



Correlation of Different Peat Soil Index Properties

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Abstract: The present study focuses on the physical properties of Sarawak peat soil and identifies the correlation between the index properties of peat from the present study and various locations in Malaysia. The physical properties of peat from the present study were obtained on site and in the laboratory, including degree of humification, moisture content, organic content, fibre content, specific gravity, liquid limit, linear shrinkage, and pH. The data obtained in this study and other tropical peats in Malaysia were compiled to identify their correlations. The correlation results reveal that with an increase in organic content, there is also an increase in value of moisture content, while the value of specific gravity reduces. Furthermore, as the bulk density of peat increases, the value of organic content reduces. Also, the moisture content, organic content, and fibre content of peat decrease with the increasing value of degree of humification. The correlations between different peat soil index properties have R^2 values ranging from 0.75 to 0.85, showing that the peat soil index properties are consistent with findings from previous studies, in which comparable trends are found. Thus, these correlations are expected to be useful for researchers and engineers to understand the peat soil's preliminary behaviour.

Keywords: Correlation, peat soil, index properties

1. Introduction

Peat is a form of organic soil that exists in swampy and wetlands areas, and it is comprised of a heterogeneous mixture of partially degraded plant remnants preserved by a high-water table [1]. Peatlands are being developed all over the world, including Malaysia, which has 2.4 million hectares of peatland and 1.65 million hectares in Sarawak alone [2]. Due to the massive volume of peatland area in Sarawak, infrastructure development has been through a lot of difficulties. Also, peat's physical and geotechnical properties are extremely difficult to determine as it exhibits high levels of permeability, porosity ratio, compressibility, and consolidation settlement. Zainorabidin & Muhammad [3] classified peat for the entire country of Malaysia as essential knowledge to improve understanding on behaviour of peat soil in tropical conditions. Kolay & Pui [4] focused on identifying peat using various index properties and determined the correlation between various index properties as it is useful for researchers and engineers dealing with peat soil. In addition, the properties of peat vary according to its locality due to several components, such as temperature, humidity, fibre composition, and climate, which may lead to different outcomes when improving the peat soil [5]. Hence, it is necessary to consider these factors in improving the intensity of peat soil since it is a major concern that frequently occurs in construction projects and the development of infrastructure.

In the literature, several researchers have reported the correlation between peat soils' index properties according to their locality. Some researchers evaluated the relationship between numerous physical and geotechnical characteristics

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