Genil river Bridge

Granada, Spain / 2007

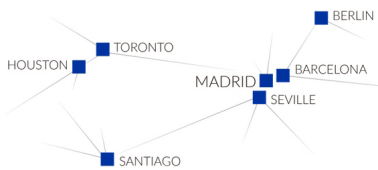
Structural type	arch bridge of 31,00 m span with composite deck and steel arch
Client	Dragados
Constructor	Salvador Rus López Construcciones

The structure of the project consists of a composite deck, a steel arch with a single span of 31.00 m between supports, five closed galfanized steel cables and load-supporting reinforced concrete abutments. The total width of the structure is 14.00 m, divided into a central part of 9.00 m for road traffic and two 2.50 m lateral parts for pedestrian use.

The longitudinal load-bearing mechanism of the deck is a central steel core of 9.00 m width, as a result of the connection of two trapezoids, and of 0.42 m maximum depth. The thickness of the steel plates vary between 15 and 20 mm. The upper concrete slab which crowns this box is of 0.18 m thickness, so that the total maximum depth at the axis of the structure amounts to 0.60 m.

In order to complement this longitudinal mechanism which directly takes on the loads coming from road traffic – the width of 9.00 m coinciding with the one attributed to road surface with a variable separation ranging from 1.81 to 2.43 m, ribs of triangular cross-section and 2.50 m length in respect to the exterior limits of the box have been projected. This transversal mechanism takes on the eccentric pedestrian load and transfers it to the central box. Thus, the resulting transversal section is optimal as it minimizes the dead loads of the deck, above all in the outer areas of the axis of the structure (plan of hangers), being especially efficient to resist combined axial, shear and torsion forces.

The steel arch is of variable section, including circular shape and a square transversal section. Its sag of 5.10 m leads to a sag-span ratio of 1/6. At springs where the bending moment is the heaviest load, the dimensions of the diagonals are 0.37 x 1.35 m whereas at key where the axial force is predominant these dimensions are of 0.83 x 0.35 m. The transition between both sections is practically linear so that the total area of the section remains practically invariable, too. The thickness of this structural element is of 30 mm at springs and of 25 mm at the central section.



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