USA MINING & CONSTRUCTION

MECHANIZED ROCK EXCAVATION WITH ATLAS COPCO - NO. 2/ 2011

Bigger Impact From Smaller Hammers

ODEX makes river blast possible

Page 4

Symmetrix helps ease traffic jams

Page 13

The Victor L. Phillips Co. Turns 100

Page 18

Atlas Copco

EDITORIAL

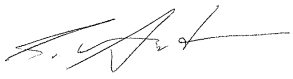
When Atlas Copco looked to complement its mining and construction offerings with a line of crushers, it focused on Hartl. Everything about Hartl's Powercrushers made sense.

As the market trended away from stationary crushers, other manufacturers searched their existing lines for anything small enough to mount on tracks. Their products were viewed as secondary crushers, at best. Hartl, though, designed units from scratch with a co-designed chassis and frame powerful enough to designate as primary crushers.

Modular construction makes maintenance and repair easy, extending overall life. We commonly find Powercrushers with 12,000 to 14,000 hours on them.

The existing Powercrusher population, whether under the previous name or new in our stores, is fully supported by Atlas Copco's hallmark customer service. That's huge. From its very beginning, the line was never about just selling a machine that made rocks into smaller rocks. It was always about the customer's profitability, machines that create valuable products efficiently.

Combining the best crushers with the best customer support is just one more way Atlas Copco demonstrates its commitment to the mining and construction industries.



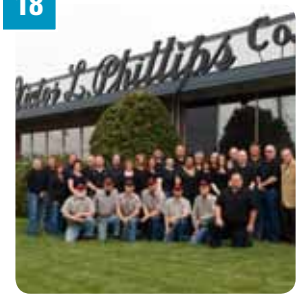
Eric Amberson
Product Line Manager
Powercrusher line, USA

CONTENTS

4

7

18



22

MINING & CONSTRUCTION USA
is published by Atlas Copco. The magazine focuses on the company's knowhow.
www.atlascopco.com

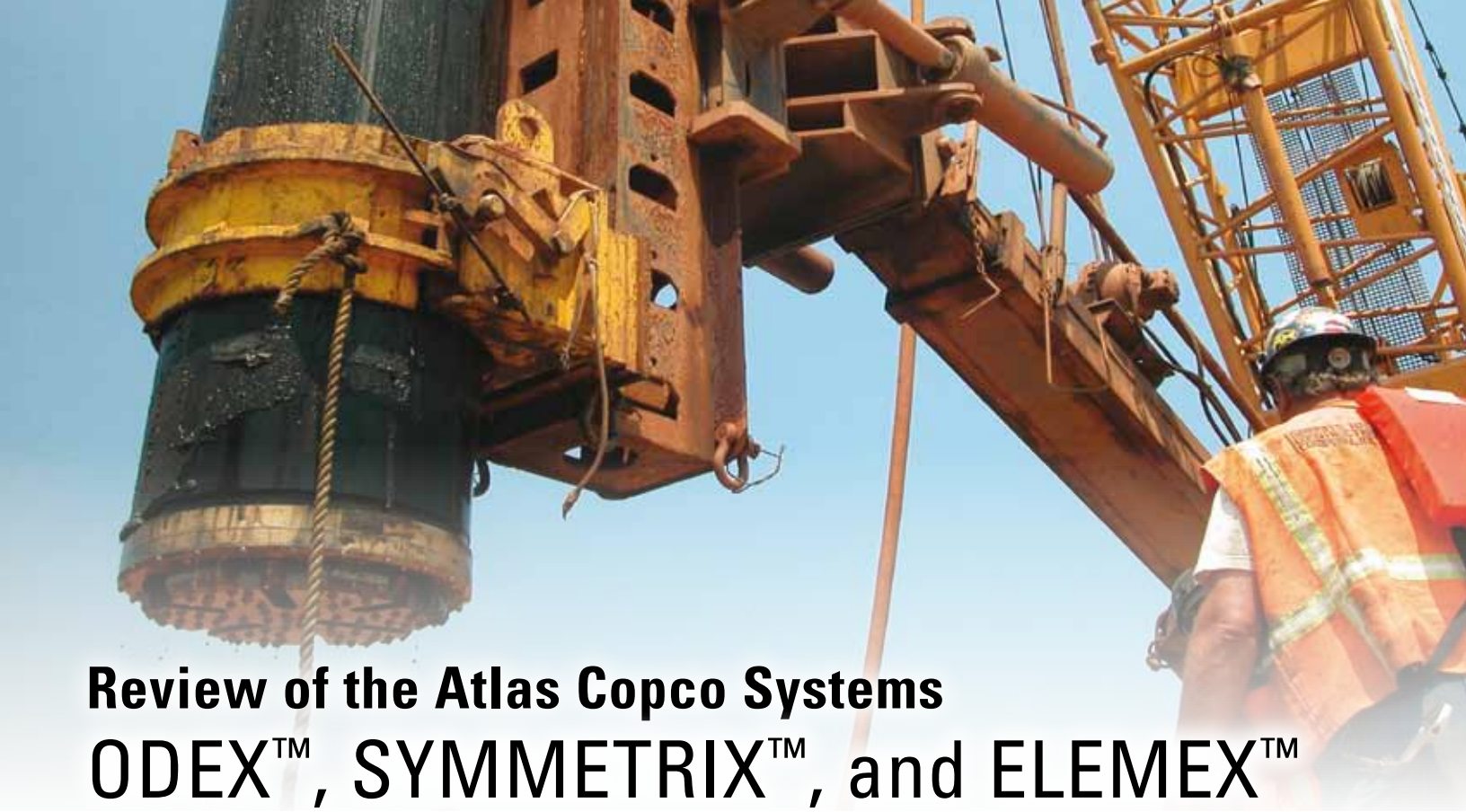
PUBLISHED BY
Atlas Copco Construction & Mining
3700 E. 68th Avenue
Commerce City, CO 80022
Telephone:
303-287-8822

PUBLISHER Christina Fisher
chris.fisher@us.atlascopco.com

EDITOR Scott Ellenbecker, scott@ellcom.us
SUBSCRIPTIONS MC-USA-Subscription@ellcom.us
Editorial production, design and layout:
Ellenbecker Communications
Round Lake, MN 56167 USA
507-945-0100

SAFETY FIRST
Atlas Copco is committed to comply with or exceed all global and local safety rules and regulations for personal safety. Some photographs in this magazine may, however, show circumstances that are beyond our control. All users of Atlas Copco equipment are urged to think safety first and always use proper ear, eye, head and other protection as required to minimize the risk of personal injury.

Atlas Copco



Review of the Atlas Copco Systems ODEX™, SYMMETRIX™, and ELEMEX™

This issue of M&C USA contains several application reports on simultaneous drilling/casing advancement systems.

The Atlas Copco casing advancement family includes the ODEX™, SYMMETRIX™, and ELEMEX™ systems. All three systems utilize a percussive top-hammer or DTH hammer and consist of a pilot bit, a reaming bit, and usually a casing shoe. In applications that do not use a casing shoe, the casing is pushed in.

The casing shoe in all three systems receives percussive blows on its shoulder from the hammer, simultaneously pulling the casing during drilling. Because of this, they are also efficient systems for horizontal applications. These systems work so well that some project design engineers have begun specifying their use by name in pre-bid project plans.

The ODEX's reamer is an eccentric bit that opens while drilling to widen the hole's annulus sufficiently for the casing. It unlocks from the pilot bit when the driller stops and makes a slight reversal of the drill string. It is then withdrawn. Drilling past the casing is accomplished with the same bit or another bit of choice, depending on the ODEX version selected for the job. Currently ODEX is available in eight diameters from 3" to 8" for DTH hammers.

The SYMMETRIX system's pilot bit locks into a symmetrical, concentric ring bit, which like the ODEX reamer, widens the hole for the casing. Several advantages of SYMMETRIX's ring bit system are increased hole straightness and depth (to 1,200 feet) through obstacles such as cobbles and concrete and the hardest rock. It is a faster drilling system than ODEX, making it a highly productive choice for vertical geothermal drilling. In this application, the casing, casing shoe and ring bit can be withdrawn for reuse in multiple holes. A SYMMETRIX system is available for casing up to 48 inches (1,220 mm) in diameter.

ELEMEX builds upon the SYMMETRIX design with two significant modifications. The pilot bit's face has uniquely designed grooves that efficiently channel air across the bit face and bottom of the hole, not down or away from it. Second, its ring bit extends past the pilot bit. This combination creates a controlled flushing of the bottom of the hole that minimizes loss of pressurized air to the surrounding soil, protecting the composition of surrounding soils and the integrity of nearby structures during drilling.

