Connections Weinbergtunnel, Switzerland
Supply and Removal Logistics Oerlikon

Editorial

Dear Reader's,

This issue deals with the Weinberg Tunnel Connections project which is interesting in every aspect. You will receive an overview about the project and the Rowa-installations used.

Project and Objective

The project

The 9.6 km long connecting line forms a central part of the West-East axis of the national railway network. It will improve the capacity of Zürich's main train station by offering new concepts in suburban railway and long distance traffic, starting in 2013. It will mostly benefit the axis Geneva – Berne – Zürich Airport – St. Gallen. West and East will move even closer due this connection.

The connecting line crosses the town of Zürich from Altstetten through the main station all the way to Oerlikon in a large curve. The Weinbergtunnel enables westbound tracks to head across two new bridges to Altstetten, and eastbound tracks to connect the main station with Oerlikon.

Master plan overview (source: SBB)

Overview supply and removal logistics
Objective Supply and Removal Logistics
Rowa Tunnelling Logistics AG, as a well-known specialist with in-depth know-how in the development of supply- and removal facilities, has received this order from the consortium ATW (consortium Weinberg tunnel, formed by the companies Implenia Bau AG, Bilfinger Berger Ingenieurbau GmbH, Wayss & Freitag, Prader Losinger AG), which was commissioned to build the connecting line Zürich section 3. This order comprised a project which had to be realized in record time: development, procurement, assembly and start-up of turn-key supply- and removal facilities. Operation start-up was planned for October 14, 2008.

The supply and removal installation is divided into the following groups:
- Removal Weinbergtunnel
- Removal Emergency- and Escape Galleries
- Removal section 4
- Gravel supply
- Conveyor bridges

Rowa Tunnelling Logistics AG is also the ideal partner for this supply- and removal installation. The acquired experience, the know-how and the short communication channels guarantee a reliable high performance installation in spite of short construction time.

The Concept
In close cooperation with the client and in compliance with the requirements and specifications of tunneling construction (excavation diameter 11.3 m, heading capacity 20 m per day in the Weinbergtunnel), Rowa's specialists have developed the complete facilities step by step.
Supply and Removal Facilities

Removal Main Tunnel
To remove the rubble from the Weinberg Tunnel, it is transported in the entry tunnel by the continuous conveyor belt onto a short transverse conveyor, and from there with the transport conveyor alongside the support wall for approximately 600 m to the bunker facility.

Bunker Facility
The bunker facility serves as buffer storage for rubble from the main tunnel and from the escape and rescue galleries. Filling capacity roughly matches a daily performance, i.e. approximately 6000 t.

Train Loading Installation
Rubble removal takes place in trains with 16 wagons each, with 60 t load capacity each, i.e. a total of approximately 960 t per train. The train is completely loaded within 30 minutes by an automatic train loading installation.

Due to the very busy flow of train traffic at the Oerlikon station, only seven free entry- and exit time slots are available.

Gravel Supply
Gravel transport to Oerlikon is facilitated by train. From the discharge gutter, the gravel is then transported across the train crossing via conveyors to the bottom of the Brunnenhof shaft.

From there, the gravel is unloaded either into silos for the supply of the TBM heading, or directly arrives via elevator at the concrete installation above ground.

Project Data
Country Switzerland
Tunnel length total 4.5 km TBM-heading
Type of heading Single shield-TBM
Inclination max. 0.29%
Excavation diameter 11.30 m
Heading performance 20 m/d
Supply Gravel
Removal Conveyor Belt/Bahnverlad
**Particularities**

**Limited available space**

Very limited available space on the installation site in Oerlikon had to be considered during planning of the overall project.

**Special assembly**

The requirements of the heading dictated a step by step construction of the facility. At times, assembly work was only possible during night time because necessary track blockings were unavoidable.

**Interfaces**

A particular challenge was presented by the very cramped local conditions as well as the need for a smooth integration of the different interfaces between installation site and Brunnenhof shaft.

- S88 line
- Transit- and shunting possibility at installation site Oerlikon
- Road traffic
- Assembly of rubble conveyor to supporting wall section 4

**Emissions**

Stringent requirements are imposed with regard to handling and transporting rubble material and gravel inside urban areas. In order to comply with severe regulations, high priority was imposed on the observance of admissible emission limits during the planning phase.

To minimize noise and dust pollution, the complete installation was encased throughout.

**Experiences / Conclusion**

The following aspects have enabled Rowa to acquire additional know-how with regard to the construction of this turn-key supply- and removal installation in urban areas:

- The challenging planning and design of the complete installation required by the smooth integration of interfaces with S88, road traffic and neighbouring lots, crowded conditions, special emission-guide values, special assembly planning and its execution
- The required high flexibility of all persons involved, based on the very short realization time
- The highest demands with regard to deadlines, performance and availability

**Conclusion**

Start-up of the facility took place within the agreed time limit. The performed services as well as availability of the facility are achieved.