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October 11, 2024

John Farley
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Re: Pedestrian Wind Conditions – Letter of Opinion
280 Clair Road West – Guelph, Ontario
RWDI Project #2507197

Dear Mr. Farley,

Rowan Williams Davies & Irwin Inc. (RWDI) has prepared this letter to comment on the potential wind conditions on and around the proposed project at 280 Clair Road West in Guelph, Ontario. This qualitative assessment is based on our knowledge of the local wind climate, the building design information received by RWDI on October 8, 2024, the existing surroundings, and our experience and professional judgement. The intent of this preliminary assessment is to inform the design team about the anticipated wind conditions and to determine the need for and extent of wind mitigation to meet the City of Guelph's requirements for the upcoming Zoning By-Law Amendment (ZBA) submission.

Site & Building Information

The proposed project site is located along Clair Road West between Clair Road Water Tower and Bishop Macdonell Catholic High School in Guelph, Ontario (Images 1 and 2). The site is currently unoccupied and surrounded by roadways, open lands, and low-rise buildings in all directions.

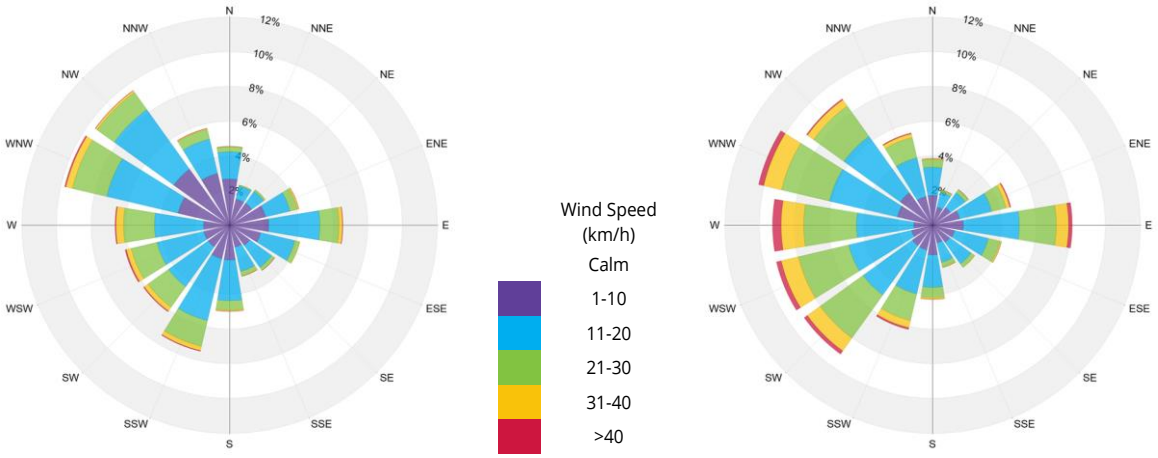
The proposed development consists of stepped Tower 'A' (16 and 8 storeys) and Tower 'B' (14 and 7 storeys) together with multiple 3-storey buildings and a parking structure (Image 2). Key areas of interest for pedestrian wind comfort include public sidewalks, walkways, building entrances, outdoor amenity spaces, parking lots and potential terraces on Towers 'A' and 'B'.

Image 1: Existing Site and Surroundings (Credit: Google Earth)

Image 2: Layout of the Proposed Project

Wind Data

Meteorological data from Region of Waterloo-Wellington International Airport recorded from 1992 to 2021 were used as a reference for wind conditions. This is the nearest station to the project site with long-term reliable wind data. The distributions of wind frequency and directionality for the summer (May through October) and winter (November through April) seasons are shown by the wind roses in Image 3. When all winds are considered (regardless of speed), winds from the south-southwest through northwest and east directions are predominant during both the summer and winter seasons. Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10m) occur more often in the winter than in the summer and they are primarily from the westerly directions.



