



Study Tour Grant 2024 Report

**Supported by International Scientific Exchange Fund-ISEF
(Japan Society of Civil Engineers -JSCE)**



Submitted by:

Mr. Zin Moe Htut

Asian Institute of Technology

Recommended by Federation of Myanmar Engineering Societies

SEPTEMBER 2024

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1. INTRODUCTION

1.1. ABOUT JSCE

The Japan Society of Civil Engineers (JSCE) was established in 1914 as an incorporated association, with the mission of advancing scientific culture by promoting civil engineering and expanding civil engineering activities. Since its inception, JSCE has focused on achieving this mission through a variety of activities, including fostering scientific exchange among members, promoting research in civil engineering-related science and technology, and engaging in social involvement.

Over the years, JSCE's membership has grown significantly from an initial 443 members to approximately 39,000 members today. The organization is actively involved in a wide range of activities across the globe.

As JSCE entered the 21st century, it reconfirmed its goals, aiming to:

1. Propose ideas for the future development of social infrastructure from the perspective of civil engineers.
2. Establish a strong relationship of mutual trust with society.
3. Promote scientific and technological research with high transparency.
4. Evaluate public works from a neutral standpoint and build social consensus on proper standards.

JSCE plays a critical role in shaping the field of civil engineering, both in Japan and internationally, through its commitment to promoting innovation, professional development, and sustainable infrastructure practices.

1.2. ABOUT THE STUDY TOUR GRANT (STG)

The Study Tour Grant (STG), launched in 1992 and supported by the Japan Society of Civil Engineers (JSCE) Academic Exchange Fund, invites young engineers from overseas academic societies with cooperative agreements to Japan. The program showcases Japanese civil engineering technology, promotes international knowledge exchange, and encourages participants to apply their learnings in their professional careers. Engineers receive financial support for travel and accommodation and participate in customized programs during the JSCE Annual Meeting, including site visits and expert discussions. After the program, participants submit a report summarizing their insights and experiences.

1.3. APPLYING FOR THE STG

As a member of the Myanmar Engineering Society (MES) and a professional engineer, I learned about the STG program and was honored to be selected as a participant for 2024. With the support of MES, I applied for the grant and was chosen to represent Myanmar.

In February 2024, I first learned about the Study Tour Grant (STG) program from my father and later saw the official announcement on the Federation of MES notice board at Myanmar Engineering Society (MES) headquarters. The program immediately caught my attention as it offered a rare opportunity to gain new insights and experiences through site visits to prominent public and private organizations. The chance to visit such significant civil engineering projects was particularly compelling, and it sparked my interest in applying for the STG program.

In April 2024, I was informed by Saya U Myint Soe, CEO of Fed. MES, and Saya U Soe Myint, VP & Chair of the International Affairs Committee at Fed. MES, that I had been selected as one of the nominees. Shortly after, I presented my research at the Federation of MES. Then, in June 2024, I received the final confirmation from Saya U Soe Myint, who emailed me the exciting news that I had been chosen as a participant in the JSCE-STG 2024 program.

When I received the email, I was filled with immense joy and excitement. I shared the wonderful news with my colleagues and my father, who had been incredibly supportive throughout the entire process. From that moment on, I carefully followed the instructions provided by Yuki-san and focused on securing my visa for Japan.

Soon after, I began preparing the necessary documents under the guidance of Ms. Shibuya Yukiko, the secretariat of the International Activities Center (IAC), JSCE. One of the key requirements was to prepare a research paper for presentation at the 26th International Summer Symposium. With the helpful support of Ms. Shibuya Yukiko and Mr. Koji Arai, I successfully completed all the documentation needed for the application.

1.4. PARTICIPANTS OF THE STG

For the 2024 STG program, there were five participants from different countries:

Table 1. Participants to the JSCE Study Tour Grant (STG) 2024

	Name	Affiliation	Country	Presentation Title
1	Ms. Urantogos Agvaanluvsan	MACE , Master Student & Senior Lecturer, Mongolian University of Science & Technology	Mongolia	Retrofit method for repair of corroded bolted connection
2	Mr. John Mark Guimba	PICE , Public Officer / Engineer IV, Department of Public Works and Highways (DPWH)	Philippines	Cost and Reliability-Based Optimization of a Water Distribution Network Using Genetic Algorithm: A Case Study of the Sasmariñs Water District
3	Mr. Satharat Pianfuengfoo	EIT , Ph. D. Student, Dept. of Civil Engineering, Faculty of Engineering, King Mongkut's University of Technology North Bangkok	Thailand	Buffer treatment method for <i>Bacillus thuringiensis</i> crack healing application
4	Mr. Hachnayen Ahmed	IEB , Master Student, Founder / CEO of CADD COARE Training & IT Services, Bangladesh University of Engineering & Technology - Japan Inst. of Disaster Prevention & Urban Safety	Bangladesh	Corrosion resistance of Steel in Historic Kalurghat bridge
5	Mr. Zin Moe Htut	Fed. MES , Developed Professional Engineering Consultants, Co. Ltd. Asian Institute of Technology	Myanmar	Evaluation of the relationship between swelling pressures determined by consolidation-swell test and constant volume test

2. STUDY TOUR ACTIVITIES

2.1. STG ITINERARY

The program spanned from **September 01 to September 06, 2024**, with activities including technical tours, the 26th International Summer Symposium, and networking events.

