

## CFF (Federal Railways of Switzerland), Bern SA Improvement of Grandvaux and Cornallaz Tunnels

### Project description

In the project of allowing the passage of the new two level coaches, important work of enlarging the free profile was undertaken in 1997. Laterally, the tunnels were widened by rebuilding supporting walls and lowering the tracks.

The tunnels, built about 1860, are respectively 494 m (Cornallaz Tunnel) and 392 m long (Grandvaux Tunnel). The original poor quality coatings were rebuilt between 1903 and 1904

The fact of having to maintain a way in exploitation required to complete work in two stages. First the way "mountain" then the way "lake". The construction field was separated from the service track by a metallic protection wall.

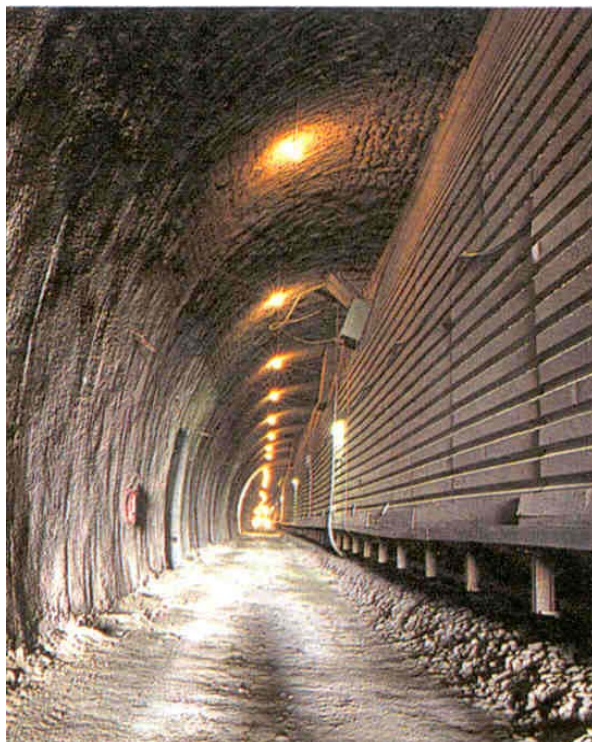
- Location: Between Lausanne - Bern
- Reference: CFF, MM. Fornerod and Burri
- Duration: 1997 to 1999
- Cost of the project: env. 27.8 mio CHF
- Fees: 0.5 moi CHF

### Highlights

- The tunnel of Cornallaz crosses a Molassic massif of poor quality, with marl alternating with sandy benches, strongly fissured and fractured. Heterogeneous Rhone Moraine is present on the last 150 m on the side of Bern.
- An important rock collapse took place in 1902, requiring the closing of the rail traffic during approximately 2 months.
- The composition of the massif in the tunnel of Grandvaux is similar, however the quality is going from good to excellent.
- In spite of the important geological difficulties and railway constraints, work was finished in deadlines, without over cost.

### Our Services

- Organization and followed campaigns of complementary probe
- Determination of the base parameters for the modelling
- Geological monitoring during work
- Following a rock collapse which has occurred on the 17.11.97, emergency measures and a improved technology for the execution were implement.
- Resumption of the local direction in partnership with the office of engineers commission.
- Measurements and monitoring of the solid-state sounds.



The mountain way tunnel after enlargement. On the right: metallic wall for protection



Rebuilt of a supporting wall with concrete

Lowering the foundation and installations towards the gate

