

M5 MOTORWAY VIADUCT

OLDBURY – WEST MIDLAND - ENGLAND

Real-time monitoring of the motorway viaduct during the replacement of structural components whilst continuing to support the live traffic



M5 motorway viaduct (Oldbury)

The Oldbury Viaduct is one of the Midland Link structures supporting the M5 Motorway to the south west of Birmingham. It consists of a reinforced concrete road deck supported by longitudinal steel beams fixed on concrete crossbeams and columns.

Currently there is a programme of structural upgrades to the viaduct which entails adding a temporary steel support whilst the concrete and reinforcing steel are removed and replaced.

The normal behaviour of the structure is not well understood, the performance of the bearings is unknown and its response to the repair operations is unpredictable. For this reason the engineers have specified a comprehensive monitoring system for both the structure and the temporary support with the capability of monitoring at frequencies of no more than 30 minutes with automatic result generation and on-site alarms to warn the contractor of breached alarm values.

SolData has installed a fully automated monitoring system covering a 100m length of the viaduct, including three of the concrete cross beams that require repairs.

The instrumentation installed includes two Cyclops mounted on steel masts located underneath the structure with around 140 prism targets fixed to the existing structure and to the temporary support to three dimensionally monitor the overall displacement of the structure.

In addition to that, there are displacement transducers, electrolevels and strain gauges monitoring the deck beam deflections.

The data is monitored by the GEOSCOPE software providing graphic displays of the current data in real-time and on-site alarms for any displacement. The monitoring computer network is installed in an on-site container and gathers the data by radio modem links to avoid the risk of cables being damaged by the site operations.

OWNER :	HIGHWAYS AGENCY
CONTRACTOR :	TILBURY DOUGLASS LTD
CONSULTANT :	W.S. ATKINS (BIRMINGHAM)
PROJECT DURATION :	SEPTEMBER 2000 – MARCH 2002
SCOPE OF WORKS :	
<ul style="list-style-type: none"> • Installation of an Automatic Monitoring System based on : <ul style="list-style-type: none"> - 2 CYCLOPS with 140 prism targets, 70 displacement transducers, 8 electrolevels & 6 strain gauges, - Radio modem links, - Computer network including GSM modem for remote connection. • Real-time monitoring and alarms with GEOSCOPE software. 	