

## **JSCE Study Tour Grant 2009 Report**

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It was a pleasure for me to receive the 2009 Japan Society of Civil Engineers (JSCE) Study Tour Grant (STG), which is one of the grants under the Fund for the International Cooperation and Exchange of Engineers. I was nominated the Engineering Institute of Thailand under H.M. The King's Patronage (EIT). I wish to express my deepest appreciation to both societies, JSCE and EIT, for providing me the opportunity to study the latest technology and science of civil engineering in Japan. During September 6-12, 2009, I have been accompanied by JSCE staff members to visit various construction sites, research institutes and university. The concise report on my visits is given as follows:

### **Public Works Research Institute**

Public Works Research Institute (PWRI), another Independent Administrative Institution of Japan in Tsukuba. Dr. Kazunori WADA, Director, Planning and Research Administration Department of the Institute introduction about the activities and the administration of the Institute. The Institute has a long history of more than 85 years as a government research institute for inclusive research and development on Civil Engineering. PWRI is the largest institute in the field of Civil Engineering in Japan to perform research civil engineering technologies. PWRI conducts fundamental and applied research in such fields as Road Technology Research, Structures Research, Hydraulic Engineering Research, Water Environment Research.

Dr. Kazunori WADA selected four laboratories for me first He took me to the a Pavement test field and then I went to Dam Hydraulic Laboratory. Mr.Hitoshi UMINO, Senior

researcher, River and Dam Hydraulic Engineering Research Team, described about the types of dam used in construction i.e. Rock fill Dam, Concrete Gravity Dam. After that I went to the Earthquake Engineering Laboratory. Dr.Susumu Nakajima, Researcher, Soil Mechanics and Dynamics Research Team, described about Large Scale Three Dimensional Shaking Table. Also, it was an interesting experience to stand on the large table. Finally I went to the Structural Dynamics Laboratory. In these laboratories I also witnessed some dynamic loading tests of the old bridge deck by using quick repeated loading of vehicle types of H20 type loading.

### **Kajima Technical Research Institute (KaTRI)**

Kajima Corporation established the first construction research institute of Japan in 1949. It was Kajima Technical Research Institute, and “Turning dreams into reality” for creating harmony between people and the environment. KaTRI is help the company create even better and more comfortable environments. At present, KaTRI have a modern instruments and machines in the fields of structural testing, dam construction technology, large underground storage tanks for liquefied natural gas, earthquake and micro tremor isolation systems, high-strength, high-fluidity and high performances concrete, advanced shield excavation techniques, building construction control system and others.

Dr. Tsuyoshi Ikeya, General Manager, Civil Structural Group took me around and we visited some laboratories of the institute. He explained me the present activities and use of the laboratories.

In complexes of KaTRI, I can visit some laboratories. First I visited the Large-Structure Testing Laboratory. Where I saw a testing of large-scale composite beam column structure. Then I visited Wind-Tunnel Laboratory, An actual three-story building with base isolators and dampers to resist earthquake damage.

## **Obayashi Corporation**

At Obayashi Head Office in Shinagawa Intercity Tower. Mr.Satoru Kawauchi, Deputy General Manager, Business Development Department, described about Obayashi Overview that provided me with a view of the Corporation's wide construction activities in big scale projects from public buildings, office buildings, educational facilities, commercial facilities, logistics centers & laboratories, plants, houses, railways, roads, power plants and include a lot of projects in Thailand such as SIAM PARAGON and Toyota Motor Thailand Co., Ltd (Ban Pho Plant).

## **Disaster Reduction and Human Renovation Institution (DRI)**

In this place I have learned about the effects of the Great Hanshin-Awaji Earthquake and lessons learned from the experience that should be shared with younger generations. DRI also works to communicate expertise and knowledge to the public in an easy-to-understand manner so as to help our cities, communities and ourselves become better prepared against disaster. Such efforts are based on the idea that disaster risk management and mitigation requires involvement not only of the national and local governments but also of local communities and individuals.

## **Akashi-Kaikyo Bridge**

Akashi-Kaikyo Bridge was completed in 1998, and is the largest suspension bridge with center span of 1,991 meters (6,532 feet), spans at 960 meters at each side of the central span, and a vertical clearance of 65.72 meters below. The bridge was designed to withstand winds of 286 KPH, earthquakes measuring 8.5 on the Richter Scale, and harsh sea currents. The two main supporting towers rise 298 meters above sea level, and due to temperature, the bridge can expand up to 2.0 meters. The total cost of construction is estimated at 500 Billion Yen. For the bridge to last at least 200 years, a technology has been developed using "dry air injection system for main cables of suspension bridges" in order to protect the main cable from corrosion by drying the inside of main cable.

## **Himeji Castle**

Himeji serves as an excellent example of the prototypical Japanese castle, containing many of the defensive and architectural features most associated with Japanese castles. The tall stone foundations, whitewashed walls, and layout of the buildings within the complex are standard elements of any Japanese castle. One of Himeji's most important defensive elements, and perhaps its most famous, is the confusing maze of paths leading to the main keep. The gates, baileys, and outer walls of the complex are organized so as to cause an approaching force to travel in a spiral pattern around the castle on their way into the keep, facing many dead ends. This allowed the intruders to be watched and fired upon from the keep during their entire approach.

## **Tokyo International Airport (Haneda Airport) Expansion Project**

Haneda Airport is currently undergoing major extension works, which all has to be performed among busy air traffic. The expansion at Haneda is a remarkable project aimed at increasing the air and ground transportation network, solving problems with aircraft noise, and effectively using waste disposal material from the Tokyo area.

