

ABSTRAK

ANALISIS KESTABILAN LERENG BERDASARKAN DATA GEOLISTRIK RESISTIVITAS DAN GEOTEKNIK PADA DAERAH GRABAGAN, TUBAN, JAWA TIMUR

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Analisis kestabilan lereng merupakan aspek penting dalam keamanan perencanaan kegiatan pertambangan. Penelitian ini dilakukan di Kecamatan Grabagan, Kabupaten Tuban, Jawa Timur, yang memiliki potensi bahan galian tinggi dan kegiatan pertambangan yang aktif. Tujuan penelitian ini adalah untuk mengetahui tingkat keamanan lereng, mengevaluasi kestabilan lereng serta mengetahui geometri lereng yang aman melalui integrasi metode geofisika dan geoteknik. Metode yang digunakan yaitu metode geolistrik resistivitas konfigurasi *Wenner-Schlumberger* sebanyak 6 lintasan yang masing masing sepanjang 320m, yang digunakan untuk mengidentifikasi kondisi bawah permukaan dan uji laboratorium geoteknik berupa uji kuat geser dan kuat tekan. Analisis kestabilan lereng dilakukan mengetahui kondisi litologi bawah permukaan dengan metode geolistrik resistivitas dan kemudian dilakukan perhitungan nilai faktor keamanan menggunakan metode *simplified Bishop*. Hasil penelitian menunjukkan bahwa terdapat zona lemah pada lintasan 4, 5, 6 berdasarkan interpretasi geolistrik resistivitas dengan nilai resistivitas rendah yaitu 0-100 Ω m. Berdasarkan nilai faktor keamanannya ditemukan lereng yang tidak stabil pada lereng buatan lintasan 4 dengan kemiringan lereng 80°-85° tinggi lereng 30m, dan kemiringan 70°-85° dengan ketinggian lereng 40m, pada Lintasan 5 dengan kemiringan lereng 70°-85° tinggi lereng 30m dan 40m. Nilai faktor keamanan menurun pada saat keadaan jenuh dan seiring meningkatnya kemiringan dan tinggi lereng, ketiga faktor tersebut memiliki pengaruh yang signifikan terhadap kestabilan lereng.

Kata kunci: faktor keamanan, geolistrik resistivitas, kestabilan lereng, metode Bishop, batugamping

ABSTRACT

SLOPE STABILITY ANALYSIS USING GEOELECTRICAL RESISTIVITY AND GEOTECHNICAL DATA AT THE GRABAGAN AREA, TUBAN, EAST JAVA

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Slope stability analysis is an important aspect in ensuring safety in mining planning. This study was conducted in Grabagan District, Tuban Regency, East Java, an area with high mineral resource potential and active mining activities. The aim of this research is to determine the slope safety conditions, evaluate slope stability, and identify safe slope geometry through the integration of geotechnical and geophysical methods. The methods used include the electrical resistivity method with the Wenner-Schlumberger configuration on six survey lines, each with a length of 320 m, to identify subsurface conditions, as well as geotechnical laboratory tests consisting of shear strength and uniaxial compressive strength tests. Slope stability analysis was carried out by first determining the subsurface lithological conditions using the electrical resistivity method, followed by the calculation of the safety factor using the Simplified Bishop method. The results indicate the presence of weak zones on survey lines 4, 5, and 6 based on the interpretation of electrical resistivity data. Based on the safety factor values, unstable slopes were identified on the artificial slopes of line 4 with slope of 80°–85° at a slope height of 30 m, and 70°–85° at a slope height of 40 m, as well as on line 5 with slope of 70°–85° at slope heights of 30 m and 40 m. The safety factor values decreased under saturated conditions and with increasing slope and slope height. These three factors were found to have a significant influence on slope stability.

Keyword: safety factor, electrical resistivity, slope stability, Bishop method, limestone