



**Japan Society of Civil Engineers**

*International Activities Center*

## IAC News No.71

### **A Message from the New President**

We all benefit from infrastructure, so will our future generations. Infrastructure cannot be established in a society where consumers put only their own interests before the common good. During World War II, much of Japan's infrastructure was reduced to ashes. However, even in the post-war turmoil, the nation was still united by the strong willpower to realize democracy and redevelop infrastructure. A vision of a national land was proposed to provide a basis for nation-building, and the progress of infrastructure development helped Japan achieve high economic growth at a phenomenal rate.



**Kiyoshi Kobayashi**  
**106<sup>th</sup> JSCE President**

It is said that we live in an age where we could live to 100. We are all extremely busy with everyday life. However, it's not that the length of the day has become longer to fit in all daily activities. So, we seek to rationalize everyday life by outsourcing parts of work, house chores, child-caring, nursing, transportation, etc. However, we still have to manage time to do leisure activities and learning activities by ourselves. Every effort must be made to ensure the efficient use of time through big data, AI development, automatic operations, linear Shinkansen trains and traffic technology development. There is only so much rationalizing effect technologies can provide individually. However, by improving efficiency in many different fields, modern people can overcome time constraints and therefore can still enjoy leisure and learning activities. IoT technology coordinates different types of infrastructure into a cohesive system and brings efficiency to time management.

“What does ‘better society’ mean?” The Japan Society of Civil Engineers (JSCE) must make persistent efforts to find the answer to this extraordinarily difficult challenge. Blessed with natural resources, the Japanese have built a fine tuned, civilized society and have been on a steady path built on the importance of human relationships both among themselves and with those of other countries. People should enjoy their lives while respecting that there is a diversity of values and lifestyles. This Japanese attitude towards the way of life is signaling the world a vision of “better society.”

I would like to conclude my message with my commitment to endeavor, together with everyone involved with JSCE, to set a new horizon of civil engineering towards “better society.” I thank you all for your continuous support.

**[ Alumni of DOBOKU Series ]**  
**“Always Grateful for Favors Received in Japan”**  
**Guanlin Ye**  
**Professor, Shanghai Jiao Tong University**

**Study and work in Japan**

After completing the master degree in Tongji University, China in March 2001, I started my PhD study at Yashima-Zhang-Sawada lab of Gifu University. I learnt the constitutive model of soft rock and finite element method deeply. Then I obtained the PhD degree in March 2004 with a dissertation on “Numerical analysis on progressive failure of soft rock slope due to heavy rain.” During the three years, not only in study, but also in personal life, Prof. Yashima supported me so much that I could be able to concentrate on study without suffering financial embarrassments. After graduation, I had worked at Geo-Research Institute (GRI) in Osaka for three years. Under the instruction of President Prof. Adachi and Director Mr. Hashimoto, I conducted in the consultant jobs in geotechnical engineering. At the same time, I kept searching for approaches that can fill the gap between academic theory and engineering practice. Influenced by the supervisors, I also had a dream to become a researcher and an educator. Then in 2007, I returned to China and took a faculty position in Shanghai Jiao Tong University (SJTU).



**Guanlin Ye**  
Shanghai Jiao Tong  
University

**Build an advanced soil laboratory**

Most of the underground construction activities in Shanghai were performed within the depth of 30-40m, where a thick layer of alluvial soft clay was deposited. The soft clay has a large fraction of silt particles, high sensitivity and strong nonlinearity. Thus it is necessary to apply a nonlinear numerical analysis with advanced elasto-plastic model to simulate the related geotechnical engineering problems. In 2007, in spite of numerous underground construction projects in Shanghai, however, almost all the numerical analysis on these projects used the elastic models or the simple elasto-plastic models, such as the Mohr-Coulomb model. Even in such situations, the material parameters were determined empirically. It has been widely recognized that precise soil testing data is indispensable for the utilization of advanced elasto-plastic models. However, it was lack of qualified testing apparatus in SJTU in 2007. I had conducted triaxial and plane-strain tests on soft rock samples in the third year

of PhD course in Gifu University. With the knowledge and experience obtained during that time, I reformed and upgraded an old triaxial apparatus, so as to obtain the first set data of consolidated drained triaxial test on Shanghai clays. This became a trigger of launching a



Photo 1 Soil testing apparatus in Shanghai Jiao Tong University  
(small-strain triaxial, hollow cylinder)

top level soil testing laboratory. In the past ten years, several apparatuses have been introduced into our lab, including a small-strain triaxial test system, a small-strain true triaxial test system and a multi-purpose hollow cylinder apparatus (Photo 1). All apparatuses are furnished with in-house developed measure & control program, so that they can deal with various testing requirements. Since I had been concentrated on numerical analysis before returning to China, the knowledge on soil testing was limited. Prof. Yashima and Prof. Zhang have supported me throughout these years. I appreciated their help.

