



Pedestrian bridge 'San Juan de la Cruz' over the Carrion river

Palencia, Spain / 2004

Structural type
Characteristics
Owner
Client
Scope

cable stayed pedestrian bridge, curved in plan, 70.7m span
70.68 m of span
Aguas del Duero
Payd / Copasa
detailed design and construction support



The San Juan de la Cruz footbridge connects the left riverbank of the River Carrión with the Islas Dos Aguas sports area. The footbridge has a span of 70.68m, a radius on plan of 45.00m and is 3.00m wide. The deck of the bridge consists of a triangular steel section 0.60m in depth and 3.0m in width. The steel plates of the deck are 15mm thick in the area close to the abutments whilst the remaining are 10mm thick. The deck has transversal diaphragms every 22.09 m and is suspended at five points, with a span sequence of 8.83 + 13.24 + 13.24 + 13.24 + 8.83m.

The tubular suspension mast is placed on the concave side of the footbridge. It is 18.00m high and consists of a circular steel section with an external diameter of 508mm and a thickness of 25 mm. The transversal stiffening of the upper zone of the mast avoids loss of shape as a consequence of the axial force transferred by the cables. This is achieved with the help of a solid steel cylinder placed inside the mast which has a diameter of 160mm and a height of 1.00m.

There are five front cables and two back stays which act as counterweights. All cables are closed, the so-called "full-locked coil rope" type with a diameter of 34mm for the front stays and 40mm for the back stays. The latter ones are anchored to a solid concrete block of 4.50 x 4.50 x 2.50m³, founded on three vertical micro-piles 180mm in diameter.

The foundation is composed of micro-piles designed for a service load of 75T. The inclination of these micro-piles is able to absorb the horizontal components of the forces which are generated by the footbridge. The maximum inclination of these micro-piles is 25°.

The mast is founded on a pile cap consisting of six micro-piles and two buttress braces. These buttress braces join the foundation of the back cable and the foundation of the mast. They have a depth of 1.00m and a width of 0.50m and transfer the horizontal component of the back cable stays.



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