



BREXTOR FOR PILE BREAKING

Due to increased densification of construction methods and construction in exposed locations, pile foundations continue to gain in importance. Previous pile breaking methods pose dangers that can be avoided with the newly developed and patented Brextor method which is manufactured in Switzerland by BRC Engineering AG.

The available building ground globally is increasingly in exposed locations and of poor load bearing capacity. In such circumstances, pile foundations are the solution to ensure a secure foundation, and for this reason, pile foundations are becoming increasingly important. The pile head is the connection to the foundation, with the highest quality being required as a foundation failure can end in disaster.

Until now, bored piles have mainly been processed with air or hydraulic hammers using processing energy that cannot be controlled. Thus, there is a risk of cracks in the concrete body and spalling on the pile outer skin. This can cause corrosion damage in the medium term. Bent or torn reinforcements further reduce the ability to absorb the tensile load. Due to the operation of hammers, a correspondingly large working space is required. Furthermore, narrow and long reinforcements are difficult to work with and major obstacles arise in the case of existing spiral reinforcement in the mining area. In order to ensure quality and to break the surface tension, a cut must also be made to the final height, with the last 30-50cm only being possible with a lot of manual work.

Brextor system

With Brextor, the horizontal force allows 100% control of the processing energy used. The pile head is handed over to the downstream trade with precise accuracy

(height accuracy +/- 1cm). In addition, the concrete structure and reinforcements remain intact. The core tension is broken with the inner cutter whilst the surface tension is broken with the outer cutter. The remaining concrete edge can be broken away with a 'BRC' pile head crusher without risk of damage. Thus, the finished bored pile head is reached in four steps: prepare the pile with the milling disc, mill up to level (+/- 1cm height accuracy), break out the residual concrete with the pile head crusher and clean and align the reinforcement.

The design of Brextor allows it to be used in very small or even no lateral working spaces. As a result, excavation can be saved as the cut at the finished excavation height is made automatically with the outer cutter. Brextor is suitable for all types of piles/walls with one system used for all operations.

Four lane expansion

Brextor was used for the four lane expansion in Liestal, Switzerland, which was carried out by the company Implenia. "In the case of manual removal by manual work, there would always be a risk that reinforcements would be injured and the concrete quality at the pile head would be disturbed. I can rule out this risk with the Brextor," says Stefan Lang, construction manager at Implenia. "The time pressure on this construction site

is great, as various milestones have to be met. We only have a limited time window available and if this cannot be massively extended, such an undertaking would only be possible without the Brextor with a lot of resources and personnel."

Time as a decisive factor was supplemented by the challenge of very limited space. Stefan Lang explains, "We would also need more space, which would be a big challenge here, as there is not enough space for a jack hammer between the nail wall and the pile head. For this reason, the wall, which is up to 6m high, would have to be set back over a length of 300m, just so that enough space could be created for pile head processing. This would mean a massive increase in costs. Thanks to Brextor, you save these costs."

In the case of a railway line extension, 80cm of working space could be dispensed with on the rear side. With an embankment of 6m height, over a distance of 300m, this results in 1,440m³ of excavation (fixed measure) which did not have to be made. In addition to the enormous cost savings for excavation, transport, landfill fees and material replacement, the case shows that the Brextor also made a major contribution to the environment. At least 280 truck journeys of 40km each were saved. As a result, the CO₂ footprint was reduced and the local inhabitants benefited from a less polluted road network.