2024 JSCE STUDY TOUR REPORT

Japan Society of Civil Engineers



http://www.jsce.or.jp/



OCTOBER 1

Authored by: Md Hachnayen Ahmed Student, BUET-JIDPUS Member, Civil Engineering Division, IEB (2023-2024)



Tab	le of	Contents

INTRODUCTION
Preparations and Departure5
Travel Arrangements: 5
Logistical Preparations: 5
Cultural and Professional Preparations:5
Departure Experience:
Arrival at Narita Airport6
First Impressions: 6
Customs and Immigration: 6
Facilities and Amenities:6
Transportation to Tokyo: 6
Cultural Encounters:
Day 2: Exploring Yokohama and Odaiba9
Consultation and Planning:9
Day – 01: Concluding Thoughts:
Day 3: September 3, 2024 – STG Orientation, Kajima Technical Research Institute, and Journey to Sendai
Morning: STG Orientation and Lunch at JSCE Headquarters, Yotsuya, Tokyo 10
Afternoon: Visit to Kajima Technical Research Institute 11
The Shaking Table Laboratory
Configuration
Features
Environmental Concerns 14
Specifications
Introduction to the Facility15

Demonstration of Seismic Simulations15
Experiencing the Large-Size Structural Laboratory at Kajima Technical Research
Institute 16
Understanding the Facility 16
Applications and Implications 16
Tour of the Base-Isolated Acoustic Laboratory Building17
Closing Reflections
Visit to Kajima Concrete Base17
Evening: Travel to Sendai, Miyagi via Shinkansen
Day – 03: Conclusion
Day 4: September 4, 2024 – JSCE Annual Meeting, Technical Tour of Earthquake
Heritage Sites, and Dinner Party 19
Morning: Attending the IAC discussion session
Afternoon: Technical Tour of Great East Japan Earthquake Heritage Sites 20
Concluding Thoughts 24
Evening: Dinner Party by JSCE at HOTEL METROPOLITAN SENDAI
Conclusion 24
Day 5: September 5, 2024 – Presentation and Networking at Tohoku University 25
Morning: Participation in the 26th International Summer Symposium, 2024
JSCE Annual Meeting 25
Afternoon: STG Meeting at Café Mozart Klee's Office
Evening: IAC Networking Reception at Kitchen Terrace Couleur
Conclusion 26
Conclusion of the JSCE Study Tour 27
My plan to share my Experience with my peers & followers 28

INTRODUCTION

The Japan Society of Civil Engineers (JSCE) study tour presented an invaluable opportunity for international exchange and professional development in the field of civil engineering. My participation marked my first visit to Japan and centered around my research paper, "Corrosion Resistance of Historic Kalurghat Bridge." This report chronicles my experiences and insights gained from the tour.

The Japan Society of Civil Engineers (JSCE) study tour is a prestigious initiative designed to foster global exchange and professional development among emerging civil engineers. This tour provided an exceptional opportunity to engage with leading experts, explore advanced engineering practices, and immerse myself in Japanese culture. As a professional from Bangladesh, this was my first time visiting Japan, making the experience particularly significant.

The centerpiece of my participation was the presentation of my research paper titled "Corrosion Resistance of Historic Kalurghat Bridge." This paper addresses critical issues related to the preservation of historical infrastructure, a topic of relevance both in Bangladesh and globally. The tour offered not only a platform to share my findings with an international audience but also a chance to gain feedback from distinguished professionals and researchers.

Japan, known for its innovative approach to civil engineering and resilient infrastructure, served as an ideal backdrop for exploring cutting-edge technologies and methodologies. From its highspeed rail networks to its earthquake-resistant structures, Japan exemplifies the pinnacle of engineering excellence. As I embarked on this tour, my goals were to absorb as much knowledge as possible, build a network with global peers, and bring back valuable insights to apply in my own work in Bangladesh.

Throughout the course of the tour, I participated in various activities, including visits to research institutes, attendance at symposium, and discussions on future projects with fellow engineers. These experiences offered a comprehensive understanding of how cultural values and technical expertise converge in the field of engineering. The report highlights these activities in detail, reflecting on the profound impact they have had on my professional development and perspective.

Preparations and Departure

Preparations began well ahead of the tour, including travel arrangements and finalizing my presentation materials. I departed from Bangladesh on the evening of August 31, 2024, filled with anticipation for both professional and cultural discoveries.

The preparations for the JSCE study tour were both exciting and rigorous, involving multiple facets to ensure a successful and enriching experience. As the tour approached, I dedicated significant time to polishing the presentation of my research paper, "Corrosion Resistance of Historic Kalurghat Bridge," aiming to convey its findings compellingly to an international audience.

