Japan Society of Civil Engineers
International Activities Committee

Newsletter

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The 2011 Earthquake off the Pacific Coast of Tohoku (The Great East Japan Earthquake) The damage by the tsunami on the coast of Miyagi Prefecture (Flash Report)

Photo credits : Professor Fumihiko Imamura,
Associate Professor Shunichi Koshimura,
Assistant Professor Kentaro Imai, Tohoku University
Author: The JSCE Secretariat

An earthquake which centered off the coast of Sanriku occurred around 2:46p.m. on March 11, 2011, and very strong tremors were measured in the vast area, at the level of seven on the Japanese intensity scale in Kurihara City, Miyagi Prefecture, upper six in Miyagi, Fukushima, Ibaragi and Tochigi, and lower six at Chiba, Saitama, Iwate and Gunma. Magnitude 9.0, announced by the Japan Meteorological Agency, was the greatest in recorded history in Japan, and a great number of aftershocks occurred as well.

Soon after the earthquake, a great tsunami occurred off the coast of the Pacific Ocean and inflicted enormous damage on the coast of the Pacific Ocean from the Tohoku region to the Kanto region. As of 7 p.m. on April 13, the number of death has reached 13,392 and 15,133 people are still unaccounted for. (According to the National Police Agency)

The Japan Society of Civil Engineers (JSCE), in response to this disaster, created a task force on March 11, on March 18, the directors board approved the establishment of Special Committee on the Great Disaster and started to consider dispatching an investigative team, and on March 23, the joint communiqué by the presidents of three societies, i.e. the Japanese Geotechnical Society, the City Planning Institute of Japan and JSCE, was issued. Here, this article is to introduce what the tsunami disaster was like on the coastal area of Miyagi Prefecture, by showing the photos provided by the Tsunami Engineering Laboratory, Disaster Control Research Center, School of Engineering, Tohoku University.

Photo 1 – The town hospital on a hill seen from the Onagawa Port. The tsunami overflowed the hill, reaching the first floor of the hospital. (Photo taken by Associate Prof. Shunichi Koshimura)

Photo 2 – Viewing the ocean from Onagawa Bypass, Onagawa Town. This is the highest place that the tsunami reached in Onagawa. The ocean is viewed way far-off. (Taken by Associate Prof. Shunichi Koshimura)

Photo 3 – A reinforced concrete building that fell down in Onagawa. It is considered that the bearing power of the piles was lost by the earthquake and it fell down by the tsunami which came subsequently. Until then concrete buildings had been believed to be able to withstand tsunamis. You can see an automobile which was drifted onto the roof of the building in the back. (Taken by Associate Prof. Shunichi Koshimura)

Photo 4 – The damage situation of the coastal levee of the Birds Ocean and the coastal forest. The coastal levee and the coastal forest were expected to keep off tsunamis and mitigate damages, but the damage was too ruinous this time. In the picture, the seawater remains in the ground scoured by the tsunami. (Taken by Assistant Prof. Kentaro Imai)

Photo 5 – Flooded Sendai Plains in the vicinity of Tobu Road. The flooded area spread more than 4 km inland from the coast. Rubbles of the destroyed houses were drifted and you can see some grease floating on the surface of the remaining water. (Taken by Associate Prof. Shunichi Koshimura)

Photo 6 – A dock at the back of Kesennuma Bay (Minami-machi). The tsunami flooded up to the 2nd floor. It flooded up to the Kesennuma City Office. (By Shunichi Koshimura)

Photo 7 – The damage situation at the Shikaori District of Kesennuma City. Large fishing vessels and other things destroyed the protection line of the coastal levee, which is seen in the front of the photo, and were drifted deep onto the city area. In addition to the boats and ships, oil tanks, lumber, farming rafts, vehicles that were washed away by the tsunami are part of the factors that spread the devastating damage. (By Professor Fumihiko Imamura)

Photo 8 – Taken from the hilltop of Minami-sanriku-cho. Almost all the buildings were washed away except a number of reinforced concrete buildings on the beach. It was reported that the approximately 75cm-deep ground subsidence occurred in Minami-sariku-cho due to the earthquake. (By Shunichi Koshimura)

Photo 9 – The floodgate of Minami-sanriku-cho. It was expected to be closed and prevent the tsunami from breaking in, but the tsunami exceeded far beyond the height of the floodgate and destroyed the entire town completely. (By Shunichi Koeshimura)

Photo 10 – The damage situation in the Matsuiwa District in Kesennuma City – All the houses were crushed down and only debris are remained. (Taken by Associate Prof. Shunichi Koshimura)

Photo Report from JSCE Magazine

Opening of the Hanshin Expressway No.8 Kyoto Line (Kamogawa-higashi – Kamitoba)