### **Clarify mechanical properties of Shanghai clays and develop constitutive model**

There were many underground constructions in Shanghai in recent years. However, the understanding of the ground stayed in the compression index from oedometer and the shear strength from direct shear. First of all, I and the students carried out soil tests to grasp the basic physical, chemical and mechanical properties of Shanghai clays. Then we sorted out the depositional environments, and disclosed the relationship between the geotechnical properties and depositional environments. By using a thin wall sampler, we retrieved undisturbed samples at good quality. Then conducted oedometer tests and triaxial shear tests to investigate the overconsolidation and structural behavior of Shanghai clays. Recently, we began to measure the small-strain stiffness of the clays by using the local displacement transducers. On the other hand, based on the Cyclic Mobility model proposed by Prof. Feng Zhang of Nagoya Institute of Technology, we developed a modified elasto-plastic model that can take into consideration of overconsolidation, structure, small-strain stiffness and the influence of intermediate principal stress. We are proposing a systematic approach for numerical analysis, including sampling, laboratory tests, constitutive model and soil-water coupled numerical analysis. We are trying our best to make it become a standard approach in Shanghai.

### **Stimulate technology and academic exchange between China and Japan**

After returning to China, under the supports from Mr. Hashimoto, director of GRI, I worked with the Japanese and Chinese experts to solve several difficult technical problems encountered in underground space development in Shanghai. For example, the construction management system for preventing ground settlement induced by Double-O-Tube shield tunnel, the construction method of middle wall for a metro tunnel with a large section, the design and trial construction method of a flat and large rectangular shield tunnel in Ningbo city. I also participated the conferences between two countries, for example, China-Japan Symposium on Geotechnical Engineering and China-Japan Conference on Shield-Driven Tunneling. In addition, I kept a close connection with young Japanese colleagues. With the support of bilateral programs between JSPS (Japan Society for the Promotion of Science) and NSFC (National Nature Science Foundation of China), collaborating with Associate Professor Moriguchi of Tohoku University, we held an “Interdisciplinary seminar on disaster prevention of heavy rain and earthquake” in Shanghai in 2015. About 70 participants joint us (Photo2). This kind of activities have increased the mutual understanding and promoted the exchanges between the two countries.

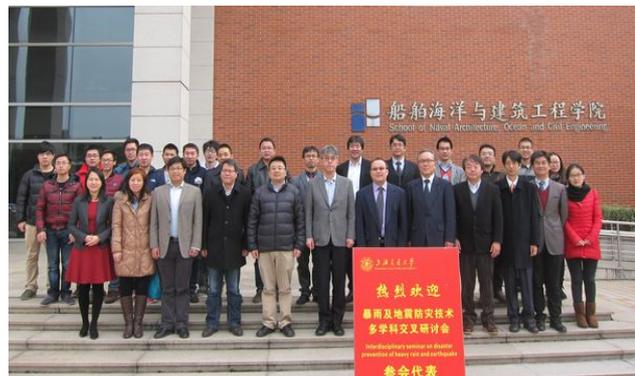


Photo 2 Interdisciplinary seminar on disaster prevention of heavy rain and earthquake (Shanghai, 2015. In the front row, fifth from right is Prof. Yashima, seventh from right is Prof. Terada. In the rear row, sixth from right is Prof. Moriguchi)

It has been 11 years since I returned to China. When I take a look back, if it weren't the days in Yashima Lab and GRI, I wouldn't become who I am today. This feeling is so strong that I would like to use SJTU's university motto "Always grateful for favors received" to close this essay.

Profile: Born in 1975. After obtaining PhD degree from Gifu University in 2004, he worked in Geo-Research Institute, then returned to China in 2007. Now he is a professor at Shanghai Jiao Tong University.

