



## Viaduct over Rego das Lamas

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### Summary

The viaduct over Rego das Lamas is part of the Lalín (Baxán) – Lalín (Anzo) section of the High Velocity Railway between Orense and Santiago, which remains under the jurisdiction of ADIF. The viaduct is designed as a 245 meter, composite concrete-steel structure that allows crossing of the railway tracks over the AP-53 motorway by 80 m bowstring span: two arches along with steel ties. Nine hangers made of Y1860S steel and formed with 150mm<sup>2</sup> strands connect every arch with its tie. The bowstring span has been erected over the highway by incremental launching from the construction yard into its final position over the piers 3 and 4.

**Keywords:** Bowstring, incremental launch, composite deck, high velocity, hangers

### 1. Introduction

The viaduct over Rego das Lamas is part of the Lalín (Baxán) – Lalín (Anzo) which is one of the sections of High Velocity Railway between Orense and Santiago. The viaduct is 245 meters long and is subjected to a horizontal radius of 7500 meters. The design of its cross section provides two lanes of railway tracks.

The span configuration of the viaduct has been highly restricted due to some particular project features. The railway alignment crosses perpendicularly the riverbed of the Río Lamas and the highway AP-53, being currently under service, which is skewed by an angle of 46,5° in horizontal plane. Therefore, the distribution of the spans is to a large extent restricted. It is required to maintain the transversal clearances of the motorway and to provide a necessary servitude zone for the riverbed and riparian vegetation.

Because of the mentioned reasons it was crucial to consider an 80 meter span to avoid placing an intermediate pier in the center of the motorway and to affect as little as possible the embankments of the existing road. Furthermore, the existing distance between the shoulders of the motorway and the piers provide a sufficient transversal visibility avoiding the illusion of going through a tunnel.

It was also decided to build an 80 m composite deck with a steel box girder which has been incrementally launched to its final position in a short time in order to reduce the interruption of the ongoing traffic on the motorway.

Finally, the distribution of the spans has been adopted in the following way: 39 m + 45 m (crossing over the Rego das Lamas) + 45 m + 80 m (crossing over the motorway with a deck suspended to the arch) + 36 m.

The fix point for the horizontal forces has been placed on the abutment no 2, maintaining the classical solution of tying up the structure to one of the abutments.

The incremental launching of the arch on the mobile platforms to its final position was the first maneuver of such magnitude and characteristics at that time in Spain.