Date	Time	Activity	Attended By
Sept. 02 Monday	09:10	Arrive at Narita International Airport	Mr. Fukumoto (SOUBUN), and Mr. Okuda (TC)
	12:20	Check-in at Hotel Intergate Tokyo Kyobashi, Kyobashi, Chuo-Ku, Tokyo	
	4:20	Free Time / Sightseeing in Tokyo	-
Sept. 03 Tuesday	08:40	Check-out at Hotel Intergate Tokyo Kyobashi and travel to JSCE HQ	Mr. Hideki Mori, Mr. Okuda
	09:30 - 11:00	STG Orientation with the ISEF Committee	Assoc. Prof. Tetsuhiro Ishizaka, Mr. Goichi Tasaka, Ms. Yukiko Shibuya, Mr. Koji Arai (JSCE)
	11:00 - 12:00	Lunch at JSCE HQ	-
	12:10	Travel to Kajima Technical Research Institute (KATRI)	Assoc. Prof. Ishizaka, Mr. Tasaka, Mr. Arai, Mr. Hideki Mori
	13:30 - 15:30	Visit at Kajima Technical Research Institute (KATRI)	Assoc. Prof. Ishizaka, Ms. Haruko Umehara, Mr. Tasaka, Mr. Arai, Mr. Mori
	15:30	Go to Tokyo Station	Assoc. Prof. Ishizaka, Mr. Arai, Mr. Mori, Mr. Okuda
	17:28 - 19:37	Travel to Sendai via Shinkansen (Yamabiko 151)	Mr. Okuda
	20:00	Check-in at Sendai International Hotel	-

Sept. 04 Wednesday	08:30	Go to Sendai International Center	Assoc. Prof. Ishizaka, Mr. Tasaka, Mr. Arai, Ms. Shibuya (JSCE), and Mr. Okuda (TC)
	10:00 - 12:00	Participate in the IAC Discussion at Sakura, Sendai International Center	
	12:00 - 12:20	Board the technical tour bus and leave Sendai International Center	
	13:00 - 14:00	Lunch at Kirin Brewery Sendai	
	14:10 - 16:10	Visit Minami-Gamo Wastewater Treatment Plant	
	16:20 - 17:00	Visit Ruins of the Great East Japan Earthquake: Sendai Arahama Residential Foundation	
	17:10 - 17:40	Go back to Sendai International Hotel	
	18:30 - 20:00	Attend the 2024 JSCE Annual Meeting Welcome Reception at the Hotel Metropolitan Sendai	
Sept. 05 Thursday	07:50	Go to Tohoku University	Assoc. Prof. Ishizaka, Mr. Tasaka, Mr. Arai (JSCE)
	09:00 - 10:20	Present at the 26 th International Summer Symposium	
	10:45 - 11:45	Meet with JSCE President Yoh Sasaki together with DPWH and PICE delegates	
	12:00 - 16:00	Attend the 26 th International Summer Symposium	
	14:00 - 16:00	STG Meeting at Mozart Klees Coffee, Tohoku University	
	18:00 - 19:00	Attend the IAC Networking Reception	Ms. Shibuya, Mr. Tasaka, and Mr. Arai (JSCE)
Sept. 06 Friday	09:00 - 11:16	Check-out at Sendai International Hotel and Travel to Tokyo via Shinkansen (Yamabiko 210)	Mr. Arai, Ms. Morichika
	12:00 - 15:00	Check in at Hotel Intergate Kyobashi	-
	5:00	Free Time / Sightseeing in Tokyo	-
Sept. 07 Saturday	7:00	Check out at Hotel Intergate Kyobashi	-

2.2. STG Day 1, Arriving in Tokyo

The STG program provided us with a unique opportunity to visit state-of-the-art Japanese engineering research centers, and observe modern civil engineering techniques being applied in projects across Japan. Below is a brief summary of the activities:

On the evening of Sunday, September 1, 2024, I left my apartment and headed to Yangon International Airport to meet with STG ambassador Ms. Win Mon Mon Lwin, the Secretary-General of Fed. MES. Our journey to participate in the JSCE Study Tour Grant program officially began at 7:00 PM local time, as we departed for Bangkok Suvarnabhumi Airport for a transit. We arrived at Suvarnabhumi Airport at around 9:00 PM, at 11:50 PM, we boarded out flight to Narita Airport, marking the official start of my exciting adventure in Japan.



Figure 1. Sunshine weather at Tokyo Narita International Airport

I was concerned about the weather situation, just days before our journey, very strong Typhoon Shanshan had made massive flood and landslide in Japan and was forecasted to move toward the Tokyo area around the time of my flight. Luckily, the typhoon weakened into a depression and slightly shifted its track northwest, making my trip to Japan much safer than I had initially feared.

We arrived at Narita International Airport at 9 a.m. on September 2nd, 2024. The weather was clear and sunny, providing a warm welcome to the Tokyo Narita Area as we began our journey. Upon arrival, we were warmly greeted by Mr. Fukumoto, who helped us board an airport bus to

Tokyo Station. From there, we took a cab to Hotel Intergate Tokyo Kyobashi. At the hotel lobby, Mr. Okuda welcomed us and gave a brief overview of the itinerary for the following day. Shortly after, I checked into my room, ready for the first day in Tokyo Metropolitan.

