

Terminal 5 at Heathrow – Heathrow express extension

Heathrow, LONDON - UK

Monitoring of an existing running tunnel, during the passage of a TBM into the existing tunnel stub to allow rail access to the new T5 airport terminal

As part of the extension to Heathrow Airport, Terminal 5 will be linked to the existing terminals via the Heathrow Express. SolData was appointed to carry out the installation and monitoring to the existing Heathrow Express running tunnel between Terminals 3 and 5, during the passage of the tunnel boring machine into the existing turnout stub and during breakout into the existing tunnel.

The new running tunnel will then link the central terminal area (C.T.A.) that serves terminals 1, 2 & 3 to the new Terminal 5 building.

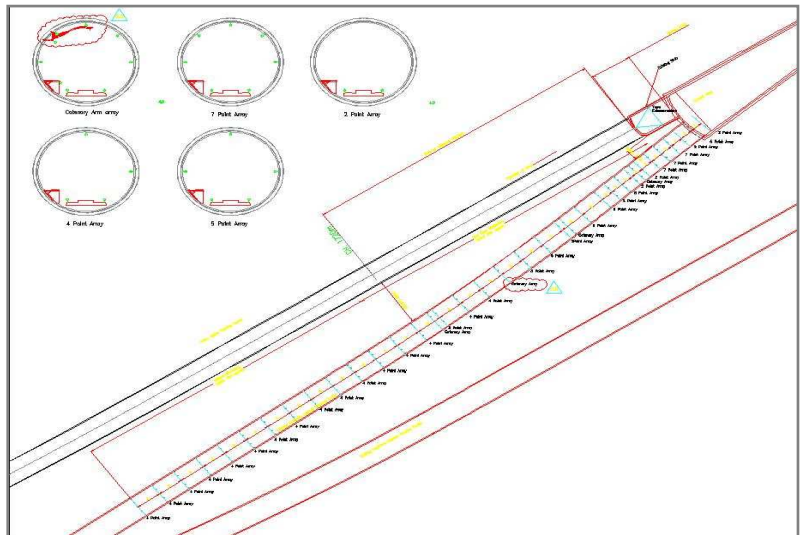
A comprehensive monitoring system including two Cyclops with 120 prisms positions were monitored in real-time along the line of the new tunnel with a further 80 manually read prisms installed further down the tunnel to detect any background movements.

These real-time movements were monitored and recorded on the Geoscope software. Both CYCLOPS instruments were driven by a computer installed in the baggage area and linked to the instruments by a data cable running along the tunnel lining.

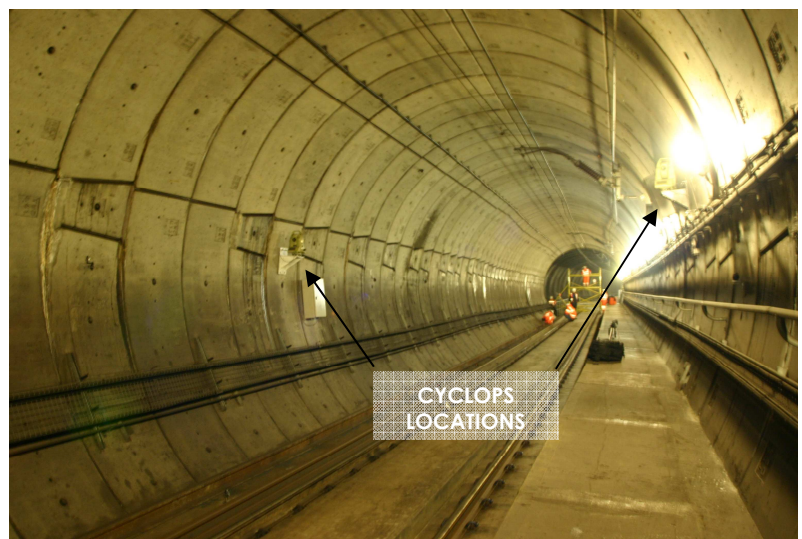
Another computer was installed in the contractor's control room and linked to the baggage area via a modem. This allowed the monitoring engineer and contractor to assess and review movements of the tunnel in real-time.

A remote alarm system was also installed within the Heathrow Express (HexEx) control room and linked to the monitoring engineer's PC via a phone line. This alarm system would activate a flashing warning light if triggers were breached, allowing the control room staff to stop train movements immediately and ensure passenger safety.

As well as monitoring the structural movements and displacements of the tunnel Sol Data also calculated thousands of rail specific movements such as cant, twist and longitudinal deformation.



Above: Monitoring arrays and route of TBM
Below: Existing running tunnel showing CYCLOPS



OWNER :	BAA – NETWORK RAIL
CONSULTANT :	MOTT MACDONALD LTD
PROJECT DURATION :	DEC 2004 – MARCH 005
SCOPE OF WORKS :	<ul style="list-style-type: none">• Installation of 2 Automated Cyclops with 120 Prisms.• 80 manually read prisms, 80 levelling studs.• Real-time monitoring, alarms and reporting.• 24hr attendance during critical phases of TBM passage.