

Railway line above the substrate strengthened with slurry walls

EpsilonRebar: Case Study

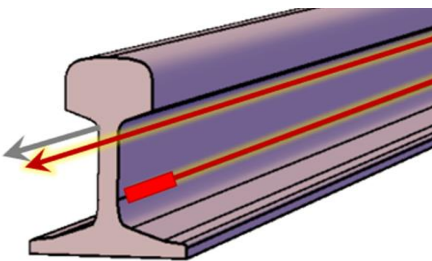
This unique research aimed to investigate the fatigue performance of the railway lines above the strengthened substrate. The strengthening slurry walls were made of a new material: fibre-reinforced concrete mixed with the ground. Vertical and horizontal **EpsilonRebars** were installed inside the walls, and optical fibres were glued directly to the steel rails. The measurements were performed statically and dynamically during millions of cycles to observe long-term effects.







Benefits of application

- Distributed measurements of **strains, cracks and displacements** at the same time
- **Detection of local events** like cracks in walls or local wheel effects in rail
- Detailed scientific data for new material **design procedures and optimisation**
- Static and dynamic measurements during **long-term fatigue research**

Example results



The most important part of the research was focused on slurry walls – based on horizontal and vertical strains, the cracks morphology of the walls was fully reflected. However, exciting phenomena were also observed on the steel rails, including tension and compression zones and local effects of wheel pressure.

-  **16 400** measurement points
-  **164 m** of sensing path
-  **16 x EpsilonRebar, 8 x DFOS**
-  **long-term fatigue tests**

 project partner: 