《Column》 Atsushi Yashima, Department of Civil Engineering, Faculty of Engineering, Gifu University



While Guanlin stayed in our laboratory in Gifu University, we had many foreign PhD candidates from Africa and China. As Japanese undergraduate students were fully stimulated by foreign students' continuous research efforts, some of them decided to study in PhD course. Some of Japanese PhD's are doing research works in some universities in Japan. The research theme of Guanlin was the numerical simulation of large slope failure due to heavy rainfall. I remember he was working very hard to solve a very difficult engineering problem. I am very happy to know him working as an active professor in Shanghai Jiao Tong University. I have been to Shanghai about 30 times. I hope Guanlin and I will carry out a new collaborative research work in the near future.

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

## - Overseas Project - Rapid Construction of Substructure and Superstructure work for the longest offshore bridge in Viet Nam (Lach Huyen Port Infrastructure Construction Project (Road and Bridge Portion))

This ODA project aims to provide access to Lach Huyen International Port (under construction) locating in Hai Phong, a city in the northern part of Viet Nam. The total length of road and bridge is 15.6km, of which the bridge with length of 5.4km and width of 16.0m is the longest offshore bridge in Viet Nam (Fig.1). Being in charge of the substructure and superstructure works of the bridge, we successfully applied advanced technologies and contrivance as described herein to realize the target of three-year construction schedule.



**Nguyen Anh Chi**  
Sumitomo Mitsui  
Construction Co., Ltd.

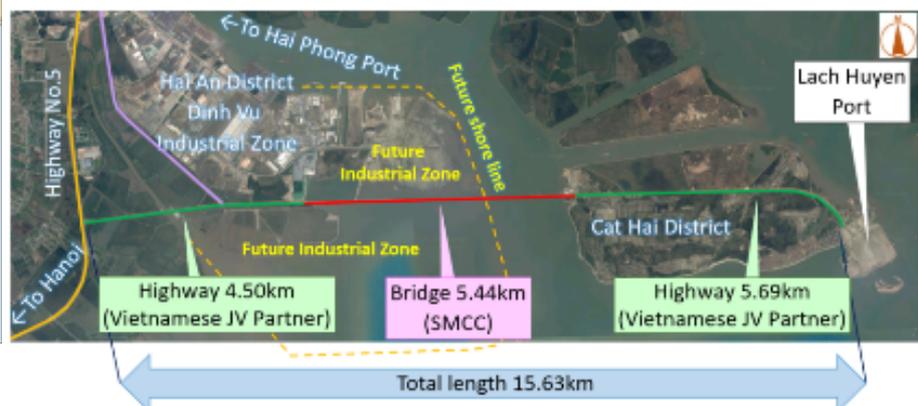


Fig.1 Site Location

## 1. Temporary Offshore Access Road by Using a Geotube Dyke

In a shallow area having with the water depth of around 2m at high tide, the temporary offshore access road was constructed by using geotube as a dyke (Fig.2). Enabling on-land condition of the site activities from piling work to superstructure work, this road contributed significantly to shorten the schedule. Geo-tube is a close-ended tubular fabric products with filling mouths at regularly spaced intervals. It is filled with a slurry mix of sand and water. Water will dissipate through the permeable tubular fabric and out of the end filling ports that are left open during filling work while sand will settle within the tube by gravity. Consequently, a structure with compacted sand contained within a strong and durable fabric skin is obtained (Photos 1 and 2).

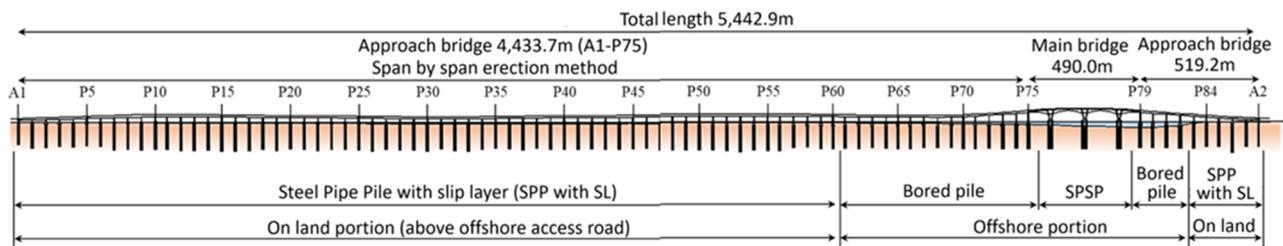


Fig.2 General View



Photo 1 Slurry filling to Geotube (total length 24,000m)



Photo 2 Laying lowest layer geotube during low tide



Photo 3 Coating SL compound in on-site fabrication facility to minimize the impact of weather and transportation

## 2. Steel Pipe Pile with Slip Layer as a Measure against the Negative Friction for the First Time Application in Viet Nam.

