



600 Southgate Drive
Cuelph, ON N1G 4P6
Canada

Tel: +1.519.823.1311
Fax: +1.519.823.1316

August 22, 2024

Mike Crough MCIP RPP

Principal – Planning
Arcadis Professional Services (Canada) Inc.
Suite 200, East Wing – 360 James St N
Hamilton, ON L9K 1N3

**Re: Pedestrian Wind Assessment – Letter of Opinion
304/314 Main & 17 West Avenue
Hamilton, Ontario
RWDI Project #2505597**

Dear Mr. Crough:

RWDI AIR Inc. (RWDI) has prepared this letter to comment on the expected wind conditions around the proposed residential development at 304-314 Main Street and 17 West Avenue South in Hamilton, Ontario. This qualitative assessment is based on the local wind climate, the design information received by RWDI on August 20, 2024, the existing surroundings, as well as our engineering judgement and experience with wind-tunnel testing of similar buildings in the Hamilton area.

SITE AND BUILDING INFORMATION

The proposed project site is located on the south side of Main Street, between West Avenue South and Victoria Avenue South (Image 1). The site is currently occupied by a low retail building, a gas station and parking lots and is surrounded by low-rise buildings in all directions, with several taller buildings to the northwest (Image 1). Hamilton's downtown is located to the distant northwest, the escarpment to the south and the harbour and lake to the north and east.

The proposed development consists of two 25-storey residential buildings with a shared 8-storey podium (Images 2, 3 and 4). Main entrances to the development are situated in the middle of north and south façades. An amenity terrace is proposed on the top of the podium between the proposed towers (Image 4). Other pedestrian areas of interest include public sidewalks and alleyways around the proposed development.



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

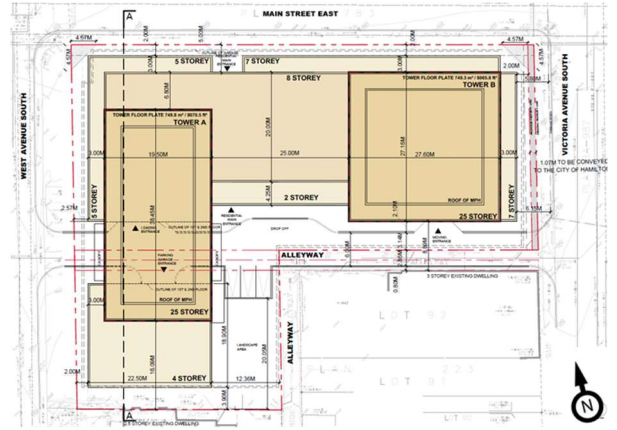


Image 2: Site Plan of the Proposed Project

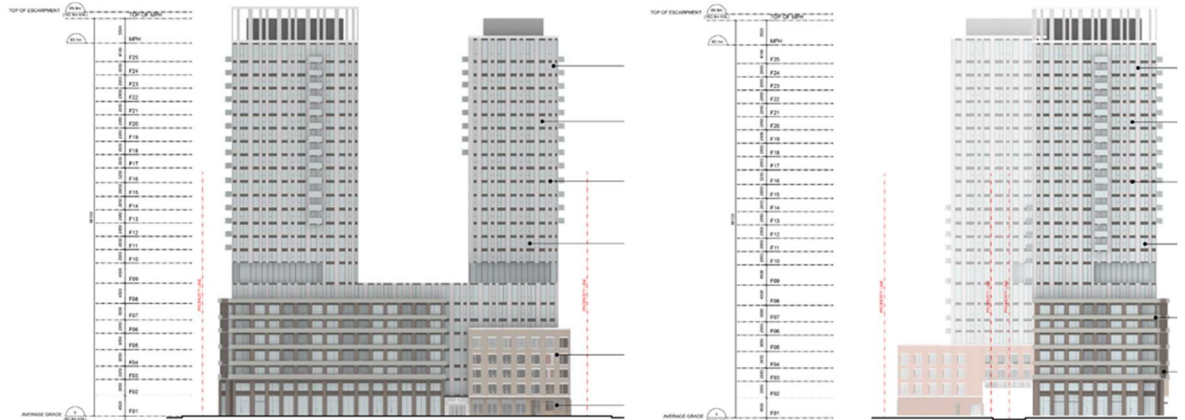


Image 3: North (left) and East (right) Elevations



Image 4: Plans of Ground Floor (left) and 9th Floor (right)



METEOROLOGICAL DATA

Meteorological data from John C. Munro Hamilton Airport recorded between 1991 and 2020 were used as a reference for wind conditions around the current project. The distributions of wind frequency and directionality for the summer (May through October) and winter (November through April) seasons are shown in the wind roses in Image 5.

