NEWS
INTERNATIONAL SYMPOSIUM ON GEOTECHNICAL ENGINEERING FOR DISASTER PREVENTION AND REDUCTION

This conference took place from July 26 to 29, 2011, at Far Eastern State Transport University in Khabarovsk, Russia (Photos 1 to 2). It was organized by Professor Sergey A. Kudryavtsev, General Secretary of Organizing Committee of 4IGS under auspices of Asian Technical Committee 3 for geotechnical natural disasters (ATC3), Russian Geotechnical Society and Kazakhstan Geotechnical Society. As shown in its title, this series of conference is intended to exchange and disseminate in Far East the up-to-date knowledge and experience both internationally and domestically. The first conference was realized in 2005 in Astana of Kazakhstan by Prof. Askar Zhussupbekov (Eurasian National University, Kazakhstan) and Prof. Takaji Kokusho (Chuo University, Tokyo, Japan) under the auspices of ATC3 for geotechnical natural disasters and this frame work has been maintained during the following occasions in Yuzno-Sakhalinsk (2007, Russia) and Harbin (2009, China). This year, the Khabarovsk conference attracted more than 150 paper submissions and about 180 participants from China, Korea, Japan, India, Poland, Russia, and Kazakhstan (Photo 1).

Photo 1 Group photograph of participants

The opening ceremony was led by Prof. Boris Dynkin who is the rector of the Far Eastern State Transport University (Photo 4) and keynote lectures together with oral presentations followed. The discussed topics included earthquakes and landslides together with a special emphasis on soil freezing. Photographs below show some aspects of the conference.


Photo 2 Conference going on


Photo 3 Dinner cruise on Amur River

The main attention is given to sharing knowledge on reliable preventive geotechnical measures directed towards damage minimization when the available information is either incomplete or inconsistent.

NEWS
INTERNATIONAL SYMPOSIUM ON GEOTECHNICAL ENGINEERING FOR DISASTER PREVENTION AND REDUCTION (continued)

International experts are invited to take part in the Symposium, present keynote and special lectures, make oral and poster reports, exhibit the equipments and devices, introduce various achievements in the geotechnical engineering field, and also discuss the lessons learned from resent disasters in order to share the modern knowledge and technologies implemented into practice for damage mitigation. As a result it is expected to receive papers dealing with the improved practical approaches and engineering solutions, unified new construction, codes and regulations for the purpose of preventing and reducing the disasters before they strike again.

Photo 4 Opening ceremony of 4IGS,2011: from left to right: Dr. V.D. Kalashnikov- Vice-Chairman of Government of Khabarovsky Krai , Minister of Economic Development and Foreign Policy of Khabarovsky Krai; Prof. B.E. Dynkin-Rector of Far Easten State Transport University; Prof. Askar Zhussupbekov-VP of ISSMGE for Asia

Photo 5 Prof. Askar Zhussupbekov (VP of ISSMGE for Asia) awarded of Dr. H. Toyota (Nagaoka University of Technology, Japan) for his excellent Keynote Lecture

Photo 6 Prof. E.C. Shin (University of Incheon, Korea)-Chairman of Section 1 "Geomonitoring, monitoring the geodynamic processes, prognoses of natural phenomena awarded of Prof. Ikuo Towhata (Appointed Board Member of ISSMGE, University of Tokyo, Japan) for his excellent Special Lecture

Photo 7 Prof. H. Hazarika (Kyushu University, Fukuoka, Japan) presented his book "Soil Mechanics Fundamentals" to General Secretary of 4IGS, 2011 Prof. Sergey Kudryavtsev (for Library of Far Eastern State Transport University, Khabarovsk, Russia)

NEWS
INTERNATIONAL SYMPOSIUM ON GEOTECHNICAL ENGINEERING FOR DISASTER PREVENTION AND REDUCTION (continued)

