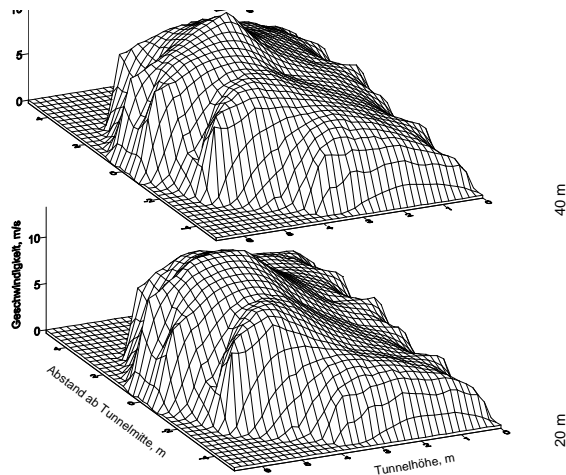




Jet Fans ‚Banana-Jets‘



Flow profile using ‚Banana-Jets‘



Uznaberg tunnel portal

Description

The Balmenrain and Uznaberg Tunnels form part of the Swiss National Road A53. The tunnels were opened for traffic in 2003. The bi-directional Balmenrain Tunnel is 1320 m long. The uni-directional Uznaberg Tunnel consists of two 940 m long tubes with a longitudinal gradient of 4.7 %.

In both tunnels, the ventilation system is longitudinal with jet fans. For the first time in Switzerland, ‚Banana-Jets‘ were installed. The jet fans are expected to have a better efficiency by reducing wall friction. A series of tests was performed in order to investigate the efficiency of the installation.

In case of emergency in the Balmenrain Tunnel, the longitudinal air flow is controlled on the basis of air-flow measurements. This was one of the first tunnels in Switzerland with a closed-loop ventilation control system.

Services

HBI Haerter was responsible for the following scope:

- Design of tunnel and safety gallery ventilation: preliminary to detailed design
- Preparation of tender documentation for jet fans and safety gallery ventilation
- Bid evaluation and recommendation for contract award
- Evaluation of supplier's technical documentation, Factory Acceptance Tests
- Site supervision during installation and commissioning, Site Acceptance Tests
- Calibration of air-flow monitors, air-flow measurements with and without ‚Banana‘-installation
- Preparation of ventilation control system functional description
- Ventilation control system Site Acceptance Test