Japan Society of Civil Engineers

Report for

Japan Society of Civil Engineers

2019 Study Tour Grant Program

Supported by International Scientific Exchange Fund- ISEF

Prepared by

Omar Faruqe Hamim

2019 STG Participant

Department of Civil Engineering

Bangladesh University of Engineering and Technology (BUET)

Recommended by The Institution of Engineers, Bangladesh (IEB)

13 October, 2019

Table of Contents

1. Introduction

1.1 About Japan Society of Civil Engineers (JSCE)

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 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 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.

1.2 About Study Tour Grant (STG)

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.

Study Tour Grant (STG) was established in 1992 to utilize JSCE supported International Scientific Exchange Fund more effectively and more appropriately. It was created as a program for supporting scientific study tours which make it a principle to exchange science and technologies and cultivate a deep international fellowship. At the time of establishment, the purpose of STG was to make Japanese civil engineering technologies and projects widely known among the engineers inside and outside Japan. Therefore, at the end of the program, the invitees to the STG program were expected to deliver the results of their experience gained in Japan to JSCE and also to the official bodies or academic journals back home. Based on over 20 years of experience from its launch, the STG program shall focus not only on the spread of Japanese civil engineering information but also on the development of engineers who play a role of liaison between their home countries and Japan.

1.3 Selection Procedure

I along with two other MSc in Civil Engineering students currently studying in Bangladesh University of Engineering and Technology were nominated for the JSCE 2019 STG program by The Institution of Engineers, Bangladesh (IEB). All of us submitted the required questionnaire forms and other necessary documents as a part of the selection procedure and waited for the final selection day. With great joy professor Dr. A. F. M. Saiful Amin gave me the news of being selected as the participant of the STG 2019 representing IEB and Bangladesh. I was assigned an advisor Prof. Tetsuhiro Ishizaka who helped me preparing for my research paper which I had to present at 21st International Summer Symposium. I felt honored and delighted to be selected by JSCE for the STG 2019 recipient.

1.4 Participants of STG 2019

No.	Name	Affiliation	Country
1.	Omar Farque Hamim	Lecturer, Department of Civil Engineering, Bangladesh University of Engineering and Technology (BUET)	Bangladesh
2.	Nguyen Bao Lam	Road and Bridge Department, Faculty of Civil Engineering, University of Transport and Communications	Vietnam
3.	Munkhsaikhan Battumur	School of Construction and Architecture, Mongolian University of Science and Technology	Mongolia
4.	Wai Yar Aung	Technical Research Engineer, Myanmar Earthquake Committee	Myanmar
5.	Gül Pınar Avcı	Civil Engineering Department, Istanbul Technical University	Turkey
6.	Mark Allen T. Zapanta	Aboitizland Inc., Civil Engineering Major in Structural Engineering, Tarlac State University	Philippines
7.	Washirawat Praphatsorn	Department of Civil Engineering, Faculty of Engineering, Kasetsart University	Thailand

2. JSCE STG Program 2019

2.1 JSCE 2019 Study Tour Grant Schedule

STG 2019 program was scheduled from September 1 to September 7 with various activities in each day as per the following itinerary.

