

# **VIBRATION MONITORING AND CONTROL OF BLASTING ASSOCIATED WITH THE CONSTRUCTION OF A HIGHWAY NEXT TO A SHOW CAVE**

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## **ABSTRACT**

The realignment of Highway H in the proximity of Crystal Cave (Springfield MO.) required the development of a blasting program that was both economical and efficient for construction, yet ecologically safe for the cave. Three component seismographs were strategically placed underground near prominent and sensitive cave features and the vibration levels from the construction blasting continuously monitored. Peak particle velocity (PPV) values were found to obey the square root scaling law and a peak particle velocity value of 0.3 in/sec was chosen as the safe maximum limit. This value proved adequate in preserving the integrity of the cave and its features. Scaled distances for the maximum and lower values enabled blasting personnel to select explosive charge weights per delay for given distance to the cave. Delays were determined from the dominant frequencies recorded underground.

The integrity of Crystal Cave was preserved with minimal interference to tours and no economic penalty to the contractor. The success of this project is due to RMERC's constant monitoring of vibration and updating of pounds per delay limits as well as the cooperation among industry, academia, government and private citizens.