



Bridge over Virilla River in RN147

San Jose, Costa Rica / 2015-2016

Structural type
Characteristics
Owner
Client
Scope

Arch shaped composite structure
132,66 m total length distributed in 39,50 + 54,00 + 39,16 m spans.
CONAVI
UNOPS Costa Rica
detailed design



The new bridge over Virilla river in Costa Rica, inaugurated in August 2018 by the President and the Public Works Minister of Costa Rica, has allowed an increase in capacity of the National Route 147 at its crossing of the Virilla river improving traffic conditions of Radial Lindora.

This frame bridge consists of a concrete-steel composite desk formed by two "I" beams, with a total length of 132 meters, which span a distance of 103 meters over a canyon created by the Virilla river.

The geometry of the bridge has been conditioned by the orography of the canyon and by the construction limitations: high tension line nearby and existing bridge reducing available space. In order to minimize the affection of the bridge to the river, the placement of vertical supports on the deepest part of the canyon was dismissed.

A frame solution with inclined supports was decided based on the good terrain conditions with advantages over the arch solution since, in the first place, the elements to be lifted and rotated have smaller dimensions, which implies reducing the risk of impact with the existing high tension lines. Secondly, in frame solutions, there is a low number of joints to be executed on site, which provides a shorter execution time. Inclined piles are made up of two reinforced "double-T" beams, with an excentric EBF bracing which allows the formation of plastic hinges in the longitudinal direction in case of an extreme earthquake.

The construction method of the bridge, built in parallel to the existing one, started with the placing of piles in a vertical position and their subsequent flip needed to reach their final position. After that, a 60 meters long deck section was launched from each side on top of an auxiliary structure. Following the execution of the pile-deck connection, the central 12-meter dowel was placed from the existing bridge.

FHECOR Ingenieros Consultores has developed the Construction Project of this bridge, managed by the United Nations Office for Project Services (UNOPS). COPISA has been in charge of the execution works, financed by the Central American Bank for Economic Integration (BCIE). Steel works have been developed by STEEL-CMS while ALE-HEAVYLIFT has been in charge of lifting operations.



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