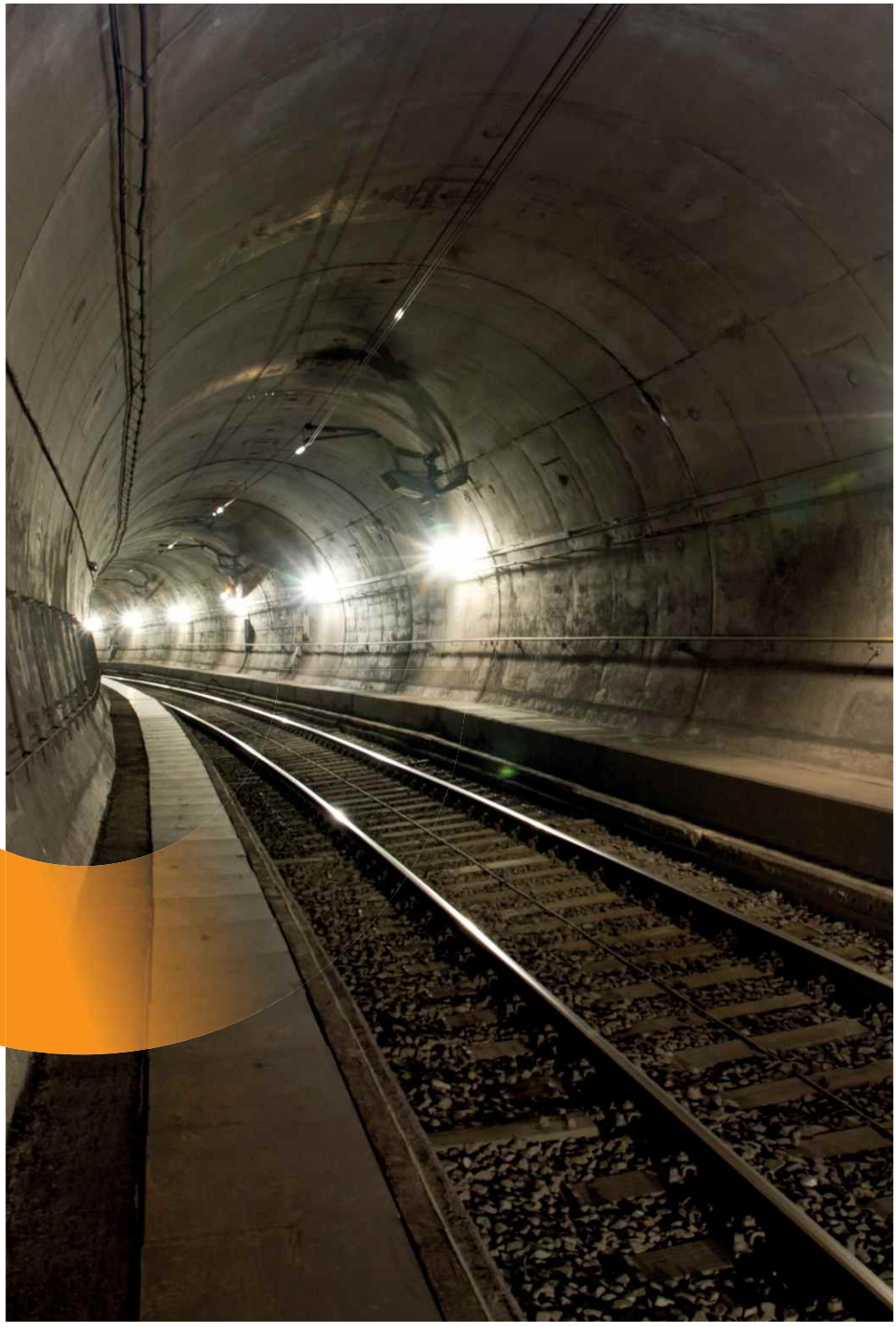
ISOLATION FOR PHILHARMONIC HALL

CASE STUDY
Philharmonic
Hall Gasteig
Munich (DE)



EFFECTIVE VIBRATION ISOLATION.

