

CASE STUDY

**BELVERS BRIDGE
SOUTHAMPTON**



In September 2011 Network Rail commenced working on a number of rail bridges in Hampshire as part of their programme to upgrade a second route out of Southampton Docks designed to take larger freight containers.

The route runs from Southampton to Basingstoke via Romsey and Andover. The project involved the demolition and rebuilding of 17 bridges all of which were completed by June 2012 with the exception of Belvers Bridge which is situated 5 miles north-west of Southampton.

At this site piled foundations had been specified and comprised ten 900mm diameter bored piles on each side of the railway to support the new bridge. Ground conditions comprised superficial deposits of river terrace gravels overlying the London Clay formation which included bands of very dense fine sand and thin bands of grey siltstone.

For such ground conditions a Continuous Flight Auger system of piling was adopted. The on board computer torque monitoring system confirmed that the design requirement for a one metre penetration into hard material had been achieved at the expected depth, approximately 10 metres below ground level.

ULTIMATE CLIENT

Network Rail

CONSULTING ENGINEERS

Tony Gee & Partners LLP

MAIN CONTRACTOR

Carillion Construction Ltd

ROLE

P J Edwards & Co (UK) Ltd acted as piling contractor

SPECIFICATION

Contract Specific
Tony Gee & Network Rail

EQUIPMENT

Llamada P150-tt Piling Rig

CONTRACT PERIOD

November 2012

All piling works were carried out in strict accordance with the latest Network Rail procedures for the operation of heavy duty piling plant next to the live railway.

The restricted working space adjacent to the existing bridge precluded the use of an attendant crawler crane which must only work with its jib in a 'parallel to or away from' orientation to the rail tracks.

A safe system of work was therefore developed which involved the use of a heavy duty excavator to unload the 2 tonne reinforcing cages for the piles and then to position them such that they could be subsequently lifted by the piling rig alone away from the railway. The piling rig then slewed back onto the pile position and inserted the very heavy rebar cages into the wet concrete. The heavy duty excavator was again used to gently push the rebar cage in to the exact required level.

The piles were installed in a 'hit and miss' sequence with 5 piles being installed on each and every day to meet the stringent piling programme. The piling rig was de-rigged and moved to the other piling location on the opposite side of the railway using a low loader which was only just able to negotiate the existing Belvers Bridge.

