Wind Study

A Wind Study is a technical document that provides a model and written description of the impact of winds associated with proposed development on surrounding public and private open spaces, outdoor amenities, building entrances, residential areas, neighbouring streets, parks and open space, (including natural areas), and other properties, in addition to the existing on-site wind conditions.

Required by Legislation

The Local Official Plan.

Who should prepare this study?

A Wind Study must be completed by a qualified microclimate professional or a certified wind tunnel specialist. All reports and drawings must be stamped and/or signed and dated by a Professional Engineer, licensed in the Province of Ontario.

Why do we need this study?

A Wind Study is required to predict and demonstrate the adverse impact of the proposed development and how these conditions can be mitigated through siting, orientation, massing, vertical and horizontal architectural articulations, landscape treatments and adjustment to the height and setbacks of a proposed building.

The objective is to maintain quality, comfortable and inviting public spaces and pedestrian environments by demonstrating that a development will not cause undue wind conditions on the subject lands, and on the surrounding context, including building facades, private and public outdoor amenity and open spaces, parkland, school yards and buildings, sidewalks, and other components of the public realm.

How should this study be prepared?

Usually, the content described under Final Wind Study will be sufficient to appropriately assess the impacts of proposed developments. However, a Preliminary Wind Study may be required for large sites, waterfront sites and/or sites where a substantial increase in height is requested.

A Wind Study should at a minimum contain:

Introduction

- Address of the property
- General site location of the subject property
- Project Name (if applicable)
- Applicant and owner's contact information
- Author name, title, qualifications, company name and appropriate stamp
- Brief description of the proposed development
- Overview of the study area
- Purpose of the study
- Location and context map.

How should this study be prepared? (continued)

Proposal Description and Context

- Description of the proposal, development stats (such as number of units, site area) type of development proposed, height, parking areas, access points, location of amenity areas, proposed phasing
- Description of the existing on-site conditions as well as surrounding areas, roads, natural areas, buildings, parking areas
- Concept Plan for the development including building location, parking, access, amenity areas, grading and natural features and any natural hazards.

Investigation/Evaluation

Preliminary Wind Study

A preliminary wind study may be required for developments for large sites where a substantial increase in height is requested. The study will be conducted by a qualified microclimate specialist to identify any design or massing features that could create pedestrian comfort concerns. Identification as to how wind data is collected is also required.

General issues to be addressed in the preliminary wind study include the following:

- Height of the proposed development in relation to the height of surrounding structures
- Orientation and general massing of the development with respect to the primary wind directions
- Location and shape of specific design features that induce wind activity
- Orientation of the development with respect to sun angles
- Potential impact of wind speed increases created by the development on the surroundings
- Outline of basic mitigation features to be included in development design including base and podium conditions, canopies and tower orientation.

Final Wind Study

Prior to finalizing the application, some proposals may require quantitative wind testing by a certified wind tunnel specialist that meets the following criteria:

Model Scale

- Outline of basic mitigation features to be included in development design including base and podium conditions, canopies and tower orientation.

Test Configuration

Unless otherwise agreed to by the municipality, the following conditions will be evaluated:

- Initial conditions defined as all existing approved development, those developments under construction and the development being proposed
- If design of mitigation is necessary to increase pedestrian comfort, the mitigation measures are also to be evaluated.

Development that is approved but not built for 5 years is not to be included in the test.

Scope of Study

- Before the final testing is done, the test sensor locations will be approved by staff, or peer reviewed by a consultant. A draft proposal for sensor locations should be provided to the municipality for comment
- Pedestrian comfort is to be evaluated based on wind force, thermal comfort and wind chill to evaluate the comfortable use of sidewalks and open spaces for appropriate uses including sitting, standing and walking
- Mitigative measures should be provided for all areas that are identified as uncomfortable or severe wind situation, such as but not limited to architectural articulation or special landscape treatments.

How should this study be prepared? (continued)

Impacts and Mitigation Measures

- Summary of the study and wind impacts of the proposed development
- Summary demonstrating how the proposal meets acceptable wind comfort conditions
- Description of any and all measures that will be taken to minimize wind impacts by the development on neighbouring streets, parks, open spaces, natural areas, public squares and other shadow sensitive properties (such as schoolyards, cemeteries, etc).

Recommendations

- Summary and conclusions of the studies and how they support the development and any special considerations or conditions that should be imposed d
- Recommendations, or conclusions that should form part of the decision on the matter.

Drawings and Supporting Information

See above requirements.

What else should we know?

The scope of the study should be discussed with the community planner, the urban designer and or other staff or agencies as part of the pre-consultation process.

Prior to preparing the study, consultants should review any municipal Official Plan policies or guidelines with respect to wind comfort.

Additional Terms

To be identified by the local municipality where proposed development is located.

Study Submission Instructions

To be identified by the local municipality where proposed development is located.

What other resources are there?

Ontario Professional Planners Institute (OPPI) - Hire and RPP
Ontario Association of Architects
Ontario Association of Landscape Architects
Professional Engineers of Ontario

About these Terms of Reference

These Terms of Reference were developed as a joint effort with participation by representatives from all York Region municipalities and the Region. The Terms of Reference are in widespread use across the Region, with local requirements added as prescribed by each municipality at the pre-consultation stage.

The need and scope for this study will be decided by a municipality during initial pre-consultation process with input from partner agencies. This pre-consultation process may include:

- Determination if this study is applicable
- Confirmation of criteria within these Terms of Reference that are appropriate for your development project
- Identification of specific technical components that need to be addressed
- Identification of detailed standards to be met

Notes:
If the proposed development is revised, the study/report shall reflect the revisions by an updated report or letter from the author indicating the changes and whether or not the recommendations and conclusions are the same (Note: this is subject to the extent of the revisions).

A peer review may be required. The cost of the peer review will be borne by the applicant.

If the submitted study is incomplete, is authored by an unqualified individual or does not contain adequate analysis, the applications will be considered incomplete and returned to the applicant.