An adjacent area will be backfilled for future industrial zone. Ground settlement is expected, and consequently down drag force (negative friction) will act to the pile during its service period. As a measure against such negative friction, Steel Pipe Pile with Slip Layer compound ( $\phi$  0.8,  $\phi$  1.1m, L=36~49m, total 1,128 nos) has been applied (Photo 3).

In order to penetrate the pile through a stiff gravel layer to the bearing layer and shorten the schedule, the pilot pile with the same diameter was driven by a vibration hammer supported by water jet. Then, the permanent pile was driven by vibration hammer and finally by diesel hammer.

## 3. Steel Pipe Sheet Pile (SPSP) foundation as the second application in Viet Nam after Nhat Tan Bridge

SPSP foundation ( $\phi$ 1.2m, L=45.5m, L=47.5m, 58 nos per pier, total 3 piers) was applied to the main bridge with the span length of 150m.

The construction period up to bottom slab was shortened from 9~10 months (achieved in Nhat Tan bridge) to 6 months thanks to the employment of the special CO<sub>2</sub> gas automatic welding machine, the double tube method to clean and fill grout to joint pipe, the combination of water jet and airlift pump during excavation work etc. (Photos 4~6)

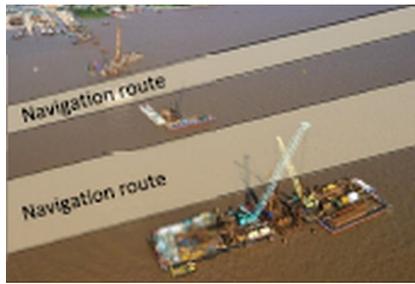


Photo 4 Position of 2 sets of huge capacity crane on barge due to limit of working area near navigation route

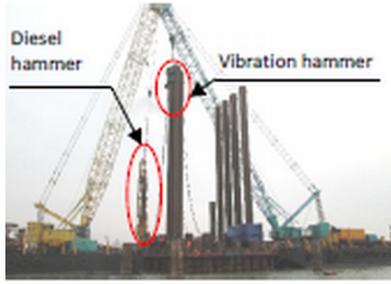


Photo 5 Driving of upper pile and lower pile by water jet + vibration hammer, respectively



Photo 6 Executing site welding of upper and lower pile by 2 nos of automatic welding machine

#### 4. Span by Span (SBS) Erection Method with Span Length of 60m as the World's Longest Class

The approach bridge with the length of 4.4km is a 5 continuous span PC box girder. In order to shorten the construction schedule, the segment was fabricated by short line match cast method (Photo 7) by controlling the dimension at 0.1mm accuracy upon taking into account the accumulative fabrication tolerance of previously cast segment and then, erected by SBS method. The necessary camber was also calculated and reflected to control the elevation of each segment at fabrication stage and erection stage.

To maximize the capacity of 2 nos of huge scale erection girder (Photo 8), the pier head was precast, the safety and moving device of the girder was improved, the segments were placed in advance on the surface of the access road (Photo 9). It enabled the completion of superstructure work within 13 months.



Photo 7 1405 nos of segment was fabricated by short line match cast method



Photo 8 Segment hanging below the huge scale erection girder with hanging capacity of 1400t



Photo 9 Precast pier head, preplaced segment waiting for erection girder

#### 5. Acknowledgement

In the traffic opening ceremony dated 2 Sep 2017, the Prime Minister of Viet Nam highly evaluated our safety, quality, and schedule control. We appreciate the effort of more than 1000 workforce, 200 staff (Japanese, Vietnamese and third country nationality) during day and night activities.



Photo 10 Opening ceremony attended by the Prime Minister of Viet Nam, the Japanese Ambassador to Viet Nam and JICA representative



Photo 11 Unity of Japanese, Vietnamese, third country nationality staff during project implementation



Photo 12 Overall view of the 5.4km long offshore bridge (from Hai An)

【Reported by Nguyen Anh Chi, (Sumitomo Mitsui Construction Corp.,Ltd.)】

## Student Voice

### “My New Life in the Land of the Rising Sun”

I am Osama from Egypt; I was born in 1991 in Egypt and raised in Kingdom of Saudi Arabia. I graduated from Cairo University and I am a second year Master’s student under the supervision of Dr. Kohei Nagai at The University of Tokyo. I would like to express my deep gratitude to IAC of JSCE for giving me this opportunity to share my life experience in Japan. Special thanks to JICA ABE Initiative for funding my study in Japan. Without their financial assistance, it would be difficult to live and study in Japan. With the expectations for Japan-the land of rising sun, I came here at the end of August of 2016.