Travel Arrangements:

My journey to Japan commenced with meticulous planning. I secured a flight with Thai Airways, a carrier renowned for its service and efficiency. The itinerary included a scheduled transit at Suvarnabhumi Airport in Bangkok, Thailand, before continuing to Tokyo. This routing provided a brief glimpse into yet another vibrant Asian nation, albeit from within the confines of the airport.

Logistical Preparations:

In addition to travel arrangements, I ensured all logistical details were addressed. This included acquiring the necessary travel documentation, such as a visa for Japan, and confirming accommodations both in Tokyo and Sendai. I coordinated these aspects well in advance to avoid last-minute complications and to focus on the academic and professional aspects of the tour.

Cultural and Professional Preparations:

To maximize the impact of my visit, I engaged in cultural preparations by learning basic Japanese phrases and understanding cultural norms, aiming to show respect and appreciation for local customs. Professionally, I researched the organizations and locations included in the tour itinerary, such as the JSCE Headquarters and Tohoku University, to better understand their contributions to the field of civil engineering and align my areas of interest accordingly. And saved them on google map. Also downloaded the map for offline use.

Departure Experience:

On August 31, 2024, I embarked on the first leg of my journey. Arriving at Hazrat Shahjalal International Airport with a mix of anticipation and excitement, I completed check-in procedures and boarded the Thai Airways flight. The first segment to Bangkok was smooth, allowing some time to relax and review my presentation materials. During the transit at Suvarnabhumi Airport, I took the opportunity to explore the airport amenities and reflect on the upcoming experiences in Japan.

After a brief layover, the final flight to Narita Airport in Tokyo marked the beginning of what promised to be a transformative professional journey. Throughout the flights, I was filled with a sense of eagerness to engage with peers and leaders in civil engineering, as well as to absorb new

knowledge and cultural experiences that Japan had to offer. Each step in the preparation and departure process was carefully curated to optimize my readiness for the multifaceted learning opportunities awaiting me in Japan.

Arrival at Narita Airport

Arriving at Narita International Airport on September 1, 2024, marked the official commencement of my journey into Japan—a country synonymous with innovation and meticulous precision, both virtues that were evident from the moment of touchdown.

First Impressions:

Narita Airport, a bustling gateway to Tokyo, stands as a testament to Japan's efficient approach to infrastructure and traveler convenience. The airport is characterized by its clean, organized spaces and cutting-edge facilities, providing a warm and welcoming atmosphere for international visitors. Despite being one of the busiest airports worldwide, it operates seamlessly, reflecting the meticulous planning Japan is known for.

Customs and Immigration:

Navigating through customs and immigration was remarkably smooth. Procedures were handled with precision and courtesy, showcasing the hospitality embedded within Japanese culture. The efficiency in processing entry formalities left a lasting impression, as staff members were both professional and helpful, ensuring that all necessary checks were completed swiftly.

Facilities and Amenities:

The airport offers a wide array of amenities catering to travelers' needs. From currency exchange counters to SIM card kiosks, the availability of services aimed to facilitate a comfortable transition into the country. Signage in both Japanese and English ensured clarity, making it easy to locate important facilities such as baggage claim, restrooms, and transportation links.

Transportation to Tokyo:

After retrieving my luggage, I proceeded to arrange transportation to central Tokyo. Narita Airport is well-connected to the city via various rail and bus services, including the Narita Express and Airport Limousine Bus, offering flexible options based on time and budget preferences. I opted for the Narita Express, which provided a comfortable and efficient journey into Tokyo, allowing me to enjoy scenic views of the Japanese landscape as I approached the city.

Cultural Encounters:

Even within the airport, glimpses of Japanese culture were abundant. Traditional art displays and informative panels about Japan's history and landmarks offered an enriching experience, setting the stage for the cultural immersion that awaited beyond the airport's confines.

Overall, Narita Airport served as a fitting introduction to Japan—exemplifying the seamless blend of tradition and modernity, precision and hospitality. This welcoming experience at Narita set a

positive tone for the rest of my stay, reinforcing my eagerness to delve into the multifaceted experiences that the JSCE study tour promised.

型, 角, 岩, 角, 等等势扩高, 省, 常, 车, 柴, 路線ネットワ 聖/董/黃/柴/ 照/ 柴/ 唐/ 畫/ 黃 /雷/昌/智 4/團 開設 O RULE

eチケット控え / eTicket Receipt

			発行日 PRINT DATE: 29JUL24
お名前 NAME	AHMED/MD HACHNAYEN MR	航空券番号 TICKET NUMBER	217-5499303541
発券航空会社 TICKETING AIRLINE	THAI AIRWAYS INTERNATIONAL	発券事業所 TICKETING PLACE	16305181
予約番号	TG/5CLXSX 1A/5CLXSX	発券日 TICKETING DATE	29JUL24

