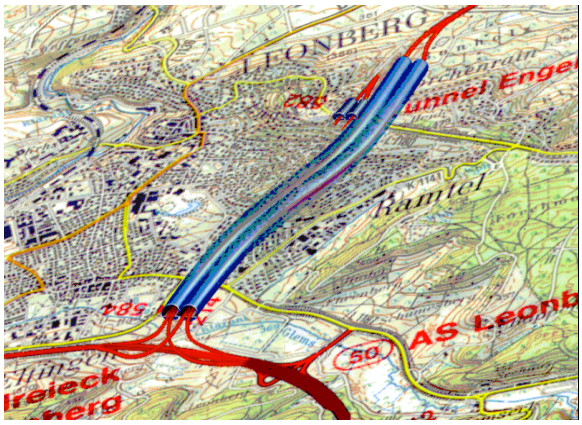
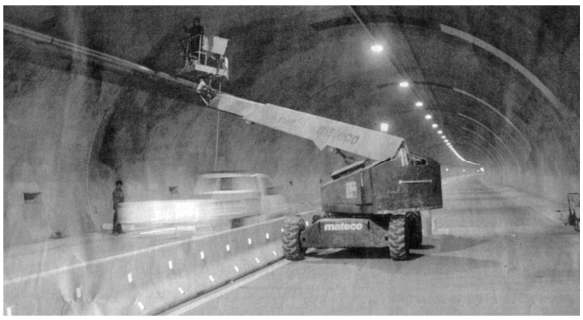
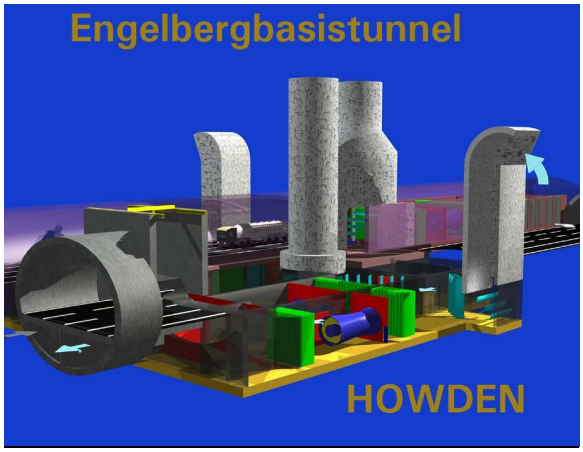
Engelbergbasetunnel (DE)
Tunnel ventilation design



Map of the Engelbergbasetunnel (Germany)



Inspection of smoke dampers in the ceiling



Ventilation system

Description

Due to the significant daily traffic of more than 120'000 vehicles, traffic congestion became a daily phenomenon on the highways A8 and A81 near Stuttgart in Germany. The twin-tube system of the Engelbergbasetunnel has eliminated this bottle neck.

Temporarily, the Engelbergbasetunnel was the second largest building site in Germany. The excavation works began on 25. June 1995. The first tube became opened on 11. September 1998. The second tube was opened on 30. November 1999.

Each of the 2'530 m long tunnels encompasses 3 traffic lanes and an emergency lane. This resulted in the largest cross-sectional area of a tunnel in Europe of about 115 m^2. The excavated area was about 265 m^2. The ducts for the fresh-air supply and the exhaust-air were placed underneath the road surface.

Services

HBI Haerter Consulting Engineers was responsible for the planning of the ventilation during all phases from concept to detailed design, planning and tendering to the selection of electromechanical suppliers, supervising the construction of the system, its testing and acceptance.

The ventilation was designed in order to prevent vitiated tunnel air from leaving through the portals. Furthermore, there were stringent requirements regarding the permissible noise levels in the vicinity of the tunnel. These restrictions were also imposed for the operation of one tube with bi-directional traffic.

Four axial fans supply a maximum of 960 m^3/s fresh air. A maximum of 1'200 m^3/s tunnel air can be removed by the 7 exhaust-air fans. 18 jet fans each delivering 900 N assist in controlling the longitudinal velocity.