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August 13, 2021

Grove Street Developments Inc.

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Re: Preliminary Pedestrian Wind Assessment – Letter of Opinion
10-24 Grove Street West – Barrie, ON
RWDI Project #2105102

Dear Sarah,

Rowan Williams Davies & Irwin Inc. (RWDI) has prepared this letter to comment on the potential wind conditions on and around the proposed project at 10-24 Grove Street West in Barrie, Ontario, in support of the project's first Site Plan Approval (SPA) application. This qualitative assessment is based on our knowledge of the local wind climate, the proposed building design information received by RWDI on August 3 and 5, 2021, the existing surroundings as well as our experience and professional judgement. The intent of this preliminary assessment is to inform the design team about anticipated wind conditions so that refinements can be considered in advance of wind-tunnel testing at a later design stage.

1.0 Site & Building Information

The proposed site is located west of Bayfield Street between Grove Street West and Highway 400 in Barrie (Image 1). The site is currently occupied by low-rise buildings, parking spaces and open green fields. The surroundings comprise a mix of low-rise buildings, roadways and treed lands, with Downtown Barrie and Harbour to the distant southeast.

The development consists of two buildings: Building 1 has three towers on a common podium and Building 2 consists of 5 storeys (Image 2). Towers 1 to 3 (from west to east) are 21, 25 and 25 storeys, respectively, with podiums between them at 5, 8 and 12 storeys. Key areas of interest for pedestrian wind comfort are building entrances, public sidewalks, walkways, surface parking lots as well as amenity spaces at the grade and podium levels.

Image 1: Aerial photo of existing site and surroundings (courtesy of Google Earth)

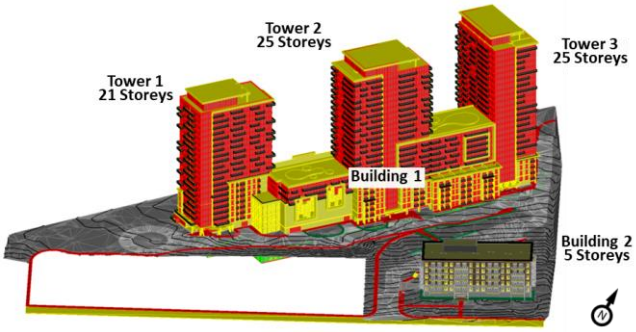


Image 2: 3D rendering of the proposed project

2.0 Meteorological Wind Data

Wind records from airports are typically measured in open areas for a long term and with high quality. They are often used as a reference of wind climate for building projects in the surrounding area. Wind statistics recorded at Lake Simcoe Regional Airport to the east of the site were analyzed for the summer (May through September) and winter (October through April) seasons and they are shown in Image 3.

In Image 3, the sectors show the frequency (along the radial axis) of winds blowing from different directions marked around the circumference. It can be noted that winds in the area may come from all directions, with the highest frequency and strength for the west-northwest direction. In addition, wind speeds are generally higher in the winter than those in the summer.

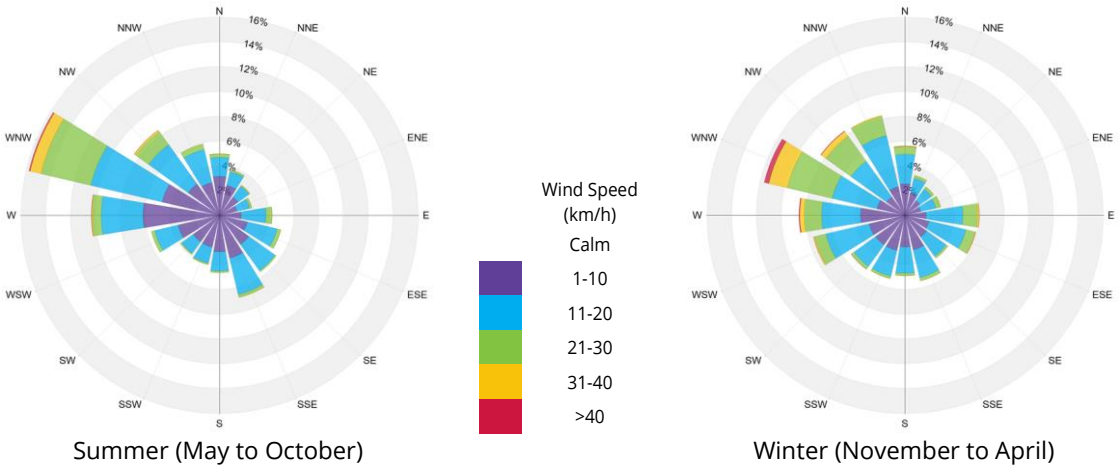


Image 3: Directional Distribution of Winds Approaching Lake Simcoe Regional Airport (2003-2020)

3.0 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 – use Image 4 as a reference:

