Seven World Trade Center, New York, NY, USA

Wind Engineering Study

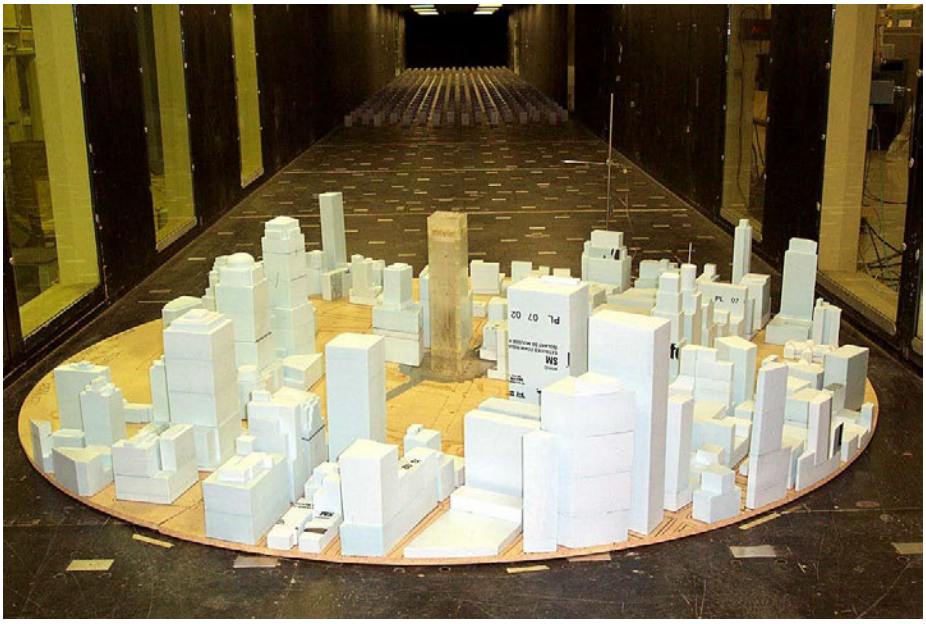

Image Credit: Skidmore, Owings & Merrill LLP / AMD Renderings

Client	*Structural Engineer*	*Architect*
Silverstein Development Corp.	The Cantor Seinuk Group, Inc.	Skidmore, Owings & Merrill LLP, NY
Height	*Year Tested*	*Model Scale*
750 feet, 52 storeys	2002	1:400

The Project

The Alan G. Davenport Wind Engineering Group carried out studies for the original Seven World Trade Center in the early 1980's. The reconstruction of this building represents the first of many efforts in rebuilding the World Trade Center (WTC) site and surrounding areas. The tower was tested with three configurations of the WTC site in order to envelope the influence of its development. One of the configurations, shown above, is with the WTC site in its current, undeveloped condition, the other two included four or five buildings of different massing.

The tower has a rhomboidal plan form extending over its entire height of 750 feet. The structural walls of the podium are concealed by two sets of stainless steel decorative screen wall panels.

The mechanical penthouse atop the building is masked by illuminated 40 foot deep parapets.

The Wind Tunnel Studies

Information on cladding pressures was determined for the tower, including the plenum areas present at the 4th floor and mechanical penthouse. Measurements were taken at 573 locations.

Wind-induced structural loads and responses including accelerations were determined using the force balance method.

A pedestrian level wind speed study was performed for 32 locations around the project site including portions of the former World Trade Center site. Predicted wind speeds at each location were evaluated using wind safety and comfort level criteria developed at the Boundary Layer Wind Tunnel Laboratory.

Hot wire anemometer velocity measurements were taken at the four main building corners of the podium. These measurements were used to estimate the drag forces on the individual wire elements which make up the podium decorative screen walls.

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