CHAPTER III

EXPERIMENTAL METHODS AND PROCEDURES

3.1 Field Sampling

The soils in this study were sampled from the new Bang Na indoor substation of Metropolitan Electricity Authority at Sukhumvit Soi 101/1, Bangkok. The area is about 400 metres from Sukhumvit Road and is in the Chao Praya Plain.

The undisturbed samples were obtained with a two metres intervals to a depth 15.30 metres below the existing ground surface. Undisturbed samplings were utilized by 3 inches inside diameter and 50 centimeters long. Thin wall seamless tubes with sharp cutting edges. The sampler were pushed hydraulically into a soil to take the soil samples after the washed boring reached the selected depths. The soil samples were sealed with wax in the sampling tubes to prevent moisture loss and to minimise disturbance whilst being transported to the laboratory for testing.

3.2 Experimental Soils

The properties of the tested soils and their classifications are summarized in Table I.

3.3 Experimental Procedure

An undisturbed sample of Bangkok clay was prepared to the selected size and covered with plastic membrane (Fig. 2) to avoid the evaporation of moisture content during heating. The prepared sample was then put into a steel tube of inner diameter

7.2 cm and outer diameter 7.6 cm with a height of 19.5 cm (Fig. 3). Graded grains of foam were filled in the space of the tube, the cover of the tuve was then closed and the tube was put into an oven which was adjusted to the desire temperature. The temperatures of 40, 50 and 60°C were selected to heated the samples since these temperatures have been recorded to be the range of field temperatures at day time in Bangkok. The sample was heated for a period of 8 hours. This period of time was selected by preveously calibrating the steel tube which contained the soil. The sample was then leaved out side the oven until it cooled down to room temperature. Further, the soil was tested to determine the consolidated-undrained strength and consclidation characteristics. Lastly, the unheated soil from the same soil layer was also prepared to be tested as the control sample for each condition.

3.3.1 Consolidated-undrained strength test procedure

The heated samples and the control samples were tested to determine consolidate-undrained strength by using a triaxial testing machine. Each represented sample was consolidated with the cell pressures of 3, 3.5 and 4 KSC until the water stopped draining from the soil for each cell pressure. After the drainage period, an axial load was applied at the rate of 24.54 min./cm. (0.407 mm./min.) under the undrained condition. The consolidated-undrained strength of each soil sample was finally measured. Then, the set of Mohr's circles were plotted to determine the angles of internal friction (Ø) and the cohesions (C) of the

tested soils which were effected by the variation of the temperatures.

3.3.2 Consolidation test procedure

The heated and unheated soils from the same layer were tested in the consolidation mold which had an inner diameter of 6.35 cm and a depth of 2.54 cm. The consolidation pressures were applied to the soil by the ratio of $\Delta P/P = 1$. For each step of increasing consolidation pressure, the compression of the sample was measured after the application of each portion of load. Then it was left about 24 hours for the maximum compression of the soil at that pressure. After the maximum pressure was reached, the sample was unloaded and the compression being recorded again after the sample was left to rebound for about 24 hours. The curves of square root time and dial reading of each increments of loading were plotted to obtain the effect of the temperatures on the coefficient of consolidation (Cv) at 90 % consolidation. The e-log p curves of soil samples were also drawn to determine the shape of these characteristic curves at each tested temperature.

FIG. 1 ● LOCATION OF BORING,

BANG NA INDOOR SUBSTATION,
SUKHUMVIT SOI 101/1, BANGKOK.

