

VICODA® SUCCESS STORY

TUNED MASS DAMPER

Matagarup Bridge, Perth, Australia

PROJECT DETAILS

Short description

Reduction of pedestrian induced vibrations on a footbridge by installing tuned mass dampers

Bridge design

Cable-stayed bridge

Requirements

Guarantee of the comfort criteria acc. to HiVoSS / EUR 23318 EN

Product details Tuned Mass Damper

Moving mass: 12,500 kg

Damping principle: Eddy current damper (required temperature range with constant properties from -5°C to 60°C)

Corrosion protection: According to EN 12944 class C4 high

Design service life: 50 years

Country, year

Australia, 2016

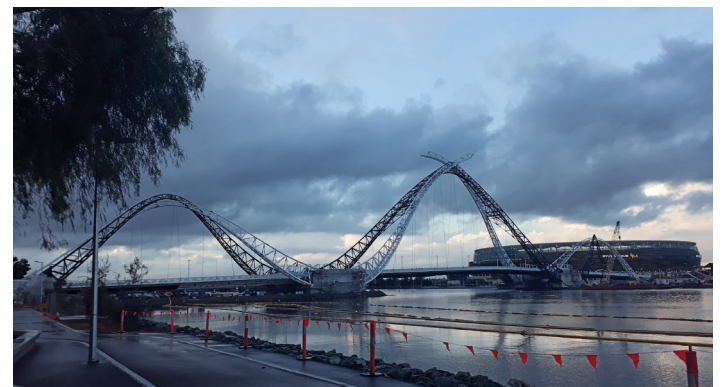
PROJECT DESCRIPTION

In the southwest of Australia, east of East Perth and crossing the Swan River, the 370 m long and 9 m wide pedestrian Matagarup Bridge connects the two districts Burswood and East Perth.

The 72 m high sophisticated structure, combined with innovative urban design, consists of a total of three large arches, a continuous black arch and two white partial arches, each comprising 1.5 arch elements and crossing in the middle at the top. The shape of the bridge construction resembles two flying swans. VICODA tuned mass dampers were used to control the pedestrian-induced vibrations.

SOLUTION

Based on the specified load scenarios, VICODA® dimensioned a tuned mass damper with subsequent adjustability in the particularly critical range of 0.4 Hz to 0.7 Hz. One TMD with a total weight of approx. 15 t was used to damp the first lateral natural frequency. To meet the design requirements, the TMD's had to be integrated into the box cross-section of the bridge. Particularly noteworthy is the innovative integrated damping within the TMD.



With an eddy current damper, the TMD characteristics (TMD frequency and damping within the absorber) can be guaranteed, independent of temperature influences. The changes in properties with regard to absorber frequency and damping level that would otherwise have to be taken into account when using a viscoelastic damper do not have to be taken into account in the design.