**Osama Abdelfattah Hegeir**  
The University of Tokyo

Before my arrival in Japan, I did not know much about Japan, however, after my arrival, I got tremendous support from JICA; they provided us with a two-week orientation program in which they explained briefly the Japanese culture and how to live in Japan. I would like to mention that the Foreign Student Office (FSO) of Department of Civil Engineering at the school helped me and continues to help me to overcome all the difficulties I encountered, they helped me to find accommodation, open bank account, improve my Japanese, make more friends, and many other things that I do appreciate, special thanks to Mrs. Tonegawa of the FSO, many things would be really hard to realize without her assistance.

I should say that my daily life was not easy without speaking Japanese; however, after I started my intensive Japanese class at The University of Tokyo, I could feel how speaking Japanese can make your life easy and enjoyable. As a Master’s student, you almost spend your first year doing coursework, once you obtain 20 credits in coursework, you start your research. In that department, you will never have any difficulty to find courses with English as a medium of study, Majority of courses are taught in English. Unlike some other majors, in the department, many Japanese students can speak English, this makes making friends easier.

Since I finished all my coursework one semester ago, I have been doing my research on “Safety Assessment of Damaged Suspension Bridges” in which I am tackling a real case bridge in Myanmar. The interesting thing about my research is that I can feel its importance and how the research is beneficial for society; our research results have a direct impact on the human beings, which I do find my interest. I would like to thank Dr. Nagai for giving me the opportunity to do such an interesting research, I also appreciate the assistance of Dr. Koji Matsumoto in this project, special thanks to Dr. Tsukasa Mizutani for his tremendous support and being more than a teacher.



With Dr. Mizutani in Myanmar



During Our Investigation of Patheingyi Bridge



My Presentation in Yangon Technological University

At the present time, I am living in an international dormitory in Odaiba called Tokyo International Exchange Center TIEC, the dormitory has students from all over the world, more than eighty nationalities are living together enjoying an international multicultural atmosphere. In the TIEC, we do have many activities organized by TIEC staff; they organize many events that can introduce the Japanese culture and other international cultures of other students, they also provide Japanese classes for those who are interested in improving their Japanese. There are many facilities in the TIEC such as a gym, a outdoor football court, an indoor football court, a volleyball court, a badminton court, and many other recreational facilities and I do join all those activities. Since I am a Muslim and pray five times per day, I was surprised that the university provides Muslim students with a place where they could pray and so was the TIEC. I do really appreciate how they respect our believes.



After a football match with some international friends

At the school, there is a host family program organized by the department; the department assigns you to a host family. The host family is an alumnus of the department. I applied for this program and I was assigned to an amazing host, whose name is Mr. Tanaka. We meet occasionally. Mr. Tanaka introduced me to many new things in Tokyo. The department also arranges meetings from time to time where we all get together and talk in a friendly atmosphere. I encourage all students of the department to join this program, experience the Japanese culture, and share your own culture. Special thanks to Mrs. Ayuko Akaike and Mrs. Akiki Suzuki, who are key persons of this pregame.



Together with Mr. Tanaka at Meiji Jingu Shrine

One of the most convenient things in Japan is the transportation system; I commute around one hour from Odaiba to Komaba, where my lab is; however, one hour is very typical if you live in Tokyo. It is also important to say that I like Japanese food very much; I do enjoy Tempura, Onigiri, Ramen noodles, and many other cuisines. I want to encourage all



With some lab mates, Mr. Tanaka and Mr. Okeil

international students to come and study in Japan. Japanese people are friendly, tolerant, polite, and helpful. It is a nice country, and I can say that I do love Japan. Finally, I want to encourage Japanese students to interact with international students and introduce the Japanese culture, not to be afraid because of your English ability. It would enhance mutual understanding.

【Reported by Osama Abdelfattah Hegeir (The University of Tokyo)】

## FY2017 JSCE Awards

A JSCE Award ceremony was held during JSCE General Assembly at Hotel Metropolitan Edmont Tokyo on June 8, 2018. 25 civil engineers including 4 non-Japanese engineers were recognized with the three awards International Lifetime Contribution Award, Continuing International Contribution Award, and International Outstanding Collaboration Award.

