



## STEEL-CONCRETE COMPOSITE BRIDGES: OPTIONS AND DESIGN ISSUES

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### Abstract

A variety of concepts for the design of steel concrete composite bridges exist. However, standard solutions for plate girder and box girder decks, have to be modified to deal with curved bridges or wide decks. Besides, steel concrete composite decks, may be interesting solutions for example when double decks for road - rail bridges are the selected option.

Extension to prestressed steel-concrete composite decks or extradosed prestressed decks, with webs made by folded plates, may offer interesting alternatives.

Developments, based on the author design experience, are discussed. Two recent design cases of curved composite box girder bridges, one recently built with a main span of 54 m and other currently underdesign with a main span of 139 m are discussed, namely in what concerns design options to avoid transverse prestressing for wide decks. Design issues related to shear resistance of the deck slab and the transference of transverse shear and torsion flow actions for the diaphragms, are discussed.

A recent design for a long railway bridge, with 2,7 km, over the Sado River in Portugal (construction expected to be initiated during 2007) is referred. The typical spans with 45 m are made of composite plate girder decks and the main bridge, with 3 spans of 160 m, are bowstrings with a composite box girder with axial suspension.

Finally some recent design studies for the new crossing of the Tagus River in Lisbon, a 7,3 km long bridge for rail or rail-road traffic, including the TGV lines, are referred. The main bridge is a cable stayed bridge with a main span of 600m and a steel-concrete composite deck.