Kazimierz-Ludwinów footbridge over the Vistula River in Cracow

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Summary

The paper presents the technical design of an innovative structure of Kazimierz-Ludwinów footbridge in Cracow over the Vistula River. The main span of the footbridge represents very unusual structural form. Static system of its two of three decks can be defined between a fixed beam and a shallow arch. The third deck supported by the two main decks has a sinusoidal profile. The most complex elements of the structure designed with rigorous requirements of architectural forming are indicated. These extraordinary elements are: massive concrete supports with a complicated geometric shape, steel decks of the main span composed of irregular tapered box girders prestressed in the edge parts of the spans and the whole structure of the approach ramps. Some details of numerical modelling of the structure by means of FEM are presented as well as the concept of the footbridge construction technology is discussed.

Keywords: steel footbridge; technical design; structural details; FEM; construction technology.

1. Introduction

The localization of the designed cycle footbridge is the strict centre of Cracow. Crossing the Vistula River, the footbridge is going to connect the historical district of Kazimierz with the district of Ludwinów, located on the left riverbank. In this way, it will link the Inflancki Boulevard (on the side of Kazimierz) with the Wołyński Boulevard near the former Forum hotel. The neighbourhood of Cracow's major tourist attractions, e.g. the Wawel Hill, Church of St. Stanislaus on Skałka, Kazimierz, obliged the footbridge authors to design an architecturally attractive and a unique structure.

Fig. 1: Computer visualization of Kazimierz – Ludwinów footbridge (Copyright © Biuro Projektów Lewicki Łatak).

The architectural concept of the footbridge was selected in June 2006 in an international competition, won by a design office Biuro Projektów Lewicki Łatak from Cracow. The construction design herein described corresponds to the winner concept at an ideological level. The visualization of the designed structure is presented in Fig. 1.

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