For further details, please visit [http://www.jsce-int.org/a\\_t/international](http://www.jsce-int.org/a_t/international).

### < International Lifetime Contribution Award: 4 winners >

The Award recognizes (1) Japanese civil engineers for their significant contributions to the development of civil engineering technology and/or the infrastructure development through their professional practices in and outside Japan; (2) non-Japanese civil engineer(s) for his/her commendable achievements to the progress and promotion of Japanese civil engineering.

NAME	AFFILIATION
Tamon Ueda	Hokkaido University
Hozumi Katsuta	Former the Ministry of Transport
Minoru Kuriki	Foundation of River & Basin Integrated Communications
Kyaw Linn	Deputy Minister Ministry of Construction, Myanmar

### < Continuing International Contribution Award: 16 winners >

The Award recognizes young professionals who have made and will make a significant contribution to the development of civil engineering and/or the development of infrastructure outside Japan with their unique and inspiring perspectives and solid technical skills.

NAME	AFFILIATION	NAME	AFFILIATION
Hiroyuki Uchida	Taisei Corporation	Makoto Sugimura	IHI Infrastructure Systems Co.,Ltd.
Hiroataka Onawa	Sato Kogyo Co.,Ltd.	Ryoji Takahashi	Oriental Consultants Global Co.,Ltd.
Katsuo Ochi	SHIMIZU CORPORATION	Masaaki Taniguchi	Konoike Construction Co.,Ltd.
Yoshihiro Kakishita	Yamanashi Prefectural Government	Takayuki Tsuchida	CTI Engineering International Co.,Ltd.
Hideaki Kamimura	Obayashi Corporation	Yasuyoshi Nomura	TOKYU CONSTRUCTION CO.,LTD.
Toshiyuki Kobayashi	Tokyo Electric Power Company Holdings, Inc.	Makoto Fujii	Fujita Corporation
Akihiko Sasaki	Maeda Corporation	Akinori Horai	Kajima Corporation
Yoshiaki Samejima	NIPPON KOEI Co.,Ltd.	Katsuichi Yabunaka	JICA Expert

### < International Outstanding Collaboration Award: 5 winners >

The Award recognizes foreigners who has made contributions to the development of civil engineering in Japan or other countries, through the exchange and collaboration with Japan, and is expected to play an active role in the

progress and development of civil engineering field.

NAME	AFFILIATION
Shrestha Robinson	CTI Engineering International Co.,Ltd.
He Haiming	Taisei Corporation
Xuehui An	Tsinghua University
Nguyen Thi Tuyet Trinh	University of Transport and Communications
Pham Hoang Kien	University of Transport and Communications

International Activities Center of JSCE held a JSCE Award Celebration lectures session and party at the JSCE HQ on the 7<sup>th</sup>, inviting Mr. Kyaw Linn the Deputy Minister, Dr. He Haiming, Dr. Nguyen Thi Tuyet Trinh and Dr. Pham Hoang Kien. These awardees delivered a speech about their projects, academic backgrounds and achievements, which reminded us how closely they have been worked with us in field and made significant contribution and achievements.



Mr. Kyaw Linn delivers a speech



The Awardees with the IAC Executives at the Celebration Party

## Updates

- ◆ **Seminar on Internationalization of Technical Standards, the 9th JOPCA Seminar (November 7, 2018)**  
<http://committees.jsce.or.jp/kokusai/>
- ◆ **Japanese Civil Engineers the Global Leaders Symposium Series No.13 (December 18, 2018)**  
<http://committees.jsce.or.jp/kokusai/>
- ◆ **CECAR8 Online Registration (Early Bird: June 1 – Jan 31, 2019)**  
<http://www.cecar8.jp/>
- ◆ **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/>
- ◆ **Asian Civil Engineering Coordinating Council (ACECC) International Newsletter archives**  
<http://www.acecc-world.org/newsletter.html>
- ◆ **IAC “News Pick Up!!” on the JSCE Japanese website**  
<http://committees.jsce.or.jp/kokusai/node/118>
- ◆ **Summary of featured articles in JSCE Magazine Vol. 103, No. 9, September 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](http://www.jsce-int.org/IAC_network)

◆ ASCE 2018 Convention

<https://www.asceconvention.org/>

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(<http://www.jsce-int.org/node/150>). We look forward to meeting you.

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(<https://www.facebook.com/JSCE.en>)

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