

Report on AGS (HK) Half-day Seminar on Tunnel Instrumentation

Date: 30 November 2013

This seminar was a follow-up to AGS (HK)'s Tunnel Construction Guidelines 03 - Guidance Note on Tunnel Instrumentation dated November 2013. The seminar was kicked off by Ir Sandy Mackay of Nishimatsu as an introduction to the seminar and then followed by Dr Angus Maxwell of Maxwell Geosystems who gave a comprehensive discussion on the purposes, expectations and limitations of instrumentation. Angus also discussed how instrumentation can be beneficial to construction works and gave a brief introduction on various types of manual monitoring instruments and automatic instruments.

Contributions from other speakers are as below:

(1) Mr Mauro Quieti, SISGEO. Mauro presented several types of instruments and a number of them are not widely used in Hong Kong, such as hydraulic cells for monitoring the load in strutting systems. He also discussed the various types of inclinometer probes and sensors with their costs and accuracies. He gave some very useful advices on good practices in taking monitoring readings.

(2) Mr Mannars Chan, Mannars Chan Surveyors. He presented a case history on his monitoring work for a MTRC immersed tube tunnel for the Central-Wan Chai By-pass project. He discussed how to minimize reading errors for a long tunnel monitoring section and how the monitoring readings can be correlated to construction works such as dredging the fill on the top of the tunnel resulted in a slight heaving.

(3) Mr Suresh Kumar, Geosmart. Suresh presented the practice of installation of groundwater monitoring points with the aid of imageries, and discussed the use of various types of sensors to monitor groundwater levels. He emphasised the importance of having a low permeability grout zone to enclose the piezometers tip to ensure that no groundwater leaks along the instrument.

(4) Ms Ada Chan, Leighton. Ada presented her site experience on the vibration monitoring for the South Island Line Contract 904 project and discussed the statutory requirements on vibration monitoring.

(5) Mr Tony Frame, Gammon. Tony presented the purposes of data logging, and

discussed the use of data loggers and relevant modules for the automatic groundwater monitoring systems with wireless connection at the HATS Stage 2A project.

In the afternoon a site walk was held for the construction site of the MTRC Express Rail Link West Kowloon Terminus, led by Ir William Tai of Maxwell Geosystems and Ada Chan. Two technicians demonstrated how to take readings for an inclinometer by (1) allowing the probe to stabilize for 5 minutes to adjust to ambient temperature; (2) raising the probe at 500 mm intervals; (3) taking data with a digital hand-held readout. Ada, the Geotechnical Manager at this site, explained the current construction progress, challenges encountered and advices on how to manage a vast number of instruments for a large construction site.

To conclude, this seminar gave a good overview on geotechnical instrumentation. Since there are many large-scale, on-going infrastructure projects in Hong Kong, I am looking forward to reading some papers on geotechnical instrumentation and how it can contribute to the implementation/control of construction works and verification of designs.

Fergus Cheng