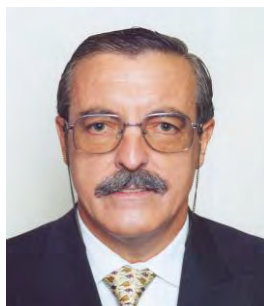


Bridge E-8 in the New Railroad of High Velocity to the Northwest of Spain

Carlos Jurado
Civil Engineer
(PhD in course)
Madrid, Spain
cjurado@recol.es



Carlos Jurado, born 1955, received his Civil Engineering degree from the Polytechnic University, Madrid (UPM), Spain. Director of Ingecal Ingenieros. Professor at UPM.

Summary

During the years 2001 and 2007 it has been constructed in Spain the new railway line of high speed, that connects Madrid with the north and northwest of Spain.

This paper exposes one of the more singular bridges in the area near to Madrid between the kilometre points 104+800 and 108+832 including the project and the construction of the bridge E-8, called in Spanish “in pergola”, over the existing railways that connects Madrid with the city of Alcobendas and Madrid with Segovia in the north of Spain.

The project of the bridge was realized by means of a three-dimensional finite element model made with the program SAP2000N that includes all the elements of the structure.

The project of the bridge was realized during the year 2004 and the construction of it during the years 2005 and 2006. Finally during years 2006 and 2007 was made the construction of the superstructure (railways, catenaries, etc) and put in service to the public the 23rd of December of 2007.

The construction was realized without stopping the traffic of the existing trains from Madrid to Alcobendas and from Madrid to the north of Spain.

Keywords: Bridge, piles, abutment, prestressed concrete, railway, foundation, deck.

1. Introduction

During the year 2001 to 2007 it has been constructed in Spain the new railway line of high speed that connects Madrid and Valladolid, with a length of 179,6 kilometres.



The time estimated to cover the distance is 50 to 55 minutes, which supposes an average speed of 215 kilometres per hour, but the railway platform is prepared to reach 350 kilometres per hour.

The cost of the works has ascended to 264,8 million of Euros.

Between the singular structures that there is present in the nearest zone of Madrid in this line of high speed, is the bridge E-8, called in Spanish “in pergola” type, to solve the crossing with the line of suburban rail network in service, which joins Madrid with the near city of Alcobendas.

Figure 1: Aerial view of the crossing between the new and the existing railways