

Zeitschrift: IABSE structures = Constructions AIPC = IVBH Bauwerke
Band: 13 (1989)
Heft: C-48: Structures in Portugal

Artikel: Côa Bridge, IP5, Guarda (Portugal)
Autor: Monteiro, V. / Vale e Azevedo, A.
DOI: <https://doi.org/10.5169/seals-21554>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 01.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>



3. Côa Bridge, IP5-Guarda (Portugal)

Owner: Junta Autónoma de Estradas
(Highway State Administration)

Engineers: Enarco Lda

Contractor: Zagope SA

Works duration: 24 months

Service date: 1987

Quantities of materials:

concrete	15 000 m ³
reinforcing steel	1190 t
prestressing steel	90 t

General

The bridge over the river Côa is placed on the main road IP5 and is located between Guarda and Vilar Formoso. It is 604 m long between the abutments and consists of 15 spans ranging from 35.5 m to 42.5 m. The bridge deck width is 14.46 m.

In plan the bridge fits into straight alignment about 456 m long, associated with a transition curve 600 m in radius and about 148 m long. Its side elevation shows a horizontal intermediate zone about 285 m long and two lateral stretches about 201 m and 118 m long, fitting into curves with 4500 m radius.

Design and construction

Taken into account the high clearance over the river and the bridge length, the structural solution adopted basically consists of a deck composed of precast girders of prestressed reinforced concrete, which were launched from the abutments by means of a special metallic launching girder. At each span the deck is formed of 6 longitudinal T beams, 35.5 m long, 2.0 m high and about 700 kN of dead weight.

During construction the deck is simply supported by the pier caps. In the following stages the deck continuity in transversal and longitudinal directions was ensured by transversal girders and slabs between the longitudinal beams cast in situ.

Due to the high number of precast girders it was necessary to have an industrial plant able to produce the girders in due time. In order to produce one girder every two days using just one special designed metallic mould, the following construction technique was used: precast the extremities of the girders in the anchorage zones; prefabricate the reinforcement including the prestressed cables; cast the remaining part of the girder against the precast extremities, accelerating the concrete hardening with temperature and humidity strictly controlled. This manufacturing technique allowed the un moulding of the girders 18 hours after casting and after applying about 60% of the final prestress; the girders were then removed to a stocking area where the remaining portion of the prestress was applied.

The ten central piers, whose height varies between 38 m and 93 m, have hollow octagonal cross-sections, maximum transverse and longitudinal dimensions respectively of 7.35 m and 3.50 m. Their headings present variable cross-sections with the maximum dimensions in plan of 14.16 m and 9.20 m, respectively in transverse and longitudinal directions.

The four lateral piers are geminated with solid square cross-section and heading is designed as a horizontal beam with variable cross-section.

The deck is fixed to both abutments and is provided with only two intermediate expansion joints, arranged in such a way that the central part of the bridge between the joints was symmetric with reference to the river centerline. Thus, three continuous deck stretches are obtained, the central one with the length of 297.5 m whereas the others are 153.25 m long.

The abutments and piers have direct foundations built in the granite formations.

(V. Monteiro, A. Vale e Azevedo)



