

## Load Test and In-situ Stress Determination



STRAINSTALL UK Ltd. undertook testing to assist with the Stage II Assessment of this historic cast iron structure.

Tickford Bridge carries the B526 over the River Ouse near the centre of Newport Pagnell, Buckinghamshire. It is a single span arch structure dating from 1810 and is now the oldest cast iron bridge in the UK currently open to traffic. The structure comprises six ornate cast iron arched ribs with lateral bracing, supporting a newer reinforced concrete deck.

As part of the Stage II Assessment of the bridge, in conjunction with Rust Consultancy, STRAINSTALL designed and implemented a programme of in situ stress measurement, load testing and monitoring.

STRAINSTALL produced a comprehensive report with all data presented in both spreadsheet and graphical formats. It provided the assessment engineers with the following information enabling a more realistic estimate of the bridge's live load carrying capacity to be calculated:

- Stress conditions within key structural elements under dead load conditions. These are compared with stresses calculated using the assessment codes.
- Global bridge deflections and strain responses due to known live loading conditions. Using the data, stresses due to live load can be derived and compared with those calculated using the assessment codes.
- Information regarding the bridge's responses due to temperature loading effects.

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



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The stages of the commission were:

- **In Situ Stress determination** on key cast iron components using "centre hole" strain relief drilling technique
- **Sensor Installation:** Deflected cantilever vertical displacement transducers, linear potentiometers, strain gauges, thermistors
- **Datalogger:** 32 data channels
- **Load Test:** Using vehicles of known weight
- **Monitoring:** Two week period for longer term responses to temperature effects

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