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July 17, 2024

Anthony D'Giacomo
President
Niagara Falls Non-Profit Housing Corporation

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Re: Pedestrian Wind Assessment – Letter of Opinion
8055-8065 McLeod Road
Niagara Falls, Ontario
RWDI Project #2409697

Dear Mr. D'Giacomo,

RWDI AIR Inc. (RWDI) has prepared this letter to comment on the expected wind conditions around the proposed residential development at 8055-8065 McLeod Road in Niagara Falls, Ontario. This qualitative assessment is based on the local wind climate, the design information received by RWDI on July 10, 2024, the existing surroundings, as well as our engineering judgement and experience with wind tunnel testing of similar buildings in the Niagara Falls area, including a recent project to the west of the site.

SITE AND BUILDING INFORMATION

The proposed development site is located on the north side of McLeod Road, between Kalar Road and Pin Oak Drive (Image 1). The site is currently covered by dense trees and surrounded by low-rise buildings as well as treed or open lands in all directions, with a 6-storey residential building to the immediate east (Image 1).

The proposed development consists of a 10-storey residential building with a rectangular floor plan (Images 2 and 3). Main entrances to the building are situated at the middle of north and south façades. A landscaped amenity space is proposed around the southwest building corner and parking lots are located to the east and north of the proposed building.

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

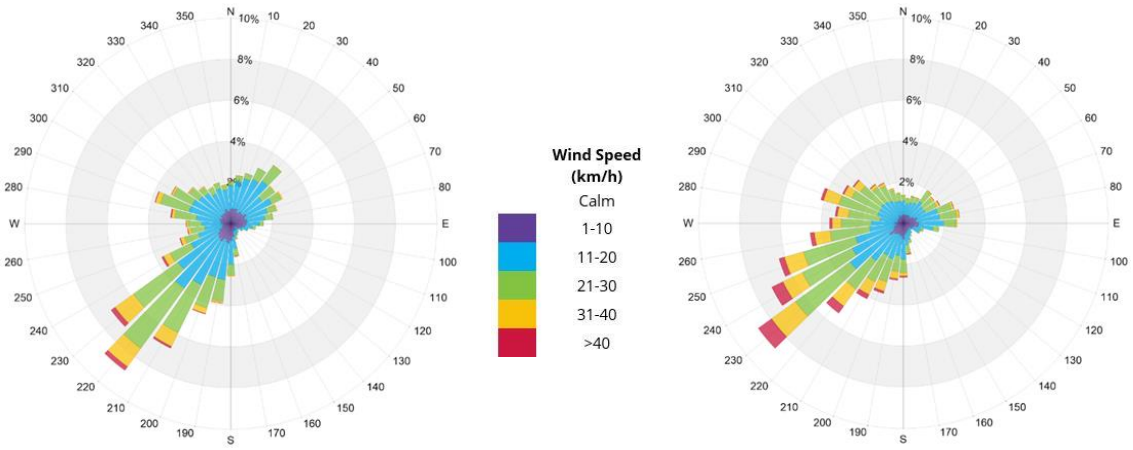
Image 2: Site Plan of the Proposed Project

Image 3: Elevations of South (left) and West (right)

METEOROLOGICAL DATA

Wind statistics recorded at St. Catharines Niagara District Airport between 2012 and 2020, inclusive, were analyzed. Image 4 graphically depicts the directional distribution of wind frequency and speeds for the summer (May-October) and winter (November-April). When all winds are considered, those blowing from the southwest quadrant are predominant during both seasons.

Strong winds of a mean speed greater than 30 km/h measured at the airport (red and yellow bands in the wind roses) are more frequent during the winter. These winds are primarily from the southwesterly directions.



Summer Winds (May to October) Winter Winds (November to April)

Image 4: Direction Distribution of Winds Approaching St. Catharines Niagara District Airport (2012 and 2020)

PEDESTRIAN WIND ASSESSMENT

Pedestrian areas of interest on and around the site include main building entrances, surface parking lots, the amenity space around the southwest building corner, and sidewalks along McLeod Road.

Existing Scenario

The project site is covered by dense trees and the sidewalks along McLeod Road are exposed to the prevailing winds from the southwesterly directions, as shown in Image 1. However, there are no tall buildings or structures to redirect winds down and cause adverse wind conditions, and suitable wind conditions are expected currently along the sidewalks throughout the year.

Proposed Scenario

The proposed development, at 10 stories, will be taller than the existing surroundings. Thus, the building facades will intercept the prevailing southwesterly winds and redirect them down to the ground level. Such wind downdrafts are expected to subsequently accelerate along the facades and around the northwest and southeast building corners, creating increased wind activity. It is worth noting that due to the moderate height of the proposed development, these wind impacts are predicted to be localized and wind conditions in the extended surrounding areas are not expected to be affected by the construction of the new building.

- The sidewalks along McLeod Road are located on the south side or upwind of the proposed building with respect to the prevailing southwesterly winds. As a result, the current wind conditions along sidewalks are not expected to be negatively affected by the proposed development.

- The main entrance and drop off area are located at the middle of the north façade, sheltered by a large canopy and designed with a vestibule and a large lobby (Images 2 and 3). These are positive design features for wind control and user comfort. Suitable wind conditions are predicted in these areas throughout the year.

- Another entrance on the south façade is also protected by a canopy and designed with a vestibule and a lobby. Suitable wind conditions are also predicted immediately around the south entrance.

- The proposed outdoor amenity space at the southwest corner of the proposed building is exposed to the prevailing southwesterly winds. While wind conditions are expected to be appropriate for active use of the area in both the summer and winter seasons, additional landscaping measures are required if passive activities such as sitting or dinning are anticipated. Large trees with under planting or bushes are often used for wind control. Coniferous species should be considered if wind protection in the winter is desired.

- Suitable wind conditions are expected on the proposed parking lots, as users will be active and not stay outdoor for long periods of time on windy/cold days.

- As discussed above, the highest wind speeds on and around the project site are expected to occur around the northwest and southeast tower corners, where wind speeds may become uncomfortable in the winter and potentially exceed the wind safety limit. Landscaping elements, such as coniferous trees, wind screens and trellises, are recommended for these two corner areas to keep pedestrians away from the corners and to reduce the wind speeds at the adjacent parking spaces and drop-off area. Also note that the snow storage area at the northwest building corner should be relocated away from the building to reduce the risk of snow drifting from the corner into the drop-off area.

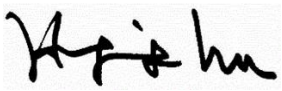
CLOSING

We trust the enclosed meets your present requirements. Should you have any questions or require additional information, please do not hesitate to contact us.

Yours very truly,

RWDI AIR Inc.

Anthony Vanderheyden, B.A.Sc., EIT
Project Manager



Hanqing Wu, Ph.D., P.Eng.
Senior Technical Director / Principal

Statement of Limitations

This letter was prepared by RWDI AIR Inc. for the Niagara Falls Non-Profit Housing Corporation ("Client"). The findings and conclusions presented in this letter have been prepared for the Client and are specific to the project described herein and authorized scope. The conclusions and recommendations contained in this letter are based on the information available to RWDI when this letter was prepared. Because the contents of this letter may not reflect the final design of the Project or subsequent changes made after the date of this letter, RWDI recommends that it be retained by the Client to verify that the results and recommendations provided in this letter have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this letter have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the letter and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this letter carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.