	Date	Time	Event	Attend
1	9/1, Sun	–	Arrive at Narita Airport	
			Go to NISHITETSU INN Shinjuku (TEL: 03-3367-5454) and check in the hotel	Ms. Suzuki (Tour Conductor:TC)
2	9/2, Mon	7:30～	Leave the hotel for KAJIMA Technical Research Institute, Nishichofu Complex (TEL: 042-489-7160) 20 Goukan in Chofu city, Tokyo by chartered bus	Ms. Suzuki (TC), Mr. Yamamura (JSCE)
		9:00～11:30	a STG orientation session with the ISEF Committee, KAJIMA Technical Research Institute, Nishichofu Complex	Mr. Yoshizawa (KAJIMA), Ms. Suzuki (TC), Mr. Yamamura (JSCE)
		11:30～13:00	Lunch at KAJIMA Technical Research Institute	
		13:00～	Go to Tokyo International Airport (Haneda Airport)	Ms. Suzuki (TC), Mr. Yamamura (JSCE)
		14:30～16:30	Visit Tunnel Construction Site of Tokyo International Airport	Mr. Araki (Shimizu), Ms. Suzuki (TC), Mr. Yamamura & Ms. Wang & Mr. Zuo (JSCE)
		18:00～19:15	Fligh to Kagawa Pref. (JAL485)	
3	9/3, Tue	7:50	Leave from Hotel Pearl Garden for Kagawa University	Ms. Suzuki (TC), Mr. Yamamura & Ms. Wang & Mr. Zuo (JSCE)
		8:40～11:55	Participate in the 21st International Summer Symposium, JSCE Annual Meeting at Kagawa University	
		11:55～13:05	Lunch & Go to Takamatsu Port, Takamatsu, Kagawa	Dr. Dang (JSCE), Ms. Suzuki (TC), Ms. Wang & Mr. Zuo (JSCE)
		13:05～13:40	Go to Ieura Port, Teshima Island from Takamatsu Prot	
		14:00～17:00	Illegal Dumping Site of Industrial Waste, Teshima Island	
		17:20～17:55	Go back to Takamatsu Port from Ieura Port	
		18:40～19:30	Join the IAC Networking Reception at Kagawa University	
4	9/4, Wed	7:30	Leave from Hotel Pearl Garden for Michinoeki-Shionoe	Ms. Suzuki (TC), Mr. Yamamura & Ms. Wang & Mr. Zuo (JSCE)
		8:40～8:50	Get on the Technical Tour Bus at Michinoeki-Shionoe	
		9:00～9:40	Visit Kabagawa Dam Construction Site, Takamatsu, Kagawa	
		9:50～10:00	Get back on the STG Bus and Leave Michinoeki-Shionoe for Sanuki Mannou Park	
		10:40～11:10	Visit Sanuki Mannou Park, Nakatado, Kagawa	
		11:20～12:00	Lunch	
		14:00～	Arrive at the Kurushima Kaikyo Bridge	
		16:30～	Arrive at the Kure Morisawa Hotel, Kure, Hiroshima	
5	9/5, Thu	9:00	Leave from Kure Morisawa Hotel, Kure, Hiroshima	Mr. Kanda (Kure National College of Technology: KNCT), Dr. Tanikawa (KNCT), Mr. Shimooka (KNCT), Ms. Suzuki (TC), Mr. Yamamura & Ms. Wang & Mr. Zuo (JSCE)
		9:20～9:40 10:05～10:25 10:35～10:55 11:05～11:25	①Disaster Waste Disposal Sites (Aga, Kure) ②The Area Affected by Sediment-Related Disasters (Tenno, Kure) ③Damaged Areas on National Highway 31 (Mizujiri, Sakacho) ④Temporal Housing (Sakacho)	
		11:45～12:45	Lunch	Mr. Shimooka (KNCT), Ms. Suzuki (TC), Mr. Arai (JSCE)
		13:00～14:00	Visit Hiroshima Peace Memorial Park, Hiroshima	
		14:40～ ～15:10	⑤Disaster Affected Area on Misawa River (Asami Kita-ku, Hiroshima) ⑥The Torigoe Bridge and Water and Sewerage Pipes (Asami Kita-ku, Hiroshima)	
		15:40	Go to Kobe by Sanyo Shinkansen from JR Hiroshima Station	
6	9/6, Fri	9:30～12:00	Visit Disaster Reduction and Human Renovation Institution, Kobe, Hyogo	Ms. Suzuki (TC), Mr. Arai (JSCE)
		12:00～13:00	Lunch	
		13:00～13:50	Go to Maiko Station from JR Sannomiya Station	
		14:00～15:00	Visit Akashi Kaikyo Bridge	
		15:00～	Sightseeing	
7	9/7, Sat	–	Check out the hotel and go to Kansai Int'l Airport	Ms. Suzuki (TC)

2.2 Day 1: Arrival at Narita International Airport

On 31st July I departed from my country for Japan. It took me 4 hours to reach Changi Airport for transit flight and 6 hours from there to reach Narita International Airport at Tokyo, Japan. I was overwhelmed seeing the mega structures from aero plane while landing at the airport.

