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Japan Society of Civil Engineers

International Activities Center

IAC News No.54

Expectation upon 5th Anniversary of IAC

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This April is the fifth anniversary of JSCE IAC. When the International Activities Center (IAC) started, the organizational structure related to international activities was completely reshuffled, the number of full time staff and the budget for international activities of JSCE was doubled and tripled, respectively. I believe that JSCE presence in international scene has been strengthened significantly during last five years. The English website of JSCE that used to be the English page of JSCE international section, has gradually become the English page of the entire JSCE website. IAC newsletter published quarterly is now published monthly together with several special issues. Before IAC was set up, JSCE only had a regular joint event with overseas institutions with Agreement of Cooperation (AOC institutions) at JSCE annual conference. At present JSCE has a number of regular events with six associations in China, Korea, Mongolia, Myanmar, Taiwan and Vietnam. A series of seminars as educational program for engineers aiming to work under international environments hosted by JSCE is increased to two after IAC started. Under the initiative of IAC, “Associate Member” category, taking into consideration benefits and interests of international members residing overseas has been introduced. It is expected to enhance international member network gradually.

During the last five years JSCE has made a firm step forward as mentioned above. This is just one step though. Information dissemination in English is still far less than that in Japanese. The regular joint activities are rather limited to technical presentations. I am not saying that all the activities in JSCE should be in English. However, civil engineering in Japan is very international in its nature. Civil engineering in Japan, which is significantly advanced due to its harsh natural environments, should be applied to other countries, especially less developed countries as the role of civil engineering. More sustainable infrastructures, which is more resilience against natural disasters and durable against environmental actions, can be achieved by the advanced technology in civil engineering. For this great purpose, JSCE together with Japanese civil engineers should attempt to take a much greater role in the world. This attempt is necessary for construction industry in Japan, which has continued to be shrinking.

What is the efficient way for JSCE to take a greater international role? One of the pillars among JSCE activities is technical activities by permanent committees, currently 28. A certain fraction of these technical committee activities should be designated as international ones. Once it is designated as international, the committee activities should be open to international members and conducted in English partially/fully. By doing so information dissemination in English would increase naturally and the regular joint activities with AOC institutions will change to include joint publications of technical documents, such as state-of-the art reports and standards. They can serve as record of the activities and at the same time contribute to the society more efficiently and widely. These technical activities can be carried out under collaboration with international organizations.

JSCE should provide financial and logical support. What is suggested here is my own rather than JSCE official one, however a similar concept is written in the JSCE statement to set up IAC. I believe that JSCE can set it as the long-term goal. During the next five years, I would like to see a step towards this goal, which is “10%” of technical activities designated as international.

New Administration of Asian Civil Engineering Coordinating Council (ACECC)

Asian Civil Engineering Coordinating Council (ACECC) the umbrella organization of civil engineering organization in Asia was established in 1999. JSCE the one of the three co-founders of ACECC has been taking an active role in developing ACECC since then.

The governing body of ACECC is Executive Committee (EC), which consists of the representatives nominated by member societies/institutions. Under the EC, as referring to the Asian Civil Engineering Coordinating Council Constitution, CECAR Local Organizing Committee (LOC), Planning Committee (PC), Technical Coordinating Committee (TCC), and Finance Committee (FC) are set up, and these committees except the LOC hold meetings at Executive Committee Meeting which is generally held twice a year.

The Organization of ACECC Administrative

*CECAR: Civil Engineering Conference in the Asian Region

The objectives of the Council are as follows:

1. To promote and advance the science and practice of civil engineering and related professions for sustainable development in the Asian region.
2. To encourage communication between persons in charge of scientific and technical responsibility for any field of civil engineering.
3. To improve, extend and enhance activities such as infrastructure construction and management, preservation of the precious environment and natural disaster prevention.
4. To foster exchange of ideas among the member societies/institutions.
5. To cooperate with any regional, national and international organizations to support their work, as the ACECC deems necessary.
6. To provide advice to member societies/institutions to strengthen their domestic activities.
7. To achieve the above objectives, international conferences called the Civil Engineering Conference in the Asian Region (CECAR) will be held on a triennial basis as the main activity of the ACECC.

