

ABSTRACT

PT. Cibaliung Sumberdaya is a gold ore mining company whose mining activities use an underground mining system using the Cut and Fill method. The cut and fill method will make the mined levels leave ore as a pillar. On the abandoned pillar there are still gold ore that can be extracted (robbing pillar), but the robbing pillar activity can reduce pillar stability. Thus an analysis of the stability of the abandoned sill pillar and rib pillar is needed. The study was conducted at the Cibitung Cross Cut XI South block

The results of the geotech mapping on the Cibitung Cross Cut XI South block show that 71% of the rocks in the poor rock category weigh $RMR \leq 40$ while the 29% falls in the fair rock category with a weight of $RMR \geq 41$. The values of rock load height in the Cibitung Cross Cut XI South Block are 3,02 m and rock load value of 6,73 tons/m², and rock load height on the Cross Cut XI Cibitung Block South Ore Drift is 3,47 m with a rock load of 9,05 tons/m².

The results of laboratory testing revealed that the density value for andesite breccia (hangingwall) rock was 2,37 gr/cm³, andesite breccia (footwall) of 2,33 gr/cm³ and quartzite vein was 2,45 gr/cm³. Uniaxial compressive strength (σ_c) quartz rock = 42,69 MPa, andesite flow = 44,47 MPa, andesite breccia = 43,37 MPa. The value of tensile strength quartzite = 1,24 MPa, andesite breccia = 2,13 MPa. From the results of calculating rock mass properties with Hoek-Brown's approach it is known that the hangingwall weighting value has $GSI = 48$, $m_b = 1,132$, $s = 0,0004$ and $a = 0,507$, and footwall $GSI = 44$, $m_b = 0,892$, $s = 0,0002$ and $a = 0,509$ while GSI vein = 20, $m_b = 0,171$, $s = 5,44 \times 10^{-6}$ and $a = 0,544$.

The probability of sill pillar failure analysis in Cross Cut XI South shows that if the sill pillar thickness is 12 meters, the probability value is 24,52%, for the 10 meters sill pillar thickness the probability is 34,14%, the thickness of 8 meters the probability of failure is 46,92 % and for a thickness of 6 meters, the probability of failure is 51,14%. The probability value of sill pillar failure in Cross Cut XI South Ore Drift, with 12 meters thickness of 27,97%, in 10 meters sill pillar thickness, probability of failure 37,25 % and probability of 8 meters thick sill pillar failure is 54,39 %, and 6 meters sill pillar found the probability of a failure of 78,80%. whereas for the pillar rib with a width of 3 meters, the probability of failure is 88,47%, so the safe limit of robbing pillar for sill pillar on Cross Cut XI South is 8 meters, and for cross cut XI South Ore Drift is 10 meters.