Evening Talk on "Geotechnical Engineering in the Middle East – A Malaysian Perspective"

by ***Ir. Dr Chan Sin Fatt***

THE talk was organised by the Geotechnical Engineering Technical Division (GETD) of the IEM on 28 May 2009. The invited speaker, Ir. Tan Ek Khai, recently completed a two and a half year posting in the Middle East. The talk, which was attended by 65 people, was held at the Tan Sri Prof. Chin Fung Kee Auditorium at the new Wisma IEM building. The session was chaired by Ir. Dr Chan Sin Fatt.

The talk was previously delivered as a paper at the 6th Asian Young Geotechnical Engineers' Conference in Bangalore, India, in December 2008 and has won an Appreciation Certificate. The author started the talk by thanking the IEM GETD Committee for inviting him. The effort and work of the co-authors of the paper (and colleagues of the speaker), Ir. Lee Seng Hoor and Ir. Dr Ooi Lean Hock, were also acknowledged.

The Middle East has experienced a major boom in its construction industry in recent years. The geotechnical engineering practice in this region is similar to the Malaysian practice where a laissez faire approach applies. An open competitive market has resulted in the construction industry with international participation in design and construction.

Ir. Tan described some of the engineering challenges in the Middle East in design and construction and how these were overcome. These were discussed as case studies relating to (1) airfield pavement subgrade preparation and performance on reclaimed fill, (2) lateral testing of offshore piles, (3) contamination of pavement aggregates, and (4) managing of geotechnical risks in dewatering an excavation by the sea.

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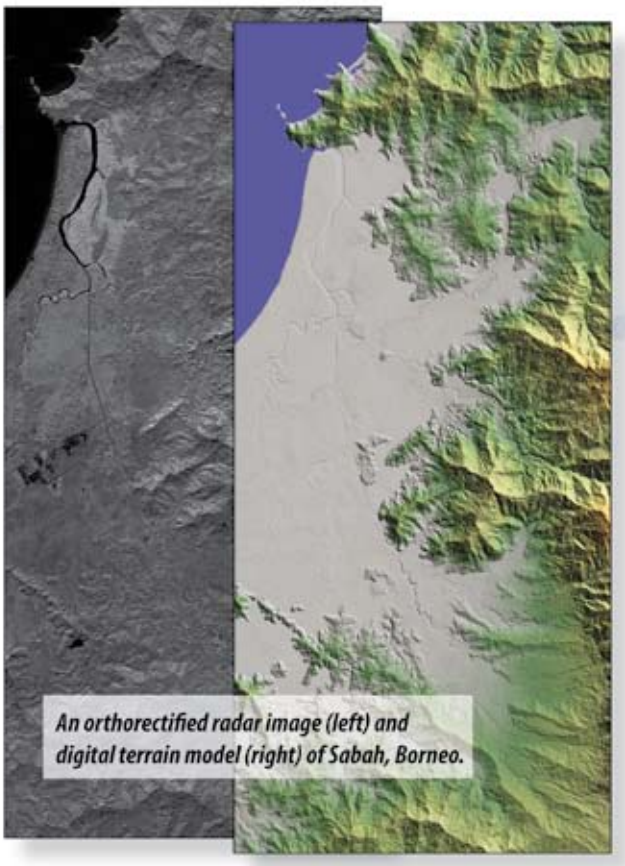
An orthorectified radar image (left) and digital terrain model (right) of Sabah, Borneo.

(Left) Ir. Dr Chan introducing the speaker. (Right) Engr. Tan delivering his talk

Findings and comparisons to other practices, in particular that of Malaysia, were made where relevant. To practise in a competitive environment such as the Middle East requires an engineer to have good understanding of not only the fundamentals of engineering design and construction, but also geotechnical investigations and testing.

These were highlighted in the case studies presented in the talk. It was also commented by the speaker that structural engineering problems are typically more difficult in the Middle East when compared to Malaysia due to the extreme climatic and aggressive environmental conditions. More attention is required to address these structural durability and construction problems, when compared to geotechnical engineering.

Recent techniques applied in Malaysia concerning geotechnical risk assessment were found to be useful in assessing geotechnical problems in the context of engineering, cost and time, especially to project stakeholders. The successful completion of some of the projects by Malaysian practitioners in the Middle East is a demonstration of effective geotechnical risk management.

Selected discussions at the end of the talk are included below for each case study presented.

AIRFIELD PAVEMENT SUBGRADE

A query was raised by the Chairman on the 'ground treatment' carried out for the reclaimed fill. The speaker clarified that the scope of the reclamation was by others. The contractor preparing the reclamation utilised a 'high energy compactor' for the preparation of the reclamation platform above water. Beneath critical structures such as the airfield, the fill beneath water was carried out using rockfill. The 'high energy compactor' was found to be suitable for earthworks with calcareous sand used in the reclamation. Selection of target density for the earthwork is, however, important when working with the calcareous sand which is susceptible to crushing of particles.

OFFSHORE LATERAL PILE LOAD TEST

A query was raised on how the lateral pile load test was carried out for the two pile types presented (0.7m and 1.4m diameters) with different free-head cantilever above the seabed when it was carried out onshore instead of off-shore.

It was clarified that a free-head cantilever condition was provided with the ground surrounding the piles being excavated to the rock-head and sleeved with a steel casing to allow for a fixed free-head cantilever of the piles. An equivalent test load of the pile using the conservation of moment principle was used in the pile verification. Some photos of how the piles were sleeved were presented.

GEOTECHNICAL RISK MITIGATION IN DEWATERING BY THE SEA

In view of the very low rainfall in the Middle East region, a member of the audience queried the necessity of the large detention ponds, which has resulted in the need of a large excavation – up to 80m x 80m.

Ir. Tan clarified that the design concept of the drainage system (*i.e.* hydraulically driven by gravity) was one of the mandatory requirement of the contract. Considering this requirement, drain configuration and platform level, the discharge point of the drainage system would be below the mean sea level. Thus, a detention pond is required to contain the drain. ■

Engineering Jokes from the Internet

New Lyrics to Beatles song - "YESTERDAY"

Yesterday,
All those backups seemed a waste of pay.
Now my database has gone away.
Oh I believe in yesterday.

Suddenly,
There's not half the files there used to be.
And there's a milestone hanging over me.
The system crashed, so suddenly.

I pushed something wrong,
What it was, I could not say.
Now all my data's gone,
And I long for yesterday-ay-ay-ay.

Yesterday,
The need for back-ups seemed so far away.
I knew my data was all here to stay,
Now I believe in yesterday.

from http://www.inflection-point.com/jokes.php