The Development of King Abdul Aziz Endowment, Mekkah

Wind Engineering Study

Illustration: Dar Al-Handasah Consultants

Photo: Wind Tunnel 1:500 scale model

Client	*Structural Engineer*	*Architect*
Dar Al-Handasah Consultants (Shair and Partners)	Dar Al-Handasah Consultants (Shair and Partners)	Dar Al-Handasah Consultants (Shair and Partners)
Height	*Year Tested*	*Model Scale*
Over 500 meters tall	2005/2007	1:500

The Project

The King Abdul Aziz Endowment Complex is one of the largest hotel/residential/retail complexes in the world. It can accommodate over 40,000 visitors.

Four residential towers and one mixed use residential/hotel tower sit on top of an 11 storey podium and adjacent to the podium are two residential towers. All towers are connected with walkways at various floor levels. The main tower is the residential/hotel complex with a museum, library and observatory dome as well as a spire. The spire is a telecommunication tower with an upper viewing deck. The site is located adjacent to the Holy Haram in Mekkah.

The Wind Tunnel Studies

The primary objective of this investigation is to provide local cladding loads and structural loads for strength design of the towers as well as pedestrian level winds for comfort and safety considerations.

The model was instrumented with over 2,700 pressure measurement locations. The overall structural loads for all seven towers were determined using the pressure integration technique.

The podium has a large courtyard area with canopies in selected regions. Pedestrian level winds were examined in this area.

The proximity model extended 600 meters from the site and included all buildings in the surroundings. An allowance was made for flow through the roadway at the base of the development.

The Boundary Layer Wind Tunnel Laboratory

Western

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