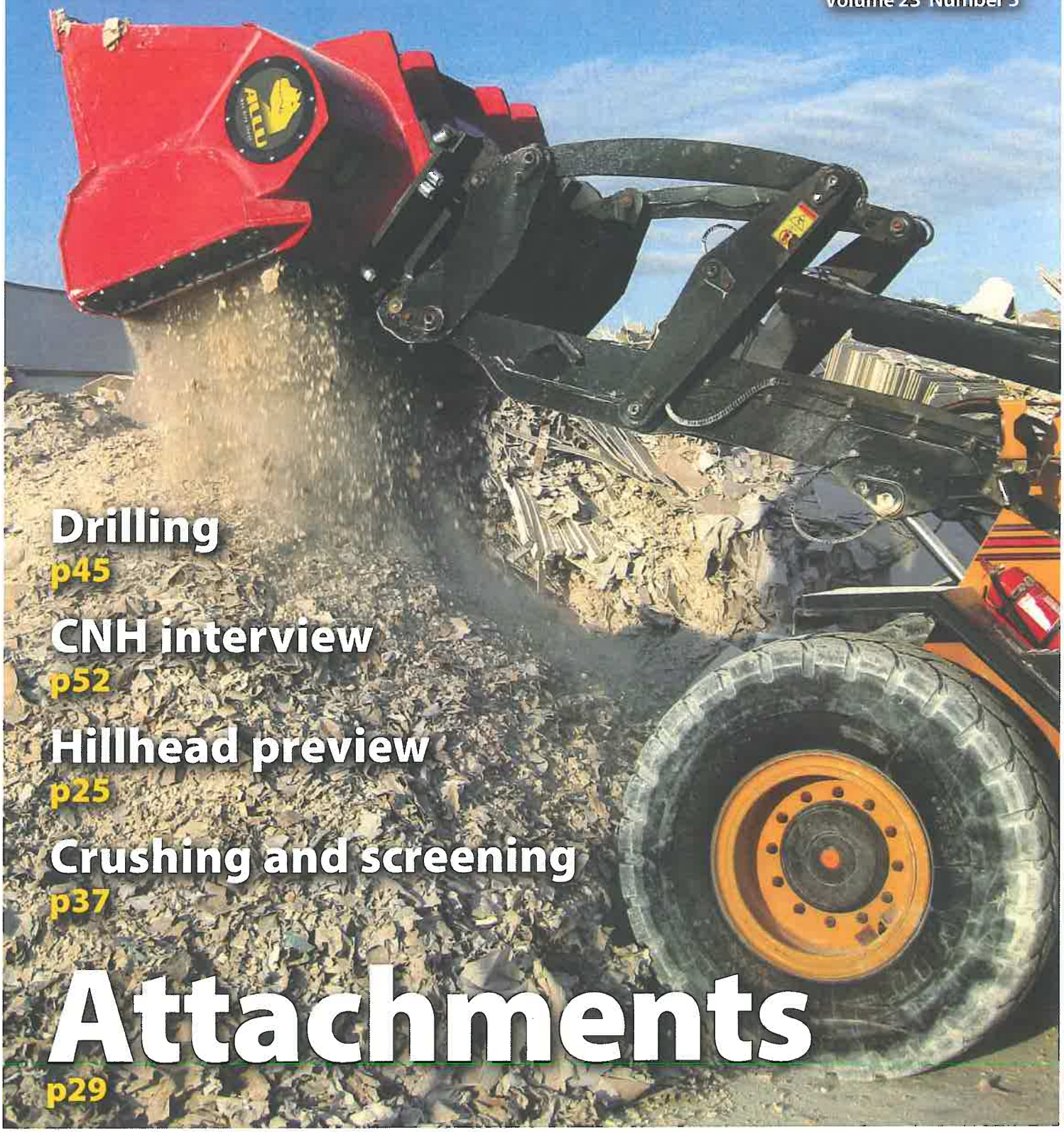
CONSTRUCTION
europe
THE MAGAZINE FOR EUROPE'S CONSTRUCTION INDUSTRY
www.construction-europe.com
A KHL Group publication
June 2012
Volume 23 Number 5



Right for the job

New drilling technology is appearing all the time, and making the correct choices is important – no matter which area of drilling that technology is required for. Sandy Guthrie **investigates.**


Soilmec's SM-28 is the largest in its range.

