Travelling formwork for the UK's first curved box jack

Werrington Grade Separation

Key Benefits

Flexible components

Early engagement to understand buildability

10 days taken off each cycle

The project at a glance
The Werrington Grade Separation scheme will make way for a new diveunder railway line, which will increase rail capacity and improve journey times on the East Coast Main Line.

Customer: Bell Formwork Ltd

Products & Services:
VTC Tunnel Formwork Carriage, PERI UP

What did the client need?

The diveunder is being constructed using a cut and cover, curved box jack method to allow the new tracks to pass under existing railway lines.

This has involved excavating the ground to form an offline jacking slab on which the UK's first curved portal box will be constructed and later jacked into position.

With the ground slab in place, a flexible formwork solution was required for the remaining structural components of the 160m tunnel, including the 1-metre thick roof slabs and walls.

How did we help?

We engaged early on in the process as the tunnel's curvature introduced its own set of challenges. After seeing a similar design during a visit to our HQ in Germany, both Morgan Sindall and Bell Formwork were impressed with the system and its speed. Understanding buildability and movement of the VTC carriage through our sequence drawings very early on in the process helped Bell Formwork to visualise how this would work on the Werrington Scheme.

The tunnel's curvature has been formed using standard, yet flexible off-the-shelf components from our VARIOKIT range along with GT 24 girders and wooden battens of various lengths on the inside shutters, helping to gradually form the curve. Standard components with this degree of flexibility reduced the need for bespoke material, contributing to greater cost savings.

For access to the soffit slabs, we integrated a suspended PERI UP stair tower at the front end of the formwork carriage. Its compatibility with the formwork solution enabled it to continue travelling with the VTC carriage to each casting section.

The project was the first in the UK to experience the benefits of our latest hydraulic drive, which meant that no other hydraulic technology or equipment was needed to push the system back and forth.

The speed of hydraulics helped save time during the construction of the tunnel, which was cast monolithically in nine segments, each measuring 17 metres in length and over 8 metres in height.

Reducing concreting time as much as possible was crucial, hence monolithic construction also being the desired casting method. The combination of the pour sequence and the speed of the VTC system contributed to shorter cycle times, saving 10 days per segment.

Contact us by email on sales@peri.ltd.uk or call 01788 861 600