Menara Jakarta, Jakarta, Indonesia

Wind Engineering Study

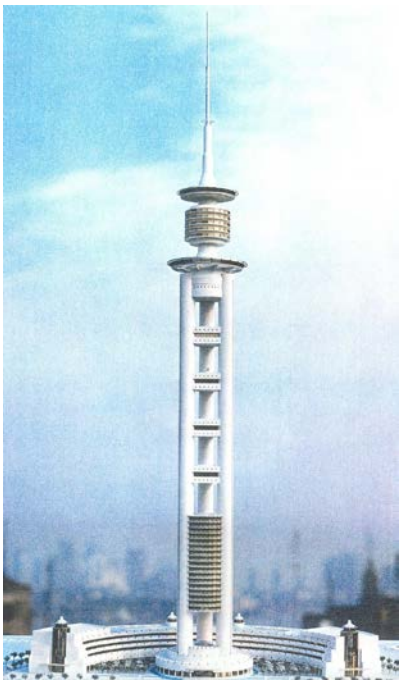
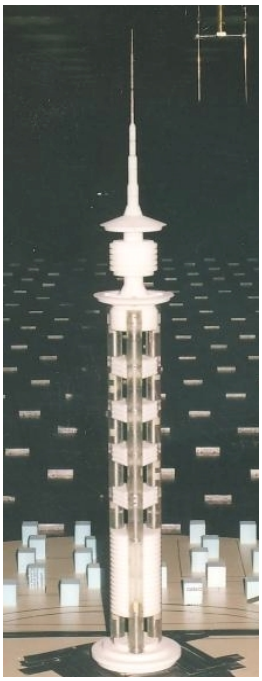


Illustration of Tower



Aeroelastic Model

Pressure Model

Sponsor PT Menara Jakarta, Indonesia	*Structural Engineer* East China Architectural Design Institute (ECADI)	*Architect* East China Architectural Design Institute (ECADI)
Height 558 metres	*Year Tested* 1996 and 1997	*Model Scale* 1:350

The Project

The Menara Jakarta is designed to extend to about 558m above ground. Structurally, it consists of 3 reinforced concrete tubes 13.2m in diameter, arranged in plan in the form of an equilateral triangle with a centre to centre spacing of 32.9m. This section of the tower shaft is referred to as the triple tube and extends to a height of 323m above ground. Beyond this, a single central reinforced concrete tube continues to a height of 452m. A steel antenna superstructure extends beyond this level to the full height of 558m.

The Wind Tunnel Studies

Simultaneous measurements at 378 locations over tower and low-rise provided information on pressures suitable for cladding design.

The Wind Tunnel Studies (continued)

The overall wind loads and load distribution on the entire structure were obtained by spatial integration of pressure data. This involved calculating the generalized forces for the first nine modes of vibration and predicting its wind-induced response using random vibration theory. Confirmation of overall wind forces was made through direct base balance measurements.

An equivalent aeroelastic model was designed and tested to confirm the findings of the pressure integration study, and to provide detailed information on the response of the antenna superstructure. The model simulated the first eight sway modes of vibration, including the higher antenna modes, and ensured no motion-dependent effects were overlooked.

Pedestrian level winds were determined at 16 locations, focusing on entries and corner areas.

The Boundary Layer Wind Tunnel Laboratory

Western

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