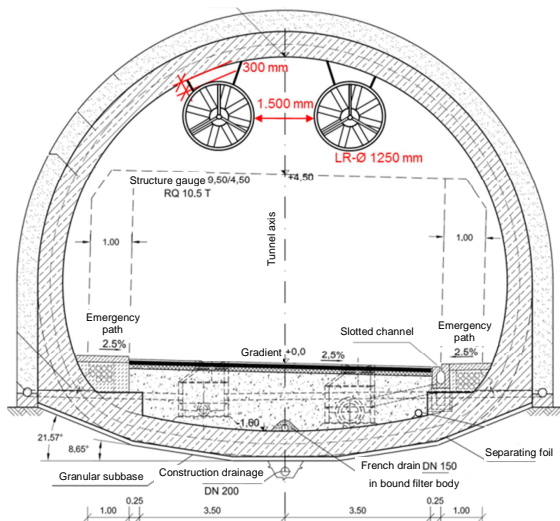
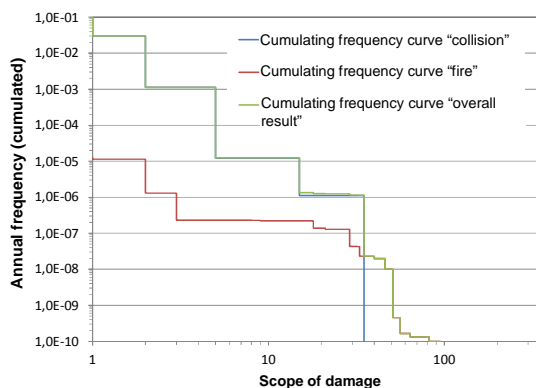


Site plan of the Scheibengipfel Tunnel



Standard cross section with location of the jet fans in the area without suspended ceiling



Cumulative risk chart for the individual events collision and fire

Description

The Scheibengipfel Tunnel is part of the planned bypass of Reutlingen and connects the B312 in the Southeast with the B28 in the Northeast.

The single-pipe tunnel with a length of 1,910 m, which is operated in two-way traffic with 80 km/h, has two lanes and one parallel rescue tunnel, which is connected to the tunnel by seven cross-connections.

In normal operation, jet fans in the tunnel's traffic area provide for a sufficient supply of fresh air. The ventilation system for the fire case consists of a smoke extraction through a suspended ceiling with 22 controllable smoke extraction flaps. An overpressure ventilation prevents the smoke from entering the rescue tunnel.

Services

Due to the special characteristics of the Scheibengipfel Tunnel, HBI Haerter Consulting Engineers conducted a quantitative risk analysis (QRA) with the following content:

- System description and definition with determination of reference and planned case
- Event trees "collision" and "fire"
- Calculation of the limiting flow conditions in the tunnel
- Calculation of smoke spread and contaminant concentration
- Person flow analysis to determine the scopes of damage
- Risk calculation and representation of the results for "collision" and "fire"
- Evaluation of safety as relative comparison between planned and reference case
- Proof of a RABT-compliant safety level

In the further course of the project, the following services were provided by HBI:

- Categorization of hazardous goods transports according to ADR 2007 with execution of the procedure of level 1b
- Draft planning of the tunnel ventilation and of the rescue tunnel ventilation according to the requirements of RABT-2006
- Call for tender for the technical ventilation equipment
- Development of the specifications for the tunnel ventilation