



## Axen Tunnels Redevelopment Works

**Client**  
**Main Contractor**  
**Planning, Design, Site Supervision**  
**Contractor**  
**Joint Venture Partners**

Swiss Federal Railways (SBB)  
Marti Central Switzerland Joint Venture  
Henauer + Gugler AG, Zurich  
Marti Central Switzerland Joint Venture  
Marti Bauunternehmung AG Lucerne  
Marti AG Altdorf  
Frigo + Marti AG Zug

**Managing Contractor, Technical and  
Financial Management**

Marti Bauunternehmung AG Lucerne

## Project

Redevelopment of SBB lines on the north-south Gotthard route between Brunnen and Flüelen

- 7 tunnels with a total length of 5,000 m
- Rock securing measures and widening of footpaths along the open track sections

## Construction Period

2003–2004

## Contract Sum

CHF 27 million

## Services Tunnel

Invert

- invert drainage

Self Rescue

- new escape recesses
- escape route
- handrail
- lighting

Vault

- upgrading of masonry works
- waterproofing of vault with gunite
- vault drainage
- grinding
- vault widening and resurfacing with shotcrete
- grouting work and vault security measures with anchors

Railway Engineering

- construction of load-bearing structure
- erection of overhead conductor line
- earthing
- tunnel radio communication
- cableducts

## Services Open Track

- rock securing measures
- footpath widening
- pole foundations
- erection of overhead conductor line
- upgrading works on a steel arched bridge



1. Widening of cross section by excavation and resurfacing with shotcrete

2. Cleaning the vault with high-pressure water of up to 2,000 bar