Summer (May to October)

Winter (November to April)

Image 3: Directional Distribution of Winds Approaching Region of Waterloo-Wellington International Airport (1992 – 2021)

Pedestrian Level Wind Conditions

Based on the current building design, local wind climate and RWDI's experience with wind-tunnel testing for similar projects, the potential wind conditions on and around the proposed project are discussed below:

- Wind generally tends to flow over open lands or buildings of uniform height, without disruption. Buildings that are taller than surroundings tend to intercept the stronger winds at higher elevations and redirect them to the ground level (Downwashing). These winds subsequently move around exposed building corners, causing a localized increase in wind activity due to Corner Acceleration. When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to Channelling Effect caused by the narrow gap. A large podium or stepped building massing is effective for reducing the wind impact at grade. These wind flow patterns are illustrated in Image 4.

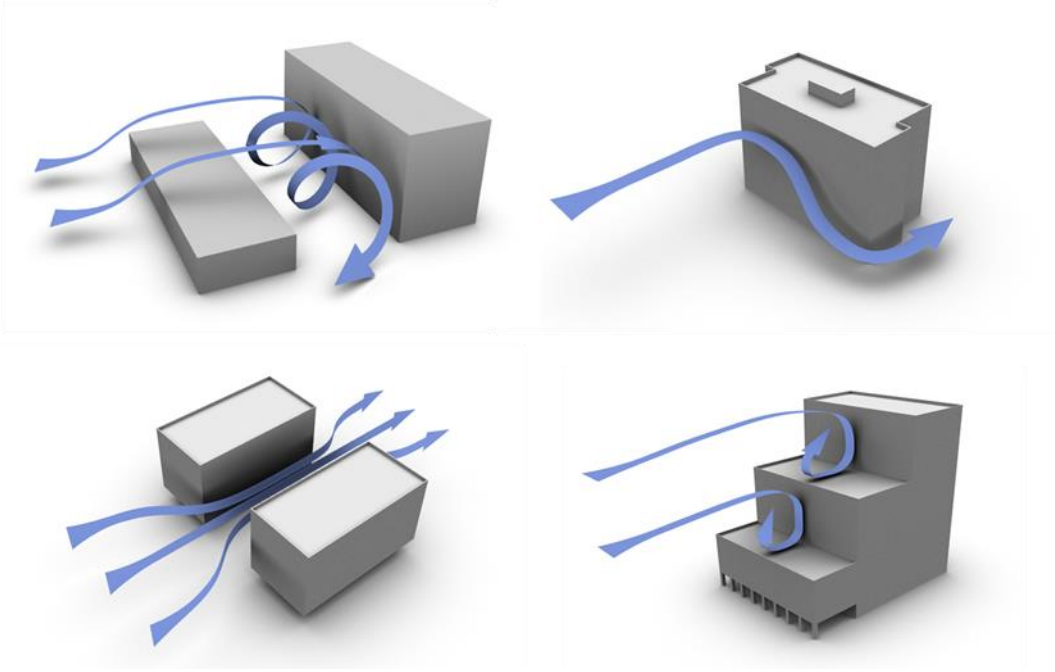


Image 4: General Flow Patterns

- As shown in Image 2, the proposed development consists of two tall towers ('A' and 'B'), plus 3-storey buildings and a parking structure. Wind conditions around the low buildings are expected to be appropriate throughout the year, due to their density and uniform height together with the existing and proposed landscaping on and around the site.
- Increased wind speeds are expected around the proposed Towers 'A' and 'B'. To assist the following discussion, seasonal wind roses are superimposed on a partial site plan for the

proposed towers in Image 5. Note that wind directions are referenced below to true north, while project north is used for building and street orientations.