*The above is excerpts from the Asian Civil Engineering Coordinating Council Constitution

As for the triennial CECAR, offer to host the CECAR will be sent by a member societies/ institutions to the ECM. Any member of the member societies/ institutions are entitled to offer to host the conference. If offers made by more than one member societies/ institutions, the EC requests them to present a proposal at the

Executive Committee Meeting (ECM), and then decides the host by majority vote. The term of host is basically three years, spanning between two CECARs; accordingly, the host with the ACECC flag is handed over to the next one at the time of CECAR.

CECAR 7 was held in Honolulu, Hawaii, August 31-September 2, 2016. At the closing ceremony, Mr. Mark W. Woodson, the President of ASCE which hosted the CECAR 7, handed over the ACECC flag to Dr. Tamiharu Tashiro the President of JSCE the next CECAR host. At the same time, the following representatives were appointed to the ACECC Chair and the EC: Dr. Osamu Kusakabe (International Press-In Association) as ACECC Chair, Mr. Masayasu Kayano (Kajima Corp.) as The Chair of CECAR 8 Local Organizing Committee, Dr. Mitsu Okamura (Ehime University) as The Chair of Planning Committee, Mr. Masaaki Nakano (Nippon Koei Co., Ltd.) as the Chair of Technical Coordinating Committee, and Mr. Jeffery R. Howard (Engineer Australia) as the Chair of Financial Committee. Dr. Kenichi Horikoshi (Taisei Corp.) would continue to serve as Secretary General of ACECC.

Dr. Osamu Kusakabe
(International Press-In Association)
ACECC Chair

Mr. Masayasu Kayano
(Kajima Corp.)
The Chair of CECAR8
Local Organizing Committee

Dr. Mitsu Okamura
(Ehime University)
The Chair of
Planning Committee

Mr. Masaaki Nakano
(Nippon Koei Co., Ltd.)
The Chair of Technical
Coordinating Committee

An interview to Dr. Horikoshi is published in the IAC News No. 52, in which he outlines the ACECC and talks about his hopes and wishes for CECAR 8. Please take a look at the newsletter on the JSCE HP (Japanese: http://committees.jsce.or.jp/kokusai/node/26; English: http://www.jsce-int.org/pub/iacnews/52).

Completing the construction work for Ethiopian National Trunk Road 3

Mr. Tomoyuki Ogawa
(Kajima Corporation)

The construction work for Ethiopian National Trunk Road 3 started in 1999 as a project financed by a grant from the government of Japan and completed full construction of 294km from Addis Ababa, the capital of Ethiopia, to Debre Markos in 2016. In this brief report, we will look back the construction work of the National Trunk Road 3 over the period of 17 years.

The Federal Democratic Republic of Ethiopia is vastly highland area and the altitude of construction site was between 1,000m and 3,100m above sea level. National Trunk Road 3, which starting point is situated in Addis Ababa, is a principal road, running through 3 northwest agriculturally important states, an inflow channel for petroleum products from neighboring country, Sudan, and an

outflow channel for daily necessities.

The Completed Trunk Road 3

For Ethiopia that is landlocked, improving National Trunk Road 3 which connects to a neighboring country, Sudan, has been their longtime hope because of the overwhelmingly expected economic effects derived from the active commodity distribution of agricultural products or petroleum. Once in several years, Ethiopia was devastated by drought and hit by severe food shortage. Although grain-growing regions in the North were fertile, foods were not distributed to drought-stricken regions in the South due to a traffic congestion caused by undeveloped roads. By the completion of improvement works for the National Trunk Road 3, more efficient distribution of foods from the North to the South are expected.

