JSCE STG REPORT 2018

International Scientific Exchange Fund (ISEF)

2018 JSCE Study Tour Grant (STG) Program

Affiliated By:

Supported By:

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Submitted by:

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平成30年度 土木学会全国大会

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I. INTRODUCTION

1.2 ABOUT JSCE AND STG PROGRAM

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;

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

Furthermore, JSCE has plan to 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 take 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.

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 young 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.

1.2 JSCE STG PROGRAM: APPLICATION, SELECTION, AND RESULT

Myanmar Engineering Society (MES), which is the AOC society of JSCE, called for application to apply for JSCE STG 2018 through various channels in February 2018. Luckily, I found the announcement via MES facebook page. Visiting to Japan, especially for the purpose of studying is my dream. As soon as I saw the application, I started gathering the requirement documents, fill up the application form, and submitted to MES. There are total of (27) applicants to MES. After the deadline of application has passed, MES announced to present our research works one by one in order to select the nomination among all.

After the first round of presentation had completed, teachers from MES had shortlisted (5) applicants including me. In order to choose (3) nominees out of (5), MES called for second round of presentation. Teachers from MES chose (3) nominees including me based on scoring criteria, and then sent to JSCE for the final selection of one participant. The result came out at the end of May 2018. I got to know the result because Sayar U Myint Soe, CEO of MES informed me via mobile that I was selected to participate in JSCE STG and to send passport soonest. When the moment I heard the information that I was selected, I was on the cloud and informed my parents, who supported me ups and downs. Then, I checked my mail, send the passport, provided further remaining documentations including presentation and paper of my research, and started the preparation.

There are total of (7) recipients from seven different countries listed down in the following table. It is such an impressive thing that we got our own supervisor to shape our research paper better.

Table: Numbers of recipients for JSCE STG 2018 program

No	Name	Organization, Country	Presentation Title for the 20th Int'l Summer	Advisor (ISEF Committee)
1	Mr. Ngoc Lan NGUYEN	VFCEA, Vietnam	Reseraching and Developing Structural Designs for the low-cost local bridges in the Northern Mountainous region in Vietnam	Dr. Ishiwatari
2	Ms. Khaliunaa Darkhanbat	MACE, Mongolia	Development of Ground Movement prediction program for CS-H wall, implemented Deep Excavation	Dr. Takagi
3	Ms. Khin Phyu Phyu Thandar	MES, Myanmar	Developing Fragility Curve for Local Structure Types in Myanmar for Earthquake Risk Assessment (Case Study: Sagaing City)	Mr. Araki
4	Mr. Ali Gürkan GENÇ	JSCE Turkey Section, Turkey	Nurol Life Project	Mr. Ishizaka
5	ENGR. AMIE LOU G. CISNEROS	PICE, Philippines	Enviromental Flow Assessment of Manolo Fortich Hydro-electric Power System	Mr. Sakata
6	Mr. Jetsada Kumphong	JSCE Thailand Section, Thailand	Motorcycle Helmet Use Intention with The Theory of Planned Behavior, Transtheoretical Model and Stages of change for Behavior Change	Mr.Machida
7	Mr. ANINDYA SAMYA SAHA	IEB, Bangladesh	Appropriate Source of Aggregates for Future Concrete Structures in Bangladesh	Mr. Suzuki

1.3 ARRIVAL DAY TO TOKYO (26.8.2018, SUNDAY)

The duration of study visit will last (5) days long excluding arrival and departure days. I departed from Yangon international airport at 21:45pm on 25th August 2018 by direct flight Nippon Airways and arrived Narita Airport Tokyo at 6:30am on 26th August 2018. Ms. Tomomi was waiting for me at the airport holding JSCE STG flag and met with my very first friend STG recipient from Bangladesh Saha san. Then, we took airport bus to nearby Nishitetsu Inn Hotel, where we will stay for (2) days. Yu Ki San was waiting for two of us to lead the way to hotel, and explain us about the upcoming days.

