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Railway Bridge with Double Composite Action across River Main

Pont-rail en structure mixte sur le Main

Eisenbahnbrücke mit Doppelverbund über den Main

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DESIGN

The double track railway bridge across the River Main at Nantenbach will link the new highspeed railway line Hannover-Würzburg to the existing trunk line Würzburg-Aschaffenburg. Due to local conditions, the bridge has a main span of 208 m, a slope of 12.5 ‰ and a radius of 2650 m.

Based on the investigation of numerous alternates, a continuous truss girder with spans of 83.2 – 208 – 83.2 = 374.4 m was found to be the best solution from economic, ecologic and aesthetic point of view, Fig.1, 2. The construction depth varies between 8.5 m at ζ and the abutments and 16.5 m at the main piers, corresponding to slenderness ratios of 1:24 and 1:13, respectively.

The cross-section, s.Fig.3, consists of

- the truss girders in a mutual distance of 6.0 m and with a spacing of 10.4 m;
- the top slab of reinforced concrete, which corresponds to the »Rahmenplanung für Talbrücken« (Masterplanning for valley bridges);
- the bottom chord, of steel in the center of the mid span and of concrete at the piers and in the side spans. The concrete bottom chord limits economically the deformations and makes that fatigue considerations do not govern the dimensioning.

The steel weight is 3300 t or 620 kg/m².

CONSTRUCTION

The construction started in early 1991 and is scheduled to be finished in late 1993. The site spans will be erected on auxiliary piers. After pouring of the bottom chord concrete, the center part of the main span, with a length of 120 m and a weight of about 1100 t, will be floated in and lifted. After closure of the center joint, the top slab is poured from ζ towards the abutments.

ACKNOWLEDGEMENT

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Fig. 1: General Layout

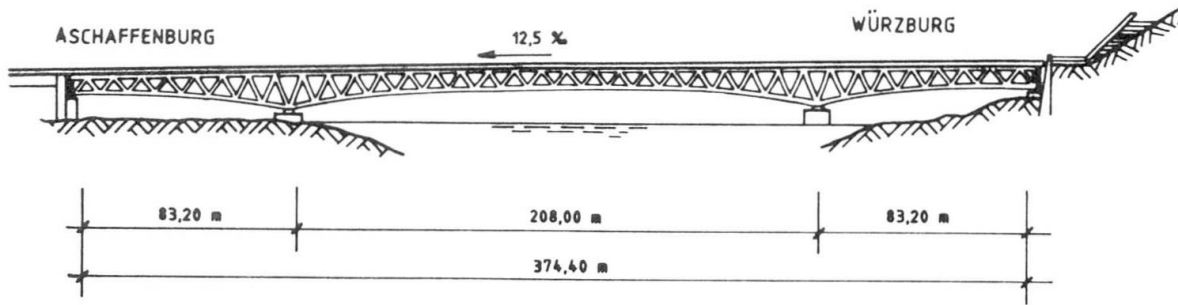


Fig. 2: Foto of model

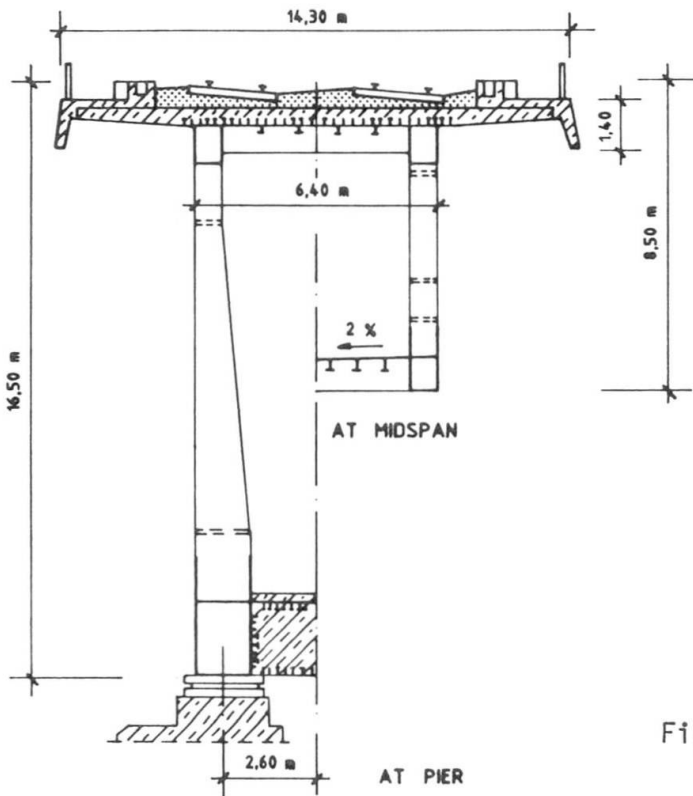
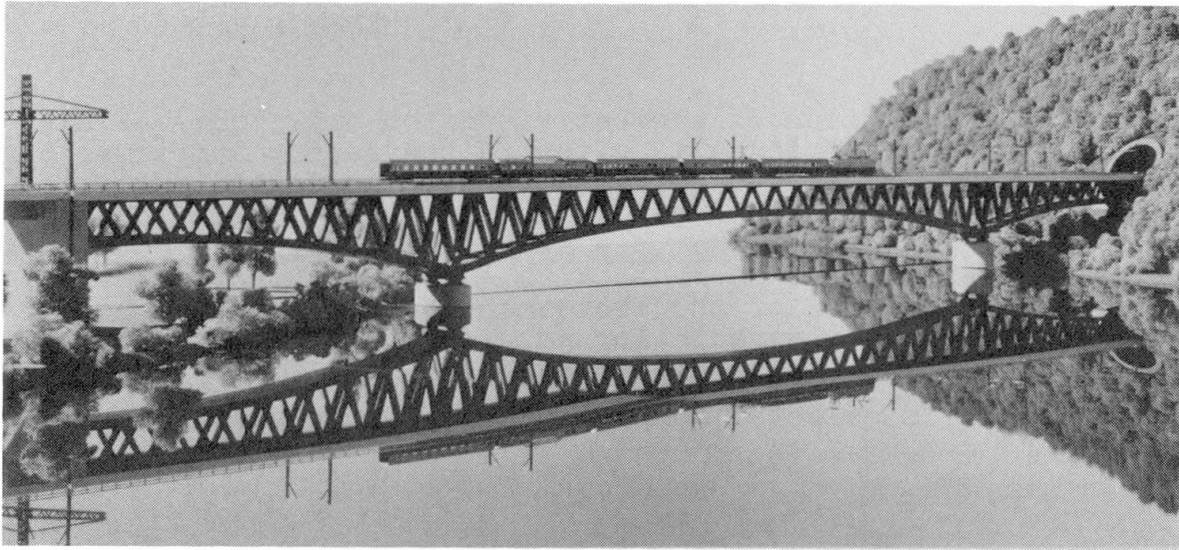


Fig. 3: Cross-section at ζ