WAY DOWN UPON THE SUSQUEHANNA

ODEX makes river blast possible

Maine Drilling and Blasting creates a unique ODEX technique to set PVC casing through shot rock islands and overburden on the Susquehanna River.

The Holtwood hydroelectric plant, currently owned by Pennsylvania Power and Light Corporation (PPL) since 1995, has generated power from its 55-foot-high dam across the Susquehanna River for just over a century. In 2010 PPL began a $440 million expansion project that will more than double its existing power generating capacity. PPL awarded the project to Walsh Construction of Chicago, who subcontracted Maine Drilling & Blasting (MD&B) headquartered out of Gardiner, Maine.

MD&B's job is to increase the depth of a mile-long stretch of the Susquehanna by 6 to 10 feet on both sides. This is to accommodate the increase in water that will pour into the river from the expansion's gates; the water must have sufficient capacity to leave the channel at the dam as quickly as it enters. Project engineers determined the depth, width, and distance downriver to expand. They calculated that MD&B would need to remove 1 million cubic yards of overburden.

According to Driller Superintendent Dave Bijolle, the company is nearing the halfway mark after devising a successful technique for drilling through the shot-rock islands they create to work in the river. But water isn't the only obstacle they have to work around.

Behind the dam is the 2,400-acre Lake Aldred and the valued environmental habitat that surrounds it, the Holtwood Environmental Preserve. Created and maintained as a joint private-public venture, the preserve protects two species in particular. One is the American Shad, a type of herring that lives in the ocean but returns inland up the Susquehanna to spawn each year in the late spring. The shad manage their way past the dam using the Holtwood fish lifts, the largest system of its kind in the country, to get to and from the lake and the tributaries that enter it. MD&B is not allowed to work during this time, as blasting would upset the migration.

The preserve is also the protected nesting area of the American Bald Eagle. The

Holtwood initiative is credited with bringing the eagles back from near extinction in this area. Drilling operations are not allowed in the river until the last nesting eagles have left the area. Although work began last fall, this combination of nesting and spawning seasons will delay MD&B from continuing work in the river until late June, perhaps even to mid-July.

Working in the river

To operate machinery in the river, the company created islands of shot rock. While this keeps crawlers and personnel above the waterline, it also becomes more overburden to remove. And the shot rock, they learned right away, was hard on equipment. Bijolle said they tried hammering a German company's tubular drill string through the shot rock down to the river bottom. Though the coring-like process had been a successful tactic for them in loose dirt and clay on other projects, rig operators became frustrated with it in this shot rock application.

"The tube would become jammed half to three quarters of the way up, it would get stuck in the hole, and it would often overstress, simply sheering off in the hole," Bijolle said. They needed to devise a strategy quickly that would prevent any further loss of holes, pipe and time.

Bijolle said when they tried the Atlas Copco ODEX casing system with 4-inch, schedule-40 PVC, the ODEX's carbide buttons easily crushed everything they encountered. The ODEX system cleaned out the grindings like a vacuum.

"The ODEX worked through the shot rock all the way to the river bottom and then 4 to 6 inches into the bed below without a problem. But the shot rock was just too hard on the PVC. It would shatter and crack up," Bijolle said. "It took being right there on the site, seeing what was happening, to say, 'Hey, what happens if we loosen up the shot rock first?'" Predrilling the holes did the trick.

Three-stage drilling solution

Drilling is now done in three, single-pass stages. First they drill a pilot hole over the pattern using an Atlas Copco ECM780, for the most part, with a 6-inch bit. The hole collapses, of course, due to the water and loose material. However, the path through the interlocking shot rock has been reconfigured and is now less resistant to the next penetration—"loosened up," as Bijolle described it. "Then we come back over the holes with a 590 and the ODEX, and the PVC slides into place all the way to the bottom without any problem. No more shattered casings." They just reverse the bit, retract the drill string, and move on. The company makes a third pass to bore a 3 ½-inch blasthole with any of the rigs that are available from their fleet. That last part "pretty much any »

(previous page) The Holtwood hydroelectric dam co-exists with the Holtwood Environmental Preserve, which is a designated Bald Eagle nesting sanctuary and boasts the country's largest fish lifts for the protected American Shad.

(below) Maine Drilling & Blasting devised a multi-stage pre-drilling process that "loosened up" the shot rock, allowing them to set PVC with the ODEX simultaneous casing advancement system.

rig can do," said Bijolle. Do they have a particular strategy for when to run the rigs after each other? "That varies," said Bijolle.

"You'd think that the holes would get tight again, wouldn't you, but they don't. Ideally, we'd want to have the predrilling about half-way done and then send in a pair of 590s to set the casings, but rigs get called away to other parts of the project. Depends on availability, but it hasn't really been a problem. We've come back, four-five days later and the holes are still loose. Only possible difficulty is if the operator doesn't align closely enough. Might be a bit of stress on the casing then. But we're not really seeing any problems.

"Seems like a lot of work for a hole, doesn't it," Bijolle added. "But it's an important step. You have to loosen up that rock first."

In spite of making three separate passes, the company is able to drill 18 to 22 holes a day. "We have about 650,000 cubic yards remaining," said Bijolle. He estimates this will take another six or seven months, if things go well. He is optimistic, but it's not a given.

"We've been making single passes and having no problem up to 18 feet. One of the 590s has an extended feed capable of 20 feet. But what are we going to do to get through areas where we need 30 to 40 feet? We're working that out now."

MD&B has time to design a solution, since the environmental protection measures mean they won't be back to blasting until midsummer. Judging from the practical ingenuity of their shot rock solution, we're willing to bet that project completion way down upon the Susquehanna isn't all that far, far away.

(above) Maine Drilling & Blasting is a can-do company, making small adaptations as necessary to get jobs done quickly, such as this short flushing diverter that helps keep the operator dry as they hammer down to the river bed.

(below) The shotrock wasn't a problem for ODEX, but it tore up PVC casing until Maine Drilling and Blasting switched to a predrilling routine. The problem was completely eliminated, without a single damaged casing from then on.

Chesapeake Materials produced about 1 million tons of material in 2010. It doesn't own a quarry but works with an extensive list of quarries and aggregate producers. Chesapeake works with them in three ways:

- It produces riprap and armor stone from a quarry's unwanted boulders and sells it directly to its customers.
- It produces riprap and armor stone within a quarry, building inventory for that quarry to sell.
- It provides breaking services within a quarry. This gives the quarry smaller sizes for use in its own primary crusher.

BIGGER IMPACT FROM SMALLER HAMMERS

Rock breaking company specializes in marine stone market »

Chesapeake Materials, of Stafford, Va., is a full-service rock breaking company operating from New Jersey to Florida that specializes in stone for marine applications, specifically the rip-rap and armor stone commonly used to stabilize and protect shorelines, dikes, grades and breakwaters from the force of waves. Yet they have no quarries of their own. They are specialists who contribute their unique skill to partnerships with quarries, adding value up and down, from quarry to end-user.

Randy Blanton, President of Chesapeake Materials, said, "Quarries can't specialize but Chesapeake does."

Chesapeake Materials excels in this market by staying quick on its feet, outperforming crews who use bigger, less mobile equipment.

Team players

Chesapeake offers a valuable service to quarries. They produce the highest quality products and ensure on-time delivery. Quarries don't have to tie up their capital in additional equipment that Chesapeake already owns, uses and maintains on a daily basis. This same equipment might only see production on a part-time basis if it were owned by a single quarry. And when Chesapeake is done on a project in the quarry, the equipment goes with them to their next job.

Often as not, they are cleaning up a quarry, turning what would be waste rock or large obstacles to the quarry's other operations into profitable products as advertised by their "Obstacles into Opportunities" slogan. And Chesapeake's specialists keep prices down for the end-customer without eroding profit margins for the quarry by providing the most efficient production, meaning lower cost.

Their rip-rap and armor stone customers, in particular, rely on Chesapeake. The rock faces tough natural forces along the water and some quarries don't have the techniques to ensure the highest quality end product. And if Chesapeake needs to deal with more than one quarry to get the best product for a job—it already has contacts in place that an individual quarry wouldn't.

Bill Magann, president of W.F. Magann, Portsmouth, Va., has been a happy Chesapeake Materials customer for more than 20 years. Magann's company specializes in heavy industrial, marine and concrete construction and design.

Magann sought out Chesapeake Materials when it was in charge of building islands for the largest bridge in the state of Georgia, the Sidney Lanier cable-stayed bridge in Brunswick. Chesapeake provided 500,000 tons of rock for that project. Magann said, "The material has to be made right, stockpiled and shipped right or everyone waits. They just know how to do it and they'd be hard to replace."

