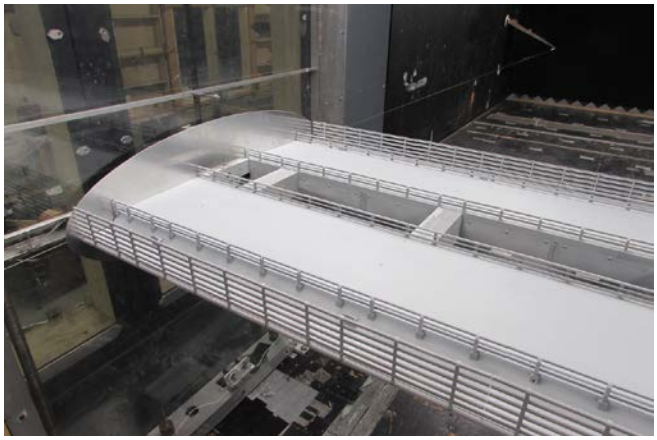
The Çanakkale Bridge, Turkey

Wind Engineering Study



Owner: Ministry of Transportation, Maritime and Communication, General Directorate of Highways	*Design: DLSY Joint Venture*	*Year Tested: Oct 2017 ~ Jan 2018*
Length: 4.608 km	*Main Span: 2023 m*	*Deck Width: 45.06 m*
Pylon Height: 318 m	*Main Span Deck Width: 45.06 m*	*Section Models: 1 to 60 scale*

The Project

The 1915 Çanakkale Bridge project is approximately 4.608 km long from start of the approach bridge on the European Side to the end of the approach bridge on the Asian Side, and connects the cities of Sütlüce and Lapseki across the Çanakkale Strait in Turkey. Upon completion, it will be the largest suspension bridge in the world with a main span of 2.023 km. The relative lengths of the spans of the bridge (side span – main span – side span) are 770 m – 2023 m – 770 m, respectively. The deck is separated into twin boxes with a gap of 9 m and connected by cross-boxes with a centre-to-centre spacing of 24 m. The design includes three traffic lanes in each direction.

A comprehensive study of the 1915 Çanakkale Bridge using the section model approach was performed in the Boundary Layer Wind Tunnel Laboratory, in support of the design and construction of the 1915 Çanakkale Bridge. Various configurations of the deck geometry for the completed bridge and selected construction stages were examined in the mandatory and optional tests, as well as several supplemental test programs.

The Wind Tunnel Studies

This wind study was consisted of a 1 to 60 scale section model. The aims of the study were:

1. to provide basic aerodynamic information in order for the design team to select the preferred cross-section of the deck and enable the final design of the bridge;

2. the determination of static force coefficients of the bridge deck for selected configurations and Construction Stages;

3. the investigation of the aerodynamic stability of the deck section with respect to vortex shedding induced vibration and flutter instability for different configurations and Construction Stages;

4. the estimation of the aerodynamic derivatives for selected configurations and Construction Stages;

5. the assessment of the traffic wind climate (i.e. critical wind speeds for vehicle roll-over) for generic vehicle types traversing the bridge.

The Boundary Layer Wind Tunnel Laboratory

Western

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

FSBR/ 2 April 2020 / LK
Last Printed: Month Day, Year