THE CABLE-STAYED BRIDGE OVER THE PO RIVER

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ABSTRACT

The new High Speed railway linking Bologna to Milano crosses the Po with an 11 Km long viaduct, the most important of the new line, in a section where the distance between the main embankments is 1.2 Km, 400 m being necessary to cross the ordinary riverbed.

Three types of structure are present in this part: (i) the cable stayed bridge, (ii) 12 simply supported 45 m decks in the right bank and (iii) two continuous p.c. box girders, built by cantilevering method, necessary to overpass the main embankments

The decks are subdivided in such a way that two joints in the rails resulted necessary. They will be the only exception along the whole line.

The cable-stayed bridge has a 192 m central span and two 104 m long side spans; it will be one of the largest P.C. bridge in the World for H.S. line.

The deck is a p.c., 4.50 deep, continuous box girder, and the towers are 60 m high from the footings. The stays are made of zinc-coated, singularly greased and sheeted strands, whose number for each stay varies from 55 to 91. The foundation of each tower is supported by 28 piles, 2m dia and 65 m long.

Special studies for the vibrations and the track-structure interactions were necessary, the design speed being up to 350 km/h. Many tests have been carried out to validate the numerical models:

- two loading tests over the 65m long piles, 18000 KN being the design load;
- a 1:2 scale model of a segment of the p.c. box girder, statically tested on the yard by the Laboratory of the University of Rome “La Sapienza”;
- a full scale model of a steel segment of the tower, tested at fatigue in the Joint Research Centre of the European Community at Ispra;
- fatigue tests on three stays, anchorage included, tested in the same JRC of the EC.

The bridge is actually under construction and will be completed in 3 years.