For contractor Coastal Design and Construction's project in Virginia Beach, Va., at Fort Story, Chesapeake produced more than 100,000 tons of 3- to 7-ton armor stone, loaded the rock on rail cars at two different quarries, shipped the product to a rail siding in Norfolk, unloaded the rail cars into their own trucks and delivered the rock to the job site. The contractor won an award for completing the job under time and under budget. Not all jobs are that large or need special treatment or troubleshooting, though. Chesapeake is even known to supply rock for single-truck residential jobs.

Using smaller hammers such as the HB 3000 allows Chesapeake Materials to use lighter carriers for less restricted transportation from one host quarry to another. Although their expert operators routinely out-produce companies using larger hammers, the HB 3600 provides them greater performance using the same carriers.

On this job

A company with a long-term relationship with Chesapeake is Independence Construction Materials (ICM). For the job photographed for this article, Chesapeake was in ICM's stone mill located at Elk Mills, Md., filling an ICM customer's order for a bridge project. The job required significant truck loads each day to meet the customer's needs. Armor stone is generally made to order by weight. But weight is not the sole specification.

On this order, the rock must be 165 pounds per cubic foot and have few seams—"not stuff that's easy to break," said Blanton. They could judge the stone at this quarry by color. Only the darker grays had a specific gravity high enough to ensure the bridge plan's engineering specifications were met.

Blanton's crews are experts at this. There will be no rejected shipments. "This is all our people do, 50 to 55 hours a week, every week," Blanton said. "They can tell you whether a rock weighs 4,000 pounds or 5,000 pounds from 30 feet away. They know what is good rock or bad rock."

> "Big thing about Atlas Copco, they stand behind their equipment. Others always say 'We're the best,' just like Atlas Copco, but they're not."
>
> **Randy Blanton**
> President of Chesapeake Materials

> The [HB] 3000 is our bread and butter. Many people are suprised what we can do with a 3000 when we show up where other quarry personnel are using a 4200-class breaker."
>
> **Randy Blanton**
> President of Chesapeake Materials

(left to right) Brad Burruss, Regional Channel Manager for Atlas Copco Construction Equipment; Mark Weeks, Senior Hammer Operator; Mike White, Operations Manager; Randy Blanton, President; and Bryan Manning, Foreman.

Tools of the trade

Blanton said the hammer, the hydraulic breaker, is the most important tool on site. "It's vital to everything—all we do is determined by the hammer."

All totaled, Chesapeake owns over a dozen hammers. For nearly 10 years all of their hammers have been Atlas Copco. "We've been approached to try other manufacturers' models, even allowed to try them for free. Some talk us into it and it usually ends up a disaster," Blanton said.

"Big thing about Atlas Copco, they stand behind their equipment. Others always say 'We're the best,' just like Atlas Copco, but they're not," Blanton said, adding about the Atlas Copco breakers, "It's not just durability. It's their efficiency. Easier on the carrier."

The company routinely gets 10 years or more of service from a breaker, keeping them well-maintained and repairing them until they decide it is time to replace them. Blanton said they recently had one scheduled for replacement that was still in operation after 12 years.

For the bit, he said, they use the Atlas Copco Silver series due to its longevity, performance and price.

Bread and butter hammer

It is common to use an HB 4200 in quarry work, and Chesapeake does have three of them in Georgia. But the nature of Chesapeake's business in the Virginia and Maryland area down through South Carolina requires greater mobility. "We need hammers that are big enough for the job but also small enough to minimize transport cost in terms of breaking the machine down and permits. The machine might need to move across the street or three states away. On the 330/350 Link-Belt and Volvo carriers we like to use, they won't take a 4200."

Larger carriers required to mount an HB 4200 present two costly complications. One, transport contractors will not load a 100,000 pound-plus, 460-series excavator with a 10,000-pound breaker onto a 55-ton lowboy trailer.

As a minimum, the breaker and counterweight have to be removed and transported separately. This means time lost both to breakdown the hammer and then again later to set it up, as well as an extra vehicle to transport the counterweight, breaker and its parts.

Then there's permitting. Depending on the state, even breaking down such a weighty carrier will likely mean purchasing a DOT-issued superload transportation permit from each state of intended travel. So Chesapeake Materials has relied on the Atlas Copco HB 3000 heavy duty breaker, which until now had been the heaviest breaker they could mount to a 330/350 class Volvo or Link-Belt excavator. The current model offered by Atlas Copco is the HB 3100.

Robert Pough, manager of Chesapeake Materials' Georgia operations, and Marvin White, a Virginia-based senior foreman, established the skill level for the company's operators based on their 20-plus years of experience with Chesapeake. The operators' superior training means they not only keep up with the larger hammers in the quarry but generally out-produce them.

Blanton explained: "The 3000 is our bread and butter. Many people are surprised what we can do with a 3000 when we show up where other quarry personnel are using a 4200-class breaker. We do it all the time."

Filling the gap

Throughout the industry an increasing demand for smaller, more mobile carriers has emphasized the gap between the 3000 and 4200 sized breakers. Enter the Atlas Copco HB 3600. When Chesapeake Materials purchased theirs, they were excited by the prospect of a unit that, Blanton said, has "higher impact performance and runs on any excavator in our fleet."

Blanton reported, "The general impression from our operators is that it hits harder and gets more work done than a HB 3000. The HB 3600 doesn't hit quite as hard as a HB 4200 but it can do as much work as one because of its higher impact frequency. We're very happy with it. The HB 3600 fills the gap."

Bow-shaped Lake Eerie Containment Disposal Facility No.4 (CDF 4) lies just south of Buffalo Harbor's south breakwater in New York state. Movement in the containment wall jeopardized its intended purpose: preventing pollutants from entering the lake water.

RUBBLE TROUBLE

Hammering in water without a bubble

Advanced Construction Techniques Inc. (ACT) primarily serves the civil and geotechnical engineering industry. They have developed a reputation over the years for cost-effective strategies for highly complex engineering problems. That's why Zoladz Construction Co., Inc. contracted them for a $2.7 million Army Corps of Engineers repair and stabilization project on Lake Erie's Containment Disposal Facility 4 (CDF 4) in Buffalo Harbor. The facility protects Lake Erie from contaminated soil deposited into it from annual dredging operations that support commercial navigation to and from the lake.

ACT's Vice President of Operations Doug Horvath said he just stood there amazed next to John Hislop, Atlas Copco's technical specialist. They were both searching for any sign of disturbance as they watched the Elemex 5 ½-inch bit complete its first 20-foot hole down through the sandstone and dolomite armor stone, boulders as large as cars, and the layers of submerged rock, gravel and sand that constitute CDF 4's filtering dike.

The channels on the Elemex bit so efficiently flush air across the face and up through the casing that minimal air escapes, preventing damage to sensitive soil conditions or in this case, the fine grain core of the containment walls.

Horvath said, "You know how the air flows over the face, cleans it [the Elemex bit]. All that air flowing over the face but not so much as a bubble anywhere. Anywhere."

A complex filtration system

The 107-acre CDF 4, with a total capacity of almost 7 million cubic yards, was built in 1976 as a temporary solution, as all CDFs were, for dealing with polluted material from commercial waterways. This gave cities time to implement pollution controls that would make the use of CDFs no longer necessary. CDF 4 was designed to have a useful lifespan of at least 10 to 20 years.

Thirty-five years later, though, it's still in use and is believed to have at least another 10 years' utility as a CDF (according to March 2008 Army Corps of Engineers estimates). When it reaches capacity, it will become a wildlife habitat.

> "Our test coring of grouting sections indeed showed that grout had impregnated the various stone and steel layers as predicted by the intelligrout programming"
>
> **David Bingert**
> Chief Engineer, multistate Buffalo distric of the Army Corps of Engineers

The construction of each of the 44 CDFs in the Great Lakes region is unique to the location where it is built, yet they all share one thing in common. Their varied layers prevent contaminants from migrating back to the lake side. Water from the CDF's pond passively filters through the dike wall, seeking equilibrium with the lake level as it is displaced by dredge material. The layered stone composition can be pretty rough on drill equipment and is a definite challenge for any case-setting system (see Figure 1).

Rubble trouble

David Bingert, chief engineer for the multistate Buffalo district of the Army Corps of Engineers, oversees all civil construction projects in that region. He described the problem: "Unfortunately, over time, the massive steel sheet pile sections were exposed to extreme ice conditions that, in effect, 'jacked' [a few of the steel sheet piles] as much as 10 feet into the air."