Fig: Arrival at Narita Airport (Waiting for bus)

Fig: Nishitetsu Inn Hotel

I have never been to Japan and this visit is my first experience to Japan. So, I followed my plan to visit to Kamakura Buddha and Saha San also joined me for exploring as there was no schedule on that day. By the help of goolge map and asking here and there, we reached to Kamakura station by taking JR line train from Shinjuku station. When we reach to Kamakura station, we take bus to Kamaura Buddha. We first visited to temple nearby Kamakura Buddha namely “Hasedera Temple“. We can see breathtaking view from the temple and the view of mountain, island, ocean, sailing, and beautiful nature took all the tiredness. Then, we visited to Kamakura and pay homage. We finally made plan happened, then return back to hotel by train and reached around 6:30 pm.

Fig: View from Hasedera Temple

Fig: Me at Kotoku-in Temple (Kamakura Great Buddha)

II. JSCE STUDY TOUR ACTIVITIES

2.1 ITINERARY

2018 JSCE Study Tour Grant Tentative Itinerary as of May 25, 2018

Date		Place
Aug. 26 (Sun)	A.M.	Arrive at Narita International Airport, and go to a hotel.
Aug. 27 (Mon)	A.M.	Attend a STG orientation session with the ISEF Committee. Visit Kajima Technical Research Institute
	P.M.	Visit Tokyo Outer Ring Road construction site
Aug. 28 (Tue)	A.M.	Visit Railway Techcnial Research Institute
	P.M.	Visit Shimizu Institute of Technology. Fly to Sapporo, Hokkaido
Aug. 29 (Wed)	A.M.	Particiapte in the International Summer Symposium, JSCE Annual Meeting at Hokkaido University
	P.M.	Go on a field trip to the Ishikari area
	P.M.	Participate in the Networking Reception in the evening
Aug. 30 (Thur)	A.M.	Visit to Ishikarri Port Ishiakari LNG Terminal Station
	P.M.	Visit to Toya Geopark, and go to Chitose Airport
	P.M.	Fly back to Tokyo in the evening.
Aug. 31 (Fri)	A.M.	Go on a sightseeing in Tokyo (including TOKYO SKYTREE)
	P.M.	Evening: dinner with the ISEF members
Sept. 1 (Sat)	A.M.	Return Home

2.2 DAY 1 MONDAY 27.8.2018

MORNING HALF AT KATRI

In the first day of study visit on 27th Aug 2018, we visited to the Nishichofu Complex of Kajima Technical Research Institute in the morning, namely KaTRI, which is the center of research and development where various tests are carried out in a daily basis. There are total of (8) buildingswithinthe total compound area of 21,871m^2. We met with Mr. Yoshizawa and Ms. Umehara at KaTRI exhibit and laboratory building. Mr. Yoshizawa provided brief about STG orientation for us and detailed schedule for each day including the day where we need to present our research work at Hokkaido University. After that, we started learning about KaTRI through video explanation. KaTRI is the first technologicalprivate sector research institute in the industry established in 1949. There are (4) places of KaTRI research laboratories in Japan: 1) Main Complex, 2) Nishichofu Complex, 3) Hayama Marine Science Laboratory, and 4) Seisho test and practice field, and one Singapore based research office for marketing of technologies across Southeast Asia. Kajma constructed high-rise Kasumigaseki building in 1968, Seikan long tunnel in 1988, Honshu-Shikoku long bridge in 1988, M-wave large span structure in 1998, Gokayama dam in 2010, Tokyo international airport runway D in 2010, energy-efficient building in 2016 and created biodiversity ECORE Kumamoto in 2015. Those are the proof that researchers from Kajima is filing up their mission to design and build buildings and infrastructures to continuously provide good services to the future generations for one hundred years and more. I am able to see many interesting works from KaTRI such as creation of environmentally friendly porous concrete, recycled aggregate concrete, restoration of heritage building, real time disaster mitigation system, and most interestingly on Kajima cut and take down method.

