One-Day Short Course on Slope Safety System in Hong Kong

GEOTECHNICAL ENGINEERING TECHNICAL DIVISION

By Engr. Dr Gue Chang Shin

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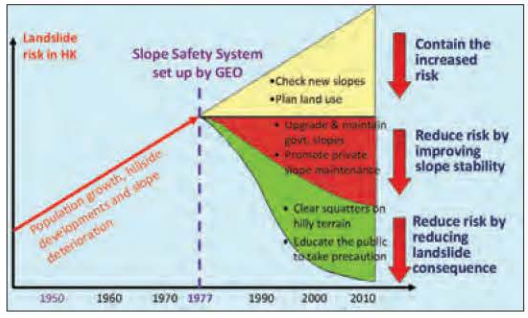
The Geotechnical Engineering Technical Division (GETD) conducted a short-course on slope safety system at Wisma IEM on 8th August 2014. the speaker was Ir. Terence Chan Chun Fai, former deputy Head of the Geotechnical Engineering Office (GEO) of Hong Kong. the workshop session, chaired by Engr. Dr Gue Chang Shin, was attended by 102 participants.

Ir. Chan started the session by saying that landslides had long been a serious problem in Hong Kong which was characterised by hilly terrain, heavy rainfall and dense population. There are many developments built on hillsides. In 1977, the Hong Kong Government set up the Geotechnical Control Office (now called Geotechnical Engineering Office or GEO), to implement a slope safety system. Through the work of the GEO over the years, the landslide risk in Hong Kong has been significantly reduced.

The GEO tackled the problem of slope failures by implementing a comprehensive Slope Safety System in stages. The key strategies in reducing the overall landslide risk in Hong Kong are shown in Figure 1.



Key strategies in reducing landslide risk in Hong Kong

Ir. Chan covered the following key areas in the course: Slope Safety System, Landslip Prevention and Mitigation Programme, Landslip Warning System, Landslide Investigation Programme, Geotechnical Control, Emergency System and Public Education.

He said that in implementing a good slope safety system, it is vital to provide input in the early planning stage to identify geotechnical constraints on land developments. Landslide risk can then be contained by means of geotechnical control and further reduction in risk through stabilisation works and mitigation measures. Furthermore, it is also essential to promote public awareness and response in slope safety through public education, publicity, information services and public warnings.

He also talked about the landslip prevention and mitigation programme (LPMitP) which included the following key areas:

- Improving slope safety standards, technology, and administrative and regulatory frameworks
- Ensuring safety standards of new slopes
- Rectifying substandard Government man-made slopes
- Maintaining all Government man-made slopes and
- Ensuring owners take responsibility for slope safety.

Ir. Chan introduced the concept of a landslip warning system, which incorporated real time rainfall monitoring and forecast, analysis of rainfall and landslide consequences, real time reporting of landslides and emergency services.

The landslide investigative programme consisted of reviews and forensic studies of reported landslides, understanding the causes of landslides and making recommendations. The common contributory factors to slope failures are adverse ground water condition, weak geological materials, inadequate surface drainage provisions, inadequate slope maintenance and leaky water carrying services.

GEO was set up to exercise geotechnical controls over public and private developments to ensure public safety. For private projects, its roles included giving advice on geotechnical constraints, auditing geotechnical design submissions and imposing conditions during development approval. Geotechnical control also included the registration of new slopes and promoting regular maintenance, monitoring

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the performance of special geotechnical installations as well as serving statutory dangerous hillside orders and statutory drainage orders for leaking services affecting slopes. The geotechnical controls for public projects are relatively similar to those for private projects. To further enhance geotechnical controls, the registration of geotechnical engineers was introduced in 2006. This was to ensure that only qualified and experienced geotechnical engineers undertook geotechnical design and construction supervision.

