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# Unique cable stayed bridge over the Mosoni-Danube with inclined steel box pylon in Hungary - Some details of the architectural and structural design

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## ABSTRACT

The city of Győr in western Hungary will be enriched with a significant transport investment of NIF PLC., a Hungarian infrastructure developer company. UNITEF'83 PLC. was commissioned with the design. The new road will cross the Mosoni-Danube over a spectacular new cable-stayed steel bridge. The future bridge is a 2-span, 68+144 meter-long box section structure, and its 65 meter-high inclined pylon will stand out from the city skyline. In addition to key design issues such as the global structural design and the details of the connections of the main load-bearing elements (cables), other structural problems requiring innovative solutions also arose during the design process. Several structural versions have been carefully analysed as early as in the initial phase of the design with the purpose of ensuring adequate torsional stiffness of the deck. Due to the sensitivity of the cable-stayed structure to the wind, cable vibration and the flow analysis of the beam and pylon also had to be carried out. The issue of construction technology had to be paid extra attention during the design procedure, since transportation by river and road were both limiting factors in the region. The paper covers the architectural and structural design of the future bridge in Győr, offering a brief outline of the most important details and solutions.

**Keywords:** design, analysis, cable stayed, inclined pylon, Hungary.

## 1 BACKGROUND OF THE PROJECT AND ARCHITECTURAL DEMANDS

The Romans founded the first settlement called Arrabona at the confluence of the river Rába, Rábca, Marcal and Mosoni-Danube. The settlement development and everyday life of the city later named Győr have always been greatly influenced by the four rivers, hence the name "City of Rivers". The first permanent bridge of the city was built in the 14th century between Révfalu and the city centre. This was followed by a series of permanent bridges. The latest bridge in Győr was built in 2018: Klatsmányi Bridge of Main Road 813.

In order to fully serve traffic demands, an additional bridge needs to be built in Győr. In 2019, UNITEF'83 PLC. was commissioned by NIF National Infrastructure Developing Company to design a new Mosoni-Danube bridge as part of the eastern section of the new traffic corridor connecting Ipar street with the Bácsa district.