The Hong Kong Convention Centre Extension, Hong Kong

Wind Engineering Study

Photo Courtesy Hong Kong Trade Development Council

Wind Tunnel Test Model

Sponsor	*Structural Engineer*	*Architect*
Hong Kong Trade Development Council	Wong & Ouyang (Civil-Structural Engineering) Ltd.	Skidmore, Owings & Merrill LLP
Height	*Year Tested*	*Model Scale*
60m	1994	1:500

The Project

The Hong Kong Convention Centre is complex consisting of four towers atop a large 60-metre high podium, located at the waterfront of Victoria Harbour. It was tested by the BLWT Laboratory in 1985.

The Extension, tested in 1994, has curved roof sections, supported by large span trusses to allow for clear spaces for convention activities. It extends north of the Convention Centre complex into Victoria Harbour and is therefore exposed to wind from all wind directions except from the south.

The Wind Tunnel Studies

The objective of the wind tunnel study was to provide information on wind loads to assist in the design of the overall roof structure and the cladding elements, and to provide information for the assessment of the wind environment in terms of pedestrian comfort. Solid state pressure scanning equipment was used to measure pressure fluctuations at all instrumented locations simultaneously.

Analysis of the Wind Tunnel Data

All simultaneously-measured wind pressure data were stored and used for analysis. Wind actions such as uplifts and overturning moments, as well as structural loads and responses, were determined by integrating the pressure data with geometric or structural influence functions. This has taken into consideration the spatial and temporal correlation of the pressures along the roof trusses.

Equivalent static load distributions were provided for the design of the roof structure. These were determined by enveloping the distributed loads required to produce the predicted wind actions or loads and responses.

Wind tunnel analysis provided information on the following: overall structural loads and load effects; net pressures across roof cantilevers; wall and cladding support loads; wind pressures on the architectural seamed roof; and pedestrian level wind speeds, focusing on areas with high volumes of pedestrian traffic.

Alan G. Davenport Wind Engineering Group

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

FSTB/214/December 2003/EH
Last Printed: March 30, 2007