

Cable-stayed bridge: localized effects due to the steel anchorage

Nerve-Sensors: Case Study

The steel cable-stayed bridge in Przemyśl was put into the service in 2012. At the time of construction it was the fourth highest bridge in Poland. It is supported by two 61.5 meter high pylons and its total length (inc. overpasses) is equal to 530 m. In 2017, the bridge was equipped with distributed fiber optic sensors (DFOS) dedicated for strain and temperature measurements. Two measurement sections were installed in cooperation with the students of the scientific association.

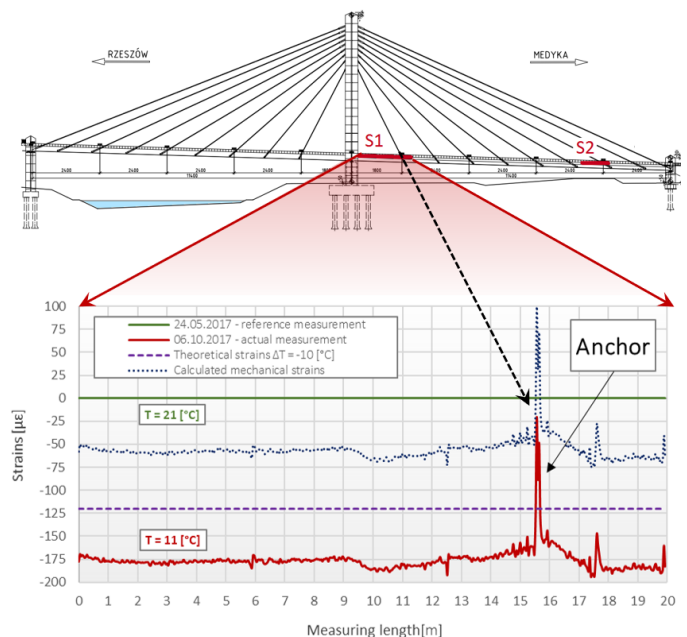


Benefits of application

- Detection of **local events**, including steel anchorages
- Distinguish between **mechanical and thermal strains**
- Observation of bridge performance due to the **non-uniform temperature load**
- Very **high compliance** with reference measurement methods (total station)

Example results

Distributed fibre optic strain sensors were installed at the bottom flange of the steel girder, which is suspended by 18 cables to the pylons. Two measurement sections were created: the first 20 m and the second 13 m long. The measurement sessions were performed according to the planned schedule, including periods with significant temperature differences. Thanks to our system, it was possible to detect localized effects in the steel girder, caused by the cable anchorages – see the strain profile in the figure.



 **3 300** measurement points

 **33 m** of sensing path

 **2 x** strain sensor

 **long-term** monitoring



project **partner:**