Fig. 1 General view

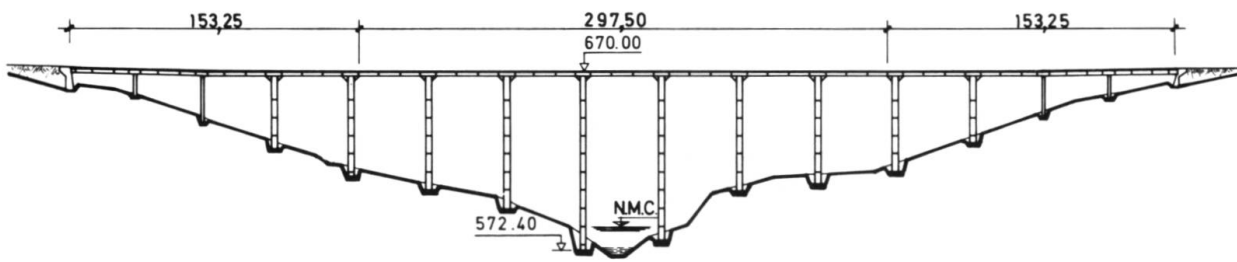


Fig. 2 Longitudinal section

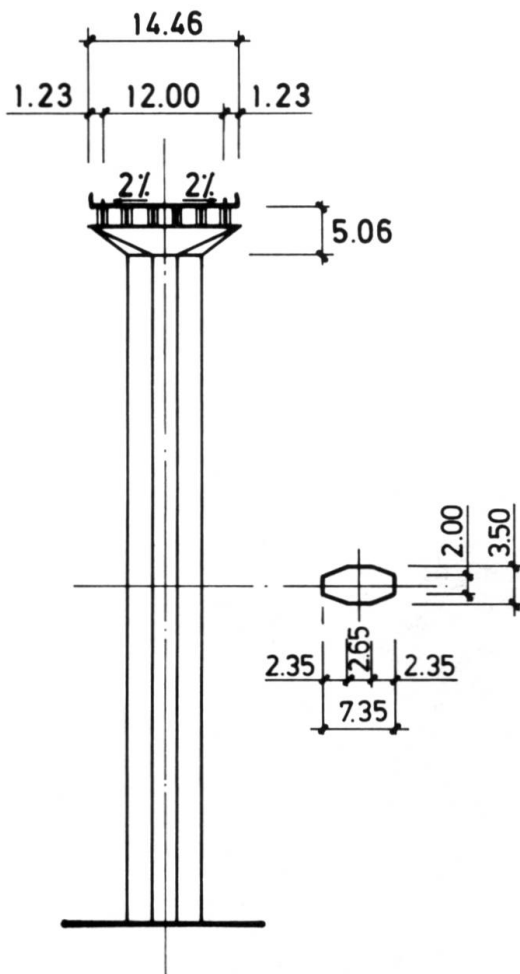


Fig. 3 Transversal section

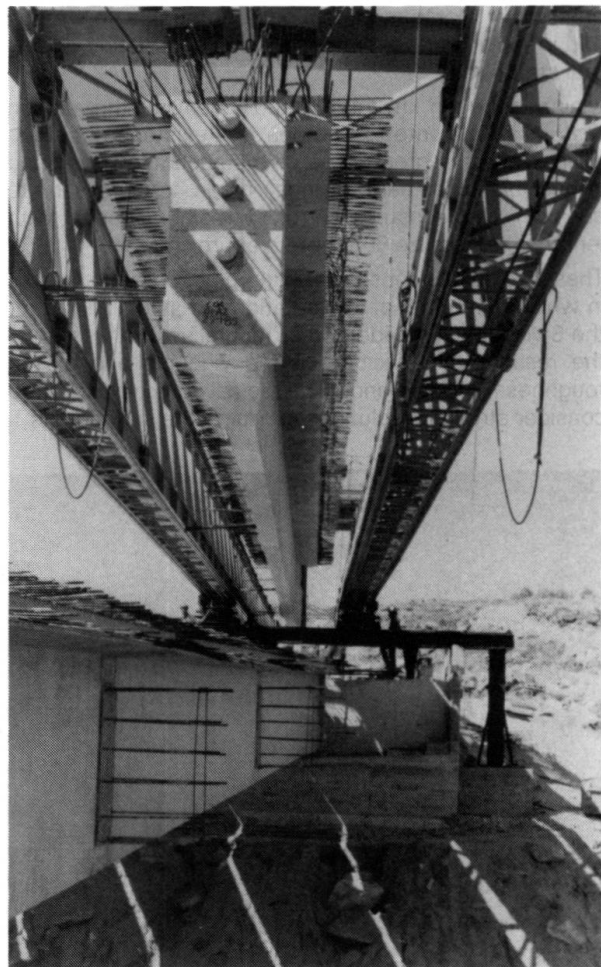


Fig. 4 Girders launching system