

ABSTRAK

Penelitian yang dilakukan di Desa Tegaldowo dan sekitarnya, Kecamatan Gunem, Kabupaten Rembang, Provinsi Jawa Tengah. Pada daerah tersebut memiliki lereng yang cukup terjal. Kecenderungan lereng untuk runtuh dalam kegiatan tambang terbuka dipengaruhi oleh sifat fisik dan mekanik massa batuan. Kajian geologi perlu dilakukan seperti stratigrafi untuk mengetahui persebaran litologi, struktur geologi untuk mengetahui proses tektonik yang berkembang di lokasi penelitian. Kajian geologi ini akan mempengaruhi rekayasa geologi teknik kestabilan lereng di tambang terbuka. Penelitian dilaksanakan pada blok yang telah selesai dilakukan penambangan yang bertujuan untuk mengetahui nilai faktor keamanan lereng daerah penelitian sebagai upaya untuk mencegah terjadinya longsor, serta pemberian rekomendasi geometri lereng yang aman, efisien, dan ekonomis.

Pengambilan data primer dilakukan melalui pengamatan kondisi litologi, pemetaan *scanline*, dan pengukuran geometri lereng, serta didukung data sekunder yang diperoleh dari inventaris perusahaan dan sumber terkait. Analisis kinematik dengan Metode yang digunakan Kriteria Keruntuhan *Generalized Hoek-Brown* dilakukan dengan bantuan *software* Phase 2.

Pola pengaliran lokasi penelitian terdiri dari pola pengaliran ubahan subparalel dengan arah umum N 160°E dan pola pengaliran ubahan subdendritik dengan orientasi arah umum yaitu N 92°E. Lokasi penelitian terdiri dari 4 bentuk lahan yaitu, lereng struktural perbukitan karst, perbukitan karst dan lereng denudasi. Satuan batuan paling tua yaitu pada daerah penelitian yaitu satuan Batupasir karbonatan Ngrayong berumur Miosen Tengah (N.12) yang diendapkan di. Kemudian diendapkan satuan Batugamping kalkarenit Bulu secara selarans yaitu pada (N.12-N.14) Satuan Batugamping terumbu paciran merupakan satuan batuan termuda yaitu berumur Pliosen Awal (N.19) Struktur geologi yang berkembang memiliki orientasi arah N-S dan sesar berkaitan dengan sesar RMKS. Dengan kondisi massa batuan rata-rata memiliki RQD sebesar 99,721% (sangat baik), RMR 76,333 (baik), GSI sebesar 71,333 (baik), serta SMR 65° (Laubscher, 1975), 74,533° (Hall, 1985), dan 80,726° (Orr, 1992). Pada ketiga blok batuan berpotensi terjadi longsoran baji yaitu blok K5 dengan arah longsoran N260°E berarah barat daya, blok N3 dengan arah longsoran N287°E berarah barat laut, dan blok O2 dengan arah longsoran N341°E berarah barat laut. Hasil Analisa menunjukkan kenaikan sifat mekanik massa batuan (kohesi) dapat meningkatkan nilai kestabilan lereng (FK) yang signifikan, karena berkaitan dengan meningkatnya gaya penahan pada tubuh lereng. Sedangkan kenaikan sifat fisik massa batuan (natural density) dapat mengurangi kestabilan lereng.

Kata kunci : analisa kestabilan lereng, faktor keamanan, satuan batuan, sifat fisik, sifat mekanik,

ABSTRACT

The research was conducted in Tegaldowo Village and its surroundings, Gunem District, Rembang Regency, Central Java Province. The area has quite steep slopes. The tendency for slopes to collapse in open pit mining activities is influenced by the physical and mechanical properties of the rock mass. Geological studies need to be carried out as follows: stratigraphy to determine the distribution of lithology, geological structure to determine the tectonic processes that developed at the study site. This geological study will affect the engineering geology of slope stability engineering in open pit mines. The research was carried out on blocks that had been completed mining with the aim of knowing the value of the slope safety factor in the research area as an effort to prevent landslides, as well as providing recommendations for safe, efficient and economical slope geometry.

Primary data collection was carried out by observing lithological conditions, scanline mapping, and slope geometry measurements, and supported by secondary data obtained from company inventories and related sources. Kinematic analysis with the method used Generalized Hoek-Brown Collapse Criteria was carried out with the help of Phase 2 software.

Primary data collection was carried out by observing lithological conditions, scanline mapping, and slope geometry measurements, and supported by secondary data obtained from company inventories and related sources. Kinematic analysis with the method used Generalized Hoek-Brown Collapse Criteria was carried out with the help of Phase 2 software. The drainage pattern at the study site consists of a subparallel alternating flow pattern with a general direction of N 160°E and a subdendritic altered flow pattern with a general orientation of N 92°E. The research location consists of 4 landforms, namely, structural slopes of karst hills, karst hills and denudation slopes. The oldest rock unit in the study area is the Ngrayong carbonate sandstone unit of Middle Miocene age (N.12) which was deposited at. Then the Bulu calcarenite Limestone unit was deposited in harmony, namely at (N.12-N.14). The Paciran reef limestone unit is the youngest rock unit, which is Early Pliocene (N.19) The developing geological structure has an N-S direction orientation and the fault is related to the RMKS fault .With rock mass conditions, the average RQD is 99.721% (very good), RMR is 76.333 (good), GSI is 71.333 (good), and SMR is 65° (Laubscher, 1975), 74.533° (Hall, 1985), and 80.726 ° (Orr, 1992). The three rock blocks have the potential for wedge avalanches, namely block K5 with an avalanche direction of N260°E trending southwest, block N3 with an avalanche direction of N287°E trending northwest, and block O2 with an avalanche direction of N341°E trending northwest. The analysis results show an increase in the mechanical properties of the rock mass (cohesion) can significantly increase the value of slope stability (FK), because it is associated with an increase in the retaining force on the body of the slope. While the increase in the physical properties of the rock mass (natural density) can reduce the stability of the slope.

Keywords: mechanical properties, physical properties, rock units, slope stability analysis, safety factor,