This jeopardized the system by making it possible for polluted sediment particles, Bingert said, to "ooze" unfiltered into Lake Erie. The Army Corps of Engineers determined that the dislodged sheet pilings needed to be stabilized by welding them and filling all voids completely.

Grout minds think alike

ACT is an expert in foundation grouting techniques. For this application, the company used its proprietary casing system to get grout where it needed to go. They used a computerized data system to help demonstrate grouting's effectiveness in this application to the Army Corps of Engineers on a small scale mockup.

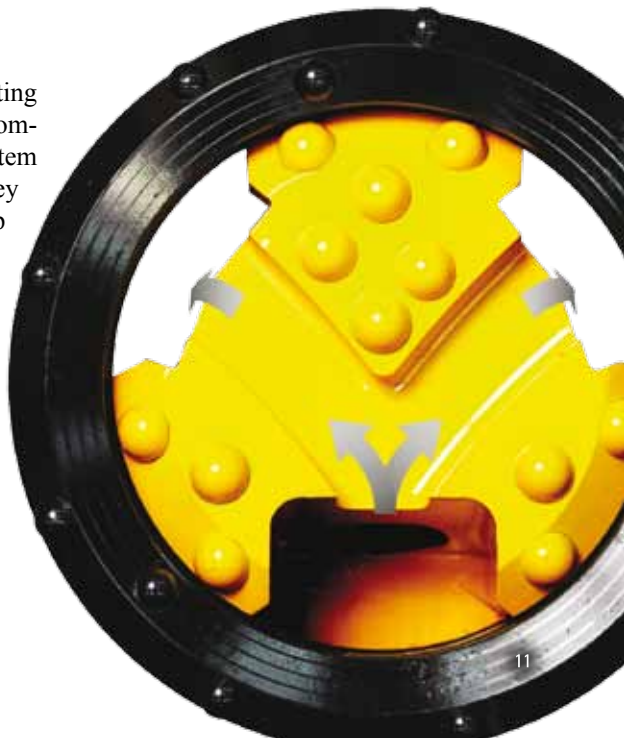
According to Bingert, "Our test coring of grouting sections indeed showed that grout had impregnated the various stone and steel layers as predicted by the Intelligrout programming." That sold the Army Corps of Engineers on grouting as the ideal remedy for CDF 4.

A hole other story

The test mockup, while effectively replicating the grouting requirements for permeation assessment, did not include armor stone and was only about half the size of the actual dike. After they started in on the job, the dike's composition quickly began to take its toll on their equipment. Horvath said he became concerned about whether they could get done before winter set in, which was the contracted deadline. Winter generally puts an end to the construction season in the Buffalo area by Nov. 30.

Originally they were using "a system similar to Elemex," Horvath said. "It really struggled. I needed to see chips coming up but was getting dust, and because of that I was going through bits. And you could see the air coming up all over, just coming up everywhere. We needed something fast and were getting worried about getting done before winter set in." The air jeopardized the integrity of the sensitive, fine-grained core of the dike. »

The arrows indicate how Elemex's design channels the air and cuttings across the face up through the casing. The extended bit ring helps prevent air from escaping into the soil surrounding the bore.



Long familiar with just about all case setting products, Horvath said, "I had heard about Elemex, of course."

And this is when Hislop joined the team, coming in person to provide any technical support and guidance, assuring all stakeholders that Elemex lived up to its billing.

A perfect solution

The Elemex system is especially designed for DTH drilling in sensitive ground, well-matched to a project such as grout repairs on the CDF 4. Its unique directional control permits only enough air to clean the bit face and clear the hole of cuttings.

Further, the extended bit ring creates a nearly sealed chamber so that all cuttings travel with the air up out of the hole through the casing. There is minimal air leakage.

In this application, air control was crucial. The air typically lost through other systems could cause catastrophic damage to the dike's lighter internal components. Elemex helped ATC complete their project, combining the aggressive power of a DTH hammer with the delicate touch of perfectly managed air.

Ahead of schedule

ATC had little time left to complete the job. Horvath said they "just made it." Bingert confided he had been a little worried because it was critical to get this job done on time. The summer's dredging project depended on it.

Sediment continually threatens commercial navigation by clogging the channels. No holding facility would mean no dredging. Weather was already making things miserable for the construction crews. And then they impressed Bingert by finishing ahead of schedule, with "wiggle room," he said, "but not a lot, maybe a couple weeks. Early storms were really giving them trouble, washing out their access road several times."

Bingert added, "ACT and Zoladz were also given our first ever Award for Construction Safety by our Deputy Commander on site on 29 October."

Winter set in for good about two weeks after completion, as Bingert recalled. But ACT's quality work "put to rest anything that would be of concern to the EPA" [Environmental Protection Agency]. Dredging operations have a green light for what Bingert said would be about 600,000 cubic yards of contaminated material they need to clear from CDF 4.

Horvath recalls that the project required about 30 grouted holes in all before they were done: "I gotta say this about Elemex. We used that same bit for all 30 holes and the thing still looks new. It's quite a testament to it, especially here, with this type of rock, underwater. Just like the advertisement—better than the advertisement."

> "We used that same bit for all 30 holes and the thing still looks new. It's quite a testament to [Elemex], especially here, with this type of rock, underwater."
>
> **Doug Horvath**
> ACT's Vice President of Operations

ATC adds one more success to their remarkable 26-year record of private and government grouting projects, in addition to many other projects the company's reputation is based on. And Elemex and CDF 4 came away from the repair project sharing something in common: both came out of it good as new.

RUBBLEMOUND DIKE

Great Lakes Confined Disposal Facility #4 (CDF 4)

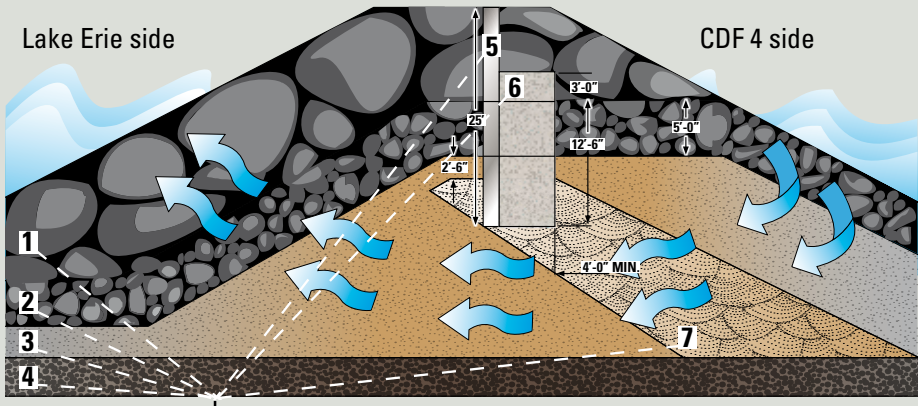
Figure 1

CDF 4's retaining wall is what the Army Corps of Engineers calls a "rubblemound" dike. The term is deceptively simple, because CDF 4 is not just a heap of rubble. A cutoff wall made from vertical, 25-foot-long, 3/8-inch interlocking steel sheet piles prevents water from leaving the disposal pond by any means other than the grainy filtering system at the bottom portion of the dike's pyramid-like structure.

The disposal side, which will contain the disposal material, is covered by layers of rock over a granular fill. The lowest layer is filter slag of fine sand and gravel. That's covered by a core made of rocks from as small as 2 inches in diameter and up to 250 pounds. Above that, there is "under-layer" stone of .5 to 2.25 tons in size.

On the lake side, which takes the brunt of the waves' force, the core slag and under-laying stone is protected by "armor stone." Armor stone consists of 10- to 20-ton sandstone and dolomite boulders. The armor stone layer continues up over the top of dike, forming a 16-foot-wide rocky cap over its top.

