquake-Proof Diagnosis and Repair Work Case Collections for Disaster Prevention of Local Governments
- Establishment of Real Time Monitoring System for Safety Evaluation of Concrete Bridge



# Projects (2004)

## - Urban Safety and Disaster Mitigation-

### Grant-in-Aid for Scientific Research

- Economic and Efficient Method for Retrofitting of Unreinforced Masonry Structures
- Development of High Precision Computational Techniques for Evapotranspiration in Urban Areas using for Water and Energy Balance Methods

### Cooperative Research with the Private Sector

- Dynamic and Large Deformation Analysis of Railway Structures
- Development of Next Generation Disaster Manuals for Increasing Total Disaster Management Capacity
- Effects of Power Outage on Urban Social Systems
- Development of Numerical Simulation for Increasing the Safety of Urban Infrastructure
- Urban Flood Inundation Modeling in Mekong River Basin using a Physically based Surface- River Model

### Research Promotion Fund

- Special Coordination Funds for Promoting Science and Technology (RR2002) Special Project for Urban Earthquake Disaster Mitigation



# Projects (2004)

## - Urban Safety and Disaster Mitigation-

### Research Promotion Fund

「Study for Integrated of Earthquake Disaster Reduction Countermeasures,  
- Pre-Event Measures」

「Development of Integrated Numerical Simulator for Tsunami Disaster  
in Coastal Region」

- Social Technology Research System

「New Technology for Earthquake Risk Assessment and Disaster Mitigation  
and Crisis Management」

- Disaster Reduction by Crisis Management of Information Technology

- Development of Crisis Management System for Japanese Society

- Reconnaissance Study on the Aftermath of Off-Sumatra Earthquake and Indian  
Ocean Tsunami Disaster

### Others

- Catastrophic Flood Risk Analysis in Bangkok, Thailand

- Flood Forecasting and Decision Support System for Chao Phraya River Basin,  
Thailand

- An Assessment of the Socio-Economic Impacts of Floods under Climate  
Change Conditions in Large Coastal Cities in South and Southeast Asia



# Projects (2004)

## - Infrastructure Information Dynamics-

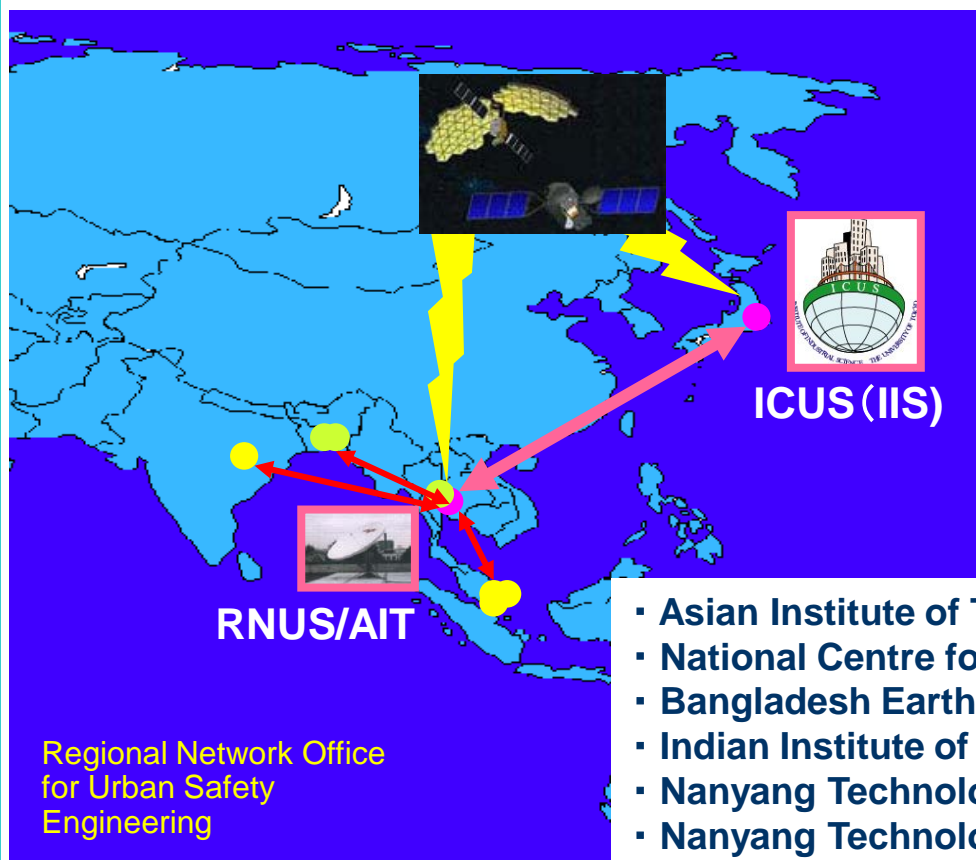
### Grant-Aid for Scientific Research

- Development of Network for Monitoring Natural Disasters in Asia using Satellite Remote Sensing (JST)
- The Application and Development of Geothermal Air-Conditioning System using Ground Heat Exchanger Utilizing Building Foundation Pile in Urban Area (NEDO)

