Teeth-shaped cable anchorage during its tensioning in steel truss bridge

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EpsilonSensors: *Case Study*

During constructing three railway bridges in Kraków, engineers decided to apply a new structural solution. Steel cable anchorages were embedded inside the concrete. To improve their bonding properties, they were shaped with teeth. To assess the effectiveness of both the friction and mechanical teeth-influenced connection, Epsilon-Sensors and DFOS strain sensors were glued on the surfaces of the steel anchorage. Measurements were performed during its tensioning.

Benefits of application

- Detailed control of the teeth-shaped steel anchorage **during cable's tensioning**
- Analysis of **interaction between the concrete and steel anchorage** inside it
- **Reliable diagnostic data** for expert analysis and 3D FEA validation
- Confirmation of theoretical predictions **to optimise similar structures in the future**

Example results



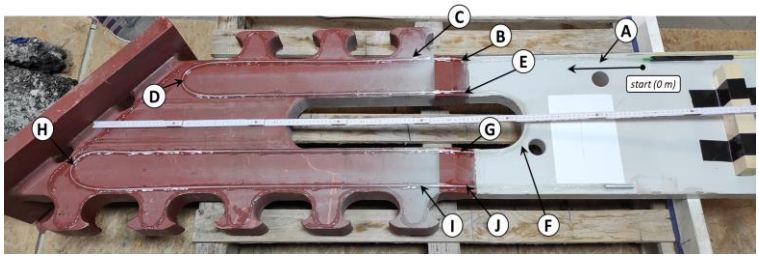
11 538 measurement points

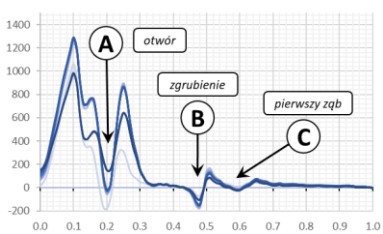
15 m of sensing path

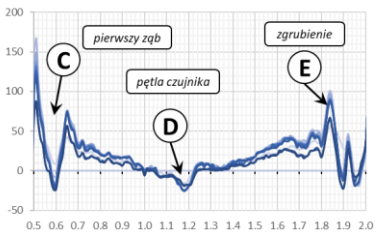
2 x ES, **2 x** DFOS sensors

short-term (load tests)

Based on the results obtained from glued EpsilonSensors while tensioning the cable, it was possible to analyse in detail all local events and disturbances within the steel anchorage. They were caused by the unregular geometry of this element, including teeth, openings or changes in widths. The example results with events identification are presented on the below graphs in relation to post-installation documentation.







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