Upon arrival at the immigration, there was a misunderstanding from the immigration personnel regarding my purpose of visit to Japan. I had the documents sent by JSCE to me and upon showing those to the immigration officials I was allowed to enter Japan finally. It was a give sigh of relief for me as well as a great cheer to land on such a beautiful country. I was warmly received at the airport and went to hotel by airport service bus. On my way, I could look outside and gaze at the infrastructures with awe. First day was a free day and as I reached quite late in night at the hotel, I just roamed around the hotel area. Then I went for sleep and prepare for the upcoming days in Japan.

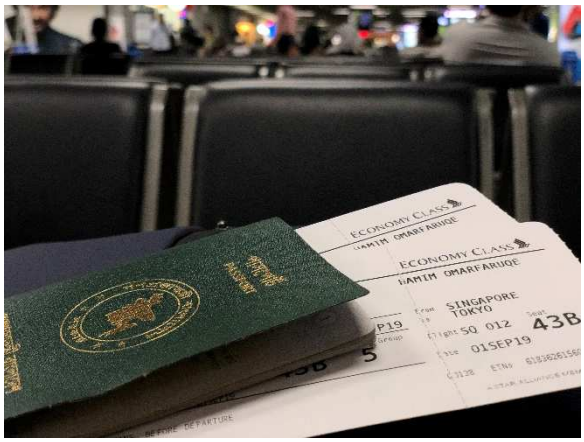


Figure-1: Flying from Dhaka, Bangladesh to Tokyo, Japan.

2.3 Day 2: Technical Visit to KAJIMA Research Institute and Tunnel Construction at Haneda International Airport, Tokyo

In the early morning all of the STG participants accompanied by JSCE representatives went to visit KAJIMA Research Institute. Kajima Technical Research Institute (KaTRI) has been playing the key role, while collaborating with other divisions of Kajima Corporation, in the R&D activities, diffusion of new technologies and construction methods, and sharing of the technical information since its establishment in 1949. KaTRI also provides technical supports and consultations for designing, implementing and improving advanced structures as well as for ensuring proper functions of the structures so that our customers can continue to use our products for a long time with confidence and assurance.

During our visit we were given a brief overview about the visions and activities of KAJIMA Research Institute. After that we visited some of their laboratories e.g:

1. High performance 3-dimensional 6 D.O.F shaking table “W-DECKER”
2. Large-size structural testing laboratory
3. Wind-tunnel laboratory etc.

Here in Bangladesh at BUET, we also have two shake tables but not that large in size compared to that I saw in KAJIMA. I was really impressed to see research facilities and arrangements which were really motivating for young researchers certainly. Any civil engineer would love to join such a dedicated research institute like KAJIMA which can bring out the immense possibilites that lie inside researchers.

After having lunch at KAJIMA Research Institute we left for visiting tunnel construction project at Haneda International Ariport. At the project site, the project in-charge presented us with a brief description about the on going construction activities and challenges regarding the tunnel construction. After that brief presentation, we were taken inside the tunnel to see it ourself how is it actually being constructed. The tunnel was huge in size, we nearly had tgo walk for half an hour to reach the end of the tunnel even though the tunnel is still not completely constructed, so you can imagine how big this thing is going to be. Upon full construction this tunnel will serve the purposes of reducing the time required for passengers to move to and from within the airport. Returning to the project office, we had a question-answer session where we the STG participants asked a lot of questions and the concerned personnel answered all of our querries with a big smile. It was the end of the activities for Day 2 and we were off to Kagawa via airplane, our next destination.