旅程/ITINERARY

日時		都市/空港	便名/予約クラス	座席	予約	備考
01SEP(SUN)	02.45	DHAKA HAZRAT SHAH IAI AL INTI	TG340 / W	29H	OK	FR:WLASVEN
01521 (5011)	02.45	TERMINAL 2	THAI AIRWAYS IN	TERNATIO	NAL	NVB/NVA:01SEP/01SEP
01SEP(SUN)	06:15	BANGKOK SUVARNABHUMI INTL				BGG:20K
01SEP(SUN)	07:35	BANGKOK SUVARNABHUMI INTL	TG676 / W	51D	OK	FB:WLASVFN
			THAI AIRWAYS IN	TERNATIC	NAL	NVB/NVA:01SEP/01SEP
01SEP(SUN)	15:45	TOKYO NARITA INTL				BGG:20K
		TERMINAL 1				
06SEP(FRI)	17:25	TOKYO NARITA INTL	TG677 / W	50F	OK	FB:WLASVFN
		TERMINAL 1	THAI AIRWAYS INTERNATIONAL		NVB/NVA:06SEP/06SEP	
06SEP(FRI)	21:55	BANGKOK SUVARNABHUMI INTL				BGG:20K
06SEP(FRI)	23:50	BANGKOK SUVARNABHUMI INTL	TG339 / W	49C	OK	FB:WLASVFN
			THAI AIRWAYS INTERNATIONAL		NVB/NVA:06SEP/06SEP	
07SEP(SAT)	01:25	DHAKA HAZRAT SHAHJALAL INTL				BGG:20K
		TERMINAL 2				

B: 運貨獲別(FARE BASIS) / BGG: 無料手荷物許容量(FREE BAGGAGE ALLOWANCE) / NVB/NVA: 有効期限(NOT VALID BEFORE/NOT VALID AFTER)

Updated 2024/08/13

Data		Agenda Accommodation		Merno
Sept 1 (Sun)	РМ	Arrive at Narita Int'I Airport in Japan •13:40 from Mongolia •15:45 from Thailand •15:45 from Bangladesh •20:00 from the Philippines		
Sept 2	AM	Arrive at Narita Int'l Aircort. Japan •6:20 from Myanmar	•Hotel Intergate Tokyo Kyobashi 3-7-8 Kyobashi, Chuo-ku, Tokyo Tel: +81-(0)3-5524-2929 <https: tokyo-kyobashi="" www.intergatehotels.jp=""></https:>	
(Mon)	РМ	Go sigthseeing in Tokyo		
Sept 3	AM	Orientation and lunch at the JSCE HQ in Yotsuya, Tokyo		JSCE HQ Yotsuya 1-chome, Shinjuku, Tokyo
(Tues)	PM	Visit Kajima Technical Research Institute, and travel to Sendai, Miyago by Shinkansen train in the evening.		Tel: +81-(0)3-3355-3452 <https: about="" access="" www.jsce-int.org=""></https:>
Sept 4	AM	Attend 2024 JSCE Annual Meeting at Sendai Intil Center	• Sandai Kokusai Hotal 4–6–1 Chuo, Aoba-ku, Sendai, Miyagi	S <u>ondai Int'l Contor</u> <http: english="" www.aobayama.jp=""></http:>
(Wed)	РМ	Lunch at the venue Go to a field trip in Sendai City by a chertered bus: %Great East Japan Earthquake Heritage Sites: Arahama Elementary School and Minami Gamo Wasterwater Treatment Center	300-0021 Tel: +81-22-268-1112 <htps: hotel="" japan="" send_ai-kokusai-<br="" sendai="" www.japanican.com="">hotel></htps:>	HOTEL METROPOLITAN SENDAI <https: sendai.metropolitan.jp=""></https:>
Sept 5	АМ	Participate in the 28th International Summer Symposium, 2024 JSCE Annual Meeting •Venue: Tohoku Univ., Kawauchi Campus		Tohoku Univ. Kawauchi Campus <https: en="" www.tohoku.ac.jp=""></https:>
(Thurs)	PM	Participate in the 28th International Summer Symposium 2024 JSCE Annual Meeting Attend the IAC Networking Reception in the evening.		< https://www.tohoku.ac.jp/en/about/map_directi ons.html>
Sept 6	АМ	Return to Tokyo by Shinkansen from Sendai Station at 9:00. • Some go to Nartia Int'I Aiport via Tokyo Station, and some spend one night in Tokyo to take a flight back home.	s Matel Integrate Tolon, Kuokashi	
(Fri) PM		-Leave for the Philippines at 13:15 -Leave for Mondfila at 14:40 -Leave for Bangladesh at 17:25 -Leave for Thailand at 17:25		
Sept 7 (Sat)	AM	Return home via Tokyo Int'i Airport •Leave for Myanmar at 10:35		

Travel arrangement: IAC in cooperation with SOUBUN. COM

Travel assistant to be decided.

