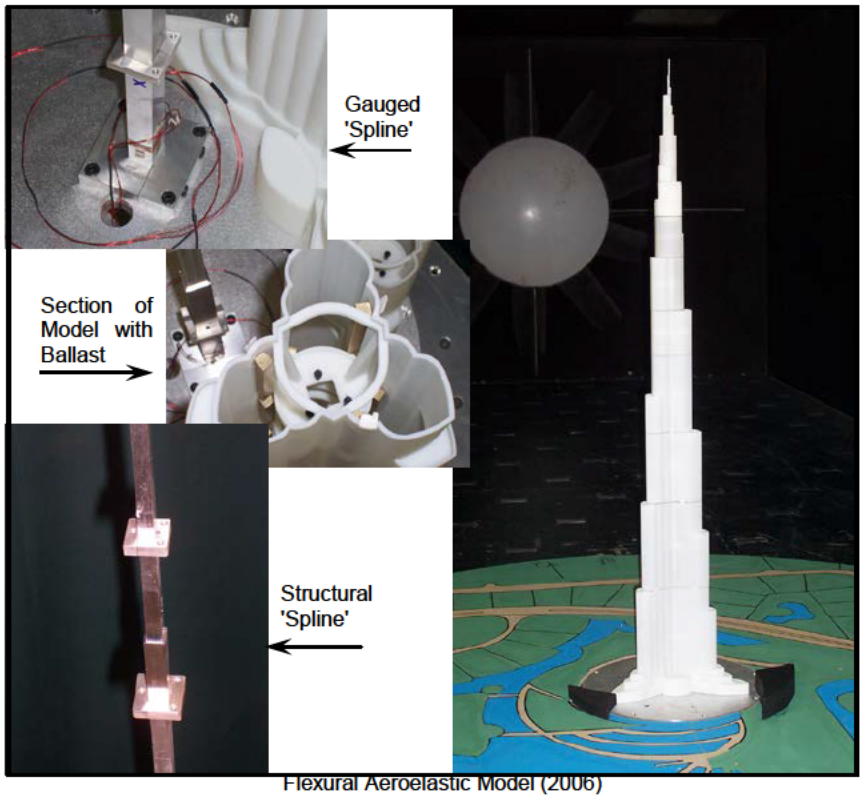
Burj Khalifa, Dubai, United Arab Emirates

Wind Engineering Study

Rendering of Tower



Flexural Aeroelastic Model (2006)

Developer	*Structural Engineer / Architect*	*Primary Builder*
Emaar Properties	Skidmore, Owings and Merrill LLP	Samsung Engineering & Const.
Height	*Year Tested*	*Model Scale*
829 m	2004	1:500

The Project

The Burj Khalifa, at its time of completion, will be the tallest building and the tallest man-made structure in the world. This multi-use tower will consist of hotel, office, residen-tial, retail and communication floor space.

The Burj Khalifa will be constructed primarily of reinforced concrete. It sits on a concrete and steel podium support-ed by 192 piles that each descend to a depth of more than 50 metres.

The structure is composed of three lobes arranged around a structural core. The resulting Y-shaped plan maximizes the views of the Persian Gulf. As the height in-creases, setbacks at each of the lobes decrease the buildings plan until it melds into a spire.

The Wind Tunnel Studies

An equivalent multi-degree-of-freedom flexural aeroelas-tic model was designed and constructed to simulate the dynamic properties of the tower in its first six sway modes.

The aeroelastic simulations of the Burj Khalifa pro-vided direct information on overall mean and dynamic wind-induced sway loads and response of the main struc-tural system. The dynamic responses represent the ac-tion of unsteady aerodynamic forces on the entire tower envelope.

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

FSTB/ 271 /February 2008 / PCC
Last Printed: May 11, 2009