

Panithan Tengya 2013: Properties of Soft Clayey Soil Stabilized with Waste-based Cement. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Supakij Nontananandh, D.Eng. 135 pages.

This research study aims to improve engineering properties of soft Bangkok clay with waste-based cement and study the engineering properties such as unconfined compressive strength parameter from undrained triaxial compression test with pore water pressure measurement the compressibility and chemical reaction. The proportion of waste-based cement between the soft clay is equal to 150 kg/m^3 , 200 kg/m^3 and 250 kg/m^3 .

The results showed that the unconfined compressive strength and cohesion-friction angle is increased by the content of waste-based cement and curing time and mixing content of waste-based cement with clay. Corresponds to the parameter A is reduced by the amount of cement mixing content and effective stress path that indicates the transition state of soil from the NC state to OC state follow on cement mixing content. The mixing content 250 kg/m^3 is the best value. Permeability is in the range of 10^{-9} cm / s and the void ratio, coefficient of consolidation, compression index, recompression index, swelling index decreased by the amount of waste-based cement and curing time and have a relation with the scanning electron microscope. The results showed that clay have to change the physical structures caused by reaction product. The results of the analysis of energy dispersive x-ray spectrometer showed that the ratio between the ratio of the element silicon to aluminium and calcium on silicon. The peak element ratio (PER) and the surface area ratio (SAR) are proposed as an index to investigate the development phase of the soil waste-based cement in terms of strength development, the compressibility and permeability. The PER between silicon (Si) with calcium (Ca) is in the range of 0.5 to 1 and the SAR between calcium (Ca) with aluminium (Al) is in the range of 0.7 to 1.5, which is the ratio of the chemical elements CSH and CASH products. That is conform closely to those derived from theory. The results of the research above, it can be concluded that the waste-based cement can be used to improve the engineering properties of soft Bangkok clay.

Student's signature

Thesis Advisor's signature