The Organizing Committee of 4IGS invited Prof. M. Okamura (Ehime, Japan) to present a Keynote Lecture 1 "In-situ Air Injection as a Liquefaction Countermeasure." Dr. H. Toyota (Nagaoka, Japan) gave Keynote Lecture 2 (Photo 5) about "Observation of Slope Failures during Natural Disasters - Case study in the Chuetsu Area of Niigata, Japan." Dr. G. Wang (Kyoto, Japan) gave Keynote Lecture 3 "Role of Pore Fluid Pressure on the Initiation and Movement of Fluidized Landslides." Dr. A.T. Bekker (Vladivostok, Russia) gave Keynote Lecture 4 "Specificity of the Coastal Construction in the Far East." Keynote Lecture 5 was presented by Prof. I. Saharov and Prof. V. Paramonov (Saint-Petersburg, Russia) on the decision of a spatial problem of freezing and heaving for the building which have not been protected for the winter period.

The Keynote Lecture 6 "Dynamic Response Analysis of Reinforced Embankment Dam and Buried Pipe Using Kinematic Hardening Constitutive Model" was presented by Prof. T. Tanaka (The Japan Association of Rural Resource Recycling Solutions, Japan). Prof. Z. Maocai (Harbin, China) gave Keynote Lecture 7 "The Study on Key Geotechniques of Stockman Nevsky Centre Project in Saint Petersburg City." Keynote Lecture 8 "An Analysis of Frost Penetration Depth for Road Design by Field Monitoring in Korea" was delivered by Prof. E.C. Shin, J.S. Lee, and G.T. Cho (Incheon. Korea). Keynote Lecture 9 "Interaction Research between the Soil Ground and a Pile Arranged by Displacement Technology" was presented by Prof. Askar Zhussupbekov (Columbia University, New York, USA and Eurasian National University, Astana, Kazakhstan).

Prof. T. Kozlowski (Kielce University of Technology, Poland) gave Keynote Lecture 10 entitled "Characteristic Temperatures of Phase Transitions in Soil-Water Systems below 0°C." Keynote Lecture 11 "An Approach of Risk Analysis for Shallow Landslide over a Wide Area" was delivered by Prof. G. Chen (Kyushu, Japan). Keynote Lecture 12 "Towards Sustainable Countermeasure against Liquefaction – A Smart Geomaterial and Its Evaluation" was presented by Prof. H. Hazarika (Kyushu University, Fukuoka, Japan); see Photo 7.

Also Special lectures were given as what follows.

Special Lecture 1: Assessment of seismic damage extent by dynamic analysis and its application to microzonation - Prof. Ikuo Towhata (Tokyo, Japan) (Photo 6).

Special Lecture 2: Liquefaction-induced damage in the reclaimed lands along Tokyo Bay during the 2011 Tohoku-Pacific Ocean Earthquake in Japan – Prof. S. Yasuda, K. Harada (Tokyo Denki University, Japan).

Special Lecture 3: Seismic site amplification formula using average Vs instead of Vs_{30} and effect of soil nonlinearity – Prof. T. Kokusho (Tokyo, Japan).

Special Lecture 4: Standard buildings, structures, territories, acquirements of safety under tsunami impact- Dr. M. Klyachko, I. Nudner, V. Maximov, E. Peelenovsky, and V. Filkov (Original Alliance for disaster analysis and reduction ,RADAR, NPO, Saint-Petersburg, Russia).

Special lecture 5: Development of geotechnical approaches and design solutions on making slope processes stable on "Amur" road section in condition of frost degradation in foundation - Prof. S.A. Kudryavtsev, Y.B. Berestyany, E.V. Fedorenko, T.Y. Valyseva, R.G. Michailin, and E.D. Goncharova (Khabarovsk, Russia).

Several social and technical tours were also provided by the organizing committee of 4IGS in Khabarovsk (Far East Russia); see Photos 8 and 9.

The next venue of the 5th International Geotechnical Symposium on Geotechnical Engineering for Disaster Prevention and Reduction was decided to be Incheon, Korea, in May, 2013 under auspices of Korean Geotechnical Society, ATC 3 and University of Incheon. The chairman of organizing committee of 5IGS will be Prof. Eun Chul Shin, University of Incheon, South Korea.