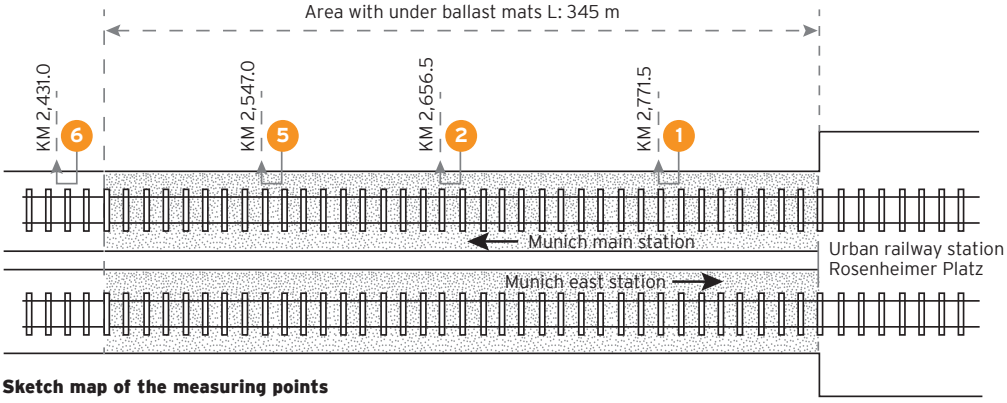
getzner

LONG-LASTING QUALITY OF UNDER BALLAST MATS – EVEN UNDER EXTREME CONDITIONS

THE PROJECT

The cultural centre "Am Gasteig" in Munich is situated next to the central tunnel of the Munich rapid transit railway system: the centre is also home to the philharmonic hall and the city library.

When the cultural centre was built in 1983, the planners had to ensure that the background noise level in the concert hall did not exceed the specified limit of 25 decibels during passing trains so that the hall could also be used for recording. To protect the noise-sensitive building from structure-borne noise, Getzner Under Ballast Mats were installed over a distance of 345 metres. The track, a heavily used rapid-transit route carrying around 150,000 metric tons per day, has subjected the mats to extreme operational loads – a total of around 1,300 million tons – as well as varying environmental influences since 1983. In 2013, it became evident just how effective the system remains over the long term: the under ballast mats have been reducing vibrations on this key route for more than 30 years, significantly lowering maintenance work and associated costs.



Sketch map of the measuring points

THE GETZNER SOLUTION

Under ballast mats remain effective after 30 years
The under ballast mats from Getzner reduce the specific load and, in turn, the mechanical strain on the superstructure components. The fact that the polyurethane under ballast mats from Getzner remain effective and retain their material properties, even over a period of 30 years, is evidenced by the studies conducted.

Since the under ballast mats were installed in 1983, Getzner has initiated several investigations and measurements of the material's effectiveness. In order to examine the long-term properties of the Sylomer® B 851 under ballast mats, Getzner took a material sample from the Munich rapid transit railway tunnel in December 2012, along with a structure-borne noise measurement, under the supervision of Deutsche Bahn AG. The "Prüfamt für Bau von Landverkehrswegen" (Institute of Road, Railway and Airfield Construction) at the Technical University of Munich subjected the extracted samples to a visual evaluation. They also determined the static stiffness and compared this with the values that were determined in 1983 as part of quality control during installation and in 2001 when a sample was taken.

Imprints of the track ballast on the under ballast mats

Exposed under ballast mat

Measuring the structure-borne noise, the static and dynamic stiffness

The visual evaluation after 29 years confirmed the excellent condition of the under ballast mats. The side of the mats facing the ballast, the load distribution layer, exhibits only slight plastic imprints; there is no sign of any damage. The static stiffness test showed that the under ballast mats still meet the requirements defined in the specification – despite the extreme operating load of around 1,300 million tons. "The dynamic spring properties of the under ballast mats remain almost the same as they were in 1983," explains Wolfgang Daiminger, Project Manager at engineering company Müller-BBM GmbH. In order to assess the long-term properties under "real" traffic loads, structure-borne noise measurements were also carried out in a section of the tunnel in the same manner as in 1983.

The Philharmonic Hall Gasteig

THE RESULT

The under ballast mats successfully reduce the structure-borne noise when a train passes through; the acoustic performance remains sound until today.

"All the tests indicate that our under ballast mats will remain effective for at least another 30 years. If we take the standard track service life of 50 years for our calculations, then we can be sure that the under ballast mats will remain effective throughout and beyond this period," says Mirko Dold, Product Manager at Getzner.

FEEDBACK

» ***"The under ballast mats from Getzner retain their properties and function even under extreme conditions. Environmental influences, such as standing water, couldn't affect these mats."***

Wolfgang Daiminger - Project Manager at Müller-BBM

© Deutsche Bahn AG

ADVANTAGES

- Excellent noise reduction: Reliable suppression of structure-borne noise, enabling concert and recording use.
- Long-term performance: Proven effectiveness for over 30 years, even under extreme loads.
- Lower maintenance costs: Reduced mechanical stress leads to less ballast wear and fewer interventions.
- Urban compatibility: Safe operation of rail lines next to noise-sensitive buildings.
- Operational reliability: Stable performance on rail routes with very high traffic loads.

Operator	Deutsche Bahn AG
Solution	2,830 m² of under ballast mats, Sylomer® B 851, 345 m distance
Implementation	1983
Project support	Deutsche Bahn AG, Prüfamt für Bau von Landverkehrswegen der Technischen Universität München (Institute of Road, Railway and Airfield Construction at the Technical University of Munich)

Additional references can be found on our website:

getzner.com/references

getzner.com

Getzner Werkstoffe GmbH
Herrenau 5
6706 Bürs, Austria
T +43-5552-201-0
info.buers@getzner.com