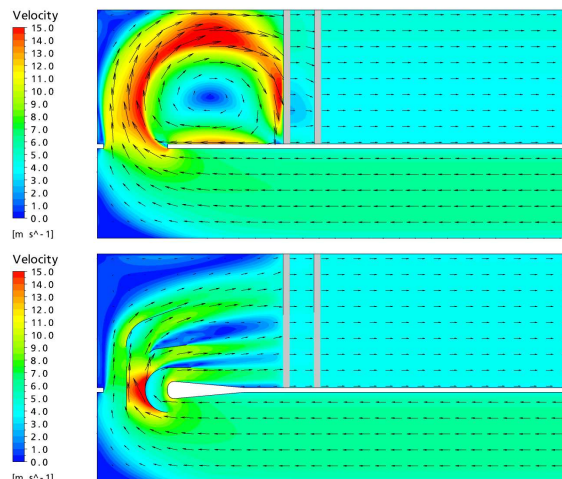




Main filtration fan: installation check



Elektrostatic precipitator



CFD-results: air-flow without/with guide vanes

Description

The M5East Tunnel is part of one of the main highway connections of the southwest suburbs into Sydney's Central Business District and towards Sydney Airport. The tunnel consists of two carriageways and is used in uni-directional traffic. Local residents formed a strong opposition against the project. The main concern was the possibility of a deterioration of the air quality in the vicinity of the tunnel portals and the ventilation outlet.

The tunnel ventilation system is rather complex. It is of longitudinal type with an air exchange station in the middle of the tunnel. As portal air discharge is not permitted, the air flow at the exit portals is returned back into the tunnel. On entry and exit ramps, additional fresh air is drawn into the main tunnel.

As an addition to the existing ventilation system, the tunnel has been equipped with an Air Filtration Plant. 200 m³/s tunnel air can be extracted from the main carriageway. In the filtration plant, fine particles are removed from the air by means of an electrostatic precipitator. The filtered air is discharged back into the tunnel. A smaller flow rate (50 m³/s) can be drawn through a De-NOx-Filter consisting of an active-carbon bed.

The filtration plant has been commissioned in April 2010.

Services

- Pressure drop calculation
- Support during filtration fan specification and procurement
- Check of installation of M&E equipment
- Evaluation of the air flow in the filtration plant by means of CFD
- Air-flow optimisation, improvement of the electrostatic precipitator's efficiency
- Design and specification of guide vanes
- Air flow measurements in the filtration plant and in the ventilation tunnel, as part of the site acceptance test