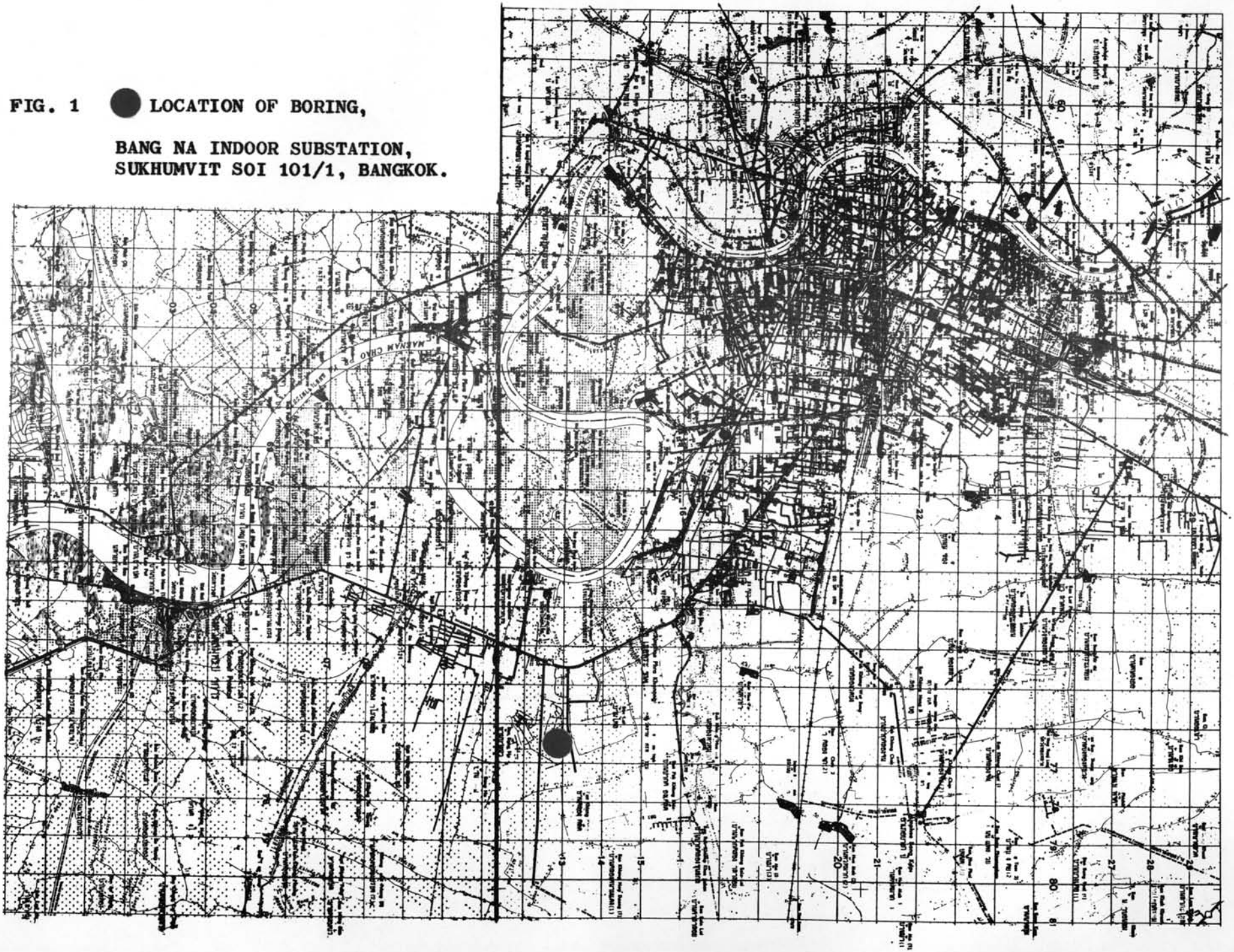

TABLE 1

PROPERTIES OF BANGKOK CLAY, LOCATION BANGNA (M.E.A. INDOOR SUBSTATION), AT SUKHUMVIT SOI 101/1, BANGNA

BORING NO.	SAMPLE & DEPTH		ATTERBERG LIMITS %			NATURAL WATER CONTENT %	WET UNIT WT. GM./cc.	DRY UNIT WT. GM./cc.	SPECIFIC GRAVITY	LIQUIDITY INDEX LI.	REMARK
	SAMPLE NO.	DEPT FROM-TO M. M.	LL.	PL.	PI.						
BH - B	B - 1	2.75-3.30	71.80	26.80	45.00	82.82	1.495	0.815	2.66	1.244	VERY SOF
	B - 2	6.75-7.30	85.00	27.18	57.82	80.65	1.442	0.797	2.66	0.924	SOFT
	B - 3	8.75-9.30	84.23	28.10	56.13	73.89	1.491	0.858	2.67	0.815	SOFT
	B - 4	10.75-11.30	78.12	28.60	49.52	63.44	1.486	0.907	2.66	0.703	SOFT
	B - 5	12.75-13.30	71.98	27.95	44.03	48.63	1.598	1.077	2.68	0.469	MEDIUM
	B - 6	14.75-15.30	66.80	26.30	40.50	28.56	1.887	1.464	2.69	0.055	STIFF

FIG. 2 CLAY SAMPLE COVERED WITH PLASTIC MEMBRANE

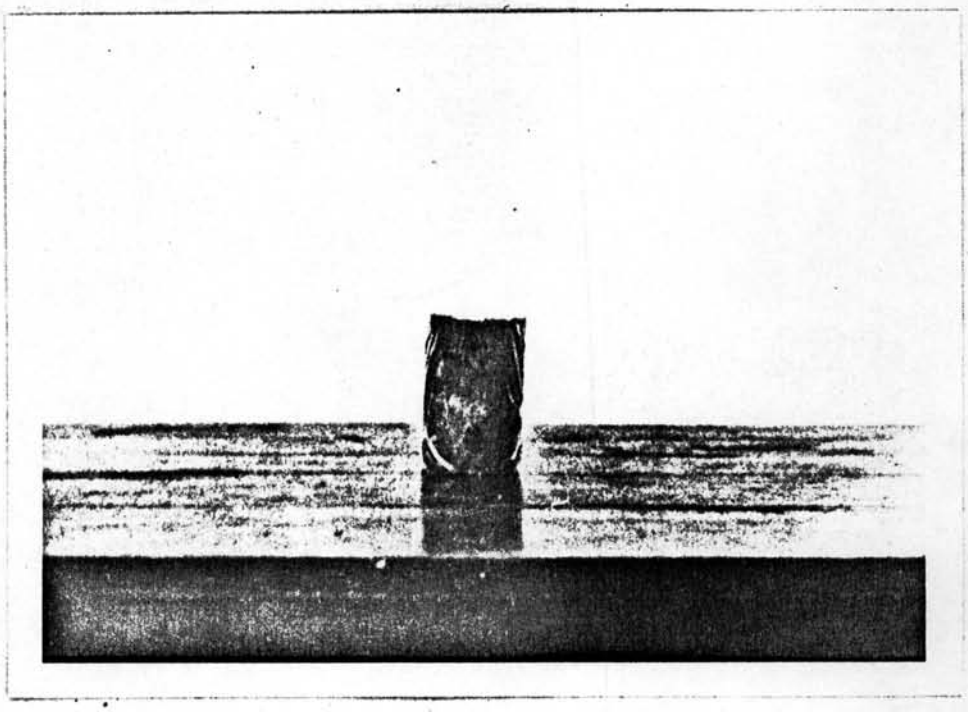

FIG. 3 STEEL TUBES USED IN PUTTING THE COVERED CLAY SAMPLE