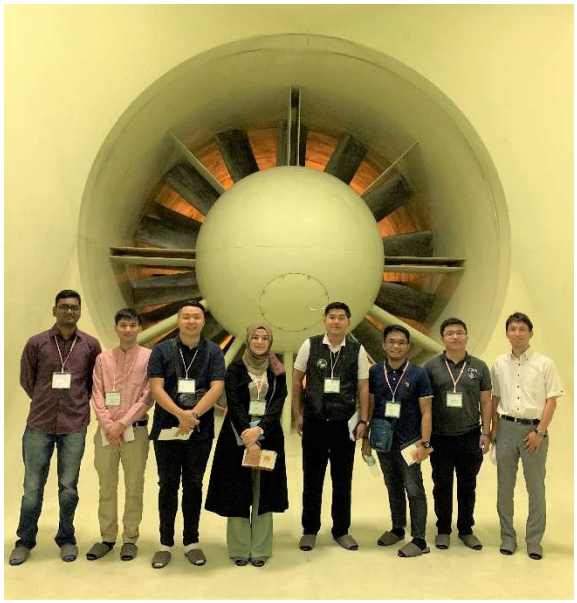


Figure-2: Wind Tunnel Laboratory

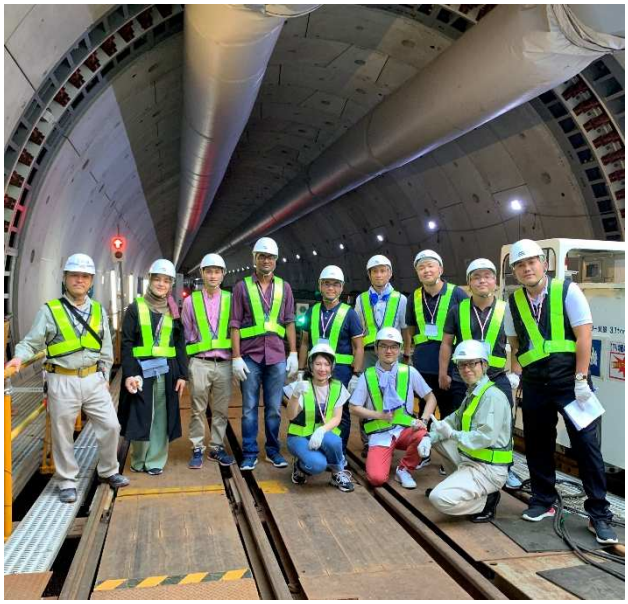


Figure-3: Tunnel Construction Site

2.4 Day 3: Attending 21st International Summer Symposium and Visit to Illegal Dumping Site of Industrial Waste at Teshima Island

JSCE 21st International Summer Symposium was arranged in Kagawa University. I along with all other STG 2019 participants were taken to the university for our individual presentation of our research work. I presented my research paper on "APPLICATION OF ACCIMAP METHODOLOGY TO INVESTIGATE THE BUS ACCIDENT AT SALEHPUR BRIDGE". It was my first presentation of my research work, so it was a great feeling of success for me. I was waiting for this day to come in my life when I will be able to showcase my research findings to people interested and inclined towards my research field. There were a few questions asked regarding my research work after my presentation and I tried to appease them with logical reasoning. I also met few of Bangladeshi students and professionals in the session and it was great to find someone from your country far away from your motherland.