An extensive land reclamation and Pile Structure are made, Runway D (Runway length 2500 m.) and New International Terminal Area. The complex works are performed by a number of contractors, one of which is Kajima. I was taken on an interesting half day tour around the enormous site. All works have to be made through full operation of the busy existing airport.

## **Waseda University**

Waseda University is a private university located in Tokyo. Founded in 1882 as Tokyo Senmon Gakko, the institution was renamed "Waseda University" in 1902. It is known for its liberal climate symbolized by the motto *independence of learning*. I have been introduced to Department of Civil and Environmental Engineering in the Graduate School of Engineering.

Dr. Tomoya SHIBAYAMA, Professor of Civil and Environmental Engineering, introduction about the major activities and took me to the advanced facilities such as faculty offices, classrooms, conference rooms, laboratories of this department.

### **11th International Summer Symposium at Tokyo Institute of Technology**

The International Summer Symposium provides a platform for international students and engineers to present, discuss and exchange their research interest in English. International students and engineers are strongly encouraged to participate in the Symposium. From last time, full papers will be reviewed. Organized by The International Activities Committee (JSCE). During the 11th International Summer Symposium, I have participated in Keynote Lecture “Creativity Developing Education at Tokyo Tech” and Tour all around Tokyo Institute of Technology.

Finally, I would like to thank The Engineering Institute of Thailand under H.M. The King’s Patronage for choosing me to this Study Tour, organizers of Study Tour and all other people who supported me all the way including:

Prof. OTSUKI Nobuaki, Dr. IKEYA Tsuyoshi(International Scientific Exchange Fund Committee,JSCE), Mr.YANAGAWA Hiroyuki (International Affairs Section,JSCE), Dr. Tomoya SHIBAYAMA(Waseda University), Dr.Kazunori WADA, Mr.KAWAKAMI Atsushi, Mr.Hitoshi UMINO, Dr.Susumu Nakajima, Mr.Naoki YANADORI, Mr.SATOU Yoshiaki (Public works Research Institute), Dr.Sivaleepunth Chunyakom(KaTRI),Mr.Satoru Kawauchi(Deputy General Manager, Obayashi Corp), Mr.LEE Tun Sub, Mr.Min Htoo (Student of Tokyo Institute of Technology).

### STG Schedule during Sep. 6-12, 2009

Date	Time	Destination to visit
Sep. 6	A.M.	Arrival: Narita International Airport/ TG 640
	P.M.	Move to Tokyo
		Check in Mitsui Garden Hotel Yotsuya
Sep. 7	A.M.	<b>Visiting to JSCE</b>
	9:30	Pick up
	10:00-10:20	Guidance
	10:20-10:50	Lecture by Prof. Otsuki
	10:50-11:00	Discussion
	11:10-11:50	Lunch
	P.M.	<b>Visiting to PWRI</b>
	11:50-13:30	Move to PWRI
	<b>13:30-16:35</b>	<b>Tour of PWRI</b>
	16:50-19:00	Return to Tokyo
	19:00	Arrive at Hotel
Sep. 8	A.M.	<b>Kajima Technical Research Institute</b>
	8:30	Pick up
	9:30	Arrive Tobitakyu Station.
	A.M.	Visiting to Kajima Technical Research Institute
	12:00-12:40	Lunch
	P.M.	<b>Obayashi Corp.</b>
	12:40-14:00	Move to Obayashigumi Corp.
	14:00-16:00	Visiting to Obayashigumi Corp.
	17:30-19:00	Move to Kobe
	18:30	Arrive Nshi-Akashi Station.
	19:00	Arrive at Hotel
Sep. 9	A.M.	<b>Visiting Disaster Reduction and Human Renovation Institution</b>
		Lunch
	P.M.	<b>Visiting Akashi-Kaikyo Bridge</b>
		<b>Tour of Himeji Castle</b>
	15:00-15:45	Move to Himeji Castle
	15:45-17:00	Visiting Himeji Castle
	17:44	Dep. Himeji Station.
	20:53	Arrive at Tokyo Station.
21:30	Arrive at Hotel	

<b>Date</b>	<b>Time</b>	<b>Destination to visit</b>
Sep. 10	<b>A.M.</b>	<b>Visit at construction site of Haneda Airport</b>
	8:30	Pick up
	9:45	Arrive Haneda Airport
	10:00-12:00	Visit to construction site
	12:30-13:30	Lunch
	<b>P.M.</b>	<b>Waseda University Prof. Shibayama Lab.</b>
	13:40-14:45	Move to Waseda University
	15:00-16:30	Waseda University Prof. Shibayama Lab.
	16:30	Dep. Waseda University
	17:30	Arrive at Hotel
Sep. 11		<b>11th International Summer Symposium</b>
	8:30	Pick up
	9:00-9:50	Move to Tokyo Institute of Technology
	10:00	Opening Ceremony of Summer Symposium
	11:00-12:00	Tour of Tokyo Institute of Technology
	12:45-14:15	Lunch
	<b>13:20-14:40</b>	<b>Keynote Lecture, STG Report</b>
	14:55-18:10	Session3,4
	18:30-20:00	Party
	21:00	Arrive at Hotel
Sep. 12	<b>A.M.</b>	Check out
	<b>P.M.</b>	Returning to Bangkok, Thailand/Departure: Narita International Airport/TG677