

## Frankfurt pile test breaks German record

OSTERBERG CELL pile load testing was used for the first time in Germany in April in what is claimed to be the largest ever static load pile test on German soil.

The bi-directional load test (*EF* Summer 2003) was intended to confirm the foundation design for the FrankfurtHochVier project in the heart of Frankfurt before demolition of surrounding older structures. The test was performed on a 1.68m diameter 47m long test pile installed 12m into the Frankfurt limestone.

Designed by architects KSP Engel und Zimmerman Architekten and Fuksas Associati, Frankfurt-HochVier is a large mixed-use project providing retail, residential, office and leisure space.

The site is on the main shopping street Zeil, one of the busiest pedestrian routes in Germany, and is currently used by Deutsche Telekom.



Most of the buildings will be demolished in the redevelopment. Only a small part of the historical porticos of the Thurn und Taxis Palais will remain.

Foundations are being installed by contractors Bilfinger Berger, Bauer and Hochtief for Dutch property developer and contractor MAB in joint venture with BPF. The geotechnical engineer is Ingenieursozietät Professor Dr-Ing Katzenbach.

Six Osterberg cells (O-cells) were installed on two separate levels in the test pile to allow the behaviour of three elements of the pile in the rock socket to be evaluated independently. The cage assembly with O-cells was manufactured off-site in sections and assembled over the bore during installation.

Testing was carried out by Loadtest's German office Scanrock. "Using to advantage a feature unique to bi-directional tests, only the section of pile in the rock socket was concreted and the remainder of the bore (35m) backfilled with gran-

ular material for stabilisation," explained Loadtest UK director Melvin England.

The pile was then base grouted and a 5m test section shaft grouted. It is normal practice to shaft and base grout piles in the Frankfurt limestone, England said.

The load test was carried out in two stages as is necessary with a multi-level O-cell arrangement. In the first stage the upper 5m of rock socket was loaded to 24MN and in the second stage a lower 5m section was loaded against the bottom 2.5m of pile. The effective mobilised capacity was 78MN.

"Until now, designers have had to rely on full scale loading test data from 146mm diameter anchors," England said. "In practice, there would have been insufficient space to perform a top-down loading test and, had it been possible, interpretation of the results from the rock socket would have been difficult.

"The test succeeded in mobilising the ultimate capacity in each of the sections of the rock socket."

Construction is due to start this summer and finish by the end of 2006.



**UK contractor Foundation Piling's first use of its new Fambo piling rig has been to drive precast concrete piles at a new waste recycling facility in Newport, South Wales. The Swedish machine has a hammer weight of 2.75t and weighs 4.8t. Foundation Piling says this makes it one of the largest and most powerful excavator-mounted piling machine working in the UK. Mounted on the dipper arm of Foundation Piling's 45t Komatsu 450 excavator via a quick-hitch hydraulic coupling, the top driven hammer was used to install 22 piles, each with a 235mm square cross-section, to provide foundations for building contractor Contracts & Tendering UK. Piles were driven 14.5m into the ground in two sections about 7m long.**

## Four-star treatment for historic Jersey hotel

JERSEY'S LARGEST privately owned hotel, in St Helier, is being protected from extension work by a large contiguous piled retaining wall.

UK foundation contractor Roger Bullivant built the wall to retain the facade of the Hotel de France's historic Golden Lounge during construction of a new wing and spa.

The wall comprises 60, 450mm diameter auger bored cast insitu piles at a maximum depth of 12m through silty clay overlying granite bedrock.

Piles were installed using a Klemm KR708 rig equipped with a

tungsten tipped bit for rock drilling. Each pile is reinforced with cages of eight T25 bars. The ground was then excavated to basement level, ready for construction of the spa foundations.

Three rows of ground anchors were installed between the piles using a Klemm 802 machine to support the wall. The 120 anchors were installed at 20° and are between 6m and 15m long, of 3m sections. Anchors were grouted, tested and tensioned to working loads of 180kN each. Sprayed concrete was then applied to strengthen and retain soil between the piles.

