



The Hungerford Millennium Footbridge comprises two cable stayed structures that share foundations with the pre-existing Hungerford Rail Bridge. Strainstall were employed by Costain Norwest Holst JV at three separate stages during the construction of the downstream structure.

The initial work involved the instrumentation of temporary support trusses used to launch the precast concrete deck sections.

Strainstall's major work task was the installation and monitoring of strain gauges on the cable stays, which are Macalloy bars of various diameters in the range 25mm to 75mm. Vibrating wire strain gauges were selected because of the relative ease and speed of installation. Two gauges were installed on each cable before it was loaded, in order that any bending effects due to take-up of slack could be eliminated.

The system provided a real-time display of cable load in kN during the course of the removal of temporary deck supports and loading up of the stay cables. Over 100 data channels were monitored simultaneously.

After completion of both structures, Strainstall's final work phase involved instrumentation for a pedestrian load test. A programme of trials was devised where approximately 150 pedestrians were used to 'excite' the bridge. The trials confirmed the natural frequency and damping characteristics of the bridge and demonstrated that the bridge would not suffer from 'wobbling' under crowd loading.

The various Strainstall systems used during the course of the project were selected on the basis of:

Relative ease and speed of installation

Provision of data appropriate to the monitoring requirements, i.e. real-time, user-friendly displays for cable load transfer monitoring and factual report presenting results of dynamic testing.

Strainstall's team of experienced engineers operate from offices in Cowes, Bath and Aberdeen (UK), Norway, Belgium, USA and Dubai.



The World of Load
Measurement and
Stress Analysis

Instrumentation Used

- Electrical Resistance Strain Gauges on Temporary Supports
- Vibrating Wire Strain Gauges and Battery Powered Dataloggers for Stay Load Transfer Monitoring
- Accelerometers and Multi-channel High Speed Data Acquisition System for Dynamic Pedestrian Load Testing

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