

## ABSTRACT

PT. Kaltim Prima Coal is one of the coal mining companies in East Kalimantan that has mining with open pit coal mining system. In open pit coal mining activities, there is an activity of placement or dumping an overburden layer in the waste dump area. Target stripping of the overburden layer at Pit Inul Lignit North PT. Kaltim Prima Coal in 2018 of 19,635 kBCM and planned to be dumped in the North Lignite waste dump area. A good embankment geometry requires stability analysis to prevent deformation of the ground degradation due to loading which causes disruption of the environment around the embankment. This can happen if the factors causing the deformation are not known for sure especially if the location of the waste dump area is soft soil that has low bearing capacity and low strength and easy to deform.

Soil improvement in order to increase soft soil strength is necessary to increase the capacity of the embankment without the occurrence of destructive deformation. The use of soft soil improvement using the Deep Soil Mixing method and Geocell method attracted attention for research.

Obtained from the research results, the largest carrying capacity is material BK05-UDS4 with a value of  $c$  of 19.5 kPa;  $\phi$  equal to  $10,4^\circ$  and  $\gamma$  equal to  $1,69 \text{ g/cm}^3$  and strength factor value at 1x1 m loading model equal to 21,56. RL 40 waste dump embankment with reinforcement is the most stable optimal model with minimum deformation, where the largest vertical deformation is -0.85 m, the smallest strength factor is 1.4; and yielded element of model is 1,863. RL 40 waste dump reinforced embankment with numerical calculation indicate that settlement stop at time of 100 days and an RL 40 waste dump embankment without reinforcement with analytic calculations showing a settlement of 90% consolidation takes 391.2 days.

Key word : soft soil, soil improvement, embankment, deep soil mixing, geocell