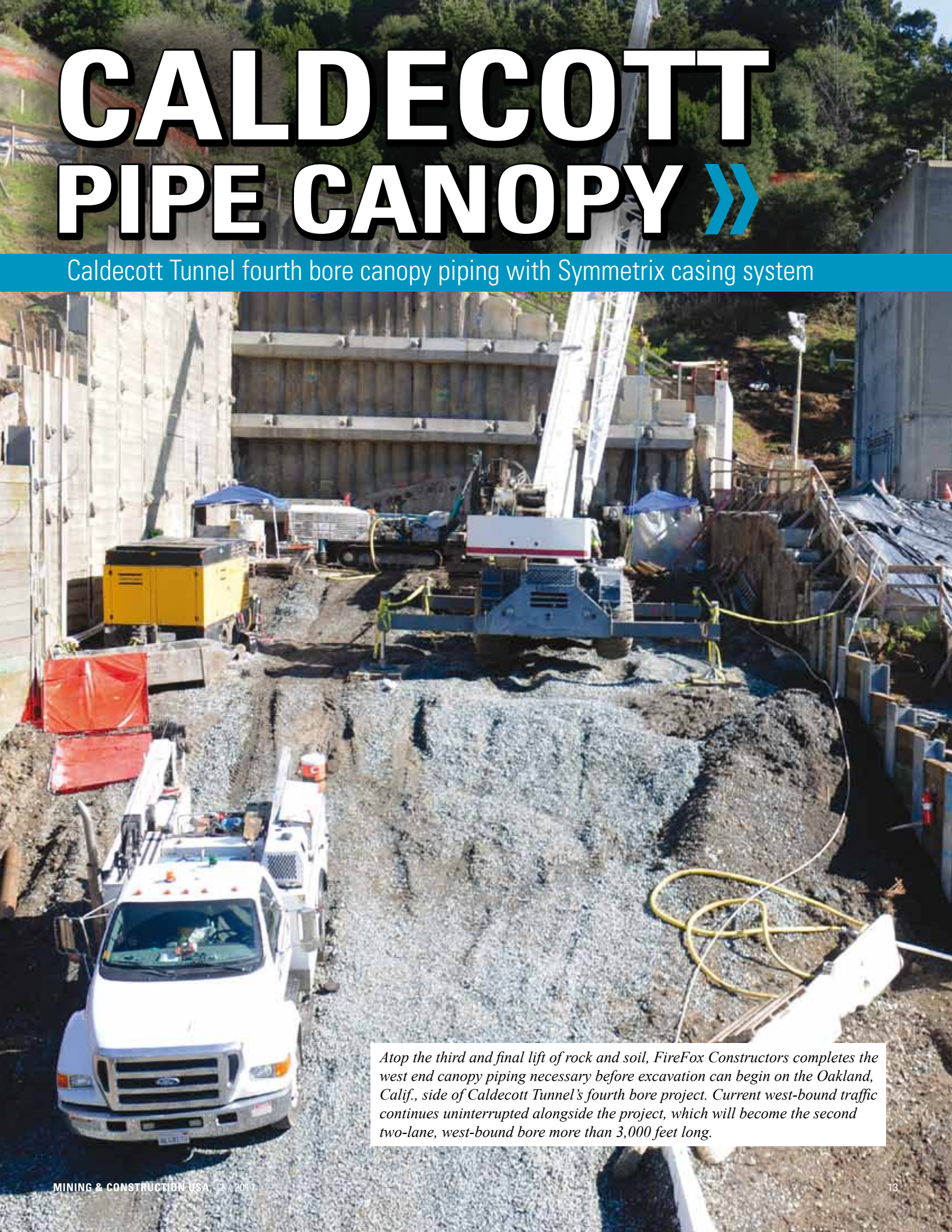
Naturally the goal is to have all the rock pieces and their layers stay in place. However, more than thirty years after it was created, some of CDF 4's parts have moved. While grouting will effectively fill any voids and help to prevent these components from further movement, the delicate core is vulnerable to displacement by the high volumes of air used by most air drilling techniques.



1. ARMOR STONE
2. UNDERLAYER STONE
3. CORE SLAG
4. GRANULAR FILL
5. PZ-27 STEEL SHEET PILE
6. GROUT AREA
7. FILTER SLAG

CALDECOTT PIPE CANOPY »

Caldecott Tunnel fourth bore canopy piping with Symmetrix casing system



Atop the third and final lift of rock and soil, FireFox Constructors completes the west end canopy piping necessary before excavation can begin on the Oakland, Calif., side of Caldecott Tunnel's fourth bore project. Current west-bound traffic continues uninterrupted alongside the project, which will become the second two-lane, west-bound bore more than 3,000 feet long.

Since 1967 the Caldecott Tunnel, which lies on Highway 24 between Oakland and Orinda, Calif., has had three two-lane tunnels, or "bores." In the morning, as travelers rush off to work in Oakland and San Francisco, the middle bore relieves congestion by becoming a second set of westbound lanes. In the afternoon, when the peak flow reverses direction, the middle bore's direction is reversed to become a second set of eastbound lanes.

However, traffic has become so dense that the "off-peak" lanes of a single bore are no longer sufficient. A $420 million fourth bore project to alleviate congestion is currently underway through a partnership of the California Department of Transportation (Caltrans), the Contra Costa Transportation Authority (CCTA) and the Alameda County Congestion Management Agency (ACCMA). It will result in two two-lane bores permanently dedicated to each direction. In charge of excavation from the west end of the fourth bore is FoxFire Constructors of San Clemente, Calif.

The case-setting system advantage

FoxFire's job is to excavate 700 feet into the west side of the bore to meet the general contractor's excavation already underway from the east end. They'll meet each other about one fifth of the way into the bore, since the general contractor started several months earlier. This was according to plan.

First FoxFire must stabilize the soil and poor quality rock conditions that exist for nearly the first 180 feet. At that point the formation transitions abruptly from shale to more consolidated sandstone.

Engineer Bill Martin coordinated with Atlas Copco representatives to configure a Symmetrix simultaneous drilling/casing advancement system for the project. With its reputation for drilling long, straight holes even in horizontal applications such as this one, Symmetrix provided an alternative that could potentially save time, fuel and labor. It meant that the canopy could be completed all at once, after which FoxFire would then be able to turn its attention solely to excavation.

The setup chosen for the project was the Symmetrix SE 219 system for 8 ⅝-inch pipe with two hammers: the Atlas Copco Secoroc QL60 running on 120 psi and the Terranox 6 hammer at 300 psi. The rig was a rental Casagrande C-8, whose air was boosted by an Atlas Copco XRVS 1000 compressor. Trey Martin and Tony Galvez were site superintendents supervising the drilling operations.

The project's specifications allowed less than 9 inches of deviation from the target 180 feet away. Using Symmetrix, FoxFire generally met these specifications. Several holes were right on the target, without any significant deviation at all.

Courtney "Stumpy" Andrus, FoxFire's dayshift crew foreman on the project, said, "Accuracy depends greatly on your initial setup."

> "You have to watch your rotation, watch the hoses. Listen to your drill. It will tell you what to do."
>
> **Courtney "Stumpy" Andrus**
> FoxFire's dayshift crew foreman

Simultaneous drilling / case-setting

The crews alternated between the QL and Terranox hammers, using one to back up the other when one was being cleaned or serviced. The crew noted that performance was pretty much the same, explaining that the Terranox required more air, about 300 psi, and seemed to hit more softly.

The average rate of penetration was about 1.3 to 1.5 feet per minute while drilling the 180-foot holes. They set each casing 10 to 15 feet into the sandstone beyond the shale, as stipulated in the design plan.

The Symmetrix system consists of a pilot bit (pictured here on the drill pipe pallet) that locks into a ring bit. The system sets casing as it drills. The pilot bit unlocks from the ring bit to drill further, or it can be simply withdrawn from the hole, leaving the casing in place, to set up on the next hole.

Miner Ricky Violet makes use of scheduled downtime to videotape a casing's interior. Completed tubes can be seen behind him on the secant wall of concrete piles. The straight lines roughly indicate the top of what will be excavated to form the tunnel below the canopy.

Each hole required nine 20-foot casings that were added and welded together during the drilling process. The casings are perforated at one-meter intervals to permit grout to fill the annulus outside the casing. Each 20-foot section of drill steel and casing pipe took about 13 to 15 minutes to drill. The total process of completing a hole generally took 8 to 9 hours. This included drill string makeup as well as joining nine 20-foot casings together, capping the casing, grouting the pipe, and then setting up on the next hole.

Training and support

Andrus said it took him about 10 days to get comfortable with the drilling and case-setting system. "You have to watch your rotation, watch the hoses. Listen to your drill. It will tell you what to do."

He added that they were impressed by the maintenance crews from Atlas Copco. Commenting on their response time, he said, "It's right away. They've been available 24/7."

Drilling in stages

Drilling on the lateral, the Casagrande C-8 rig's reach is about 8 feet. To drill higher holes for the arched canopy required that they build up the rock and earthen pad three times. Each time the crew had to remove all equipment from the drill pad, build it up with rock, and then reset all the equipment on the pad. This took about 24 to 36 hours (two to three shifts) to complete each time.

Because these holes are drilled so closely together, they did not want to drill them in a progressive series. Instead, they let the grout of one hole set up well before coming back later to drill next to it. That way, should there be any interference between holes, the grout from the one hole would be unaffected by pressurization during grouting of its adjacent hole.

2013 completion date

FoxFire is on schedule at this point to finish the excavation by fall. Projected completion of the bore for public use is set for late 2013.