We went to **No.21 shake table laboratory** where research works for seismic-resistant structural properties and seismic performance of non-structural components are conducted to protect damages and losses against earthquake. I have seen that 2 layers 3-Dimentional 6 D.O.F shaking table built in 2011, the lower main shaking table (5m x 7m) is for the purpose of reproducing the actual historical ground motion which can be loaded up to 60Tons, and the upper small one (2m x 2m) placing on it is to capture long period motions at the top of high-rise building.

Before we moved to Concrete and Wind-tunnel laboratory, we went for a short visit to see base isolation building. That is my very first time in my life to see base isolation damper in person. I have learnt that the idea of base isolation is to reduce the acceleration of earthquake in which thin layer laminated rubber with steel plate is strong against horizontal vibration, whereas thick layer laminated one with steel plate can response both directions.

When we reached to **No.22 Concrete Technology and Wind Tunnel building**, I am surprised that I can see research and experiments of different type and mixture of concrete blocks by considering the performance of concrete materials such as workability, durability, and strength. Those are high ductile fiber reinforced cementitious composites (ECC), non-shrinkage concrete, ultrahigh strength fiber reinforced concrete, self-compacting concrete, anti-washout underwater concrete, and high durability concrete. Researchers from KaTRI also utilize recycled concrete, recycled aggregate, silane and siloxane water repellent agent for concrete, new curing method using water repellent sheet, and super plasticizer middle/high flow concrete. Then, we went to wind tunnel laboratory, which is the largest one among Japan construction companies, where control center is placed at the core of it letting the wind flow in clockwise direction along the tunnel path length 121.9m (closed return type). The main objective of wind tunnel is to examine the wind pressure, wind force and the effects of wind on the target building and surrounding environment. There are more than a hundred of wind notes attached to the model and apply (16) to (72) wind directions targeting the center to measure the wind pressure and force across the building and its surrounding areas.

The last laboratory we visited shortly at KaTRI is **No.23 Large-size Structural Testing Laboratory,** where various large-scale and important structures are tested to examine the strength and safety. Researchers observe the deformation and failure of structural specimen in this laboratory in order to verify the complex structural response which cannot be solved theoretically. We noticed that two reaction walls (large one: height 12m x width 16m x thickness 3m, and small one:height 5m x width 12m x thickness 3m), which can withstand maximum load of 46400kN are rest on the 2.1mthick reaction floor slab, which can resist maximum shear force of 180kN/m. That place is the end of study at KaTRI for our STG group. I have explored today to create the sustainable future, following the KaTRI's "**Exploring today, Building tomorrow**". We had the very cute and delicious Japanese style lunch and moved to another place.

Fig: Orientation Section

Fig: Beautiful and Yummy Lunch

AFTERNOON HALF AT TOKYO OUTER RINGROAD JCT NORTH RAMP PROJECT: CONSTRUCTION

Fig: Group Photo at Site Office

Our group reached to Tokyo outer ring road construction site at 1:25 pm, which is one of the biggest projects in Japan. We were welcomed by a group of smiling engineers from Obayashi Corporation with Japanese green tea. We watched the introductory video of the site. Overall length of Tokyo outer ring road is about 85km and the place where we visited falls under 16.2km long section called Kanetsu-Tomei expressway and it is open cut "Cut and Fill" structure. The main objectives of the ring road construction is to reduce the travel time, to improve the road safety, to improve the environment by reducing air pollution, and to secure the alternative transportation network in case of disaster. There are 6 lanes in main line with design driving speed of 80km/h. We went to construction site by 10mins walking distance from site office. The whole surrounding area close to construction site is protected by sound-proof fencing in order to avoid noise pollution. It is such an amazing fencing that I did not hear any noise before I enter to the compound. That is underground construction, so we went deep down to study and see the reality in person. The ongoing construction are we visited is 80m wide, and 27m long. They keep some empty rooms for emergency evacuation, and there is one deepest emergency room. I noticed that ventilation pipe is also installed to allow the natural air flow underground. There is construction joint in every 45~50m along longitudinal length. I am feeling impressed that I saw many old professionals and staff working at the construction site.

