SLOPE STABILITY ENGINEERING RELATED TO WORK SAFETY IN LIMESTONE MINING AREA AT KLAPANUNGGAL VILLAGE, KLAPANUNGGAL SUB-DISTRICT, BOGOR REGENCY, WEST JAVA

ABSTRACT

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Insufficient understanding of slope stability needs to be known by workers in mining activities. The location of the study had been a disaster of rock mass movement in the limestone mining area, which resulted in material losses and fatalities. The study aims to determine the geological conditions (rock units, geological structure and slope geometry related to topography) and slope stability. This analysis is needed to determine the stable shape of the slope so that it can create a productive and safe work environment for mine workers and surrounding communities.

The method used is surveying and mapping existing conditions, making maps, measuring slope geometry, rock sampling, observing geological structures, etc. Laboratory analysis of the physical and mechanical properties of rocks. The method of calculating FK values using the Markland calculation method and evaluating slope stability data using the RocPlane program which corresponds to the type of rock mass movement at the location, namely rock block slides. The parameters that influence and are used to determine slope stability are rock shear strength (cohesion and internal shear angle), mass or rock load on slopes, physical properties (density) of rocks, slope geometry and vibration (Ground Vibration).

The results of the study of slope stability, known geological conditions and slope stability of the study area. The geometry of the slope at LP 1 is Height: 27 meters, α Slope: 70 °, α Plane: 55 °, α Tension crack: 90 °, Distance from crest: 10 meters, α Upper face: 10 °, and seismic coefficient: 0, 8 mm / s, and in LP 2 namely Height: 27.2 meters, α Slope: 69 °, α Plane: 55 °, α Tension crack: 90 °, Distance from crest: 9.8 meters and α Upper face 10 ° and seismic coefficient: 0.8 mm / s. LP 1 is an unstable slope with a FK value of 0.34 and LP 2 with a FK value of 0.23 indicating that the slope is very susceptible to rock mass movement. Rock mass movement control uses a mechanical engineering approach (slope slope (resloping), with a 600 mining slope angle, 450 mine slope angle, 2-30 excavation floor slope, 3 meter slope height and 11 meter terrace floor width. security (FK) results of Markland (FK) LP1 9.54 and LP2 calculations 5.50, and after adding the seismic coefficient using Rocplane obtained (FK) LP1 of 2.89 and LP2 of 1.60 and with the results supported by the approach socio-economic and institutional approach.

Keyword : Rock mass movement, slope stability, safety factor, *Markland, RocPlane*.