

# SOME ENGINEERING PROPERTIES OF SOFT CLAY FROM KLANG AREA

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## ABSTRACT

*The solutions of many geotechnical issues for construction are very much directly or indirectly related to the understanding of the problematic soils. Soft marine clay is one of the problematic soils which is commonly found along the coastal areas at West Malaysia. In Klang area, the thickness of the soft marine clay may vary from 20 to 40m. This paper compiles the results of the geotechnical site investigations carried out at few sites located in Klang area. The general physical properties of the Klang clay are presented in this paper. In general, the unit weight of the soft clay is about 14 to 16 kN/m<sup>3</sup>. The Liquid Limit (LL) of the soft clay is high which is mostly at about 50% to 150%. Plasticity Index (PI) varies from 20% to 80%. The compressibility properties of the Klang clay are mainly assessed from the laboratory consolidation test results. The Compression Index (Cc) is found related to the Liquid Limit as well as the void ratio of the soft clay. Compression Ratio (CR) of the soft clay is generally in the range of 0.25 to 0.5. An approximate linear relationship between the Compression Ratio and moisture content is presented. This will be useful for Engineers to estimate soil settlement when there is lack of relevant test results. The undrained shear strength (Su) of the soft clay generally increases with depth. An empirical correlation of Su with effective overburden pressure is presented. The Su could be evaluated from the results of cone penetration test too. The cone factor, Nk, of 8 is recommended.*

## 1. INTRODUCTION

The in-situ behavior of soils is usually very complex due to its varies geological origin, the formation and evolution process. However, in many situations geotechnical engineers are often expected to provide prediction of the subsoil behavior during and after construction. To be able to provide satisfactory prediction, geological knowledge and understanding of subsoil are essential.

Quaternary deposits of soft clay cover almost the entire west coast of Peninsular Malaysia as shown in Figure 1. The soft deposits are usually highly compressible and having very low shear strength. As the result, a lot of civil construction works carried out on these soft deposits encountered many problems. At Klang area as shown in Figure 1, the soft clay thickness may vary from 20m to 40m. As many site investigations had been carried out, this paper attempts to compile these information for better understanding of the soft soil surrounding this area. In addition, as Engineers are often expected to provide their estimation of soil behavior even when there is no relevant test results are available, this paper attempts to correlate the engineering properties and physical properties as well.

## 2. PHYSICAL PROPERTIES OF KLANG CLAY

### 2.1 Unit Weight and Clay Fraction

Figure 2 shows the unit weight and clay size fraction (particle size < 2 $\mu$ m) of the soft clay from Klang areas. In general, the unit weight is mostly in the range of 14 to 16 kN/m<sup>3</sup>. It appears that the unit weight is constant from the ground surface to about 30m depth. The clay fraction (CF) of the soft clay is normally in the range of 30% to 60%.