Design Proposal of New Roadway Bridge across the Danube in Novi Sad

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Summary

The paper deals with design proposal of new roadway bridge across the Danube in Novi Sad, with an overall length of 545 m, having the spans: 40,0+40,0+50,0+50,0+91,7+188,3+85 m. The bridge deck, width of 23,5 m, carries 4 lanes of vehicular traffic and two lanes of pedestrian/ cycleway. The main bridge part is an asymmetric cable-stayed structure, with a main span of 188,3 m and a back span of 91,7 m. The unique single pylon of the original curved shape and height of 59,5 m is rigidly fixed into the deck. The stays of harp configuration are in middle plane. The aesthetics plays a major role in bridge design to be a meeting point for engineering and architecture. The proposed bridge has an original architectural appearance well incorporated in Novi Sad city environment of plane left bank and the hilly right bank with old Patrovaradin Fortress. This is a feasible original bridge design concept from structural point of view as well.

Keywords: cable-stayed bridge; bridge architecture; bridge structure.

1. Introduction

In 2008 the City of Novi Sad published an international competition for concept design solution of new roadway bridge, tunnel and approach roads on the traffic route passing across the Danube on the location of the remaining piers of the former railway bridge called Franz Joseph (built in 1883 and destroyed in 1941) and through the former railway tunnel beyond the Petrovaradin Fortress (built in 1883 and now out of function). Both, former railway bridge and tunnel, were built in the scope of the old railway line from Budapest, through Novi Sad, to Belgrade (Zemun). In employer's requirements it was demanded to use the remaining piers of the former bridge and to enlarge the former railway tunnel.

The paper presents an original concept design proposal of new roadway bridge across the Danube, submitted by Euro Gardi Group Novi Sad. The paper authors were engaged in the concept design proposal of the bridge [1].

Although this design proposal of new roadway bridge is not chosen by the client to be further elaborated in preliminary design, the authors mean that it should be presented as an interesting design solution from architectural and structural point of view.

2. Novi Sad Bridges and Traffic

Novi Sad is the capital of northern Serbian province of Vojvodina and with an urban population of near 300 thousand it is the second largest city in Serbia. It is a transit center of the roadway and railway route connecting the middle Europe to the southeast Europe.

Novi Sad is lying in the southern part of Panonian plain and it is located on the banks of the Danube River (municipality of Novi Sad – left bank and municipality of Petrovaradin - right bank), while facing the northern slopes of Fruska Gora mountain (right bank).

Satellite photo of Novi Sad, with the existing three bridges across the Danube, is presented in Fig. 1.

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