One of the key elements that made the construction work continue over a period of 17 years was to cultivate local staff that was the center of the construction work. Not only exchanging skills and techniques between Japanese and Ethiopian staff, but also transferring them among local staff took place smoothly. At monthly safety meetings, the purpose of this project, safety-first policy, and the contribution to a local community were explained with time and care to local staff. As a result, Japanese method of management for measures to improve black cotton soil was learned and shared among those involved in the construction work and techniques were also carried on. At the height of construction work, over 1,000 workers were engaged.

As mentioned above, our contribution to the economic development in Ethiopia was highly valued and led to receiving an award for distinguished service from engineer association.

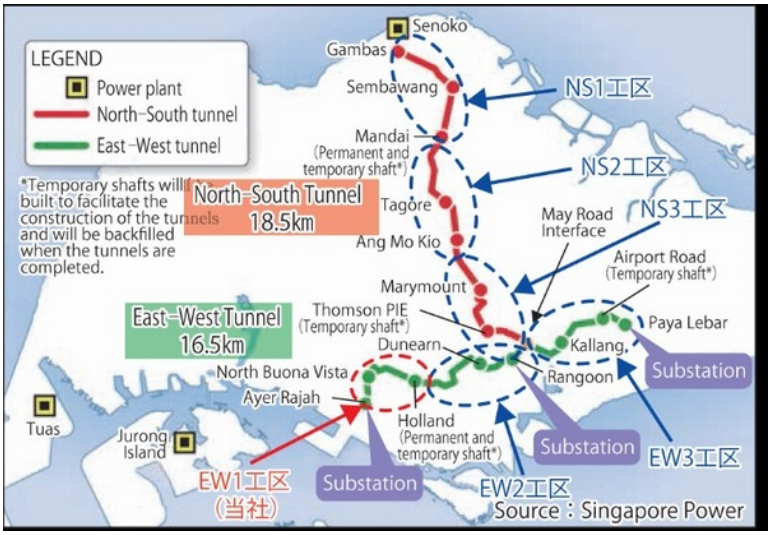
Full View of an Ending Point (Downtown Debre Markos)

Deep Underground Cable Tunnel Project in Singapore – EW1 section

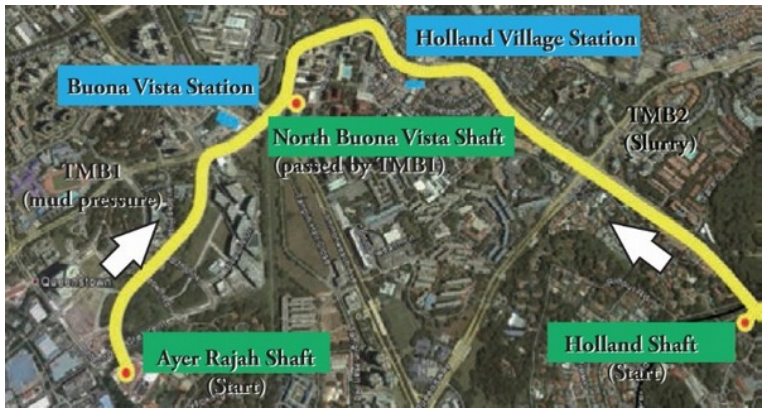
Mr. Toshiya Imazato
(Obayashi Corporation)

The new transmission cable tunnels, which were planned to meet the expected increase in electricity demand in Singapore, are 18.5 km in north-south direction (NS construction packages) and 16.5 km in east-west direction (EW construction packages). EW1 package is located at the west end of the East West Line and its bored tunnel is approx. 4km in length. EW1 started in October 2012 and is scheduled to complete in March 2017. The whole project is planned to complete at the end of 2018. In this highly urbanized city state, various utilities such as gas, water supply, telephone lines, etc. have been embeded underground, and MRT (subway) tunnels have been running deeper because of the developing network. Since it crosses the existing Deep Tunnel Sewerage System (DTSS), the cable tunnel is planned at a depth of 55 m or more, i.e. deeper than the DTSS. The project comprises six design-build packages, awarded to two Japanese companies and three Korean companies.

