Case Study
Reducing The Costs of Drill and Blast While Increasing Production and Improving Community Relations
2nd LAFARGE Friendship Quarry, USA

Customer Profile
- Owned by Blue Circle Aggregates, a subsidiary of LAFARGE Corporation.
- Located in Buford Georgia, 35 miles northeast of Atlanta.
- Been in production over 30 years.
- Production target of 2 million tons a year.
- Drill and blast operation with four haul trucks.

Mining Issues
- Deposit is highly fractured granite gneiss, with a lot of overburden, making for challenging blasting.
- Early 9’x11’ pattern produced oversize in 65% of blasts.
- Started to enlarge shots two years ago from 30,000 tons to 50,000 - 60,000 tons.
- Management wanted to explore all opportunities for reducing blast vibrations and production benefits.
- Fines were a significant issue.

The Situation
- Management focus is on being good neighbours and contributing to the community.
- Quarry has undergone extensive expansion to meet increased demand.
- Expansion into new areas resulted in a new set of variables for the operation and its’ effect on the community.

Technical Solutions
- Introduced i-kon™ System December 2000.
- Using pyrotechnic and digital delays had Vibra-Tech (a leading vibration monitoring company) monitor frequencies and vibration levels to establish benchmarks from which to explore new timing.
- These benchmarks took into account local geology, variations in bench height, and the effect of blast direction.

Discovered low frequency issue through comprehensive monitoring.
- Has Rock-on-Ground drill & blast contract with Orica.
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- Used the precision of i-kon™ to evaluate the effect of one millisecond increments on frequencies.
- Dialled into optimum timing window “the sweet spot” of 28 ms. (hole-to-hole) form that specific area of the deposit.
- Went to 13’x16’ pattern with excellent fragmentation

Demonstrated Benefits
- Increased hole-to-hole timing has led to higher frequencies, which have reduced impact on neighbours and kept good community relations.
- Discovered north/south and east/west vibration profiles and optimum blast timing for each.
- Expanded pattern to shoot more rock with same amount of explosives and detonators, which has reduced cost per ton.
- Excellent fragmentation and reduced fines.
- Increased throughput to the crusher.
- Production has gone from 8,000 - 13,000 tons in 14 hours to 10,000 tons in 10 hours, delivering huge labor savings.

Testimonial
“This is the great thing about the i-kon™ System. We can play with the timing between rows and between holes. It has worked out really well. Now we’ve upped our pattern to 13’x16’ and we’re still getting great fragmentation, great muck pile and the complaints are so minimal. It’s just incredible.”
Larry Henry
Pit Foreman
Friendship Quarry
Blue Circle Aggregates

“You’re assured that you have control over the shot. Because the accuracy of the detonation timing is there, it eliminates a lot of variations that could otherwise cloud the results you’re looking at. i-kon™ really establishes a good baseline for the rest of the work that you want to look at. Expanded patterns, difficult timings etc.”

Jim Prock
Plant Manager
Friendship Quarry
Blue Circle Aggregates

“Our printouts showed distinct energy zones, which I’ve never seen before. The peak zones were very narrow and distinct because of the accuracy. The bulk of the energy is in the 30 Hz range or greater, which is where we want to be. We’ve registered blasts almost to 60 Hz. We weren’t able to do that before. That’s progress!”

Matt Pilz
Regional Manager
Vibra-Tech
“We found that we can dial into the different reactions of individual benches. For example, say we’re shooting north/south on the second bench with one set of timing, but on the top bench we want to shoot east/west. Then we can change the timing to get the best results.”

Ron Cocklin

i-kon™ System Specialist

Orica USA Inc.

“It was extremely worthwhile that we were not only able to help with good neighbourhood relations but also add more value to Blue Circle with higher production rates and to help them minimize their pit fines.”

Ronny Ledford

Sales Representative

Orica USA Inc.