2.3 DAY 2 TUESDAY 28.8.2018

MORNING HALF AT RAILWAY TECHNICAL RESEARCH INSTITUTE (RTRI)

According to the schedule, our STG group went to RTRI. RTRI is founded in 1907 as Imperial Railway Agency's Railway Research Center. RTRI developed the world first high-speed train "Shinkansen" in 1959. They started the research and development of Maglev system shown in figure. In 1987, RTRI becomes independent foundation after Japanese National Railway (JNR) is prioritized and divided into several companies. RTRI has different collaborative research fields such as vehicle technology, civil engineering, electrical engineering, information and communications technology, material science, environmental engineering, and human science. RTRI has three missions: 1) intensifying research and development activities, 2) fulfilling the tasks using the best science available in an ethical way as an independent and impartial research body, and 3) becoming a world-leader in the field of railway technologies. In 2015, RTRI started research and development to address four major challenges such as improvement of safety, cost reduction, improvement of convenience and harmony with the environment. There are three pillars of research: 1) basic research for railways, 2) research and development for the future of railways, and 3) development of practical technologies.

RTRI has its own 700m long railway test line, rolling stock test plant, large-scale vibration testing system, large-scale tunnel lining model testing machine, large-scale rainfall simulator to check their research and development. We started our visit at RTRI by car to **real scale roadbed test apparatus**, where roadbeds are tested with several combination of materials. It can conduct the cyclic loading tests for the solution of phenomenon and the performance evaluation against the real scale roadbed and track. Roadbeds and subgrade with different stiffness are placed and apply cyclic loading. The apparatus can produce maximum 300KN at static, and 250KN at dynamic condition, and increase the loading frequency up to 40Hz. The purpose of loading test is to calculate the relation between displacement – loading of the ground.

After that we went to **large sale shake table**, in which it is tested to check the performance of train bogie, dynamic behavior of train to run safely. Unfortunately, no tests were going on when the time we visited. We then went to **rolling stock testing plant (RSTP)**. The test stand is capable of reproducing the running conditions in the speed range up to 500km/h by the use of actual vehicle.

We finally visited to **large scale rainfall simulator** at RTRI, where our group experienced the manmade rainfall with the capacity of water supply 650L/min (700 – 300 mm/h amount of rainfall) through sprinkler. The main purpose of this test is to examine the landslide probability in case of heavy rainfall.

Fig: Group photo in front of high-speed train

Fig: Group photo at rainfall simulator

Fig: Group photo in the classroom of RTRI

AFTERNOON HALF AT SHIMIZU CORPORATION

Our STG group accompanied by Yuki san and Mr. Yoshizawa san reached to Shimizu corporation at 2:25 pm in the afternoon. I am happy to meet with my advisor Mr. Araki san, who gave me advise to improve my article. Director of Shimizu corporation provided us the welcoming speech and video screened about shimizu. The shimizu Institute of Technology was the first institute of the construction industry established in 1944. The institute is not only a research and development focus but also a base for the dissemination of information on the cumulative research to society. Shimizu mainly focus on Safety against disasters, environment-friendly community, health and comfort, and advanced technologies. Almost 300 people works at Shimizu and two-third of them are researchers.

