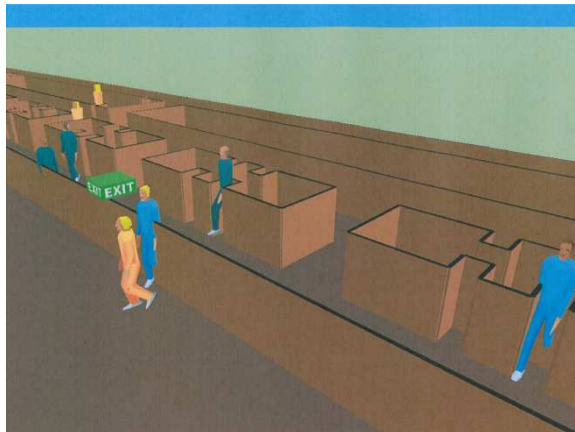
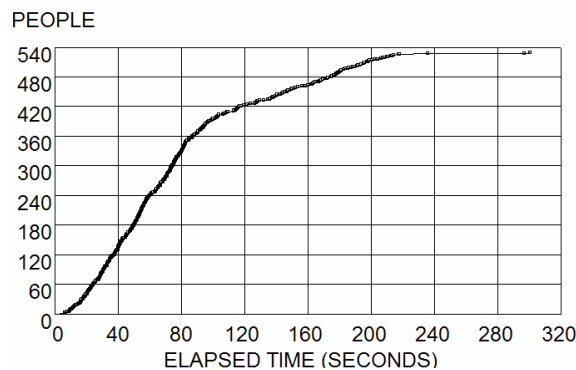


CFD Simulation, CO-concentration



Tunnel users leaving their vehicles



Escape graph

Description

The Dublin Port Tunnel is characterized by the following data:

- Dual tube with unidirectional traffic
- Tunnel length of 4'500 m
- Gradient variable from -4% to +4%
- 19 cross passages between tubes
- Longitudinal ventilation with 16 jet fans per tube for flow control during fire

The Dublin Port Tunnel is part of the M50 motorway and is a dedicated route for Heavy Good Vehicles between the port and the greater road network. It opened to traffic in 2006.

Services

HBI Haerter Consulting Engineers provided the preliminary and the detailed ventilation design. This included:

CFD Checking on ventilation design:

- Fire Scenario 100 MW
- fluid traffic
- Longitudinal velocities varied
- Investigation of backlayering lengths
- Critical velocity determined (design confirmed)

CFD and Egress Modelling for evaluation of operational strategy of tunnel ventilation in case of fire during traffic congestion:

- Fire Scenario 30 MW, congested traffic
- Modelling of cars and HGV's
- Longitudinal velocities 0.5 m/s, 1.0 m/s, 1.5 m/s and 2.5 m/s
- Uphill and downhill gradients (-4% and +4%)
- CFD calculations output: velocity, temperature and smoke distribution, concentration of toxic elements
- CFD results input for egress modelling
- Exposure to convective and radiative heat, as well as exposure to CO included in egress model
- Obscuration by smoke included in egress model