

# "DESIGN CRITERIA FOR SEQUENTIAL BLASTING"

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## ABSTRACT

The use of sequential blasting techniques that combine surface and in-the-hole delays has provided blasters with increased flexibility in blast design to promote good rock fragmentation and displacement while minimizing offsite blast effects such as air blast, flyrock, and ground vibration.

Experience in bench blasting has shown that best results are normally obtained when the delay time between holes in rows parallel to the free face is between one and five milliseconds per foot of burden and when the delay time between rows is two to three times this value. The rate of blast progression along the free face should be less than about 500 feet per second to minimize the superposition of air blast pulses radiated from each hole.

Experience has also shown that the level of ground vibration can increase significantly if the effective powder factor is too low. Experiments have shown that the frequency content of the ground vibration can be modified to exclude unwanted components by adjusting the delay interval.