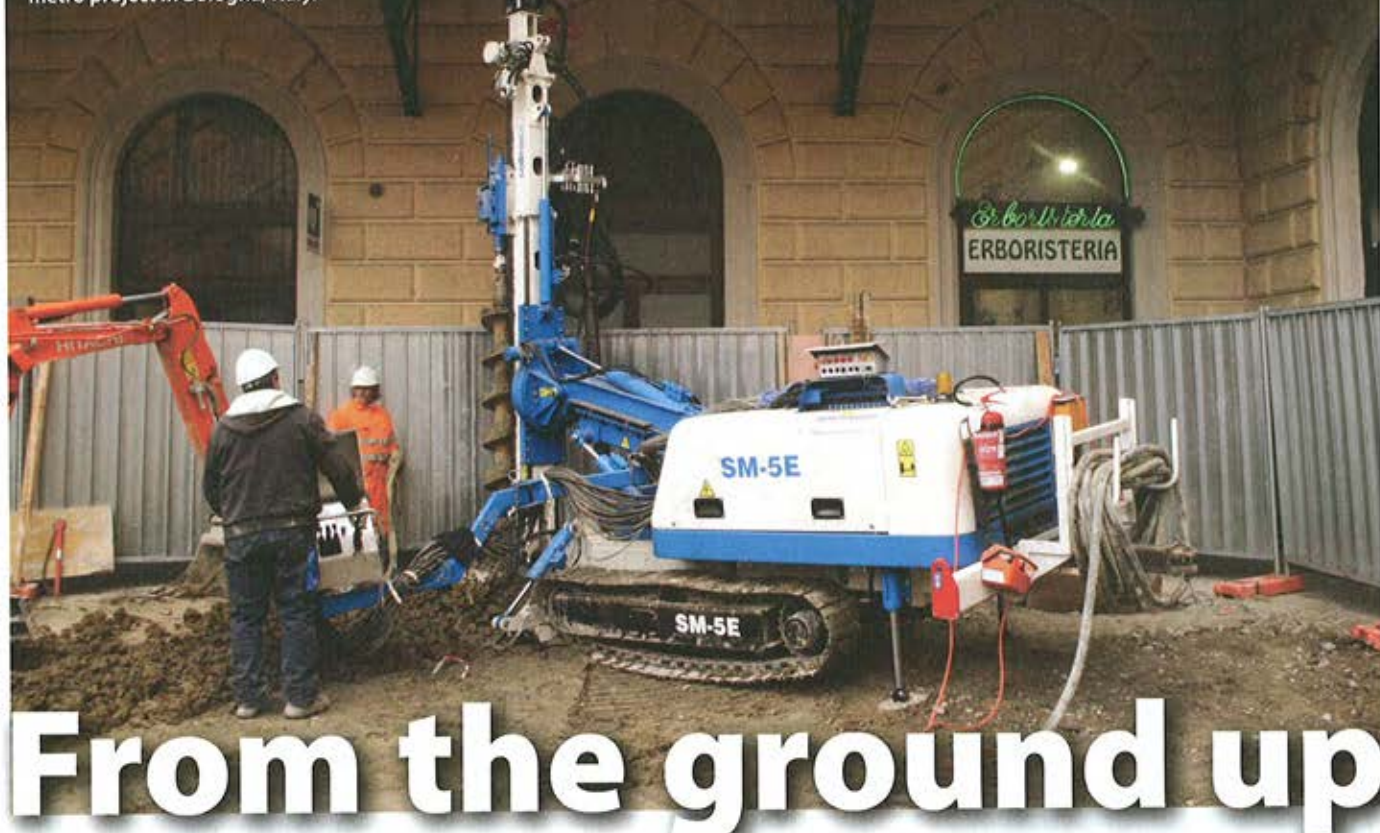


Soilmec's new electric multipurpose drill rig – the SM-5E – at work on a metro project in Bologna, Italy.



From the ground up

Helen Wright looks at how foundation equipment manufacturers are focusing on reliability, robustness and energy efficiency to meet the challenges of today's projects.

While this year has seen new equipment launched in the foundations sector, existing equipment has also been tested in new ways on a host of challenging projects around Europe.

Manufacturers of foundation equipment must produce equipment that is robust and reliable enough to be capable of working in hostile environments – at altitude, in poor soil conditions or even over water.

In addition, such equipment must be as flexible and, in some instances, as compact as possible to be able to perform a wide range of tasks in sometimes tight working conditions like city centres.

Environmental concerns must also be taken on board, with many of the latest machines featuring new, low emissions engines, as well as a focus on reduced vibration and the introduction of energy-saving modes.

In certain circumstances, no emissions can be allowed on the construction site, necessitating the development of electrically-powered equipment.

