Bridge over Vigo estuary

Cangas-Vigo, Spain / 2007

Structural type	suspension bridge
Characteristics	main span 1500 m, total length 2700 m
Client	Xunta de Galicia

The bridge will connect the City of Vigo with the Morrazo Peninsula with the aim to alleviate the already saturated traffic network in the area especially the Rande bridge. It will begin in the southern area of the duty-free area of Vigo Port and will end up on the Northern Side near Punta Rodeira on the Mozzara Peninsula. The proposed structural solution is a 2,700m long suspension bridge, with a 1,500m central span which will allow current sea traffic maneuvers with a horizontal clearance of around 300m and a free height clearance greater than 50m. The transversal cross-section employed in this solution is 43.0m wide which accommodates a 3-lane motorway and two tracks for a light railway which imposes a 4% longitudinal slope limitation on the deck.

The main piers have their foundation levels established at -22m on the Vigo side and -9m on the Cangas side, which are both technically viable as well as being economically acceptable.

The main cables are continuous from the anchors blocks which are located at both extremes. The blocks work by gravity and therefore anchor themselves by gravity load, hence obtaining sufficient friction to anchor the stretch of the cables through the elevated weight of these elements.

The central piers have to be able to offer longitudinal stiffness to the main cable, otherwise, the vertical deformation values of the cable and deck would be unacceptable. For this reason the pier section has an A-Shape.

Only two expansion joints have been foreseen to be placed in the areas of the anchor blocks. Shock Transmitter Units shall be placed in both these areas which will transmit longitudinal forces between the deck and the abutment-anchor block. These shock absorbers permit a reduction in the horizontal deck deformations due to asymmetric positional overloads, therefore reducing the need for expansion joints.

The deck is supported vertically and horizontally on the anchors, whilst it does not support vertically on the main piers it does support transversally on piers and abutment-counterweights.

The box cross section has been chosen so that it combines the necessary structural requirements along with aerodynamic needs. The combination of a closed trapezoidal-shaped box girder with a high stiffness towards torsion along with the rise/span ratio foreseen in the main cables, will assure a critical high speed flutter as has been established in the calculations performed.

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