A NEW COMPETITIVE EDGE IN DEEP HOLE DRILLING

Now drillers can really tell what goes on inside the hole

By Leif Larsson

More than two years of research has resulted in a major step forward in deep hole drilling efficiency. Called EDGE, this worldwide patented drilling monitor system provides drillers with the eyes and ears in the hole.

One of the biggest challenges that constantly faces deep hole drillers is how to predict the changes that take place in a hole during drilling, especially at depths of 100 meters or more.

The driller's own competence is naturally a great asset and enables assumptions to be made based on experience—and some drillers also possess a kind of sixth sense that puts them in a class of their own. But at the end of the day these assumptions are, at best, educated guesses.

We wanted to find out if it would be possible not just to predict but actually see what goes on at the bottom of the hole.

The result is EDGE, the world's first system for deep hole monitoring. It gives the driller instant feedback on the performance of the hammer as it strikes the bit.

EDGE can be fitted to all types of deep hole drill rigs that use Secoroc™ DTH (down-the-hole) hammers. It consists of a sensor, a data capturing and processing unit and a rugged PC with a 7-inch display screen.

How it works

The sensor is mounted on the drill head or rotation unit and is connected by a cable to the data capturing unit mounted on the rig.

The complete EDGE system consists of sensor, data capturing and processing unit, a PC with 7-inch display, a magnetic mount cable, a PC mounting device and power cords.

The display PC is mounted next to the drill controls at eye level.

The process starts immediately when the piston in the DTH hammer strikes the bit, creating vibration. The vibration is captured, processed and interpreted and data is transmitted to the PC where it is displayed on screen.

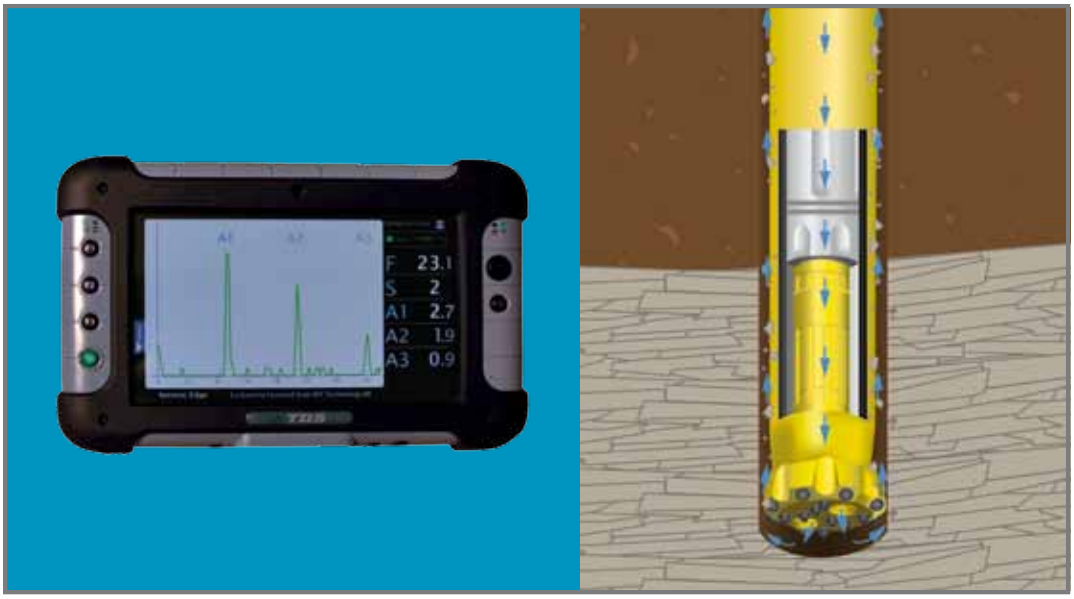
This immediate and continuous feedback enables the driller to continuously optimize the drilling process.

End of "blind" drilling

Aimed primarily at the oil and gas industries, where the majority of drilling is beyond sensory feedback from the surface, the benefits of using EDGE are many. It means the driller will no longer be drilling "blind," reducing the possibility that something unexpected may change at the bottom of the hole to hinder progress.

When the bit encounters a new type of rock formation that threatens to "shank" the bit, the driller has time to make adjustments before this catastrophic failure. Perhaps the hole is not being flushed properly and the drill string is in danger of jamming. Or perhaps there is a slight vibration caused by movement inside the chuck due to insufficient feed force, gradually reducing the efficiency of the cutting capacity.

Whatever the scenario, the earlier the driller knows about it and takes preventive measures, the less chance there is for equipment failure.



Continuous monitoring using EDGE has proven to give deep hole drillers a wide range of important benefits and also increases the life of DTH drilling equipment.

New dimension

The system brings a whole new dimension to the deep hole drilling industry such as the oil and gas fields of the United States, where equipment loss, trouble-shooting and maintenance represent a major portion of the investment.

Apart from the obvious benefits of continuous high productivity and improved overall economy through less wear on the equipment and lower fuel consumption, there are other benefits in terms of enhanced driller performance and an improved working environment.

For example, drillers with years of experience can get back to an optimum penetration rate quicker after making a connection because they can see the "sweet spot" on the monitor rather than wait for cuttings or circulation indicators.

EDGE also has a huge impact on the training of new drillers. They no longer need to learn how to identify what goes on in the hole solely "by ear," a talent that is only acquired from years of experience,

Experienced drillers can enhance their skills as well. They also appreciate how EDGE takes away the stress of worrying whether they can catch a variance quickly enough to prevent equipment damage.

A typical example

In Sweden, it normally takes six to eight months to train a driller up to standard proficiency. Using the EDGE system, Swedish customers who have been part of the test group for EDGE are cutting this training time dramatically. The geothermal well drilling company SYDAB recently trained a former truck driver to the standard for drilling proficiency in just a few weeks. Furthermore, the company has realized substantial economic benefits since it mounted the EDGE system on one of the drill rigs.

As EDGE puts the driller firmly in control, he or she does not have to worry about getting any "nasty surprises" during the drilling process.

When the driller makes an adjustment, for example, to the feed force, the result is immediately shown on the display. If the driller wants to review what happened on the previous shift, he can do this, too.

Down-the-hole hammer drilling has traditionally been left to fewer drilling companies because rotary drilling is easier to master, costs less in tooling and offers fewer formation complications for drillers at the bottom of the hole. With EDGE these barriers can be greatly reduced by the benefits of percussion drilling. Improved penetration rates and less time in the hole, minimized tooling issues, and improved training and driller performance are all replacing the objections.

There are not many innovations that change an industry. Much as instrument-rated pilots today fly without actually needing to see, EDGE has taken drilling to a new level. This ability to see what's happening at the bit face is creating a paradigm shift in drilling. It may not be too far in the future when drilling "blind" will be an option for shallow drilling just as flying by instruments became available for even the smallest of airplanes.

ENTHOFEN APPOINTED PRODUCT SUPPORT TECHNICIAN FOR ATLAS COPCO EDGE PRODUCT LINE

Aaron Enthofen has been appointed to the position of Product Support Technician for Atlas Copco's EDGE Drill Monitor product line. In his new role, Enthofen will report directly to Jason Blais, Product Manager, DTH (Down-The-Hole) Products. Enthofen's position was effective April 4.

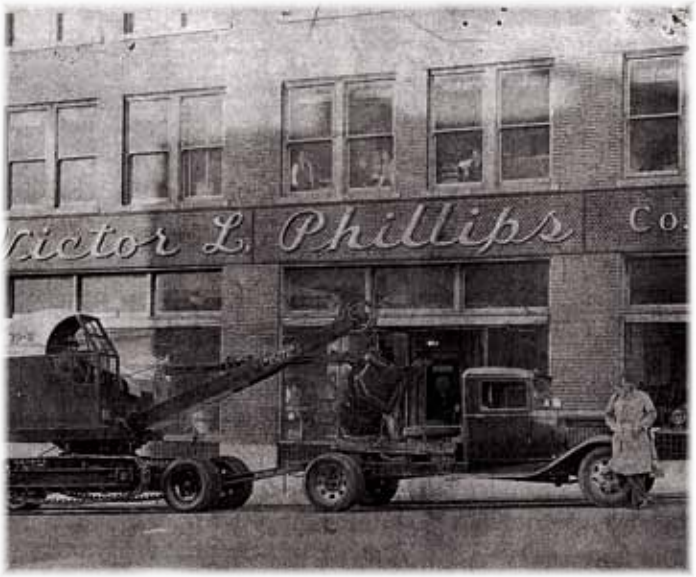
Enthofen comes to Atlas Copco from Wellbenders Directional Service. In his new position, his primary responsibilities will include complete product support for EDGE DTH drill monitoring systems, supporting both Atlas Copco store and distributor channels.

