19th IABSE Congress Stockholm, 21-23 September 2016
Challenges in Design and Construction of an Innovative and Sustainable Built Environment

Tradition and Innovation in San Ignacio´s Bridge on the New Island of Zorrotzaurre, in Bilbao

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Abstract

San Ignacio's Bridge is a singular structure in which the materials were determined by Bilbao's industrial tradition of steel but optimized by using the latest constructive innovations in order to design a technological and slender arch bridge.

Keywords: Symmetric composite arches; high performance self-compacting concrete HPC100; composite deck; stainless steel.

1 Introduction

The north road communications of the future island of Zorrotzaurre are particularly important as they connect the island with the city of Bilbao. San Ignacio's Bridge is conceived of as the central artery that organizes the traffic, the pedestrian as well as the service nets over the Deusto Channel of the Nervion River. No internal supports were allowed in the river and there were very high expectations as to aesthetic integration with the urban environment because Zorrotzaurre's Masterplan was completed by the architect Zaha Hadid.

Figure 1. Aerial view of the Bridge

2 The Bridge

2.1 Genesis

The conception of the Bridge was limited by rigid conditions: the need to cross 75 meters without any intermediate support; the demand of using mainly steel in reference to the industrial tradition of Bilbao; the geotechnical conditions, the bed rock appeared at 26 and 15 meters depth in both abutments and the ground were alluvial-fills, deep foundations were needed; the requirement to respect the 500 years' flow pass under the deck; and the expectation to have the maximum visual permeability and formal integration with the urban environment.

Those main constraints define the conceptual scheme of the bridge: a slender, technological, symmetric, double-arch bridge.

https://doi.org/10.2749/stockholm.2016.2322