

Shear strength performance of dredged sediment soil stabilized with lime

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ABSTRACT

Dredged sediment soil (DSS) is a type of soil that cannot be directly used for construction due to its hard and strong characteristics in dry conditions and its loose and weak characteristics in wet conditions. Several feasible engineering treatments to improve its properties include stabilization. The dredged sediment soil sample was collected from Lam Glumpang, Banda Aceh. This research aims to determine the shear strength and compressibility of lime-stabilized dredged sediment soil. Various physical and mechanical laboratory experiments were performed on both treated and untreated dredged sediment soil. In addition, scanning electron microscopy was used to examine the morphological change of stabilized dredged sediment soil with lime treatment (SEM). This experiment was carried out by mixing the soil and lime in different ratios of 2%, 4%, 6%, and 8% of the dry weight of the soil. According to AASHTO, the soil is classified as an A-4(8) soil type and according to the USCS, it is classified as an inorganic silt soil type (ML). Findings demonstrate that after lime stabilization, the shear strength and compressibility of dredged sediment soil gradually increased. The combination internal friction angle and cohesion value indicated that the shear strength of the soil was enhanced with the addition of lime up to 6% but then declined with the addition of lime to 8%. In addition, the study of micrographs indicates that the formation of aggregate particles has a substantial effect on the increase in shear strength and compressibility of treated dredged sediment soil.

KEYWORDS

Dredged sediment; Lime; Silt; Soil stabilization

ACKNOWLEDGMENT

This research was supported by Universitas Syiah Kuala, Banda Aceh, Indonesia, research grant Lektor scheme No: 146/UN11/SPK/PNBP/2022. In addition, the authors are grateful Mrs. Lisma Liza for supporting with the experimentation and data collection. In addition, the financial support provided by the Universiti Malaysia Pahang with project code PDU213219 is also much appreciated.