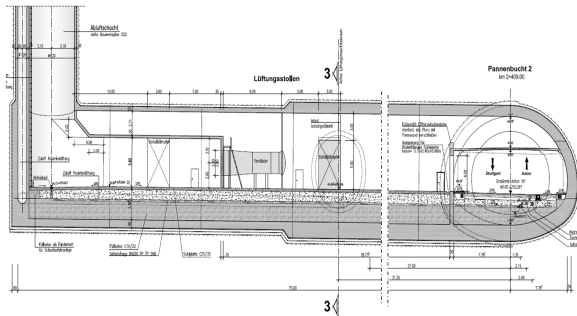


Pollution dispersion analysis: annual mean of NO₂-concentration in the vicinity of the tunnel portal, 10% portal air discharge

Schnitt 1-1



Longitudinal section of exhaust ventilation station with ventilation outlet



Exhaust dampers in the false ceiling: air extraction in normal operation or smoke extraction in case of tunnel fire

Description

The Einhorn-Tunnel in Schwäbisch Gmünd constitutes part of the city bypass on the federal road B29. The two-lane, bi-directional traffic tunnel is 2.230 m long. The system includes a parallel safety gallery. The tunnel was opened to traffic in autumn 2013.

According to the project approval a minimum of 90 % of the annual tunnel emissions have to be discharged through the ventilation outlet in the middle of the tunnel. In order to comply with this requirement, two axial exhaust fans are installed in the underground ventilation building. The fans will be operated daily from 5 am to 8 pm. During extraction, five of the thirty exhaust dampers will be used. Fresh air will be supplied from the tunnel portals in to the traffic space. In case of a tunnel fire, five dampers will be opened at the fire location. The same exhaust fans will be used for smoke extraction. In order to control the longitudinal air flow towards the extraction location, jet fans will be used at both tunnel portals. The parallel safety gallery is equipped with a pressurisation system that allows a smoke free egress.

Services

HBI Haerter is responsible for the concept and detailed design of the ventilation for tunnel and safety gallery as well as for the pollution dispersion analysis during project approval.

For cost-optimisation, the tender documents were written to allow the bid evaluation not only according to investment costs, but also according to costs for operation and maintenance for a period of 10 years.

In order to comply with the requirement of the 10 % limit of pollution discharge at the tunnel portals with a minimum of operating costs, the Tunnel Ventilation Control System TVCS detailed functional description has been developed by HBI Haerter.