The James River Bridge, VA, USA

Wind Engineering Study

Owner The Virginia Department of Transportation	*Design* Figg and Muller Engineers, Inc. Tallahassee, Florida	*Year Tested* 1984
Length of Superstructure 4680 feet	*Span Lengths* 3@150 / 630 / 3@150 feet	*Shipping Clearance* 145 feet
Tower Height 293 feet, 6 inches	*Deck Depth* 12 feet	*Deck Width* 125 feet, 8 inches

The Project

The James River Bridge is a concrete deck cable-stayed bridge with a single plane of stays and a main span of 630 ft. The bridge is part of a 4680 ft structure crossing the James River near Richmond, Virginia.

The Wind Tunnel Studies

Wind engineering studies for this bridge included the following:

- A meteorological study was performed to define the wind conditions at the project site.
- The results of a dynamic section model study of a bridge of similar cross section, tested previously at the Boundary Layer Wind Tunnel Laboratory, were adapted to the James River Bridge to yield design wind loads for the fully completed structure.
- Aeroelastic model tests of a double cantilever under construction configuration of the bridge were performed in order to define the wind loads and stability criteria during the critical double cantilever construction phase of the project.
- Shielding factors were obtained from the tests on the double cantilever portion of the under construction configuration to define the load sharing mechanism between the two decks of the structure.

The Boundary Layer Wind Tunnel Laboratory

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