



Passenger train in the Engelberg railway tunnel



Smoke at the southern portal during a fire test



Jet fans of the emergency ventilation at the passover south (white arrow)

Description

The single-tube railway tunnel Engelberg allows a wintersafe access to Engelberg, improved train connections, a more efficient operation of the line and shorter travelling times.

The 4'059 m long tunnel with a gradient of 10.5 % leads from the northern portal Mettlen to the southern portal Boden, which is located close to Engelberg. The two double-track passovers north and south are located inside the tunnel.

Services

The operator of the railway line, zb Zentralbahn AG, assigned HBI Haerter AG to analyse and implement concepts for smoke control and extraction in case of a train fire. Based on results of studies and investigations regarding safety and a set of safety relevant protection objectives, an emergency ventilation system with jet fans is implemented.

The planning services of HBI Haerter AG focused on:

- Design and arrangement of the jet fans in the tunnel and passovers taking into account the constructional and railway related boundary conditions
- Installation of a mechanical emergency ventilation system in the tunnel with jet fans, compensating the fluctuating environmental conditions and keeping the emergency walkways smoke-free and thereby supporting the self-rescue of affected persons
- Installation of switch cabinets with electrical components for operation, control and surveillance of the emergency ventilation system
- Integration of ventilation control scheme into overall control concept considering all operation modes
- Confirmation of achievement of the given ventilation goals by exercising smoke tests