

Bridge over the River Danube

The viaduct over the Danube River is part of Highway D4 in Bratislava and has a total length of 2955 m. It splits into two approach viaducts and a main bridge, proposed as a 5-span structure with span lengths of 109,00 + 220,00 + 223,20 + 220,00 + 109,00 m.

The superstructure is a prestressed concrete box-girder with a variable depth between 4 and 11 m. The main viaduct is built with a traveler formwork from the 4 piers, 2 of them placed inside the Danube course. The approach viaducts consist of 70 m long spans built with Movable Scaffolding System (MSS) and a 4 m deep superstructure cross-section that provides continuity to the whole solution.

The width of the deck is one of the main constraints of the project. The deck has to have four 3.75 m wide lanes, two 3.25 m wide shoulders, two 3.00 m wide cycling lanes and a 3 m wide median strip. All of these constitute a total width of 35 m, including barriers and other auxiliary items, and result in 12.80 m long overhangs. Due to the very long overhangs, precast concrete struts were provided to support them. Therefore, the bridge cross-section is built in two stages: Initially, the MSS in the approach viaducts and the traveler in the main bridge execute the main box-girder and later, the wing travellers place the precast struts and cast the overhangs.

The piers inside the Danube River require a cofferdam due to their large dimensions. The cofferdam is executed with the help of pontoons, steel sheetpiles are driven down to the required depth. Afterwards, once the cofferdam is filled, a waterproof concrete slab is executed from the surface by jet grouting. Once the cofferdam is impermeable, it is possible to excavate under the river level, considering that there is a pump to extract leaked water. Due to the high and variable water level, most of the piers, including the approach viaduct piers, require the same construction process, although the cofferdam is only required for the river course.

Slovakia/2015

Project data

Structural type:
balanced cantilever bridge
Characteristics:
70 m span in approach viaducts, 220 m
spans in main viaduct
Construction sequence:
balanced cantilever
Location:
Bratislava, Slovakia
Owner:
Ministerio de Transportes de Eslovaquia
Client:
Dragados-Hochtief
Scope:
tender design