

GEOTECHNICAL

The 12th Taiwan Geotechnical Society Conference

A close tie with the Taiwan Geotechnical Society (TGS) has been forged since the GE Division (GD) undertook the Taiwan technical visit in April 2006. During the 16th SEAGC in Kuala Lumpur, Malaysia in May 2007, when TGS and GD delegates met, Ir Albert Ho was invited to give a special lecture at the TGS bi-annual conference. The GD formed a delegation comprising representatives from consultant, government and university to attend the conference.

The conference was held in a hotel at Hsi Tou, a scenic area in Tai Chung. This hotel was almost completely destroyed in 2001 by a debris flow event induced by the intense rainfall from a typhoon and the effect of changes to the hillside features caused by the Chi-Chi Earthquake on 21 September 1999. Arising from this incident were numerous issues on insurance covers against natural disasters, which also bankrupted the previous hotel owner. The new owner spent over US\$100 million to reconstruct the hotel. It was reopened in early 2007. The conference location reminds geotechnical engineers the impact of nature.

The keynote was given by Prof Lee Der-her of the National Cheng Kung University, who summarised previous studies and investigations on the properties of mudstone slopes found in southwestern Taiwan and their significance in geological disasters. He correlated rainfall and temperature data, made comparison with recorded incidents and suggested possible effects from global warming on these slopes.

Two of the three special lectures were given by Dr Woo Siu-mun of Trinity Foundation Engineering Consultant Co Ltd and Prof Ou Chang-yu from Department of Construction Engineering, National Taiwan University of Science and Technology. Both presentations discussed issues related to excavations. Ir Albert Ho presented the last special lecture on landslide risk management and sustainable slope greening approach in Hong Kong. Taiwanese participants had found Hong Kong's systematic approach to landslide risk mitigation to be most impressive with discussions carried on over dinner.

Other conference paper and thesis presentations on topics such as geology and tunnelling, soil mechanics, foundation design, landslide mitigations, excavation and lateral support and construction monitoring were carried out in parallel sessions. Poster exhibitions were also arranged to allow authors to discuss their findings with audiences in greater details. The conference also included some exhibitions by suppliers and manufacturers such as geosynthetics and monitoring techniques. Site visit of debris flow mitigation measures closed to the hotel was organised on 30 August 2007.

The conference concluded with a closing ceremony on 31 August 2007. Vote of thanks was given by Ir Albert Ho with the presentation of souvenirs from the GD.

Technical visit to landslide preventive works site at Po Shan Road - tunnelling by non-explosive methods

The GE Division has organised a technical visit to the works site at Po Shan Road on 25 August 2007. The Po Shan catchment area is affected by high groundwater levels and unfavourable geological conditions. Therefore, landslide preventive works including drainage tunnels and soil nailing are proposed to improve the stability of the Po Shan Area. Major works include 2 numbers of drainage tunnels, driven by a Robbins Hard Rock Tunnel Boring Machine (TBM), with a total length of about 500 m; 200 numbers of sub-vertical drains, a 5 m high flexible barrier with total length of about 130 m, about 1,000 numbers soil nails, 140 numbers raking drains, and rehabilitation of existing surface channels. In the aspects of advance techniques, it is the first project in Hong Kong using high-

pressure water hammer for percussive upward drilling for sub-vertical drain installation with nominal lengths of over 100 m. A wireless real-time groundwater monitoring system has been set-up to closely monitor the site during the construction and commissioning phases.

Ir Andrew Westmoreland, the resident engineer from Maunsell Aecom (Maunsell), briefed the visitors on the tunnelling methods of using TBM and drill and break without using explosive. He presented detailed illustrations to the visitors of the TBM configuration, the lining works for the tunnel, the installation of sub-vertical drains and the construction of the flexible barrier. Technical staff from Fugro Geotechnical Services (HK) Limited presented valuable information about the setting up of real-time monitoring of the groundwater regime of the site. There was a fruitful discussion during and following the presentations. During the discussion, Ir Y C Lam from Maunsell shared the design philosophy and constraints about the project.

Then, Ir Westmoreland took us to visit the on-site real-time groundwater monitoring system and the extensive slope improvement works, the site formation works at the tunnel portal and the mucking out system for tunnel excavation. The visitors got the opportunity to enter the tunnel and took a close look at the TBM, which is being assembled before tunnel excavation. This project will not only improve the long term stability of the Po Shan area against large-scale and deep-seated slope failure, but will also help to minimise slope deterioration and shallow slope instabilities.

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