Improvements in drilling technology are aimed at producing better, faster, easier-to-maintain equipment that increases uptime and makes the jobsite more efficient, according to Randy Stevens, vice president of sales at US-based E-Z Drill.

He said that professionals in the concrete paving industry, for example, had seen significant changes to their dowel drilling equipment over the years.

"Many years ago, only one option existed – hand-held models," he said. "When the first machine, a hydraulic drill, was launched more than 30 years ago, it was the first time the industry had seen innovation and advancement come to the equipment. Higher production was possible, and less manual, back-breaking labour required."

He said that at the time, hydraulic drills had been a step in the right direction, but they were accompanied by many drawbacks, including the need for additional equipment not necessarily common to the jobsite, the risk of hydraulic fluid spills, and maintenance protocols that were time consuming and costly.

"Within a short time, a third option became available to address these concerns. Pneumatic drill systems have since emerged as the equipment of choice, essentially becoming the industry standard," he said.

Drills are now offered in various styles within the category of pneumatics, differing in operation, production capabilities, and more.

He said that rather than a matter of personal preference, drill selection should be down to one primary factor – application.

"All characteristics of the job must be considered. Naturally, a major factor is how many total holes are to be drilled. Combine that with outside factors such as conditions, deadlines and expected production rate and you begin to get the complete picture."

He said that while basic jobsite conditions would be a major factor and help narrow the choice down, that alone was not enough to make the selection.

"When the final choice is to be made," said Mr Stevens, "one remaining factor needs to be considered. While selecting the proper unit does ultimately boil down to the application on which it will be used, it's important to approach the decision with the big picture in mind. Consider, not just the job at hand, but the primary type of work the company or agency does. A drill is an investment, not a throw-away item, so be sure it's going to fit the company long-term, not just a single project."

HEAVY DUTY RIG

New products and technology are being introduced constantly in many areas of drilling technology. For example, Italian company Soilmec has introduced a heavy duty microdrilling rig – the SM-28, which is the largest in its range. It claimed that as a result of previous studies and models, it was possible to provide a rig with "the best performance and flexibility with minimum operating costs".

The company said the use of the powerful Cummins QSB 6.7 diesel engine with 194kW rated power, the range of high performance rotaries of up to 33kNm maximum torque, high quality components and advanced circuit design enabled Soilmec to increase performance under extreme conditions.

There is a telescopic zoom with mast tilting +/-18° using a short mast, or +/-10° with a long mast, and ground telescopic stabilisers – two at the front and two at the rear – to increase stability.

In addition, the SM-28 can be radio-controlled either in the set up or drilling phase. The rig, equipped with up to 430mm size clamp and breaker, can reach 17,500kN hoist pull, 8,750kN feed force and 6,000mm maximum stroke.

Soilmec said the rig versatility was further demonstrated by the jet grouting version which is available. It has a rod diameter up to 114mm and 34m maximum treatment depth. >

A multi-gang option from E-Z Drill could be the right choice for a job.

It added that its SM-10 multipurpose drilling rig had been developed through a synergy between parent company Trevi Group's job-site experience and Soilmec technological research.

This rig is powered by 129kW diesel engine and can be supplied with a large range of rotary heads up to 1,300daNm torque value for high drilling capacity. Double rotary is also available.

For underground mine and tunnel expansion projects, Atlas Copco claims that production targets will be hit sooner with a new Atlas Copco Boomer E1 C-DH face drilling rig.

The single-boom, diesel-hydraulic multipurpose unit is specifically designed for mines or construction sites lacking water and electrical infrastructure. The Boomer E1 C-DH comes with dual onboard 450 litre water tanks and a 6-cylinder, 173kW Deutz diesel engine to drive the rig, its boom and the drill's hydraulic pumps.

