2016 JSCE Study Tour Report

JAPAN SOCIETY OF CIVIL ENGINEERS (JSCE)

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1. Japan Society of Civil Engineers Organizational Profile

Japan Society of Civil Engineers (JSCE) was established as an incorporated association in 1914 entrusted with the mission to contribute to the advancement of scientific culture by promoting the field of civil engineering and the expansion of civil engineering activities. Since its establishment, JSCE has endeavored to achieve the above mission, through extensive activities including scientific exchange among members, researchers / promotion of science and technologies relating to the field of civil engineering, social involvement, etc. Over the years, the JSCE membership has increased significantly from the initial 443 members to approximately 39,000 members at present, and is currently engaged in various wide-ranged activities around the world.

With the birth of the 21st century, JSCE has reconfirmed its goals to exert perpetual efforts.

a. to propose an idea for social infrastructure development in the future from civil engineers' perspective,
b. to acquire a steadfast relationship of mutual trust with the society,
c. to promote scientific and technological researches/studies with a high degree of transparency, and
d. to evaluate public works from a neutral standpoint, and to reach a social consensus on those proper standards.

Furthermore, JSCE will implement such new indispensable programs as Civil Engineers' Qualification System, Continuing Professional Development, etc., for the benefit of creating an environment where civil engineers can widely taka on an active role in the international community, and where civil engineering technologies may contribute to the amenity of the people both in and outside of Japan.

2. The Objectives of Study Tour Grant

JSCE Study Tour Grant (STG), supported by International Scientific Exchange Fund (ISEF), is a unique program for young civil engineers to learn Japanese civil engineering technology and projects. The STG program invites the civil engineering students who are nominated by the AOC societies to Japan to stay for about one week. During their stay, those students visit project sites and research institutes, meet leading civil engineering professionals and academics, and share their projects with other students. At the end of the program they are requested to submit a report on their experience gained in Japan to JSCE and also to the AOC to which they belong home. This program gives a chance not only to see technological innovations, but also to experience them in the environment that they are achieved.

3. Participants of Study Tour Grant

This 2016 STG grant attended by the engineers from 7 countries as follow:

a. Turkey Delegation represented by Dogancan Telli
b. Indonesia Delegation represented by Habibie Razak
c. Philippines Delegation represented by Alben Bagabaldo

d. Thailand Delegation Rattanaporn Kaewkluengklom
e. Mongolia Delegation Purevdorj Sosorburam
f. Myanmar Delegation represented by Aung Myat Thu
g. Vietnam Delegation represented by Tran Dinh Tung

4. Study Tour Activities

a. Day 1 Program

First day program in this study tour was to visit Public Works Research Institute (PWRI) and National Institute for Land and Infrastructure Management (NILIM) located in Tsukuba City. We were accompanied by Dr. Wada, Mr. Hashimoto and their staffs to visit the civil engineering laboratory and test facilities in this complex. The facilities consisted of:

Figure 1 – NILIM Building

- Structural and Bridge laboratory and testing facility. We listened to laboratory staff's presentation describing what kind of tests they normally do such as buckling strength of stiffened plate girders, bending, shear strength of PC/RC girders and slip strength of bolted joints with high strength bolts. We also watched directly in the monitor on the movement of girder beam due to the increment of the load performed by the universal testing machine.

Figure 2- Structural and Bridge Laboratory

- Dam Hydraulic laboratory facility. In this laboratory facility we witnessed several dam simulations with the objectives are to investigate the hydraulic phenomena concerning dam's reservoirs and hydraulic facilities such as spillways, outlet works and intake system.

Figure 3- Dam Hydraulic Laboratory

- Transportation and Track test facility. This facility included several tests and experiments such as active soft edge soundproof barrier, porous elastic pavement, traffic sign test, experimental facilities for lighting, impact test, full size test tunnels, radius 148m design speed 100 Km/Hour super-elevation test and others.

Figure 4- Track Test facility

- Geotechnical Centrifuge laboratory. We listened to the one of the staffs presentation with regard to the type of tests conducted in this laboratory. There are mainly two kind of tests done in this facility; three dimensional shaking table test and general vibration test.

