



POLITECNICO DI TORINO
Dipartimento di Georisorse e Territorio



GEORESOURCES AND ENVIRONMENT ASSOCIATION



ITALIAN TUNNELLING ASSOCIATION

INTERNATIONAL CONGRESS

MECHANIZED TUNNELLING: CHALLENGING CASE HISTORIES

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SORENBERG GAS PIPELINE TUNNEL (Switzerland)

Abstract

Sörenberg tunnel has already been commissioned by Transitgas as part of a new pipeline (1200mm of diameter) for the transportation of gas from North Europe to Italy. The tunnel is located near the village of Sörenberg (elevation 1150m asl) in the zone of Entlebuch, Canton of Lucern, Central area of Switzerland. The tunnel is 5203m long with a slope of 4.87%, a maximum overburden of 550m and a finished internal diameter of 3.8m.

From the geological point of view the tunnel passed through very deformed formations, typical of the area, such as Schlierenflysch, Sörenberg Melange, and Globigerinenmergel, which was foreseen to contain some volume of gas.

The difficulties which challenged the design and construction of this tunnel were:

- presence of different litologies at the face which caused problems for the mucking;
- volume of gas which required special equipments and procedures;
- incoming of water, even in great quantity with consequent problems related to the filling of the tail void and cracking of the segments;
- the tunnel is located in a very sensitive environment such that long-term drainage of groundwater was not permitted.

Most of this difficulties were encountered and also successfully dealt with through a constant close and synergetic collaboration among the Owner, the Contractor and the Designer.

The excavation was done using a shielded TBM for rock, having a diameter of 4.56m. The tunnel was supported by a an universal fibre-reinforced segmental lining, 25cm thick, made of 6 segments per ring, 1.5m in length. The tail void has been filled directly from the rear of the machine with mortar (lower part) and pea-gravel (upper part).