In the evening, my dear senior Ms. Win Mon Mon Lwin and I enjoyed exploring Ginza, visiting Hibiya Park, and admiring the beauty of the Imperial Palace. To wrap up a wonderful day, we had delicious ramen for dinner at a cozy spot near the hotel

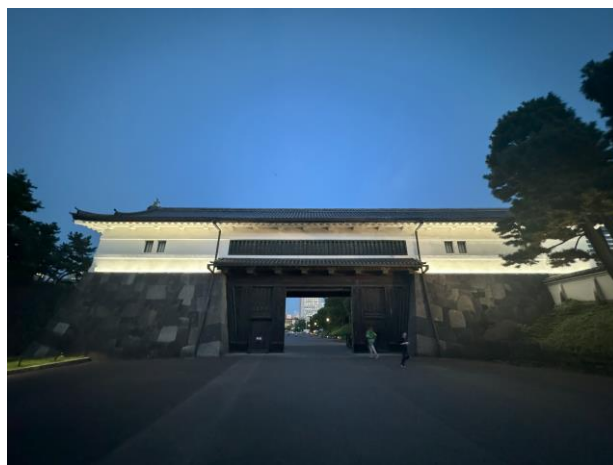


Figure 2. The beauty of Gate at the Imperial Garden

2.3. STG Day 2, ORIENTATION AND TECHNICAL TOURS

The first official activity for the 2024 STG Program took place on the morning of September 3rd with the STG Orientation at the JSCE Headquarters in Yotsuya 1-Chome, Shinjuku, Tokyo. After having breakfast, I checked out of the hotel and met my fellow STG participants for the first time at the hotel reception. There was a shared sense of excitement and anticipation as we introduced ourselves, knowing that we were about to begin an exciting journey together.



Figure 3. On the way to JSCE HQ with my fellow STG participants

Once we were all ready, we made our way to Tokyo Station to catch a train to Yotsuya. As we traveled, the vibrant atmosphere of Tokyo around us added to our growing anticipation for the program ahead. We knew the next few days would be filled with opportunities to learn, explore, and connect with professionals in civil engineering.

At around 09:00, we arrived at the JSCE Headquarters by the assistant of Mr. Mori and Mr Okuda and finally, we had a chance to meet Ms. Yuki Shibuya and Mr. Koji Arai, with whom we had been coordinating via emails for several months. It was a great moment to finally connect with them in person. Shortly after our arrival, the STG Orientation began, where Associate Professor Tetsuhiro Ishizaka gave us a detailed briefing on the official itinerary and what we could

expect in the coming days of the program.

He also provided us with information about the technical tour scheduled for the next day, which included visits to the Minami-Gamo Wastewater Treatment Plant and the Arahama Residential Foundation Ruins. These sites showcase the immense devastation caused by the M9.0 Great East Japan Earthquake in March 2011. I had long been eager to see these locations, as I wanted to understand the scale of destruction that nature can cause, wiping out lives and properties in an instant. Moreover, I hoped to learn from the experiences of the Japanese people—not only in how they managed to rehabilitate critical infrastructure but also how they emotionally recovered from such a massive catastrophe.



Figure 4. STG Orientation 2024 with Ms. Yukiko Shibuya and Assoc. Prof. Tetsuhiro Ishizaka



Figure 6. Sandwich lunch box by JSCE



Figure 5. At the JSCE Headquarters in Yotsuya, Tokyo, Japan for the 2024 STG Orientation.

This tour promised to provide invaluable lessons, and I was excited for the chance to witness these significant sites firsthand.

After enjoyed lunch, we headed to the Kajima Technical Research Institute (KATRI), located in Tokyo, Chofu. Upon our arrival, we were warmly welcomed by Ms. Umehara, the Head of Public Relations of Kajima Corporation, who greeted our group and guided us to the main Kajima building. Once inside, Ms. Umehara gave a speech, providing us with an overview of how KATRI collaborates with the government on R&D projects, as well as the institute's mission, vision, and insights into future trends in civil engineering in Japan. It was fascinating to hear about the cutting-edge work being done at KATRI to advance the industry.



Figure 7. The Facility Map of Kajima's Nishichofu Complex

Following the presentation, Ms. Umehara led us on a tour around the institute's compound, where we had the opportunity to visit several of their advanced laboratories, gaining insight into the innovative research and technology being developed at KATRI. We were notified that our visit would include three major research laboratories within the facility: the **Shaking Table Laboratory**, the **Large-Scale Structural Testing Laboratory**, and the **Kajima Experimental Concrete Laboratory**. Furthermore, we would have the chance to explore the **Kajima Open Laboratory**, where we could experience a simulation of the powerful 1995 Great Hanshin Earthquake (Kobe Earthquake), allowing us to better understand the magnitude and effects of such a significant seismic event.

Shaking Table Laboratory

Our first stop was the Shaking Table Laboratory, home to Japan's most advanced 3-D shaking table system, designed to replicate the powerful earthquake motions the country has experienced in recent years. This state-of-the-art system not only offers the best performance in Japan but is also capable of producing the world's largest amplitude of displacement during long-period seismic motions.

The Kajima 3rd generation shaking table is a cutting-edge facility designed to simulate earthquake motions with high precision. Access to the interior is restricted, but the system boasts impressive specifications. It features a 70 m horizontal and 30 m vertical displacement range, with a 7 x 5 meter table capable of moving up and down, replicating a wide range of 3-dimensional vibrations. The shaking table can handle up to 60 tons of load with a maximum acceleration of 2000 gal (2g). Its double-deck structure includes a smaller deck on top of a larger one, allowing for complex movement simulations, making it ideal for studying the effects of earthquakes on buildings and other structures.