—An urban expressway passing through the crowded city area—

Photo credit: Hanshin Expressway Company, Limited

Authors: Kohei Nanjo, Regular Member, Hanshin Expressway Co., Ltd.
Yasuto Sakai, Member of the Editorial Board

The Hanshin Expressway No. 8 Kyoto Line (Kamogawa-higashi – Kamitoba), 1.9 km long, was opened on March 27, 2011. Thereby, the section from Yamashina to Kamogawa-higasi (Sin-jujo-dori) of the No. 8 Kyoto Line, which had already been placed in service, and the section from Kamitoba to Daini Keihan Road Junction (Abura-koji Line) of the No. 8 Kyoto Line were directly connected, which has greatly improved the accessibility to the eastern part of Kyoto, to the southern part of Kyoto and also to Osaka.

Out of the total 1.9 km, which was extended this time, 1.8 km is the section of steel girder that adopted weather proof steel in full, and positively adopted a rational structure combining the steel-concrete composite slab and the narrow box girder type.

Since this section which was opened this time is crossing important structures such as the Kintetsu Kyoto Line, which is now in operation, and major arterial roads such as National Road No. 24, Kuzebashi-dori, Aburakoji-dori, and the Hanshin Expressway No.8 Kyoto Line Kamitoba Entrance, it was constructed with a method to minimize the effects on the surrounding areas as well as the traffic by adopting the large block erection method and the incremental launching method.

Since this particular section is now under construction with two lanes temporarily, considering the maintenance and inspection after its full opening, introduced LED road lighting which lasts long with good durability and with little power consumption for the entire section, which contributes to the reduction of carbon-dioxide emissions.

Photo 1: Viewing the Higashiyama mountain range from on this road

Photo 2: A steel fastening structure unifying the girder and the pier, and a narrow box girder was partially adopted.

Photo 3: The erection of the bottom steel plates of the composite slab.

Photo 4: Unifying the girder height, considering the continuity since it passes along the Kamo-gawa River.

Photo 5: LED road lighting which was adopted for the arterial road of expressways for the first time in Japan.

Photo 6: The construction of the No.8 Kyoto Line (Kamogawa-higashi – Kamitoba) that pass through the city area.

Photo 8: The erection by the large block construction method at the crossing of the National Road No. 24 Kamogawa West Entrance.

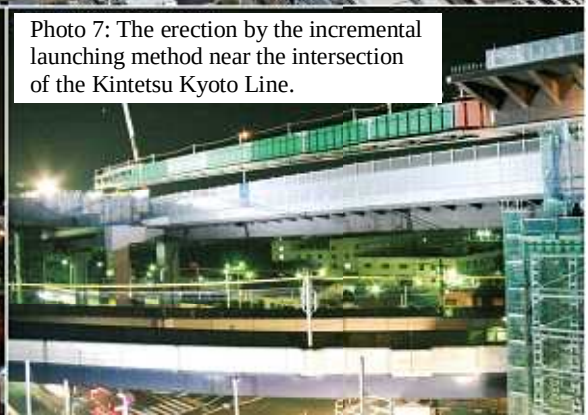

Photo 7: The erection by the incremental launching method near the intersection of the Kintetsu Kyoto Line.

Report of the 13th International Summer Symposium

Date: Friday, 26 August 2011
Venue: Uji Campus, Kyoto University

The Thirteenth International Summer Symposium organized by the International Activities Committee of JSCE (Chair: Prof. Tamon Ueda, Hokkaido University) was held at Uji Campus, Kyoto University on 26 August 2011. The symposium is held annually so as to provide an opportunity to exchange information and ideas associated with various aspects of civil engineering among international students and engineers, including Japanese. Another objective of the symposium is to promote international exchange and mutual understanding between international communities and Japanese students and engineers. The symposium started in 1999 and has received high reputation as a valuable opportunity for exchanges among students and engineers in English. In the symposium proceedings, papers through full review process are inserted.

The Thirteenth Summer Symposium was supported by the International Scientific Exchange Fund, JSCE. The symposium was aided by the two Kyoto University Global COE programs, Global Center for Education and Research on Human Security Engineering for Asian Megacities, and Sustainability/Survivability Science for a Resilient Society Adaptable to Extreme Weather Conditions.

The number of attendants of the symposium was 124 (foreign students / engineers: 75; Japanese students / engineers: 14; Committee members and others: 35). This year's keynote lecture was given by Prof. Hitoshi Furuta, Kansai University and the former chair of International Activities Committee of JSCE, entitled "Applications of Soft Computing in Civil Engineering". In the technical sessions, 77 technical presentations from 7 areas in civil engineering were presented. The symposium was brought to a close with the Reception where there were lively exchanges between the participants. The "Certificate of Excellence" was awarded, during this reception, to 19 speakers for their outstanding papers and presentations.