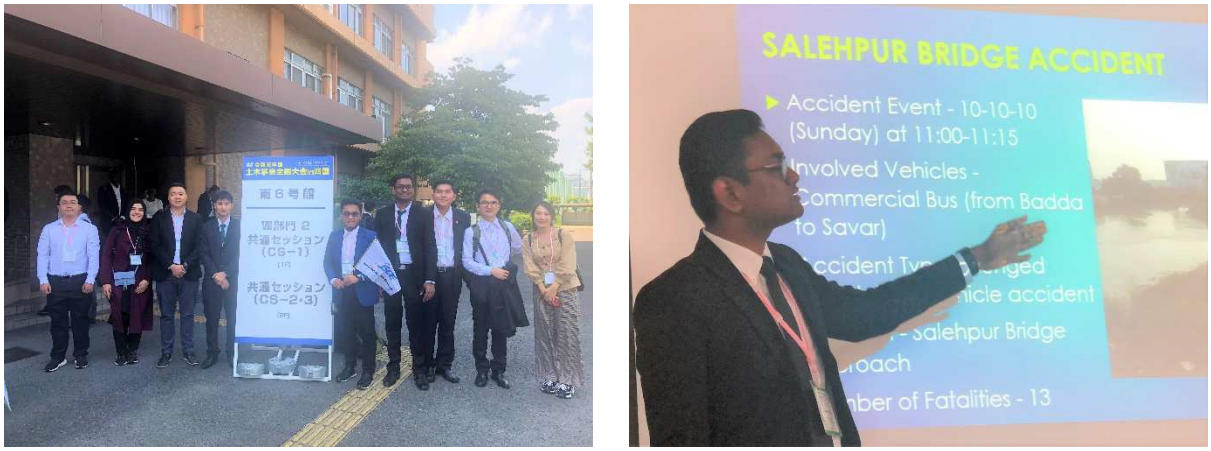


Figure-4: Presenting Research Work at JSCE 21st International Summer Symposium

After attending the symposium, we took our lunch and went to Teshima Island to visit and Illegal Dumping Site of Industrial Waster where we were informed about the history behind this abandoned island. Experiencing such a tragic outcome of careless acts from corporate entities was really astonishing and at the same time I was overwhelmed by the fact how people in Japan have responded with refined thoughts in making a clean and pollution free world. After the tour to Teshima Island, we returned to Kagawa University to join the IAC Networking Reception and met other delegates from different countries. It was a great opportunity to socialize with people coming from different parts of the world. During the dinner, we could share our thoughts with other participants in the symposium. It was a good gathering of talented people roaming all around us.

Figure-5: Museum at Teshima Island

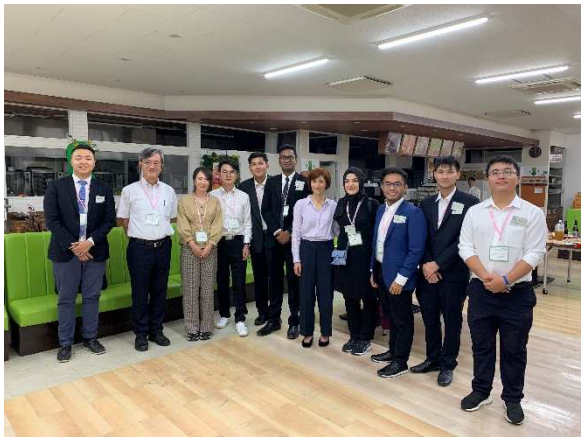


Figure-6: IAC Networking Reception

2.5 Day 4: Technical Tour at Kabagawa Dam Construction, Visit Sanuki Mannou Park and Kurushima Kaikyo Bridge

On the 4th day of our study tour, we got the opportunity to visit Kabagawa Dam Construction which has great structural engineering as well as social importance for the local residents. It is a massive construction intended to meet the water supply demand for the inhabitants. After this technical tour we visited Sanuki Mannou Park along with other delegates from different countries. The park is first of its kind and the landscaping made me feel serene among greeneries. It was nice start to the day.

