

THE MAPPING OF VIBRATION PATTERNS AROUND A B LAST

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ABSTRACT

A system consisting of an unlimited number of biaxial geophones that measure peak particle velocity and frequency has been developed and utilized at surface mines, quarries and construction sites. An ability to accurately measure ground vibrations completely surrounding a blast and to construct a vibration topograph has facilitated the study of blast design parameters and geologic factors on the resulting generation and propagation of the vibrations.

Blast design parameters were observed to influence the near-field level of vibrations but became less important as distance from the blast increased and geologic effects controlled the amplitude of vibration. Geologic conditions were responsible for relative increases in vibration such that the maximum peak particle velocity was not always measured at the closest structure.

The vibration levels measured around a site were found to be consistent from shot to shot. This has implications in that the vibration pattern or vibration 'fingerprint' of a site, once established, can then be used with single-point seismograph measurements to more accurately assess the level of vibration at specific locations.