

RVT provides fresh air for tunnel workers

September 2015

Facts and figures about Box Tunnel works

1836 –1841 Tunnel construction

- Between 1500 and 4000 men working night and day
- 1 ton of candles used weekly
- More than 100 lives lost
- Approximately 250 tons of gunpowder used
- Up to 300 horses working night and day

18/07/15 – 31/08/15 Preparation for electrification

- More than 100,000 site hours
- 226 engineering trains
- 22,914 concrete sleepers replaced
- 98,889 tons of ballast delivered
- 163,650 tons of spoil removed
- 1,394 tons of pea shingle delivered
- 1,420 tons of sand delivered

Box Tunnel going electric after 174 years.

Box Tunnel is one of the many achievements of Isambard Kingdom Brunel, one of Britain's finest engineers. Completed in 1841, it provides a route through solid Bath stone from Box to Corsham, and was the longest tunnel in the world at the time.



An impressive feat of engineering, Box Tunnel was dug from both ends and, when the two ends were joined in the middle, there was found to be less than 5 cm (or 2 inches) error in their alignment. Brunel had good reason to be proud of his accuracy.

The tunnel has remained in use ever since its opening in 1841. Recent works in the tunnel during August 2015 formed part of the Electrification Programme of the Great Western line, something that Brunel would no doubt have been delighted to see.

RVT ventilation solution: key benefits

- Speed of setup – this advanced solution did not hold up project schedules at all
- Both roads left free for both work teams through the tunnel
- Significantly enhanced air quality throughout the duration of the project

RVT provided 24/7 backup and regular monitoring to ensure that air quality was maintained throughout the project. The positive air movement throughout the tunnel made dust and fume control straightforward and effective.

A very satisfied RVT customer:

Many thanks for your efforts, services and support. It's worked very well – so well done from me to you and your teams. Our Box worksite was successfully handed back early at 1300hrs today, with all the planned track lowers completed.

Scope of works in 2015

The works during July and August were preparing for electrification and involved lowering of 10km of track through Dundas Aqueduct, Box Tunnel, Middle Hill Tunnel and Sydney Gardens – all within six weeks! 11 new switches and crossings were also installed at Bathampton Junction, which enable trains to move from one track to another. The work through Box Tunnel was particularly challenging due to the length and size of the tunnel and the importance of maintaining safe working conditions.

The Network Rail 'Orange Army' gave an impressive display of coordination and project management, completing the project within the prescribed time schedule, despite setbacks.



RVT provides air for the army to breathe

Given the unique characteristics of the Box Tunnel, it was essential that a highly effective ventilation system was put in place; a system that would maintain positive air quality right through the 2.9km of tunnel. Traditional methods, involving large fans located in the tunnel to try and draw fresh air into the tunnel and keep air moving, were recognised as inadequate.

As the UK specialists in air quality control, RVT was pleased to be called on to assist with this project. Our site consultants visited the site and quickly identified the unique project needs and proposed a very much more effective solution.

Powerful fans were located at each end outside the tunnel in the cess area, with large ducting carrying the air into the tunnel. The fans provided high speed jets of air into the tunnel, creating a vortex which continuously sucked further fresh air into the tunnel. Air flow was maintained at 2 metres per second, and consistent levels of good air quality were maintained throughout the project.