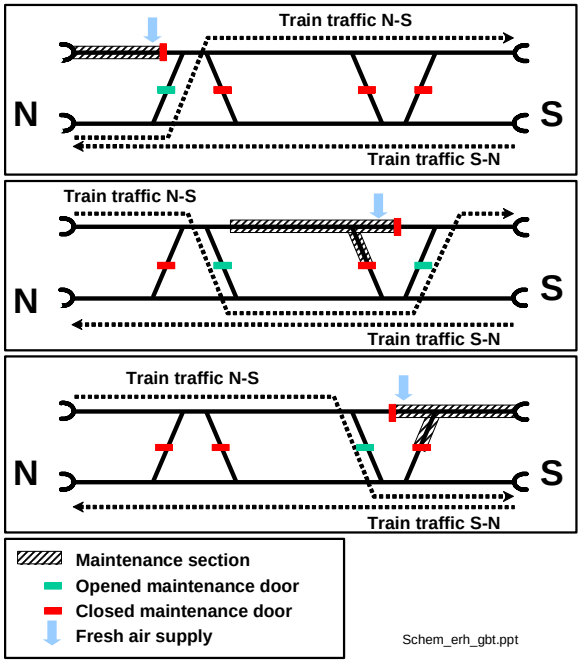
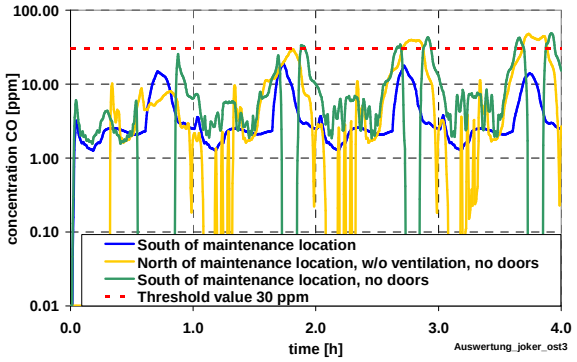
Gotthard base tunnel (CH)
Climate during maintenance

Maintenance works



Ventilation concepts during maintenance in the east tube of Gotthard base tunnel



CO-concentration during maintenance in the east tube (southportal) of Gotthard base tunnel

Description

Considering the extraordinary length of 57 km the maintenance concept plays a key role for the safety and availability of the Gotthard base tunnel.

During a periodic maintenance sequence one section of the base tunnel will be closed for train services (according to the principle: either traffic or maintenance).

Certain climatic thresholds and reference values must not be exceeded in the working area to ensure health protection and to allow efficient and reliable work.

Beside the temperature and humidity the flow velocity within the working area is important.

Furthermore, low diesel induced pollution must be limited to sufficiently low values either by dilution (ventilation) or reduction of engine emissions (e.g. filters), so that a natural ventilation will be sufficient.

Services

HBI Haerter Consulting Engineers provided the following services:

- Recommendations for threshold and standard values on the basis of existing guidelines and under consideration of special boundary conditions
- Calculations of the expected flow velocities in the maintenance section
- Calculations of pressure fluctuations
- Computations of the expected temperature and humidity as well as their evolution during a maintenance period
- Computations of the concentration of pollutants (CO, NO_x, etc.) to comply with MAC-values
- Optimisation of the efficiency of the emergency ventilation to dilute pollution
- Conceptual design of measures using doors or mobile devices blocking temporarily the tunnel
- Specifications for further project phases
- Input for civil design
- Definitions of interfaces to other disciplines