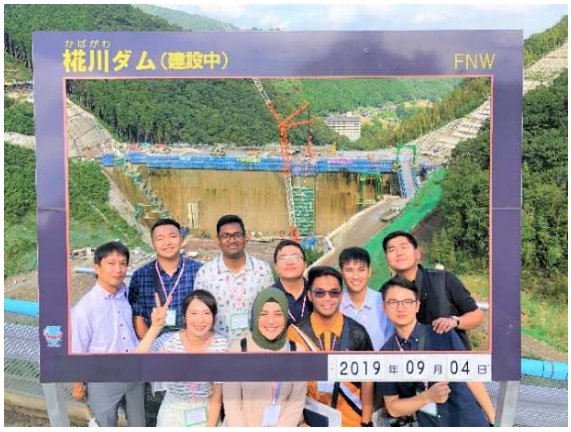


Figure-7: Kabagawa Dam Construction Site

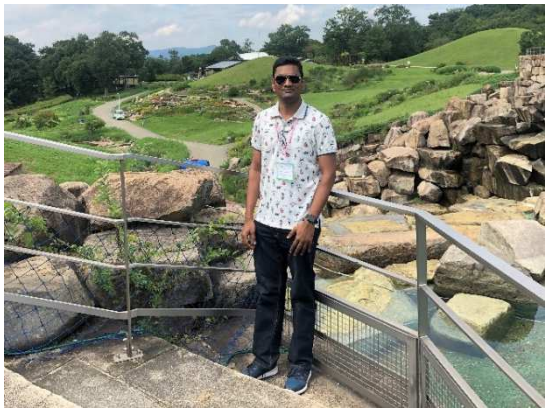


Figure-8: Sanuki Mannou Park

After departing from the Sanuki Mannou Park, we started our journey towards Hiroshima. On our way we stopped by and admired the colossal Kurushima Kaikyo Bridge. It is a gigantic bridge connecting two islands. Even though I am from a riverine country, such huge bridge structures are rarely seen in my country. Seeing such mega bridge certainly elicited awe.

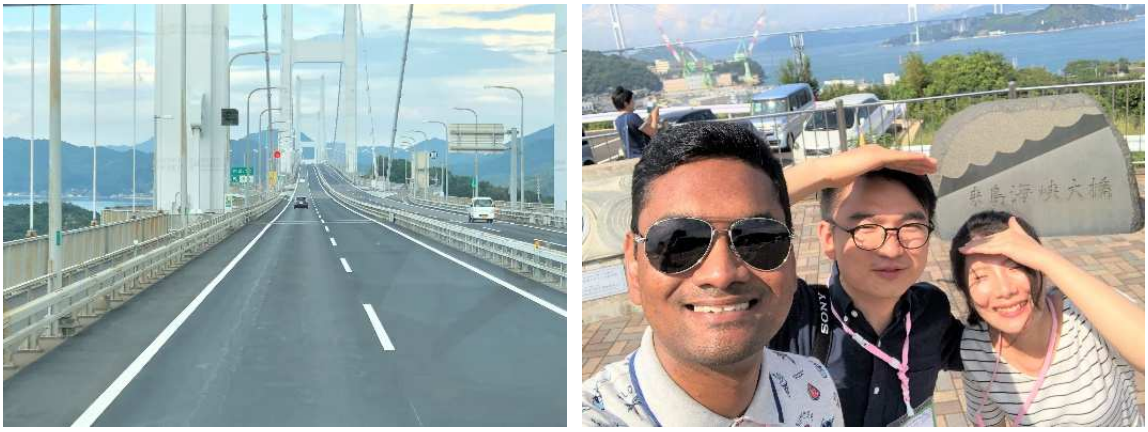


Figure-9: Kurushima Kaikyo Bridge

2.6 Day 5: Visiting Hiroshima Peace Memorial Park and several disaster affected structures in Kure, Sakacho and Hiroshima Area

On Day 5, we were scheduled to visit some disaster affected areas and learn how it was restored. At first, we went to Aga Marinopolis District Disaster Sediment Separation and Management site where we experienced how the disaster sediment is being transported. It was huge field filled with sediments where many workers were working with full dedication to transport these sediment to another place. Then we visited Tenou Junior High School Disaster Situation and learned about the implementation of emergency measures, ensuring safety of sabo dam construction and its overall construction status. The landslide at that place caused the shutdown of the school and the students of that school had to shift to another place to continue their study. But seeing how the engineers and workers were working hard day and night to recover from the disaster and provide prevention measures was really appreciable. Following this, we visited the National Highway 31 where we were given a brief on reconstruction of JR Kure Line and Hiroshima Kure Road. The rail line and the highway got damaged due to a natural disaster. To keep on the communication an alternative road through the parking area was prepared until the infrastructure was reestablished. Then we went to Saka district to visit the emergency temporary housing and learn about the construction techniques used to build temporary shelters rapidly. The concerned people of the municipality department were very keen to provide quick shelters to the people affected from earthquakes. After that we went to visit the Hiroshima Peace Memorial Park to witness the mass destruction caused by atomic bombing at Hiroshima. Upon knowing the history and the consequences of such a devastating act, I was literally heart-broken. The after effects of the atomic bombing was really cruel and unbearable for any human.

