

Barntrup bypass, Germany



Reinforced concrete work for two new bridges for the Barntrup bypass in the state of North Rhine-Westphalia, Germany is complete, allowing road and rail traffic to flow smoothly from March 2020.

Katja Münch, PASCHAL-Werk G Maier, Steinach, Germany

[Image: PASCHAL-Werk G. Maier GmbH.]

The construction work for bridge structure nine began in May 2019. Using approximately 770m² of Logo.3 for one abutment, the entire inner formwork was ready after only six weeks of construction.

The construction company Wilhelm Becker worked on behalf of the Ostwestfalen-Lippe regional branch of the NRW provincial road authority to build bridge structures four and nine concurrently for the Barntrup bypass, which is part of the Lippe general transport concept.

Railway bridge

Bridge structure four is located immediately to the west of Barntrup and serves the future B66n now that the underpass is completed. Since it is a railway bridge, this structure has been built as a single-span composite structure using the 'rolled steel girders in concrete' (WiB) construction method in accordance with DB-Ril 804.9010⁽¹⁾ and has a span of 21.86m.

Following completion of the overpass, bridge structure nine serves the B66n, taking it over the Alverdissen-Barntrup railway line. Since this bridge structure is designed without any abutments on the parallel wings, the structural plan stipulated that it should be built as a single-span structure with integral framework and a span of 14.2m.

As a regular client of Paschal, the construction company requested the formwork and shoring systems from the formwork company's trade partner Heinrich Grotemeier in Bünde. In order for the Wilhelm Becker construction company to be able to establish a coherent

and inexpensive rental offer, the entire formwork plan was developed and calculated at the Gifhorn branch using Paschal Plan Pro (PPP) software, based on the construction and design drawings from the company eberhardt - die ingenieure.

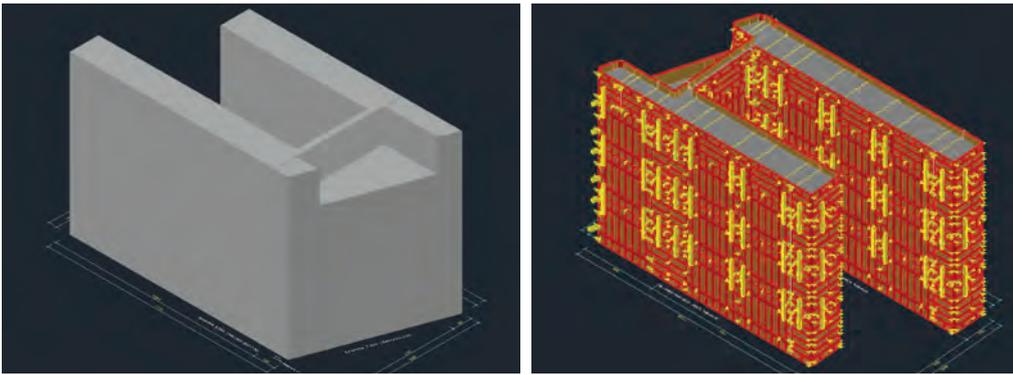
The site manager, foreman and formwork consultants were involved from the beginning in order to ensure that any and all opportunities to improve the efficiency of the formwork and concrete work could be implemented in accordance with company policy.

Vertical formwork tasks

It became clear during the preparatory meetings for the best formwork plan that the LOGO.3 formwork system would be most suitable for shuttering of the four bridge abutments of building structures four and nine. In addition, the construction company Wilhelm Becker has its own formwork systems, the Modular/GE universal formwork system and the Athlete steel frame formwork from Paschal that had already been used to form and concrete the load-bearing foundation plates up to 1.6m thick.

During an on-site interview, site manager Stephan Hirschmann mentioned that one of the many advantages of Logo.3 is that it allows both of the chamber walls of building structure four to be formed together using the system.

(Images: PASCHAL-Werk G. Maier GmbH)



Left and far left: 3D views for the abutments for bridge structure nine created using Paschal Plan Pro.

This is another advantage of particular importance for the construction company, since each of the four bridge abutments was entirely formed and concreted in one pour.

In the formwork plan, engineers combined Logo.3 with the hinged corner posts at the full height of the formwork in order to be able to use the system to form all the acute, obtuse and right-angled corners accurately.

The sloping formwork inserts to align each inclination were prepared on-site by the construction company's reinforced concrete operatives using wooden structures. The same applied to certain fillers that were deliberately made of timber since the asymmetrical corners were cross-braced due to the enormous pressure of the fresh concrete.

Approximately 290m³ of C30/37 strength-class concrete was laid in one pour, up to a height of approximately 9m for each abutment in bridge structure four.

Approximately 350m³ of concrete was laid in one pour up to a height of over 9m for each of the large abutments of bridge structure nine.

In order to meet the visual quality stipulated by Wilhelm Becker in accordance with the tender specifications, the

Logo.3 formwork panels, for the reinforced concrete surfaces of both structures that were not covered in earth, were mounted on-site using saw rough-cut boards. The construction company also relied on its permanent employees, who had been trained as reinforced concrete experts.

The diversity of the Logo.3 system was also seen in combination with the security equipment. Every concrete section was therefore prepared using the Multip multi-functional working platform for safe ascent and descent.

The Multip and Logo.3 formwork panels were, again, combined with the Logo.3 platform brackets and offer the important workplace safety required for formwork, bracing and concreting. These measures also helped to simplify the operatives' jobs and, consequently, increased efficiency as a whole. This was all prepared in advance according to the respective formwork plan.

Successful completion of the entire project was reached earlier this year in March. ■

Reference

1. DEUTSCHE BAHN, Richtlinie 804 – Modul 804.9010. *Richtzeichnungen "Stählerne Eisenbahnbrücken"*. DB Netz AG, Frankfurt am Main, Germany, 2012.



Completed concreting work.

(Image: Stephan Hirschmann)