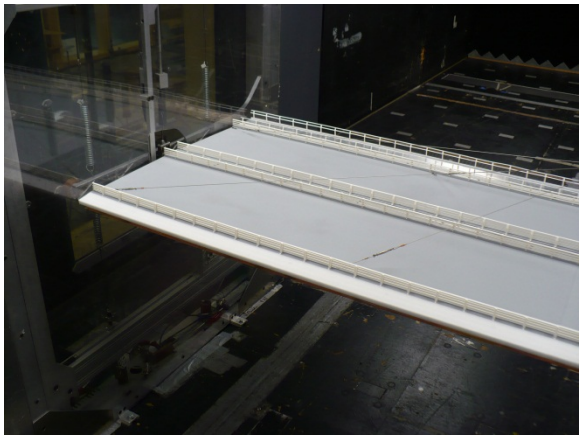
The Nipigon Bridge, Nipigon, Ontario

Wind Tunnel Study



Owner: Ministry of Transportation, Province of Ontario
Date Tested: August 2012

Client: McCormick Rankin Corporation, Mississauga, Ontario.

Cable Supported Spans *112.8 m and 139 m*	*Section Models* *1 to 50 Scale Section Models of Deck for Completed Bridge and North Half Under Construction Phase of Bridge*	*Deck Widths* *36.2 m for Completed Bridge and 20.1 m for the Under Construction North Half of the Bridge Deck*
Tower Heights *74 m*		

The Project

The Nipigon River Bridge spans the Nipigon River in Nipigon, Ontario on Highway 11/17 near the North shore of Lake Superior. A new four lane cable stayed bridge will replace the existing two lane, four span plate girder structure. The new bridge includes cable-supported spans of 112.8m and 139m. The 36.2m wide deck is comprised of concrete deck panels supported on transverse floor beams. The concrete tower is a double “H” system, with an overall height of 74m.

The replacement is planned in stages, with the east-bound lanes eventually occupying the existing bridge space. In order to maintain traffic, the bridge is constructed in two stages. Stage 1 includes the construction of the north half bridge while traffic is maintained on the existing bridge. Stage 2 has the traffic switched to the new bridge, while the existing bridge is demolished and the south half bridge is completed.

The Wind Tunnel Studies

A primary objective of this investigation was to define the dynamic response characteristics of the bridge to “smooth” and turbulent wind over a full range of wind speeds and provided confirmation of the design of the structure against wind effects.

The study consisted of:

- A 1 to 50 scale section model of the completed bridge deck. Tests were performed in smooth flow to investigate the overall aeroelastic stability of the deck, and in grid-generated turbulent flow to define the dynamic buffeting response characteristics of the section.
- A 1 to 50 scale section model of the north half bridge deck. Tests were performed in smooth flow to investigate the overall aeroelastic stability of the deck, and in grid-generated turbulent flow to define the dynamic buffeting response characteristics of the section.

The Boundary Layer Wind Tunnel Laboratory

The University of Western Ontario
Faculty of Engineering, London, Ontario
Canada, N6A 5B9 **Tel: (519) 661-3338** Fax: (519) 661-3339
Internet: www.blwtl.uwo.ca E-mail: info@blwtl.uwo.ca

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