

SUCCESS STORY

RAILWAYS

Katzenberg tunnel, DB Karlsruhe–Basel railway

PROJECT DETAILS

Short description

Mass-spring system comprising elements of the Bögl ballastless track system; based on a cast-in-place concrete track slab with a thickness of around 34 cm and USM 1000-W as strip bearing; gaps covered with fibre cement slabs; tuning frequency achieved in the mass-spring system: $f = 12,5 \text{ Hz}$.

Requirement

Create an effective elastic support for the track to reduce vibrations and structure-borne noise caused by freight trains and high-speed trains and possible noise and vibration transmission into residential buildings above the tunnel.

Location, year

Katzenberg Tunnel, Bad Bellingen, Germany, 2012



PROJECT DESCRIPTION

The German Federal Traffic Forecast predicts that some 60 long-distance trains, more than 100 local trains and around 300 freight trains will pass through the Katzenberg Tunnel every 24 hours by 2025. This is equal to one train every three minutes. More than 70 million tons of load are expected to be transported along the route every year, causing vibrations and structure-borne noise in the buildings above the tunnel.

SOLUTION

Implementation of a high-quality mass-spring system: The versatile USM 1000 W was laid lengthwise in strips 640 mm wide. The gaps between the strips were covered with fibre cement slabs and the longitudinal and crosswise joints were sealed before the track supporting layer was concreted into place. The USM 2020 and USM 3000 were used over the entire surface in transition sections.

The advantages:

- Vibration protection and drainage provided by the profiled USM 1000 W directly on the tunnel floor
- The tuning frequency achieved by the mass-spring system ensures effective protection