

Case Study

Hydroelectric Power Stations in Kempten



» New construction and renovation of two hydro power plants in the immediate vicinity of a planned residential development

» Planning and implementation of vibration mitigation measures despite difficult installation conditions

» Considerably below the required limits for the neighbouring buildings



Elastic Mounting of Machine Foundations and Buildings

Description of the project The Getzner Solution

Getzner was responsible for implementing the vibration isolation during extensive renovation of the Keselstraße and Füssener Straße run-of-the-river power stations on the Iller. The challenge in this project was to carry out vibration isolation while complying with the increased emissions directives and to reduce structure-borne noise of the power station machinery by the required amount.

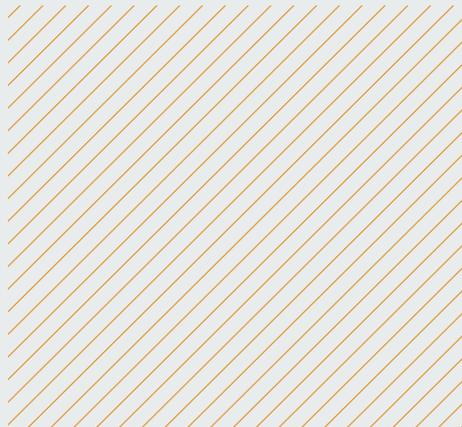
The new power station building in the Keselstraße is directly linked with a listed historic residential area. The old power station building in the Füssener Straße is a fully historical listed building. For both projects, it was therefore necessary to comply with increased acoustic and vibration protection requirements. While the Keselstraße power station is designed for two hydraulic machines, the Füssener Straße reservoir hydroelectric power station has just one. The aim of the vibration-isolating measure was to effectively protect the residents and the listed buildings from vibrations and secondary airborne noise.

Effective protection against vibration

Getzner Werkstoffe implemented a full-surface bearing for the power station in the Keselstraße: The floor slab on which the two power station machines stand is elastically-mounted and minimises the vibration and acoustic transfer to the surrounding residential buildings. The side walls of the new power station building were also fully decoupled from their surroundings with Sylomer®, from the lower edge of the floor slab to the top edge of the ground beneath.

The listed power station building in the Füssener Straße also needed to be efficiently protected against vibrations: "With its elastic bearing of the new machinery foundation, Getzner has made an essential contribution to maximum acoustic isolation", explains Michael Lucke, managing director of the operator, Allgäuer Überlandwerk GmbH.

Complete decoupling of the foundations with Sylomer® also guarantees the acoustic and vibration protection required here. Getzner first determined, on the basis of the known loads, the most suitable Sylomer® types and then supplied the mats on schedule to the construction site. Installation was carried out, under the supervision of Getzner experts, by the executing building firm. In total around 2,000 m² of the material Sylomer® was used. The overall solution takes into account the needs of the residents and also complies with the stringent requirements for listed buildings.



2



Feedback

Planning - Concept - Implementation

The fact that Getzner was not only actively involved in the implementation but also in the planning process particularly contributed to the success of the project: Firstly, the company specialises in developing and manufacturing materials for vibration reduction. Secondly it acts as a technical building consultant. With their calculations, its experienced specialists provided the technical foundations for the subsequent decisions.

“We were able to offer a technically tried and tested optimum solution with commercially viable conditions. The material itself is impressive: it has an homogenous material structure, is easy to install, absorbs very little water once fitted and is easy to use, even in the event of local damage. These arguments convinced the client” explains Rainer Zindler, project manager at the Getzner site in Grünwald.

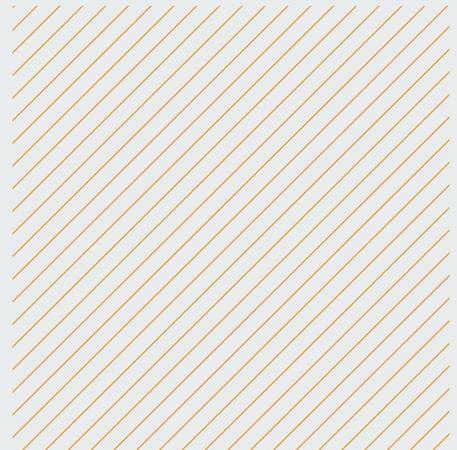
Vibration protection therefore enables undisturbed use of neighbouring facilities.

“The test measurements after completion of the project showed that all residential compliance thresholds were complied with. There is even a safety margin of error between the actual values and the specified requirements. This confirms that the measures for reducing vibrations and particularly structure-borne noise transfer have been extremely effective.”

Dipl.-Ing. Dr. techn. Hansjörg Schmid,
Ingenieurbüro für Technische Physik,
Hall i. Tirol

“The Füssener Straße power station was commissioned at the beginning of March 2011 and is a shining example of a calm and quiet operation. As a result, the Kempten town council has been asked to approve the building area directly adjacent to the reservoir hydroelectric power station for residential purposes.”

Walter Feßler, TNA department,
Allgäuer Überlandwerk GmbH





Facts and figures at a glance

Keselstraße and Füssener Straße hydroelectric power stations in Kempten

Operator and client:	Allgäuer Überlandwerk GmbH, Kempten
General construction:	Xaver Lutzenberger GmbH & Co. KG, Pfaffenhausen
General planning:	RMD Consult, Munich
Vibration isolation:	Getzner Werkstoffe GmbH
Services:	Pre-planning, project management and project supervision, health and safety planning for both power stations
Project duration:	11 months
Project completion:	End of 2010
Commissioning:	March 2011

Keselstraße power station

Type:	Laufwasserkraftwerk
Year of construction:	1958 new build - completed 2010
Vibration solution:	Full-surface elastic bearing of floor slab and decoupling of side walls with Sylomer®

Füssener Straße power station

Type:	Reservoir hydroelectric power station
Year of construction:	1927 reconstruction - completed 2011
Vibration solution:	Complete decoupling of turbine foundation

Building and machine bearing references

- Skyline Vienna, Vienna (AT)
- Oslo Opera, Oslo (NO)
- Drachen-Center, Basle (CH)
- The Rushmore Building, New York (US)
- Bolshoi Theatre, Moscow (RU)
- Teatro Nacional de Catalunya, Barcelona (ES)
- Welfenhöfe, Munich (DE)
- Arnulfpark, Munich (DE)
- Vier Sonnen luxury residential complex, Moscow (RU)