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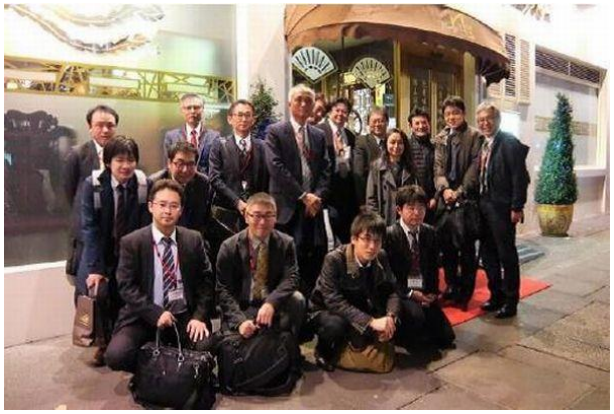
Japan Society of Civil Engineers

International Activities Center

IAC News No.65

Report on 2017 Geo Risk Management Study Mission to UK

The Geo Risk Society of Japan began its activities as a web-based virtual academic society in January 2010 and it has been functioning formally as an academic society since January 2012. The executive office is established within the Geological Information Utilization and Promotion Initiative NPO, and it promotes various activities for dissemination of geological risk management.



Commemorative Photograph with UK Section Members
Taken in front of the venue for the Discussion Session

As a part of its activities, and with the cooperation of the Japan Geotechnical Consultants Association, from October 22 to 29, 2017, the Geo Risk Society of Japan studied movements in academic research in geological risk management in the UK, and implemented the "2017 Geo Risk Management Study Mission to UK," aimed at clarifying future trends. Having a total of 15 participants, the delegation included the author, acting as delegation leader, Masatsugu Ogasawara (National Institute of Advanced Industrial Science and Technology), acting as the deputy delegation leader, as well as delegates from the geological survey industry, consultancy companies, etc.

For this study mission, in addition to participating in the conference on "Ground Related Risk to Transportation Infrastructure," hosted by the Geological Society of London and held in London on October 26-27, 2017, there were visits to general insurance/financing companies involved with world-leading UK survey/design consulting firms and companies involved in global risk management businesses, providing opportunities for exchange of opinions, and there was also a discussion session held with Japanese engineers working in local companies.

The discussion session with the Japanese engineers was held with the cooperation of the UK Section of Japan Society of Civil Engineers, and took place over dinner on October 25th, with participants sat around circular Chinese banquet tables at the "Phoenix Palace," located in central London. The six participants from the UK Section* were Section President, Mr. Daisuke Saito (Senior Bridge Engineer, Mott MacDonald), Mr. Takafumi Nakada (Bridge Engineer, Atkins, seconded from Obayashi Corporation), Ms. Manika Maharjan (Assistant Geotechnical Engineer, Atkins), Mr. Kensei Yamada (Manager, Technical Department, Giken Europe), Mr. Jinta Takino (General Manager, Giken Europe) and Mr. Takahiko Ikeda (Managing Director, Giken Europe). [The affiliations are those from the time of the UK visit.]

* For details of the UK Section established in October 2001, see Special Issue No. 11 of IAC News issued in March 2017.

During the discussion, each attendee contributed details of their valuable experiences and a wide range of topics were introduced including: 1) geological risk management, 2) the roles of clients (public institutions,

infrastructure companies), 3) the roles of private enterprises, 4) the roles of engineers, 5) general technology, 6) working styles, 7) communication styles, 8) mastery of languages and 9) engineer qualifications. As it was possible to converse in Japanese, a great deal of information could be obtained, not only concerning the technical aspects of geological risk management, but also about the differences between the UK and Japan over a wide range of subjects which could not be thoroughly probed in the meetings with UK companies. The following is a partial summary of the report by Mr. Kyo Fujiwara (Kokusai Kogyo Co., Ltd.) and Mr. Takafumi Ida (OYO Corporation). (For details, see the report "2017 Geo Risk Management Study Mission to UK," pp. 29-34, (Japanese) http://www.georisk.jp/research/report201711.pdf)

