

Anchorage zone in 57-year-old post-tensioned precast girder

Nerve-Sensors: Case Study

Ageing infrastructure is a growing problem in many countries, making it a challenge to take optimal decisions for their further safe operation. Therefore, effective diagnostic solutions are being sought, enabling reliable technical condition assessments. The case study presents the results of static and dynamic DFOS strain measurements of a 57-year-old girder dismantled from one of the production halls. Nerve-Sensors were successfully applied for this purpose.



Benefits of application

- Detailed investigation of a **57-year-old post-tensioned girder**
- Real-time, **high-frequency measurements** while cutting the tendon off
- Detection of all the microcracks and estimation of their widths
- **Thousands of measurement points** without disturbing structural behaviour

Example results



DFOS sensors were glued to the upper surface of the girder using two-component epoxy to monitor strains within the anchorage zone (along longitudinal and transverse sections at the same time). Thanks to high-spatial-resolution strain measurements, and the transmission length of the tendon related to the quality of cement injection was analysed in a very detailed way. The measurements were performed in both static and dynamic (high-frequency) ways while cutting one of the tendons off. Moreover, detection of existing microcracks and estimation of their widths was possible. The performed tests proved the great possibilities of DFOS technology for evaluating existing prestressed-concrete structures.

 **106 000** measurement points

 **138 m** of sensing path

 **48 x** DFOS strain sensors

 **short-term (laboratory)**

 Project partner:

