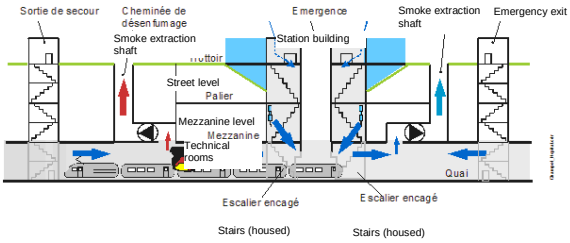
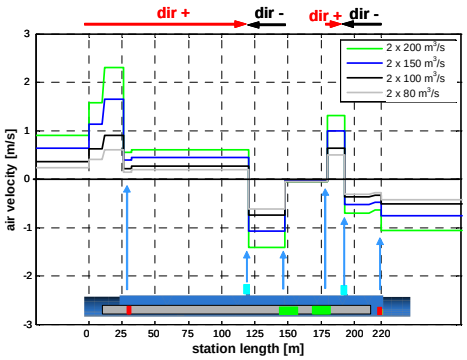
Rail link Geneva – Annemasse (CH/FR)
Smoke extraction from underground stations

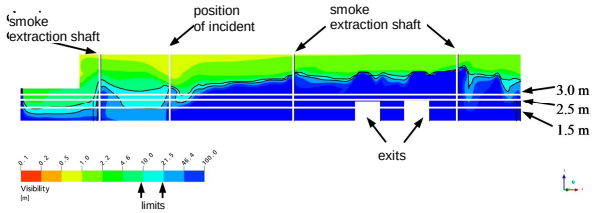
Scheme of rail line between Geneva-Cornavin and Annemasse with the four underground stations



Concept of smoke extraction for the station Champel-Hôpital



Parametric study for the determination of the flow rates for the station Champel-Hôpital



Numerical simulation of the visibility in case of fire of a train in the station; Ventilation extraction rates: 50 m³/s in the left shaft, 50 m³/s in the central shaft and 100 m³/s in the right shaft

Description

The Cornavin-Eaux-Vives-Annemasse (CEVA) link, planned as long ago as the 19th century, is finally being built. Long-distance services will cover the Annemasse – Geneva route in only 17 min, and Eaux-Vives will be connected to Geneva's main station with 9 min travel time.

The CEVA project includes the construction of a 4.8 km rail tunnel between the two existing lines of Cornavin – La Praille and Eaux-Vives – Annemasse.

Services

HBI Haerter Consulting Engineers provided the following services:

- Definition of the ventilation concept for the four underground stations: mechanical ventilation for Carouge-Bachet, Champel-Hôpital and Eaux-Vives and natural ventilation for Chêne-Bourg
- 1-dimensional transient simulation of air flow in all tunnels and exits by means of the simulation program ThermoTun, taking into account the train induced air velocities in the system
- Definition of the qualitative and quantitative ventilation objectives in case of a train fire
- Exact definition of the required flow rates for each shaft for smoke extraction to provide and maintain the ventilation objectives, even in case of unfavourable weather conditions
- Verification of the functioning of the ventilation concept by means of 3-dimensional transient and stationary simulation of the smoke propagation in case of fire in the station, using the numerical simulation tool CFX
- Fulfilment of the requirements with regard to operational, maintenance and replacement costs