To list a number of the points: 1) In terms of geological risk management, prior investigations may not necessarily be sufficient, and if there are problems with the contractual relationships between the three parties represented by the ordering party, the design consultant, and the contractor, there is a tendency to avoid what is mutually disadvantageous, and the project in general will not progress rapidly. 3) With regard to the roles of private enterprises, those of designers and constructors are clearly divided in the UK, and major construction contractors have no design department and specialize solely in construction. 4) With regard to the roles of engineers, it is not common for one engineer to work in multiple fields in the UK, which can be contrasted with Japan, where designers are often involved with designs from super-structural to foundational levels. Also, because calculations for temporary structures are not covered by general insurance, it is rare for a major design company to be responsible for construction-related design. 5) With regard to overall technology, in the UK, according to design standards, there are sections for which designers entrust judgments to different individual designers, and the variations in the design results according to the persons responsible can be considerable. This can truly be described as a difference in design culture. 6) Regarding working styles, the effects of being a contract-based society are great. Overtime is not recommended and there is flexibility in working styles. Unlike Japan, a work environment exists in which non-managerial staff feel able to return home at the scheduled time. 9) With regard to engineer qualifications, the Institution of Civil Engineers (ICE) of UK etc. issue the qualification of Chartered Engineer (CEng) to engineers, but it is broader than Japanese professional engineer qualifications and, while it leads to an improvement in services for members, there are fears that technological skills of UK civil engineers will decline. In the UK, there is the Construction Skills Certification Scheme (CSCS) providing certified qualifications for various skills in the construction industry, and although it is not a legal requirement, most construction work requires the use of persons in possession of such qualifications (Reference: https://www.cscs.uk.com/applying-for-cards/types-of-cards/).

Regarding our current theme of geological risk management, there are aspects that depend on the scale of projects, but this does not necessarily apply to all British projects, where private companies play an important role. However, when inquiring about the circumstances in which this does generally apply, the effects of the British contract-based/rationalist way of thinking seem to extend, like the musical accompaniment of a basso continuo, from the division of roles for the project as a whole to the working styles of individual engineers.

Although the discussion session was relatively short, lasting only a few hours, the extent to which attendees from the UK Section of the Japan Society of Civil Engineers were striving hard for their businesses on a day-to-day basis, first and foremost in the UK, but also further afield in Europe, and feeling pride both in themselves and in their technologies, left a deep impression. As the Section President Mr. Daisuke Saito said, I hope members of the UK Section to recount their experiences in the UK when they are back in Japan. I would like to thank all those involved, particularly those at the International Activities Center.

【Reported by Tsunemi Watanabe (Kochi Univ. of Technology), President of Geo Risk Society of Japan】

Joint Company Information Session in Civil Engineering for International Student 2017

Masato Saitoh
(Saitama University)

The IAC International Student Network Group, held its Joint Company Information Session in Civil Engineering for International Student at the Headquarter of Japan Society of Civil Engineers on December 16, 2017, with the aim of informing international students studying in Japan about Japanese companies working in relation to civil engineering. This year's session, held in the Kanto area, marks the fifth. With cooperation from seven companies, presentations were given, individual consultations provided via corporate booths, and brochures distributed. There were 37 international students participating and, in addition to those from the Kanto area, there were also participants from more distant locations such as Hokkaido.

Participating Companies

Dai Nippon Construction, Eight-Japan Engineering Consultants Inc., NIPPON KOEI CO., LTD.,
Yachiyo Engineering Co., Ltd., TODA CORPORATION, Obayashi Corporation, HAZAMA ANDO CORPORATION

Lecture by Mr. Shrestha Santa Man

International students ask questions at a corporate booth

The session was organized in three parts, being conducted entirely in English. For the first part, following an introduction to the activities of the IAC International Student Network Group, there was a special lecture from Mr. Ryoji Kawabata, Director for International Cooperation in the Policy Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, who explained the Ministry's overseas expansion. A former international student, Mr. Shrestha Santa Man, now working at a Japanese company (COMMONWEALTH ENGINEERS CO.,LTD.) also spoke about his experiences. For the second part, there were ten-minute company introductions given by each of the attending companies, with information provided on company features, overseas projects and business activities. In recent years, the opportunities for young and mid-level foreign staff with experience studying abroad in Japan to give introductions have been increasing, and corporate information is being provided from various perspectives. For the third part, the various companies held their respective booth-based sessions. Participants were actively visiting several corporate booths and appeared enthusiastic as they gathered information. In addition to careful explanations provided by Japanese staff with a wealth of international experience, the cordial responses from foreign staff with experience participating in the session also left an impression.

Through communication with the participants, it was also possible to sense the diversity of purpose amongst the international students. The students included those wanting to learn about the state of Japanese enterprise and overseas projects, those looking to secure opportunities to work in Japanese companies in the future, and those hoping to accumulate several years of occupational experience following their graduation before returning to their home countries where they would make use of their experience and know-how. In order to respond to these wide-ranging needs, the International Student Network Group holds Joint Company Information Sessions in alternate years, not just in the Kanto area, but also in the Kansai area. Going forward, we expect to continue to provide a place for international students and Japanese companies to exchange information. Finally, I would like to take this opportunity to express my appreciation to the lecturers and individuals from participating companies who provided much cooperation for this session.

