



## CASE STUDY

### Gateway Project, Birmingham New Street

**Project:** The Gateway project will transform Birmingham's New Street station to create a stunning 21st century transport hub for Birmingham and the West Midlands.

**Van Elle Involvement:** New bearing pile foundation design and installation for the new 'New Street' station.

**Location:** Birmingham, West Midlands

**Client:** Network Rail

**Principal Contractor:** Volker Fitzpatrick

**Engineer:** Atkins

#### The Project Outline:

The current Birmingham New Street, rebuilt in 1967, was designed to cater for fewer than 70,000 passengers and yet more than 140,000 now pass through the station every day. The new development, known as the Birmingham Gateway, will give passengers three and a half times more space and transform the grey, concrete exterior into a stunning building fit for the 21<sup>st</sup> century. The project is expected to generate over £2bn in transport and wider economic benefits for the region.

The redevelopment consists of:

- A concourse with three and half times more space for passengers, enclosed by a giant light-filled atrium
- More accessible, brighter and clearer platforms, reached by new escalators and new public lifts
- A stunning new station exterior, adding to Birmingham's growing reputation as a leader in city centre design
- Better links to and through the station for pedestrians, with eight entrances
- A major stimulus for the physical regeneration of the areas surrounding the station

#### The works:

The works began on site for Van Elle in the early hours of Christmas Day, 2010. Prior to this a great deal of work had been carried out by our in-house design and contracts teams to ensure that the piles we were designing could take the various required loads and they could be installed within the 72 hour blockade starting at 1am.

To date, we have installed 72No. 450mm diameter piles to carry loads of up to 1550kN and have carried out works on platform 12 using a Klemm 702, on platforms 9 & 10 using 2 Klemm 702s and platforms 7 & 8 with another Klemm 702. A back-up rig was available at all times in case we suffered a breakdown or hit unexpected time delays.

Due to the predicted temperature at Christmas of well below -5°C and an actual temperature of -13°C, a specially designed, pre-blended bagged grout was used which provided excellent workability and results.

With Birmingham New Street station remaining live and their busiest time of period being the lead up to Christmas, mobilisation and logistical planning was paramount to the success of the project.

42No. PTS trained members of staff were utilised on site, including spannermen, rig drivers, groutmen, lorry drivers, fitters, supervisors, managers and directors.

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Our specially designed 24t beavertail wagon constantly ferried materials to and from our work areas, set-up on the upper concourse level and reinforcement cages were lowered down to the specific platforms, as and when required, by mobile cranes. Grout stations were also positioned on the upper concourse level approx. 6m above the platforms and due to existing permitted weight limits, 200t of pre-blended grout was delivered to a nearby sidings where it was continually fed to the work areas by our beavertail.

Headroom under the existing platform canopies was limited to approx. 2.9m and our Klemm 702s were altered to allow successful and safe pile installation. Most of the piles had high tension/lateral capacities and H32 threaded cages were connected together in 2.6m lengths using Lenton couplers enabling us to achieve the design requirements.

Underground tunnels were also taken into consideration and permanent 508mm threaded casings were used to penetrate through any obstructions found and to prevent grout loss.

### **Results:**

Both the client, Network Rail and the principal contractor, Volker Fitzpatrick were extremely pleased with the service we provided, carrying out our work efficiently and safely despite the challenging, city centre location and the demanding weather conditions experienced throughout much of the works. We have kept ahead of programme and formed a great working relationship with all involved, attending many on-site design and project meetings.

We continue to receive enquiries for future phases of work on this development as well as for other rail related schemes for Volkors and other principal contractors. We have recently been appointed to carry out similar Christmas closure works this year as well on the Birmingham Gateway project for another Internationally recognised and respected contractor.