

Soil-Water Characteristic Curve analysis of silt clay in the Garinono Formation, Sabah

ABSTRACT

The Soil-Water Characteristic Curve (SWCC) serves as a fundamental tool for investigating unsaturated soils and comprehending the relationship between soil water content and properties. This study analyses the SWCC for silt clay soil from the Garinono Formation in Sandakan, Sabah. Field sampling and laboratory tests were conducted to gather the soil's physical properties and SWCC data, representing the study area. The primary findings illuminate the unsaturated behaviour of the soil within this formation, providing valuable insights into its water retention capabilities. Through rigorous laboratory testing, the SWCC data reveal how the volumetric water content (VWC) changes concerning varying suction conditions (matric potential). The analysis indicates that the SWCC measured data are best represented by Fredlund and Xing model, encompassing the entire range of suction from lower to higher values. The findings underscore significant variations in the SWCC shape based on the bulk density of the soil samples, a crucial indicator of mechanical properties such as compaction and strength. Additionally, the study discusses the direct impact of soil composition and porosity on the SWCC, deepening understanding of their interrelationships. The study's outcomes hold implications for diverse fields, including geotechnical engineering, agriculture, soil science, and environmental science.