Figure 8. Kajima 3rd Generation 3-Dimensional Shaking Table

A notable feature of the Shaking Table Laboratory is its floating foundation, which utilizes Kajima's cutting-edge base isolation and damping technology. Ms. Umehara led us to a vantage point on one side of the laboratory, where we were able to see the base isolators carefully placed at the bases of specific columns and atop the footing tie beams. We also had the opportunity to examine samples of Kajima's base isolators and dampers.

Base isolation technology is a critical innovation used to protect buildings from earthquake damage by reducing the acceleration transferred to structures during seismic events. This system typically consists of steel plates and rubber dampers

with a lead core, and has been widely adopted in Japan since 1986, with over 5,000 buildings now utilizing this method. The technology can be customized based on building height, and even older structures, like Tokyo Station, have been retrofitted using this technique. Base isolation has proven to be highly effective, with real-world earthquake data closely matching predictions, ensuring improved safety for buildings during seismic activity.

Large-Size Structural Testing Laboratory

Another stop was the Large-Size Structural Testing Laboratory at Kajima is dedicated to testing large structures like bridges and large structure buildings. It conducts key tests such as loading tests, structural integrity evaluations, and tensile tests on materials like fabric and steel. Notably, the lab performed a pull-out test on a suspension bridge anchorage of Toyota Arrows Bridge in 1989, and its findings are used to create detailed reports for submission to the ministry. The lab adheres to Japanese Industrial Standards (JIS), ensuring high-quality results for both Kajima's internal projects and external clients.

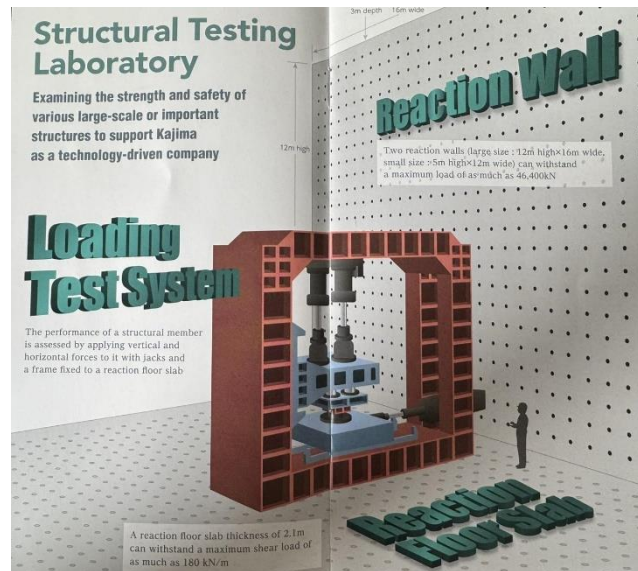


Figure 9 . Large-Size Structural Testing Laboratory Setup

Experimental Concrete Facility

For the next stop, the Experimental Concrete Facility at Kajima focuses on developing environmentally sustainable concrete solutions. Each panel in the facility showcases different types of concrete, such as **CO2-suicom**, which incorporates carbon dioxide into the mix, making the concrete harder and more durable. Some panels demonstrate **CO2 reductions of 50% to 80%**, with the mix achieving **109 kg/m³ of CO2**. This innovative concrete requires water for its production and has already been applied in practical settings, such as the **pavement in front of the building**. The name "**Eien**," meaning eternity in Japanese, reflects the facility's aim of creating long-lasting, eco-friendly materials.

Other interesting concrete technologies found in this lab include **Carbon-Neutral 3D Concrete Printing Technology**, **High-Fluidity Concrete**, **Cuco-Suicom Formwork**, **SUQCEM**, **Eco-Crete**, **CO2-SUICOM**, and **Eco-Crete R3**—all focused on sustainability and reducing the environmental impact of construction.

KAJIMA Open Laboratory (KOLabo)

At the Kajima Open Laboratory, we explored an exhibition showcasing Kajima's profile, projects, and innovations, but our main focus was the Hands-On Vibration Table. This table allows visitors to experience earthquake vibrations based on real data, including the 1995 Kobe Earthquake.

We experienced two scenarios: one without base isolation and one with it. Initially, the vibrations were mild, but the intensity increased dramatically during the main earthquake simulation. I felt securely fastened in my seat, but it was still a jarring experience! The strong shaking lasted around 30 seconds to a minute before gradually subsiding.

As a geotechnical engineer, I studied the Kobe Earthquake during my M.Sc. program at Asian Institute of Technology, but experiencing the high-intensity simulation firsthand was truly invaluable. It deepened my understanding of the event and fostered a profound empathy for those who endured such a traumatic experience.



Figure 10. KOLabo - KAJIMA Open Laboratory

After a Q&A session, we left the KATRI Nishichofu Complex and headed to Tokyo Station to catch the Yamabiko 151 Shinkansen. We arrived at 16:30, boarded at 17:10, and departed for Sendai. After over two hours of travel, we finally reached the Sendai Kokusai Hotel, where we will be staying for night.

One of the highlights of the today tour was the visit to **Kajima Technical Research Institute (KATRI)**. There, we witnessed cutting-edge technologies, including a shaking table used to simulate seismic activity. The facility's focus on earthquake resilience was especially enlightening, given Myanmar's susceptibility to seismic events.