【Reported by Masato Saitoh (Saitama Univ.), Leader of Int'l Student Network Group, IAC】

【Alumni of DOBOKU Series】
"Conversion of career from an engineer to a faculty"

Tzu-Ying Lee
Associate Professor of Department of Civil Engineering,
Director of Research Center of Bridge and Railroad Engineering,
College of Engineering, National Central University, Taiwan

Work at CECI Consultants, Inc.

Tzu-Ying Lee
Associate Professor,
National Central
University

Being an engineer at CECI Consultants, one of the largest consultant companies in Taiwan, I never thought that I will study in Japan and be a faculty of universities one day. Those positions were beyond my career plan. In fact, I loved my jobs and was interested in plan, design and construction of bridges. However, there are a number of connections between Taiwan and Japan in my life. Since Taiwan and Japan have similar geographical and meteorological features, we suffer from same natural disasters, such as earthquakes and typhoon. Thus Japan's experience and advanced technologies are valuable to Taiwan. Since there are lots of Japan's engineering books and magazines in CECI's library, even though I was not good at Japanese, I frequently referred to those books and magazines for better design of bridges, particularly the "Specifications for Highway Bridges" edited by Japan Road Association.

In August 1999, my coworkers and I went to Japan for a business trip. After discussing the design of a special cable-stayed bridge with our Japan consultants, we visited Seto-Chuo Expressway, Kobe-Awaji-Naruto Expressway, and Hanshin Expressway. I was surprised at the high technology of bridge engineering in Japan. Also, we visited Hokudan earthquake memorial park and viewed the Nojima Fault preserved as it was. It is my first trip to Japan which lets me respect the high development of civil engineering in Japan. Just one month after this trip, Chi-Chi earthquake hit central Taiwan. A number of bridges suffered damage and even collapsed. We were shocked that the dislocation of Chelungpu Fault is much larger than that of Nojima Fault and could be obviously observed along the fault. After joining the site investigation and reconstruction, I decided to further my study in Japan for learning more knowledge regarding earthquake engineering. Fortunately, one of my coworkers, who just met Professor Kawashima on the site of Chi-Chi earthquake, passed me a name card of

"Professor Kawashima" just in time. It directly reminded me that I saw this name in the "Specifications for Highway Bridges" and he is the Chairman of members of special sub-committee on seismic countermeasures for highway bridges.

Study at Tokyo Institute of Technology

Finishing the twelve-year engineering career, I returned campus to be a doctoral student in October 2002. It seems to be a dream. When the dream came true, I could not believe that I do study in Japan. Meanwhile, I was very excited that I can learn the firsthand and advanced knowledge and technology of earthquake engineering in Japan. Professor Kawashima led me into the research of earthquake engineering and gave me complete freedom to determine the research topics of my dissertation. Different from in Taiwan, there are numerous international and domestic conferences, workshops, and symposiums held by academic societies or associations, such as JSCE, JAEE, in Japan. I have many chances to participate in many academic activities and presented my research. Such experience broadened my viewpoints and enriched my knowledge of earthquake engineering.

In particular, Center for Urban Earthquake Engineering (CUEE) was established in Tokyo Tech. in 2003. I was sponsored as a research assistant and attended many activities organized by CUEE. CUEE also financially supported me to stay in University of California, Irvine as an exchanged student supervised by Professor Jann Yang for three months. During this stay, I became familiar with most theories of structural control and obtained the preliminary result of my dissertation. In summer of 2004, I took part in 13th World Conference on Earthquake Engineering (13WCEE) in Vancouver with the members of CUEE, which internationalized my viewpoints. Most importantly I met with several future colleagues of National Central University (NCU) in this conference and realized that there is a position available in civil engineering. This information results in another turning point in my career.

Birthday Party at NCU with fourteen Taiwan graduate students, three overseas graduate students and one overseas exchanged student in December 2016

In addition to academic study, I love living in Japan even though the weather is colder than in Taiwan. Generally, Taiwan students are used to live in Japan quite quickly because of similar food, drink, Chinese characters and culture. The only difference is that there are lots of "izakaya" restaurants in Japan. In Kawashima lab, we have drinking parties quite often for newcomers, farewell, graduation, New Year … etc. Through the drinking parties, I learned more Japan cultures and got close friendship with other members including Japanese, American, Chinese, Filipino, Greek, Korean, Thai, Vietnamese. In fact, Kawashima lab likes a little United Nations.

