Pedestrian Comfort

Services:

Building Acoustics

Wind and Snow Loading

Environmental Noise

Air Quality Studies

Structural Wind Loading

Wind Tunnel Testing

Cladding Pressures

Long Span Roofs

Control of Mechanical Vibrations

Computational Fluid Dynamics

Microclimate Engineering

Design of Mass Dampers

Telephone:
(613) 836-0934

Facsimile:
(613) 836-8183

Wind and climate influence our daily lives in more ways than we may be aware. From wind loading on buildings, to pollution dispersion in the atmosphere, climate influences our routines and shapes our fortunes in significant ways. *GmE* offers a broad range of services that address issues and problems related to the microclimate, including:

- Wind effects on pedestrians
- Wind forces on structures
- Field measurements and structural response
- Dynamic wind effects on flexible structures

Aerial View of City Core – empty lot to receive new building, Ottawa, Ontario [Photo Courtesy of Canadian Aerial Photo Corp]

Wind flow around buildings affects pedestrians using the facility as well as the building operations, including; access, door closures, and mechanical ventilation equipment.

Pedestrian Comfort

Pedestrian Comfort

Pedestrian level wind studies are performed in a wind tunnel on a physical model of the study buildings at a suitable scale. Instantaneous wind speed measurements are recorded at a model height corresponding to 1.5 m full scale using either a hot wire anemometer or a pressure-based transducer. Measurements are performed at any number of locations on the model and usually for 36 wind directions. For each wind direction, the roughness of the upwind terrain is matched in the wind tunnel to generate the correct mean and turbulent wind profiles approaching the model. At each receptor, data, including wind speed and direction would be synthesized to generate pedestrian comfort on an annual and seasonal basis.

The general concept and approach to wind tunnel modelling is to provide building and topographic detail in the immediate vicinity of the study site on the surrounding model, and to rely on a length of wind tunnel upwind of the model to develop wind properties consistent with known turbulent intensity profiles representing the surrounding terrain.

Pedestrian level wind sensors on podium of future building planned for an urban area.

Experience and research on people's perception of mechanical wind effects has shown that if the wind speed levels are exceeded for more than 70% to 80% of the time, the activity level would be judged to be uncomfortable by most people. For instance, if a wind speed of 9 mph was exceeded for more than 70% of the time, most pedestrians would judge that location to be too windy for sitting or more sedentary activities. Similarly, if 19 mph at a location were exceeded for more than 80% of the time, walking or less vigorous activities would be considered uncomfortable.