

## Riudellots High Speed Line Bridge

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### Summary

Riudellots's Bridge is a railway structure located in Catalonia (Spain). The structure combines stiffness conditions with a sense of lightness, by a truss system with a variable depth. The bridge has an important skew and has a special lateral span to avoid any interference with the comfort of the railway traffic.

**Keywords:** bridge, truss, railway, vibrations, damper, skew.

### 1. Introduction

The high-speed line bridges should be robust structures in order to fulfill the comfort passengers and ballast stability conditions. The high-speed line between Barcelona and the French border cross an important highway, with a large skew  $34^\circ$ . The resultant bridge has two spans of  $53.00 + 53.00$  m. The high visibility of the structure from the highway, the importance of span and strong deformational constraints imposed by the railroad, led to a bridge with two lateral variable steel lattices. The structure combines stiffness conditions with a sense of lightness.

### 2. Conceptual design

From the initial stages of the design, it was considered to make the lattices with a parabolic shapes converging toward the central node that was capable of giving the necessary continuity in bending moments and would lead compression forces naturally to the central support.



*Fig.1: General view of the railway bridge*

To break the visual mass of the upper and lower chords, lateral cells were used, creating edge lines dividing in two the side elevation viewed from the board and the top chord of the beam.