

Effectiveness of Emulsion Explosives in Quarrying in High Grade Metamorphic Rocks in Sri Lanka

Weerawarnkula¹ S, Hemalal¹ PVA and *Pathirana^{1,2} KPR

¹Department of Earth Resources Engineering, University of Moratuwa, Sri Lanka

²Ministry of Defence, Sri Lanka

*Corresponding author - rohanakp64@gmail.com

Abstract

The optimization of explosive usage in Sri Lankan metamorphic rock is the main objective of this research. Sonic velocity of the rock is a reliable indicator of its structural integrity and resistance to fragmentation. Aggregate impact value is a one parameter of hardness of rock. This study has been conducted on the assumption that the aggregate impact value is an indicator of hardness of the rock. Tests have been planned keeping blasting parameters constant against different rock types having different aggregate impact values. Comparison of the results shows the behaviour of explosives with different rock types having different aggregate impact values or hardness. D'Autriche method has been used to determine the velocity of detonation of emulsion explosives. According to the results of blasting using emulsion explosives on hard rocks produced a greater blast volume and a higher production with a lower fly rock throw, compared with that of softer rocks. Therefore, it is established that the concrete relationship with higher blast efficiencies exist with the hardness of rock and emulsion explosive usage.

Keywords: Detonation, Emulsion, Fragmentation, Optimization