



## Sant Julia de Loria bridge, in Andorra. Structural design.

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### Summary

The Bridge of Sant Julia de Loria, in Andorra, is part of the variation of the CG1 road, main entrance from Spain. SIGMA99 company is in charge of the junction engineering project and has entrusted AMATRIA with the structural design of it. The bridge is a geometrically complex structure resulting from the connection between the portals of tunnels of Tapia, currently under construction, and Grau Vell, planned for future action. The bridge also crosses the Grand Valira River and the existing CG1 road. Three slip roads connect the bridge to the road. So the bridge, or structure, has 11 spans, 7 columns and 5 abutments, with spans between 15 and 50 m. The bridge, without expansion joints except at the 5 abutments, behaves like a spatial structure where two-dimensional behaviour is significant. The deck surface is approximately 3.600m<sup>2</sup>. It is developed over an area of approximately 165 m by 75 m.

**Keywords:** *composite bridges; multicellular steel box girder; branched piers; steel; concrete; spatial bridges.*

### 1. Bridge description.

The defined structure is a bridge of 11 spans with a total extended length of 340 m, an approximate area of 3600 m<sup>2</sup>. Spans are compressed between 15 m and 50 m and the deck width varies between 9 m and 40 m. The layout of the bridge is complex, having three slip roads that connect the CG1 main road with its future diversion through the tunnels



Fig. 1: General view