A PROCEDURE FOR SOIL SUCTION DETERMINATIONS USING WHATMAN'S NO 42 FILTER PAPER.

REFERENCE: A LOW-COST METHOD OF ASSESSING CLAY DESICCATION FOR LOW-RISE BUILDINGS.

R J Chandler, DSc (Eng), FICE, M S Crilly, BSc, MSc, DIC & G Montgomery-Smith, BSc, FICE, FIStructE.
Proc. Instn. Civ. Engrs. Civ Engng, 1992, 92, May, 82-89.

INTRODUCTION:

Calibration (using various different techniques, and carried out by several different investigators) shows that the Equilibrium water content of this particular brand of filter paper placed in contact with a sealed soil sample enables the magnitude of the soil suction to be established with an accuracy of about 25%. This can be improved upon if a reasonable number of samples are tested, and an average suction or trend of suction with depth is determined.

TEST PROCEDURE:

This is carried out to a documented Procedure based on the BRE Information Paper IP 4/93 using **UNDISTURBED** samples. A Summary is given showing the soil suction calculated from the average moisture content of the 3 filter papers which have been sealed in-between the soil slices at a temperature of 20+/-2 °C for a period of between 5 and 10 days,

CALCULATION:

The average moisture content of the filter papers is taken and the corresponding soil suction established using Equation 1. BRE IP 4/93 (Amended). The possibility of rogue results from individual filter papers can occur, where an unusually high suction is recorded, possibly due to poor paper/soil contact. If this situation arises the individual result may be discarded. The soil suction test results are then plotted on a graph against depth.

INTERPRETATION:
REFERENCE: BRE Digest 412: Desiccation in Clay Soils. February 1996.

The soil suction test results are plotted on the graph, together with the calculated equilibrium envelope for U100 samples of suction that would be expected in unaffected undisturbed soil samples using a range of Ko values from 1 to 2.5 and sampling disturbance ranging from 50 to 100 kPa. The following assumptions are used when plotting the equilibrium envelope:

NATURAL GROUNDWATER TABLE: -	1.5m Below Ground Surface
AVERAGE BULK DENSITY OF SOIL: -	2 Mg/m^3
CHANGE IN SUCTION CAUSED BY USE OF U100 SAMPLE TUBE: -	Values ranging from 50kPa to 100kPa
COEFFICIENT OF EARTH PRESSURE AT REST Ko: -	Using values of min 1 and max 2.5