The new Boomer E1 C-DH rig claims to be one of the largest diesel-hydraulic face-drilling rigs on the market, with a coverage area of up to 95m^2. This is a 38% improvement over its predecessor, the Boomer L1 C–DH drill rig, said Atlas Copco.

GETTING AHEAD OF SCHEDULES

Johan Jonsson, product manager for Atlas Copco Underground Rock Excavation, said the new rig provided particular advantages in the field.

"In the case of a new project, the Atlas Copco Boomer E1 C-DH drill rig can be used to get started even before water and electricity are installed at the job site," he said. "Mines begin earning sooner, and contractors are able to get ahead on their schedules."

Jonsson also pointed to the new drill rig's advantages in widening existing tunnels or adding bolts in older workings, as it is not necessary to install power and water infrastructure to support the rig on-site.

The new drill rig is also said to contribute to more economical use of a fleet's resources. The Boomer E1 C-DH rig is able to handle small construction jobs more efficiently than larger rigs, said Atlas Copco, and is compact and manoeuvrable enough to get the job done in tight spaces.

The multipurpose capabilities of the new rig are enhanced with the addition of the optional basket attachment. This allows the Boomer E1 C-DH rig to be used as a bolting rig and as a utility rig for drilling holes and installing ventilation ducting, among other tasks.

The Boomer E1 C-DH drill rig comes standard with Atlas Copco's Rig Control System (RCS) with the option to upgrade to a higher degree of automation. Jonsson said, "As a member of the Atlas Copco Boomer E-series of face-drilling rigs, the new rig has access to the wide range of existing options for that established product family," which he said he believed to be another important consideration for those in the market for a large diesel-hydraulic rig.

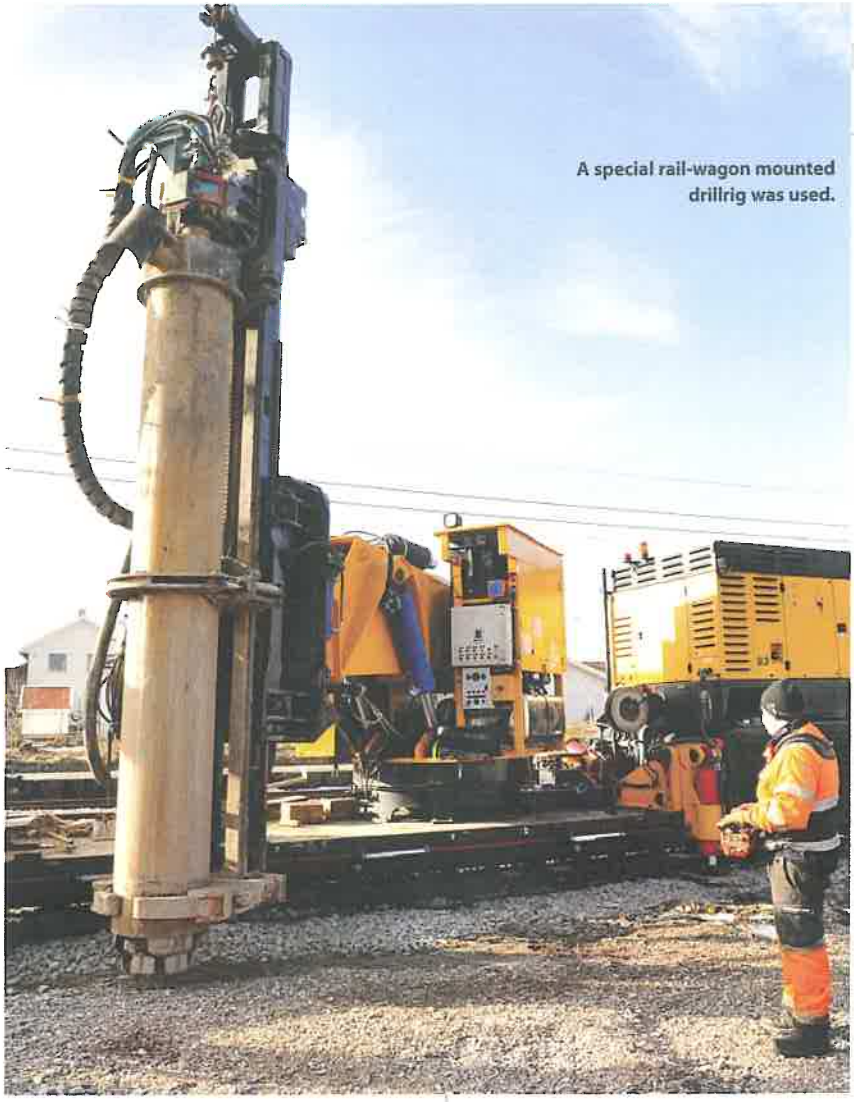
The Boomer E1C-DH was developed together with the Scandinavian contractor Veidekke, based on its request for a diesel hydraulic driven rig with large coverage area combined with a service basket.