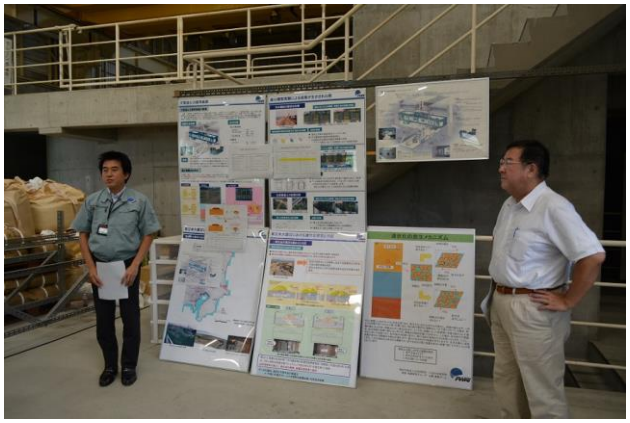

Figure 5- Geotechnical Laboratory

This technical visit started at 09.00 am and finished before 12.00 PM and after that we headed to one of the restaurant that was nearby for lunch session.

Afternoon session at first day program was to conduct the technical visit to TAJIRI Intersection Project. This project is being executed by the consortium consists of 3 contractors; TAISEI, TODA and DAIHO Join Venture. The objective of the project is to shorten the route on this area by constructing new tracks to connect to Tokyo-Gaikan Expressway and Keiyo-Road Way. During the construction, the existing roadway is diverted in some parts.

Figure 6 – TAJIRI Tunneling Construction Activities

The value of the contract is around USD 1 Billion for almost 4 years construction duration. We went to the construction segment where we could watched directly the construction of underground tunneling work using shield tunneling machine (STM). I was convinced that TAISEI has been performing quality works in safe ways.

Figure 7 – TAJIRI Reinforcing Bar and Steel Structure Erection & Installation Work

After technical visit to TAJIRI project, we were leaving for downtown of Tokyo and checked-in to Super Hotel Lohas nearby Tokyo Station. The dinner event was managed by Mr. Hashimoto and brought all the STG participants enjoying the Japanese foods.

Figure 8 – Dinner Time with Hashimoto San

b. Day 2 Program

Day 2 activities started with the visit to KAJIMA Technical Research Institute in Chofu City, Tokyo. The visit consisted of 2 main activities, the first was the KATRI presentation class done by Ms. Haruko Umehara assisted by Maruyama San. The second activity was to look around the research facilities owned by KAJIMA Corporation. The Nishichofu complex facilities as it is called consisted of several facilities:

a. Shaking table laboratory
b. Concrete and win tunnel laboratory
c. Large-size structural testing laboratory
d. Soil mechanics and foundation laboratory
e. Environmental engineering laboratory
f. Construction and fire safety laboratory and
g. Equipment storage building

Figure 9 – STG Participants with Hashimoto at KATRI office building

One of the learning points was the introduction to isolator made by the combination of steel and rubber which is installed between pedestal and base plate column. This isolator will function to absorb the movement due to earthquake with higher magnitude in Japan. This simple technology has been proven as the building equipped with it has been standing still since 1986.

Figure 10 – with Maruyama San – GM International Business, KAJIMA

We enjoy the lunch session in this KATRI complex and took some photos inside their office including to take pictures with Ms. Haruko and Mr. Maruyama.

The next destination was to visit the Tokyo Metropolitan Assembly Hall and Tokyo Olympic facilities in Shinjuku-ku Tokyo. The representative of Tokyo Government presented the Disaster Prevention Management as we knew Japan was hit by several disaster including tsunami, earth work and fire. The rescuers and evacuation team should be staying within 3 Km radius off the center of disaster prevention to assure they are available in case of they are needed for the rescue and evacuation activities.

Figure 11 – Tokyo Metropolitan Government Building

We also had a chance to visit the office of Tokyo Metropolitan Assembly and took some photos with other STG participants. The Tokyo Metropolitan Assembly is the place where assembly members, who are elected as representative of the Tokyo citizens, assemble to discuss and decide on the affairs of Metropolitan Tokyo. The Governor of Tokyo acted based on decisions of the Tokyo Metropolitan Assembly.

Figure 12 – Tokyo Metropolitan Governor Office

The next visit was to witness the construction activities of Tokyo Station Northern Pedestrian Passage Enhancement Project located in JR Tokyo Station. The construction is being done by one the top 4 Japanese Contractors, Obayashi. The scope of the projects are to widen the underground station in this area. The JR Tokyo station has been connecting all railway networks in the city of Tokyo which has been servicing 1.8 Millions of passengers every day and has been operating 40 trains per line/hour during peak hour. This project consisted of several phases, it was started since November 2019 and expected to complete in January 2019.

