Liaoning, China

Back-up system for Gripper TBM with Tunnel Belt

About the project
The structure is a part of an 80 km-long drift which interconnects two reservoirs with water supply dams in Liaoning Province (in the north-east of China).

Project data

Country: China
Start of construction work: 2004
Contract awarded to Rowa by Wirth GmbH, Erkelenz
Function of the follow-on installation: Supply and disposal functions for a high-performance TBM driving operation with tunnel belt
Driving method: Gripper TBM
Driving length: 8,365 m
Excavation diameter: 8.03 m
Lining method: Shotcrete
Inclination: < 0.5 %

Rowa’s order
On 30 March 2004, Rowa was awarded the contract for manufacture and supply of a back-up installation for a gripper TBM with tunnel belt from the Wirth GmbH company, subject to the proviso that the heavy steel structure be manufactured in China.
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Concept

As a logical consequence, Rowa’s design was based on Chinese steel construction sections. The entire installation was assembled at the works in China before being transported to the construction site over 2000 km away for final assembly.

Supply and removal logistics

The excavated muck is transferred via a conveyor belt directly onto the tunnel belt. Supply material and material subject to wear is transported by rail to the tail of the TBM and, from there, using a special crane, to the storage location on the material transloading bridge or directly to the installation point on the TBM.

Scope of delivery

The back-up installation consists of a 150 m-long steel structure supported on auxiliary rails. The rock is consolidated in the L2 zone by means of two independent shotcrete systems, consisting of 2 shotcrete robots, delivery pumps and handling systems.

Special aspects

Assembly work was performed in an assembly cavern accessed via an over 2 km-long access drift and was completed on 31 January 2005 as regular operation commenced.

Technical data

- Length of the back-up installation: 150 m
- Covering diameter: 7400 mm
- Weight of the back-up installation: approx. 400 metric tons
- Connected electrical load: approx. 200 kW
- Driving time: 24 hours per working day
- Removal by Supply
  - Tunnel belt
  - Rail

Ventilation reservoir / high-voltage drum

Shotcrete robot

Shotcrete installation