



London, UK: Tottenham Court Road station upgrade project

CONSULTANT
KELLER/BAUER JV
CLIENT
LONDON UNDERGROUND
MAIN CONTRACTOR
VINCI/BAM NUTTALL (VBN) JV
CONTRACT VALUE £18M
OVERALL COST £250M

The construction of a new London Underground station box at Tottenham Court Road represents the first major construction step towards the completion of the Crossrail project. Work began in 2010 to connect Tube lines to those of Crossrail and involves

a complete regeneration of the station. A Bauer/Keller JV was responsible for the construction of hard/firm secant pile retaining walls and bearing piles for the extension, which involved 30m deep excavations to accommodate the Northern Line escalator shaft. The retaining walls were built using CFA soft primary piles and rotary bored secondary hard piles.

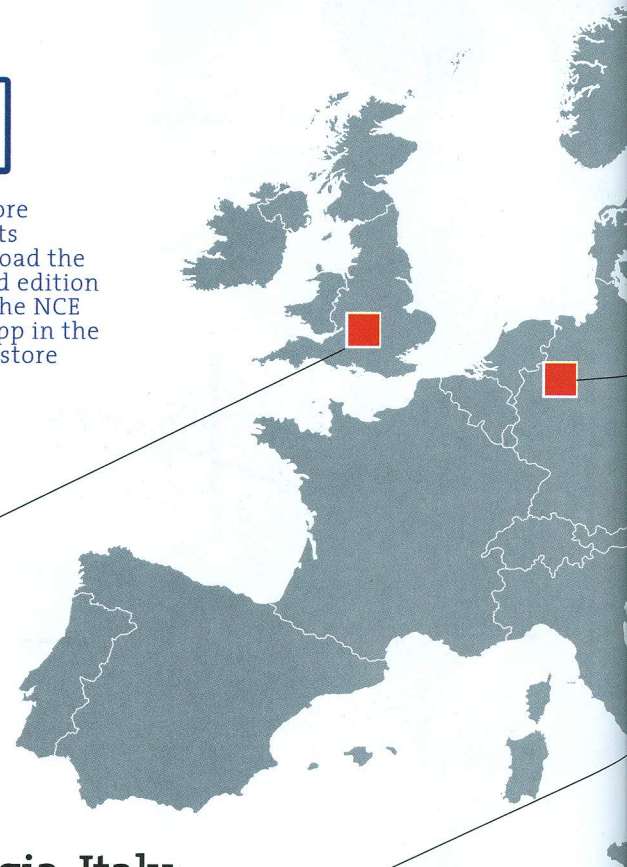
The Crossrail box itself will be created using a 1m thick 41m deep diaphragm wall and 11 large-diameter bearing piles with plunge columns to allow for a top-down construction method. Additional works on the Northern Line box include seven consolidated piles up to 64m in depth for an oversite development, three of which closely skim the Northern Line station by only 2m. Working in the heart of London, consultants were required to carefully consider the environmental knock-on effects of the work. The use of Bauer precise joints between diaphragm wall panels has kept noise and vibration levels to below regulatory limits.

The project also uses the first plunged column guidance system of its kind in London. The 32m 50-tonne plunged columns, positioned vertically within piles in extremely limited spatial constrictions, have never previously been used at this weight, length and verticality. Completion is due in autumn 2011.

PROJECT MAP



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Foggia, Italy: Manfredonia landfills

In the southern Italian region of Puglia, a pair of municipal waste landfill sites 6km south-west of the city of Manfredonia began to pose a contamination problem.

Geotechnical hydraulic surveys revealed a land profile of a 25-40m layer of soft rock in the form of calcarenite, dating from the Neogene period – 23-2.6 million years ago – which has a low permeability and contains large fissures.

Trevi, the ground engineering arm of Trevi Group, developed a methodology first to create an on-site barrier without having to transfer the waste offsite and secondly to substantially reduce the secondary and primary permeability of the land where dissolved calcarenite was present.

The first challenge was to build a bottom-tight liner for the landfill, achieved by grouting a continuous sub-horizontal strip of cement and silicate mixes beneath the waste. To avoid the waste mass crossing with vertical drillings, the project then used directional drilling technology, a horizontal directional drilling technique that enables directional, curvilinear, sub-horizontal boreholes to be drilled.

CONSULTANT TREVI
CLIENT GOVERNMENT
AUTHORITY FOR
MANFREDONIA
CONTRACTOR CONSORZIO
COOPERATIVE COSTRUZIONI
WITH JV
COST £37M