

CHAPTER I

INTRODUCTION

One of the forces that affects the surface layer of the earth is the force of daily and yearly variation of temperature.. Soils are created by this force and may be considered having a relation to it. As a result of this factor and the other periodic phenomenon, soils in situ are natural organized systems. These systems continue to be subjected to the forces that formed them and their properties are in a continuous state of flux. Consequently, soils in situ share many essential properties with living systems and may almost be considered as living even if we disregard the large microflora and microfauna dispersed in soils that render soils actual living systems.

The daily and seasonal warming and cooling of the earth surface results in a temperature wave penetration into the soil. This temperature fluctuations on the surface may be expressed as sinusoidal waves. L.A.J. QUETELET (1796 - 1874) has reported that the length of surface yearly wave and daily wave were 17 m. and 1m. respectively. These surface waves which reported by H.F. WINTERKORN (21) that they are transmitted into the interior by the heat conductivity of the earth. Since one of many potentials that cause the water movement in soils is the thermo-osmotic potential. This potential dues mainly to the change in water affinity of the internal soil surface with change in temperature. Hence, many engineering properties of especially fine grained soil would be varied with temperature changing.

The effect of temperature on the properties of cohesive soil has been studied since the year 1936. The result of many investigations that had been recently summarized showed that the change in temperature had an effect on the engineering properties of cohesive soil. This effect depended on many basically factors such as the type of soil involved, the range of temperature variation and the method of applying the temperature to the soil while testing. These three factors vary from place to place. Since the nature of these factors in Bangkok is different from the previous factors investigated, many research studies on this subject for Bangkok clay need to be done. However the study of the effect of temperature on the properties of shear strength and consolidation which are the important properties for general foundation construction is necessary for the time being. The range of the investigated temperatures is selected to be 30 to 60°C which is about the range of the daytime temperature in the field of Bangkok area. Hence, this primary investigation of the effect of temperature on these two properties of Bangkok clay may be served as the basic informations for the futhur study in this field and other relative applications.

1.1 Research Objectives

The research project consisted of an experimental study designed to investigate the following objectives:

1. To study the effect of temperature on the consolidated-undrained shear strength of the Bangkok clay with different consistency.
2. To study the effect of temperature on the coefficient of consolidations and the characteristics of e - $\log p$. curves of the same soils.