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# Expansion joints and bearings for the largest lift bridge in Europa

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## Abstract

**Expansion joints and bearings for the largest lift bridge in Europa**

Rotterdam has the largest lift bridge in Europe: the Botlekbrug. Opening and closing a bridge of this size represents uncharted territory. It requires special bearings and expansion joints which MAURER has developed specifically for this purpose. These can be opened and closed.

The new Botlekbrug is part of a 37 km motorway section of the A 15 that passes through Rotterdam port and is being widened by order of the Rijkswaterstaat.

Botlekbrug consists of two directly adjacent lift bridges.

The bridges do not open up completely – that would no longer be feasible with these dimensions. They move up to 40 m upwards.

A MAURER DS 720 swivel joist expansion joint is installed on the external passage of each bridge, while a MAURER DS 320 swivel joist expansion joint is installed on the internal passage.

The swivel joist is suspended from the steel superstructure and moves upwards with the bridge.

However, in order to ensure that it doesn´t fall down, the new expansion joints have extra lifting beams as a second special feature along with the standard cross beams. These lifting beams are twice as long as the cross beams, must not be rigid and have to be integrated – a group of requirements that significantly compresses and complicates the steel constuction.

Also a Challenge was moving the bridge downwards, expecially if it had been open for an extended period of time and had changed as a result of the heat, cold or wind. This meant that a centering system was required that was produced in the form of funnels and pins.

Also we have installed 16 spherical bearings with a second plane across the slip plane which can be opened.

It goes without saying that all bearings also require centring mechanisms again when being closed.

**Keywords:** Botlekbridge; lift Bridge; swivel-joist construction; expansion joint; structural bearing

## 1 Introduction

Rotterdam is located in the Netherlands and, with approx. 630,00 inhabitants, is the second largest city of the country after Amsterdam. Due to its proximity to the coast, Rotterdam has Europe´s largest seaport and the third largest sea port worldwide. It is fair to say thaat Rotterdam is Europe´s gate to the world and constitutes an imprtant share of global trade. A vast number of container ships from Asia and other parts of the



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