Gerald Desmond Bridge Replacement Project

Long Beach, Los Angeles, USA / 2011-2013

Structural type	composite cable stayed bridge - approach viaducts box girder built with MSS
Characteristics	Cable stayed bridge with a main span of 305m and approach viaducts with 70m spans built with MSS.
Client	Shimmick - FCC Construcción – Impregilo CJV
Constructor	FCC Construcción – Shimmick – Impregilo
Scope	tender design and detailed design

The new Gerald Desmond Bridge is placed in the Port of Long Beach and will replace the existing bridge, with the aim of increasing the vertical clearance over the navigation channel and improve the seismic behaviour.

The new bridge has a cable stayed section of 610m, with a main span of 305m over the navigation channel providing a vertical clearance of 60m. The single shaft towers are placed in the central reserve and have a total height of 105m, with two planes of stays connecting the top of the towers with the edges of the deck. The superstructure consists of two longitudinal steel girders placed in both edges with transverse beams spaced 5m and the stays anchored to the deck every 15m. The deck is made of lightweight concrete with a total thickness of 250mm. Viscous dampers are placed between the superstructure and the towers and the side piers both in longitudinal and transverse direction.

Each approach viaduct has an approximate length of 1000m, with expansion joints in the connection with the cable stayed section and spans varying from 55 to 70m. The total width of the superstructure varies from 14 to 26m.
The superstructure is made of single-cell and multi-cell box girders built with Movable Scaffolding System (MSS) combined with other spans built with falsework in those sections where the ramps connect with the main line. The piers of the approach viaducts have a height varying from 8 to 60m. The shorter columns are solid, while the taller ones are made of hollow sections. The connection between the piers and the superstructure is monolithic. The strategy adopted to resist the seismic action follows the traditional way used in California, consisting on dividig the viaducts in sections of four spans and considering the development of plastic hinges in the columns.

FHECOR participated in the Tender Design stage providing technical support to the contractors and performing value engineering. During the Detailed Design stage, FHECOR participated in the design of the approach viaducts superstructure in the team leaded by Arup. During the construction, FHECOR carried out the checkin of the MSSs used in the construction of the approach viaducts.

FHECOR

C/ Barquillo 23, 2° | 28004 Madrid | España
T. (+34) 917 014 460 | F. (+34) 915 327 864
www.fhecor.com | fhecor@fhecor.es