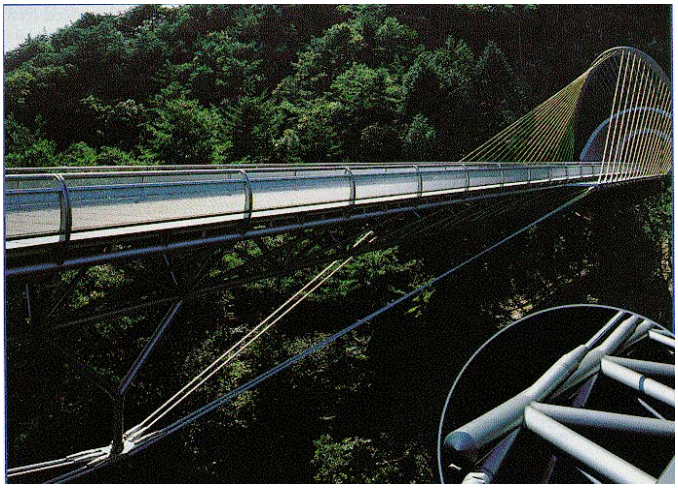
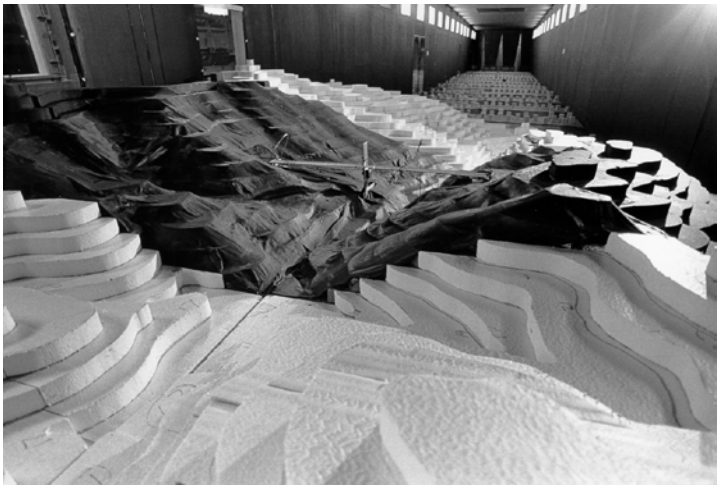
The Miho Museum Bridge, Shiga-raki, Japan

1Wind Engineering Study





Owner: Shinji Shumedai

Design I.M. Pei Associates	*Engineers* Leslie E. Robertson Associates	*Year Tested* 1992
Main Span 120 metres	*Deck Width* 7.5 metres	*Clearance* 20 metres
Arch Height 206 metres	*Truss Depth* 2 metres	*Cable Stay Diameter* 22.4 mm to 60 mm

The Project

The Miho Museum Bridge, in Shiga-raki, Japan is the transition between the surrounding rugged terrain and the Miho Museum. To reach the museum, patrons must pass through a tunnel, across a ravine and onto the grounds of the museum. The main span of 120 metres is comprised of a cable-supported space truss structure. The deck structure is two metres deep with post-tensioned cables cantilevering the bridge from the concrete tunnel. The cables are anchored to the mouth, span to an inclined arch and fan out to support the deck. Although primarily a pedestrian bridge, the structure was designed to support two lanes of stretch limousines.

The prime objectives of the wind tunnel studies were to demonstrate the safety of the structure, both with respect to aerodynamic stability as well as the possible effects of extreme typhoon wind speeds. Pedestrian comfort was a prime consideration in the study.

The Wind Tunnel Studies

- 1 to 60 scale section model of the deck to investigate the wind forces on a portion of the deck.
- 1 to 100 scale full aeroelastic model of the entire bridge. The full model was tested in the completed bridge state in turbulent boundary layer flow, complete with the local topography in order to model the wind conditions at the rugged site.
- The topographic model encompassed a scale area of 500m x 2000m.

The test results indicated that the dynamic response of the bridge is characterised by turbulent buffeting without any evidence of excitation due to vortex shedding or instability up to wind speeds at deck level of up to 90 m/s.

The Boundary Layer Wind Tunnel Laboratory

Western

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FSBR/ 09 / June 2000 / PK
Last Printed: March, 19, 2009