

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

3DSensors & ER: Case Study

This project involves 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 analysis 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** the spatial numerical models
- Detailed **comparison between two road** construction technologies

Example results



 **10 600** measurement points

 **106 m** of sensing path

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

 **load tests & long-term**

 project **partner:**



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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 longitudinal direction. Two axis of the loading track are clearly indicated by tensile strains, while in the surrounding area the compression was observed. What is more, the short-term creeping was monitored and at the same time, vertical displacements were registered by **3DSensors**.

