

Bridge

DESIGN & ENGINEERING

Tokyo triple

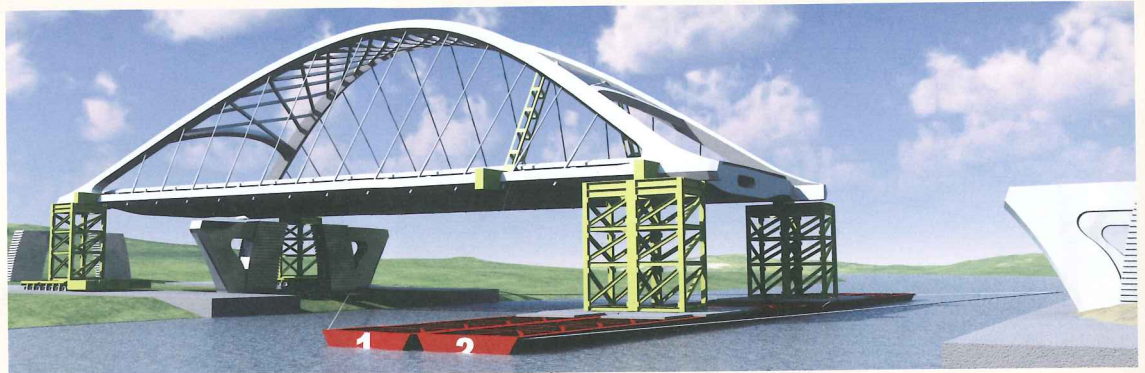


Deck girders serve a double purpose

Construction of a new bridge over the river Miño in the town of Lugo in Galicia, north west Spain, has just begun, and an unusual installation method is planned for the main span. Girders designed for the approach spans will first be used as barges to carry the arch across the river.

Traffic currently uses a Roman bridge that restricts the passage of heavy vehicles and requires an alternative option for two-way traffic. In 2008 the Spanish Ministry of Public Works commissioned consultant Técnica y Proyectos (TYPSA) to complete the final design. The contractor is FCC and the installation scheme has been designed by specialist subcontractor ALE.

The need to reduce the impact on the environment, in particular on the banks of the river, were one of the main criteria for the design. For this reason a 95m-long span bowstring arch bridge was chosen for the main crossing of the 65m-wide river, along with 50m-long approach spans. The deck of the approach spans is



composite, and consists of two steel box girders with a concrete slab.

The structural system of the main section consists of a pair of inclined arches with a deck that simultaneously connects the two arches and hangs from them by means of 12 pairs of cables. The deck has two longitudinal girders and a succession of transversal ribs.

A complex metal lattice was designed to link the two arches. Straight rods define a surface that is similar to a hyperbolic paraboloid, confined by both arches and by two much stronger cross-bracing

beams that effectively prevent the arches from buckling.

The inclined planes of cables are designed to guarantee torsional resistance, and together with the deck ribs assure the aerodynamic stability of the structure.

The intention is to assemble the arch on the west bank, where the steel structure of the approach span girders will also be assembled independently.

After the arch, the main deck and the stays have been assembled and the stays initially stressed, the arch section will be

raised and its four corners placed on temporary towers that will each rest on a platform of self propelled modular transporters. These will carry the arch to the river where the leading edge will be placed on towers on the girder barges and guided across the river by a system of crossed cables. Once the process is complete, the girder barges will be installed on the approach spans.

The cost of the main bridge is US\$15 million and the cost of the complete structure is US\$29 million. The works are expected to be finished in April 2011. ■

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