

INTISARI

Judul : Analisis Stabilitas Lereng Tanah Timbunan Menggunakan Perkuatan Geogrid

(Studi Kasus : Site Tambang Batubara Banko Pit 3 Timur PT Bukit Asam Tbk), Nama :

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Peningkatan pada produksi berbanding lurus dengan produktifitas dari aktifitas penambangan, maka dengan kata lain semakin banyaknya area tambang yang harus digali dan artinya banyak lahan bukaan bekas galian tambang. Sehingga untuk mengurangi bukaan bekas galian tambang tersebut, dilakukan penimbunan tanah kembali di bukaan bekas galian lokasi tambang untuk mengurangi bukaan bekas tambang dengan cara membentuk lereng, dimana di PTBA disebut dengan lereng timbunan atau *pit dump*.

PTBA akan melakukan kegiatan sepanjang tahapan usaha pertambangan untuk menata, memulihkan dan memperbaiki kualitas lingkungan dan ekosistem agar dapat berfungsi kembali dengan sesuai peruntukkannya dengan cara lereng timbunan atau *pit dump* tersebut dilakukan tahapan revegetasi. Sehingga PTBA menyadari diperlukan suatu kemantapan (stabilitas) pada lereng timbunan tersebut untuk menunjang tahapan kegiatan penataan dan pemulihan area sesuai yang diharapkan Perusahaan.

Proses analisis stabilitas dilakukan dengan cara meninjau angka keamanan (*safety factor*) dengan menggunakan program PLAXIS 2D sebagai program untuk menganalisis lereng timbunan. Berdasarkan analisa, hasil pada kondisi pertama saat terjadi gejala kelongsoran sebelum menggunakan perkuatan *geogrid* yaitu didapatkan FK 1,475 yang dikatakan sebagai lereng riskan dikarenakan $FK < 1,5$. Sedangkan untuk kondisi kedua saat sudah ditambahkan material perkuatan *geogrid* dan penambahan material tanah timbunan maka didapatkan nilai faktor keamanan untuk variasi 1 nilai FK = 1,606; variasi 2 dengan nilai FK = 1,605; variasi 3 nilai FK = 1,609; variasi 4 nilai FK = 1,607; variasi 5 nilai FK = 1,609 dan variasi 6 nilai FK = 1,608. Dari analisis kondisi kedua untuk variasi 1 sampai dengan variasi ke 6 merupakan kategori lereng stabil karena $FK \geq 1,50$. Perbandingan nilai angka keamanan FK pada analisis kondisi pertama dan analisis kondisi kedua didapatkan persentase pengaruh perkuatan *geogrid* dalam menambah kestabilan lereng untuk variasi 1 yaitu 8,16%, variasi 2 = 8,10%, variasi 3 = 8,33%, variasi 4 = 8,21%, variasi 5 = 8,33%, variasi 6 = 8,27%. Variasi yang paling direkomendasikan berdasarkan nilai angka keamanan FK nya yaitu pada variasi 3 dan variasi 5 dengan nilai FK = 1,609 serta persentase pengaruh *geogrid* dalam menambah kestabilan lereng yaitu sebesar 8,33%.

Kata kunci: Analisis Stabilitas Lereng Timbunan, Perkuatan Lereng, *Geogrid*, Angka Keamanan (*Safety Factor*).

ABSTRACT

Title : Analysis of Soil Slope Stability Using by Geogrid Reinforcement (Case Study: Coal Mine Site Banko Pit 3 Timur PT Bukit Asam Tbk), Name : Vara Yulia Ulfa, Nim : 41117110005, Mentor : Ir.Desiana Vidayanti, MT, 2019.

The increase in production is directly proportional to the productivity of mining activities, so in other words, there are more mining areas that have to be excavated and that means there are lots of former mining sites. So as to reduce the openings of the former quarries, a backfill is carried out at the former excavation site of the mine to reduce ex-mine openings by forming slopes, which in PTBA are called slope dumps or pit dumps.

PTBA will carry out activities throughout the mining business stage to organize, restore and improve the quality of the environment and ecosystem in order to be able to function again according to its designation by means of the pit dumps, the revegetation stage is carried out. So that PTBA realizes that it needs a stability on the slope of the embankment to support the stages of structuring and restoring the area as expected by the Company.

The process of stability analysis is done by reviewing the safety factor by using the PLAXIS 2D program as a program to analyze embankment slopes. Based on the analysis, the results of the first condition when there was a symptom of landslide before using geogrid reinforcement were FK 1.475 which was said to be a risk slope due to $FK < 1.5$. Whereas for the second condition when the geogrid reinforcement material is added and the addition of embankment soil material is obtained, the safety factor value is obtained for variation 1 FK value = 1.606; variation 2 with FK value = 1.605; variation in 3 FK values = 1,609; variation in 4 FK values = 1.607; variation of 5 FK values = 1.609 and variation in 6 FK values = 1.608. From the analysis of the second condition for variation 1 to variation 6 is the category of stable slopes because $FK \geq 1.5$. Comparison of FK safety number values in the first condition analysis and second condition analysis found the percentage of the effect of geogrid reinforcement in adding slope stability for variation 1 was 8.16%, variation 2 = 8.10%, variation 3 = 8.33%, variation 4 = 8.21%, variation 5 = 8.33%, variation 6 = 8.27%. The most recommended variation based on the FK safety number value is in variation 3 and variation 5 with FK value = 1,609 and the percentage of the influence of geogrid in adding slope stability that is equal to 8,33%.

Keywords: Stability Analysis of Hoard Slopes, Slope Strengthening, Geogrids, Safety Factors.