Atlas Copco has also released a smart phone/tablet app from its underground rock excavation division. By downloading its app free of charge, users will be able to get access to details of the company's wide range of underground face drilling rigs, loaders, trucks and other equipment.

The exclusive content in the app includes high resolution images of the products presented as 3D turntables, which enables the products to be viewed from all angles. In addition, all of the content can be >

The new app from Atlas Copco includes details of the company's range.

The new Atlas Cpco Boomer E1 C-DH rig claims to be one of the largest diesel-hydraulic face-drilling rigs on the market.



A special rail-wagon mounted drillrig was used.

PHOTO BY EVEN BERGUM

synchronised so that it can be accessed offline.

Paula Blamberg, vice president of marketing communications, underground rock excavation, said, "Due to the staggering number of new mobile devices we now see in use, and knowing the capability of these devices, we see that this technology has huge potential to simplify the way our customers, the media and other important contacts can access our products."

The app is available from the Apple App Store and from Google Play.

PROVEN TECHNOLOGIES

Boart Longyear claims to have continued to evolve with the needs of the mining sector with new innovations in mining equipment.

It said proven technologies had been incorporated into exploration and production products to drive up productivity and to increase safety. For surface drilling, its LS600 Sonic Drill Rig is said to deliver more accurate core sampling, less than 1% hole deviation, reduced waste, and faster penetration than conventional methods.

Kevin Tomaszewski, director of global product management at Boart Longyear, said, "The LS600 delivers advanced sonic technology to the field, allowing drillers to gather continuous and undisturbed core samples in varying and difficult ground formations."

The technology of the LS600 incorporates sonic frequencies that match the resonant energy of the ground, allowing the core barrel to advance in unconsolidated and difficult >

Rockmore International's ROK 500DH is a new DTH hammer and the first in its emerging Deep Hole series.

Mast upgrade

Demanding conditions were faced by UK firm Bulroc in part of a project to replace rail masts in Norway.

Jærbanen is part of Norway's South Country (Sørland) Railway that connects the capital Oslo with Stavanger in the south west. Jærbanen covers the stretch between Egersund and Stavanger, and crosses the Jæren district, noted for its typical flat moraine landscape strewn with boulders large and small.

The line was originally constructed in the 1870s, and was electrified in 1956. Traffic on the line has increased dramatically over the past decade and as the old masts and poles were over 50 years old, it was decided that an upgrade of the catenary masts including foundations for these was required.

The railways' geotechnical engineers and independent consultants concluded that precast concrete foundation piles, 555mm in diameter, would be required for guaranteed stability.

On other stretches of railway in Norway where upgrading had already taken place, concrete foundation piles of 355mm were typically used, but the ground conditions across Jæren were considered more demanding than most, varying from solid hard rock, soil with stones and boulders, moraine with boulders, to gravel and fine silt.

The contract for installation of the concrete foundations was awarded to Baneservice, an independent company owned by the Norwegian Department of Transport.

A special rail-wagon mounted drillrig was ordered from BS Mekaniska Verkstad in Falköping, Sweden.

The concrete foundations used come in lengths of 2m, 3m and 4m, with drill-rig operators evaluating which lengths to use according to the ground conditions observed during drilling.