Fig: Group Photo at Site Office

We firstly went to **geotechnical centrifuge laboratory**, in which researchers conduct experiments related to ground and structures. By applying centrifugal force, the behavior of actual ground and structures are simulated in small-scale models in order to develop the countermeasures against liquefaction, slope failure, and other ground related disasters based on the test results. We walked to "**Concrete Design walk**" monument wall where different concrete blocks are cast. Those are high-performance fiber-reinforced concrete, zero-shrink concrete, advanced fire-resistant concrete, porous concrete, high strength concrete, timber texture warm concrete, concrete with limestone, and so on. Then, we headed our way to **structural testing laboratory**. Two main facilities (6MN structural testing machine and large-force reaction wall and floor) are placed in the lab. The first one is to conduct compression, tension, and bending tests immediately without loading frames, applying the loads up to maximum of 6MN for both compression and tension. The second one has reaction wall and floor, which are used to apply heavy loads vertically and horizontally with high rigidity.

We later went to advanced earthquake engineering laboratory, where shake tables (7m x 7m large-scale shaking table E-Beetle and 4m x 4m large-stroke shaking table E-Spider) are installed. Different types of testing are carried out in this lab such as 1) basic research on how structures collapse, 2) development of seismic isolation and vibration control system and evaluation of performance, 3) evaluation of the seismic performance of ceilings and other interior and exterior components, 4) evaluation of the seismic performance of equipment and machinery, and 5) Experiencing the shaking caused by an earthquake and evaluating the degree of difficulty in taking action (E-Spider). We watched a short video clip of operating shake tables and then moved to **wind tunnel test laboratory** to see some of the models which Shimizu conducted the wind test. The construction cost of model for wind test is so expensive and it can be 1 or 2 million of dollar as per the size and coverage of the actual condition. One model can only be used one time. We got to know that this is government law for the buildings more than 150m height in Tokyo area are required to do wind load testing. We also saw the 3D printed model of Sensoji Temple there. Shimizu replaced the old heavy roof type with the modern titanium roof materials keeping the same look with the old one. We later returned to the main building walking through the biotope and watched the construction of cocoon tower using 3D glass.

As soon as we finished the study visit to Shimizu, we headed to Haneda airport by chartered bus and flied to new Chitose airport, Sapporo by flight ANA 075 at 6pm. We stayed at Sapporo Sumire Hotel for 2 nights. The weather is cool there.

2.4 DAY 3 WEDNESDAY 29.8.2018

MORNING HALF AT HOKKAIDO UNIVERSITY

We left the hotel in the early morning to participate as speaker in proceedings of the 20th International Summer Symposium at Hokkaido University on 29th August 2018. Presentation rooms were divided based on the similar topic. My research topic falls under International session (2) earthquake structure and disaster, room CS-1/III-12. When we reached to the room, Yuki san gave me the collection of international paper printed book, in which my research paper is included. I was so surprised and felt special for being a speaker at the symposium. The topic I presented is "Developing fragility curve for local structural types in Myanmar for earthquake risk assessment (Case Study: Sagaing City)". Every speaker including me has 7 minutes time for presentation, and the moderator set alarm once in 6 minutes and final alarm in 7 minutes. I got a chance to learn different types of structural and earthquake engineering topics from the other researchers.

