Modified natural fiber with lime and alkaline activation treated marine clay

ABSTRACT

Geotechnical structures and foundations that are constructed on clay soils normally experience serviceability and structural quandaries due to wetting. Traditional and mechanical binder have been widely used for soil stabilization recently in order to improve clay soil. In this study, a comparison was made between lime and alkaline activation treated tropical marine soil reinforced with modified natural fiber. Treatment of soil with lime and alkaline activation show an excessively brittle behavior that influences the stability of the structure. For this purpose, the inclusion of natural biodegradable material which is coir fiber is needed as it enhanced the tensile strength of the soil matrix. The mechanical properties of unconfined compression test were carried out on tropical marine soil stabilized with lime (5%) and alkali activation with class F fly ash as a precursor (60%) with and without fiber inclusions at different curing times. Based on the test results, the inclusion of modified natural fiber in lime and alkaline activation treated tropical marine clay increased the strength of the soil matrix.

Keyword: Tropical marine soil; Modified natural fiber; Lime; Alkaline activation