

Matagarup Bridge, Perth, Australia

PROJECT DATA

Short description

Mitigation of pedestrian-induced vibrations at the new construction of a pedestrian bridge by installing passive absorbers

Bridge construction

Cable-stayed bridge

Request

To ensure the comfort criteria according to HiVoSS / EUR 23318 EN, the degree of damping of the bridge with the absorber must be increased to at least 4.5 %

Data passive absorber

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| 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 life: | 50 years |



PROJECT DESCRIPTION

In southwestern Australia, east of East Perth and above the Swan River, the 370-meter-long and 9-meter-wide Matagarup Bridge connects the two districts of 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 with 1.5 arch elements, which cross in the middle at the top. The shape of the bridge structure resembles two flying swans. In order to reduce the pedestrian-induced vibrations, SCHREIBER absorbers were used.



SOLUTION

In relation to the specified load scenarios, SCHREIBER dimensioned a vibration damper with subsequent adjustability in the particularly critical range of 0.4 Hz to 0.7. A vibration damper with a total weight of approx. 15 t for damping the first horizontal vibration eigenmodes was used. In order to meet the design specifications, the vibration absorbers had to be integrated into the box section of the bridge. Particularly noteworthy is the innovative integrated damping within the absorber. With an eddy-current damper, the damping properties (damping frequency and damping inside the damper) can be guaranteed irrespective of temperature influences. The changes in properties that would otherwise have to be taken into account with regard to the absorber frequency and degree of damping when using a viscoelastic damper do not have to be taken into account in the design.