### Collaborative Research with Industry

- The Application and Development of Geothermal Air-Conditioning System using Ground Heat Exchanger Utilizing Building Foundation Pile
- Study on Progress of Heat-Island Effect in Tokyo 23 Wards Area by Numerical Meteorological Model
- Basic Analytical Research on the Influence Factor to Outdoor Thermal Environment of Residence Region Scale – Mechanism Clarification of New Phenomenon and Application Development
- Study on the Influence of Air-Conditioning Systems and Distributed Local Energy Supply Systems on Heat-Island Phenomenon

# Activities of Network Office of ICUS (2004)



**Memorandum of Understanding and The joint research network**

- Asian Institute of Technology School of Civil Engineering
- National Centre for Earthquake Engineering (BUET)
- Bangladesh Earthquake Society(BES)
- Indian Institute of Technology, Kanpur
- Nanyang Technological University College of Engineering
- Nanyang Technological University (PTRC)
- National University of Singapore Dept. of Civil Engineering



# Activities

(2004)

## Domestic

- SEIKEN Open House (June 5-6, 2004) IIS
- 6th ICUS Open Lecture (April 9, 2004) IIS  
“WORLD AND JAPAN, PEACE AND DISASTER PREVENTION”
- 7th ICUS Open Lecture (September 29, 2004) IIS  
“PREDICTION AND COUNTERMEASURES OF GLOBAL DISASTER IN ASIA”
- 8th ICUS Open Lecture (February 28, 2005) IIS  
“EARTHQUAKE, TYPHOON AND FIRE – MESSAGE FROM DISASTER SITES”

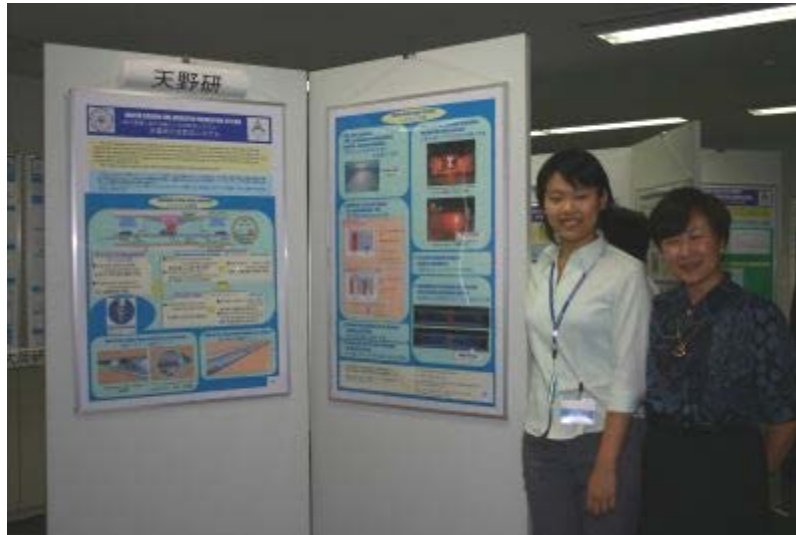
## International

- The 3rd International Symposium on New Technologies  
for Urban Safety of Mega Cities in Asia (October 18-19, 2004)  
Agra, India (Jaypee Palace Hotel)

# Activities (2004)

## - Open house -

### “SEIKEN Open House”



Open house of ICUS was held in conjunction with open house of IIS.





# Activities (2004)

## - Open Lecture -

### Photographs taken at the “7<sup>th</sup> ICUS Open Lecture”

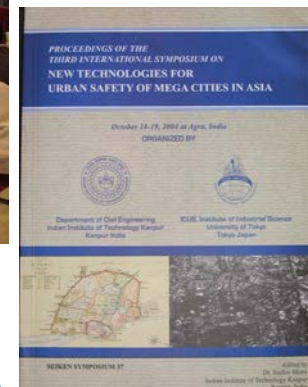


September 29, 2004

# Activities (2004)

## - Workshop -

**The 3rd International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (October 18-19, 2004)  
Agra, India (Jaypee Palace Hotel )**



# Activities (2004)

## – Industry-university joint research–

Three working groups have been organized for conducting the activities of RC39. The themes of these working groups are as follows; 1) Aging infrastructure management, 2) Disaster prevention, and 3) Environment.





