

Automated Monitoring Determines Bridge Health and Longevity



PRODUCTS

- Geosense LVDTs 50mm*
- TiltMate Rotation Beams*
- Solar Panel*
- Wireless Logger*
- Vibrating Wire Transceiver*

LOCATION

Scotland

SCOPE

Installation

After cracks were detected on the pilaster of the West Water Bridge in West Linton Village, DYWIDAG was contracted to provide and install an automated solution to monitor changes and movement in the bridge in real time.

Context

Constructed in 1831, the single span masonry bridge located in West Linton Village, Scotland, carries the busy A702.

A manual monitoring system, which could only be checked monthly, showed the formation of cracks. DYWIDAG was then contracted to install an automated monitoring system which collects data about bridge health and alerts owners to changes as they happen. Over the course of the next three months, bridge data will be collected, and next steps determined.



Scope

- Installation of an automated solution to monitor changes and/or movement in the bridge using 3d crack monitoring.

Solution



We installed six of our LVDT systems to provide 3D crack monitoring on either side of the pilaster. The system incorporates a specially designed mounting beam and anchor system, creating solid and permanent contact, measuring the X-, Y-, and Z-axes. The data feeds into DYWIDAG's cloud-based database, Infrastructure Intelligence, allowing bridge owners to better understand what is happening with the bridge.

In addition, two TiltMates were installed, one over the pilaster to determine if the pilaster was rotating or moving outward from the structure. This automated system minimizes the client's environmental impact and keeps people safer, this avoids visits to the structure to manually read tell-tale crack sensors.

The solution provided was a wireless type, transceivers have been installed in close proximity to the monitoring area meaning this is a cable free solution. This type of system can be expanded to allow for further monitoring by adding extra vibrating wire products or wireless products to measure a different area within the structure. After three months (potentially longer, depending on results), next steps for the bridge – repair and maintenance – will be determined.



The previous manual monitoring system required three hours of travel time, so readings were only done monthly. The automated system provides now 24/7 readings in real-time.

Going Further

Rope access was used to install one of the rotation sensors as this needed to be at height, as we have this capability in house it allows us to provide exactly what was needed for the client without having to outsource this to another contractor.