As drilling equipment, Baneservice chose a Bulroc Hyper 181 18in (457mm) DTH hammer with in-the-hole shock absorber, and model CDS 560 RS (Stablex) overburden drilling system with drive shoulder for driving the casing.

The system consists of a driver (pilot), an exchangeable ring bit and three segments that swing out during drilling, reaming the correct diameter hole to clear the casing. The segments swing back as rotation is reversed so that the drill-string can be pulled out through the casing shoe.

Bulroc said that an important feature with the RS (Stablex) version was that most of the flushing air was directed back up the casing (retroflush). This not only helps flushing, but very importantly avoids large volumes of air being pumped into the ground. Since the distance from hole centre to centre track is only 3.5m, this is very important, it said.

overburden formations. During drilling, boreholes are cased continuously by first allowing the core barrel to advance into the substrate, followed by the outer casing.

Boart Longyear said this protective measure allowed for the accurate measurement of continuous in-situ and undisturbed core samples, even in varying ground conditions.

The company's Multi-Purpose LC6 Reverse Circulation Drill – formerly the RC6 – drill is a lightweight and compact multipurpose rig that is said to offer a powerful and safe reverse circulation (RC) drilling solution.

The LC6 multipurpose drill can be configured for RC, coring, down-the-hole-hammer (DTH) and rotary drilling applications.

The company also said that the drill was equipped with robust steel crawlers and an optional radio remote control for driving, and could be driven on slopes up to 30° while the operator maintained a safe distance from the rig when unloading or driving on uneven terrain.

The rig also has an optional trailer-mounted cyclone and splitter that can be towed behind the drill rig for flexibility and ease of mobility on site.

Boart Longyear offers UltraMatrix (UMX) diamond core bits. The series includes the SSUMX, 07UMX, 09UMX and the recently release 10UMX.

The Boart Longyear LS600 Sonic Drill Rig is said to deliver faster penetration than conventional methods.

The company said the UMX bits were engineered to drill faster, last longer and outperform existing bit technology in a wide range of drilling conditions and ground formations.

The UMX uses advanced metallurgical formulas with larger impregnated diamonds which it said provided increased penetration capabilities.

DEEP HOLE SERIES

Rockmore International has launched a new DTH hammer in its emerging Deep Hole series, the ROK 500DH.

Rockmore said the 5in (127mm) range hammer incorporated innovations and features characterised in the new Deep Hole class of DTH hammers.

The ROK 500DH is the first release in the series. As a 5in class hammer, the 500DH is targeted to drill 5.5in (140 mm) to 6in (152 mm) diameter holes.

Designed to increase drilling effectiveness and efficiency in deep hole applications, the ROK 500DH incorporates engineering advancements for drilling in DTH applications such as geothermal, exploration, water-well, and in other mining and construction sectors, said Rockmore.

Specific drilling requirements in such applications often demand drilled holes of more than 300m deep, and include high volumes of water, thus presenting great challenges for conventional DTH hammers to drill effectively.

Rockmore said the ROK 500DH had been designed specifically to handle such challenges by incorporating new airflow and component design advancements, primarily in the air ports of the wear sleeve and piston.

The hammer is rated for use with large compressors – 24.1 Bar at 25.2m3/min – however, it can readily accept greater air volumes and pressures from larger air compressor packages. The upper and lower hammer air chambers of the 500DH have been modified to achieve optimum drilling efficiency.

The advanced piston design claims to offer maximum blow energy with each stroke to the bit, allowing for superior hammer and bit penetration rates in all conditions. ce

Moscow rail work

Bauer Technologie, a local subsidiary of German firm Bauer Spezialtiefbau, was awarded the works of 2,800m of bored piles for the new Hodinskaja Pole metro line in Moscow.

The job comprised two rows of secant bored pile walls with a diameter of 1,180mm, while the drill depths were approximately 47m. The work has being carried out by several Bauer rotary drilling rigs, and is scheduled for completion shortly. In total, 600 piles have to be installed within four months, together with other drilling companies.

SMU Ingeokom, the main contractor, is building 13 metro stations on a new 16km long metro line in the Russian capital within the next three years.

Bauer at work on the Hodinskaja Pole metro line in Moscow.