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Ph.D. THESIS „Kierbedź bridge in Warsaw“

ABSTRACT

This dissertation concerns the Kierbedź bridge in Warsaw, whose preserved superstructure elements were discovered and taken out from the bottom of the Vistula river in 2011. The thesis aims at acquiring maximum data on the subject of the bridge and its history, its designer and the builders. The crossing was built between 1859 and 1864, as the extension of Nowy Zjazd, running from the Castle Square towards the Vistula, where there already had been an access road to the river – a viaduct and an embankment, built between 1844-1846, according to a design by Feliks Pancer. The Kierbedź bridge was a six-span steel riveted truss structure, with the deck between the girders. Its superstructure was based on five piers and two abutments and consisted of three continuous two-span beams. Each beam was constructed of two truss girders with parallel chords and a dense lattice web. The bridge was over 475 meters long. It was designed by a Pole, Stanisław Kierbedź, distinguished engineer and builder, who finished the Institute of the Transport Engineers Corps in Saint Petersburg. He designed and built, among others, the first cast iron bridge over the Newa river in Saint Petersburg. The main company that took part in the construction and was responsible for founding the piers and for the bridge superstructure, was French Ernest Goüin et Compagnie. The bridge piers were based on iron cylinders, that were sunk with the use of a novel, at that time, caisson method. Modern tools and innovative technical solutions were used during the bridge construction. The crossing was opened on 22nd November 1864, under the name of Alexander bridge. It enabled the intensive development of the city and, first and foremost, its infrastructure, by creating a permanent connection between Old Warsaw and its right bank district Praga. The assumed influence of the bridge construction was the decrease in population density on the left river bank by facilitating communication and encouraging people to settle in Praga, as well as to move there warehouses and industrial plants. On the left Vistula bank major urban changes had taken place already between 1844-1846, in relation to Nowy Zjazd construction. Preparations for the opening of the permanent river crossing led to arranging part of the city between Krakowskie Przedmieście and Dziekanka streets. The biggest investment at that time in the right bank Warsaw was the construction of the new housing area, called Nowa Praga. From December 1866 the first Warsaw line of a horse railway connecting the railway stations run via the Kierbedź Bridge. On 5th August 1915 two

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middle spans of the bridge were blown up by the withdrawing Russian Army. At first German sappers erected, below the damaged bridge, a beam bridge on timber pile supports, called the Beseler bridge. The Kierbedź bridge was rebuilt by German companies - C.H. Jucho from Dortmund and Philipp Holzmann AG from Berlin, in a changed structure. The bridge was reopened on 27th January 1916. On 13th September 1944 the bridge was again destroyed, this time by the German Army. Damage was much more serious than in 1915. Only abutments, utmost piers and utmost spans survived. After World War II the Śląsko-Dąbrowski bridge was built on the preserved supports of the Kierbedź bridge. The dissertation discusses the results of chemical composition analyses of steel used for the bridge structure and its corrosion products. It also explains the idea behind Pontiseum, an outdoor exhibition of fragments of oldest Warsaw bridges on the premises of the Road and Bridge Research Institute, where the Kierbedź bridge elements have been displayed. Principles of protecting large-scale iron artefacts exposed outdoor, in municipal space, likewise methods of preserving this specific type of technical heritage based on examples from Poland and abroad are also examined.

KEY WORDS Kierbedź bridge; Warsaw; Stanisław Kierbedź; technical monuments; heritage protection

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