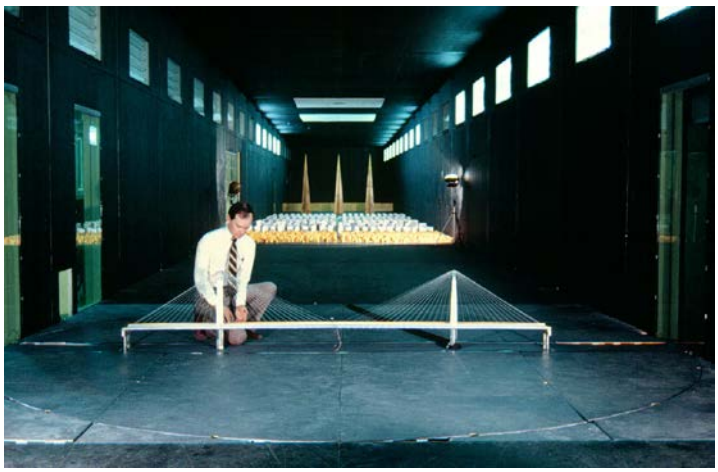
The Clark Bridge, Alton, IL, USA

Wind Engineering Study



Owner The Illinois Department of Transportation	*Design* Figg and Muller Engineers, Inc. Tallahassee, Florida and Hanson Engineers, Springfield, Illinois	*Year Tested* 1990
Length of Superstructure 4620 feet	*Span Lengths* 302 / 756 / 302 feet	*Shipping Clearance* 70 feet
Tower Height 250 feet above mhw	*Deck Depth* 4 feet	*Deck Width* 100 feet, 6 inches

The Project

Wind engineering studies were carried out for the steel and concrete alternates of the Clark Bridge to provide information on structural design. The two design alternates of the structure shared a common pylon design with different deck designs.

The Wind Tunnel Studies

Common elements of the studies included;

- A meteorological study, which included the analysis of existing records at three locations near the project site, comprised of both surface and upper-level data.

The Wind Tunnel Studies (cont'd)

- A section model study for each alternate, tested in two configurations;

  i) on a force balance in which the overall static lift, drag and torque forces were measured at different angles or wind inclination; and

  ii) with scaled dynamic structural properties of the prototype. The section model was tested in smooth flow, as well as grid generated turbulent wind representative of the natural wind at the project site.

- The concrete alternate also included tests of a full aeroelastic model of the bridge.

- An integration of the wind tunnel test data with the full-scale properties of the prototype provided static and dynamic wind loads on the bridge for its fully completed phase, as well as in the critical double cantilever construction stage.

The Boundary Layer Wind Tunnel Laboratory

Western

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