



TRANSPORTS - BRIDGES & VIADUCTS

Morreira's Viaduct

ABOUT

Morreira's Viaduct is a structure located at the A11 motorway, connecting Braga to Guimarães, in the Celeirós – Guimarães Oeste section.

The [viaduct](#) has a total length of 554 m, between abutment axes (35.0 + 11×44.0 + 35.0). The roadway consists of two carriageways, one in each independent deck. The decks have a width of 14.95 m and 16.20 m, respectively, on the left and right sides. Each carriageway includes the respective traffic lanes, shoulders and service walkways.

Structural solution

Each deck is composed of two beams, connected by intermediate slabs with 0.30 m of regular thickness. These slabs extend beyond the beams, in a cantilever, having a thickness of 0.20 m in the extremities. The intermediate slabs are thickened to of 0.50 m, near its support.

The adopted modelling of spans, combined with the height of the columns (maximum of 50 m and an average of 30 m), led to the use of a movable scaffolding system for the execution of the viaduct deck, span by span.

As requested by the contractor, the beams axes are rectilinear, even when the axis of the track develops in a curve. The slight changes of direction are concentrated in the columns alignments, where there are always cross beams.

The decks are continuous reinforced concrete structures, and longitudinally prestressed. The post-tensioned tendons were installed in the referred beams.

FACTS

Year: 2000-2002

Client: Ascendi

Services: Detailed design, Structural Engineering, Foundations design, Geological and geotechnical studies, Consulting and on-site technical support

TEAM

LOCATION

Braga-Guimarães, Portugal

Each deck is supported by abutments, in the extremities, and columns in the remaining alignments, always with the use of bearing devices.

The longitudinal beams have a 2.50 m height and a current width of 0.75 m (0.70 m at the base and 0.80 m at the slab connection), increasing linearly up to 1.45 m on the columns (1.40 m at the base and 1.50 m at the top).

There is a column per alignment and per deck. This column is the same for all alignments and for both decks. The column has a hollow rectangular section and its dimensions are 4.10 m x 2.60 m, with a thickness of 0.30 m.

The configuration at the top of the columns was conditioned by the scaffolding system used in the construction process. It was thus possible to execute the top of the T-pillar with a 10.10 m x 2.60 m lintel support. This support is solid and post-tensioned transversely to the axis of the viaduct. The overhang of this part is horizontal regardless of the deck superelevation. The gaps are absorbed by plinths, integral with the lintel supports.

The structural solution is identical in both abutments, and the possibility and convenience of choosing counterfort and open type abutments with all four counterforts aligned with the longitudinal beams of the decks. This scheme was suitable for the installation of the anti-seismic devices in both abutments.

MORE IMAGES

