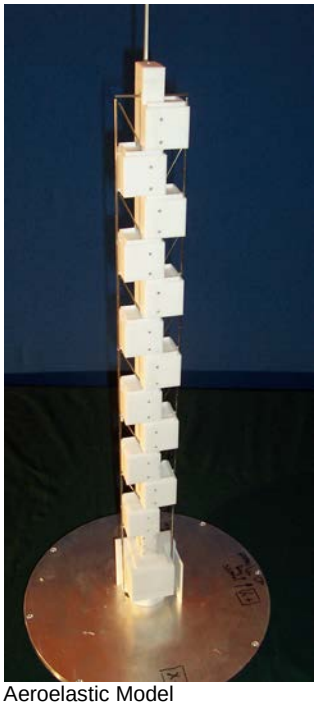
80 South Street, New York, NY, USA

Wind Engineering Study

Rendering of Tower

Force Balance Model



Aeroelastic Model

Developer/Builder	*Structural Engineer*	*Architect*
Sciame Development Inc.	Santiago Calatrava S.A.	Santiago Calatrava S.A.
Height	*Year Tested*	*Model Scale*
Top of Roof - 896 ft Top of Mast - 1123 ft	2005	1:375

The Project

The building, located in lower Manhattan, consists of a series of 12 rectangular cubes which combine to give this building its innovative shape. Each cube cantilevers alternately side to side from a central concrete core.

Ten of the 12 cubes consist of residences, while the two lower cubes and the base will be allotted to commercial use. This building will house some of the most prestigious residences in New York City and perhaps the world.

Santiago Calatrava creates a sensation with this unique design in New York City - the home of the skyscraper.

The Wind Tunnel Studies

A high frequency force balance (HFFB) technique was used to determine the information on structural loads and building motions.

Given the slender and unique geometry of the building, aeroelastic simulations were carried out to capture the influence of aerodynamic behaviour due to the relative building motion to the wind, such as aerodynamic damping. This involved the design and testing of an equivalent multi-degree-of-freedom aeroelastic model. The aeroelastic model simulates the first four sway modes of vibration and one torsion mode. These tests were carried out to validate the findings of the HFFB study.

The Boundary Layer Wind Tunnel Laboratory

Western

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