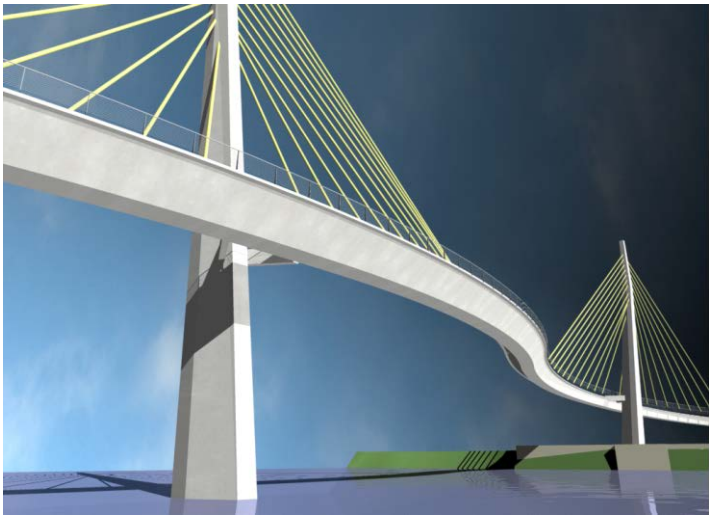
Missouri River Pedestrian Bridge, Omaha, USA

Wind Engineering Study



Owner Cities of Omaha, Nebraska and Council Bluffs, Iowa	*Design* Figg Engineering Group Tallahassee, Florida	*Year Tested* Summer/Fall 2003
Length 2566 feet	*Main Span* 500 feet	*Navigation Clearance* 52 feet
Pylon Height 266 feet	*Stay Cable Diameter* 9 inches	*Deck Width* 26 feet

The Project

The Missouri River Pedestrian Bridge links riverfront trails on both sides of the river located between the cities of Omaha, Nebraska and Council Bluffs, Iowa. It provides a between the Omaha Convention Center, Lewis and Clark Landing and Gallup campus on the Nebraska side to a planned park and residential development on the Iowa side.

The bridge follows a horizontal S-curve with a 600 ft radius. One of the 266 ft tall inclined pylons is located on the Omaha riverbank, while the other pylon is located in the river on the Iowa side. The precast concrete deck has an overall width of 26 ft and depth of 9 ft, with a walkway of 20 ft. The cable stays are connected to the deck on the concave side of the S-curve.

Due to the S-curve, the deck soffit is continuously varying along the span, making conventional section model testing inappropriate.

The Wind Tunnel Studies

- A primary objective of this investigation was to identify the critical wind speeds for flutter instability and vortex shedding. The investigation also defined the dynamic response characteristics of the bridge to turbulent wind, pedestrian comfort over a full range of wind speeds and provided information for the design of the structure against wind effects.

The study consisted of:

- A 1 to 100 scale section model tested in the small 1.5 ft BLWTL open circuit wind tunnel to provide early estimates of the static force coefficients.
- A meteorological study.
- A 1 to 100 full aeroelastic model study performed in the low speed side of BLWT2. Tests were performed for a construction stage of the bridge.

The Boundary Layer Wind Tunnel Laboratory

Western

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FSBR/ 14 / September 2004 /PK
Last Printed: June 5, 2013