Figure-10: Disaster Sediment Management

Figure-11: Tenou Junior High School Disaster

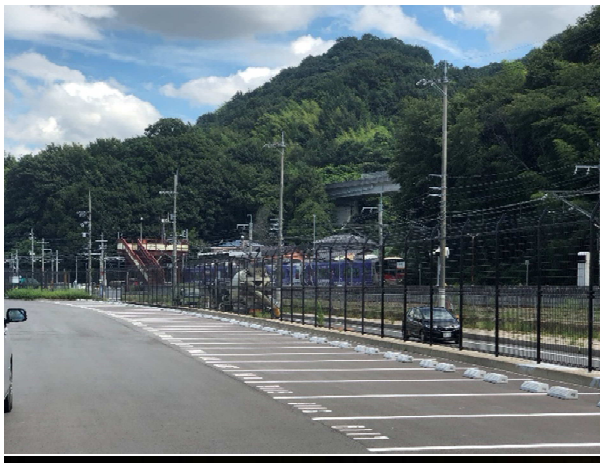


Figure-12: Reconstruction of National Highway 31

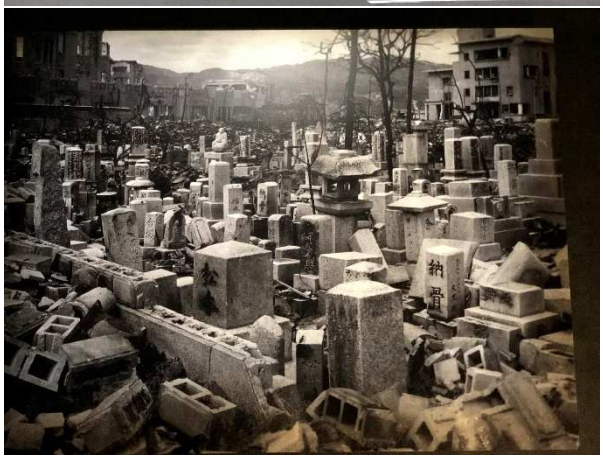


Figure-13: Hiroshima Peace Memorial Park

After having lunch we continued our study tour and visited disaster affected area on Misasa River to learn about the emergency countermeasure work and full-scale restoration work on the right bank of the Misasa River. The river was damaged due to flood and the embankments were reconstructed to ensure usual flow of river water. The techniques used were very unique and certainly helped me understand how we should protect river banks from erosion due to flooding. As my country is full of rivers, this visit will certainly give me an aid in understanding the countermeasures to be taken to protect river banks. From there we went on to visit Torigoe Bridge which fell due to increase in river water and a consequence the water supply was disconnected. We learned about how temporary water supply was provided to the residents. The promptness of the Japanese people in dealing with disasters is really impressive and definitely a trait to be learned for every civil engineers working in disaster prevention and mitigation sector. At the end of our day's activities we started our journey to Kobe by Sanyo Shinkansen from JR Hiroshima Station. It was my first time in a bullet train and I was certainly amazed throughout my journey.

