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What means external prestressing for an old Gerber structure

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Abstract

The bridge over the Timis River in Albina, assures the connection between the city of Timisoara and Lugoj through the city of Buzias, facilitating the access to the county capital for the inhabitants of this area. Due to the important economical development of this region, DJ 592 represents an artery with a special role for maintaining the social-economical connections in this part of the Timis county, but also a viable alternative for the DN 6 route linking Timisoara to Lugoj. In order to provide normal traffic conditions on the bridge, works have been designed to increase the loading class to E level (trucks A30 and special vehicles V80), under 2 lane gauge conditions. This aim modified the static schema of the bridge from a Gerber structure in a longitudinal and vertical prestressed continuous beam. The gauge was obtained by realizing a reinforced concrete slab, over the existing one (overlay).

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1. Old bridge

The old bridge was designed as a cantilever structure with Gerber joints, having 5 spans (26,5+26,5+30,4+26,5+26,5), with counterweight cantilevers of 7,00 m length at each end of the bridge. The total length of the bridge is 150,40 m (Fig. 1).

The structure joints are disposed in such way, that the spans 2 and 4 formed two simply supported substructures of 26,50 m and 6,10 m long cantilevers, which bear on the piers 2 and 3 respectively 4 and 5. In the spans 1 and 5 two

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substructures were formed of 20,40 m length having counterweight cantilevers of 7,00 m length, which bear on pier 1 and the cantilever from the 2nd span, respectively on pier 6 and on the cantilever of span 4.



Fig. 1. View from downstream

The main span (30,40 m) is realized as a substructure with constant height and a length of 18,20 m, which bear on the cantilevers of the spans 2 and 4.



Fig. 2. Gauge of the old bridge

In cross section, the width of the carriage way is 6,00 m and the footways of each 0,50 m (Fig. 2). The bridge consists of 3 main girders emplaced at a distance of 2,55 m from each other (Fig. 3). The transversal load distribution is realized by two cross girders in the span and the upper slab, which has a constant thickness on the entire bridge length. At the bottom part, on the piers, the girders are connected by a 24 cm thick slab.

Longitudinally, the height of the girders varies from 1,68 m in the span to 2,63 m on the bearings. The width of the girders is constant through the entire bridge length, namely 30 cm for the marginal girders and 35 cm for the central girder.

The pedestrian parapet is steely and it is made out of rolling profiles.

The infrastructure consist of 6 piers, out of which pier 1 and 6 are emplaced in the major streambed, are about 4 m height, whereas the piers 2, 3, 4 and 5 are situated in the minor streambed and are about 8 m height. The cross

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