



As part of Network Rail's upgrade, the platform on Blackfriars Bridge in London will have to be extended to allow much longer trains to travel along the Thameslink line. They needed to check that the composition of the 1870 bridge piers and underlying clay could take the extra load.

The work presented many challenges, not least the fact that the station and bridge had to remain open, and manoeuvring Skate 2E and associated plant and machinery required very precise planning.

Initially 14 holes were drilled at varying angles through the existing piers and abutments and into the underlying clay. Further boreholes and cone penetration tests were performed around the bridge into the river bed. Rotary coring was also required to drill through the piers and down into the clays.

Before work could start, a multi-positional, rotary drilling cantilever was designed and constructed in Fugro Seacore's workshop in Falmouth. Flush water was provided by a CAT pump with all drill cuttings re-circulated through a fully enclosed loop system enabling clean water to be reused. Solids were collected and taken ashore for disposal — no dirty water was discharged into the Thames.

During the planning stage the idea was raised of conducting angled CPTs through the London Clay at the base of the cored boreholes. FSCL designed a CPT Unit that was fully integrated into the rotary drill rig.

This unique addition enabled a safe and efficient transition from rotary coring to CPT. Angled CPTs were then conducted through completed cored boreholes.

In addition there was a requirement for high-speed rotary coring through the piers from the horizontal to the sub-vertical which was conducted with Geobor-S triple tube wireline coring equipment, obtaining a core with a nominal 102mm diameter. All cores were recovered in clear plastic liners, labelled and boxed onboard the jack-up.

On completion of drilling and testing the holes were grouted to surface with gel modified grout. Throughout the project



drilling rates were approx. one metre an hour with 100% core recovery. A number of the holes required CCTV surveys to check for any voids. The piers were found to be in excellent condition with strong intact brickwork and concrete throughout.