Ref. the Great East Japan Earthquake

① Densho Road (伝承ロード): https://www.thr.mlit.go.jp/shinsaidensho/kids.html

② Reconstruction Agency (復興庁): https://www.reconstruction.go.jp/english/index.html

Day 2: Exploring Yokohama and Odaiba

Initially, my second day (September 2, 2024) in Japan was planned to include a scheduled event in Tokyo as part of the JSCE study tour. However, due to a typhoon, the planned activities were canceled, prompting a change in itinerary. This unexpected development provided an opportunity for personal exploration, a decision shaped by the valuable guidance of my Professor Dr. A.F.M. Saiful Amin, who was staying in the same hotel, just a floor above my room.

Consultation and Planning:

Seeking to make the most of the unforeseen free day, I reached out to Prof. Dr. Amin for suggestions. During our dinner meeting, he recommended visiting two notable areas known for their innovative development on reclaimed land: Yokohama and Odaiba. Both locations not only showcase Japan's impressive infrastructure but also its ability to blend modernity with natural beauty.

Day – 02: Concluding Thoughts:

The day concluded with a sense of fulfillment, having explored two dynamic areas that exemplify Japan's innovative urban development. The guided explorations through Yokohama and Odaiba not only revealed stunning examples of engineering and planning but also underscored the cultural richness and versatility of Japan's urban landscapes. This unplanned day of exploration turned into a rewarding adventure, setting a positive tone for the rest of my study tour.

Day 3: September 3, 2024 – STG Orientation, Kajima Technical Research Institute, and Journey to Sendai

The third day of the JSCE study tour was packed with enriching activities designed to deepen our understanding of international civil engineering practices and foster collaboration across cultures. The day was structured around three main events: an orientation session at the JSCE Headquarters, a technical visit to the Kajima Technical Research Institute, and travel to Sendai via Shinkansen.

Morning: STG Orientation and Lunch at JSCE Headquarters, Yotsuya, Tokyo

We began our day at the JSCE Headquarters in Yotsuya, Tokyo, with the STG Orientation session. Assoc. Prof. Tetsuhiro Ishizaka delivered a comprehensive presentation on the International Scientific Exchange Fund, tracing the history of the STG and providing insights into its objectives and milestones. His presentation highlighted the initiative's role in promoting global partnerships and the importance of such collaborations in advancing civil engineering practices worldwide.



Photo: STG Orientation Program

Alongside Assoc. Prof. Tetsuhiro, Yukiko Shibuya san and Koji Ara san from the JSCE International Activities Center were present. They contributed to a vibrant discussion session, where they elaborated on the upcoming technical tours and addressed any questions from participants, enriching our understanding and aligning expectations for the rest of the tour.



a) Assoc. Prof. Tetsuhiro

b)STG Ambassadors & c) Presentation discussion Participants

Prior to lunch, we engaged in a collaborative session to discuss our individual presentations. Each participant shared their draft presentation, allowing for peer feedback and suggestions that would improve and refine our final delivery. This session fostered a supportive environment for exchange of ideas and constructive critique.



Photo: Discussion on paper & presentation

Afternoon: Visit to Kajima Technical Research Institute

After a communal lunch, we departed for the Kajima Technical Research Institute. Renowned for its state-of-the-art research in construction technology, the institute offered us a glimpse into the cutting-edge developments shaping the future of civil engineering. Upon arrival, photography was prohibited to ensure confidentiality and focus on the immersive experience.

KAJIMA CORPORATION		14:00 ~ 15:15	Facility Tour • Shaking Table Laboratory • Base Isolation Building : completed 1986 • Structural Testing Laboratory • KAJIMA CONCRETE BASE (Exhibition room) • KOLabo (Exhibition room)
	AGENDA		
	September 3, 2024		施設見学 ・振動実験棟 ・免震建物:1986 年竣工
13:30 ~ 14:00	Introduction of KaTRI (incl. movie presentation) 研究所概要紹介(研究所紹介ビデオ上映)		・構造実験棟 ・KAJIMA CONCRETE BASE(展示室) ・KOLabo(展示室)
		$15 \cdot 15 \sim 15 \cdot 30$	0&A



Photo: KAJIMA Complex (Source: Scanned from brochure)

The visit commenced with a welcome session that included an informative movie presentation outlining Kajima's history, its pioneering projects, and ongoing research. Following this introduction, a staff member led us through a detailed facility tour. Highlights of the tour included:

The Shaking Table Laboratory



High Performance 3-Dimensional Shaking Table System



The new high-performance 3-D shaking table system provides the Japan's best performance in reproducing the large earthquake motions observed in Japan in recent years. The system also possesses the capability of producing the world's largest amplitude of displacement in longperiod motion.