The tunnels in EW1 were constructed maximum 68 m deep from Ayer Rajah Shaft at the west end and from Holland Shaft at the east end with two TBMs. The TBMs started mining in May and June 2014 respectively, then arrived and connected by underground docking in January 2016. Both of the TBMs were firstly scheduled to be dismantled at North Buona Vista Intermediate Shaft; however, EPB (Earth Pressure Balanced) TBM on the Ayer Rajah side advanced farther after passing the intermediate shaft and the TBMs docking location was arranged under Holland Village MRT Station.



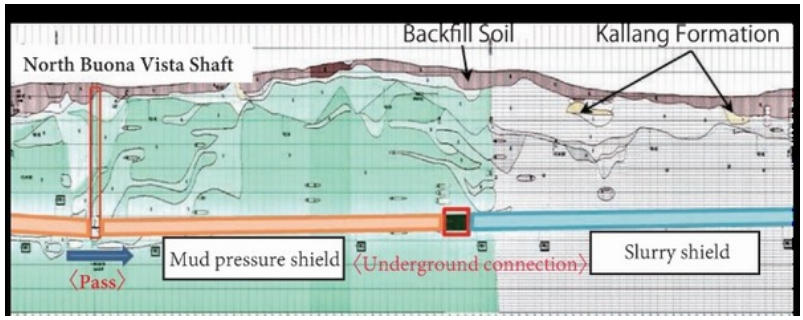
The Location of the Project



The Tunnel Route

The west side ground of EW1 tunnel is sedimentary rocks which is called Jurong Formation (maximum unconfined compressive strength: 78 MPa) and the east side ground is Bukit Timah Granite (maximum unconfined compressive strength: 227 MPa). There are also in part mixed ground condition containing weathered soil layer.

It was necessary to frequently replace roller cutters in the Bukit Timah Granite section in particular. Compressed air facilities and drilling/grouting machines were provided in TBMs as auxiliary facilities for roller cutters replacement, which are the standard facilities for bored tunneling in Singapore. When it was unable to decrease the groundwater inflow to a specified flow with compressed air only, we controlled the inflow of water by called “reverse flow grouting” method, which was devised at one of our bored tunnel construction sites in the USA.



Geological Profile near the Docking Location

The method is that water is injected into the TBM chamber at a pressure higher than the natural water pressure to make water flow towards the surrounding ground cracks, and at the same time cement grout material is discharged to outside of the TBM to naturally flow into the cracks to fill them.

Besides the vertical shafts, adits and bored tunnels as mentioned above, cut & cover tunnel, two ventilation buildings, and one equipment building have been constructed. At this time, M&E works are nearly completed and various testing & commissioning are in progress for handing-over to the Client and other cable laying packages. Since our East Coast Reclamation Project started in 1965, the year of Singapore independence, a lot of projects have been done until now by Japanese contractors. We are happy that EW1 project is now almost completed, and it will also be recorded as one of the successful projects by Japanese contractors here in Singapore.

Updates

◆The summary of feature articles in the April 2017 issue of the JSCE Magazine is available on the JSCE website.
http://www.jsce-int.org/pub/magazine

◆Journal of JSCE
The Journal of JSCE is the collection of research papers which can be viewed on the JSCE website.
https://www.jstage.jst.go.jp/browse/journalofjsce

◆Disaster Fact Sheet
http://committees.jsce.or.jp/disaster/

◆IAC Students and Alumni Network
http://www.jsce-int.org/IAC_network

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§ IAC Facebook §
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Please send us your feedback and comments to help us improve the IAC news. We look forward to hearing from you.
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