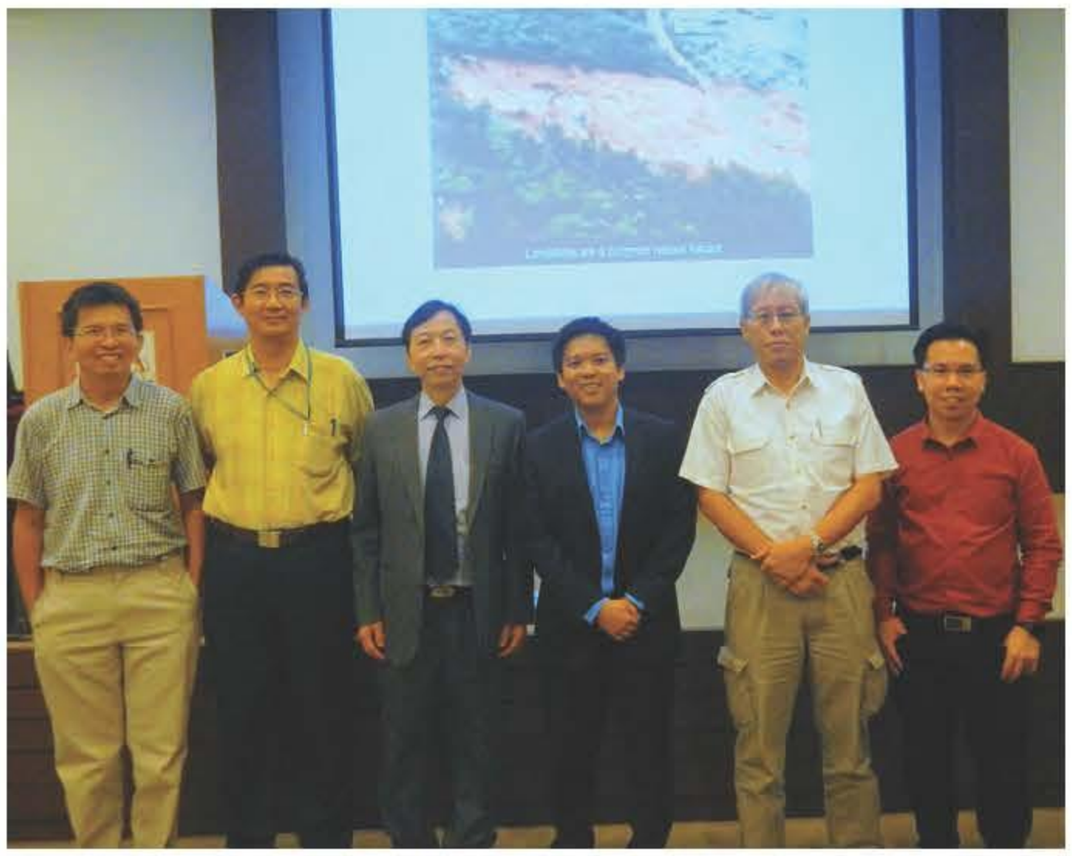
GEO's emergency roles include deciding when a landslip warning should be issued or cancelled, maintaining a 24-hour service to provide advice to government departments on immediate or potential dangers due to landslides and measures to deal with the situation.

Landslides are classified into different categories based on degree of seriousness, and follow-up works are carried out, including a rescue phase and a restoration phase. Training and drills are conducted to ensure that emergency services personnel are always prepared for any eventuality.

It was highlighted that public education and awareness are vital in maintaining a slope safety system. The strategies of public education include fostering good public understanding of landslide hazards, promoting public response to landslip warnings, enlisting public support in times of serious landslides and reaching out to slope owners. Ir. Chan stressed that public awareness should be nurtured from a very young age. He said public education is far less expensive than engineering works and is effective in combating the landslide threat.

Finally, he said there can never be zero landslide risk and that once risk is detected, prompt response is crucial to minimise the damages.

The course ended with the presentation of an appreciation memento to Ir. Chan by technical division Chairman Ir. Yee Thien Seng. ■



GETD committee members with the speaker. From left: Ir. Dr Chan Swee Huat, Ir. Liew Shaw Shong, Ir. Terence Chan Chun Fai, Ir. Jack Pan Kok Loong, Ir. Yee Thien Seng and Engr. Dr Gue Chang Shin