Source: https://www.kajima.co.jp/english/tech/katri/research/fac_shindou/index.html

Configuration

The key design of the system is the double-deck shaking tables configuration; the larger, main table is to reproduce usual earthquake ground motion and the smaller, upper table, which is detachable, is to reproduce large amplitude displacements of a super high-rise building caused by long-period ground motion.



Shaking Table System (Small table attached)



Demonstrative Experiment (Longperiod Motion)

Features

Large Table

- 5 m x 7 m flatbed table with the rated load capacity of 600 kN
- Capable of reproducing virtually all the earthquake motions with large displacements observed in Japan in recent years

Small Table (detachable)

- Specifically designed to reproduce large amplitude displacements of the upper floors of a super high-rise building in long-period ground motion
- Capable of reproducing large amplitude displacement of up to 2.7 m in combined operation with the main table

Environmental Concerns

The entire shaking table system is mounted on the floating foundation made of 40,000 kN of reinforced concrete block, which is isolated from the outer structure by numbers of oil dampers and air springs in order to minimize the propagation of vibration to the residential neighborhood.

[Source: https://www.kajima.co.jp/english/tech/katri/research/fac_shindou/index.html]

Specifications

		Large Table	Small Table
Table Size		5 m x 7 m	2 m x 2 m
Rated Loading Capacity		600kN	50 kN
	Horizontal	2.0 g	0.5 g
Max Acceleration	Vertical	2.0 g	-
Max Velocity	Horizontal	200 cm/sec	250 cm/sec
	Vertical	100 cm/sec	-
May Displacement	Horizontal	X:±50 cm Y:±70 cm	±200 cm (X: ±250 cm Y: ±270 cm) *
Max Displacement	Vertical	±30 cm	- (±30 cm) *

* in combined with the main table

The Shaking Table Laboratory, where seismic simulations are conducted to test building resilience. One of the standout experiences during our visit to the Kajima Technical Research Institute was the exploration of the Shaking Table Laboratory. This facility exemplifies Japan's cutting-edge approach to research in seismic engineering, an area of particular importance given the country's seismic activity.

Introduction to the Facility

Upon entering the Shaking Table Laboratory, we were greeted by an impressive setup that includes one of the most advanced seismic simulation platforms in the world. The introduction, conducted by Kajima's knowledgeable staff, provided an overview of the laboratory's capabilities and its role in advancing building safety and design resiliency. The shaking table itself is designed to simulate earthquake conditions with high precision, allowing for the testing of structures and materials under controlled seismic stress scenarios.

Demonstration of Seismic Simulations

During our visit, we witnessed a live demonstration of the shaking table in action. The simulation replicated the movements and forces experienced during Kobe earthquake magnitudes of 7.2 (Richter scale) with damping and without damping. It was fascinating to observe real intensity of an earthquake with damping and without damping. Illustrating the importance of robust design and the effectiveness of various construction techniques. Kajima's research enables the development of buildings that can withstand seismic forces, minimizing damage and ensuring safety during real earthquakes.

Experiencing the Large-Size Structural Laboratory at Kajima Technical Research Institute

During our insightful visit to the Kajima Technical Research Institute, we had the unique opportunity to explore the Large-Size Structural Laboratory, a pivotal facility in advancing structural engineering research. This laboratory is equipped to conduct large-scale loading tests, critical for understanding the behavior of structural elements under significant stresses.

New Large-size Structural Laboratory



This testing laboratory, which is used to examine the strength and quake-resisting behavior to be applied in civil engineering and various other construction works, strongly justifies the use of the term "Kajima:The High-Technology Corporation".

Understanding the Facility

The laboratory is renowned for its expansive reaction wall and reaction floor, which facilitate the testing of large structures under controlled conditions. These features enable researchers to apply complex load combinations to structural components, mimicking real-world forces they would experience, such as those in seismic events, high winds, or other demanding conditions. The ability to conduct these tests at a full scale differentiates this facility from many others, providing results that are directly applicable to real-life engineering challenges.

Applications and Implications

This facility plays a crucial role in gathering basic information that directly informs civil engineering and construction practices. The data acquired here are applied to diverse structures, from high-rise buildings to marine structures and nuclear facilities. Importantly, the laboratory allows for the clarification of quake-resisting behavior, insights that can only be obtained through rigorous experimental procedures.

The results from these experiments provide foundational data that significantly contribute to achieving designs with high reliability. For instance, by understanding how large panel elements behave under different stressors, engineers can design safer and more efficient structures. Moreover, these insights are invaluable for developing new technologies and innovative materials, pushing the boundaries of what is currently achievable in structural engineering.

