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Braila bridge: Design and construction of the cable system

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ABSTRACT

The Braila bridge is a three-span suspension bridge spanning the Danube in Romania with a main span of 1120 meters, currently under construction. This bridge will be the first constructed long-span suspension bridge in Romania. The construction of the main cable system started in March 2021 and completed in December 2021. Strands of the main cable are erected by using low tension aerial spinning method by which wires are spanned one by one on site and then bound into a strand. It is of importance to assure the quality of strand/main cable on site, and two methodologies were adopted. One is to control the deflection of the catwalk by water counterweight. With the progress of wire spinning, the catwalk deflects due to increase of the weight of the spun wires. The excessive deflection makes the variation of wire length within a strand which causes unbalanced stress distribution within the cable, and thus shall be avoided. The other is to move the tower top saddle during construction. Due to asymmetric superimposed dead loads between the spans, the tension force is not balanced between main span and side span during the main cable construction, and it may cause a slippage of strand at saddles which results failing of designated geometry. Therefore, the position of tower saddle was adjusted to have the equilibrium by hydraulic jacks. Thanks to the measures above, the quality of the main cable was assured on site, and the construction was completed on schedule.

Keywords: Suspension bridge, cable system, main cable, aerial spinning method.

1 PROJECT OUTLINE

The Braila bridge is a three-span suspension bridge spanning the Danube in Romania with a main span of 1120 meters. The bridge is being constructed as the Design-Build project of 23 km national road in Braila and Tulcea countries, eastern part of Romania. Currently, the transportation crossing the Danube in this area is done by ferries at 5 km away from the bridge proposed location. It takes about 30 minutes – 1 hour to cross the river, and sometimes operations are cancelled due to bad weather. This project is expected to strengthen the existing transportation. [1]

The administrator of this national road is CNAIR, national company for road infrastructure administration. The project period is totally 48 months, 12 months for design and 36 months for construction except the period for acquisition of land for roads, relocation of lifelines et al. Figure 1 shows the plan of this project.

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