

Blast Design Changes to Accommodate Poor Geology



Project Summary

POOR GEOLOGY AND PROXIMITY TO HOMES POSES CHALLENGES

This Granite quarry in the Carolinas uses their own blasters and Dyno Nobel provides a TITAN® XL 1000 truck and driver, additional support in blaster assistance, as well as signature analysis for every shot design.

This operation is removing a small section of bench and creating a final wall catch bench. Neighboring homes are within 750 feet of the shot area. In addition, poor geology results in excessive backbreak, requiring either paired holes, reduced front row spacing or angle holes.

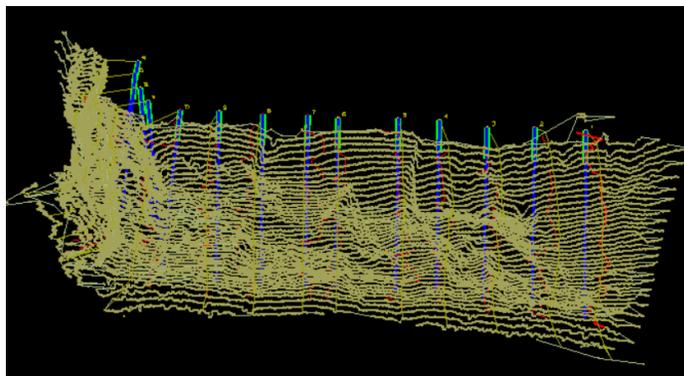
Recent shots have resulted in concerns from neighbors and peak particle velocity values were approaching the NC DNR limit, (USBM Appendix B criteria).

Technology Applied

CHANGES NEEDED AND QUICKLY

With only about 5 shots remaining in this area a systematic approach was not plausible. The decision was made to make several changes all on one shot.

- Shoot an additional test hole adjacent to the critical area, but still in the same rock. This data will be used to update the DYNO 42 analysis for sequencing future blasts.
- Open on the closed side of the blast, closest to adjacent structures. This would serve two purposes. It will create a developing free face where seismic energy will be directed away from the structures. It will also create an area of broken rock and muck between successive holes firing and the target structures.



- Change the pattern to a square pattern and shoot on a true echelon. This will create an actual burden that is approximately fifty percent (50%) of the design burden.
- Incorporate angle holes where needed.

Results

FIRST SHOT A SUCCESS

Only one blast in this area has been shot at this time. Seismic results were excellent, with a significant reduction in recorded peak particle velocity and all channels showing a frequency spectra about 70 Hz. Backbreak appears to be reduced and the overall breakage is good. No complaints were received on this blast.

Next Steps

KEEP GOING WITH WHAT WORKS

The logical next step here is to maintain gains. Accurate profiling of the face for shot layout and design will be critical. Part of this sensitive area contains a very different rock mass. So, a second test hole will be initiated to provide the basis for determining hole sequencing when blasting moves to this area to complete the blasting on this bench.