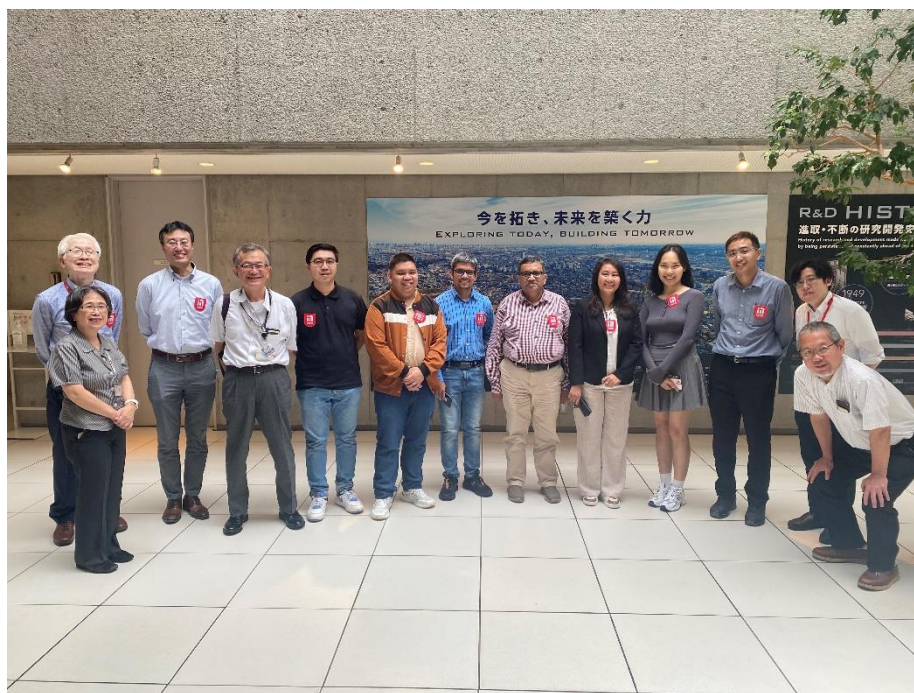


Figure 11. STG Technical Tour at the Kajima Technical Research Institute (KATRI) Nishichofu Complex, Chofu, Tokyo.

2.4. STG Day 3, JSCE Annual Meeting At Sendai International Conference Center

On September 4, 2024, the big day in Sendai had arrived. I woke up at 7:00 AM, got ready, and headed to the hotel's breakfast lobby. After finishing my meal, I went to the hotel lobby to meet up with my fellow STG participants. At around 08:30, we left the hotel and made our way to Aoba-dori Ichibancho Station, where we boarded the subway, heading towards the Sendai International Center.

The first item on the itinerary for the day was the International Activities Center (IAC) Discussion, with the theme "**Civil Engineering Turning Point at Junction, Road, Future - Paradigm Shift.**" We arrived at Sakura Hall 1 of the Sendai International Conference Center at around 08:20 am.



Figure 12. Meet up with my fellow STG participant at the lobby of Sendai International Hotel

The IAC Discussion officially began at 10:00. Mr. Ryo Kimura, Senior Director of JSCE IAC, began with opening remarks, followed by a recap of the previous year's discussion, presented by Associate Professor Hiromasa Iwai from Kyoto University. The focus of the session was the Keynote Speech delivered by Mr. Koji Nakamura, a broadcaster from the NHK Broadcasting Center, who shared valuable insights on the evolving role of civil engineering in shaping the future.

At the Sendai International Conference Center, Mr. Nakamura gave an insightful presentation on the impact of liquefaction on Japan's infrastructure, its implications for global civil engineering, and the expansion of Japanese construction businesses beyond Japan. The session was part of the International Summer Symposium (ISS) and featured a panel discussion with four prominent panelists.



Figure 13. Mr. Koji Nakamura sends his Keynote Speech during the IAC Discussion.

One of the panelists, Mr. Nagasan, provided a compelling account of the redundancy in civil engineering, citing the collapse of bridges in 1985 due to liquefaction. He discussed how the economic and safety considerations for infrastructure have evolved since the 1950s. Another panelist, Professor Ji, emphasized the need for balancing cost and safety, and mentioned guidelines for infrastructure maintenance. He also shared insights on the environmental challenges both China and Japan face, highlighting the public's growing interest in environmental issues.

The panelists shared comments on the Nishinomiya Bridge, noting how it failed to meet modern standards, and discussed what should be prioritized in the maintenance of infrastructure. A point was made about the importance of public perception and media involvement in shaping infrastructure projects. They also touched on the Akashi Kaikyō Bridge, built between 1990 and 2000, which highlighted the importance of foundational stability and its role in civil engineering.

Mr. Nakamura concluded by addressing the differences in criteria between engineers and the general public, emphasizing the potential risks associated with aging infrastructure and the need for planning with a 100-year vision for future generations. He also mentioned global challenges, such as food and water shortages, and how civil engineering needs to adapt to address these issues.

The discussion also included topics like carbon neutrality, climate change, and Japan's development of manuals to tackle these issues. The Netherlands' efforts to reduce carbon emissions by 20 to 50 percent through reuse and repair strategies were also highlighted, with special mention of the twin

bridge repair project, where civil engineering technologies played a key role in sustainable infrastructure development.



Figure 14. Assoc. Prof. Tetsuhiro Ishizaka and me at Sendai KIRIN Brewery

Following the IAC Discussion, all international delegates boarded a chartered bus to continue with the Technical Tour portion of the International Program. Our first stop was at Kirin Brewery Sendai, where we enjoyed a lunch generously sponsored by the JSCE. After a satisfying 40-minute break, we set off for the first destination of the tour: the Minami-Gamo Wastewater Treatment Plant.

