

# Balfour Beatty

## Ground Engineering



## KINGS CROSS NORTHERN TICKET HALL

### KEY DETAILS

#### // CLIENT

London Underground Limited

#### // JOB SPECIFICATION

To install piles to create a 'box' for the new Kings Cross Northern Ticket Hall

#### // STRUCTURAL ENGINEERS

ARUP

The Northern Ticket Hall redevelopment at Kings Cross will complete the transformation of London's busiest underground station into a venue suitable for serving international and domestic passengers.

Experience was vital for this project, and Balfour Beatty Ground Engineering's (BBGE) previous involvement on the Westminster Underground redevelopment proved essential when the contract was awarded. Technical ability and outstanding design skills are two of BBGE's strengths and these were applied throughout the Kings Cross project.

The project involved creating a box for the new station, with the engineers' design allowing for top down construction,

[www.bbge.com](http://www.bbge.com)

# Technical ability and innovative problem solving ensured the project was completed successfully.

and ensuring support for the box once excavated. The piling consisted of several phases and included 85 load bearing piles up to 2100mm in diameter, all of the piles were constructed under Bentonite, of which 29 of these had permanent liners for the deep cut offs and included plunge tubes to allow for the top down construction. In order to form the box, 490 contiguous bored piles up to 1000mm in diameter were installed to a depth of 30m. Finally a 2400mm diameter mono pile was installed for a tower crane positioned to an accuracy of 5mm in plan.

During the piling works the risk of damage occurring to the Kings Cross Service Tunnel was highlighted by the site team. BBGE came up with a unique solution to ensure no pressure was exerted on the tunnel when piling only 100mm from it. This involved using a crane hung rig so piles could be installed from a distance of 5m from the service tunnel thereby negating pressure from the piling rig. It also involved forming 'pile voids' next to the service tunnel so forces from the auger were reduced to a minimum.

BBGE's design team and engineers also applied their knowledge to develop a plunging frame capable of plunging 900mm tubes into a pile to a maximum depth of 22m and to an average accuracy of plus or minus 18mm in plan and a verticality of better than 1 in 400.

With an ever increasing emphasis on sustainability, BBGE aligned themselves to TfL's vision for promoting greater environmental sustainability, by reusing spoil from the piling on another part of the Kings Cross development.



## FOR FURTHER INFORMATION CONTACT:

### // HEAD OFFICE

**Pavilion C2, Ashwood Park, Ashwood Way,  
Basingstoke, Hampshire, RG23 8BG**

**T** +44 (0)1256 365200

**F** +44 (0)1256 365201

**E** [info@bbge.com](mailto:info@bbge.com)

