REPORT

TALK ON PIEZOCONE TESTING: A BRIEF OVERVIEW OF USAGE FOR SOFT GROUND ENGINEERING WORK

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A technical talk by Ir. Yee Thien Seng on the subject of "Piezocone Testing: A Brief Overview of Usage for Soft Ground Engineering Work" was organised by the Geotechnical Engineering Technical Division on 10 October 2003 at the IEM Conference Hall A. A total of 43 participants attended the talk.

In recent years, soft ground engineering works have become more and more important in many infrastructure projects and housing developments. Constructions in soft ground are invariably carried out with very low margins of stability as evidenced by the large numbers of earthworks collapses. A few recent cases were shown. Therefore, it is important to correctly acquire the ground information in order to realistically evaluate engineering problems in soft ground construction works. Of the many geotechnical exploration and testing tools, the piezocone has gained popularity in subsurface investigation of soft ground problems. It has the capability of providing high resolution profiling of the probed ground and is fast in implementation for providing subsurface information to the designer.

The geotechnical parameters vital to soft ground engineering work are listed below, out of which piezocone testing can be expected to yield data for evaluation of the first 3 aspects:

a) Stress history
b) Shear strength variation with depth
c) Permeability (horizontal)
d) Compressibility properties
e) Soil classification
f) Effective stress properties

The piezocone test cannot furnish data for realistic evaluation of the last three aspects (contrary to common belief) and supplementation with other means of testing has to be resorted to.

Owing to heavy reliance on electronics in modern piezocone equipment, the common phenomenon of electrical drifting becomes a real problem in view of the very low soil resistances encountered. Ir. Yee has illustrated such phenomenon with a few case studies. The temperature drift effect also has significant influence on the piezocone measurements. It is important to condition the cone temperature to the ground temperature before the test. It is also important to select a piezocone of appropriate capacity in order to minimise unavoidable drift errors in test measurements in soft ground where cone resistances routinely smaller than 0.5MPa prevail. The cone area ratio is also a crucial parameter to correct the measured cone resistances for the effects of dynamic pore pressures. Ir. Yee mentioned that the only comprehensively presented publication of Malaysian NkT factors had been made with a cone area ratio that was too small. A serious defect with most piezocone tests has been the failure to attain a well-saturated pore water pressure sensing system. On-site calibration of the sensors and good practices during site implementation, have been suggested by Ir. Yee during the talk to cross check the piezocone system before testing. Ir. Yee also informed the audience that currently a Malaysian Standard for In-situ Soil Testing is being drafted, incorporating local experience on piezocone testing and other good practices not covered in British Standards. At end of the talk, there was a lively discussion with many questions from the floor. ■