

Terms of Reference: Pedestrian-Level Wind Study

Purpose:

- Pedestrian Level Wind Study (hereafter called 'Wind Study') is a technical report that provides a model and written description of wind conditions as a result of a proposed development. The objective of the Wind Study is to maintain comfortable and safe pedestrian-level wind conditions that are appropriate for the season and the intended use of pedestrian areas. The Wind Study will determine the wind impact of a development, and appropriate mitigation measures if required to inform and direct the development design to be wind responsive, at various times of the year.

Required in Support of:

- Through a Preliminary Meeting or Pre-Consultation (PARC) Meeting, Town Staff will confirm if a Pedestrian-level Wind Study is required.
 - Official Plan and Zoning By-law Amendments seeking development over 5 storeys will require to provide a Wind Impact Study.
 - Site Plan Control applications over 5 storeys in height.
 - DART
- The Preliminary Wind Impact Study shall be required for initial submission and the final Wind Study will be required for a subsequent submission following comments on the Preliminary Study for proposals over 12 storeys in height.

Prepared By:

- Professionals who specialize in, and can demonstrate extensive experience in dealing with wind and microclimate issues in the built environment. The studies are to be signed and sealed by a Professional Engineer.

Peer Review and Scoping:

- The Town will require a peer review of this document at the sole cost of the owner/applicant submitting the development application.
- On a project-by-project basis, the Town will identify any possible scoping of the assessment, or alternatively, other considerations to be incorporated into the assessment.

Content:

1. General Details:

- Project details such as name, submission date, phasing outline
- Applicant and owner information
- Legal description and municipal address (if known)



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- Drawing number and title
- Town of Caledon Site Plan Application (SPA) File Number
- Revision box and dates
- Key map showing the location of the property, provincial, regional and municipal roads
- North arrow
- Graphic Scale bar (metric)
- The direction of view, i.e. north, south, east, west (avoid using front, back, right, left, etc.)

In the majority of instances, the content described under the Preliminary Wind Impact Study will be sufficient to appropriately assess the impacts of proposed developments. However, a Final Wind Impact Study may be required for sites 3 ha and larger in size, and/or sites where a substantial increase in height is requested. The requirement for, and scope of this work, should be discussed with the Planner and Urban Designer in pre-application consultation meetings.

2. Preliminary Wind Analysis (desktop exercise): A preliminary wind study may be required for developments that meet the above criteria. The study will be conducted by a qualified microclimate specialist to identify any design or massing features that could create pedestrian comfort concerns.
- 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
 - The 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 mitigative features to be included in development design including base and podium conditions, canopies and tower orientation
 - Provide a wind-rose diagram
 - Post development (showing impact of mitigating measures taken)
 - As part of the preliminary study, a quantitative pedestrian comfort evaluation including a wind tunnel test will be undertaken. This study will include a minimum of 15 sensor locations. The focus of this initial study is to recommend appropriate mitigation measures that involve changes to the building design, massing and form. Changes to landscaping are not to be included in the initial study.
 - The assumption is that the wind flow characteristics and remedial solutions will be incorporated into tested building designs and/or will be used to modify building design to achieve appropriate wind conditions.

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- It is recommended that for optimal comfort, wind speed for building entrances should not exceed 15 km per hour (standing) for all seasons, and for outdoor amenity areas, wind speeds should not exceed 10 km per hour (sitting) for summer season and shouldering months.
3. Final Wind Study (wind tunnel): Prior to finalizing the application, proposals that meet the study criteria may require quantitative wind testing by a certified wind tunnel specialist that meets the following criteria:
- Model Scale: The model shall be no smaller than a 1:500 representation of the proposed development and will include all buildings within a minimum of 480 m of the site, in keeping with the industry standard.
 - Test Configuration: Unless otherwise agreed to by the Town, the following conditions will be evaluated:
 - Initial conditions defined as all existing Town approved development, those developments under construction and the development being proposed
 - If design mitigation is necessary to increase pedestrian comfort, the mitigation measures are also to be evaluated
- Note: Development that is approved but not built for 5 years is not to be included in the test.
4. Scope of Study
- Before the final testing is done, the test sensor locations will be approved by the Town of Caledon Urban Designer. A draft proposal for sensor locations should be E-mailed to the Urban Designer 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.
 - Measures are to be taken to ensure user comfort at street level, the force of opening doors (at ground and rooftop levels), door slamming protection, downdraft concerns, sweeping debris off rooftops, protection of children's play areas and potential shelter protection areas in cases of severe wind alerts.
 - Areas found to be uncomfortable or severe must be accompanied by mitigation solutions. At this stage of the process, this may include landscape elements.

Submission Requirements:

- Digital copy of the report in PDF format
- File size not to exceed 4 GB



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6311 Old Church Road
Caledon, ON L7C 1J6
www.caledon.ca
T. 905.584.2272 | 1.888.225.3366 | F. 905.584.4325