RINGKASAN

PT. Trubaindo Coal Mining (PT. TCM) merupakan perusahaan tambang batubara yang terletak di Kutai Barat, Kalimantan Timur. Pembongkaran lapisan *overburden* dilakukan dengan metode pengeboran dan peledakan yang dapat menimbulkan efek hasil peledakan terutama getaran tanah terhadap kestabilan lereng *highwall*. Kegiatan peledakan terkontrol yang dilakukan di Pit 3000 Block 05 menggunakan metode *linedrill*.

Data hasil pengukuran getaran yang didapat dari pembacaan alat tidak serta merta menjadi faktor getaran yang mempengaruhi stabilitas lereng *highwall*, tetapi getaran dengan arah rambatan horizontal yang menjadi penyebab menurunnya stabilitas lereng *highwall*. Percepatan horizontal maksimum yang muncul dari kegiatan peledakan sebagai parameter yang berperan dalam stabilitas lereng didapatkan dengan menghubungan pada PPA dengan persamaan a_{max} = 0.5167 x PPA.

Oleh karena itu, untuk mengetahui pengaruh getaran tanah akibat peledakan terhadap stabilitas lereng *highwall* perlu dilakukan permodelan penampang A-A', B-B', C-C', D-D' dan E-E'. Hasil prediksi persamaan nilai faktor keamanan tiap penampang sebagai berikut :

- Penampang A-A', FK = 5,1489 a_{max}^{6} – 32,719 a_{max}^{5} + 79,933 a_{max}^{4} – 93,928 a_{max}^{3} + 54,189 a_{max}^{2} – 13,898 a_{max} + 1,30852
- Penampang B-B', FK = 0,4838 a_{max}^{6} – 3,0058 a_{max}^{5} + 7,0149 a_{max}^{4} – 7,6767 a_{max}^{3} + 4,4953 a_{max}^{2} – 2,4997 a_{max} + 1,44549
- Penampang C-C', FK = 1,2021 a_{max}^{6} – 7,4203 a_{max}^{5} + 16,907 a_{max}^{4} – 17,239 a_{max}^{3} + 8,0429 a_{max}^{2} – 2,8212 a_{max} + 1,3628
- Penampang D-D', FK = 5,279a a_{max}^{6} – 33,941 a_{max}^{5} + 84,105 a_{max}^{4} – 100,68 a_{max}^{3} + 59,648 a_{max}^{2} – 15,946 a_{max} + 1,57907
- Penampang E-E', FK = -1,9442 a_{max}^{6} + 11,453 a_{max}^{5} – 24,289 a_{max}^{4} + 20,677 a_{max}^{3} – 2,7313 a_{max}^{2} – 4,8741 a_{max} + 1,65573

Hasil perhitungan percepatan horizontal maksimum kritis untuk setiap penampang bervariasi seperti pada berikut :

- Penampang A-A', a_{max}-kritis = 0,007 g
- Penampang B-B', a_{max}-kritis = 0,118 g
- Penampang C-C', a_{max}-kritis = 0,062 g
- Penampang D-D', a_{max}-kritis = 0,025 g
- Penampang E-E', a_{max}-kritis = 0,09 g

Variasi nilai tersebut dipengaruhi oleh ketebalan lapisan tanah pucuk (*topsoil*) dan geometri lereng *highwall* setiap penampang.

ABSTRACT

PT. Trubaindo Coal Mining (PT. TCM) is the coal mines company located in West Kutai, East Kalimantan. The loosening of a overburden layer done with drilling and blasting methods which can cause effects mainly result blasting ground vibration for highwall slope stability. Controlled blasting activities undertaken in 3000 Pit Block 05 using linedrill.

Vibration measurements data obtained from the tools is not necessarily a factor affecting vibration highwall slope stability, but with the direction of propagation horizontal vibrations that cause the decrease highwall slope stability. The maximum horizontal acceleration arising from blasting activities as parameters that effecting in the stability of the slope obtained by collerating to the PPA by the equation $a_{max} = 0.5327$ x PPA.

Therefore, to determine the effect of ground vibration due to blasting of the highwall slope stability modeling needs to be done cross-section A-A ', B-B', C-C ', D-D' and E-E '. Results of prediction equations safety factor value of each cross-section as follows:

- Cross-section A-A', $FK = 5.1489\ a_{max}^{6} - 32.719\ a_{max}^{5} + 79.933\ a_{max}^{4} - 93.928\ a_{max}^{3} + 54.189\ a_{max}^{2} - 13.898\ a_{max} + 1.30852$
- Cross-section B-B', $FK = 0.4838\ a_{max}^{6} - 3.0058\ a_{max}^{5} + 7.0149\ a_{max}^{4} - 7.6767\ a_{max}^{3} + 4.4953\ a_{max}^{2} - 2.4997\ a_{max} + 1.44549$
- Cross-section C-C', $FK = 1.2021\ a_{max}^{6} - 7.4203\ a_{max}^{5} + 16.907\ a_{max}^{4} - 17.239\ a_{max}^{3} + 8.0429\ a_{max}^{2} - 2.8212\ a_{max} + 1.3628$
- Cross-section D-D', $FK = 5.279a\ a_{max}^{6} - 33.941\ a_{max}^{5} + 84.105\ a_{max}^{4} - 100.68\ a_{max}^{3} + 59.648\ a_{max}^{2} - 15.946\ a_{max} + 1.57907$
- Cross-section E-E', $FK = -1.9442\ a_{max}^{6} + 11.453\ a_{max}^{5} - 24.289\ a_{max}^{4} + 20.677\ a_{max}^{3} - 2.7313\ a_{max}^{2} - 4.8741\ a_{max} + 1.65573$

The maximum horizontal acceleration calculation results critical for every cross-section varies as follows :

- Cross-section A-A', a_{max}-critical = 0,007 g
- Cross-section B-B', a_{max}- critical = 0,118 g
- Cross-section C-C', a_{max}- critical = 0,062 g
- Cross-section D-D', a_{max}- critical = 0,025 g
- Cross-section E-E', a_{max}- critical = 0,09 g

The variation of value was influenced by the thickness of the layer by top soil and any cross-sectional geometry highwall slope.