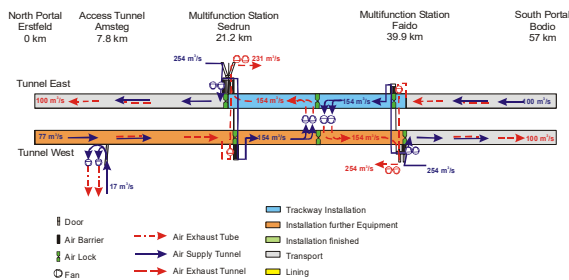
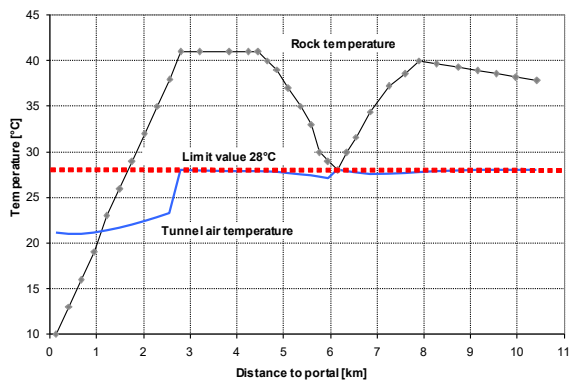




Construction of the trackway with preliminary ventilation



Concept of ventilation during the equipment of the Gotthard Base Tunnel



Temperature of air and rock as well as limit with operating ventilation and cooling (simulation with BAUKLIMA)

## Description

The installation of railway equipment in the Gotthard Base Tunnel is a challenging task in many respects. More than 500'000 tons of material must be brought into the tunnel system via very long transport distances. In addition, large quantities of heat and pollution from the surrounding rock as well as from heavy machinery must be considered. The ventilation and cooling during the installation phase must provide an acceptable tunnel climate both during normal and emergency (e.g. fire) operation.

## Services

In the framework of the basic design and the call for tenders of railway equipment in the Gotthard Base Tunnel HBI Haerter Consulting Engineers accomplished the following tasks:

- Definition of the climatic limits in working environment (MAC values, air speed, temperature, humidity, etc.)
- Application of the concepts for ventilation and cooling for different sections and phases according to the construction schedule
- Calculation of fresh air requirements
- Calculation of cooling power requirements (using the numerical code BAUKLIMA of HBI)
- Elaboration of ventilation and cooling concepts for each section and phase of construction
- Numerical verification of compliance with limits
- Designing of all equipment related to the preliminary ventilation (fans, dampers, air locks, etc.)
- Designing of all equipment related to the preliminary cooling (air coolers, cooling towers, pipes, etc.)
- Issue of the technical reports
- Elaboration of the tender documents
- Evaluation of the offers
- Participation in award of contract
- Monitoring of the execution phase
- Continuous improvement of the installation efficiency
- Acceptance tests and inspections