Soilmec, for instance, has introduced a new electric multipurpose drill rig – the SM-5E – for work in tunnels or other restricted spaces where diesel engine emissions would be harmful.

The SM-5E comes directly from the SM-5 and has the same main features, including rotary heads with torque ranging from 687 to 972daNm, and maximum drilling speeds of between 98 and 862rpm. The power source, however, has been changed to a 75kW ABB electric engine.

As well as its compact design, the SM-5 is also a multipurpose machine – its optimised mast articulation and large range of rotary heads ensures that it covers a broad application field from anchoring and tiebacks to micro-piles, jet grouting (fitted with a special extension), coring, water well drilling, tunnelling and radial soil consolidation.

The new rig and its electric counterpart is the result of a collaboration between Soilmec technological research and sister-company >

Contractor Miller Piling used Piletec's ICE 1423 vibrating hammer to install temporary steel pile casings in poor soil conditions on a project in London. UK





PVE's new Ecostrrike hydraulic piling hammer is said to be 25% quieter than its predecessor, and 20% more efficient.

the Trevi Group, which brought its jobsite experience to the Soilmec designers.

Meanwhile, Soilmec has also responded to customer demand for increased versatility with the launch of the SF-65 continuous flight auger rig.

The upper structure of the SF-65 is mounted on base carrier with extendable crawler frames and turret, and the rig can rotate 360° to allow for the best possible working area.

Soilmec has introduced a new, telescopic mast that features two hydraulically sliding parts. This is said to provide a more compact rig to allow for easier transport as none of the components have to be disassembled.

The SF-65 is also equipped with Soilmec's Drilling Mate System (DMS), on a 305mm touch screen. This technology allows users to monitor and control the operating parameters on the self-erecting rig, which is powered by a 205kW diesel engine and can handle 1m diameters to a depth of 27m.



The upper structure of Soilmec's new SF-65 continuous flight auger rig is mounted on base carrier with extendable crawler frames and turret, and can rotate 360°.

TECHNOLOGY'S KEY ROLE

Technology is also playing a key role in the latest developments. Take PVE's Ecostrrike hydraulic piling hammer, for example, which is available with the company's Measurestrike system for regulating and recording impact parameters.

As well as allowing contractors to document their work, this means the hammer is suitable for a range of applications, including pre-cast concrete piles, steel casings and profiles, wood piles and combi piles.

Features of the hammer include a low wear cylinder assembly, shock-resistant electrical

connectors, accelerated or free-fall modes, and high frequency operation if required.

PVE also says the machine is 25% quieter than its predecessor, while using the accelerator mode is said to increase efficiency by 20%. The Ecostrrike hammers are available with 3 to 40 tonne drop weights.

Specialist applications are another area of current development. BSP, for instance, has introduced a new DX-RT piling hammer for driving steel piles which support electrification stanchions, gantries and other railway projects.

The DX-RT has been designed as an attachment for mounting on road/rail hydraulic excavators with an operating weight of around 30 tonnes. When mounted to the machine's bucket linkage, the hammer also has a tilt range of 5° to allow it to cope with the cant of the rail lines.

Two models are available, the DX-RT 20 and the larger DX-RT 25, which offer ram weights of 1.5 tonnes and 2 tonnes. Maximum impact energy is 20kJ and 25kJ respectively while blow rate at rated energy for both models is 80 blows per minute.

Terrawise Construction, a UK-based civil engineering company, bought one of the first DX-RT hammers produced, and used it to drive piles on the new Manchester Metro rail line linking Oldham and Rochdale in the north of the country.

Terrawise project director James Crossen said, "Piling in a rail environment has one major drawback – restricted access to the worksite. We approached BSP to manufacture and develop the hammer to a specification devised by engineers from various sectors within the rail industry, including designers, plant specialists, piling contractors and Network Rail.

"As a result, and following extensive trials and tests, the new hammer was delivered and

Seeking high productivity

A Liebherr LRB 255 piling and drilling rig was used to install a vibrated beam slurry wall for a hydro-electric project on the River Muerz in Styria, Austria – and high productivity was essential.

Austrian energy and environmental services company Evn Naturkraft employed contractor G Hinteregger & Soehne Baugesellschaft (H&SB) to seal off the foundation pit with the slurry wall. H&SB relied on rental company Liebherr-Werk Nenzing, which provided the LRB 255.

Powered by a 605kW engine, the piling and drilling rig was equipped with a 27m long leader for the slurry wall work together with a 23Hz PVE 105M vibrator.

H&SB said it was able to construct 4,700m² of vibrated beam slurry wall in 13 workdays.

The depth of each panel was between 17 and 20m, and the production of one panel required an average of 15 to 20 minutes. During the vibration work, a total of about 1,640m³ of cement slurry was pumped into the ground to create the required impermeable foundation pit enclosure.



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