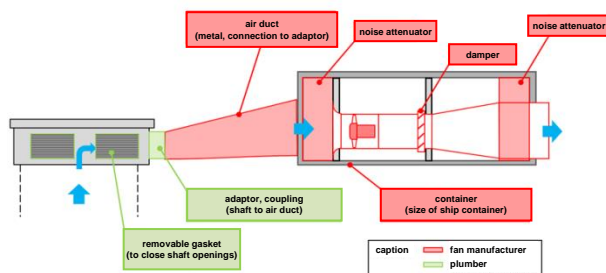




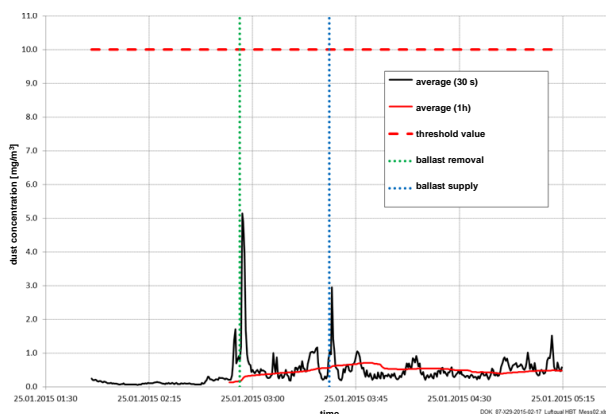
Ventilation system at shaft head in Zeglingen



Layout of the ventilation container at shaft head in Zeglingen (side view)



Excavation of old ballast with Vanoliner



Measured dust concentration downstream of working site

## Description

The double track Hauenstein base tunnel (HBT) between Olten and Tecknau (8.2 km) is one of the most frequented railway tunnels in Switzerland and in operation since 1916. The tunnel includes a vertical ventilation shaft of ca. 135 m length.

In 2015 the Swiss Federal Railways (SBB) exchanged the switches in the HBT. Due to the limited space and increased emissions during this work (dust, Diesel pollutants) a temporary ventilation system was installed at the shaft head to ensure a sufficient air quality at work sites (e.g. MAC values).

## Services

For the project phases of preliminary investigations, detail design, call for tenders and execution of the switch exchange in the HBT HBI Haerter provided the following services:

- Definition of the ventilation objectives (e.g. regarding removal of Diesel emissions and dust)
- Evaluation of the optimum ventilation system and emission reducing measures (employment of machines, dust removal by irrigation) for the planned work
- Design of the mechanical ventilation (i.e. number of fans, air barriers) at the shaft head in Zeglingen
- Numerical simulation of the ventilation (e.g. calculation of thermal draught and train induced pressure fluctuation) to verify the ventilation objectives and loads on the ventilation system
- Specification of the ventilation system (volume rates and pressure rise of 3 axial fans, noise attenuators, dampers)
- Elaboration of the submission documents, processing of the offers and support of SBB with the allocation
- Site supervision, factory and site acceptance tests as well as planning and realisation of the commissioning
- Monitoring of switch exchange by measurements (verification of acceptable work environment and air quality in the HBT)