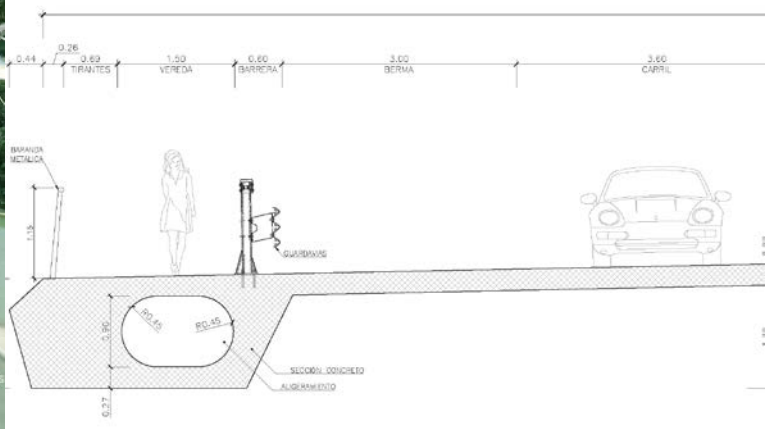
Ashaninca Bridge, Peru

Wind Engineering Study



Client: Oritia & Boreas, Spain	*Year Tested: 2015 (Honda Bridge, Colombia)*	*Total Length of Bridge: 1010 m*
Pylon Heights: 90 ~ 96 m	*Deck Width: 20.2 m*	*Deck Section Model Scale: 1 to 40 (Honda Bridge)*

The Project

The Ashaninca Bridge is a cable stayed bridge, which has a total length of 1010m, with 3 main spans and 4 towers. The tower heights range between 90 and 96 m. The deck cross section is the same as that of the Honda Bridge in Colombia, which was tested in the Boundary Layer Wind Tunnel Laboratory in 2015. The deck width is about 20.2 m. Since the deck configuration of the Ashaninca Bridge is the same as that of the Honda Bridge, the wind tunnel test results of the Honda Bridge were used in the current analysis.

This desktop study of the wind flutter and buffeting analysis as well as the Equivalent Static Loads on the Ashaninca Bridge was a joint effort by the Boundary Layer Wind Tunnel Laboratory and the Oritia & Boreas, with the analysis performed in the Boundary Layer Wind Tunnel Laboratory at the University of Western Ontario. The aerodynamic information of the bridge deck has been adopted from the wind tunnel study performed by the Boundary Layer Wind Tunnel Laboratory in 2015.

The Wind Tunnel Studies

A primary objective of the desktop study was to use available aerodynamic information from tests of a similar bridge in the Laboratory to investigate the aeroelastic stability of the bridge in high wind conditions and to define the wind speeds associated with possible flutter instability and vortex shedding induced oscillation. The investigation was also intended to define the dynamic response characteristics of the bridge to turbulent wind over a full range of wind speed and to provide information on the equivalent static loads for the design of the bridge against wind effects.

A 3-D multimode analysis was employed, which integrates the findings of the experimental study (Honda Bridge) with the dynamic modes and frequencies of the structure. Another major output of this analytical study is the equivalent static wind loads, which are used to verify and improve the wind load distributions used for design of the Ashaninca Bridge.

The Boundary Layer Wind Tunnel Laboratory

The Boundary Layer Wind Tunnel Laboratory
The University of Western Ontario
Faculty of Engineering, London, Ontario
Canada, N6A 5B9 Tel: (519) 661-3338 Fax: (519) 661-3339
Internet: www.blwtl.uwo.ca E-mail: info@blwtl.uwo.ca

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