



Exhaust stack at western tunnel portal



Glass covered section at eastern tunnel portal

Description

The Petuel Tunnel is a twin-tube road tunnel with uni-directional traffic. The tunnel is about 1'550 m long and comprises several entry and exit ramps. The southern tunnel is connected to a 250 m long glass covered structure, extending the tunnel to a total length of 1'800 m. The Petuel Tunnel has been opened to traffic in July 2002. In 2013, additional safety equipment was installed.

The ventilation system of the Petuel Tunnel is characterized by the following elements:

- Longitudinal ventilation with 63 jet fans for normal and emergency operation
- Portal air extraction ($360 \text{ m}^3/\text{s}$) at the western tunnel portal and discharge of air through an exhaust stack
- Longitudinal ventilation during emergency operation to control back-layering

Services

HBI Haerter Consulting Engineers provided the following services:

Air dispersion study:

- Calculation of vehicle emissions for pollutants NO_x , benzene and soot
- Air dispersion calculation assuming free portal discharge or air extraction
- Cost benefit assessment of portal air extraction
- Air dispersion calculation of stack exhaust
- Assessment based on legal pollutant limits
- Technical advice during community consultation meetings and project approval

Tunnel ventilation:

- Concept design
- Ventilation design for normal operation
- Calculation of aerodynamics in tunnel network
- Design of portal air extraction
- Ventilation design for emergency operation
- Check of civil design drawings
- Study of climate in the glass covered section of the southern tunnel
- Control system functional specification
- Commissioning