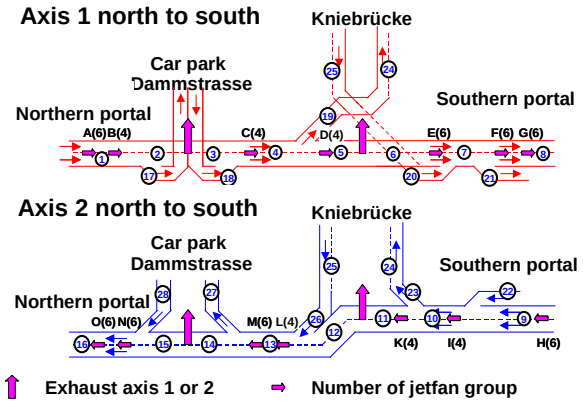
Rheinufertunnel Düsseldorf (DE)
Smoke control

The Rheinufertunnel



The Rheinufertunnel network

New exhaust fans for smoke extraction "Kniebrücke"

Description

The Rheinufertunnel in Düsseldorf has a total length of 1,930 m. It consists of two parallel tubes, each having several entry and exit ramps. Furthermore, the tunnel system includes an underground connection to the parking deck Dammstrasse. The tunnel was opened to traffic in December 1993.

Services

HBI Haerter was tasked by the City of Düsseldorf to propose improvements of the general level of safety in the Rheinufertunnel. The proposed safety measures were to be based on the new German regulations for tunnel operation and safety equipment RABT, drafted in 2003.

In the framework of an initial feasibility study several improvements have been proposed. In the later design stages of the retrofit project for smoke control and extraction in the Rheinufertunnel, the proposed measures were undertaken.

The most relevant measures were:

- Consideration of the rescue and fire fighting phases as well as traffic situation (flowing or congested) and air flow measurements in the tunnel ventilation system response
- Installation of air-flow monitors and traffic control system
- Replacement of the fire detection system; early detection of fire development by evaluation of video data as well as turbidity- and CO-monitor readings
- Dedicated signs directing tunnel users towards egress passages
- Improvements to the smoke control system (increased capacity and temperature resistance)
- Improvements to the pressurisation system for egress staircases

In order to optimise the ventilation's system response in case of a tunnel fire, computer simulations of emergency scenarios were performed. Different conditions for rescue and fire fighting phases were taken into account.