

Estimating Damage Caused by Rock Vibrations

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ABSTRACT

Over the past 30 years, the Nordic countries have developed similar practices for estimating damage caused by rock blasting vibrations. However, over the last few years the risk of damage has sometimes been estimated by using international values, which have created unnecessary costs, since they are too conservative. This paper gives a proposal for Finnish blast vibration standards and a calculation model for the extent of the zones for building inspection, risk analysis, and vibration measurements. The international conclusion is that particle velocity is the best descriptor for limiting damage potential for structures. Over 900 000 vibration data recordings from 52971 blasts were collected for this paper during 1970-1989. They show that the most practical description is the vertical component of the peak particle velocity. As rock is a nonhomogeneous medium, it is hard to predict the need and scope of risk analyses, building inspection, and vibration measurements. As a large number of blasts were monitored for the recording of the peak particle velocity in several locations in Finland, and the data combined, it is possible to establish safe scaled distances for the calculation of the need and scope of risk analyses, building inspections, and vibration measurements.