

## The Quick-Exchange Expansion Joints of the Köhlbrand Bridge in Hamburg

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### Abstract

A method of renewing modular expansion joints in bridge structures with minimal effort on site and minimal impact on traffic or on the bridge structure has been recently optimised. This approach is described with reference to a project to replace the existing expansion joints of Hamburg's Köhlbrand Bridge, installing so-called "Quick-Ex" modular joints in their place, which will enable future renewal works to be carried out much more easily and quickly. These joints were specially designed for easy replaceability of the mechanical part of a modular joint of this kind, primarily consisting of the centerbeams that form its driving surface and the cross beams that support them, without the need for breaking out or pouring concrete, or cutting or welding steel – greatly reducing the costs of future renewal work and the impact this work will have on traffic.

**Keywords:** Expansion joint; modular; renewal; replacement; optimised; low impact; traffic congestion.

### 1 Introduction

The Köhlbrand Bridge in Hamburg (Fig.1), one of the city's most important structures since it was built in 1974, has a total length of 3,618 m. The cable-stayed structure that spans one channel of the River Elbe as it flows through the city has a length of 520 m, with a main span of length 325 m. A recently completed major renovation of the bridge included the replacement of its main expansion joints, of the roller shutter type, with new modular expansion joints.



Figure 1. The Köhlbrand Bridge, one of Hamburg's most important bridges