"With his experience working on oil and gas drill rigs, Aaron will be a great asset to the success of Atlas Copco's new EDGE product," states Blais.

The EDGE Drill Monitor is an innovative new tool from Atlas Copco Rock Drilling Tools (RDT.) It is a device for continuous monitoring that can be fitted to all types of deephole drill rigs that use Secoroc DTH hammers. It consists of a sensor, a data capturing and processing unit and a rugged PC with a 7-inch display screen that presents real-time visual translations for a driller of bit performance at the bottom of the hole.

Dealership turns 100

The Victor L. Phillips Co. grows over time with focus on customer service



When The Victor L. Phillips Co. was founded in 1911, a horse-drawn, tip-over concrete cart was considered heavy construction equipment. One hundred years later, the company is one of Atlas Copco's most successful private dealers and is known as a quality distributor of construction and materials processing equipment.

VLP carries the Atlas Copco ROC drill line as well as compressors. Tom Borer is Vice President Independent Distribution for Atlas Copco Construction Mining Technique. He said, "We at Atlas Copco would like to congratulate VLP on reaching this important milestone. Atlas Copco has benefitted greatly from VLP's commitment to the construction and aggregate industries. Their customers know they are going to be treated fairly."

VLP President Butch Teppe said he's proud to carry Atlas Copco products, including the Dynapac paving and rolling line, while offering the service that backs up each sale. "Every customer counts and is a valued customer. We won't take a second seat to anyone in service. Our employees are top notch and are probably due the credit for us being successful for 100 years."

VLP President Butch Teppe and owner James Foreman (seated).

One of VLP's longtime customers has been Dane Braden, president of Explosive Contractors in Hollister, Mo. Braden said, "They're better at service than anyone else."

Braden has worked with Atlas Copco products in his large drill and blast business since 1993 and does all his purchasing and gets all service done through VLP. "Atlas Copco makes excellent machines and Victor Phillips is second to none in handling them," Braden said.

Jerry Enyeart is Atlas Copco's district manager for the Midwest. He said, "Through our Drilling Solutions division, Atlas Copco has had the privilege of working with VLP for most of their 100 year history. It's no accident that VLP has endured for so long when most have not. When times are good, it's easy to do the right thing, but when times are tough, VLP's customers know they have a true partner standing beside them when it counts. That's why those customers have kept coming back to VLP for 100 years, and it's why they will keep coming back."

Borer added, "It is truly a pleasure to work with a company that takes servicing the customer so seriously. They have this as one of their guiding principles and have developed a very loyal customer base."

> "Every customer counts and is a valued customer. We won't take a second seat to anyone in service."
>
> **Butch Teppe**
> President, The Victor L. Phillips Co.

Victor L. Phillips: "The L in my name stands for lucky."

In its small start, two asphalt salesmen, Victor L. Phillips and W.C. Jones, formed the Jones-Phillips Co. in Kansas City, Mo., to sell used paving equipment on commission. The fledgling company got a boost when Phillips designed an asphalt melting kettle that became popular with the company's paving customers. By the end of the first year, Phillips bought out his partner. Phillips himself didn't retire until 1964.

In 1978 James W. Foreman purchased the company and still owns it today. The original two-man business now has 90 employees and six locations serving contractors, municipalities, federal and state governments, industrial accounts and the oil and gas and exploration fields.

Before Foreman became the majority owner he worked as vice president of sales for VLP. He was recruited from a sales position at an equipment dealership in Iowa and had previously worked at an equipment manufacturer and was a pilot and instructor in the Air Force. Foreman said, "It's been a really good ride."

At 80 years old, Foreman is still active in the company and works every day. "I get my oars wet and still do some good once in a while," Foreman said.

Teppe said that his 35 years in the industry, 27 years with VLP, has taught him about people as much as equipment. "People talk about integrity a lot, but we really live by it. We are fair to our customer, fair to the manufacturer and fair to ourselves and our employees. Our owner Jim Foreman exemplifies integrity and has set that standard for us to follow."

As only the fourth president in the company's history, Foreman said he's proud of the longevity of VLP. "I enjoy the business, the customers. And I enjoy our own people. I know from what I've read about Victor Phillips that treating people with integrity was a part of his philosophy. We still have ledgers from 1911, and we have some of the same customers now as we had then."

Foreman concluded, "I am convinced you won't find a group of people anywhere who are friendlier, harder working or more capable."

(photos, facing page) The Victor L. Phillips headquarters in the early years and today. Also shown at right is the first logo for VLP and their current logo.

VLP rents and sells used and new equipment: surface crawlers and rock drills, compressors and generators, hydraulic attachments and tools, skid steers, wheel loaders, backhoe loaders, excavators, motor graders, milling equipment, pavers, compactors, trailers, mowers and dozers.

Each of its six locations has a full parts department and inventory. Toll free numbers connect customers to a live answering service any time of day or night.

Kansas City, Missouri	800-241-9290
Joplin, Missouri	800-878-8223
Springfield, Missouri	800-955-2729
Wichita, Kansas	800-878-3346
Topeka, Kansas	800-878-4345
Garden City, Kansas	800-511-1435

What's in a name?

Atlas Copco to use new surface rig naming convention

Atlas Copco's surface drill division is providing customer relief with a revamped rig naming convention. Many customers may have already noticed that Tier 4-compliant rigs recently introduced to the market now carry names such as AirROC, PowerROC, FlexiROC, and SmartROC in accordance with a logical and consistent naming and codification convention. Customers can tell exactly what the rig does for them just by knowing the name of the unit—without having to sort through incomprehensible alphanumeric coding they have been confronted with by many of the market's other brands and those acquired through the years by Atlas Copco.

For manuals, technical references and paperwork, the convention continues with a logical classification system that, as you read from left to right, gets increasingly specific about the particular unit. For example, in the product name "FlexiROC T30 R - 11SF NAS," FlexiROC is the "family name" that distinguishes rigs that can undergo the most extensive customization, adding on various features to unique customer requirements. The "T" tells the customer that this is a tophammer rig. The "30" means that its optimum nominal hole size is 3.0 inches. "R" means it is a radio remote-controlled model.

Following the family name, drill type, and nominal hole size is additional information pertinent to maintenance or add-on selection. The information quickly identifies whether the unit has a cab or not (0 or 1), comes with exterior direct or radio remote control, or has options such as short feed (SF), long feed (LF), rotational boom head (U), or reverse circulation (RC). Finally, a three-letter abbreviation tells what plant it came from: Orebro (ORE), Nanjing (NAN), Nasik (NAS), Yokama (YOK), or Zhangiakou (ZHA).

So the complete name "FlexiROC T30 R - 11SF NAS" means the rig is a customizable tophammer rig in the 3.0 inch hole range with radio remote control. The first "1" tells a technician over the phone that it has a cab; the second, that it has a folding boom. SF means it has the short feed option. And it came from the Nasik, India plant. Uniform and consistent use of this user-friendly naming convention will make any discussion of SDE rigs easier to understand.

From this point forward

- AirROC designates pneumatic rigs.
- The PowerROC family consists of powerful electric-over-hydraulic models.
- FlexiROC denotes those rigs that provide a customer with options and upgrades to customize the unit to his or her specific needs.
- SmartROC designates Rig Control System (RCS), GPS-equipped rigs.

Anderson appointed District Manager for Atlas Copco

Derek Anderson has accepted the new position of District Manager for the South Central Region of Atlas Copco's Drilling Solutions (ADS,) Rock Drilling Tools, Surface Drilling Equipment, and Geotechnical Drilling and Exploration (GDE) product lines. His responsibilities include working with Atlas Copco distributors Luby Equipment and Venture Drilling Supply. In his new role, Anderson will continue to report directly to Scott Slater, Business Line Manager for GDE and ADS Oil & Gas.

Anderson has worked for Ingersoll-Rand and Atlas Copco for a combined total of 15 years. Commenting on Anderson's background, Slater said, "With experience in engineering, direct sales, distributor sales management, business development and a particular focus on the oil and gas industry, we are confident that Derek will assure the success of Atlas Copco with today's products, as well as future products that service this industry."

In addition to a focus on oil and gas related products, Anderson will be giving special attention to the quarry, mining and construction industries.

Atlas Copco welcomes James River Equipment, new distributor for drilling equipment in the Carolinas

Atlas Copco welcomes its newest drilling equipment distributor, James River Equipment. The company, well-known as a heavy equipment supplier, will represent Atlas Copco in the Carolinas for blasthole rigs, other surface drilling rigs and equipment, and Secoroc rock drilling tools. In North Carolina, James River Equipment will also distribute Atlas Copco's Dynapac compaction and paving equipment.

