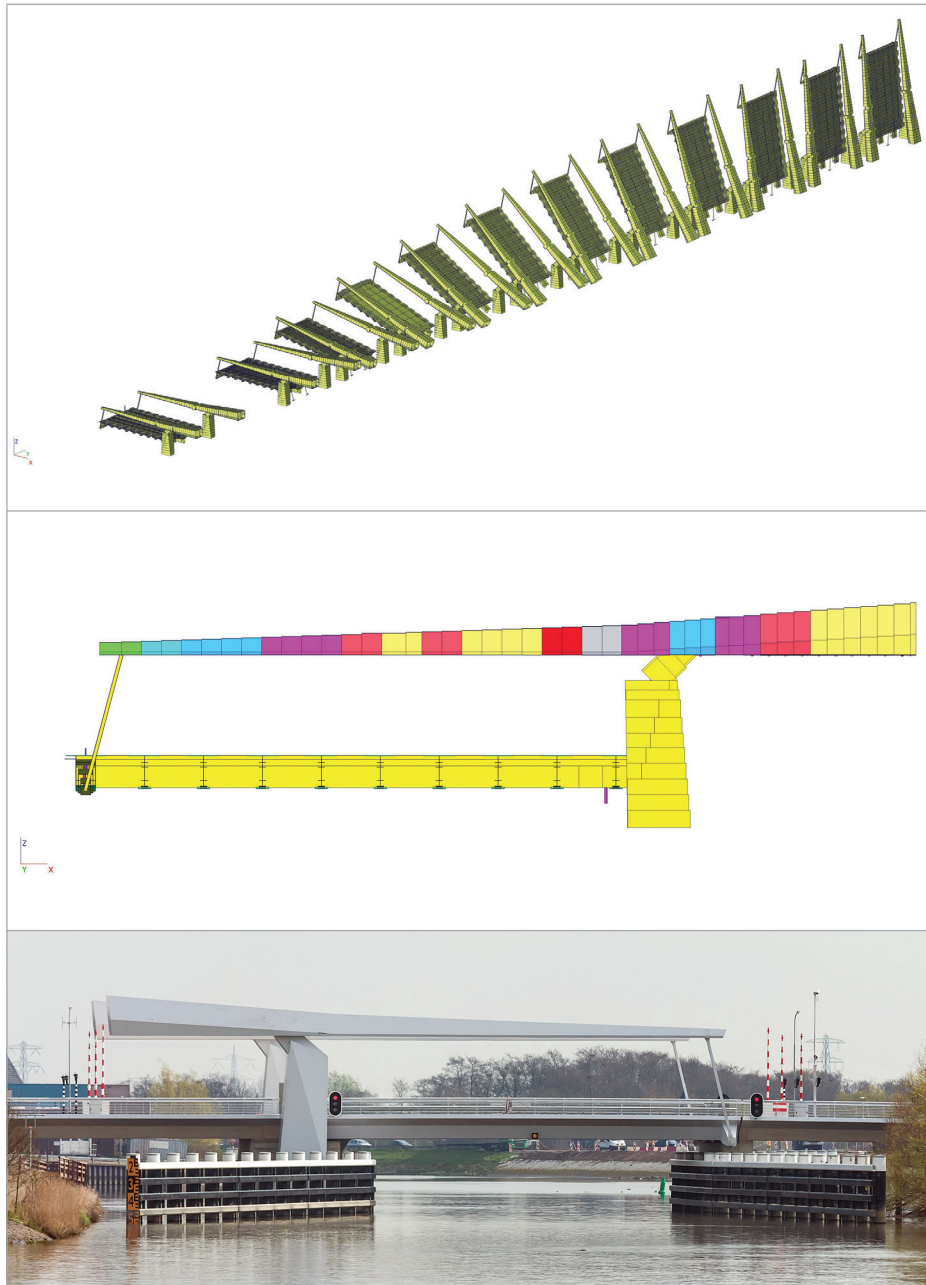


“Gouderakse Brug” Movable Road Bridge - Krimpenerwaard Gouda, The Netherlands



Introduction

The movable road bridge at Gouda is built to cross over the Hollandsche IJssel. The bridge is a part of the project ‘construction of the south-east ring road’, aimed at achieving a better and easier road to Krimpenerwaard and decreasing the traffic in the centre of Gouda. The bridge is also called the ‘Gouderakse brug’.

The bridge has the span of 30 m and is of the drawbridge type. The bridge is powered by two heavy jacks situated under the bridge deck. The bridge is balanced by ballast situated in the back of 2 peak arms, each supported by 1 tower. The bridge deck is hung up on the end of the arms by a tension bar. The arms have the total length of 40 m and are characterised by their peak and sharp forms.

The total weight of the bridge is 400 tonnes. That weight is balanced by 480-tonne ballast.

The bridge deck is built upside down. A special lifting procedure was foreseen to turn the 230-tonne heavy bridge deck afterwards.

Description of technical questions to be resolved with Scia Engineer

Scia Engineer was used both for the dimensioning of the bridge in the traffic situation and the erection engineering of the bridge.

The complete 3D model was formed with bars, even the orthotropic deck plate, divided into longitudinal and cross girders with an equivalent stiffness and adopted mass. Correct modellisation of the mass was very important because of the balancing of the bridge.

From the engineering point of view, this project has several challenges.

First, there were the different states of the bridge to be studied. The possibility of creating different states of the bridge in one model was a big advantage towards calculation of the bridge. With the automatic steel code check (EC) of Scia Engineer it was possible to check all members in all states in one calculation model. This gave an important gain in calculation / optimisation of the structure in the different states.

Third, the use of graphical sections with different

material properties to model the exact weight of the bridge into the different states of the bridge. The input of complex forms for the arms and towers was possible thanks to the use of graphical sections.

Fourth, the calculation of eigenvalues / frequencies of the bridge in order to check if there were risks of vibration under wind loads.

Fifth, for the erection engineering the different construction stages had to be examined.

Description of how our experience with Scia Engineer proved its completeness

- Dimensioning a 3D structure in different states.
- The possibility of using and combining the results of Scia Engineer in a flexible way.
- The use of graphical sections with different section properties.
- Stability calculation and second order calculations.
- Calculation of eigenvalues.

This project proves the great diversity of Scia Engineer in checking the structure and the use of materials.

Modules used:

- Base
- 3D frame
- Steel code check (EC)
- Stability
- Dynamics

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Integral quality is our top priority

Stendess calculates and draws complex steel constructions in a high quality and efficient manner while seeking economically responsible and sustainable solutions for specific technical stability issues. Thanks to the integral service, whereby the design of the metal superstructure and the concrete substructure are calculated and drawn by experts in the same office. The building owner and principal contractor retain 100% control over the complete structure.

Managing complex projects with care.

Recent references demonstrate the multidisciplinary knowledge and ability of our engineers and designers in the market of bridges, industry, utility and other projects located all over the world.

Project information

Owner	Provincie Zuid Holland
Architect	Hollandia B.V.
General Contractor	Combinatie Van Hattum en Blankevoort / KWS Infa / Boskalis / Hollandia
Engineering Office	Ingenieursbureau Stendess N.V.
Location	Krimpenerwaard Gouda, The Netherlands
Construction Period	09/2010 to 03/2012

Short description | “Gouderakse Brug” Movable Road Bridge

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