NEWS
INTERNATIONAL SYMPOSIUM ON GEOTECHNICAL ENGINEERING FOR DISASTER PREVENTION AND REDUCTION (continued)

Photo 8 Reception at Russian Restaurant at Khabarovsk

Photo 9 Group photograph of technical tour to coastal area of Amur River

NEWS
The 4th Japan-Korea Geotechnical Engineering Workshop (Geotechnics for Human Security)

The 4th Japan-Korea Geotechnical Engineering Workshop was held in Kobe, Japan from July 6 to 7, 2011. It was organized jointly by Japanese Geotechnical Society (JGS) and Korean Geotechnical Society (KGS).

Under the success of previous workshops (the 1st Workshop in Seoul, Korea, in 1990, the 2nd Workshop in Tokyo, Japan, in 2008, and the 3rd Workshop in Ansan, Korea), the 4th Japan-Korea Geotechnical Engineering Workshop was held in Kobe, Japan, at the same venue as the JGS National Conference, with the main theme of "Geotechnics for Human Security". A total of 27 papers were submitted from JGS and KGS and the paper presentation was made in four sessions on the first day:

9:15 – 10:15 Session A
Earthquake and dynamic issues (4 papers)
10:30 – 12:00 Session B
Ground characterization, modification, and bearing capacity (6 papers)
13:00 – 15:00 Session C
Soil and rock fills, slopes, and excavations (8 papers)
15:15 – 17:30 Session D
Environmental issues (9 papers)

A technical site tour was conducted on the second day by visiting the places in the photographs.

- Miki Disaster Prevention Park
http://www.city.miki.lg.jp/english/tourist_hst_disa.html

The next workshop is planned to be held in some city in Korea, in the year of 2013. Both societies wish to continue strengthening the collaborations and friendship between members of the two societies through workshops.

NEWS
The 4th Japan-Korea Geotechnical Engineering Workshop (continued)

E-defense of Hyogo Earthquake Engineering Research Center
http://www.bosai.go.jp/hyogo/ehyogo/index.html

Hokudan Earthquake Memorial Park
http://www.nojima-danso.co.jp/index.php

Akashi Kaikyo Bridge http://www.jb-honshi.co.jp/english/bridgeworld/index.html

NEWS
TC302 OSAKA2011
International Symposium on Backwards Problem in Geotechnical Engineering

Yoshinori Iwasaki
Geo Research Institute

1. TC302 Osaka Symposium

The TC302 (Forensic Geotechnical Engineering, Chair Dr. V.V.S. RAO) had an International Symposium on Backwards Problem in Osaka from July 14 and 15, 2011 at Kensetsu-Koryu Kan in Nishi-ku, Osaka (about 150 participants from UK, USA, Ukraine, Kazakhstan, India, Korea, Taiwan, Nepal, and Japan). The Symposium was organized by a joint activity of TC302, ISSMGE (Chair V.V.S. RAO, India) and Research Committee on Forensic Geotechnical Engineering, Disaster Prevention Research Institute, Kyoto University (Chair Y .Iwasaki, Secretary M. Mimura, Japan) under the auspices of ISO Committee of JGS as well as Kansai Branch, JGS.

Photo 1 TC302 Chair Dr. V.V.S. Rao

2. Increases of Failures of Geotechnical Works

Recent geotechnical works become deeper in depth and bigger in size and tend to cause negative effects to the society as casualties of over 50 persons at Can Tho Bridge failure in Vietnam (2007/9/26). These are manmade accidents and the attitude of geotechnical engineering at present might have critical shortage in safety of the geotechnical construction. The Osaka Symposium tried to sound the reason of such failures of geo-construction and find solutions to improve the situation.

Photo 2 Group Photo TC302 OSAKA2011 July 14-15, Osaka, Japan

NEWS
TC302 OSAKA2011 (continued)

3.Papers presented in the Symposium

The Symposium started with the greeting welcome address by Dr. V.V.S. RAO, the Chair of TC302, followed by Dr. Iwasaki with the outline and objectives of the Symposium.

