

ABSTRACT

PT. Kaltim Prima Coal is one of the coal mining company located in Kalimantan Timur which applied the surface mining process. One of the activity in the surface mining method is piling up the overburden layer of the stockpile after the demolition procedure. To prevent deformation caused by the degradation of the base soil, the stability analysis is used to find the ideal geometry of the stockpile. This occurrence caused by the load over piled area which affects the surrounded environment. The phenomenon may occur if the factors causing the deformation is not recognized, moreover, when the location of the stockpile is soft soil.

The ground reinforcement in the means of enhancing the strength of the ground is necessary to increase the capacity of the stockpile without increasing the potency of the ground deformation which affect the palm oil plantation. In the process of solidification of the soft soil, the Deep Soil Mixing method is used.

To identify the strength and the ideal proportion of the mixture material of Deep Soil Mixing, the examination of Uniaxial Compressive Strength (UCS), physical attribute, compression strength, tensile strength, and shear strength of the mixture of the organic material (peat) and cement are used in this study.

In the result of the study, the optimal result of the Deep Soil Mixing strengthening appeared in the sample H with the mixture of cement, polcon, sand, and water. After soaked, the mixture made a score of 19,92 kPa with 14 days of curing time. The soaked mixture of the cement + polcon + sand + water in sample H can improve the stability of the piling over the soft soil. The Deep Soil Mixing method can improve the safety score from $FK=0,668$ to $FK=1,243$. The percentage of the mixture of the sample H is 19,80% cement; 73,74% sand; 5,99% water; and 0,47% polcon.