Facing the challenges

With cities becoming even more densely populated, companies continue to innovate to make sure they can match and better any challenges they may face. Joe Malone **reports**

Companies have faced many challenges when carrying out foundation works on construction sites – whether its tight spaces, difficult surfaces or tight time schedules, the need for efficient machines are vital to ensure the job is done properly.

While foundations may not be seen once a project is completed, they are perhaps the most important part of the building process, as the results of inaccurate engineering or construction can be catastrophic.

Close to the city centre of Paris, France, Liebherr's LB 24 rotary drilling rig is being used by construction company Bouygues for the erection of a new apartment building.

In the business district of La Défense, located west of the inner city, an 18-storey building comprising both apartments and a school is under construction.

A subway is also being built, as the complex is situated directly next to a track of the Parisian rapid transit system RER.

The Liebherr LB 24 rotary drilling rig was used for laying the foundation. The machine installed piles with a length of up to 30m and a diameter of approximately 1,500mm, using the Kelly drilling method.

Beams of 2m in width, 4m in height and 20m in length are now being placed on these piles, said Liebherr.

Liebherr also said that because of the compact space on the construction site, its LB 24 was the perfect tool.

The LB 24 belongs to the LB series of Liebherr rotary drilling rigs. The machine is equipped with a 270kW diesel engine and has a total weight of 76 tonnes. Another benefit of the LB 24 is its rope crowd system with a push and pull force of 20 tonnes.

In addition, the rotary drilling rig is equipped with the BAT rotary drive, manufactured by Liebherr, offering a torque of 270kNm. The company said the main advantages of the hydraulic drive were automated torque adjustment, continuous speed optimisation and four electronically adjustable speed ranges. Further advantages of the rotary drive, said Liebherr, were its simple structure, its low maintenance requirements and its efficiency.

Liebherr's LB 24 rotary drilling rig was used by Bouygues SA in Paris, France

Meanwhile, in Finland, Skanska Infrastructure has been using Junttan machinery to carry out piling work at the Prisma retail chain extension site in Järvenpää.

Junttan's PMx22 drill rig, which uses its SHK5 hammer, has been used to carry out the laying of the precast concrete and steel pipe piles. The average pile length on the project is between 25 and 30m, which uses a two-pile element with one pile joint.

Jyrki Nikkinen, general superintendent of Skanska Infra, gave a number of reasons why the company adopted Junttan machinery. He said that, with telescopic leader, the setup of the piles was very fast, while the stability of the rig was crucial. It can lift 14.5 tonnes of material. He also noted that the SHK hammer was powerful, ensuring the work was carried out efficiently.

Another key feature, said Nikkinen, was the easy operation of the rig with its rear legs, which he said minimised track drive needs, which was important in tight spaces. Finally, he claimed the rigs gave total accuracy when placing the piles.

Trevi is carrying out the foundation works for the Torrigiani embankment, Florence, Italy, which suffered a structural collapse this year

Movax has launched a range of new products this year, including the DH-20 and DH-30 piling hammers

STRUCTURAL COLLAPSE

In Florence, Italy, Trevi is being tasked with carrying out the first phases of foundation works for the Torrigiani embankment, which suffered a structural collapse earlier this year, causing a 3m displacement, with a depth of 3.5m.

Pile Dynamic's SQUID is an alternative to the camera-based visual inspection of the excavated shaft base

Trevi said that it had no time to lose in carrying out the consolidation works, structural restoration and hydraulic protection, as the winter weather could cause the river to flood.

The company believes its experience of working to tight deadlines, and delivering quality, aided its case in being awarded the contract.

Tommaso Gondolini, jobsite director at Trevi, said, "We are in the city centre and we want to minimise the impact of works on the citizenship. But, at the same time, we must be quick in order to ensure safety of the riverbank's protection wall by early November."

Ironically, November will mark the 50th anniversary of the Florence flood, which caused the Arno River to burst its banks on the Lungarno Torrigiani.

The company will use its PSM-20, SM-405/8 and SM-30 drilling rigs to help toughen the soil and create a stable workforce. It said a wall would be built adjacent to the Poggi Channel, which would protect and stabilise the tunnel, while supporting the excavation up to 3.5m to create a horizontal working platform.

The foundations will be trelicon piles, with a 6m diameter, and will connect on the top with capping beams and cross beams, forming a rigid frame. Another wall will be built near the riverbank wall, and will consist of wooden piles.

Moving on to product launches, Movax has launched a range of new products this year, including the DH-20 and DH-30 piling hammers.

Movax DH-20 and DH-30 piling hammers are described as excavator-mounted, hydraulic impact-type hammers for driving load-bearing piles or assisting in sheet pile driving. The piling hammers can be flexibly mounted onto the excavator or when greater depths are required on an excavator mounted leader mast. >