

Optimization of the practicability of thin vertical foam barriers in soil as vibration reduction measure

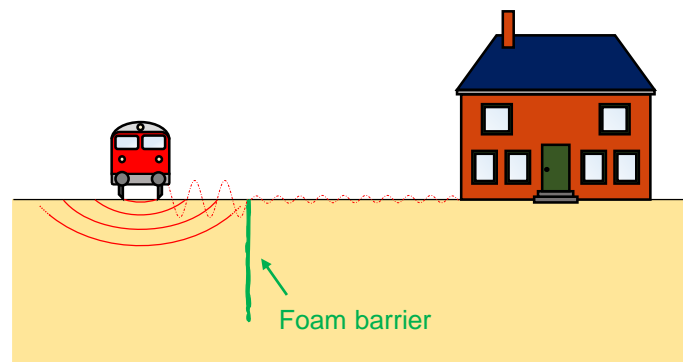
Research cooperation between the Chair of Geotechnical Engineering (RWTH Aachen) and URETEK Deutschland GmbH

Problem

The growing quantity of rail traffic in the past years has led to a heavily used railway net. Since many of those railways are close to, or even located within urban areas, there are increasing complaints about vibrations caused by passing trains. These vibrations can affect the quality of living close by, and in extreme cases, may even lead to the loss of usability of a building.

Approach

Vibration reduction in soils can be achieved by material discontinuities in the transmission area. Materials used need to have a significant lower density than the surrounding soil, because the density is the decisive parameter considering the possible effect of **Thin Injected Foam barriers (TIF-barriers)** as vibration reduction measure. The two-component resin used by URETEK has a high porosity and therefore the desired low density.



The two components are mixed and injected into the soil, where they react and start to expand immediately. The procedure usually is used to treat undesired subsidence in the soil. By using the resin as material for TIF-barriers the desired vibration reduction will be achieved.

Aim

Aim of the cooperation is the development of a method, based on existing techniques by URETEK, which allows the creation of a homogeneous and vertical TIF-barrier. The efficiency of TIF-barriers is proved in field tests, where soil velocities are measured for different test setups. Additional numerical calculations will help to understand the effect of soil parameters and boundary conditions on the reduction efficiency and will serve as a prediction tool.

The project will result in a guideline for the future application of TIF-barriers as vibration reduction measure.