[Keynote Papers]
The first Keynote Lecture was given by **Prof. Malcolm Bolton**, University of Cambridge, UK, under the title of "Learning from Reality: Lessons from Centrifuge Models." He showed the slope failure that took place in Hong Kong in 1976 triggered by rainfall was not caused by seepage from surface but the increase of seepage pressure beneath the fill. Centrifugal test had clarified the mechanism of internal hydro-fractures that triggered failure.


Photo 3 Prof. M. Bolton


Photo 4 Prof. K. Ishihara

The second Keynote Lecture was given by **Prof. Kenji Ishihara**, Chuo University, Japan, under the title of "Collapse of Braced Excavation in Singapore." He pointed out the big difference of geotechnical condition between the assumed design and the reality. The field studies after the Nicoll Highway Collapse on 20 April 2004 revealed that failed part of the temporary retaining wall corresponded to an ancient narrow river that deepened thick soft marine clayey layer.

Photo 5 Prof. Y. Shioi on Can Tho Bridge


Photo 6 Prof. A. Asaoka

NEWS
TC302 OSAKA2011 (continued)

The third Keynote Lecture was delivered by **Prof. Yoshitake Shioi,** Prof. Emeritus, Hachinohe Institute of Technology, Japan, who was a committee member of Governmental Investigation for Can Tho Bridge failure on September 26, 2007 in Vietnam. He was the only committee member from Japan. Prof. Shioi showed the special characteristics of the soft clay in the region and proposed to introduce creep characteristics into the design of the bridge foundation. The accident occurred during the process of lifting PC girder from the ground to top of the piers. The vertical member to support the girder had been buckled due to the inclination of the foundation of 12mm/400m with settlement of about 35mm.

In Singapore, the construction was rather heavily instrumented but appropriate observational procedure was not performed. In Vietnam, no attention was paid to monitor the movement of the tilting of the foundation as well as settlement during the lifting of the girder.

The fourth Keynote Lecture was given by **Prof. Akira Asaoka, Prof. Emeritus, Nagoya Univ.,** who introduced the delayed consolidation caused by extreme sensitive clay that is often difficult to deal with in conventional consolidation theory.

Photo 7 Dr. K. Ito

Photo 8 Dr. R. Hwang

The last Keynote speaker was **Prof. Toshihiko Omoto**, Kyoto University, Japan, who specialized and qualified himself as an international member of board of dispute on construction. Dr. Omoto introduced the enrollments of dispute board in the international construction to avoid critical dispute of the construction as well as to secure the safety of the construction.

Two current topics of Tsunami as well as nuclear power problem were also introduced. **Dr. Masanobu Shishikura**, Geological Survey of Japan, showed historical evidence of the tsunami deposits caused an ancient huge tsunami just like the one of March 11, 2011 in the northern East region Japan.

NEWS
TC302 OSAKA2011 (continued)

Photo 9 Prof. Y. Nemchynov

Photo 10 Dr. M. Shishikura

Prof. Yuriy Nemchynov, NIISK, Kyiv, Ukraine, presented the process of covering the nuclear power plant at Chernobyl (Ukraine) to control the radioactive contamination. He also demonstrated structural and geotechnical aspects of this nuclear power plant disaster and recovering progressing of international joint project (USA, France, Ukraine) since 1986 till 2011.

[Investigation Method] Prof. Askar Zhussupbekov, Columbia University, USA, presented Remote Methods Research System and Base Foundation above Ground Building, which refers to some mysterious application of "bio-location." This interesting method came from Russian military service for obtaining submarines with this biolocation.

[Earthquake Geotechnical Engineering] Prof. Susumu Iai of Kyoto University discussed "Backwards problem for Earthquake Geotechnical Problem."

[Anchored Wall] "Failure of Anchored Wall in Korea" was presented by **Prof. Myoung-Mo Kim** and "Simulation of Failure of Anchored Wall by Centrifugal Model Test" was presented by **Dr. Kazuya Itoh**, National Institute of Occupational Safety and Health.

