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Two Junttan PM 23 pile driving rigs were put to work on a demanding bridge, road and rail construction project in Finland.

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

Covering all bases

This year has so far seen new equipment launched in the foundations sector, while existing equipment has also been tested in new ways on a host of challenging projects around the world. 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.

Technology is playing a key role. PVE, for instance, has developed the new Ecostrike hydraulic piling hammer, 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 Ecostrike hammers are available with 3 to 40 tonne drop weights.

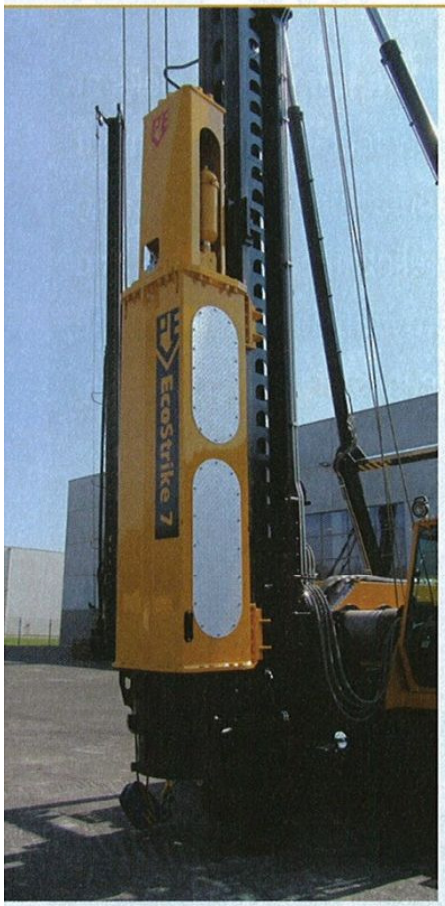
Versatility

Soilmec, meanwhile, has 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 >

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°.



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

System (DMS), on a 12 in (305 mm) touch screen. This technology allows users to monitor and control the operating parameters on the self-erecting rig, which is powered by a 205 kW diesel engine and can handle 1000 mm diameters to a depth of 27 m.

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.

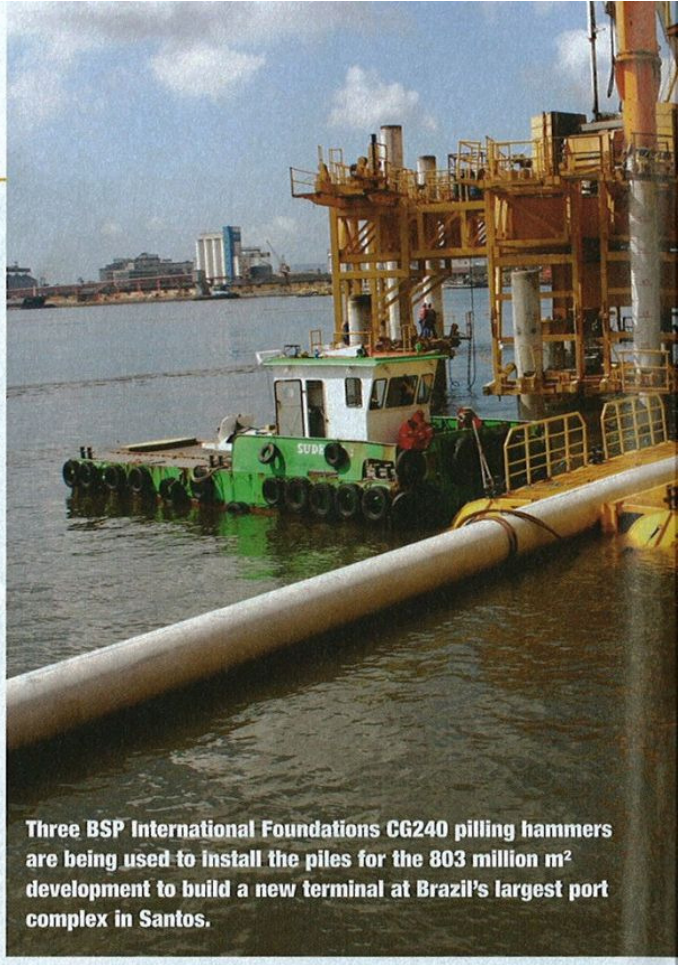
Two models are available, the DX-RT 20 and the larger DX-RT 25, which offer ram weights of 1.5 tonnes and 2 tonnes. Maximum impact energy is 20 kNm and 25 kNm respectively while blow rate at rated energy for both models is 80 blows per minute.

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 commissioned last December and although it has been working on various projects around the country since then, its full potential has recently been realised on the Manchester Metro project."

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.



Three BSP International Foundations CG240 pilling hammers are being used to install the piles for the 803 million m² development to build a new terminal at Brazil's largest port complex in Santos.

Both the new DX-RT hammers can also be used to drive sheet piles, small bearing piles or tubular steel with ultimate load bearing up to 1800 kN depending on site conditions.

Prototype development

IHC Fundex is also developing new foundations technology in the form of the F5000 hydraulic foundation machine for piling and drilling, and hopes to unveil a prototype at next year's Bauma exhibition.

The F5000 drill and piling rig will be self-erecting with a maximum leader length of 56 m. Flexibility is a key design concept, and the machine will feature a fully rotating uppercarriage as well as a variable hydraulic pump which makes it possible to operate different functions at the same time.

The machine will also be available with either a 315 kW or 565 kW Volvo engine depending on the size of impact hammer or torque demand of the rotary heads. The installation of a power pack will also be possible.

Meanwhile, Pile Dynamics has released new accessories and software for its Pile Installation Recorder (PIR) – the PIR Viewer and a new version of its PIRPLOT data processing and reporting software

The PIR is automated monitoring equipment that records and displays grout volume versus depth, along with other parameters that help the construction of augered cast-in-place and continuous flight auger piles.

The PIR Viewer is a handheld WI-FI device that allows a supervisor or inspector to see, in real time, the information that the PIR is displaying to the operator in the crane cab. This enables the supervisor to stop the rig operator sooner in case there is a concern.

In the past, the pile had to be completed and summary report