

DISTRIBUTION OF THE ROCK MASS CONDITION IN THE ADDIT TUNNEL OF THE LA MERCED QUARRY, CENTRAL CORDILLERA OF THE COLOMBIAN ANDES

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The La Merced Quarry is located in the Central Cordillera of the Colombian Andes. Their objects of operation are Paleozoic marble layers surrounded by strongly folded schistose rocks. The mine is constituted of two exploitation open pits and one addit tunnel. The dimensions of the addit tunnel are 1.40-m high X 1.80 m wide X 100 m long with four crosscuts.

The multiple tectonic evolution is revealed by complicated geological structures, which are characterized by remarkable plane structural elements S1, S2 and S3. These are considered to have been formed as fold with variable dimensions in regional tectonometamorphic events expressing in chlorite – muscovite zones in green schist facies of low-grade metamorphism.

Some joint sets are developed in the marble body while several joint sets in the surrounded schistose rocks. These may affect the rock mass condition in there as well as fault systems and natural dissolute caverns.

On the other hand, Heterogeneity of crystalline metamorphic rock masses causes some complications in tunnel construction. The crystalline metamorphic rock mass of the La Merced Quarry was subdivided into 4 geotechnical types based on their geomechanical properties, rock mass condition distribution and geological as well as structural characteristics. This subdivision is the basis for the successful design and excavation method in the underground portion of the mine.