Tour of the Base-Isolated Acoustic Laboratory Building

We began our tour in the base-isolated acoustic laboratory building, a 2-story reinforced concrete structure supported by 18 specialized elastomeric bearings. Kajima's base isolation system is distinct due to its use of unfilled, steel-laminated elastomeric bearings reinforced with steel bars for enhanced damping. These bearings are engineered to exhibit more flexibility in the vertical direction compared to other systems used throughout Japan, with a vertical isolation frequency set at 5 Hz. This low frequency is crucial as it is specifically designed to provide effective isolation from not only seismic activity but also microtremors and ambient ground vibrations.

Closing Reflections

The experience at Kajima's Base Isolation Building was profoundly educational, offering a comprehensive look at state-of-the-art seismic isolation technologies. It underscored the importance of cutting-edge research and innovative engineering solutions in safeguarding structures from natural hazards. Kajima's commitment to developing and implementing effective seismic isolation systems significantly contributes to the field, providing reliable and adaptable solutions essential for enhancing the resilience of infrastructure in earthquake-prone areas. This visit was not just an observation of technical prowess but a deep dive into how engineered solutions can profoundly impact safety and stability in a challenging natural world.

Visit to Kajima Concrete Base

During our insightful tour of the Kajima Technical Research Institute, a notable highlight was the visit to the Kajima Concrete Base, a museum dedicated to the innovations and advancements in concrete technology. This unique museum provides a comprehensive exploration of the various concrete products developed through Kajima's extensive research and development efforts.



Photo: Kajima Concrete Base (Source: https://www.kajima.co.jp/english/tech/c_sus_con/index.html)

The tour concluded with a Q&A session, offering us an opportunity to delve deeper into the technicalities of Kajima's research projects and clear any uncertainties regarding their applications and outcomes.

Evening: Travel to Sendai, Miyagi via Shinkansen

As the day drew to a close, we transitioned to our travel segment aboard the Shinkansen to Sendai, located in Miyagi Prefecture. The Shinkansen experience was remarkable; it exemplified the efficiency and sophistication of Japan's rail network. The journey provided a moment of reflection on the day's insights while observing the picturesque Japanese landscapes whizzing by.

Day – 03: Conclusion

Day 3 was an intensive yet inspiring day, marked by intellectual engagements and hands-on learning. The balance of theoretical orientation, practical exposure, and peer interaction provided a holistic view of Japan's contributions to civil engineering and underscored the importance of cross-cultural and international collaborations in addressing global challenges in our field. This set the stage for continued exploration and learning in the days to follow.



Photo: 2nd day at JSCE HQ



Photo: 2nd day Technical Tour at KAJIMA (Bottom)

Day 4: September 4, 2024 – JSCE Annual Meeting, Technical Tour of Earthquake Heritage Sites, and Dinner Party

Morning: Attending the IAC discussion session

Venue: 2F, Sakura 1, Sendai International Center Theme: "Junctions, Paths, and Future ~ Paradigm Shift ~"

Our fourth day in Japan began with attending the Attending the IAC discussion session at the Sendai International Center. The conference featured a series of keynote speeches, panel discussions, and technical sessions covering a wide spectrum of topics, including sustainable infrastructure, disaster resilience, and cutting-edge construction technologies. The diversity of presentations reflected the multi-faceted challenges and advancements facing the civil engineering industry today. Networking opportunities abounded, allowing us to connect with peers and leaders, fostering discussions that enriched our professional perspectives and broadened our understanding of global engineering practices.



Photo: IAC Discussion at Sendai International Center

Afternoon: Technical Tour of Great East Japan Earthquake Heritage Sites



Post-conference, we embarked on a poignant technical tour to understand the impact of the Great East Japan Earthquake and subsequent recovery efforts. Our first stop was Arahama Elementary School, a preserved site that stands as a powerful reminder of the 2011 disaster. Here, we learned about the evacuation strategies used during the tsunami and the school's role in saving lives. This site offered deep insights into emergency preparedness and the importance of community-based responses during natural disasters.



Photo Source: Scanned from Brochure Provided at Plant.

Next, we visited the Minami Gamo Wastewater Treatment Center, which showcased resilience in infrastructure design. The center's ability to remain operational during and after the disaster was a testament to Japan's forward-thinking engineering. This part of the tour emphasized the significance of resilient infrastructure in disaster-prone areas and provided practical lessons on integrating resilience into engineering designs.

The technical tour not only highlighted the physical infrastructure changes but also the socioeconomic recovery efforts, underlining the essential role of civil engineering in community resilience and rehabilitation.

Visit to Sendai City Minami Gamo Wastewater Treatment Plant

Our first stop was the Sendai City Minami Gamo Wastewater Treatment Plant, which played a crucial role during and after the earthquake and subsequent tsunami. The facility is a testament to engineering resilience, having endured one of the most challenging natural disasters with minimal downtime.

