



# SIKA AT WORK

## VISP TUNNEL (TUVI) VISP, SWITZERLAND

A COMPLEX STRUCTURE BUILT DEEP IN THE MOUNTAIN

BUILDING TRUST



# VISP TUNNEL (TUVI) SWITZERLAND

## PROJECT DESCRIPTION

The Visp Tunnel is a section of the new Visp south bypass which is part of the A9 motorway in Switzerland. It is a complex underground structure, consisting of the north and south directional road tubes between the Schwarzer Graben and Chatzuhüs (Staldbach Bridge junction), and the underground interchange with the motorway to the Visp Valley.

This bypass is therefore formed by the new Visp Tunnel, together with the Eyholz Tunnel, plus the south tube of the motorway, which already existed as the Visp Valley Tunnel, but had to be upgraded to a motorway tunnel. The north tube had also been started as an earlier ground exploration tunnel in 2005, so this was now being significantly enlarged and widened from 4.75 m to 10.80 m diameter.

There were two headings for the TBM, one from the Chatzuhüs portal and the other from the Schwarzer Graben portal to the west of Visp. The Chatzuhüs portal had to be protected against rock falls by barriers so that tunnelling works could safely proceed by working 2 shifts per day on weekdays. Branch tunnel structures I, II, III have therefore all been excavated and these structures formed at the same time.

Since autumn 2014 more than 350,000 m<sup>3</sup> of rock has been excavated and had to be moved by truck through the closed Visp Valley tunnel to the Schwarzer Graben area; where after crushing and grading it was used as fill material on several of the A9 construction sites. These excavations were completed in mid-2016, with the breakthrough of the north tube being achieved on 22 August 2016.

## PROJECT REQUIREMENTS

Shotcrete:

- C 30/37 CL 0.20,  
maximum particle diameter 8 mm

Concrete:

- C 35/45 XC4/XD3/XF4/CL0.1,  
maximum particle diameter 32 mm



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- 1 New Visp south bypass
- 2 Shotcrete application intersection tunnel
- 3 Release agent und Antisol store
- 4 Expansion main tunnel



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- 1 Meeting with foreman
- 2 Invert depression Vispertaltunnel
- 3 Arched formwork Tunnel Visp



## SIKA SOLUTION

Sika was able to provide a complete solution for the many different concrete mix designs and applications required on this project, including all of the sprayed and site-placed concretes, as well as the structural waterproofing systems. This amounted to some 150,000 m<sup>3</sup> of sprayed concrete, 185,000 m<sup>3</sup> of site-placed concrete and 150,000 m<sup>2</sup> of Sikaplan sheet waterproofing system, which were used in this project. In close support of the Project Engineers and the Contractors on site, Sika was also able to assist and provide the right products for many other different applications during this project as evidenced in the summary that follows.

## SIKA PRODUCTS

- Sika® ViscoCrete® – superplasticiser and ultra-plasticiser
- Sika Sigunit® – shotcrete accelerator
- Sika® Separol® – formwork release agent
- Sika® Antisol® – curing agent
- Sika Boom® – expanding foam sealant
- Sika® Rock – anchor mortar
- Sikament® – superplasticiser
- Sika® Retarder – retarding agent
- Sika® Fro – air entraining agent
- Sika® Frost Protection – mortar additive
- Sika® Stabilizer – anti-segregation additive
- SikaControl® – crack reducing admixture
- SikaRapid® – concrete hardening accelerator
- SikaFume® – silica fume additive
- SikaPump® – concrete pumping aid
- Sikaplan® WP – sheet waterproofing membrane system
- Sikaplan® WP Protection Sheet – waterproofing membrane protection
- Sika® Waterbar – movement and construction joint waterstops
- Sika® Dilatec® – waterproofing and sealing tape





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- 1 Umbrellar waterproofing tunnel Visp
- 2 Detail floor level construction site tunnel Visp
- 3+4 Water bar detail open pit area Schwarzer Graben
- 5 Arched formwork open pit Schwarzer Graben
- 6 Portal section Schwarzer Graben with arch block and installation site



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# VISP TUNNEL (TUVI), SWITZERLAND



## PROJECT FACTS

Contract volume: CHF 200 Mio.  
Construction period: Sept 2014 – Sept 2018  
130 Employees and 20 Subcontractors  
Excavation: 320,000 m<sup>3</sup>  
Shotcrete: 150,000 m<sup>2</sup>  
Anchor: 620,000 pieces  
Spoil: 60,000 m<sup>3</sup>  
Construction pit connections: 5,500 m<sup>2</sup>  
Waterproofing: 150,000 m<sup>2</sup>  
Site concrete: 185,000 m<sup>3</sup>  
Reinforcing steel: 7,000 tons  
Reinforcing mesh: 1,600 tons  
Steel arch: 1,800 tons  
Bituminous flooring: 20,000 tons  
Back filling: 80,000 m<sup>3</sup>

## PROJECT DETAILS

### Owner:

Kanton Wallis built to order of ASTRA (Federal Office for Road Construction)

### Contractors:

ARGE Tunnel Visp (ATV)  
Imboden Ulrich AG, Visp  
Prader Losinger SA, Sion  
Dénériaz Sion SA, Sion  
Evéquo SA, Conthey  
STRABAG AG, Erstfeld

### Planner and Engineers:

IG Vispa  
IUB Engineering AG, Bern  
Rothpletz, Lienhard + Cie. AG, Bern  
SPI AG, Brig-Glis

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