

ABSTRACT

PT. Freeport Indonesia is a mining company engaged in copper (Cu) and gold (Au) metals. The mining system is open pit and underground mining. The research location is located in DMLZ underground mine using the block caving method, which is a method that utilizes the earth's gravitational force to bring down commodities down. There are stresses work in the DMLZ underground mine, one of them is in situ stress due to the location of the mine that located as deep as 1.7 km from the surface. The stress acting causes damage to the rib pillar, this damage is a fracture inside the rib pillar.

Fracture in the rib pillar if left without treatment will cause failure. Preventing this from happening is done a treatment using a High Pressure Grouting injection on rib. The HPG will fill the fracture inside the rib pillar and improve the rib. The use of HPG so far has not gone through scientific research on the mixture of grouting, the success rate of injection and its effectiveness if correlated with working time.

In analyzing the grouting mixture, 4 parameters were used as testers, there are compressive strength test, flow time test, flow ability test and mixed shrinkage test. As a sample 12 samples were used which had different compositions of water, cement, and admixture in this case using viscocrete SC-305ID. From these 4 parameters, it will be eliminated and get 1 optimum mixture. The usage so far is a mixture of W / C (ratio of water to cement) 0.6 and the amount of viscocrete SC-305ID 1.5%. The success rate of injection grouting can be seen from the depth of failure and the value of the Geological Strength Index before and after injection. The assessment was obtained using a camera bore hole that was inserted into the drill hole and research area carried out in two areas using the initial injection pattern (panel 19) and the case study injection pattern (panel 17)

The result of the optimum grouting mixture after testing was a mixture with W/C 0.4 and the viscocrete SC-305ID amount of 2.5%. The mixture had a value of 31.8 MPa compressive strength, flow time was 70 seconds/liter, flow ability value was 430 mm and shrinkage value in 28 days is 3.3 mm. The success rate of injection was assessed by decreasing the depth of failure, before injection the depth of failure was 90-100 cm on panel 19 and 100-120 cm on panel 17 after injection depth of failure to panel 19 became 40-50 cm and panel 17 became 50-70 cm. The value of GSI which originally was 15-25 (very poor - poor) increased to the value of 30-40 (poor - fair). The results of this success rate are correlated with the working time of grouting injection which was originally 7 shifts to 4 shifts.