Strain and displacement monitoring inside a road structure

NERVE
nerve-sensors.com

ER & 3DSensors: *Case Study*

EpsilonSensors and 3DSensors were used to create embedded nervous systems in a test environment, simulating the structural behaviour of the actual road substructure. Both longitudinal and transverse sections were investigated at two levels. Despite many sensors installed inside the box, they were not acting as reinforcement and thus, they did not influence the response of the substructure. Strains and displacements were measured at the same time during mechanical loading.

Benefits of application

- Measurements of **strains and vertical displacements** inside the substructure
- **Same sensors used for multiple tests** with changeable conditions (e.g. humidity)
- Thausands of measurement points **without reinforcing** ground layers
- Detailed **scientific data** for design procedures and FEA calibration

Example results

The example plots on the right correspond to the substructure deformations in one of the tests with increased ground humidity. Both strains [με] and vertical displacements [mm] (settlements, sinkholes) were measured with extremely high spatial resolution.

◎ **5 600** measurement points

📏 **28 m** of sensing path

NERVE **8 x** ER, **6 x** 3DSensor

⏱ short-term **(laboratory)**

🤝 project **partner:**

Silesian University of Technology

Axial strains (με)

Vertical displacements (mm)