During our visit, we were briefed on how the plant's design and infrastructure contributed to its resilience. The plant incorporates advanced engineering features that allow it to withstand extreme environmental conditions. We learned about the plant's strategic design, including elevated facilities and protective barriers that helped mitigate flood damage. This visit underscored the importance of robust infrastructure and adaptive strategies in ensuring continuity of critical services during and after disasters.

3 Damage to sewerage works in the Great East Japan Earthquake

	Type of facilityTreatmentplant, etc.SewagNo. of facilitiesNo. of affected facilitiesTotal length	Treatmentplant, etc.		Sewage pipes		
Works		Length of pipes affected	Population ratio			
Public sewerage system	Treatment center	5	4	=		
	Pumping station	236	55			
	Government building, etc.	3	1	4,476km 94km		98%
Other		1,239	166	116km	8km	2%
Tot	al	1,483	226	4,592km	102km	100%

Damage to sewerage works in the Great East Japan Earthquake (as of December 2012 approximate figure

Photo Source: https://sendai-resilience.jp/en/efforts/practice/practice_08.html

In addition to the structural insights, discussions with onsite engineers highlighted the swift recovery actions taken to restore full operational capacity. The plant's ability to quickly resume services was pivotal in the broader community recovery efforts in Sendai, emphasizing the role of infrastructural resilience in disaster management.



Photo: Minami Gamo Wastewater Treatment Plant engulfed by the tsunami (March 11, 2011)





Photo: Pumping Station No.3 at Minami- Photo: Ruins of the whole village kept for Gamo Wastewater treatment plan, which was distorted

learning to the world

Ruins of the Great East Japan Earthquake: Sendai Arahama

Following our visit to the wastewater treatment plant, we proceeded to the Arahama area, which bore significant devastation during the 2011 disaster. The preserved site offers a poignant reminder of the earthquake's impact and the subsequent tsunami, serving both as a historical testament and an educational resource.

The Arahama area features ruins and displays that document the sheer force of the disaster and the extent of its impact on the local community. Exhibits include photographs and personal stories of residents, providing a deeply human context to the physical destruction.

Unfortunately, time constraints meant that we couldn't visit the Arahama Residential Foundation, as it closed at 4 PM. Despite this, the partial exploration offered invaluable lessons about the importance of readiness, resilience, and rapid response in minimizing disaster impacts.

Concluding Thoughts

The technical tour of the Great East Japan Earthquake heritage sites provided critical insights into disaster resilience and recovery. The experience at the Minami Gamo Wastewater Treatment Plant alone highlighted how thoughtful engineering and design can dramatically reduce disaster vulnerability.

These visits illustrated the broader implications for civil engineering: designing infrastructure that not only serves routine functions but also withstands and recovers from extreme events. This knowledge underscores the critical role civil engineers play not just in construction, but in safeguarding communities against future hazards.

Evening: Dinner Party by JSCE at HOTEL METROPOLITAN SENDAI

The day concluded with a formal dinner party hosted by JSCE at Hotel Metropolitan Sendai. This evening event was a blend of relaxation and professional networking, offering a chance to reflect on the day's learning experiences and to forge deeper connections with fellow engineers and experts.



Photo: The Kagami-biraki ceremony at Dinner Party

The dinner featured a selection of Japanese cuisine, allowing us to indulge in local flavors while engaging in stimulating conversations. The atmosphere was vibrant, filled with exchange of ideas, shared reflections on the day's events, and discussions about future collaborations. The gathering was an excellent reminder of the tour's central goal: to build international ties that transcend borders through shared professional interests and mutual respect.

Conclusion

Day 4 was marked by a blend of reflection, learning, and cultural exchange, effectively framing the importance of resilience in engineering through both academic discussions and real-world examples. It not only added depth to our understanding of disaster recovery but also strengthened the camaraderie among international counterparts, setting a positive tone for future engagements and collaboration in civil engineering.

Day 5: September 5, 2024 – Presentation and Networking at Tohoku University

The fifth day of the JSCE study tour marked the culmination of our official activities, filled with academic engagement and enriching networking opportunities. As the final day of the tour's structured events, it was dedicated to both showcasing our work and fostering professional connections.

Morning: Participation in the 26th International Summer Symposium, 2024 JSCE Annual Meeting

The day began with our participation in the 26th International Summer Symposium, a highlight of the 2024 JSCE Annual Meeting, hosted at Tohoku University's Kawauchi Campus. This significant event brought together emerging engineers and researchers, providing a platform for presenting innovative ideas and research findings.