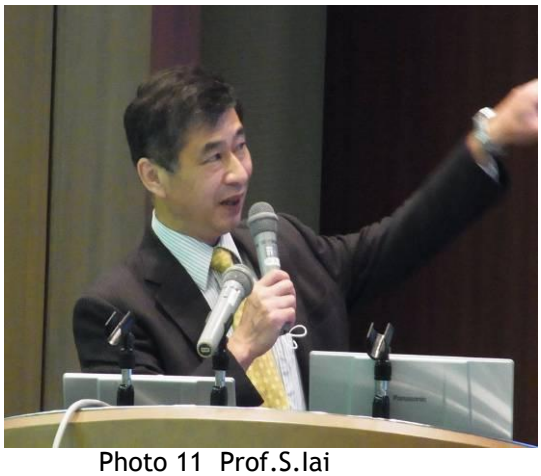

Photo 11 Prof.S.Iai

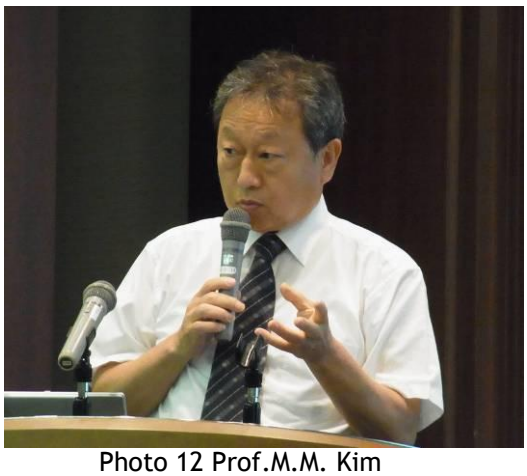

Photo 12 Prof.M.M. Kim

NEWS
TC302 OSAKA2011 (continued)

Photo 13 Prof. M. Mimura

Photo 14 Prof. B. Hsung

[Settlement] Prof. Mamoru Mimura, Kyoto University, reported the special characteristics of long term settlement at Kansai Airport, Japan.

[Excavation and Subway Construction] Case study on failure and damage to metro construction includes "Piping failure of a Metro Tunnel Construction" by **Prof. Wei Lee** of National Taiwan University of Science and Technology, "Damages to metro tunnels due to Adjacent Excavation" by **Dr. Richard Hwang**, Moh and Associates, Taiwan, "Rethink of Failure of Underground Construction" by **Prof. Benson Hsiung** of National Kaoshung University of Applied Science, "A Soil Water Coupled Finite Element Analysis of Open-Cut Excavation for Soft Clay Deposit by elasto-viscoplastic Model" by **Prof. Yosuke Higo**, Kyoto University, "Forensic Analysis of Failure of Shoring Piles" by **Dr. Santosh Rao**, Naghadi Consultants, India, and "Backwards Analysis from Retaining Wall Systems by Sheet piles based upon Lateral Wall Displacement in Soft Ground, St. Petersburg " by **Prof. Kenji Okajima**, Mie University, Tsu, Japan.

Photo 15 Prof. W. Lee

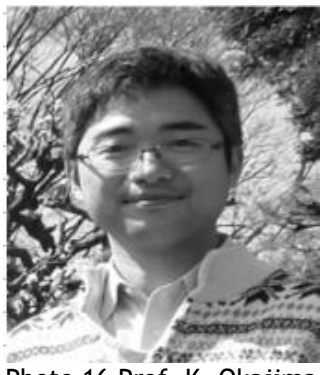

Photo 16 Prof. K. Okajima

Photo 17 Prof. Y. Higo

NEWS
TC302 OSAKA2011 (continued)


Photo 18 Prof. A. Mochizuki


Photo 19 Prof. A. Zhussupbekov

[Reinforced Soil] Prof. Satoru Shibuya, Kobe University, presented "Case Study on Causes and Countermeasures of Largely Deformed Reinforced Earth Wall with Geotextile in Hyogo, Japan." **Prof. Eun Chul Shin**, University of Incheon, Korea, presented "Case Study of Reinforced Earth Wall Failure during Extreme Rainfall."


Photo 20 Prof. E.C. Shin


Photo 21 Dr. S. Rao

[Slope Stability] Prof. Akitoshi Mochizuki, Prof. Emeritus, Tokushima University, Japan, showed that the total stress analysis provides an effective method for "A Failure of a Cut Slope and Deterioration of Shear Strength due to Weathering."

