

The relocation of a heritage bridge

Ing. P. Hogesteeger, ir. R. Vergoossen

Royal HaskoningDHV, Department Transport & Planning, Rotterdam, The Netherlands

ir. M. Bruchner

Municipality of Amsterdam, Engineering Department, Amsterdam, The Netherlands

Contact: paul.hogesteeger@rhdhv.com

Abstract

This paper describes the history of a heritage bridge in Amsterdam (The Netherlands) and the efforts made for the relocation of this bridge. Investigations were made to determine the structural integrity of the original elements and structural assessments were done to find the remaining capacity for future use. The Ultimate Limit State for the original elements was investigated. Lateral stability was checked and based on the historical use and the required future use the fatigue loads were calculated for the different cross sections and for critical connections. These calculations showed that a required residual service life of 30 years after relocation was technically possible for this bridge. Some pros and cons for the re-use of this bridge are also discussed.

Keywords: Movable bridge; Heritage bridge; Relocation; Bridge Engineering; Structural Engineering; Construction History; Conservation of structures.

1 Introduction

In 2000 a bridge in Amsterdam, originated from 1930, was dismantled (and placed into 'storage') because it was impossible to rearrange the deck layout for the integration of a light rail in the existing deck structure.

The bridge is one of the members of a family of bridges in Amsterdam all designed by the same engineer, Ir. W.A. de Graaf (1880-1970) and the same architect, mr. P.L. Kramer (1881-1961). Reference to these bridges is made as the "Kramer" bridges.

1.1 Location

The bridge crossed over one of the waterways, the 'Oostertoegang' (translated as 'East Entrance')

between the canals of Amsterdam and the "het IJ", the open waterfront behind the main train station of Amsterdam. 'Oostertoegang' also was the original name of this bridge.

1.2 History

The bridge has been in service from the year 1930 until 1973 as part of one of the important connections between the city centre of Amsterdam and the motorway around the city. Figure 1.

From 1973 till 2000 the bridge was part of a pedestrian and bicycle route; no motorized traffic was allowed on the bridge. Figure 2. The lifting mechanism has been out of commission from the period that the bridge was no longer in use as part of the main road infrastructure. Only the lifting cables were removed. The lifting towers,