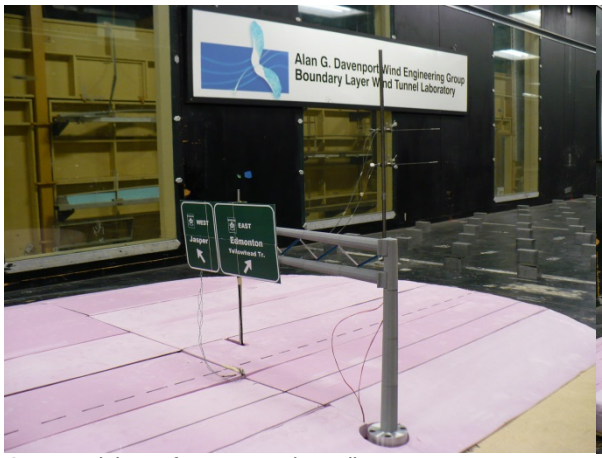
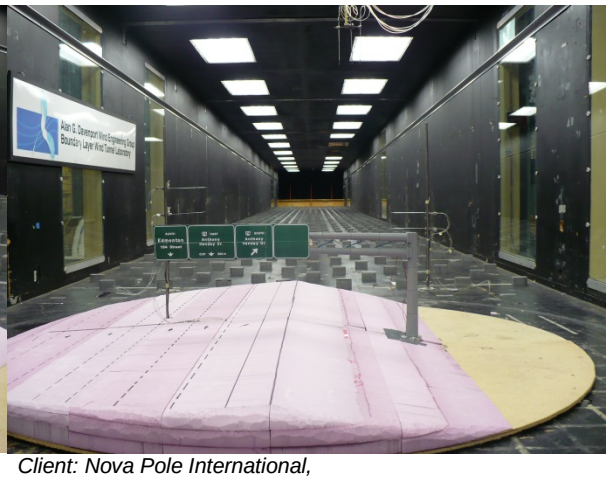
Cantilever Sign Support Structures, Alberta

Wind Engineering Study





Owner: Ministry of Transportation, Alberta
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Client: Nova Pole International, Vancouver, British Columbia.

Aeroelastic Models	*Sign Structure Specifications*
1 to 25 Scale Full Aeroelastic Models of A1828 and A1815 Cantilever Sign Structures	*A1828 Sign Structure - 25 m Cantilever, Sign Area of 15.4 m × 3.5 m,* *A1815 Sign Structure - 15 m Cantilever, Sign Area of 8.4 m × 4.2 m*

The Project

The Cantilever Sign Support Structures examined in this study are intended for use in the Province of Alberta. These cantilever structures utilise a braced double cantilever arm design. The focus of the study was to ascertain the adequacy of the structure against onset of galloping motion, referenced in the Fatigue Design Section 11 of the 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

Two representative designs of the cantilever sign structures were selected for this study: the A1828 Sign Support Structure which has a 25 m cantilever and a maximum sign area of 15.4 m x 3.5 m, and the A1815 Sign Support Structure with a 15 m cantilever and a sign area of 8.4 m x 4.2 m.

The Wind Tunnel Studies

The objective of the study was to provide information for design against wind effects and to ensure aerodynamic stability over a full range of wind speeds. The primary focus of the assessment includes the likelihood of cross-wind galloping and vortex shedding induced oscillation. The investigation was also intended to define the dynamic response of the structures to three-dimensional turbulent wind and to provide information to verify the design of such structures against wind effects.

The study consisted of 1 to 25 scale full aeroelastic models of the selected sign support structures. Tests were performed in smooth flow to investigate the overall aeroelastic stability, and in turbulent boundary layer flow to define the dynamic buffeting response characteristics of the structures.

The Boundary Layer Wind Tunnel Laboratory

Western

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