

### **Talk on “The Role of a Geotechnical Instrumentation Monitoring Program in Averting a River Exclusion Cofferdam’s Possible Disintegration”**

by Ir. Chua Chai Guan



**T**he talk was delivered by Engr. Yee Thien Seng on the evening of 29th May 2009 at the Chin Fung Kee Auditorium Hall, Wisma IEM, at 5.30 p.m. The talk had about 60 participants. A brief summary of the talk is presented below.

Engr. Yee started with the project background where a new Raw Water Intake works had to be built on the eastern bank of Sungai Selangor at Batang Berjuntai, Selangor. The intake works required its construction to be executed in a general excavation 5.5m below the river bed. A sand filled double wall steel sheet pile cofferdam with tie-rods and prestressed ground anchors was erected to keep out the river and flood waters to a level 10.5m above the excavation floor. The cofferdam and selected anchors were instrumented and monitoring readings routinely taken fortnightly; but greater frequency during flood periods.

During the rising major flood, instrumentation readings showed the monitored anchor at the upstream end of the cofferdam had lost a significant amount of load accompanied by the cofferdam moving out of the excavation into the river. This unusual behaviour, running against the expectations of increased water loading, prompted an immediate investigation which revealed that the river bed here had been lowered by 5m. owing to local scour. Elsewhere along the cofferdam, the river bed had only been scoured by 1m.

The remedial action by filling up the deeply scoured areas in front of the cofferdam with crushed rock gravels was quickly completed before the flood receded.

Engr. Yee pointed out that it was the presence of instrumentation readings that allowed the developing situation, which departed greatly from what the cofferdam was designed for, to be caught and addressed early. This is an illustration of a meaningful use of geotechnical instrumentations but emphasised that it required each set of monitoring data collected to be promptly processed by a person who can make sense out of them. Under similar unusual circumstances, the customary practice of comparing monitored quantities against preset trigger values would not have been meaningful but instead potentially dangerous.

The talk ended at 7.00 pm with some interesting questions from the floor. Engr. Chua Chai Guan, the chairman of the evening talk presented a certificate and token of appreciation to Engr. Yee TS for delivering an excellent talk.



Completed cofferdam