Visit to the Minami-Gamo Wastewater Treatment Plant and the Arahama Residential Foundation Ruins

The Minami-Gamo Wastewater Treatment Plant, situated on the east coast of Sendai, Japan, commenced construction in 1959 and began operations in 1964. It manages approximately 70% of the city's sewage, which is treated and released into the sea. Initially, the plant had a maximum processing capacity of 400,000 cubic meters per day, which increased to about 992,300 cubic meters during rainy weather conditions, allowing it to effectively handle variations in sewage volume.

This facility is crucial for public health and environmental safety, treating wastewater before it is released into local water bodies. Its importance was highlighted after the 2011 Great East Japan Earthquake, which caused significant damage in the area. In response, the plant underwent extensive rehabilitation and upgrades to enhance its resilience and ensure it can effectively handle future challenges.



Figure 15. Plant officer explained the history of the Minami-Gamo Wastewater Treatment Plant.

On March 11, 2011, the Minami-Gamo Purification Center sustained severe damage from the earthquake and tsunami triggered by the Great East Japan Earthquake. Instead of restoring the facility to its original condition, a new water treatment plant was constructed to withstand future tsunamis of similar magnitude. Key features of the new facility include:

1. **Height Consideration:** The plant was rebuilt to account for a tsunami height of 10.4 meters, based on the 2011 event.
2. **Waterproof Infrastructure:** New waterproof doors have been installed to protect against flooding.
3. **Evacuation Facility:** A tsunami evacuation facility has been constructed to ensure the safety of personnel during emergencies.

We had the opportunity to see an old warehouse building at Minami-Gamo, one of the first structures impacted by the tsunami in Sendai. A massive, nearly perfectly circular dent on one of its walls starkly illustrates the immense power of the tsunami waves and the debris they carried. It's a chilling reminder of the devastating force of the tsunami, which obliterated everything in its path within seconds.



Figure 16. Damage hit by 10.4m height Tsunami wave at Minami Gamo Wastewater Treatment Plant

Arahama Residential Foundation Ruins

After completing our visit to the **Minami-Gamo Wastewater Treatment Plant**, we headed to our next stop, the **Arahama Residential Foundation Ruins**. Arahama was one of the most severely affected areas during the 2011 tsunami, triggered by the **M9.0 earthquake**. The massive waves swept away nearly all structures, leaving behind only the concrete foundations of homes and buildings. This area has since been preserved as a memorial site, where the foundations vividly depict the layout of the former community, offering a sobering reminder of the immense destruction.



Figure 17. The ruins of residential at Arahama District

As our guide explained, Arahama was once a vibrant community of farmers and fishermen. From the ruins, we could see **Arahama Elementary School** in the distance, a building that served as an evacuation center during the disaster. Its survival amidst the

devastation stands in contrast to the surrounding destruction, symbolizing both the tragedy and resilience of the community.

As I stood before the ruins of Arahama, I couldn't help but be reminded of the **Indian Ocean Tsunami** that occurred when I was young. On December 26, 2004, a **M9.1 earthquake** off the coast of **Sumatra, Indonesia**, triggered one of the deadliest tsunamis in history. The enormous waves swept across many countries around the Indian Ocean, including Myanmar.

In Myanmar, the tsunami heavily impacted the Tanintharyi Region, Ayeyarwady Region, and Rakhine State. Entire coastal villages were destroyed, and while Myanmar wasn't as severely affected as Indonesia or Thailand, the disaster still claimed hundreds of lives and caused severe damage to infrastructure in coastal communities. The memory of that tragedy has stayed with me, and seeing the devastation in Arahama brought back those vivid reminders of nature's overwhelming power and the long-lasting impact it has on communities. The disaster raised awareness of Myanmar's vulnerability to tsunamis, leading to a greater focus on disaster preparedness and early warning systems in the years that followed.



Figure 18. The signboard shows the before and after of Great East Japan Earthquake at Arahama District

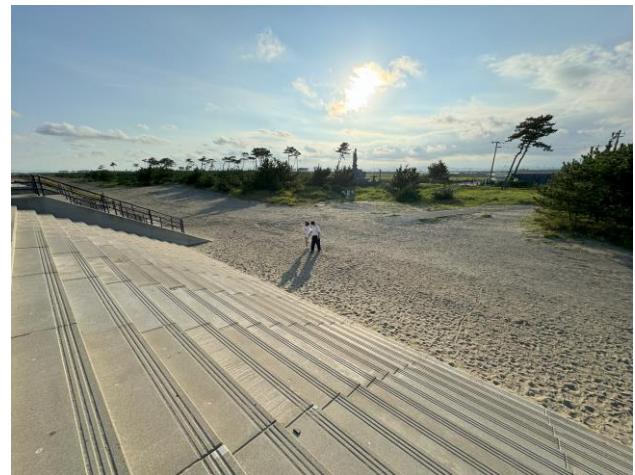


Figure 19. Costal Embarkment near Arahama Ruins

Welcome Reception

After the interesting tour, we returned to Sendai Kokusai Hotel to freshen up and prepare for the Welcome Reception. At around 18:15, our group headed to Hotel Metropolitan Sendai, where the reception was set to take place.

