CHAPTER 5

CONCLUSIONS

The results from the research on interpretation of strength measurement of soft Bangkok clay are as follows.

For the general properties of the soft clay under investigation at both sites are list below:-

Table 5.1 General properties of the soft clay at Memorial Bridge

Depth (m)	W_n (%)	W_L (%)	W_p (%)	PI (%)	γ_T (t/m^3)	OCR	Classified in to zone
3.50	62.60	69.60	26.90	32.70	1.50	1.20	Very soft to soft clay
5.00	57.53	57.80	26.20	31.60	1.66	1.10	zone slighly overconso-
6.50	51.35	57.30	26.20	31.10	1.75	1.0	lidated clay (CH)
8.00	42.66	52.80	27.80	25.00	1.67	-	
9.50	44.51	65.10	28.60	36.50	1.69	1.01	
11.00	41.80	44.50	24.90	19.60	1.70	-	
12.50	33.20	38.20	25.40	12.60	1.87	-	

Table 5.2 General properties of the soft clay at Teves

Depth (m)	W_n (%)	W_L (%)	W_p (%)	PI (%)	γ_T (t/m^3)	OCR	Classified in to zone
3.50	66.65	67.20	27.80	39.40	1.70	3.83	Weathered clay zone
5.00	67.25	68.40	32.20	36.20	1.60	-	Overconsolidated clay(CH)
6.50	60.91	61.00	29.50	31.50	1.64	2.04	
8.00	58.60	61.00	30.30	30.70	1.65	-	Very soft to soft clay
9.50	78.92	79.20	31.30	47.90	1.54	1.02	zone slightly overconso-
11.00	51.40	63.80	28.00	35.80	1.69	-	lidated clay
12.50	51.29	57.10	28.30	28.80	1.70	1.04	

1. Both sites yield the results indicating that the cone resistance q_c and local friction, f_s, from the Dutch cone tests can be correlated with field vane, corrected field vane test, consolidated quick direct shear test, quick direct shear test and anisotropically consolidated undrained triaxial compression test. The relationships are given below. The correlation coefficient of each relationship are also shown after the expressions.

$$q_c = 19.50\ S_{uv} \quad , r^2 = 0.92$$

$$q_c = 21\ \mu S_{uv} \quad , r^2 = 0.90$$

$$q_c = 18.50\ S_{u(CD)} \quad , r^2 = 0.88$$

$$q_c = 19\ S_{u(UD)} \quad , r^2 = 0.84$$

$$q_c = 19\ S_{u(TXL)} \quad , r^2 = 0.89$$

$$f_s = 1.20\ S_{uv} \quad , r^2 = 0.87$$

$$f_s = 1.30\ \mu S_{uv} \quad , r^2 = 0.89$$

$$f_s = 1.15\ S_{u(CD)} \quad , r^2 = 0.87$$

$$f_s = 1.20\ S_{u(UD)} \quad , r^2 = 0.80$$

$$f_s = 1.20\ S_{u(TXL)} \quad , r^2 = 0.95$$

The shear strength of the soft Bangkok clay can simply be determined from the above equation when the cone resistance and local friction are obtained. Moreover, the resistance of the friction pile in Bangkok clay can be predicted using the friction factor from the curve as shown in Fig. 4.13

2. The shear strengths measuring from field vane test and anisotropically consolidated undrained triaxial compression tests, consolidated quick direct shear tests, quick direct shear tests are

practically equal, but unconfined compression tests show appreciably different, generally lower. The correlation using corrected field vane as a basis are as follows.

$$\mu S_{uv} = 1.60\ S_{u(UC)} \quad , r^2 = 0.96$$

$$\mu S_{uv} = 0.90\ S_{u(CD)} \quad , r^2 = 0.87$$

$$\mu S_{uv} = 0.85\ S_{u(UD)} \quad , r^2 = 0.92$$

$$\mu S_{uv} = 0.90\ S_{u(TXL)} \quad , r^2 = 0.92$$

The μ value used to correct the field vane strength vary from 0.81 to 1.03

3. Both quick and consolidated quick direct shear tests will overestimate the strengths for stability analyses partly due to the loss of water during shear. This is based on the interpretation that the corrected field vane strength is the average strength on the circular failure arc.

4. Strength from Dutch cone test based on theory assuming soil to be elastoplastic material can not be interpreted as the strength for circular arc analyses. The theory will yield the strength which is too high.

5. Mostly due to anisotropy of clay and reconsolidation, strength from anisotropically consolidated undrained triaxial compression tests is higher than the average strength above the circular arc failure.

6. Due to sample disturbance, strengths from unconfined compression tests are too low.

7. In field test, field vane test is suitable for stability analyses because well-documented data are derived by Bjerrum (1972) and it is economic. In Dutch cone test, local friction and cone resistance value are more suitable to estimate the resistance of pile. This is because of mode of failure in the cone is closest to the failure of pile compared with other field tests.

The suggestions for furthure study are as follows:

1. The triaxial compression and extension tests should be carried out and compare with the test fill bringing to failure to see the reliability of the mean strength.

2. Pile load tests, friction piles should be carried out to determine the fittness of curve for the friction factor determine from Dutch cone test for Bangkok clay.