Figure 13 – Obayashi JR Station Extension Construction Area

One of the learning outcome taken from this visit, as the project manager and site engineers explained the challenges they have been facing in this project especially when they dealt with existing underground facilities during the excavation and installation works.

Figure 14 – Q & A Sessions at Project Site

Those facilities were to be relocated or protected in safe manner as necessary using the as-built drawings documentations however those drawings sometime were not really as-built and again, they needed to perform manual digging in order to safely relocate those facilities. They found gas line, water supply line as well as electrical and telecommunication cables during construction. I also learnt a lot on how they performed the installation and construction works such as the construction method and sequences.

After Obayashi's visit we headed for Sendai City using Shinkansen-Guchi as tomorrow we will attend the 18th International Summer Symposium at Tohoku University. We checked at Unisite Sendai Hotel and then had a dinner nearby the hotel.

c. Day 3 Program

Third day program started with the visit to Tohuku University Kawauchi-kita Campus in Sendai. We presented our technical paper in front of the JSCE 18th International Summer Symposium. I myself delivered the presentation with the title **"Project Management of 21 LNG Receiving Terminal throughout Indonesia's Archipelago – a Preliminary Execution Plan"**. This presentation was to describe the rough execution plan when we were in the situation that all 21 locations shall be done simultaneously in order to finish less than 24 Months. Then Project Manager has to come-up with the different strategy compared if the project only located in one single location.

クラス	座長名	講番希望 採番	受付番号	第2希望	NAME	所属機関
		041	9073	714028 第4部門	Aoyagi Tatsuya	日本大学大学院理工学研究科社会
		042	9059	713316 第4部門	suzuki mio	東京工業大学
9月7日		043	9050	712841 第5部門	Srimahachota Teeranai	
9:00 ⑦ 7	Goit Chandra	044	9024	710766 第6部門	HAUSSNER DANIEL	
B-201 STG 1	埼玉大学			STG-7 Thai	Rattanaporn Kaewkluengklom	Student, Department of Civil Engine
		045	9066	713871 第5部門	Nguyen Cong Luyen	名古屋大学大学院
		046	9058	713110 第5部門	Rodolfo Mendoza Jr	Nagoya University, Civil Engineering
8		047	9068	713912 第5部門	Lemlem Tatek Yenehun	Nagoya University
		048	9063	713481 第5部門	Nguyen Thi Loan	埼玉大学
9月7日		049	9033	711630 第5部門	Tahery Zabihollah	東海大学大学院
10:40 ⑧ 6	ルアン ヤオ	050	9036	711693 第5部門	Malikyar Abdul Ahmad	東海大学大学院
B-201 STG 2	(LUAN Yao)			STG-2 Indonesia	HABIBIE RAZAK	Project Manager, ASEAN Chartered
	埼玉大学			STG-4 Mongolia	PUREVDORJ Sosorburam	Teacher, Mongolian University of Sci
		051	9037	711749 第5部門	Irfanullah Irfan	東海大学大学院
		052	9064	713762 第5部門	Nishida Takahiro	京都大学大学院工学研究科社会基
8		053	9069	713914 第5部門	Hasanyar Masihullah	名古屋大学大学院

Figure 15 – Technical Paper Presenter Schedule

There were some recommendations and conclusions taken from this paper as follow:

- Identify the scope of works thoroughly by getting more familiarity on each project location. 21 locations will be different in term of ambient condition, geotechnical condition, met-ocean and bathymetry as well as topography and hydrology.
- The use of manpower for each stage (engineering, procurement and construction) in term of experiences and numbers will govern the successful of the project. Project Director together with project manager are responsible to propose the right team-members for their project.
- Project Manager will need to identify the critical path of the schedule such as the procurement and construction of LNG storage tank as well as jetty construction which most likely put as critical path. The right selection of LNG storage tank technology can also shorten the overall duration.
- Process Engineer will need to provide faster engineering works by categorizing the capacity of each regasification and since here are some locations have nearly similar regasification capacity it is considered to create typical design.

Figure 16 – Technical Presentation Showcase

After the presentation session, we were invited to have a lunch with JSCE central committees. During lunch time we discussed some infrastructure projects in Japan and we were also welcomed to discuss our country situations in term of economic development. The lunch took an hour and continued with photo sessions with the committees.

Figure 17 – Photo Session with JSCE Committees

Next event, we decided to visit Sendai Castle where it is nearby the conference venue. We went there to buy some souvenirs and took some photos including one memorable photo in front of the Samurai with his horse.