Welcome Reception's atmosphere was quite different from what I'm used to in my country. Instead of formal seating arrangements, the hall was set up with cocktail tables, encouraging guests to stand, interact, and mingle more freely. The buffet offered only light meal, unlike the heavier meals typically served at such events back home. However, despite the casual setup, the reception was



Figure 20. The beginning of the Ceremony

lively and festive, with the room packed and

buzzing with conversations and new connections being formed. In that moment, I had the pleasure of greeting with **Ms KOHRI Kazuko**, the **Mayor of Sendai City**, and I felt truly grateful and excited for the opportunity. It was a cheerful and memorable experience.



Figure 21. New JSCE President Yoh Sasaki leads the ceremonial salute during the Kagami Biraki in the 2024 JSCE Annual Meeting Welcome Reception.

The climax of the **Welcome Reception** was the **Kagami Biraki** ceremony, where a sake cask is opened to symbolize new beginnings and bring good fortune. In Japanese, "Kagami" means mirror, and "Biraki" means opening, signifying the start of something new. **Ms. Win Mon Mon Lwin**, the Secretary-General of **Fed. MES**, represented the **Federation of Myanmar Engineering Society**, alongside other international delegation leaders. The ceremony was particularly significant as it also marked a new chapter for **JSCE**, with the recent election of their first female president, **Ms. Yoh Sasaki**.



Figure 22. Mr. Satharat, Ms. Win Mon Mon Lwin, Prof. Tetsuhiro Ishizaka, and I at JSCE Annual Meeting

2.5. STG Day 4, 26th International Summer Symposium and IAC Networking Reception

On September 5, 2024, I woke up filled with excitement, knowing I had the opportunity to present my research as a JSCE participant. It was my first time presenting technical work overseas, and the nerves quickly set in. I felt honored to present at the **26th International Summer Symposium**, held at **Tohoku University**. My presentation, titled "**Evaluation of Relationship Between Swelling Pressures Determined by Consolidation-Swell Test and Constant Volume Test**," in International Session (4) of Geotechnical Engineering. We left the hotel at around 08:30 and took the subway to Kawauchi Station, which is conveniently located within the **Tohoku University, Kawauchi**

Campus. After a short walk, we arrived at the College of Law Building by 8:45 AM, ready to participate in the symposium.



Figure 24. Morning Session with my fellow STG participants



Figure 23. Enjoying lunch at TOHOKU University Canteen with Mr. Sugino San

We were split into different rooms based on our research topics. I was in the same auditorium as Mr. Ahmed, Mr. Satharat, and Ms. Uren. During the morning session, Mr. Ahmed and Ms. Uren completed their presentations. Afterward, we had lunch on campus with my fellow participants, enjoying the break before the afternoon session. At 3:45 PM, my presentation time finally arrived. I felt a mix of excitement and nervousness before stepping up. However, once I finished, all the stress melted away, and the world seemed like a more pleasant place. The entire experience was rewarding, both personally and professionally.



Figure 25. Presentation during the International Ssession (4) Goetechnical Engineering of the 26th International Summer Symposium, held on September 05, 2024 at Tohoku University Kawauchi Campus.



After wrapping up our presentation, our STG participant group enjoyed a few hours exploring the Tohoku University campus. It was a great opportunity to take in the surroundings and connect with each other. Later, we returned for the IAC Networking Reception, designed to facilitate connections among professors, students, and young engineers. We savored delicious food, enjoying Miyagi Sake, made new friends, and engaged in meaningful conversations with other attendees and faculty members. As the evening concluded, we returned to the hotel, marking the end of our official itinerary for the day.

After arriving back at the hotel, we planned to go out and do some shopping for local souvenirs and goods around 21:00. We headed to Clis Road, near the Sendai International Hotel, at around 21:15. While many stores had already closed by that time, we managed to find a few still open and bought some items for our families and coworkers. We returned to the hotel around 23:00, wrapping up our night in Sendai.



Figure 26. JSCE President Ms. Yoh Sasaki's greeting speech

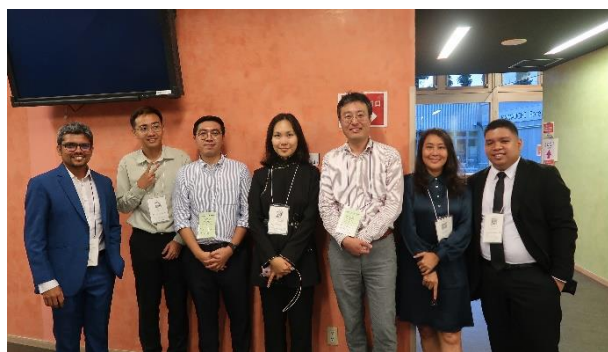


Figure 27. Our STG participants and Prof. Tetsu

2.6 STG Day 5, Travel to Tokyo

After completing the official itinerary, it was time to head back to Tokyo, with most STG participants preparing to return to their respective countries. After breakfast around 7:15 AM, we checked out of the hotel and headed to Sendai Station to catch the Yamabiko 210 Shinkansen at 8:00 AM, arriving at Tokyo Station around 11:00 AM after a two-hour journey.

Although we didn't have much time to bond during the STG Program, with just a brief walk to the Sendai Museum and some night shopping at Clis Road, we still managed to form strong connections and new international friendships. After a week of amazing experiences, it was finally time to say goodbye.