Fig: Presenting my research at Hokkaido University

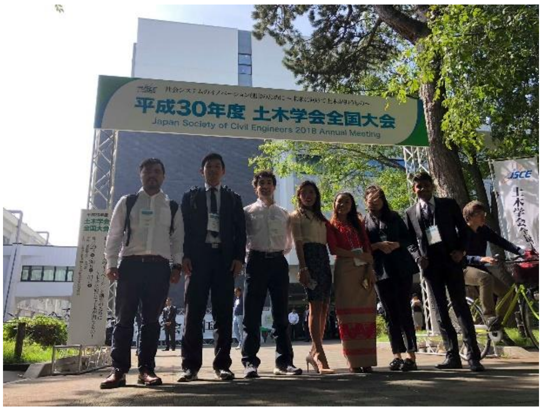

Fig: Group Photo after presentation time

EVENING HALF ISHIKARI AREA

We left Hokkai University in the afternoon after having lunch at canteen and headed to Kawano Museum by chartered bus. We learned how they manage flood control, improvement of water transport by reducing the length of Ishikari river, maintaining the wetland, prevention of sea water intrusion, fresh water and sea water separation by using Gate, and we visited to gate control room. The original length of Ishikari river is 364km. There are total of (29) cut-off canals along the river so as to service as discharge canals at the time of flooding, improve the travel time, more efficient use of the river and it reduces into 268km. Among them, Oyafuru cut-off line, which is the closet part to Japan sea, is the longest one becoming 18.2 km original length into 3.7 km. The flood control plan in Ishikari started since 1899 by Dr. Bunkichi Okazaki after the flood damage happened around the area in 1898. He invented the concrete single flooring blocks in 1917 to maintain river canals and protect the riverbank, and these are still usable well keeping the environment as it is. Levee improvement works has also been done in the area to firmly protect the river water with levee and protect the lowlands against flooding. Then, our group visited to the field by chartered bus. We walked to the Ishikari river (Oyafuru cut-off canal) view point passing through the wetland area and then visited to No.5 Gate, the Makunbetsu Marsh Canal Sluice, No.6 Gate, Ishikari Drainage canal, and Ishikari river estuary. We were finally back to Hokkaido University to join Networking Reception and met with Yukiko Shibuya San, who the main person from the host organization, JSCE, helping all of us for this STG program.

Fig: Group Photo at Kawano Museum

Fig: Group photo at wetland area

Fig: Group photo at Makunbetsu Marsh Canal Sluice Gate No.5

Fig: Group photo with Yukiko Shibuya San

2.5 DAY 4 THURSDAY 30.8.2018

MORNING HALF ISHIKARIWAN SHINKO THERMAL POWER STATION

In the next day, we all went to Ishikariwan Shinko Thermal Power Station owned by Hokkaido Electric Power Co.,Inc (HEPCO), which is the first LNG thermal power station. Mr. Nichi, head of power station, delivered the welcoming speech. After the presentation time was over, we went for a visit at 9:56am to power station. The main features of that power station are high power generating efficiency, outstanding environmental performance, and excellent operability. There will be three units of thermal power station aiming for the generation of 569.4MW output each (1708.2 MW in total). The construction of only one unit is started and the remaining two are scheduled to build from 2023 onwards. Power generation system is the combination of gas and steam turbines by the use of natural gas as fuel source. Natural gas is burned in the combustor to become the generated combustion gas enough to rotate the gas turbine, whereas heat of the exhaust gas is used to generate steam to rotate steam turbine. They will start the commercial operation of the first unit in February 2019.

Fig: Inside power plant

Fig: Group photo at Ishikariwan power station

EVENING HALF AT VOLCANO SCIENCE MUSEUM, TOYAKO TOWN

We directly went to volcano science museum, Toyako town from Ishikariwan using national highway. We bought lunch box at 711 on the way and enjoyed our lunch on chartered bus. Then, we continued our way to volcano science museum and reached at 1:45 pm. We experienced the volcanic eruption of Mt. Usu at the theater. Video images are projected on the large screens installed at the front, on the ceiling and at the sides of the theater, and the deep bass speaker on the floor creates a realistic sensation. We feel like we are in the real situation. Mt. Usu is one of the most active volcanoes in Japan as it has erupted nine times since its first eruption in 1663. Many of the damages destroyed by the volcanic eruption are kept at the museum, such as buckled railway tracks, car, flying stones, and so on. We also experienced the simulation of the 1977 eruption in a room. Because of the better preparedness and well-planned evacuation, on one was died in 2000 eruption.