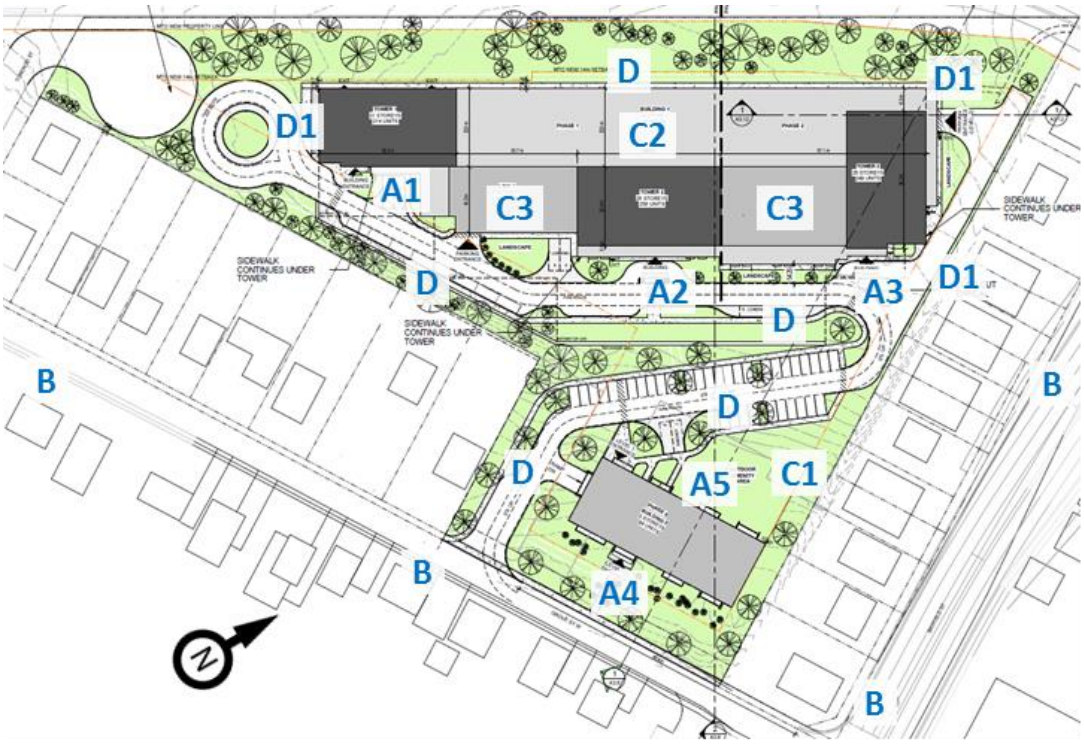


Image 4: Reference plan for key pedestrian areas

- Wind speeds naturally increase with elevations. Buildings taller than their surroundings tend to intercept the stronger winds at higher elevations and redirect them to the ground. Such a downwashing flow is often the main cause for wind acceleration at ground level or on building podiums. Furthermore, when winds approach a large façade and are redirected, a localized increase in wind speeds or corner acceleration can be expected around the exposed building corners. Narrow passages also cause winds to accelerate through them. These wind flow patterns could cause uncomfortable or unsafe wind conditions around the current project, due to the size of the project and low surroundings.

- The main entrances to the three proposed towers in Building 1 (Locations A1 through A3 in Image 4) are favourably located on the downwind side of the proposed building massing. Entrances to Building 2 (Locations A4 and A5) are sheltered by the proposed Buildings 1 and 2 from the prevailing winds. As a result, suitable wind conditions are generally expected around these entrances.

- Public sidewalks along Grove Street West and Bayfield Street (Location B in Image 4) are separated by existing residential buildings from the proposed project and the existing wind conditions on sidewalks are not expected to be affected significantly by the proposed development.

- With the existing and proposed buildings and landscaping in place, suitable wind conditions are predicted on the outdoor amenity space at grade (C1 in Image 4) during the summer. Winter wind speeds will be higher, but this is not a concern due to reduced usage of the area. Wind speeds are expected to be higher than desired for passive activities on the 5-storey podium (C2). Wind control solutions will be provided if frequent use of these above-ground areas is planned, and they may take the form of tall guardrails, trellises, wind screens, landscaping, etc. RWDI will coordinate with the landscape architect and developer to ensure the amenity deck at C2 is comfortable and safe for occupants from a pedestrian wind perspective.

- Users of on-site walkways and parking lots (Area D in Image 4) will be active and can tolerate higher wind speeds. Therefore, future wind conditions in these areas are appropriate in general. However, wind speeds around the exposed corner of Towers 1 and 3 (D1) may be uncomfortable or unsafe in the winter season. Pedestrian activities should be planned away from these areas, or wind mitigation measure should be developed, ranging from massing changes (corner articulations and arcades) to landscaping details (trellises, canopies, wind screens, coniferous trees etc.). RWDI will coordinate with the landscape architect and developer to ensure these areas are comfortable and safe for pedestrians and occupants from a pedestrian wind perspective.

- The design team intend to quantify the wind conditions discussed herein through wind-tunnel testing in the fall of 2021 and wind control strategies should be developed for windy areas.

4.0 Conclusions

Given the local wind climate, the present design of the proposed project and existing surroundings, suitable wind conditions are predicted for the main residential entrances to Tower 2, Tower 3 and Building 2, on public sidewalks along adjacent Bayfield Street and Grove Street West, on the ground amenity space and most on-site parking lots and walkways. Elevated wind speeds that may be uncomfortable or unsafe in the winter are expected on the podium spaces around and between the proposed towers. Areas of predicted elevated wind activity will be addressed through wind-tunnel testing and RWDI's coordination with the landscape architect and owner, to ensure these areas are comfortable and safe for occupants from a pedestrian wind perspective.

If desired, we can be available to discuss these findings with the design team and City staff. We understand these predicted pedestrian wind conditions will need to be quantified with wind-tunnel testing and wind control solutions will be developed for windy areas at a later date.

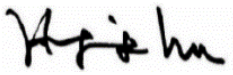
5.0 Closing

We trust that this satisfies the City of Barrie Planning & Development department's requirements for this project's first SPA submission at this time. The design team have been diligent in proactively addressing any wind concerns and have committed to conducting full wind-tunnel testing, the results of which are forthcoming and will be included in subsequent SPA submissions.

Please do not hesitate to contact us with any questions or comments.

Yours very truly,

Rowan Williams Davies & Irwin Inc. (RWDI)



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