Soil Density Measurement by the Thermal Probe Method

SIAH BOON SENG, M.I.N.C.O.

An indirect method for determing the "in situ" density of a small volume of soil is described. The technique is based on the fact that changes in soil density cause changes in thermal conductivity of the soil. The details and construction of miniature thermal probes employing transient heat flow principles are described. The performance of the thermal probe in measuring sand density has been found to be excellent. Results obtained indicate that there is a direct relationship between the density and thermal conductivity values of the sand. Calibration charts and equations relating density and thermal conductivity of the sand used are presented. The potential of the technique as a general quality control method and as an instrument for monitoring the behaviour of soil structure systems are discussed.

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 7, No. 1, January-February 1981