

CFF Federal Railways of Switzerland Land Line 210 : Dailens/south - Bienne Improvement of the St-Blaise Tunnel

Project description

The tunnel of St-Blaise was built between 1858 and 1860. 157 m long, it crosses under 2 and 5 m a massif made up of tuff and limestone (yellow stone from Neuchâtel).

To maintain the passage of the two floors coaches, and because the vault had many signs of ageing, important works were undertaken in 2002.

The project consists in replacing masonry by reinforced concrete vault resting on two lines of nonjointed drilled piles. The work is undertaken from surface, in trench.

- Location: St-Blaise (Neuchâtel)
- Reference: Mr. Burri, CFF I-AM-LS-TR
- Duration: 2002 - 2003
- Cost of the project: Approx. 10 mio CHF
- Fees: 0.5 mio CHF

Highlights

The optimization of the program done by the specialists of CSD has permitted to reduce the duration of the construction by 26 to 18 months and has also permitted to decrease the financial risks.

The project was taking place in a residential zone that was especially critical for the environment and was also an architectural protected zone.

The vault was made from 16 stages of concrete, joint less in final stage. The thickness ranges between 60 and 120 cm.

The technique of drilling the 80 cm in diameter piles was adapted to the geological conditions of the site. Because of the hardness of the rock, previous small diameter drilling were carried out in limestone. Some zones in tuff with high porosities and with karstic erosions have required to armour the wells.

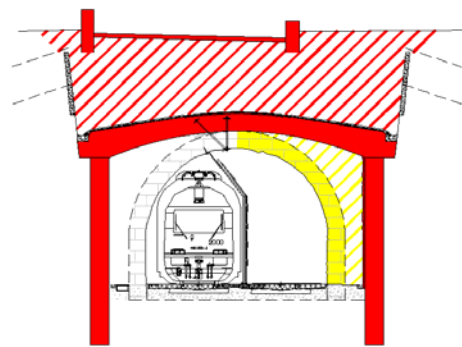
Our Services

- Execution and local direction.
- Optimization of the program and technical solutions.
- Structural analysis with finite elements program (Zsoil).
- Coordination of industrial services, provisional deviations and replacement of the conduits and pipes.
- Geotechnical monitoring and complementary probes.
- Environmental monitoring.
- Measurements of shocks and movements.

View of the trench



Demolition of the old masonry in two stages, by maintaining a service way



Drillings of the vault for the installation of tie beam.

