



Safety Tunnel Cholfirst (CH) Structural Waterproofing

Country	Switzerland
Type	Safety Tunnel (SiSto)
Client	ASTRA
Main Contractor	Implenia Schweiz AG
Execution of the work	Renesco AG
Designer/ Engineering	Gähler, AFRY (Pöyry), Amstein + Walthert, Amberg Engineering
Construction Period	2021-2022

Project Description

The national highway N4/06+08 between Schaffhausen Nord - Flurlingen and the Swiss-German border was put into operation in 1996 with 2x1 lanes. Part of this section is the Cholfirst Tunnel south of the river Rhine, which is 1'260 m long.

For the demand of tunnel safety, a 1,169 m long parallel safety gallery was constructed including a 70 m long cut & cover structure in the south. Construction of the southern preliminary cutting in groundwater-saturated loose rock using sprouted sheet piling and retaining walls as an excavation pit closure in the immediate vicinity of existing buildings. Construction of an underground operations, control, and ventilation centre. Construction of 6 x cross-passages from the safety tunnel to the road tunnel. Construction of the portals.

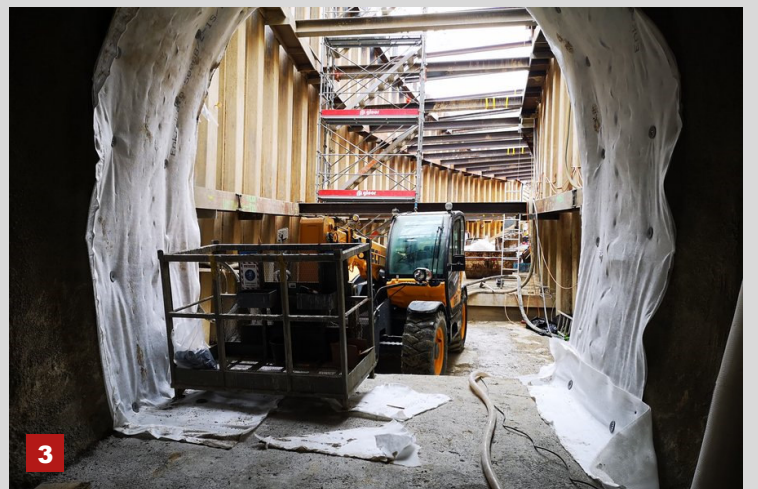
Scope of Service

Supply and install a "post-applied" system based on a fully surface glued/ bonded membrane at the open-cut sector.

The system combines the advantage of a flexible sheet waterproofing with the "fully adhered" approach with documented product lifetime expectancy, permanent seaming by thermo-welds, substrate inspection/ testing & levelling, prevention of lateral underflow between the concrete structure and the membrane in case of leakage.

Structural waterproofing:

- Fully bonded waterproofing system at the cut & cover wall/ roof section. The system consists of a 2-K-PU based adhesive and a 2 mm thick synthetic sheet waterproofing membrane (reinforced TPO/FPO) on the existing concrete structure.
- Loose-laid sheet waterproofing (3 mm, FPO) in the base slab including protection geotextile (1'500 g/ sqm, PP) and protection sheet membrane (3 mm, TPO)
- Adhesive tapes/ stripe, water barriers
- Pipe penetrations, BA- anchors, trumpet flanges



1. Base slab waterproofing via loose-laid system
2. Cut & Cover structure
3. Transition between cut & cover structure and tunnel