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2. Advanced Methods for Cable-Stayed Bridge Erection (Belgium)

Owner: Ministry of Public Works
Engineers: Bureau d'études R. Greisch
Service dates: Lanaye – April 1987
 Ben Ahin – May 1989
 Wandre – April 1990

The Lanaye Bridge: composite system

The bridge (Fig. 1) is of the unsymmetrical cable-stayed type with an inverted Y shaped pylon and two layers of 15 cables supporting a reinforced light concrete deck.

The main span over the canal is 177 m long, prolonged by a 55 m long span and a balancing abutment.

The deck is composed by a concrete box 1.60 m deep and two steel girders.

The lower plate of the box, cast in a fixed formwork, is brought into its permanent position by slipping, hanging from the two steel girders supported by the cables.

The Ben-Ahin Bridge: by rotation

The bridge (Fig. 2) is a cable-stayed one with only one pylon and one central layer of 40 cables (20 on each side of the pylon) supporting a partially prestressed concrete deck.

The total length of the bridge is 341 m. The balancing cantilever, which is 128.5 m long, bears on 3 supports on the left bank. The main span over the river Meuse, 168 m long, is extended on the right bank by a 42 m long span.

The pylon is 93.5 m high. It is shaped like an inverted Y, the lower arms of which are turned-up and embedded in a single concrete footing.

A cross beam connects the arm elbows and resists the thrust. This beam also supports the deck.

The deck is composed of a concrete box girder 21.8 m wide and 2.9 m deep with steel bracings inside.

The two cable-stayed spans – 296.6 m long – have been built on the left bank in a direction parallel to the river, by using a complete scaffolding. After erection and adjustment of the cable forces, the construction has been rotated 70° about the pylon axis and brought into its permanent position; the continuity with the 42 m span cast in situ on the right bank has then been executed. The weight to be rotated exceeded 16 000 tons.

The Wandre Bridge: by launching

The bridge (Fig. 3) is a cable-stayed one with only one pylon and one central layer of 38 cables (19 on each side of the pylon) supporting a partially prestressed concrete deck.

The total length of the bridge is 524 m. The main span over the river Meuse is 168 m long, prolonged by a 66 m long span. The balancing cantilever over the Albert canal is 144 m long. The two main spans are separated by a small 30 m long span. On the left bank, the cable-stayed bridge is prolonged by four small spans.

The pylon is 100 m high. It is shaped like an inverted Y. Each leg is embedded in a concrete footing resting directly on the rock. The deck is composed of a concrete box girder 21.80 m wide and 3.40 m deep with steel bracings inside.

It is erected in fixed formwork on the left bank of the canal and brought into its permanent position by launching.

The cables are composed of a stainless sheath enclosing the galvanized parallel wire strands individually protected by a PEHD sheath injected with epoxy-bray.

(J. M. Cremer)

