VIBRATION MONITORING

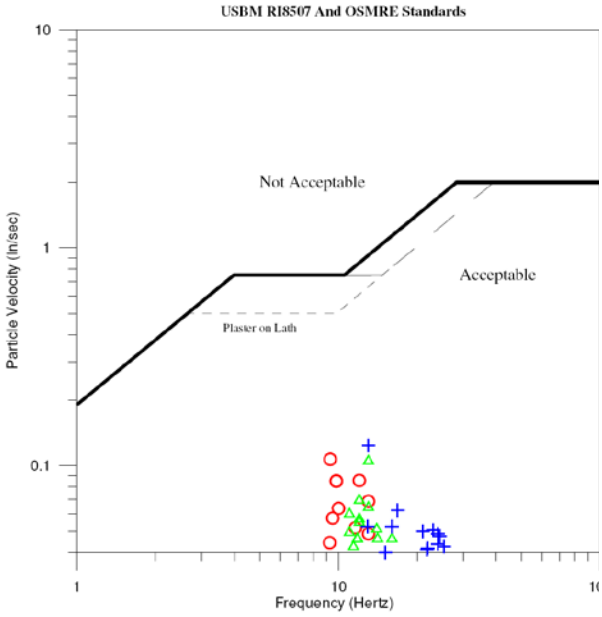
Vibration Monitoring of Pile Vibrating – SANTA BARBARA COUNTY, CA

Vibration and sound monitoring are useful methods for documenting and controlling the effects of blasting, pile driving and other construction activities on man-made structures. Measured values can be compared with established threshold levels for structural damage and used to prevent generated vibrations and overpressures from exceeding safe levels.

Area of Investigation

Vibration monitoring was conducted in Santa Barbara County, California to document the ground vibrations and air-blast overpressures generated during pile vibrating activities, as there was concern regarding claims of structural damage from nearby residents. These measurements were then referenced to the frequency-based threshold levels for structural damage established by the US Bureau of Mines (USBM) and the Office of Surface Mining and Reclamation (OSMRE).

Spectrum established two stations at the site and monitored the vibrations and overpressures generated by pile-vibrating over the course of 4 days. A Blastmate III monitor coupled to a three-component geophone and a linear microphone were used to continuously record peak particle velocities and peak overpressures (and their associated frequencies) at one-minute intervals for the duration of pile vibrating activities. In addition, background vibrations and overpressures were monitored in order to compare the daily vibration and overpressure levels from significant air and vehicle traffic with the levels associated with pile vibrating. Field logging of pile vibrating activities was used to compare peak particle velocities and overpressures with specific activities, and waveforms of pile vibrating vibrations were recorded in order to identify dominant frequencies associated with pile driving. Data were processed using the Blastware® software package. Peak particle velocities for all three components were found to fall well below the established frequency-based threshold levels for structural damage.



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