After arriving at Tokyo Station, we bid farewell to each other, as Uran, Satharat, Ahmed, and Mark had to head to Narita International Airport for their return flights. Meanwhile, Ms. Mon Mon Lwin, Professor Saiful Amin, and I stayed on for a few more days in Tokyo. We walked for about 15 minutes to the Intergate Hotel Kyobashi and checked in again.

That evening, I visited famous Shibuya Cross and spent time around the famous Hachiko statue, known for its story of loyalty. Over the next four days, I explored various sights around Tokyo, including the Tokyo Skytree, Asakusa Temple, and took trips to Kamakura, Mount Fuji 5th Station, and lake of Kawaguchiko enjoying some extra time in the city after the STG program.



Figure 28. Famous Loyal Archi Dog "Hachiko" statue



Figure 29. Asakusa Temple



Figure 26. Me at Tokyo Skytree 350m height Floor



Figure 27. Skytree view from Sumida, Azumabashi



Figure 28. Mount Fuji 5th station



Figure 33. Lake of Yamanakako



Figure 294. Mount Fuji San view from Lake of Kawaguchiko



Figure 3530. Kamakura Statue of Buddha

After spending four more days exploring Japan, I embarked on my journey back home to **Yangon** with a transit through **Bangkok**. Finally, I arrived back home on **September 12, 2024**, bringing with me unforgettable memories and invaluable experiences.

3. CONCLUSION

The **JSCE Study Tour Grant 2024** was an eye-opening experience that provided me with valuable insights into Japan's advanced civil engineering practices and broadened my understanding of the global challenges faced by engineers. The knowledge I gained, especially in **earthquake resilience** and **sustainable infrastructure development**, will be incredibly useful as I apply it to my work in Myanmar.

Throughout my time in Japan, I had the chance to explore cutting-edge **civil engineering technologies** and innovative approaches used in the country. Immersing myself in **Japanese culture** also enriched the experience, allowing me to appreciate both the professional and personal dimensions of my stay. Meeting esteemed professors and researchers at **Tohoku University** expanded my academic and professional outlook.

A significant highlight was visiting the **Kajima Research Center**, where I was introduced to advanced **earthquake-related technologies**, deepening my understanding of **seismic engineering**. The visit to the **Arahama District** offered me valuable lessons in **disaster recovery and rehabilitation**, and I gained a deep respect for Japan's resilience in the face of such catastrophic events.

Additionally, visiting the **Minami-Gamo Wastewater Treatment Plant** showcased Japan's impressive efforts to rebuild critical infrastructure following the **2011 Great East Japan Earthquake**, leaving me with a deeper appreciation for Japan's engineering prowess and disaster recovery strategies. This entire experience has been both educational and personally enriching, and I am eager to implement what I've learned back home.

4. ACKNOWLEDGEMENTS AND GRATITUDE

I would like to extend my heartfelt gratitude to the **Japan Society of Civil Engineers (JSCE)**, especially President **Yoh Sasaki**, the **International Activities Center (IAC)**, and the **International Scientific Exchange Fund (ISEF) Committee**, for selecting me to represent **Myanmar** in the **2024 STG program**.

I also want to give a special thanks to my dear **Associate Professor Kuo Chieh Chao** from the **Asian Institute of Technology** for providing me with the opportunity to publish my research paper and for his invaluable support, which significantly enhanced my presentation at the **26th International Summer Symposium (ISS)**.

I also appreciate the support from **Ms. Yukiko Shibuya** and **Mr. Koji Arai** of the IAC, who patiently addressed all my questions regarding the STG. Additionally, I would like to express my gratitude to **Associate Professor Tetsuhiro Ishizaka**, who provided invaluable assistance throughout the program and graciously answered my questions during the tours. I would like to thank to **Mr. Tokuro Asano** from Obayashi Corporation who insightful comments and review my paper and give a lot of idea as supervisor.

Special thanks go to the **Federation of Myanmar Engineering Society** for nominating me, as well as to my colleagues and family for their unwavering encouragement and support. I would like to express my appreciation to my dear sister, **Ms. Win Mon Mon Lwin**, the Secretary General of **Fed. MES** and the **STG Ambassador**, for her warmth, guidance, and care throughout the **STG program**.

I also appreciate the support from **Saya U Soe Myint, VP & Chair of the International Affairs Committee-1** at **Fed. MES**, for his patience and assistance regarding the STG program, as well as his trust and kind recommendation. My gratitude extends to **Saya U Myint Soe, Chief Executive Officer of the Federation of Myanmar Engineering Society**, for his support and kind recommendation.

Additionally, I would like to express my gratitude to the **Fed. MES Board Committee of Selection**, including **Saya U Khin Maung Htay, President of Fed. MES**, and **Saya U Aung Myint, Former President of Fed. MES**, for selecting me as one of the nominees for the **STG 2024 program**. Lastly, I appreciate my Managing Director, **Saya U Ye Gaung Nyunt, of Developed Professional Engineering Consultant Company**, who has been an invaluable mentor throughout my life journey.

I would like to extend special appreciation to my family, particularly my father, **U Kyaw Moe**, who has supported and raised me since birth. I also honor my mother, **Daw Nu Nu Lwin**, who passed away three years ago; her unwavering support, both physically and mentally, was instrumental in helping me reach this stage in my life. A heartfelt thank you to my brother, **Aung San Lin**, for his constant support throughout my journey. All of your love and patience have fueled my determination to succeed. You are the reasons behind my achievements, and I am deeply grateful to each of you.