"This is a perfect match," said Andrew Lee, District Manager for Atlas Copco Construction & Mining. "James River actually has a lot of people with drill experience. I would say they already have about 100 years' worth of drill experience in-house."

Equipment covered by this new relationship includes surface crawlers such as Atlas Copco's SmartROC, FlexiROC, and PowerROC surface rigs, the ROC L8 and the SmartRig F9C. James River Equipment will also sell and service Atlas Copco Secoroc rock drilling tools.

"I have to say," said Andrew Lee, "that this company (James River Equipment) is one of the most customer-focused companies out there anywhere. In fact, even though I knew them by reputation, they have not ceased to amaze me with the intensity of their commitment to quality and customer service in the time that I've been working with them."

Terry Thomas, General Manager at James River Equipment, commented on the new business relationship. "We are very excited to have the Atlas Copco line. It's a great addition to our product portfolio. It complements the growth we've enjoyed in other industries such as aggregates. They've been a great bunch of people to work with, too. We look forward to a long and profitable future together."

James River Equipment, headquartered in Ashland, Va., has 25 locations throughout North and South Carolina and Virginia. The company supplies and services the equipment needs of the Construction, Forestry, Paving, Mining, Agricultural, and Consumer & Commercial Lawn Care industries.

Atlas Copco shines at 26th Annual Elko Mining Days

Record prices for gold and higher prices for silver and copper no doubt contributed to the exceptional turnout at the 26th Annual Elko Mining Days Event in Elko, Nevada, June 9-10, 2011. Atlas Copco Elko store manager Matt Willeford reported from the exhibit floor, "Show turnout is great. More people are genuinely interested in our new machines. The Scooptram ST7 SMD loader alone is bringing in tons of people."

According to published reports from Adella Harding of the Elko Daily Free Press, at least 390 booths were sold to exhibitors for this year's show.

Customer Appreciation Night

The Atlas Copco Elko store once again hosted a Customer Appreciation Party in conjunction with Elko Mining Days. Door prizes raffled off at the event included camping gear, noise canceling headphones, a portable DVD player, and the evening's grand prize, a 55-inch television.

A months-long promotion for the new Excore diamond bits culminated in a grand-prize drawing for the winning driller and his helper. The driller received a new iPad, and his helper received an iTouch.

The new Excore diamond bit line has been tested over the past two years on four continents under varied conditions and with different customers. Results have shown a significant improvement in performance and bit life.

Forecast Optimistic

Recent RDT sales training predicts good outlook

Sales Outlook Positive
Recent RDT sales training: Worst is behind us

Thirty Atlas Copco U.S. salesmen attended the San Diego Rock Drilling Tools (RDT) Sales training session Feb. 14–18 to brush up on their product line familiarity and learn the company's focus for the upcoming year. The annual event has resumed after its brief hiatus during the longest economic downturn in the U.S. market in fifty years.

Rob Fournier led an eight-man staff to host the event at the Best Western Hacienda Hotel and conference center in San Diego for west coast personnel. A similar event was held two weeks earlier in Ft. Lauderdale, Fla., for east coast sales representatives.

Themes during the week-long event all confidently shared an optimistic outlook for the future. Several PowerPoint presentations included sales charts indicating a return from the 2008–2010 recession with a stronger U.S. team and a positive sales forecast. Individual reports from salesmen located throughout the western region resonated with the message that sales are solid and the outlook is bright.

The company's market tracking noted that it is strengthening in many areas as the economy recovers. The most likely explanation for comparatively rapid recovery credited Atlas Copco's dedication to service and support after the sale.

"We're out of the woods now," announced Jason Blais. "The economic downturn here is over, but we've always got room for improvement." Blais clarified, saying that improvement will come through Atlas Copco team personnel. Recruitment goals, he said, include greater gender diversity and attraction of those who are mobile, willing to relocate. Focus will be on "high potentials"—degreed college graduates who will be retained through company guidance and visible career paths within the company.

Sessions during the training also familiarized the participants with troubleshooting of customer equipment concerns, from data collection (including photography tips that make pictures useful to analysts) to the most likely causes of various tooling and equipment problems.

The information helps salesmen educate clients about such things as tooling failures, which more often develop from improper drilling procedures than from material or manufacturing defects.

Along with overviews of the Atlas Copco product line, the training introduced participants to new products and to current research and development initiatives. These included the ROC T20 wheeled surface drill, the new Powercrusher family, Terranox hammers, Elemex, ST7C, Omega bits, PARD, MRX hammers, Edge monitor development for deep-hole drilling, the return of the T2, and the introduction of the Predator in the United States.

The training concluded with educational sessions for a variety of cost calculation and contract tools that are available to salesmen to better serve existing and potential clients in their area.

Each night participants gathered at social events that presented opportunities to share insights about the specific customer needs of their unique regions. Many came away with insights about techniques, products and solutions that might be of value to customers of their own locations.

Leif Larson, the Product Line Manager for Atlas Copco's Down-the-Hole tools, presented sales figures, comparisons and goals, including a briefing on sales in other countries around the world.

Scot Simon

Bringing experience and excitement to ground engineering

> The resources available at Atlas Copco [gave me] the chance to help build something great in the foundation equipment industry."

Scot Simon
Foundation Drill Specialist

Atlas Copco readily credits its position as a world leader in industrial, mining, and construction to its number one asset: superior human resources. Scot Simon, who has accepted the position of Foundation Drill Specialist, represents once again the company's ability to identify and recruit the highest quality employees.

Before joining Atlas Copco in October 2010, Simon had been working in the drilling equipment industry in the Philadelphia area. Atlas Copco presented him, he said, an offer he couldn't refuse: "The resources available at Atlas Copco," he explained, gave him "the chance to help build something great in the foundation equipment industry." Among the resources he listed were its strategically located stores and the quality of the personnel he would get to work with who, Simon said, "are unmatched elsewhere in the industry—there was no way I was going to pass up this opportunity."

A licensed professional engineer with an MBA from University of California, Berkeley, his civil engineering background includes both heavy construction site experience and more than 20 years in the sale of specialty foundation equipment.

The first eight years of his career were in geotechnical construction, working with large civil contractors on major construction sites including tunnels and bridges. "I was immediately drawn to it. This interest led me to pursue the foundation equipment business and I have been there ever since."

His well-rounded education, fieldwork, and frontline customer relations experience makes Simon an exceptionally valuable addition to Atlas Copco's geotechnical drilling and exploration division. He brings with him not only his expertise but crucial insights into what the customer base needs and expects from their equipment and their supplier, as well as a keen understanding of the strengths and weaknesses of competitors.

Simon said his division's emphasis right now is growing the foundation equipment business, which includes both small bore drilling equipment and grouting equipment. The division has taken several key steps to achieve this growth. "We have positioned ourselves with Atlas Copco's premiere line of grouting equipment, the Unigrout™ grouting platforms, and we added a well-known, strong line of foundation drills."

He added that it's about having the best equipment but it's also about generating excitement for the division through a "combination of product training, service training, product availability and proactive product management."

WHERE TO FIND US

Please contact your nearest Atlas Copco Customer Center.

State	City	Phone
CO	Denver	866-466-9777
NV	Elko	775-777-2204
MA	Ludlow	413-589-7439
MD	Baltimore	877-797-0987
TN	Knoxville	888-339-0344
WI	Milwaukee	866-254-8511
TN	Nashville	615-641-3000
PA	Clarks Summit	800-950-1049
CA	San Diego	866-374-5757
GA	Atlanta	888-762-3745
CA	Sacramento	916-655-3005
AZ	Tucson	520-834-0400
FL	Miami	954-977-1041

For further information, please visit www.atlascopco.us

USA MINING &
CONSTRUCTION
30120 State Hwy 264
Round Lake, MN 56167
USA

Advantage — Pit Viper

Interested in increasing your productivity?

The Pit Viper blasthole drills have a reputation for dependability and productivity. Operator safety and ergonomics contributes to their high long-term value. Simple and rugged, or advanced and automated, the Pit Viper is your answer. The Atlas Copco Rig Control System (RCS) option allows you the flexibility to add advanced functions later. Atlas Copco also offers complete drill string and service packages tailored to your specific requirements.

If you need another reason to invest in a Pit Viper—how about single pass drilling!

Visit www.atlascopco.com/blastholedrills today to learn more about the Pit Viper series.

Atlas Copco Construction & Mining 800-732-6762
www.atlascopco.us

Sustainable Productivity

Atlas Copco