



## Almonte Viaduct. Construction Process

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### Abstract

The Almonte Viaduct is a huge challenge for those who have been involved in the construction of this singular structure. Never a viaduct like this was built for a railway line. New construction processes and techniques have been implemented during the construction of the different elements of this gorgeous viaduct. This article describes the most notable aspects during the construction of the bridge.

**Keywords:** Concrete arch bridge, railways arch bridge world record, construction with a temporary cable stays system, self-compacting concrete, singular viaduct, specific form traveller, high speed railways viaduct.

### 1 Introduction

The Almonte viaduct is located in the west of Spain close to the Portuguese border, in Cáceres province. The viaduct is situated within the Embalse de Alcántara- Garrovillas section in the Spanish Madrid-Extremadura high speed line that ADIF AV (Administrador de Infraestructuras Ferroviarias. Alta Velocidad), the Spanish high speed railways authority belonging to the Development Ministry is building since 2009. The section will be part of the European Madrid-Lisbon High Speed Line that will join both neighbour countries. The HS line passes through a very important environmental value area within the corridor indicated by the Environmental Impact Statement and in parallel to the Alcántara reservoir where two important rivers, Almonte and Tagus, flow into.

The terrain close to the Almonte mouth is a hilly area with lots of deep valleys with gradual slopes. The construction of the Alcántara dam, around 1960, caused that both river banks were highly flooded expanding the river width up to 400 metres in several areas. The corridor indicated by the Environmental Impact Statement crosses the Almonte River in an area where the river width goes up to 340 m. The Environmental Impact Statement indicates that the riverbed cannot be affected by any HS line element. To tackle this issue ADIF AV entrusted to the Joint Venture formed by the Spanish designers IDOM and Arenas & Asociados the design of the section where is located the Almonte Viaduct. The specific viaduct design was carried out by Arenas & Asociados and was finished in December 2009. A concrete deck viaduct with a 384 meters lower concrete arch was designed. Once built, it will become the longest arch viaduct for railways and the third longer in the world considering concrete