Reitersberg, Germany

Bridge over invert construction site

About the Project

The Reitersberg tunnel, under construction since 2009, is a 2975m long railway tunnel. This is one of the 25 tunnels of the 230 km long railway line under construction, from upper Franconian Ebensfeld via Erfurt all the way to Leipzig and Halle (Saale). The sections are part of the VDE 8 (traffic project German Unity), starting operation in 2017. The pressure-tight tunnel pipe, with an interior lining wall up to 90cm, is excavated with blast, respectively with excavator heading. It has a double-track extension and allows for a design speed of 300 km/h. The projected construction time lies somewhere around 4 years; the end of the construction is scheduled for February 2013.

More information at www.vde8.de

Project Data

Country: Germany
Execution: 2009 - 2013
Builder/owner: DB Netz AG
Rowa’s customer: Arge Tunnel Reitersberg:
Alfred Kunz Untertagebau, München
Swietelsky Tunnelbau GesmbH & Co. KG

Heading method: Blast and excavator heading
Tunnel length: 2975m
Excavation diameter: 177m²
Lining method: Shotcrete and inner situ concrete

Advantages for the customer
The advantages of this installation are:
- Construction of base invert during heading without interruption
- Bringing in large amounts of concrete without pumping (less additives)
- High performance concreting

Rowa’s Order

The JV Tunnel Reitersberg has given Rowa the order to manufacture, supply and assemble, a movable steel bridge including invert formwork, concreting device and reinforcement crane, in order to bridge over the invert concreting site. Thereby, removal of excavation material and concreting the bottom under the bridge can take place simultaneously.
The Plan

The bridge is passed over by heavy rear discharging dump trucks. Therefore, a high bearing force (> 50 Tons) is required. Until breakthrough, a total of 53'000 load transports will be executed. The following stages of work take place under the bridge:

- Digging out of excavated invert
- Preparation and sealing of invert
- Reinforcement of base invert
- Concreting of base invert and inserting filling concrete up to a strength of 2,5m.

The free bridge span amounts to 48m. For the delivery of reinforcing steel, a crane is placed next to the bridge. The bridge is equipped with a stepper and ramps. The bulkhead and side formworks needed for bottom concreting are transferred via the bridge. After each concreting step, the bridge is advanced by 12,5m, duration approximately 30 minutes. Concrete supply is effected with mixer trucks via a system consisting of a longitudinal and a reversible lateral conveyor belt.

Scope of Delivery

- Movable steel bridge
- Invert formwork
- Concreting device
- Reinforcement crane

Concreting process

Concreting of the base invert takes place in two steps:

- Structural concrete in the base invert with a strength of 75 – 95cm
- Filling concrete up to 2,5m strength

The concrete is brought to the bridge with mixer trucks and distributed to the desired location in the base invert via a longitudinal and a reversible lateral conveyor belt. One bulkhead and two longitudinal formworks form the shape of the base invert to be concreted.

After the first concreting step - the supply of structural concrete - the longitudinal formworks are lifted on all sides of the bridge and removed. As soon as the lining of the base invert with filling concrete is finished, the bulkhead formwork can also be lifted. After relocating the bridge by the length of a concreting step to the new position, the formworks are placed in position again.

Technical Data

**Bridge**

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<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
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<tr>
<td>Load capacity</td>
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<td>Travelling speed</td>
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<td>Gross weight</td>
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<tr>
<td>Concreting steps</td>
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