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### ANALISIS PENGARUH GEOMETRI PELEDAKAN TERHADAP FRAGMENTASI BERDASARKAN KARAKTERISTIK GEOLOGI TEKNIK DI QUARRY DAERAH UNGGULINO, KECAMATAN PURIALA, KABUPATEN KONAWE, SULAWESI TENGGARA

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*Quarry* adalah area penambangan terbuka batuan dan mineral non logam, termasuk material batu yang dibutuhkan sebagai bahan timbunan bendungan. Dalam pengambilan material di *quarry* terdapat beberapa aspek yang harus diperhatikan yaitu massa batuan, kestabilan lereng, dan juga metode ekskavasi, seperti kasus di daerah penelitian untuk kebutuhan konstruksi Bendungan Ameroro. Pada penelitian ini, metode yang digunakan adalah metode *Rock Mass Rating* (RMR), *Safe Cut Slope*, *Slope Mass Rating* (SMR), penentuan geometri peledakan, dan analisis prediksi fragmentasi. Hasil penelitian menunjukkan bahwa tiga lereng yang diteliti memiliki nilai RMR dalam kategori *Good Rock*, menandakan kestabilan lereng yang baik dengan sudut kemiringan yang aman sebesar 65°. Geometri peledakan aktual di lapangan memiliki *burden* 3m dan *spacing* 3m yang menghasilkan fragmentasi berukuran *boulder; cobble; pebble; very fine* secara berurutan sebesar 67,10%;20,95%;10,66%;0,45%. Berdasarkan hasil analisis, diajukan dua geometri peledakan yang dianggap optimal dengan *burden* 1,96m; *spacing* 2,72m dan *burden* 2,48m; *spacing* 3,19m. Fragmentasi dari geometri usulan pertama secara berurutan sebesar 63,85%;32,64%;3,49%;0,01%, sedangkan fragmentasi dari geometri usulan kedua secara berurutan sebesar 74,68%;22,01%;3,27%;0,02%. Dengan demikian, penelitian ini memberikan kontribusi penting dalam mengoptimalkan metode ekskavasi di *quarry*, meningkatkan efisiensi fragmentasi, dan memastikan kestabilan lereng yang aman.

**Kata kunci :** *Quarry*, Geologi Teknik, *Rock Mass Rating* (RMR), *Safe Cut Slope*, *Slope Mass Rating* (SMR), Blasting, Geometri Peledakan, *Burden*, *Spacing*, Fragmentasi.

## ABSTRACT

### ANALYSIS THE EFFECT OF BLASTING GEOMETRY ON FRAGMENTATION BASED ON ENGINEERING GEOLOGY CHARACTERISTICS IN QUARRY UNGGULINO, PURIALA DISTRICT, KONAWE REGENCY, SOUTHEAST SULAWESI

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A quarry is an open mining area for non-metallic rocks and minerals, including stone materials needed for dam embankment construction. In the extraction of materials from a quarry, several aspects need to be considered, such as rock mass, slope stability, and excavation methods, as in the case of the research area for the construction needs of the Ameroro Dam. In this study, the methods employed include the Rock Mass Rating (RMR), Safe Cut Slope, Slope Mass Rating (SMR), determination of blasting geometry, and fragmentation prediction analysis. The research results indicate that the three examined slopes have RMR values in the Good Rock category, signifying good slope stability with a safe slope angle of 65 degrees. The actual blasting geometry in the field has a burden of 3m and spacing of 3m, resulting in sequential fragmentation sizes of boulder; cobble; pebble; very fine at 67.10%; 20.95%; 10.66%; 0.45%, respectively. Based on the analysis, two proposed blasting geometries considered optimal are presented: burden 1.96m; spacing 2.72m and burden 2.48m; spacing 3.19m. The fragmentation from the first proposed geometry sequentially measures 63.85%; 32.64%; 3.49%; 0.01%, while the fragmentation from the second proposed geometry sequentially measures 74.68%; 22.01%; 3.27%; 0.02%. Therefore, this research significantly contributes to optimizing excavation methods in quarries, improving fragmentation efficiency, and ensuring slope stability for safety.

**Keywords:** Quarry, Engineering Geology, Rock Mass Rating (RMR), Safe Cut Slope, Slope Mass Rating (SMR), Blasting, Blasting Geometry, Burden, Spacing, Fragmentation.