

Famous University Bridge in Bydgoszcz: anchorage zone yielding



Nerve-Sensors: Case Study

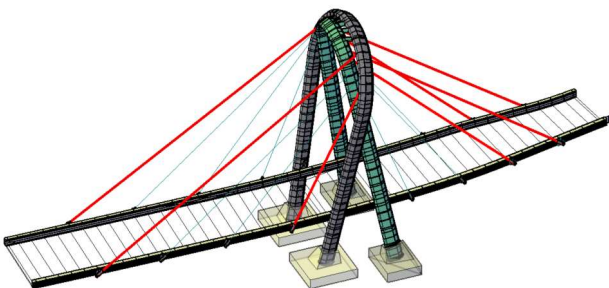
After seven years of operation, University Bridge in Bydgoszcz became famous because of its structural failure. Significant deformations of the steel anchorage plates beyond the elastic range were identified. All the cables were relieved and then prestressed again after strengthening. **Nerve-Sensors** were used to monitor this process and identify the safety-critical areas most probable to yield. Now, this unique and essential to the city bridge came back to regular operation.



Benefits of application

- Detailed control of the real cable-stayed bridge **during its strengthening**
- Identification of **local and safety-critical areas** most probable to yield
- **Reliable diagnostic data** for expert analysis and 3D FEA validation
- **Integrated nerve system** capable of long-term structural health monitoring

Example results



1 600 measurement points



16 m of sensing path



16 x DFOS strain sensors



short-term (strengthening)



Project **partner:**



DFOS sensors were glued to the steel anchorages using two-component epoxy. The cables suspended to the unique pylons (A-shaped and Ω -shaped) were relieved and prestressed again after strengthening. Nerve-Sensors were used to control this process in a very detailed way. Thanks to high-spatial resolution strain measurements, **identifying local and safety-critical areas (susceptible to yielding) was possible.**

DFOS measurements provided reliable data for the expertise and calibration of 3D finite element models. The installed sensor system can be successfully used for long-term structural health monitoring.