The award winners are: Rajendra Soti (The University of Tokyo) / Shanker Dhakal (Ehime University) / Rusnardi Rahmat Putra (Kyoto University) / Sherliza Zaini Sooria (Kyoto University) / Sha Lou (Nagasaki University) / Manojkumar Langhi (Kyoto University) / Khoi Nguyen Dao (University of Yamanashi) / Netrananda Sahu (Kyoto University) / Nguyen Hoang Duc (Tokyo Metropolitan University) / Seto Wahyudi (The University of Tokyo) / Deepak Raj Bhat (Ehime University) / Mohsin Usman Qureshi (The University of Tokyo) / Rama Mohan Pokhrel (Saitama University) / Muneyoshi Numada (The University of Tokyo) / Esmael Mohamed Omer (Institute of Transport Policy Studies) / Yong Wu (Nagoya University) / Usman Akmal (Yokohama National University) / Yunjing Wang (Nagoya University) / Xin Tian (Nagoya University)

Photo 1 Technical session

Photo 2 The award winners

(Keiichi Toda, Chair, Organizing Committee of the Thirteenth International Summer Symposium, JSCE)

Student Network

In Winning the Future

Since the Great East Japan Earthquake struck on March 11th, 2011. I have visited several times of the damaged areas along the Japan's coastline as part of my research program. Except the priceless of human casualties, the economic loss caused by the damage of infrastructures is another blow for Japan's fragile economic. It was hard to believe that infrastructures made by massive concrete and steel structures were stumbled easily by nature forces from Earthquake and Tsunami.

Japan is an exceptional nation when it comes to the comprehensive infrastructure facilities and its technology from highways, railways, ports, bridges etc. Japan fully understands that infrastructures across the nation are essential for their economic strength. Like no other countries, infrastructures in Japan were designed to deal with disastrous nature forces such as earthquakes and typhoons. Therefore makes Japan a frontier in advance infrastructure technology and envied by other countries.

Unlike Japan, Indonesia, the country where I belong, is fallen behind in terms of the development in infrastructure facilities among other nations. The fact is inconvenient to see since Indonesia's current economic holds the highest GDP with robust growth among the Southeast Asian countries. Particularly in engineering point of view, infrastructure development in Indonesia is facing setbacks primarily due to their geographical conditions and lack of research/expertise. Therefore, the

awareness of each fellow countryman in human capital investment is the answer resolving technical difficulties and winning the future.

By: Wahyudi, Seto
(PhD student, The University of Tokyo)

Foreign Student from Pakistan

In the 13th International Summer Symposium of Japan Society of Civil Engineers, held in Kyoto, I was honored with the "Award of Excellence" for the best presentation in the session of "Rock Engineering and Foundation Engineering". I obtained my Ph.D. from The University of Tokyo in 2011, under the supervision of Prof. Ikuo Towhata, who leads a dynamic research group of Geotechnical Engineering and a highly equipped laboratory for advanced experimental research. The most recent equipment, "Temperature Controlled Triaxial" whose development involved my technical contribution, serves as to reproduce the physical weathering process of soft rocks.

I am always inspired by the diverse Japanese culture and super-modern infrastructure, during my five years of stay in Japan. As a civil engineer, I not only get versed with the knowledge but my exposure to the great projects and interaction with best professors of the world, brought me up as nation builder for my country.

The recovery of Japan after the great disaster of March 11 has inspired the whole world and set an example for the nations tackling with natural disasters. I myself wish to play an important role in the future research related to the geotechnical problems faced by Japan during and after the earthquake. An increase in slope disasters is observed after the East Japan Earthquake, which will continue for long duration. This is a present problem to the seismically disturbed slopes after the 2005 Kashmir earthquake in Pakistan which is affecting the local roads and infrastructures. Therefore, it needs to be investigated in detail.

I extent my gratitude to MEXT, Gov. of Japan, for financial assistance during my studies in Japan and appreciate the efforts of JSCE to bring together young civil engineers on one platform for valuable discussions.

By Qureshi Mohsin Usman
(Asst. Prof., The Univ. of Wah, Wah Cantt, Pakistan)

Japan, JSCE and Me!

To me, a guy from a little village in the country of Nepal and more importantly with an uneducated-to-very-less-educated as well as financially challenged family background, the only option to survive and progress in life was to study well at any cost. It was either to get scholarship in succeeding class/level/degree or to get employed easily afterwards purely based on the academic achievements, offsetting from the disadvantages, for instance, of any family recommendation (so called power!). Following my majoring in Science (especially Physics) and Mathematics during the Secondary and Higher Secondary Schooling, I had developed an amazing interests and habit of going logically deeper and deeper into matters to grasp the root cause/reason interpreted in terms of mathematics or mechanics!

My enthusiasm for research was almost dying by the middle of 2009 and I was almost making a mind of not trying anymore for my higher education abroad toward feeding my mind with the joys of research. Surprisingly, I never ever made up a mind, to try elsewhere except Japan despite the failures – probably I was born to study in Japan anyhow! Meanwhile, I was selected for a scholarship in Special Course in Disaster Mitigation Study for Asian Students at Ehime University (EU), where I had applied for with a kind correspondence of Asst. Prof. Dr. Netra Prakash Bhandary. Accepting my destiny, I finally compromised and ended up with Ehime. I still had a sincere hope that I would be saving some money and, primarily, would be doing excellence with my research working extra-hard in an environment amidst the expert Japanese professors.

I remember the very day, the 22nd of September 2009, when I landed onto Japan at Kansai International Airport. I also remember quite well my answer to a question by Dr. Bhandary on how I was feeling while crossing a bridge over sea by bus. "It's wonderful! Heavenly beautiful!". As such I was viewing a sea-landscape crafted with such a mind-blowing architecture and civil/structural engineering for the first time. Finally, I reached my destiny, Ehime/Matsuyama.

Photo: A Section from Matsuyama Castle, a typical Japanese castle and my ever 'close friend' standing over the tall rock-fill walls (By my wife, Ar. Sweta Acharya/Dhakal)

While searching for more hopes, and importantly, to fulfill the gap of social life cum professional exposure that I acutely lacked at Ehime, I decided to work in an organization Nepal Engineers' Association – Japan Center (NEA-JC) being in some active position, and I fortunately got to work as Secretariat in its 2010/2011 tenure. Furthermore, I decided to travel many places in Japan to make Japanese technology my close and inspiring "friends". Continuing life in Japan hygienically had been more important for me than to save any money from my little scholarship. Innocently speaking, do not have even one hundred thousand yen in my account collected in this more than two and years of stay in Japan unlike many international students as I know. Anyway, Tokyo Sky-tree, Disney Land; Ginkakuji Temple in Kyoto; Kobe Earthquake Memorial Museum, Earthquake Memorial Park at Awaji Island; Onaturo Whirlpool; mega bridge systems joining Shikoku and Honshu islands; Tottori ski-tour; Hiroshima Peace Memorial Park, Yamato Museum at Kure; Fukuoka City and Tower; Sakamoto Ryoma Memorial Museum in Kochi; and last but not least, my ever 'close friend', Matsuyama Castle, are indeed amongst the most important images of Japan that are stamped so impressively onto the diary of my mind. I hope all these impressions shall be of some benefit while I work as a structural engineer or educator or planner for the infrastructural development of Nepal in future.

During my tenure in NEA-JC, I could closely learn about many of the nice programs of JSCE. Very recently, I have been fortunate enough to participate in the Annual International Roundtable Meeting of JSCE held at Ehime University as a delegate on behalf of NEA and NEA-JC. I learnt a great deal on the global experience regarding the PPP policies and guidelines for project implementation including a typical scenario of Japan. I could also share my tiny observation of the deficiency of effective and skilled peer-review body for the implementation and evaluation of big and important projects such as high-rise buildings in Nepal, which I learnt while working as the Joint-Secretary of Structural Engineers' Association- Nepal (SEA-Nep) before I came Japan.

Not only did I benefit from JSCE that way, I have benefited much more by participating in the various annual conferences of JSCE and its Shikoku Branch. Most significantly, for its 13th International Summer Symposium last August at Kyoto University, I submitted a 4-page manuscript. My paper was reviewed by two anonymous referees. In addition to important email-based suggestions from Prof. Lam as well as Dr. Volkwein who I share my relevant problems with at times, I got very nice criticisms and suggestions from the symposium referees. The comments have been, in fact, guiding me until today. I continued trying my best to follow all the comments I had received. Until the day of symposium, I was much improved and confident. My efforts were paid off – I got one of the best presentation awards (certificate of excellence) of structural engineering!

Overall, I am thankful to Japan, JSCE, and all who directly or indirectly supported my tiny research on "Modeling and Analyses of a Newly Developed Rockfall Protective Cable-Net-Brake Structural System" conducted at Geo-Disaster Research Laboratory of Ehime University. If I am asked to share my experience in very brief to my junior friends, I would say, "Whilst you continue to struggle to get what you are looking for, accept your destiny and try to make the best use of your current opportunity!"

By: Shanker Dhakal
(Ehime University)

Send your comments and suggestions to: iad@jsce.or.jp
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