



Tunnel Belchen (CH) Sheet Waterproofing

Country	Switzerland
Type	Motorway Tunnel
Client	Federal roads office - ASTRA
Main Contractor	Marti Tunnelbau AG
Execution of the work	Renesco AG
Designer	IG STBelchen, ILF, Aegerter/Bosshardt
Construction Period	2016 – 2017

Project Description

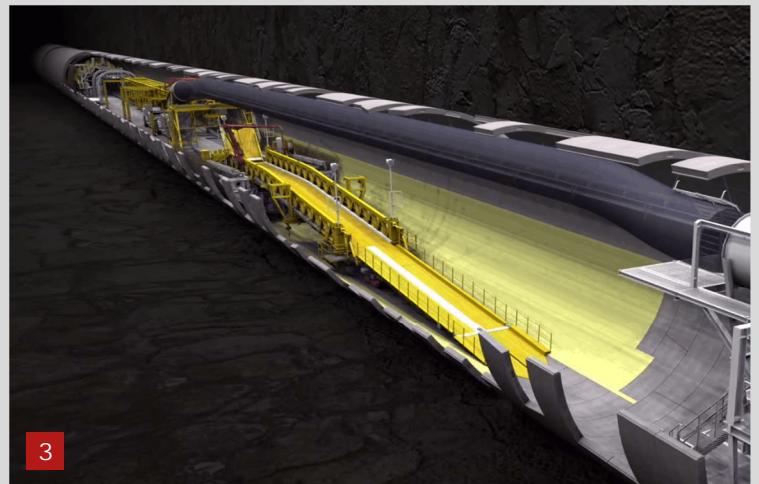
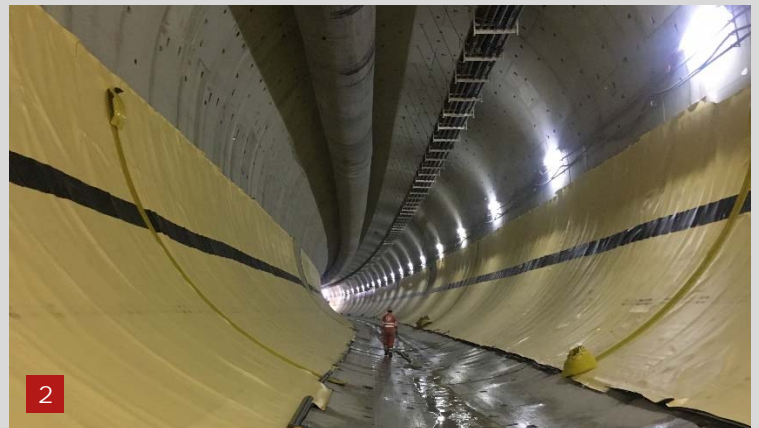
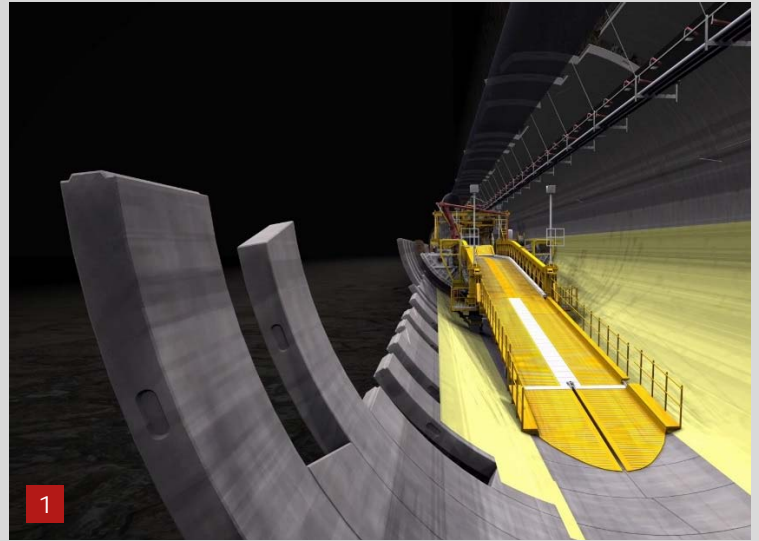
Double-tack tunnel between Hägendorf (SO) and Eptingen (BL) with a length of 3'177m. Excavation with a single shield TBM (\varnothing 13.97m) with precast segments (d=35cm) and simultaneous inner lining (40-81cm), double shell method including sheet waterproofing.

The Belchen area of the Jura Mountains presents geological challenges for tunnelling, as they did for construction of the existing twin two-lane tubes on the motorway. The geology consists of tightly compacted folds and thrust faults, and includes a large amount of swelling rock comprising gypsum Keuper marl and opalinus clay (swelling anhydride) resulting in aggressive groundwater with high sulphate content.

Scope of Service

Sheet waterproofing, 2.5mm PVC-P acc. to SIA272 (Swiss standard), laminated with a 500g/sqm polypropylene geotextile, full-round (360°) sealing, full-automatically installation via hot-melt process, protection sheet membrane, PVC-P water barriers every 2nd block, drainage layer, sealing works under an invert construction bridge.

- 110'000 m² PVC-P, 2.5mm laminated with a 500g/sqm PP geotextile
- 45'000 m² PVC-P protection sheet, 3mm
- PVC-P water barriers, 500/6/30
- Drainage layer



1. Invert construction bridge
2. Sheet waterproofing/ invert
3. Construction sequence