

San Benito Viaduct

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Summary

The San Benito Viaduct is a railway bridge over the Lérez River. It is in the Pontevedra – Cerponzons Section in the High Speed Atlantic Corridor, located near the city of Pontevedra, in the Northwest of Spain. The bridge is 171 m long and it consists of 3 spans: 57 m + 84 m + 30 m. It is a hyperstatic post-tensioned concrete structure: The superstructure is a variable depth single cell box girder, with a total width of 14,0 m. First, the side spans were built by means of a full shoring. After that, the central span, over the Lérez River, was erected using a segmental cantilever construction method, with cast in place segments, by means of a form traveller. Due to the presence of a tunnel following the viaduct, the last span is only 30 m long. Because of that the bearings in the abutment 2 were properly anchored to avoid uplift.

Keywords: Prestressing, cantilever segmental construction, railway, high speed, anti-uplift bearing

1. Introduction

The San Benito Viaduct, over the Lérez River, is in the High Speed Atlantic Corridor, Section: Pontevedra – Cerponzons, near the city of Pontevedra, in the Northwest of Spain. The total length of the bridge is 171 m and it consists of 3 spans: 57+84+30 m. The concept design of the bridge had to fulfil the following requirements: the bridge should be erected by means of usual construction techniques; it should comply with the environmental requirements (spanning the Lérez River without piers in the water) and bridge aesthetics friendly with the surrounding landscape. Besides the bridge cost should also be taken into account, avoiding a too much expensive structure.

2. Superstructure

The deck houses a double-track railway platform containing 10,10-m width of ballast, service sidewalks, and several devices for the installation of the railway at both sides, resulting in a total deck width of 14 m, that is normal in the high-speed Spanish railways

The cross section is a continuous post-tensioned concrete single cell box girder. The deck depth is variable following a second degree parabola. Maximum depth is 6,50 m, at piers, and minimum depth is 3,25 m at central mid-span and at abutments (figure 1). Thus the depth/length ratio is 1/13 at piers and 1/26 at central mid-span.



Fig. 1: Constant depth deck cross section

https://doi.org/10.2749/222137814814069372 Distributed by Structurae