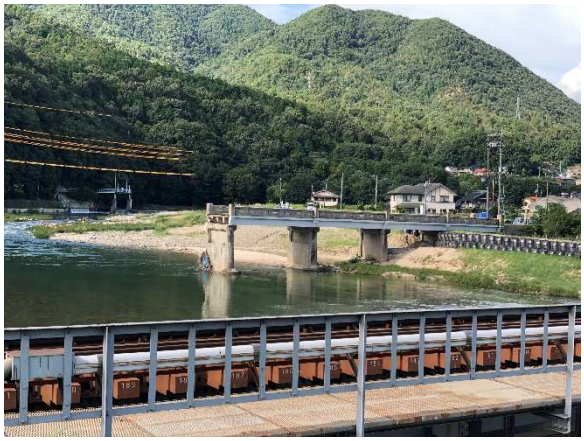


Figure-14: Fallen Torigoe Bridge

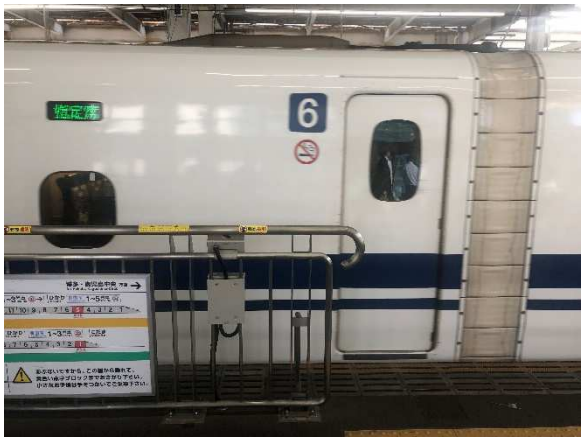
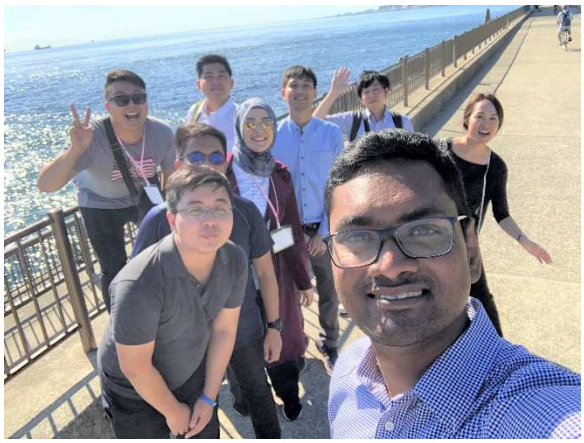


Figure-15: Sanyo Shinkansen

2.7 Day 6: Visiting Hiroshima Peace Memorial Park and several disaster affected structures in Kure, Sakacho and Hiroshima Area

Day 6 was the last day of the study tour and we visited Disaster Reduction and Human Renovation Institution at Kobe, Hyogo where we re-experienced the Great Hanshin-Awaji Earthquake. At the institution we saw how they portrayed the history of the earthquake, the after-effects that was really horrible. Through documentaries the feelings of the affected people who lost their families were demonstrated which was heart-touching. It was great to see how the Japanese children were being introduced to the earthquake history and the way to tackle situations after earthquakes. School going children were taken to this institute on a regular basis where they can see how earthquakes occur and how one should be prepared for such occurrences. Then we went to visit Akashi Kaikyo Bridge which was the last spot of STG 2019 study tour. It was a dream come true to step onto this huge cable stayed bridge in my lifetime.



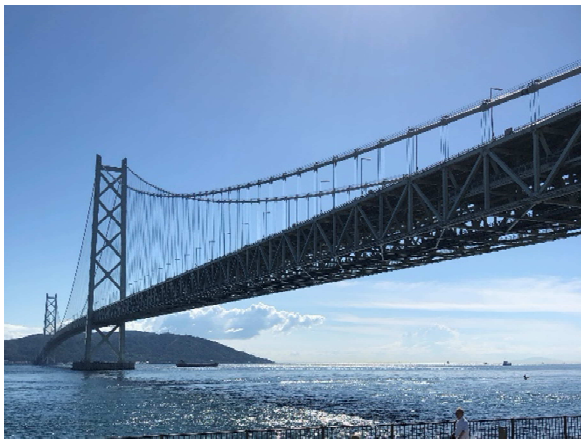


Figure-16: Akashi Kaikyo Bridge

3. Concluding Remarks

STG 2019 was a great experience indeed. I feel fortunate to be a part of it as a representative from my homeland, Bangladesh. Especially as a young civil engineer, this study tour will definitely have strong impact on my future goals and intentions in my life. I would always cherish this week full of activities. I learned through experiencing real-life situations. This study tour will certainly be a big boost to my professional career as well as personal life. Finally, I would like to express my gratitude towards JSCE and all other institutes and organizations for arranging such a well-organized study tour for young civil engineers across the world.