OVER THE RIVER CONGOST

JOAN CAMPS FOOTBRIDGE

Granollers. Spain.

The Joan Camps footbridge, with its 29.95 metre main span, is an example of how, with a holistic approach during the concept stage and a special care on the details, it is possible to achieve a highly esthetical design and excellence in construction with a limited budged. With this footbridge the city not only has obtained a new crossing but a new place for citizens to enjoy the green strip the river provides.

The river Congost divides the city of Granollers in two parts. The city centre is located on the left-hand bank of the river while the right bank is mainly occupied by the industrial area. In order to prevent cars from entering downtown, the City Council wanted to make available the car parking places available on the industrial area for people going to the city centre, chiefly on weekends. Due to that, in 2004 we were commissioned to design a new footbridge over the river to provide a new link between both sides. The construction started in December 2006 and it was open to the public at the end of July 2007.

The general design of the footbridge was conditioned by the presence of the flooding walls, whose top level is 1.20 metres above the bank level. We designed a Corten steel deck formed by two longitudinal beams linked together at their bottom flanges by transversal I shape beams. Setting out most of the structural depth of the main girders above the level of the deck paving, we got the maximum clearance reducing to the minimum its height and, therefore, the length of the ramps on the approaches. Corten steel was chosen due the beauty of its surface and because, in spite of its low maintenance feature, its appearance improves through its life.

In order to give transparency to the parapets and, therefore, provide pedestrians with better views over the river, the main girders are Warren trusses. They have a slight curved shape in elevation and their depth varies, being maximum at the centre of the main span and minimum at the ends. The web members of the truss project beyond the lateral plates of the chords emphasizing its zig-zag shape and providing the trusses with an interesting play of shadows, one of its most characteristic features.

Since the upper chord of the truss has no bracing, in order to prevent it from lateral buckling, we improved the torsional stiffness of the bottom chord by giving it a hollow box shape, reinforced the lateral stiffness of the web members and increased the width of the top chord, to which we gave an inverted U shape. The later allow enough room for the light lamps to be embedded on it. We chose high efficiency low maintenance LED technology lamps installed on each of the bays of the truss. This solution not only provides an agreeable street lighting along the crossing, but, by means of the combination of light and shadows, in the night it highlights the beauty of the structure.

Taking into account future needs, below the wood paving eight galvanised steel pipes were provided for utility services to be installed in the future. The transversal beams that link the two main girders have eight holes to allow pipes to pass through them. Easy accessible chambers at each of the abutments facilitate the access to the pipes.

The design of the piers had to give response to multiple requirements. The environmental agency wanted the piers to be very slender to reduce to the minimum its influence to the water flow during the characteristic flash floods of this river. On the other hand, since the main girders are set out at the ends of the cross section of the deck, the piers had to be wide enough to provide a safe support to the footbridge. The response was a pier composed by two elements: a stem and a capital. The stem, made of concrete, has a highly hydrodynamic profile and is very slender, the top of which is above the maximum flood level. At its top, a Y shape Corten steel capital provides support to the deck by means of the bearings set out at each of the two arms of the Y. The result is a pier with a very structurally efficient design and beautiful aesthetics.

Over the deck, a wooden decking has been placed over longitudinal joists supported by the transversal beams. We thought that wood is a warmer material in contrast with the coldness of the steel of the structure. On the ramps and stairs of the approaches granite stone slab paving has been provided. The handrails over the deck follow the inclined shape of the web members of the truss. To prevent people from falling down from the deck, longitudinal stainless steel cables passing trough the web members have been installed.

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