My presentation session was scheduled to allow for a concise delivery of my research on "Corrosion Resistance of Historic Kalurghat Bridge." The presentation allotted me a strict seven minutes to present my findings followed by a three-minute Q&A session.

During my presentation, I focused on the key aspects of my research, emphasizing methodologies, results, and implications for preserving historical infrastructure. The session concluded with insightful questions from the audience, which allowed for a brief yet engaging exchange of ideas. This opportunity granted me invaluable feedback, highlighting potential areas for further research and application.



Photo: Presentation Session at Tohoku University's Kawauchi Campus



Photo: JSCE Tour Grant Participants at Tohoku University's Kawauchi Campus

Afternoon: STG Meeting at Café Mozart Klee's Office

Following the presentations, I attended an STG (Scientific and Technical Group) meeting, accompanied by my professor, at the cozy and inviting Café Mozart Klee's Office. This meeting served as a debrief and reflection on our experiences during the tour.

The informal setting of the café facilitated open discussions about the insights gained from the various technical and cultural activities. We shared observations, challenges, and future aspirations, deepening our understanding of how the lessons learned could be applied in both our academic and professional endeavors. The meeting emphasized the STG's commitment to fostering ongoing exchange and collaboration among its members.

Evening: IAC Networking Reception at Kitchen Terrace Couleur

The official activities concluded with the IAC (International Activities Center) Networking Reception held at Kitchen Terrace Couleur. This reception provided a relaxed and engaging environment for all participants, including engineers, academics, and industry professionals from various countries.

The evening was a blend of networking, delicious food, and camaraderie. Conversations ranged from professional discourses to cultural exchanges, highlighting the diverse backgrounds and experiences of the attendees. This setting was perfect for building connections, discussing potential collaborations, and reflecting on the shared experiences of the tour.



Photo: STG Participants at IAC Networking Reception at Kitchen Terrace Couleur

Conclusion

Day 5 was a fitting conclusion to the official activities of the JSCE study tour, characterized by intellectual engagement, collaborative discussions, and the strengthening of international ties. The combination of academic presentations, collaborative meetings, and networking opportunities underscored the tour's success in fostering a learning environment that extended beyond technical knowledge, encouraging cultural understanding and professional growth. These final activities served as a catalyst for future collaborations and continued engagement within the global civil engineering community.

Conclusion of the JSCE Study Tour

The JSCE study tour has been a transformative experience that offered an in-depth exploration of Japan's innovative civil engineering practices and resilience strategies. Through this journey, I have gained invaluable insights and firsthand exposure to advanced technologies and methodologies, which will be essential in shaping my future research and professional pursuits.

The comprehensive STG program provided a multifaceted understanding of civil engineering's role in addressing critical challenges, notably through its focus on seismic resilience, sustainable construction, and infrastructural innovation. Interacting with esteemed professionals and fellow participants during the 26th International Summer Symposium fostered a dynamic exchange of ideas, enhancing my perspective on global engineering solutions.

The exposure to cutting-edge research at facilities like the Kajima Technical Research Institute has enriched my understanding of material sciences and structural integrity, particularly in harsh environmental conditions. This knowledge will directly contribute to advancing my research by informing new techniques and strategies for improving the longevity and resilience of historical structures against corrosion.

Moreover, the experiences at the Minami Gamo Wastewater Treatment Plant and the earthquake heritage sites in Sendai underscored the importance of designing infrastructure resilient to natural disasters. These insights are pivotal as I consider the broader implications of my research for infrastructure preservation and disaster preparedness, both critical considerations for historical sites like the Kalurghat Bridge.

As I return to my research projects and career pursuits, the technical and conceptual experiences from the STG program will be instrumental in guiding innovative approaches and enhancing my contributions to the field of civil engineering. The connections formed and the knowledge gained will serve as a foundation for future collaborations and endeavors, inspiring ongoing professional growth rooted in the lessons and relationships fostered through this exceptional opportunity.

My plan to share my Experience with my peers & followers

01	Detailed written Report about the STG Program in English will be submitted to the ISEF by October 1, 2024.	Completed
02	Distribution of reports to my faculties, colleagues and peers at IEB, BUET-JIDPUS and my office	Expected to Complete by November 2024
03	Posting social media and write a series of blog posts documenting each phase of the study tour.	Continued Till December 2024
04	I will present my report in the upcoming conference organized by Civil Engineering Division, IEB this year to engage and inform a broader audience through an interactive and visually engaging presentation.	DatetobeestablishedbasedonCivilEngineeringJivision, IEB
05	Also, I have plan to organize a seminar on civil engineering career session at CADD CORE Training Institute where I will present my experience gained STG by JSCE.	Seminar plan to held by October
06	Organize a seminar on civil engineering career session at BUET-JIDPUS where I will present my experience gained STG by JSCE.	Seminar plan to be held by January 2025