Start Academy Career at National Central University

I still remember that our lab had a picnic under blossomy cherries one day after 13WCEE, Professor Kawashima advised me by using his own experience and encouraged me to apply for the faculty position. Meanwhile, the faculty and students of NCU started to participate in the international conferences organized annually by CUEE and the experimental lectures given by Professor Kawashima. Thanks to the faculty of CUEE, following the above activities, NCU and Tokyo Tech. started more exchanged activities and cooperation including Taiwan-Japan Symposium and Study Camp on Earthquake Hazard Mitigation Technology, Concrete Canoe Contest, Steel Bridge Competition in Asia, Joint Student Seminar, Distance Learning Course, and Exchanged Student

Program, which continue to date. Furthermore, NCU extended exchanged activities and cooperation with Hiroshima University including International Conference and Leader's Camp on Civil and Environmental Engineering, Distance Learning Courses, and Exchanged Student Program. Nowadays, more NCU students are interested in study in Japan.

I deeply appreciate Professor Kawashima, CUEE, and Tokyo Tech. for supporting my study in Japan. The study experience with Professor Kawashima gave me lots of ideas to do research in earthquake engineering. Besides structural control, I have extended my research to develop new dynamic finite element analysis and new isolators. The main objective is to enhance the seismic performance of infrastructures using new technologies.

Profile: The author got Bachelor and Master degrees at National Central University (NCU) and National Taiwan University, respectively, in Taiwan. After working at CECI Consultants, the author got Doctoral degree at Tokyo Institute of Technology. Currently, the author is a faculty of NCU.

《**Column**》 Kazuhiko Kawashima, Emeritus Professor, Tokyo Institute of Technology

All started after the 921 Earthquake (1999 Chichi, Taiwan, Earthquake). It was one of the world's largest earthquakes that resulted in over 10 m vertical thrust. The destructive damage inspired Professor Lee, a practitioner on planning, design and construction at a consultant company at that time, to pursue a dream of becoming a researcher. I shared a great sympathy with her decision because I did not have any intension to become a university professor when I joined the Ministry of Construction in 1972. Then she became my 5th and the first overseas Ph. D. student after my appointment at the Tokyo Institute of Technology in 1995. I used to let the Ph. D. students to determine the research target after providing overall research needs and research resources. Stimulated by Professor Yang, UC Irvine, Professor Lee started to study structural control. She has been expanding her interest to develop new structural analysis. I trust that she continues to identify real problems for saving people's life and contribute to create safer society.

※Alumni of DOBOKU Series is in collaboration with Editorial Committee of JSCE Magazine.

- Overseas Projects -
MRT Purple Line Project Bang Yai to Bang Sue Section Elevated Structures (East)
MRT Purple Line - Bangkok, Thailand

Traffic congestion in Bangkok, the capital city of Thailand, has rapidly intensified since the 1980s, and measures to improve the urban environment have become a matter of urgency, with environmental health issues now also posing a serious social concern. To solve this problem, the Ministry of Transport announced a Bangkok City Railway Master Plan devised by the Mass Rapid Transit Authority of Thailand (MRTA), and with the construction of an elevated railway, as its main project entity in the city of Bangkok proceeding, railway infrastructure development has begun to progress rapidly, in spite of the delays in improvements to the National Railways.

Hiromasa Nagai
Tokyu Construction Co., Ltd.

Bangkok's MRT Purple Line, which opened in August 2016, is the second MRT line,

extending 20.9 kilometers between Tao Poon and Khlong Bang Phai Stations and, in August 2017, with the extension of the first MRT line (Blue Line) to connect it to Tao Poon Station, Nonthaburi Province in the north became connected to central Bangkok, greatly improving the usability of both lines and bringing a jump in passenger numbers.

As a joint venture with CH. Karnchang Public Company Limited, a major company in Thailand, the Company constructed a 12 kilometer section, including both the route's eastern construction section and the above-mentioned Blue Line extended section.

Construction began in November 2009, with an assigned construction period of 45 months, but land acquisition delays occurred in sections tracing curves along the route, and the number of mobile erector cranes required to construct the concrete box girders was increased from the originally planned three units to six.

Tao Poon Station
– Intersection of MRT Purple Line and Blue Line

Furthermore, in October 2011, due to heavy rain in central Thailand, floodwater surged into Bangkok, and the elevated box segment factory in Ayutthaya Province became completely submerged, making production supply impossible for about six months. The route from the mountain aggregate source was cut, and wide areas of the western section construction sites were also flooded.

Not only did these problems lead many workers from the provinces to return home, but labor shortages in central Bangkok were further deepened as workers flowed to the factories upon a legislative increase in basic wages, and in consideration of these factors, an approximately one year construction period extension was approved.

