STABILITY EVALUATION TUNNEL BY MODELLING GEOTECHNICAL AND PULL OUT TEST METHODS AT SITE KENCANA PT NUSA HALMAHERA MINERALS NORTH HALMAHERA DISTRICT NORTH MOLUCCAS PROVINCE

ABSTRACT

Site Kencana PT Nusa Halmahera Minerals (NHM) is one of the underground gold mining company in Indonesia with underhand cut and fill method. Overcome the instability in underground mining required support system which optimum in terms of geotechnical aspects.

Location K1-Sub8A-UC3-LA01 is the depth of 260 m with a type of andesite lava and has an average width 5.6 m and a height of 6.4 m. Geotechnical mapping studies show that the quality of the rock mass classification RMR rocks mass class IV (poor rock), while the Q-System rock mass class of very poor rock.

Based on the finite element method, the installation of support system were able to raise the value of strength reduction factor (SRF), the value of SRF before propped each sectionnya is 1.5 and the value of SRF after support at section A-A 'is 2, section B-B' is 3.5 and section C-C 'of 2.75. And be able to raise the value of strength factor and lower the value of the total displacement. Based on data from the pull out test, the installation of a support (splitsets) has the right and is able to withstand the load and displacement caused by the instability of the rock mass with an average safety factor of 1,98. The average value of displacement that occurred in the study site by 24,75 mm by observation methods (pull out test) and 32,57 mm based on numerical methods. Splitsets use of a support system with a diameter of 47 mm length of 2,4 m in the walls and 3 m on the roof with a spacing of 1 x 1 m, shotcrete with a fiber thickness of 100 mm and wire mesh research location is considered effective in areas of research.

Keywords: Underground Instability, Rock Mass Quality, Strength Reduction Factor, Pull Out Test, Support.