



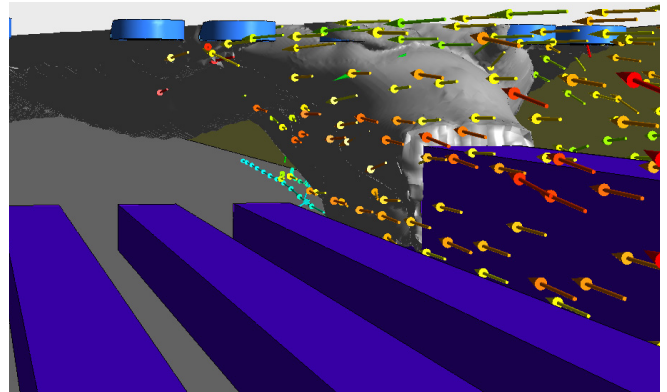
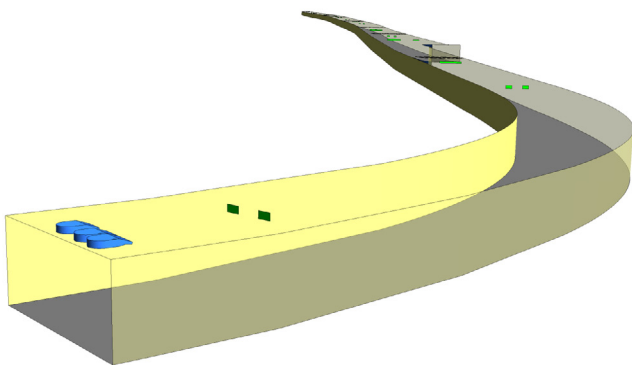
Al-Salam Street tunnel Abu Dhabi

Fire safety

Facts

The Al-Salam Street tunnel enhances the traffic flow in the city centre of Abu Dhabi and connects new developments. The tunnel has a length of 2.2 km and is composed of 2 tubes separated by a closed wall. There are 4 driving lanes per tube, all in 1 driving direction.

The tunnel safety measures consist, amongst others, of a smoke control ventilation system, sprinkler system, and evacuation system. The ventilation system is composed of several exhaust/supply shafts and high thrust induction fans at the portals. The evacuation system is composed of doors to the other tube and structures at the shaft locations.



Research objectives

Two types of simulations were executed for this project, both for multiple fire scenarios.

CFD simulations were used to verify the ventilation systems ability to prevent backlayering. Additionally, the conditions during evacuation were analysed. The visibility, temperature and radiant heat flux need to remain below specific tenability limits during the entire evacuation process.

Evacuation simulations were used to calculate the required evacuation time. The calculated required evacuation time needed to be shorter than the available evacuation time as calculated by the CFD simulations.

Achieved improvements

The simulations helped improving both the ventilation and evacuation system. The influence of the exact location of the thrust fans at the obtained air flow was investigated and an optimal position determined. For some scenario's the effect of wind on the performance of the ventilations system was also analyzed. The initial evacuation simulations showed bottlenecks at some specific locations inside the tunnel increasing the total evacuation time. Adding doors in this regions reduced the evacuation time resulting in a safer tunnel.

