

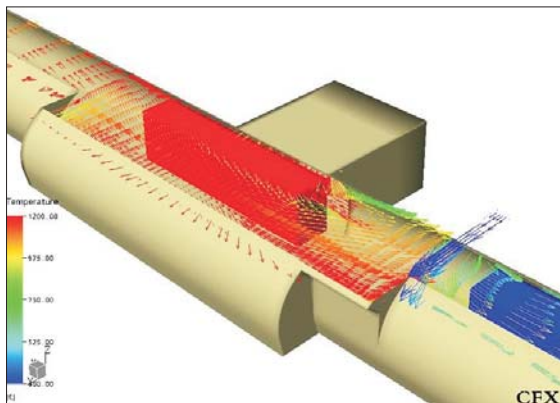
## What Atkins can offer

### We deliver:

- Contract management
- Geotechnical and engineering geology
- GIS and survey
- Structural assessment
- Civil design
- Settlement and associated impact evaluation
- Lighting, ventilation and E&M services
- Life safety engineering
- Operational evaluation and life cycle costing
- Risk management

### Tunnelling Skills & Services include:

- Cut and cover tunnels
- Caverns and underground stations
- Railway, road and water tunnels
- Mechanised and traditional soft ground and rock tunnels
- Shafts
- Directional drilling and thrust bore tunnelling
- Tunnel remedial works
- Expert services



## Atkins Key Contacts

If you are interested in discussing potential projects in any of the topic areas described in this leaflet please get in touch.

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# ATKINS

## Tunnelling: Ventilation & Life Safety



Atkins has one of Europe's largest tunnelling groups working extensively in all fields of tunnel life safety and ventilation.

This includes the design for new road, rail and other forms of tunnels as well as specialist studies for a wide range of international clients.

Atkins, through its size, is able to offer a fully multi-disciplinary service to its clients who range from public bodies through Contractors to specialist clients in the legal and financial sectors.

## Project Experience

### The Channel Tunnel Fire Investigations, UK



The Channel Tunnel fire of 18 November 1996 trapped 34 people in dense smoke for 23 minutes and destroyed 10 loaded carrier wagons. The tunnel was closed to lorry shuttle traffic for 6 months while 480m of damaged tunnel was repaired and operation was re-authorised. The cost of the damage is reported to have been in excess of £200m.

Eurotunnel commissioned Atkins to conduct expert investigations into the smoke management and the fire development.

### Mont Blanc Tunnel Fire Investigations, France



The Mont Blanc Tunnel fire of 24 March 1999 resulted in 39 deaths. Physical damage included 23 lorries and 10 cars burnt as well as 900m of tunnel damaged. The tunnel was subsequently closed for 3 years of extensive safety upgrades. The operator, ATMB, commissioned Atkins to investigate key questions relating to the rapid spread of the smoke which claimed the victims' lives. This expert investigation was led by Dr WMS Bradbury.

## Project Experience

### Victoria Line Upgrade - Heat and Ventilation Analysis, UK

Atkins was commissioned by Metronet BCV to develop a heat ventilation computer model of the Victoria Line using the SES (Subway Environmental Stimulation) software. Atkins built the SES model and carried out validation exercises, generating temperature and airflow data from monitoring on the existing Victoria Line. The validated model is being used to predict temperature effects of the introduction of new rolling stock and timetables on the Victoria Line and to assess the impact of proposed control measures.



### Gautrain - Tunnel & Station Ventilation, South Africa

Atkins' commission for the preliminary design of bored tunnels, underground stations and shafts for South Africa's Gautrain Rapid Rail Link, a US\$1.5 billion high speed 80-km rail system linking Johannesburg, Sandton, Tshwane (Pretoria) and Johannesburg International Airport, includes the mechanical and electrical engineering design for the underground stations, tunnels and shafts as well as the civil engineering, tunnelling and architecture disciplines. Atkins is developing design solutions for the safe operation of the underground railway with the aid of aerodynamic and thermodynamic modelling techniques for the stations and tunnels, including modelling with the Subway Environmental Simulation software (SES).



## Project Experience

### A3 Hindhead Tunnel, UK

Atkins was commissioned by the Highways Agency to develop the A3 Hindhead improvement scheme, including a 2km twin-bore road tunnel, to sufficient detail for the tender of the 'early contractor involvement' (ECI) design and build contract which was awarded in September 2002.

In the course of the development of the illustrative design, Atkins made technical and operational proposals for the tunnel. Safety objectives were established and analysis carried out of the operational hazards. Quantitative assessment of risk, including time-line analysis for incident development and modelling of vehicle fires using computational fluid dynamics, contributed to the development of the tunnel configuration and fire and emergency strategies.



### KCRC Contract No. DB320 West Rail Phase I - Kwai Tsing Tunnels, Hong Kong

The 3.6km Kwai Tsing Tunnels, which run between Mei Foo and Tsuen Wan form a key component of the new KCRC West Rail Project which serve the Western New Territories of Hong Kong.

A major element of the project was the 1.8km Tsing Tsuen Tunnels which comprise twin, single track bored tunnels with interconnecting cross passages. An Ancillary Building was also constructed as part of the works to accommodate the tunnel ventilation and power facilities.

