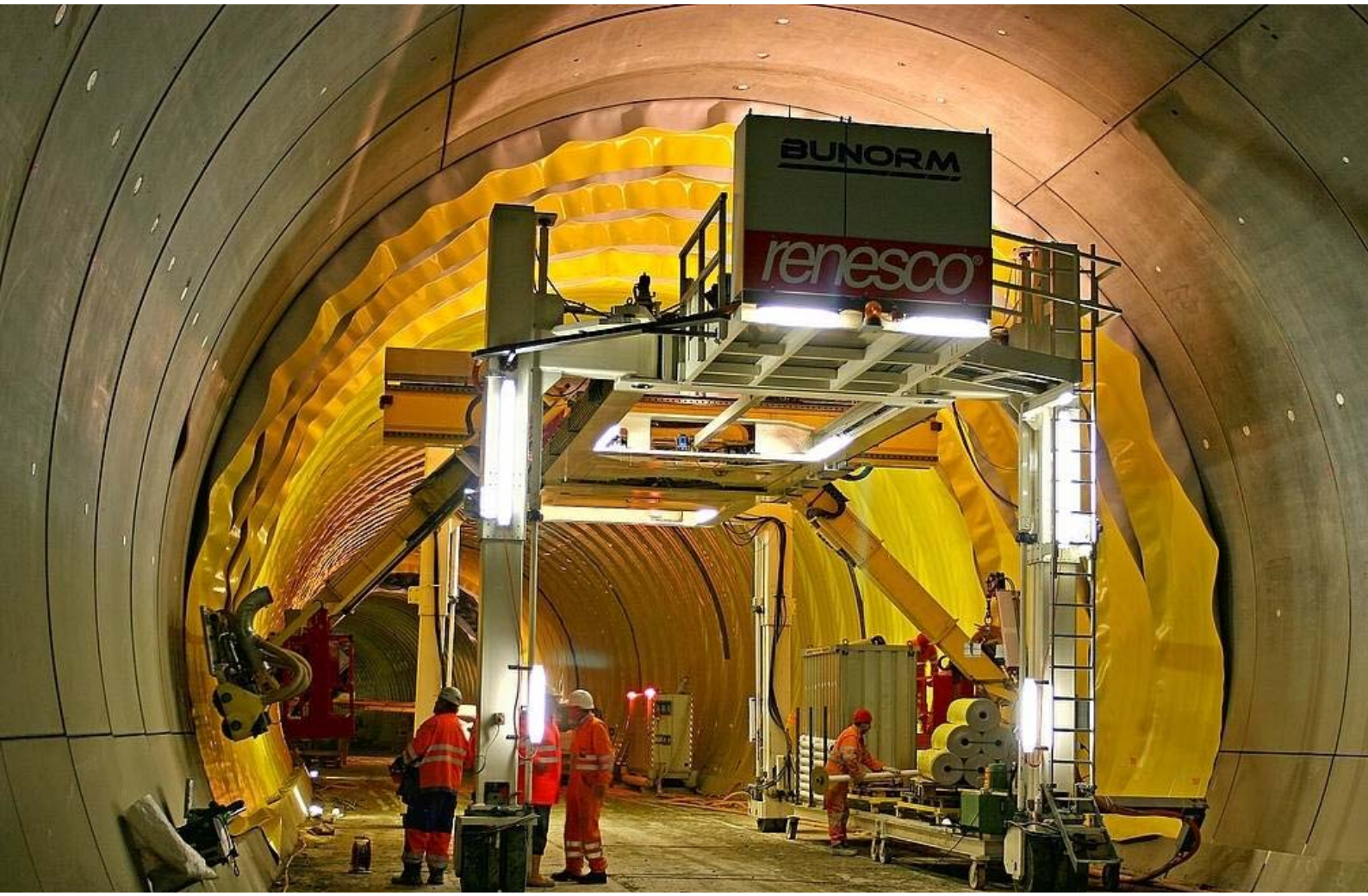


Tunnel Islisberg (CH)
Sheet Waterproofing

Country	Switzerland
Type	Highway tunnel
Client	Public work management of the canton of Zuerich
Main Contractor	ARGE IBT Islisbergtunnel (Marti Tunnelbau, Ed. Zueblin, Marti AG)
Designers	Grouping of engineers N4.1.6, CH-6460 Uri
Execution of the work	Renesco AG
Construction Period	2005 - 2007

Renesco Group, Seedorffeldstrasse 21, CH-3302 Moosseedorf, Phone: +41 (0)31 388 74 20
info@renesco.com, www.renesco.com

Project Description

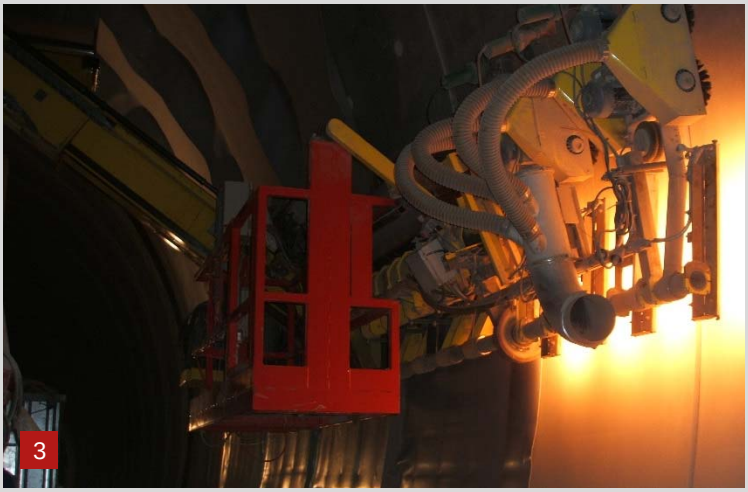
The 4.95km long Islisberg tunnel is part of the national highway A4 in the Knonau district. It consist of two tubes each with two traffic lanes. The rooms housing the electromechanical equipment are located at both portals and in the middle of the tunnel. The Islisberg tunnel lies primarily in rock of the upper freshwater molasses. The tunnel drive in rock was carried out using a TBM. The tunnel tubes were driven consecutively from north to south, with a downward slope. At the north portal over a length of 35m the east tube passes through soil. The top heading was excavated under a jet-grouted arch, while the bench was excavated using the TBM. At the south portal, due to the shallow rock cover and the highly weathered molasses, over a length of 36m counter of the top heading was carried out with the roof protected by pipe umbrella.

Section Uetliberg West – Knonau

- 2 tunnels of 4'950m
- Excavation cross section A= 110m²
- 3 ventilation chambers north, south and central
- 15 pcs cross cuts, of that 5 driveable
- TBM-drive Ø= 11.86m with concrete segmental lining
- Inner lining with PVC-P waterproofing membrane
- Service duct elements, concrete internal ring and suspended ceiling, backfilled by cement-stabilised spoil material
- Jetting drive in soft ground section at north and south portal
- The primary lining consists of 30cm thick and 2m wide ring segments

Scope of Service

Application via Hot-Melt Technology of a 2mm thick PVC sheet waterproofing membrane according to SIA-V-280 (Swiss standard) laminated with a 500g/m^2 polypropylene (PP) protection geotextile, umbrella seal, fully automatic-ally installation equipment.



1. Sheet Waterproofing, umbrella seal
2. PVC-P sheet waterproofing laminated with a PP geotextile
3. Hot-Melt application onto the segmental lining