A9, Luncarty to Pass of Birnam

Efficient formwork and falsework for one of Scotland's busiest roads

Key Benefits:

One principal formwork designer for greater consistency

Efficient formwork design reduced costs

Reinforcement solution supported faster pour rates

The project at a glance

The A9 is a busy traffic route in Scotland, running between Perth and Inverness. To ease congestion and improve traffic flow, Transport Scotland is in the process of expanding almost 80 miles of single carriageway into a dual carriageway. Eight new structures are being constructed across the route from Luncarty to Pass of Birnam, all of which are being formed using PERI formwork and shoring.

Client: Balfour Beatty

Developer: Transport Scotland

Project type: Infrastructure, Bridges

Products and Services:
VARIOKIT, VKP parapet system, TRIO panel formwork, MULTIPROP **sho**ring, PERI UP

What did the client need?

A feature finish was specified for the columns and abutments, keeping it consistent with projects that had previously been developed by Transport Scotland. Whilst taking the finish into consideration, the design also had to combine new panels with the customer's existing PERI equipment where possible.

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What was the challenge?

Balfour Beatty wanted to improve the rate of rise to speed up the construction process. The only way to do this was by increasing the temperature of the concrete, which in turn would increase the concrete pressure and the demand for additional support.

This became a challenge, as it was not possible to tie the reinforcement solution into the panels due to the type of finish that was required.

How did we help?

The reinforcement solution

We designed an RCS wraparound along the **PERI**meter of the TRIO shutters. This involved using clamps to hold all external corners of the shuttering together. The connection was strengthened using long dwidags that were installed in both directions between the RCS rails.

Lifting the unit into its final position was a challenge in itself because of its unusual height. By integrating vertical SRUs at the top of the unit, the formwork joints stayed tight during erection and pouring.

We were able to maximise TRIO's tolerance, with shutters supporting an additional 9.5kN per metre. In the end, the customer was able to achieve a 2m rate of rise per hour, whilst delivering the required feature finish.

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Abutments and VKP parapet

We designed ply-lined TRIO for the abutments to deliver a seamless finish.

With the abutments, columns and beams in place, the next step was to tie the structures together by pouring the diaphragm. This was formed using a MULTIPROP and PERI UP shoring scaffold comprising GT 24 girder primary and ALU MPB secondary beams faced with plywood.

For the parapet, our technical designers looked at various load cases and combinations to ensure the formwork was being used in conjunction with safe working loads. We used the cantilevering VKP parapet system, as it was ideal for the specified F4 finish. This type of system offered lighter loading and quick installation on to the precast beams.

As most of the precast beams that span the bridges are identical, the same VKP formwork and platforms could be cycled onto subsequent structures.

Formwork reuse saved time on site as erecting and dismantling operations were reduced. On identical structures such as the S02 and S09 bridges, the formwork units could be removed from one structure and repositioned onto the other without any changes to its design.

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