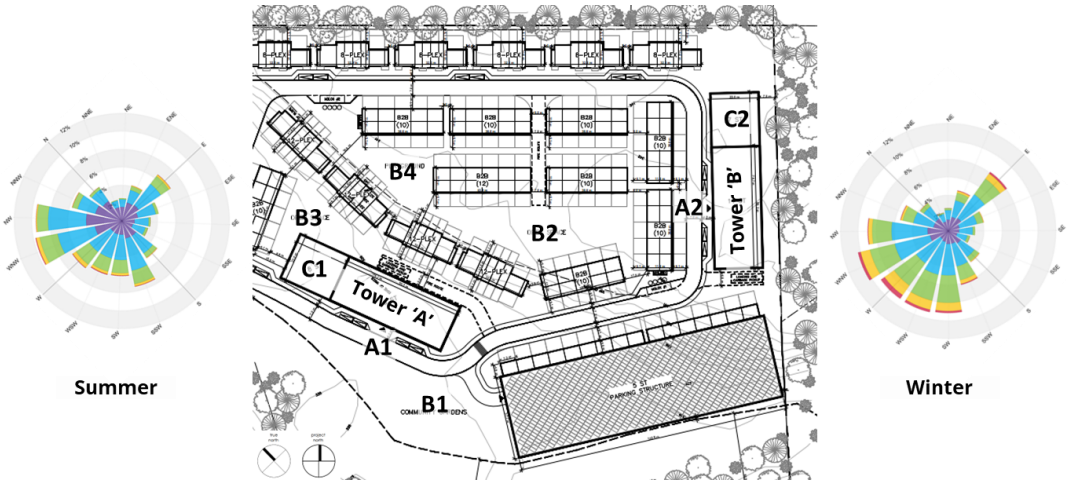


Image 5: Reference Plan for Towers, Entrances and Amenity Spaces with Wind Roses

- Pedestrians on sidewalks, walkways and parking lots are typically active and relatively high wind speeds can be tolerated. Suitable wind conditions are generally predicted for these areas throughout the year, but uncomfortable wind conditions may occur in the winter around the corners of Towers 'A' and 'B'.
- In the summer, suitable wind conditions are also expected for the two main entrances to Towers 'A' and 'B' (Locations A1 and A2, respectively, in Image 5). In the winter, however, wind speeds in these areas may be higher than desired for a main entrance, due to the prevailing westerly winds downwashing off the south façade of Tower 'A' and accelerating along the west façade of Tower 'B'.
- For outdoor amenity spaces at grade (B1 through B4 in Image 5) and potentially on the podia of Towers 'A' and 'B' (C1 and C2), low wind speeds are desired for passive use during the summer when these areas are often in use. This requirement is expected to be met for Areas B2 and B4 because they are largely enclosed by the proposed 3-storey buildings. Higher wind speeds may occur in B1 due to winds accelerating around the southeast corner of Tower 'A' and channelling between Tower 'A' and the parking structure, and in B3 due to winds accelerating around the northwest corner of Tower 'A'.
- Due to increased elevations and exposure, high wind speeds are also expected on the podia of Towers 'A' and 'B', which may potentially be used as outdoor terraces.
- As design progresses, the following wind control measures may be considered for the above-mentioned windy areas, and RWDI can provide additional assistance to refine these measures through computer simulation and/or wind tunnel testing at later design stages:
    - To include additional coniferous and marcescent species in the proposed landscaping on and around the development;

- To include a large canopy above the main entrance to Tower 'A' and wind screens and/or planters on the west side the doorway;
- To include wind screens and/or planters on the south side the main entrance to Tower 'B';
- For amenities B1 and B3, to locate the areas for passive activities away from building corners and gaps, and to install trellises, screens and/or planters around seating areas; and,
- To install tall guardrails along the perimeters, if outdoor amenity is planned for the podia of Towers 'A' and 'B', plus trellises/canopies close to the towers and landscaping over the entire podium spaces.

Conclusions

Given the local wind climate and the current design, no significant wind impact is expected on the adjacent sidewalks, the school or other surrounding areas. Suitable wind conditions are predicted for the sidewalks, walkways and parking lots throughout the year.

Suitable wind conditions are also predicted for the main entrances to Towers 'A' and 'B' in the summer and for the outdoor amenity spaces largely enclosed by the proposed 3-storey buildings. Higher-than-desired wind speeds are expected for the main entrances to Towers 'A' and 'B' in the winter as well as in the amenity spaces adjacent to Tower 'A' and on the potential podium terraces. Conceptual wind control measures are provided above and RWDI can assist in developing these measures in order to achieve appropriate wind conditions for these areas. Further wind studies can be conducted at later design stages to quantify these wind conditions and to refine any wind control strategies.

We trust the above wind assessment satisfies your current need. If you have any other questions, please do not hesitate to contact us.

Yours very truly,

Rowan Williams Davies & Irwin Inc. (RWDI)

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