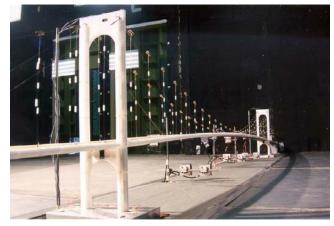
Wind Engineering Study





Owner	Engineers	Year Tested
The Triborough Bridge and Tunnel	Weidlinger Associates, Inc.	1999
Authority, New York, NY, USA	New York, NY, USA	
Length	Main Span	Shipping Clearance
3770 feet	2300 feet	135 feet
Tower Height	Suspension Cable Diameter	Deck Width
367 feet	21 inches	74 feet

The Project

The Bronx-Whitestone Bridge, New York is a vital link in the transportation network of New York City. Opened to traffic in 1939, the bridge has undergone a number of structural modifications, including the addition of a stiffening truss atop the main girders and a tuned-mass damper located at midspan. Both of these modifications were attempts to raise the critical wind speed for flutter, which, for the original bridge was approximately 50 mph.

The bridge is undergoing a deck replacement and aerodynamic treatment of the stiffening girder system. Aerodynamic model tests were a vital component of the bridge rehabilitation process.

The Wind Tunnel Studies

The Boundary Layer Wind Tunnel Laboratory has been involved in aerodynamic investigations of the bridge since the early 1970's and has performed the following experimental investigations:

The Wind Tunnel Studies (cont'd)

- 1 to 60 scale section model of the deck and 1 to 400 scale taut strip model of the main span, used in the design of the tuned mass damper system.
- 1 to 60 scale section model of the deck for the orthotropic deck replacement. This model was the testbed for the evaluation of a number of aerodynamic enhancement schemes.
- 1 to 25 scale full aeroelastic model of the entire bridge. The full model was tested with the proposed orthotropic deck replacement and revised section properties. Different values of structural damping were used for the model to simulate the effects of the tuned mass damper. Tests were performed in turbulent boundary layer flow, in order to model the wind conditions at the site.

A full scale monitoring programme was undertaken to better understand the behaviour of this long span bridge in wind and to compare the results to wind tunnel studies.



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