[Geo Code] Prof. Askar Zhussupbekov, Eurasian National University, Astana, Kazakhstan, introduced problems in Kazakhstan by "Forensic Issues of Adaption of Eurocodes of Geotechnical Engineering to Kazakhstan Geotechnical Norms."

NEWS
TC302 OSAKA2011 (continued)


Photo 22 Prof. T. Adachi

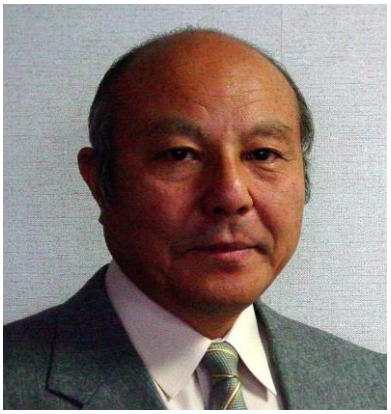
Photo 23 Dr. Y .Iwasaki


Photo 24 Prof. S. Shibuya

[Safety of Geo-Construction] Dr. Yoshinori IWASAKI, Geo Research Institute, Osaka, Japan, showed a case study how to apply Observational Method (OM) presenting "An Alternative Approach as OM Inferred from Monitored Data to Avoid the Failure of the Geotechnical Excavation in Singapore." **Prof. Toshihisa ADACHI**, Geo Research Institute, expressed his experiences as "Enrollments of Technical Committee and Geoinformatics for Geo-construction."

Failures may be divided into two groups "during construction" and "after construction." Observational method has been proposed by Terzaghi and Peck for the safety of the geotechnical works and practiced in the past.

Failures during construction have been attributed to mainly two reasons. One is the difference between the assumed failure theory and conditions in the design and the reality (Bolton, Ito, and Ishihara). Another important point is the difficult local soils (Asaoka, Lee, Mimura). The misuse and/or practice without OM during the construction cause failure of construction (R. Hwang, B. Hsiung, and Y. Iwasaki).

Failures after the construction were caused by different causes of changes of characteristics of deformations (Shibuya) and strength (Kim, Mochizuki, and Shin).


Photo 25 Prof. A. Iizuka


Photo 26 Prof. T. Omoto in discussion

4. Panel Discussions

Discussions were focused upon characteristics of local soils that may lead to critical failures and practical case study of OM for geotechnical constructions. **Dr.Tara Nidhi Lohani,** Geo Research Institute, discussed local sensitive soft clay in Osaka based upon data base of geotechnical borings in Kansai Area. **Prof.**

NEWS
TC302 OSAKA2011 (continued)

Atsushi Iizuka, Kobe Univ., Japan, reported an application of OM for highway embankment on very sensitive soft clayey ground. **Dr. Takahiro Konda**, Geo Research Institute, showed OM approach for subway shield machine in urban area in Osaka.

One of the key approaches for OM consists of some interactive design process that is continuously fed back between the predicted design and monitored reality.

Prof. Omoto, Kyoto Univ., suggested the best way to extract insurance money, if happened. Usually, owner and contractor applied for insurance separately in the past. However, the best way is that the both owner and contractor apply to united insurance.

Prof. Iizuka commented the specialty of geotechnical engineering work among other constructions within the frame work of WTO (world trade organization). WTO defines the structures neither by its shape nor its dimensions but its performance. It is commonly difficult to define "performance" before confirming the geotechnical characteristics in the field. **Prof. Iizuka** insisted that the design should be verified during the construction phase to obtain the best estimate of the expected performance in the future, which might be made easier by rather united contract of "design and built" than independent contract respectively.

Failure of Nicoll Highway

During the Symposium, special attention was focused upon the possible causes to trigger the disaster. Dr. Y. Iwasaki suggested that if the deflection of the retaining wall had been compared to appropriate failure strain of jet grouted slab under horizontal compression as well as asymmetry of the deflection, some countermeasures could have been provided to avoid the final failure.

Dr. R. Hwang pointed out the possibility of effect of the incompleteness of jet grouted slab due to the electric cable line that existed across the area to be excavated.

