



## 2<sup>nd</sup> Rehabilitation of Tunnel Belchen (CH) Cross-Passage Waterproofing

<b>Country</b>	Switzerland
<b>Type</b>	Highway, Road Tunnel
<b>Client</b>	Federal Roads Office (FEDRO), ASTRA
<b>Main Contractor</b>	ARGE Belchen, Marti Tunnel AG
<b>Execution of the work</b>	Renesco AG
<b>Designer</b>	ILF Consulting Engineers, Emch & Berger Group, Lombardi Engineering
<b>Construction Period</b>	2025

## Project Description

Double-tack tunnel between Hägendorf (SO) and Eptingen (BL) with a length of 3'177m. Since the beginning of September 2024, anticipated measures have been underway to renovate the centre tube as part of the 'Belchen Zweite Instandsetzung' project. The Belchen tunnel system consists of 3 tubes with directional and bidirectional traffic. Following the commissioning of the 3rd tube in the year of 2022, the first two tubes are now being completely refurbished, the tunnel safety is being increased, and all areas are being brought up to the state of the art. Two cross-connections will be converted into underground control centers.

Part of this work is the construction of new cross-passages between the centre tube and the "Basel" tube. A total of nine cross-passages will be constructed, seven of which will be accessible and two of which will be larger and drivable. In addition to the excavation work in the rock, concrete repair work, asbestos work, waterproofing and interior work are also underway.

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 opalines clay (swelling anhydride) resulting in aggressive groundwater with high sulphate content.

## Scope of Service

Supply & install of the Sheet Waterproofing Membrane System under pressurized water for the cross-passages including sealing grouting measures.

- PVC-P sheet membrane, 2.5mm with a 500g/sqm PP geotextile
- PVC-P protection sheet, 3mm
- PVC-P water barriers, 500/6/30
- Drainage layer
- BA anchors
- Adhesive termination tapes/ stripes
- Chemical injections based on PU and acrylic



1. Cross-passage waterproofing with inner lining
2. Larger Cross-Passage, shotcrete works
3. Waterproofing of the larger Cross-Passage