Fig: Buckled railway track inside museum

Fig: Inside Museum

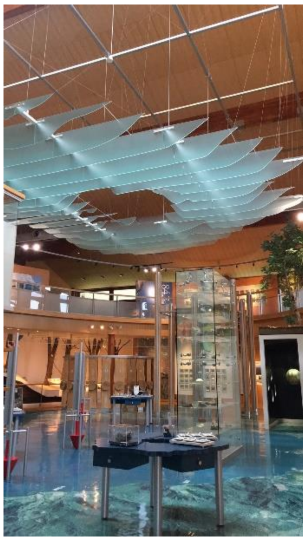

Fig: Map of Toya lake and surrounding area on floor

We walked to the real damaged buildings due to flying stones and thick mud layer, and bridge which was displaced almost 160m far from the upstream carried by mud flow. They keep those damages as part of the museum. Based on the historic volcanic eruption, the return period of the volcano is 25 to 30 years and another eruption will come in 2025. Although the area became nightmare due to disasters in the past, it is doubtless that the place is so beautiful and I even wanted to save the real natural view in my pocket for the refreshment of myself if possible. I raised a question to the uncle who guided us "I am surprised why people stay in this high level of disaster-prone area?". His answer is simple "We love our place". The answer makes me feel so impressive to him and the people of Japan. As soon as our visit was completed, we went to Chitose Airport and flied back to Tokyo. We stayed at Kieo Presso Inn hotel for (2) nights.

Fig: Toya lake View point and me

Fig: Group Selfie while walking around

Fig: Group photo in front of damaged building

Fig: Displaced bridge due to mud flow

2.6 DAY 5 SIGHT SEEING TOUR 31.8.2018

Our STG group went out in the morning and took a visit to Yasukuni Shrine, Yodobashi Camera multimedia center, Sensoji temple, and Tokyo skytree. At the end of the JSCE STG 2018 program on Friday night, we had a dinner with our advisors. We had a nice talk about our last 5 days experiences.

Fig: Group photo at Yasukuni Shrine

Fig: Me at Sensoji temple

Fig: Group photo at Tokyo Skytree Tower

Fig: The last group photo of JSCE STG 2018

III. ACKNOWLEDGEMENT

I would like to express my sincere gratitude to teachers from Myanmar Engineering Society and Japan Society of Civil Engineering for giving me such a great opportunity to boost up my motivation, learn modern techniques, and open my eyes of knowledge to be a good and reliable contributor for the society. I have learnt a lot throughout STG program not only technology but also to serve the community better. Every step of me in Japan is all about to learn from road sign to the restaurants and people. I would like to say special thanks especially to Yukiko Shibuya san, Suzuki Yuki san, Araki san, Arai san, Yoshizawa san, Nomura san, Prof. Ishizaka, and ISEF members. I would like to thank all JSCE staffs for their effect in making all the arrangement smoothly.

Besides, I would like to send heartfelt thanks to all of the volunteers from KAJIMA technical research institute, Tokyo Outer Ringroad JCT Construction site, Railway Technical Research Institute, SHIMIZU Institute of Technology, Ishikari kawano museum, Ishikariwan Shinko Thermal power station, and Toya-UNESCO global geopark (volcano science museum) who voluntarily explained and showed us the works they are doing, and sparing their precious time for us.

I would like to express my gratitude to U Aung Myint (President of Myanmar Engineering Society), U Ko Ko Gyi (Vice President of Myanmar Engineering Society), U Myint Soe (CEO at Myanmar Engineering Society), and all interviewers from Myanmar Engineering Society for their valuable time in supporting the STG program and Mr. Bijay Karmacharya (Country Programme Manager of UN-Habitat) and Mr. Shashank Mishra (DRR Programme Manager, UN-Habitat) who allowed me to go for leave.

I want to express my appreciation to my friends from Bangladesh, Mongolia, Philippines, Thailand, Turkey, and Vietnam who became good friends with me throughout the program and for further communications. I had an unforgettable moment and gained the invaluable network in my life. This STG trip to Japan boost my motivation up to do further study in Japan from my personal development to national contributor of my country, Myanmar.

Let’s walk together to build the world better, and safer!