Harbour Grand Hotel, North Point, Hong Kong

Wind Engineering Study

Client	Structural Engineer	Architect
Super Winner Development Ltd.	Top Talent International Ltd.	MD Vista Ltd.
Height	**Year Tested**	**Model Scale**
165 metres	2005	1:350

The Project

The development consists of an L-shaped 165m tall tower. The luxury hotel accommodations include 828 rooms and serviced suites featuring different perspectives of Victoria Harbour.

The development is located on the north shore of Hong Kong Island and is very exposed to winds from the harbour side. The site has significant hilly terrain over the southerly directions and far upstream to the north.

The Wind Tunnel Studies

The wind tunnel studies provided structural loads. A topographic study was performed to provide matching wind conditions to full scale over Hong Kong's complex hilly terrain.

The 1:3000 scale topographic model extends for a full scale diameter of about 14km. wind speeds and turbulence intensities were measured for 19 wind directions to provide a matching condition for the 1:350 scale model tests.

The structural loads and responses were determined using the force balance technique. The force balance technique is suitable for very unusual, complex shapes. The analysis of the force balance data was initially carried out based on a combined system including all diaphragms. The dynamic properties showed that the diaphragms behave as a rigid unit on a floor-by-floor basis. The effective static wind loads obtained above for the combined structural system are then distributed to the individual diaphragms.

The proximity model extended 425 meters from the site, two configurations of surroundings were tested to investigate sheltering effects.

The Boundary Layer Wind Tunnel Laboratory

Western

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