The Memaliaj Bridge

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Summary

The new Memaliaj Bridge over the Vjosa River in Southern Albania, with a total length of 123,20m, consists of a continuous, seismically isolated, three-span deck. Due to hydraulic reasons, the central span over the river should be at least 75m long, while the structure had to be economical, easily and rapidly constructible. Thus, the deck is formed by a cast in-situ prestressed concrete box girder, except the 56m of the 76m long central span, which consist of a steel-concrete composite deck, fixed to the concrete part by prestressed tendons and bars. The steel structure was assembled in-situ and erected in five segments, which were put in place by cranes, using the free cantilever method. The application of a composite deck at the central span led to a significant mitigation of the bridge's self weight and a huge reduction of its construction time.

Keywords: bridge; design; construction; steel; concrete; composite; prestressing; cantilever method; seismic isolation

1. Introduction

The new Memaliaj Bridge over the Vjosa River is part of the North-South Corridor Levan-Tepelene, connecting Vlore and Tepelene in Southern Albania. According to the hydraulic design, at the area of the Memaliaj village, the Vjosa River exhibits significant water supply. In order to improve the local hydraulic conditions (the maximum water level of the river is only 5m below the red line of the bridge), it was decided that the new bridge should provide a clear central span at least 75m long, while the existing old bridge, with a mid-pier at the centre of the river-bed, had to be demolished right after the completion of the new one. Furthermore, for contractual reasons, the bridge should be constructed with a limited budget, within a very short and strict time schedule.

2. Design conception

Considering the above mentioned design premises, the size and the cost limitations of the bridge, as well as the overall in-situ construction conditions, the design of a structure which would require special construction methods, implemented by specialized staff using expensive equipment, was avoided. Furthermore, the adjacent existing old bridge could not serve the construction, as it was carrying the traffic of the National Road and its adequacy to resist significant loads was questionable. Thus, the idea of a three span deck with a light weighting cross section at the central span constructed by the cantilever method, and two cast in-situ edge spans, was formed.

Taking into account the morphology of the river-bed at the axis of the bridge and the local

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