

RINGKASAN

PT. Pesona Khatulistiwa Nusantara (PT. PKN) merupakan perusahaan pertambangan batubara yang beroperasi di Kabupaten Bulungan, Provinsi Kalimantan Utara. Kegiatan penambangan tambang terbuka PT. PKN akan membuat lereng berjenjang hingga kedalaman 88 meter.

Lereng penambangan akan berpotensi longsor apabila geometri lereng yang digunakan tidak sesuai dengan karakteristik massa batuan di dinding lubang bukaan, sehingga diperlukan adanya perancangan geometri lereng pendahuluan yang aman dan stabil sesuai karakteristik massa batuan, jenis potensi longsor dan kondisi geologi setempat.

Lokasi penelitian dilakukan pada *site* Ardimulyo dengan penampang sayatan *highwall* A-A' yang ditargetkan hingga kedalaman 88 meter, sayatan B-B' yang ditargetkan hingga kedalaman 80 meter dan dinding *lowwall* sayatan A-A' yang ditargetkan hingga kedalaman 88 meter. Perhitungan pada dinding *highwall* dan dinding *lowwall* yang berpotensi longsor menggunakan metode Bishop. Metode analisis dalam perhitungan Faktor Keamanan menggunakan metode kesetimbangan batas (*limit equilibrium method*) dengan Metode Bishop (*Circular Failure*) serta dengan pendekatan perhitungan kriteria keruntuhan Mohr-Coulomb. Permodelan dilakukan dengan pendekatan sifat fisik dan mekanik batuan hasil uji laboratorium. Analisis lereng tunggal menggunakan variasi kemiringan 50° sampai 70° dengan kondisi lereng kering dan jenuh. Analisis lereng keseluruhan menggunakan variasi lebar *bench* dengan kondisi kering dan jenuh, faktor seismik bernilai 0,1gal dengan asumsi beban alat mekanis diabaikan. Lereng tunggal dianggap stabil jika Faktor Keamanan (FK) $\geq 1,1$ dan lereng keseluruhan stabil apabila FK $\geq 1,2$ (sesuai dengan Keputusan Menteri Energi dan Sumber Daya Mineral Republik Indonesia No. 1827 K/30/MEM/2018).

Berdasarkan hasil analisis menggunakan metode kesetimbangan batas dengan program Slide Rocscience v.6.0 diperoleh lereng tunggal yang dapat diaplikasikan dengan tinggi 8 meter dan sudut 50° . Untuk lereng keseluruhan *highwall* sayatan A-A' ketinggian 88 meter dengan sudut lereng 33° , lebar *bench* 6 meter dalam kondisi jenuh dan probabilitas longsor 0%. Untuk lereng *highwall* sayatan B-B' ketinggian 80 meter dengan sudut lereng 34° , lebar *bench* 6 meter dalam kondisi jenuh dan probabilitas longsor 0%, untuk lereng *lowwall* ketinggian 88 meter dengan sudut lereng 33° , lebar *bench* 6 meter dalam kondisi jenuh dan probabilitas longsor 0%. Analisis menghasilkan lereng optimum dalam kondisi lereng jenuh sehingga analisis area pengaruh MAT diperlukan untuk mengontrol kestabilan akibat pengaruh MAT berupa pemasangan *standpipe piezometer* dan kegiatan drainase serta penyaliran.

ABSTRACT

PT. Pesona Khatulistiwa Nusantara (PT PKN) is a coal mining company that operating at Bulungan District, North Kalimantan Province. Mining activities of PT. PKN will makes slope till 88 meters of a depth.

Mining slopes have potential failure if the slope geometry is not suitable with the rock mass characteristics, so it is necessary to design a safe and stable preliminary geometry based on rock mass characteristics, potential failure types and local geological conditions.

The location of the research was carried out on the Sekayan site with cross section highwall A-A' targeted to a depth of 88 meters, B-B' cross section targeted to a depth of 80 meters and a A-A' lowwall cross section targeted to a depth of 88 meters. Calculation on highwall and lowwall with circular failure potential using Bishop method. The analytical method in calculating the Security Factor uses the limit equilibrium method with the Bishop (Circular Failure) Method and Probabilistic Analysis (Probabilistic of Failure) and with the approach to calculating Mohr-Coulomb's collapse criteria. Modeling is done by approaching the physical and mechanical properties of laboratory test results. Single slope analysis uses a slope variation of 50° until 70° with dry and saturated slope conditions. 0.1 gal seismic factors and the load of mechanical devices is ignored. The single slope is considered stable if the Safety Factor (FK) 1,1 and the overall slope is stable if $FK \geq 1,2$ (according to the Decree of the Minister of Energy and Mineral Resources of the Republic of Indonesia No. 1827 K / 30 / MEM / 2018).

Based on the results of single slope analysis used limit equilibrium method from Slide Roscience v.6.0 program obtained a height of 8 meters and the angle below 50° . for the highwall slope A-A' obtained height of 88 meters with the slope angle below 33° , bench width 6 meters in a saturated slope conditions and probability of failure 0%. highwall slope B-B' obtained 80 meters with slope angle below 34° , bench width 6 meters in saturated slope conditions and probability of failure 0%. lowwall slope obtained 88 meters with slope angle below 33° , bench width 6 meters in saturated slope conditions and probability of failure 0%. The analysis produced the optimum slope in saturated slope condition so that the analysis of the influence area of water table position was needed to control the stability of the slope due to the change in water table position in the form of a piezometer standpipe and drainage and drainage activities.