

Angled Holes Used to Blast Excess Burden



Background

EVALUATION NEEDED FOR APPROPRIATE BURDEN ON ANGELED HOLES

This granite quarry in the Eastern United States currently uses a 12ft x 14ft pattern with a 5.75 inch diameter hole. The quarry uses TITAN® XL1000 and uses DigiShot® for the initiation system. The quarry regularly uses a 2D profile to evaluate each front row hole.

The side of the quarry that the shot was designed for is close to houses that are right at the edge of the quarry property. The bench face had a bad back break from the previous shot and so the burden on the front row was an excess of 50 feet. The decision was made to put 40 degree angles for the front row in order to have the appropriate burden. The second row then would have to be 25-30 degree angles for the second row to have the correct burden.

Technology Applied

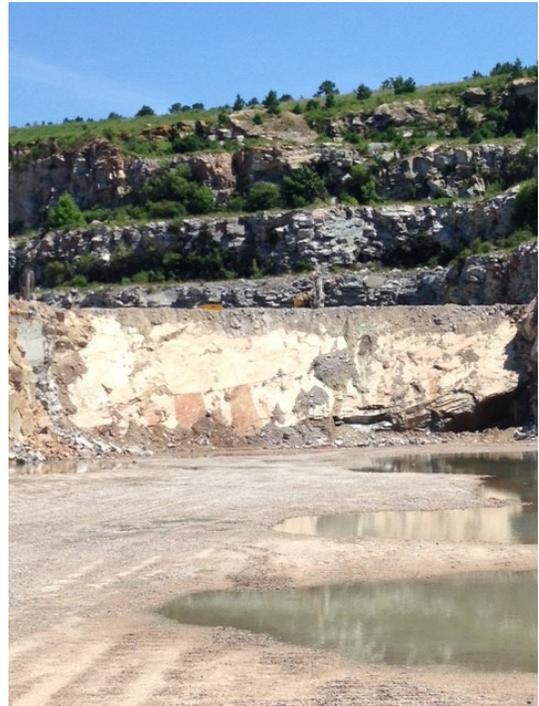
RARE SHOT NEEDED 3D PROFILE AND BORETRAK OF ANGLE HOLES

This quarry shot was a very rare occasion of having such big angle holes and so the tech team of Dyno Nobel was called in to complete a 3D profile and boretrak of all the first and second row angle holes.

Results

MULTI-LEVEL ANALYSIS PROVED SUCCESSFUL FOR THIS BLAST

The first and second row of holes were actually in line with each other, but had the appropriate burden because of the difference of the angle holes. This resulted in 35 holes across the face of the shot. The drilling of the holes was checked by the boretrak and most holes were averaging 3-5 degrees higher than planned for on the layout diagram. A report was generated showing the blaster all of the profiles from the combined 3D



and boretrak information. This gave him an idea of the amount of burden that was present on each individual borehole. Another report was generated showing the wandering of the boreholes from side to side to show if holes got too close to each other and one hole would set off the other. All this information was put together and used to decide how to load the entire shot.

Utilizing such big angle holes is typically not ideal for quarries, but sometimes the geology dictates the usage of angle holes. The quarry took all the necessary actions in getting a 3D profile done and boretraking of all the big angle holes to help the shot go as planned and not have any fly rock from the blast. This was especially important with neighbor houses facing the highwall where the angle holes were located.