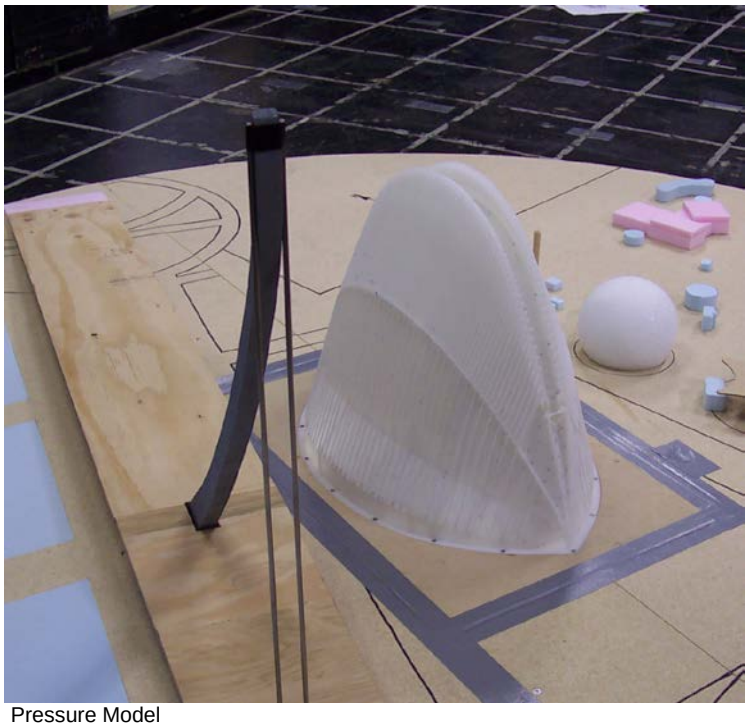
Agora Building, Valencia, Spain

Wind Engineering Study

Images Credit: Santiago Calatrava Valls S.A.



Pressure Model

Client	*Structural Engineer*	*Architect*
UTE Agora	Santiago Calatrava Valls S.A.	Santiago Calatrava Valls S.A.
Height	*Year Tested*	*Model Scale*
86 m	2007	Pressure Model 1:200 / Aeroelastic Model 1:50

The Project

The Agora Building is a cupola that covers a place close to the new Oceanographic Museum in Valencia, Spain. The structure roof is covered by a movable canopy, made of lamellas that can control the lighting of the inner space. The lamellas are hinged at the top of the cupola and to a movable arch that can activate the simultaneous movements of them. The movable arch is supported by hydraulic jacks at the bottom. The top of the central lamella is 86 m and 77 m, respectively, at open and closed positions. The top of the building structure is at 69 m.

The Wind Tunnel Studies

The wind engineering studies for the Agora Building project included studies of wind-induced structural loads and responses as well as local cladding pressure loads using the combination of a pressure model study, a force balance study and an aeroelastic model study with the lamellas at an almost closed position. The pressure model study was carried out for 516 measurement locations distributed over the building envelope. The force balance study was performed by mounting the pressure model in a sensitive force balance.

The Wind Tunnel Studies (continued)

The aeroelastic model study was conducted with the lamellas in the open, closing and almost closed positions to evaluate dynamic wind loads and the aerodynamic stability of the lamellas.

A supplement study was also conducted using the pressure model setup to correlate the wind speeds at various locations relative to the upper tip of the central lamella in the open position to select a location to install an anemometer in the prototype project site.

The Boundary Layer Wind Tunnel Laboratory

Western

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