Chapter 6

Physical and Geotechnical Properties of Tropical Peat and Its Stabilization

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Additional information is available at the end of the chapter

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Abstract

The chapter presents the physical and engineering properties of tropical peat treated with various types of stabilizers. Quick lime (QL), fly ash (FA), and ordinary Portland cement (OPC) were used as stabilizers. The amounts of QL, FA, and OPC added with the peat samples are in the range of 2–8, 5–20, and 5–20%, respectively. Various physical or index and engineering tests have been conducted to characterize the peat samples. Unconfined compressive strength (UCS) tests were conducted on original and treated peat samples cured for 7, 14, and 28 days. The results show that the UCS value increases with the increase of all stabilizers used and with curing period. The UCS tests were also conducted on the peat samples with the combination of QL and FA to study the combined effects of the stabilizers. The present study established different correlations between physical and engineering properties of original peat and UCS results on treated peat samples with different types of stabilizers. Geotechnical engineers can refer to these correlations to determine the bearing capacity of treated peat. In addition, scanning electron microscope (SEM) studies were conducted on original and treated peat samples to investigate the microstructure of the samples.

Keywords: tropical peat, characterization, stabilization

1. Introduction

Peat or organic soil is highly heterogeneous formed due to the decomposition of organic matter such as plant remains, leaves, trunks, roots, and so on. Peat can be found anywhere in the world except in barren and arctic regions which cover about 5–8% of land area [1]. Tropical peats cover about 8–11% of the area in Malaysia, Indonesia, Brazil, Uganda, Zambia, Zambia, Venezuela, and Zaire. The department of irrigation and drainage in Sarawak mentioned that