Figure 18 – Sendai Castle with the Samurai

As Dr. Wada reminded, we need to be present on dinner party session since it was attended by most of conference delegates from various countries. The welcoming speech delivered by Mr. Tamiharu Tashiro, the President of JSCE who is also the Chairman of Kajima Corporation. We enjoyed the dinner time by having different kind of foods and drinks. I also managed to meet

some of the guests and committees during dinner time such as Katsuhama San, a professional who has been working for Nippon Koei and was staying in Indonesia for few years working for dam and other infrastructure projects. We also met Ms. Yuki and had a photo session with her.

Figure 19 – Photo Session with Ms. Yuki at Dinner Time

d. Day 4 Program

Day 4 program was opened with the visit to Rikuzen Takata by bus. This area located in the east-north side of Japan facing the Pacific Ocean. The area got hit by Tsunami back in March 2011. Presently, Shimizu Corporation has been doing the reconstruction activities by raise the elevation of the existing ground to be 35 meters high. The work has involved major earth work since the new elevated residential area required up to 6 Million Cubic of backfilled soils and rocks. This backfilled materials taken from the mountain by blasting process and then transported by heavy equipment to the conveyor lines which convey the materials up to 3 Km to new residential area. Japanese government has prepared the mitigation plan for this area in case of the Tsunami occurring again in the future.

Figure 20 – The Post Tsunami Remediation Area

Not far away from Shimizu project site, Kajima Corporation has done the sea wall construction at the seashore side. The design of the sea wall which is basically like a coffer dam was unique. General Manager of Kajima, Yoshihawa San presented the big drawings in front of the STG participants and explained on how the built the sea-wall.

Figure 21 – Sea Wall Construction Presentation by Yoshihawa San, KAJIMA

We also managed to visit the Shinkasennuma Bridge which was nearly completed. The old bridge was also hit by Tsunami. On the way back to JR Sendai Station we stopped by in several cities such as Shishiori Karayama dan Koizumi that are currently under reconstruction. Finally, we managed to arrive at Sendai station and heading to Tokyo city. We again for the second time checked-in Lohas Hotel and enjoyed the dinner time afterwards at Budou No Yashiro, Godanya which was walking distance from the hotel.

Figure 22 - Shinkasennuma Bridge Post Tsunami

e. Day 5 Program

Day 5 program was basically a free tour to some interesting and exciting places such as Azakusa area and Skytree Tower. Azakusa is the famous tourism area in the downtown of Tokyo. It was easy to reach there by taking the tour program by Sato Bus in the downtown of Tokyo. We paid few thousand yen to them and during the tour we were guided by Japanese guy who was speaking English fluently. During the tour I took some pictures with Chinese Girls who wore Kimono traditional shirt of Japan before I had a chance to picture with real Japanese girls with their Kimonos.

Figure 23 – Azakusa Area, Tourism Area

Figure 24 – Skytree Tower

5. Summary of the Visit

During the full 5 days program and total stay for 7 days in Japan, I have gained a lot of information from this study tour trip granted by Japan Society of Civil Engineers that I try to summary as follow:

1. The STG program has taught me some new knowledge especially on tunneling construction projects using Shield Tunneling Machine (STM)
2. I learnt the new concept of Disaster Prevention Program by Tokyo Metropolitan Government as this is something we can share to Indonesian Government as the reference to enrich their own disaster management/prevention plan.
3. Japan is a country with rich civil engineering innovations and I believe I can learn more civil engineering knowledge and technology in Japan both by having my master and doctor degree in Japan or by working with the Japanese Civil Engineering Contractors such as Kajima, Taisei and Obayashi.

6. Closing Remarks

Thanks to Hashimoto San, a friend who was with us during our visit in Japan. He accompanied and took care of us day and night to ensure we did not get lost. Dr. Wada who was very keen to teach us during the technical visit, my warm regards to him, thanks for everything. Ms. Yuki who had been in correspondence with us two months earlier before the event, she planned the program very well because of her I could plan my trip properly. Special thanks to Fakhruddin Muchtar who was accompanying me to see some nice places in the downtown of Tokyo city, indeed appreciated.

Finally, my greatest thanks also to Mr. Bachtiar Sirajuddin who guided me through the process of applying this STG program and finally I have done the whole process till the submission of this report. Last but not least, thanks to Japan Society of Civil Engineers (JSCE) and The Civil Engineering Chapter, The Institution of Engineers, Indonesia (BKS-PII) Committees.