# Publications

(2004)

- News Letter Volume4 Number 1–4
- ICUS Report 2004-01 – 2004-03
  - “Seismic risk management for countries of the Asia pacific region”
  - “2004 NEW TECHNOLOGIES FOR URBAN SAFETY OF MEGA CITIES IN ASIA”
  - “Report on the result of the concrete degradation of the bridge”
- ICUS Committee Report 2004-01
- SEIKEN SYMPOSIUM 37
- KNOW RISK
- The 4<sup>th</sup> workshop for “Comparative Study on Urban Earthquake Disaster Management”
- Annual report

@ News letters were sent to about 150 countries, foreign embassies /consulates in Japan and 1,500 researchers. The letters can be downloaded from “ <http://icus.iis.u-tokyo.ac.jp/> ” free of charge.



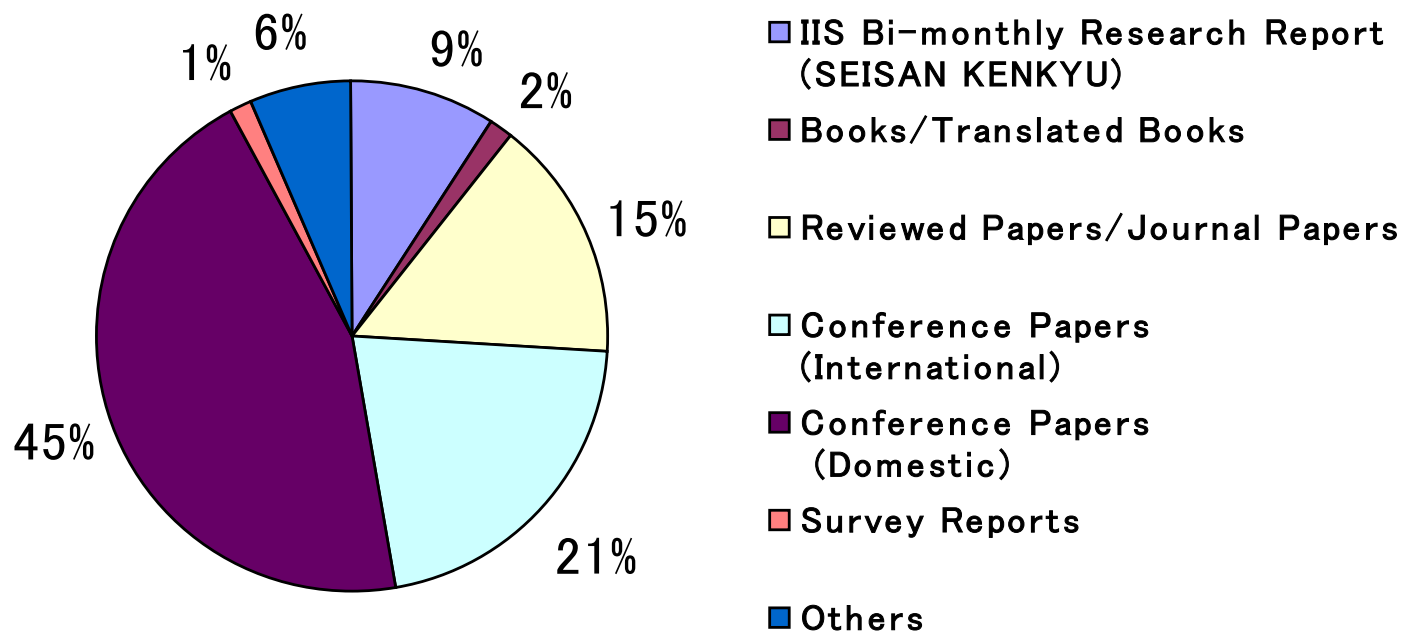
# Research Papers

(2004)

	Sustainable Engineering Division	Urban Safety and Disaster Mitigation Division	Infrastructure Information Dynamics Division
IIS Bi-monthly Research Report (SEISAN KENKYU)	15	8	4
Books/Translated Books	1	2	2
Reviewed Papers/Journal Papers	16	8	18
Conference Papers (International)	18	27	18
Conference Papers (Domestic)	37	25	71
Survey Reports	1	3	0
Others	0	17	2
<b>Total</b>	<b>88</b>	<b>90</b>	<b>115</b>

# Research Papers

(2004)





# ICUS Activities Recognized (2004)

Name	Date	Prize Name	Organization	Supervisor
K. SHIRASE	May-04	Excellent presentation award	JCA	Prof. UOMOTO
P. SANCHAROEN	May-04	Excellent presentation award	JCA	Prof. UOMOTO
K. OYOYOSHI	Jun.-04	Best presentation award	JSPRS	Prof. YASUOKA
S.KONDO	Sep.-04	Excellent presentation award	JSCE	Prof. MEGURO
A. ONEZAWA	Sep.-04	Excellent presentation award	JSCE	Dr. KATO
N. TAKESHITA	Sep.-04	Excellent presentation award	JSCE	Dr. KATO

JCA: Japan Cement Association

JSCE: Japan Society of Civil Engineers

JSPRS: Japan Society of Photogrammetry and Remote Sensing

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for Urban Safety Engineering (ICUS)**

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