Engineering Structures for Life

TRANSPORTS - RAILWAYS

High-Speed Railway track between Poceirão and Caia

ABOUT

Poceirão-Caia is the longest Portuguese segment of the Lisbon-Madrid new high-speed railway connection, promoted by RAVE – the Portuguese Authority for High-Speed Railways. It includes a double high-speed line for passenger traffic and a single conventional line for freight, with a stop, not far from the middle of the line, at Évora's station.

Viaducts

Due to the low track longitudinal inclination, and even if the terrain is relatively flat, the project counts with approximately twenty railway viaducts, of which six were studied by GEG, in a total of 2.500 m of railway viaducts.

The longest railway viaduct is 660 m long, with central spans of 40m, with a pre-stressed box girder deck. The box girder bridge was also applied to the other five railway viaducts considering that it was the most economical solution since the average height from deck to ground is of about 30 m. Each viaduct is composed by two separate decks, one for the high-speed lines and the other one for the conventional freight line, being consequently independent of each other, and working as two viaducts instead of a single viaduct.

FACTS

Year: 2009-2010
Client: Altavia Consortium
Services: Preliminary design, Structural Engineering, Foundations design, Bridge and Viaduct Engineering, Railway Engineering, Geotechnical Engineering, Soil-structure interaction analysis, Tender documents elaboration

TEAM

António Campos e Matos
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LOCATION

Poceirão-Caia, Portugal

There is also a roadway viaduct, serving A6 motorway and two secondary roads, in a total of eight lanes, which crosses railway lines. This viaduct, designed taking into consideration a possible duplication of the freight conventional railway line, was specified as a single segment reinforced and pre-stressed concrete superstructure containing a 120 m long and 47 m wide beamed slab deck, supported by three alignments of columns and

reinforced concrete abutments.

All the six viaducts and track embankments were specially designed for high-speed railways, and special attention was taken to the transition between embankment and viaduct's deck in order to ensure a correct, smooth and stable transition. To account for seismic actions, seismic dampers were specified on both abutments and an expansion joint acts as a fuse releasing the structure in case of an earthquake, to allow viaduct's structure, by behaving in a more flexible way, to dissipate as much energy as possible.

GEG took place in the tender's phase as member of a consortium and developed the required studies and designs to present a competitive proposal.