King Khaled Monumental Gate, Riyadh, Saudi Arabia

Wind Engineering Study

Owner	Engineer	Contractor
Kingdom of Saudi Arabia	Saudi Socotec Company, Jeddah	Saudi Oger Ltd.
Height	**Year Tested**	**Model Scale**
15 m	2000	1:100

The Project

The King Khaled Monumental Gate provides a unique arched entrance over the main Highway to the King Khaled International Airport, located approximately 25 km north of the city of Riyadh. The concerns for the already built structure were primarily with unbalance dynamic wind loads that could adversely affect the structure.

The structure consists of steel tubes connected in over 880 locations, each containing between 3 to 4 tubes at each joint. It is covered on its outer surfaces with a thin membrane of fibreglass and polytetrafluoroethylene.

The Wind Tunnel Studies

A model of the structure was constructed at a scale of 1:100 and instrumented with just over 200 pressure taps.

Simultaneously measured pressures were analysed to determine structural wind loads and responses for the roof for balanced and unbalanced loads.

The wind tunnel model study also provided information on local peak wind-induced pressures and suctions on outer skin.

Differential pressures were developed for the fabric covering by calculating internal pressures from measured external pressures and information on the fabric covering.

The Boundary Layer Wind Tunnel Laboratory

Western

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