

Strains and displacements in asphalt layers: static load tests & SHM



3DSensors & ER: Case Study

This project involved two types of road surface structures equipped with Nerve-Sensors, measuring both strains (**EpsilonRebars**) and displacements (**3DSensor**). All of them were embedded into the road layers during its construction, providing the possibility of analyzing its internal structural behaviour under static proof load tests. Our nervous system, supplemented by spot temperature sensors, was used successfully also in terms of long-term structural health monitoring (SHM).



Benefits of application

- Measurements of both **strains and displacements** inside the asphalt layer
- Observation of structural response and creep during **static load tests**
- Possibility of **validation and calibration** of the spatial numerical models
- Detailed **comparison between two types of road construction technologies**

Example results



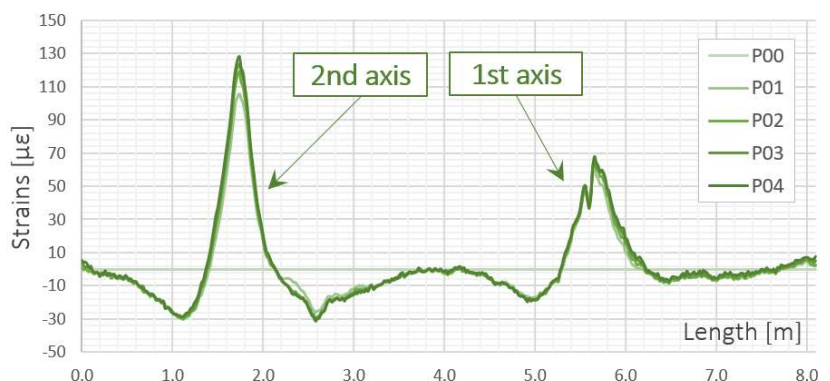
The DFOS-based nervous system was used for short-term measurements during static truck load tests as well as for long-term monitoring during changeable thermal conditions. The figure below presents example strain profiles measured by **EpsilonRebar** embedded into asphalt layers along the longitudinal direction. Two axes of the loading track are clearly indicated by tensile strains, while in the surrounding area, the compression was observed. Furthermore, short-term creeping was monitored while vertical displacements were registered by **3DSensors**.

 **10 600** measurement points

 **106 m** of sensing path

 **4 x 3DSensor, 16 x ER**

 **load tests & long-term**



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