IMPORTANCE OF DISCONTINUITIES ON FRAGMENTATION OF ROCK MASSES USING EXPLOSIVES

1PONTES, J.C., 2LIMA, A.A., and 3ROLIM FILHO, J.L. 1Centro Federal de Educação Tecnológica do Rio Grande do Norte, Natal, Brazil; 2Universidade Federal da Paraíba, Campina Grande, Brazil; 3Universidade Federal de Pernambuco, Recife, Brazil.

The main objective of this research is to analyze the fragmentation resulting from blasting at a quarry located at Queimadas County, in the State of Paraíba. The field works involved the measurement of rock blocks with at least one dimension larger than 0.70m, encompassing ten primary blast rounds. The relationship between the volumes of oversize blocks with respect of the total volume of rock for each blasting round varied form 28 to 73 percent, with values over 53 percent for nine, among the ten blasting rounds studied. A topographic survey of the whole quarry was conducted, followed by a detailed mapping of rock mass joints, at both quarry levels. The data from the topographic and geotechnical surveys were plotted in plan views and vertical sections. From the hemispheric projection of join poles, two sets of sub-vertical joints were detected. The direction of those joint sets are approximately normal, with joint spacing around 5 and 9 meters. For the sake of comparison, the quantities of different types of explosives were converted into dynamic and semi-static energy. The energy per volume of rock blasted was plotted against the percentage of oversize blocks for the blasting rounds analyzed. From those graphs it has been concluded the major influence of rock joints density into the generation of oversize blocks. In order to improve fragmentation a reduction of bench height is suggested. Also, it is emphasized the importance of selection of explosive type considering joint spacing for different domains of the rock mass.