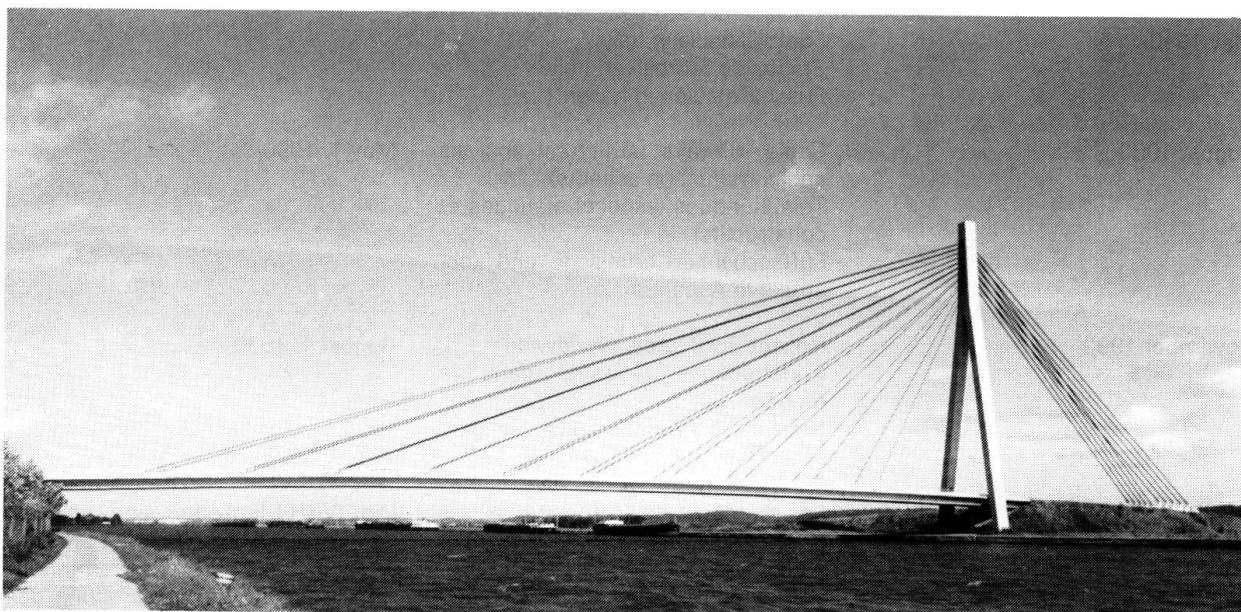


Fig. 1: The Lanaye Bridge



Fig. 2: The Ben-Ahin Bridge

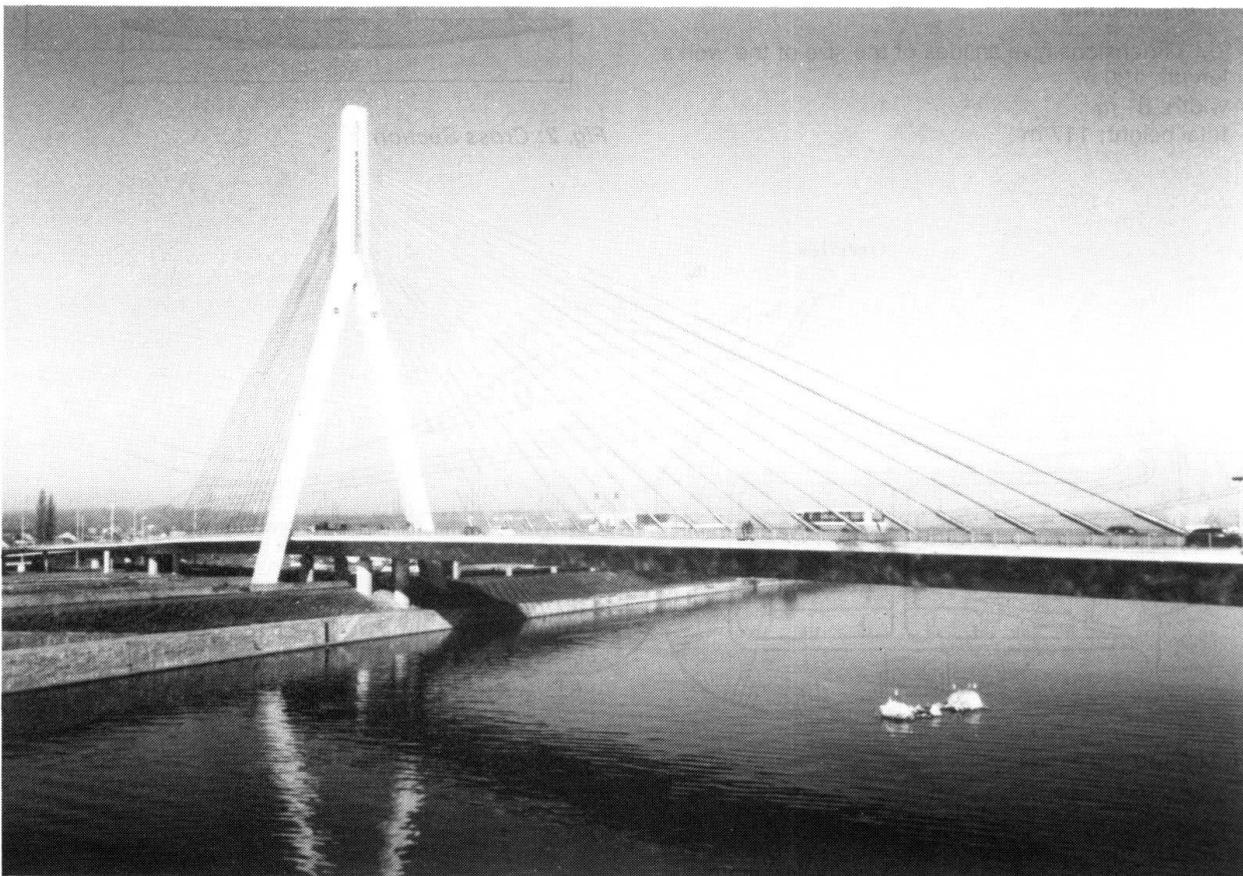


Fig. 3: The Wandre Bridge