Dr. Hwang pointed the misuse of assumption of the bottom of installed inclination pipe as fixed point to compute the horizontal deflection along the pipe. The guide pipe for inclinometer is usually inserted into "hard layer" and assumed as "the bottom as the fixed point." This assumption has been commonly adapted in the geotechnical practice and was wrong in most cases (Hwang, Hsiung, and Higo). To avoid the wrong assumption, the displacement of the top of the guide pipe should be monitored.

Photo 27 Group photo at the Reception of TC302 Osaka 2011

NEWS
TC302 OSAKA2011 (continued)

Reception

A reception party was held in the evening of the first day of the Symposium. During the reception, Prof. Askar Zhussupbekov, the Vice President of ISSMGE for Asia, expressed his deep thanks to Dr. V.V.S. RAO, Dr. Y. IWASAKI, and Prof. M. MIMURA for their contributions to activate the interactive exchange of geotechnical engineering in Asian region.

Photo 28 Prof. Askar, Vice President of ISSMGE in Asia, expressed his gratitude to organizing TC302 Osaka.

Technical Trip

On July 17, a technical site visit was arranged to Kansai Airport, where expected settlements are more than 10m. The extensometers and countermeasures to adjust differential settlement of large structures including passengers building were very special and interesting. Technical details were explained by Mr. Yukio Nakatani, Leader, Dep. of Civil Engineering, Construction Office, Kansai Airport Company.

Next Conference (Symposium) of TC 302 will take place in Bangalore (India) in 2013.

NEWS
TC302 OSAKA2011 (continued)

Resolution

Discussions revealed that main reason of failure in geotechnical construction is the difference between assumed conditions during design stage and the real site conditions including the local special soil. The effective countermeasure to this problem is given through only "Observational Method (OM)." At present, most big projects are funded to install sensors to monitor construction performance. Conducting monitoring does not necessarily mean an OM and sometimes resulted in critical failure like as in Singapore and Vietnam. We have to create guidelines of OM in geotechnical engineering to provide the background, preparatory procedures, initial design including study of possible modes of deformation and failure, arrangement of countermeasures, selection of monitoring items and sensors, and interactive design as feeding back process based upon monitored results. The guideline is intended to be a draft of an international standard of "Observational Method in Geotechnical Works" that may be discussed in the technical session of ISO/TC182.

The Osaka International Geotechnical Symposium adapted the following resolutions.

July 15, 2011

Resolution of TC302 Osaka Symposium

TC302 conducted an International Symposium in Osaka on July 14-15, 2011 and discussed the emerging topic of forensic geotechnical engineering. The main causes which trigger failure in geotechnical constructions were recognized as differences between design assumptions and reality.

Peculiar soils like very soft sensitive clays which can exhibit prolonged settlements due to changes of load, and silty sands which can exhibit piping failure under hydraulic gradients, were discussed as important factors in embankment and excavation works respectively.

Unusual slope failure mechanisms were identified from centrifuge model tests, and the forensic examination of a variety of earth retention failures in the field indicated that ground distortion mechanisms could not always be predicted.

The Observational Method was identified as a key tool for reducing construction costs whilst maintaining safety and serviceability in geotechnical design. The installation of measuring devices for construction monitoring has become common but the monitored data are not always interpreted, and this has sometimes led to failures. This can arise when the designer does not clearly specify the expected ground deformation mechanism, or does not set appropriate alarm levels. Other possible reasons are the inadequate installation of instruments, or the lack of a capable geotechnical engineer on site during the critical stages of construction.

Since its incorrect application can result in the necessary application of Forensic Engineering, TC302 proposes to work with other interested parties to clarify and refine best practice in the use of the Observational Method in geotechnical engineering. We therefore seek to include this activity in the terms of reference of TC302, and we will invite TC 206 (Interactive Geotechnical Design) and TC304 (Engineering Practice of Risk Assessment and Management) to do likewise, so that a joint report can be produced. It is proposed that a symposium be jointly organised to disseminate findings, and to seek contributions from ISSMGE members that demonstrate the state of the art