

SATELLITE BLASTHOLES:

Practical Application of Explosive Energy to Fragment Rock

Ken Roosa
Quarry Supervisor
Blue Circle Atlantic, Inc.
Ravena, New York

Abstract

Blue Circle Atlantic of Ravena, New York, operates a four million ton per year quarry. The quarry management objective is to maximize crusher throughput tonnage while optimizing the aggregate cost to drill, blast, dig, haul, and crush a ton of rock. To meet this objective, Blue Circle's blasting program combines, large diameter production blastholes with medium diameter satellite blastholes.

By drilling eight inch diameter production holes and by custom loading bulk/emulsion blends and bulk ANFO initiated with precision millisecond delay detonators energized with a programmable sequential blasting machine, Blue Circle achieves optimal drilling and blasting costs for the desired muckpile fragmentation and displacement except for the oversize caprock.

The limestone formation at Blue Circle is a massively bedded structure with major joints. Because of the use of a large diameter production hole and the requirement to adequately stem blastholes, over-size results. In order to alleviate this situation, medium diameter satellite holes are drilled and blasted in conjunction with large diameter production holes.

Satellite blasthole drilling and blasting requires careful planning and engineering to assure results. Integral factors such as hole diameter, hole depth, hole location, hole delay timing relative to adjacent production holes, explosive product, along with the necessity to control flyrock and abate airblast have been analyzed to achieve the "best working method" at Blue Circle Atlantic.