Japanese-made rolling stock was introduced for the first time on this line, making it a monument to the global spread of overseas railway technology collaborations.

Japanese-made Rolling Stock for MRT Purple Line

Further, to account for coordination with the use of private vehicles, large car parks were built adjacent to three stations, with low-cost contracts available for use in conjunction with the rail services. Connections along the Blue Line have amassed, and access to central Bangkok has improved remarkably, with construction booms beginning, such as for high-end condominiums, large multi-purpose shopping malls, etc.

We look forward to the continued safe operation of the country's MRT routes with the extension of the project's lines.

【Reported by Hiromasa Nagai (Tokyu Construction Co., Ltd.)】

Report on World Engineering Forum (WEF 2017) in Rome, Italy

Masayuki Yoshimi
National Institute of Advanced Industrial Science and Technology

Akihiro Toyooka
Railway Technical Research Institute

We Masayuki Yoshimi and Akihiro Toyooka of Earthquake Engineering Committee of JSCE participated in World Engineering Forum 2017 (WEF 2017) held in Rome, Italy, in order to introduce topics relating to seismic design in Japan. WEF is an international conference organized by the World Federation of Engineering Organization (WFEO), which covers a whole area of engineering. The previous conference WECC 2015 was held in Kyoto. We were dispatched by the Earthquake Engineering Committee to the WEF2017 supported by the International Scientific Exchange Fund of JSCE, as had received a proposal from the Italian Engineering Association (CNI) in charge of the forum.

WEF 2017 Opening Ceremony at the Italian Parliament

The theme of the WEF 2017 was "Safeguarding humankind's heritage, the great challenge for engineers," which includes climate change, natural disasters, sustainability, information security and so on. Opening ceremony was held at the Italian Parliament. Then, on the second and third day, keynote speeches and parallel sessions were held. There were about 100 oral presentations and about 500 participants from all over the world. Simultaneous interpretation for keynote lectures was prepared between Italian and English. From Japan, Dr. Toshimitsu Komatsu, a professor emeritus of Kyushu University (Vice President of The Japan Federation of Engineering Societies), gave a keynote speech about a dry dam system to prevent flood by strong rainfall increased by the climate change.

At the Entrance of the Conference Hall for WEF 2017

We participated in the session of the seismic risk. Yoshimi gave the talk on "Active fault evaluation in Japan for disaster mitigation: validation by the 2016 Kumamoto earthquake (Mw = 7.0)," showing uncertainties in the active fault evaluations and bridge damage by the fault displacements which resulted in a revision of seismic code. Toyooka made the presentation "Seismic design of railway structures," which outlined current earthquake-resistant design standards compliant with international standards such as ISO 23469, damage and countermeasures for railway facilities due to recent earthquakes, and the concept of crisis resilient design. We also had impressive and interesting oral presentations in the session: structural monitoring using an inexpensive GNSS module, ground disaster risk assessments along the Italian railway, case

examples in seismic isolation reinforcement of historical buildings. After the session, we received many comments and contacts from the audience. We would like to make the most of the opportunity to expand our network for building future collaborations. We thank JSCE and CNI for providing us a great opportunity to attend the forum.

【Reported by Masayuki Yoshimi (National Institute of Advanced Industrial Science and Technology), Akihiro Toyooka (Railway Technical Research Institute), JSCE Earthquake Engineering Committee】

Updates

◆The 20th International Summer Symposium in 2018
http://www.jsce-int.org/node/538

◆Online Museum of Civil Engineering "DOBOHAKU –Tokyo Infrastructure Anatomy –" (English ver.) is now open.
http://www.dobohaku.com/tokyo/en/

◆CECAR8 Call for Abstract: August 1, 2017 – ~~February 28, 2018~~ **March 23, 2018**
http://www.cecar8.jp/

◆Asian Civil Engineering Coordinating Council (ACECC) International Newsletter archives
http://www.acecc-world.org/newsletter.html

◆Concrete Committee International Newsletter No. 52
http://www.jsce.or.jp/committee/concrete/e/newsletter/newsletter52/

◆The International Infrastructure Archives
– A Compilation of Japan's Greatest Projects in Transfer of Civil Engineering Technology in Service –
http://www.jsce.or.jp/e/archive/

◆IAC "News Pick Up!!" on the JSCE Japanese website
http://committees.jsce.or.jp/kokusai/node/118

◆Summary of feature articles in JSCE Magazine Vol. 103, No. 3, March 2018 on the JSCE website
http://www.jsce-int.org/pub/magazine

◆Journal of JSCE
https://www.jstage.jst.go.jp/browse/journalofjsce

◆IAC Students and Alumni Network
http://www.jsce-int.org/IAC_network

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