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KTI Project Report No.6

INSTALLATION OF TUNED-MASS-DAMPERS IN WILHELM-KAUFMANN-STEG SALZBURG

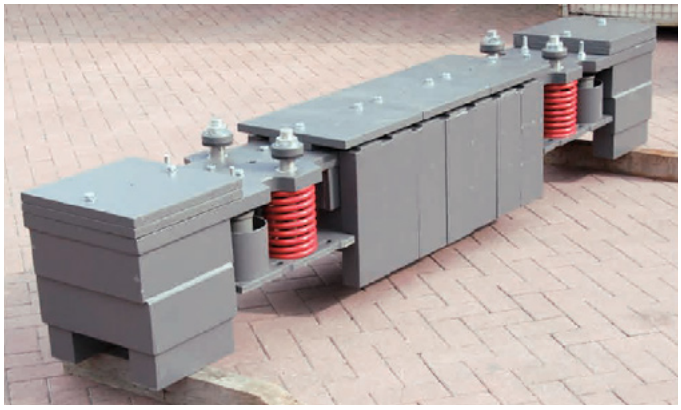
Customer	Mühlbauer Stahl + Metallbau GmbH
Location	Salzburg, Austria
Year	2011
KTI product	Tuned-mass-damper with viscose damping
Special feature	Precise adjustment of vibration frequency with low structural damping

The company Mühlbauer from Furth im Wald erected a pedestrian and cycling bridge over the river Salzach in Austria on behalf of the city of Salzburg. The bridge was conceived as a halved cable-stayed structure with a span of 94.5 metres. Due to the long span of the bridge and its low structural damping, KTI had to assume significant vibrations. Installation of three tuned-mass-dampers enabled the structural damping of the bridge to be increased and its vibrations reduced such that there are now no disturbing movements in the bridge noticeable.

With a bridge weight of 130,000 kg, a damper mass of 8,050 kg, spread over three tuned-mass-dampers, was installed. Additional masses added to the principal weight enabled the absorber frequency to be adjusted to the natural frequency of the parasitic vibration of the bridge of 1.5 Hz. The low net damping of the steel construction of only 0.3 % was increased to 6.6 % with the installation of mass dampers. This reliably prevents any inadmissible movements of the bridge.

The mass of 8,050 kg is borne by pressure springs, which have a vertical natural frequency under load of 1.5 Hz. The necessary viscose damping is installed in damper pots arranged beside the springs. A damping mass of stable temperature secures the function of the tuned-mass-damper even with extreme fluctuations in external temperature.

Cable-stayed bridge over the Salzach near Salzburg, Austria



KTI tuned-mass-damper with an absorption mass of approx. 2,680 kg