RENEWAL TUNNEL CROCETTO & GIUSTIZIA, 4 METER CORRIDOR
BIASCA (CH)

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

DESIGNER
F. Preisig AG, CH-8050 Zurich

TIME OF COMPLETION
May 2014 – December 2016

CONTRACT SUM
CHF 15.3 Mio.

EXECUTION OF THE WORK
ARGE C.G.T. Osogna

CONSORTIUM PARTNERS
Marti Tunnel AG, CH-3302 Moosseedorf
Mancini & Marti SA, CH-6500 Bellinzona
Marti Bauunternehmung AG, CH-6005 Lucerne

LEAD COMPANY – TECHNICAL AND COMMERCIAL LEAD
Mancini & Marti SA, CH-6500 Bellinzona
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BIASCAS (CH)

SCOPE OF THE WORKS
The Crocetto (275 m) and Giustizia (64 m) tunnels are located between Biasca and Osogna-Cresciano in the Canton of Ticino (CH). The two-track tunnels were commissioned in 1874, together with the opening of the Gotthard pass tunnel, and have been renovated and refurbished several times.

In regards of the 4-Meter-Corridor project, the tunnels will be expanded to a larger clearance profile and the old structure will be upgraded according to the concept of "Tunnel maintenance II" for a useful life of 50 years.

The establishment of the profile clearance is implemented by means of a track sinking and profile sawing in the vault and masonry demolitions. As a result of the lowering of the track, the abutments must be undertaken continuously. The renovation measures are carried out by rehabilitating the masonry joints, specific drainage measures and sprayed concrete sealing lining.

ACTIVITIES
The two-track railway tunnels Crocetto and Giustizia were upgraded under running railway operation. The railway tunnels are crossed daily by up to 180 passengers and freight trains, which requires a 100% availability of the railway track.

Vault renovation from rehabilitation train:
- Vault cleaning with HDWE  
  2'000  m²
- Vaultsawing 
  500  m²
- Joint repair 
  500  m²
- Sprayed concrete waterproofing 
  2'000  m²
- Arch drainage 
  500  m²

Invert sinking down to 1.3 m depth in rock and loose material from the site trail:
- Nail wall 
  700  m²
- Diamond bladesawing 
  200  m²
- Invert sinking by blasting 
  3'500  m³
  (under running train operation)
- Sole lowering in loose material 
  3500  m³
- Tunnel drainage 
  1’600  m
- Substructure PSS 
  2’000  to
- Subbase coating 
  1’100  to
- Cable channels 
  1’600  m

Abutment undertaking of the tunnel vault in 340 stages as well as performance of the edge walls in the pre-cuts.
- Arch support by means of rock bolts and longarines 
  700  m
- Injections 250 to
- Abutment undertaking in the "pilgrim" step method 
  3’000  m²
- Rehabilitation of the edge walls 
  350  m²

Niche:
- Escape niches 
  13  units

GEOLOGY
- Gneiss
- Granite
- Soft ground

27.02.2018