



Design and construction of a large railway bridge in a complex traffic junction

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Abstract

To enable widening of the highway A1, a new, large double track railway bridge is being constructed near Amsterdam in The Netherlands. This new structure is part of the SAA project, a large infrastructural project that aims to increase road capacity of the Schiphol-Amsterdam-Almere corridor, to alleviate the current traffic congestion and improve the environmental quality of the area.

The superstructure comprises a steel arch bridge with a diagonal hanger configuration. With a span length of 255m, the bridge is considered to be the largest railway arch bridge in Europe. Because of the required necessity to minimise the hindrance of the road and railway traffic, the erection of the bridge has proven to be the most challenging aspect during the design process. Important design starting points are defined in consultation with the steel contractor during the preliminary design. Steel grade S460, with high client requirements for the material properties, is chosen because of limitations of the bridge weight during transport and installation.

This paper aims to give insight into the design process, the approach to determine the optimal erection methods and the design choices to reach a sustainable bridge with minimal noise emission in favour of the residents.

Keywords: Arch bridge; railway bridge; aesthetical design; steel grade S460; wind-induced vibrations; bridge design; construction method.

1 Introduction

The project SAA-A1/A6 Diemen - Almere Havendreef is part of the Schiphol - Amsterdam - Almere road extension. In the coming years the principal Rijkswaterstaat will extend the highways on this corridor. This ensures that the region remains accessible. At the same time Rijkswaterstaat improves livability along the highways. Construction activities last until 2020. Total costs of the railway bridge, including substructures, are about € 40.000.000.

The work will be carried out based on a DBFM (Design, Build, Finance and Maintain) contract. This means that the construction consortium will be responsible for the design, building, financing and maintenance process. The contract term is 30 years. The highways A1 and A6 will be expanded over a distance of 20 kilometres. This includes two reversible direction lanes across the entire expanded section.