RENEWAL AND PROFIL EXPANSION
TUNNEL MAROGGIA, 4-METER CORRIDOR
BISSONE / MAROGGIA (CH)

EMPLOYER
Swiss Federal Railway Company, SBB, CH-6002 Lucerne

DESIGNER
Rothpletz, Lienhard + Cie AG, CH-4600 Olten
Pini Swiss Engineers SA, CH-6900 Lugano

TIME OF COMPLETION
May 2016 – March 2018

CONTRACT SUM
CHF 13 Mio.

EXECUTION OF THE WORK
ARGE M&M

CONSORTIUM PARTNERS
Marti Tunnel AG, CH-3302 Moosseedorf
Marti Bauunternehmung AG, CH-6002 Lucerne
Mancini & Marti SA, CH-6501 Bellinzona

LEAD COMPANY AND TECHNICAL LEAD
Marti Tunnel AG, CH-3302 Moosseedorf

COMMERCIAL LEAD
Mancini & Marti SA, CH-6501 Bellinzona
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SCOPE OF THE WORKS
The Maroggia tunnel is the railway line between Basel and Chiasso and is located in the Canton of Ticino (CH) between Bissone and Maroggia. The double tube tunnel was commissioned in 1874, together with the opening of the Gotthard main tunnel, and has since been renovated and maintained several times. The access routes to the new Ceneri- and Gotthard Basistunnels will be expanded to a frame profile as part of the project 4-meter corridor. This allows semitrailers with a height of 4 meters and a width up to 2.60 meters to be transported by train from Basel to Chiasso. By means of extensive support measures and a one-sided profile expansion under continuous rail operation, the insufficient profile clearance be eliminated and the tunnel upgraded to the new requirements.

ACTIVITIES
The two-570 m long railway tunnel will be during railway operation. The railway tunnel is daily by up to 180 passenger and freight trains, which requires a 100% availability of the tracks.

Construction measures:
- Vault injections 600 to
- Shotcrete plates 1’000 m²
- Arch support by spiles 3’500 m
- Buil of a concrete bolt longarine 570 m
- Pre-tensioned bolts 500 kN 4’000 m
- Diamond blade cuts 2’000 m²
- Excavation support with mortar bolts 1’000 pcs

The expansion of the roof takes place in 172 stages. In the portal areas and fault zones, the excavation occurs in the pilgrim step method. In the other sections, the excavation continuously in steps of 2 to 4 meters.

Vault Replacement:
- Vault excavation 5’000 m³
- Rock support with sprayed concrete 800 m³
- Support with grouted bolts 3’000 pcs
- Umbrella water proof sealing 4’200 m²
- Vault concrete 2’000 m³
- Joint sealing 1’200 m

Niche:
- Escape niches 15 pcs

Invert renovation:
- New construction of tunnel drainage 600 m
- Invert adjustment 1’000 m²
- Cable channels 800 m

Self-rescue device
- Handrail with illumination 570 m

GEOLOGY
Tunnel: - Porphyr
Portal sections: - Loose material artificially covered

09.01.2018