When all winds are considered (regardless of speeds), winds are frequent from the southwest and northeast quadrants for both seasons, as indicated by the wind roses in Image 5.

Strong winds of a mean speed greater than 30 km/h, measured at the airport at an anemometer height of 10 m, occur more often in the winter than in the summer (red and yellow bands in Image 5). They are also from the southwest and northeast quadrants.

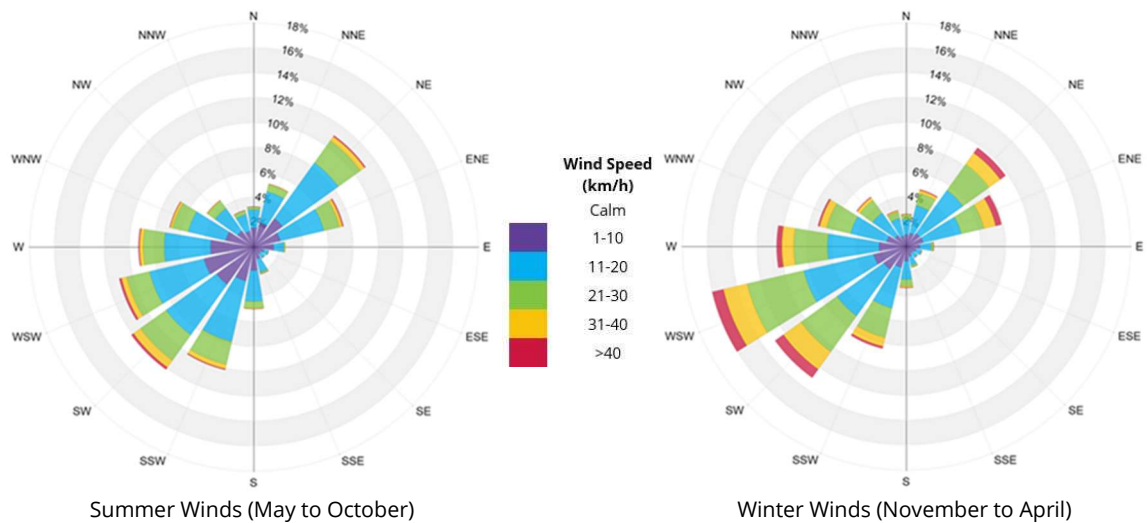


Image 5: Directional Distribution of Winds Approaching John C. Munro Hamilton Airport (1991 to 2020)

PEDESTRIAN WIND ASSESSMENT

Pedestrian areas of interest on and around the site include main building entrances, the amenity terrace on the podium, and sidewalks and alleyways adjacent to the project.

Existing Scenario

The project site is occupied and surrounded by low-rise buildings. There are no tall buildings or structures to redirect winds down and cause adverse wind conditions on site. Currently, suitable wind conditions are expected along the sidewalks and parking spaces throughout the year.



Proposed Scenario

The proposed buildings, at 25 storeys, will be taller than the existing surroundings. Thus, the building facades will intercept the prevailing southwest and northeast 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, as well as through the driveway underneath the west building, creating increased wind activity.

- As shown in Images 2 and 3, the proposed towers are set back at various levels along the west, north and east facades, reducing the potential impact of downwashing winds on the ground level.
- The main entrances to the proposed buildings are recessed into the north and south façades, away from building corners and sheltered by the project itself from one of the prevailing winds. The proposed vestibules and lobby (Image 4) are also positive for wind control and user comfort as they provide indoor waiting spaces on windy and cold days. Suitable wind conditions are predicted around these entrances throughout the year.
- Pedestrians on sidewalks and alleyways are active and can tolerate slightly higher wind speeds. Suitable wind conditions are expected for all sidewalks and alleyways during the summer and most areas in the winter. Elevated wind speeds are predicted in the winter around the northwest and southeast corners of the project and along the driveway underneath the west tower. The resultant wind conditions may potentially be uncomfortable and even exceed the wind safety limit. Typical wind control strategies may range from massing changes (e.g., additional tower setbacks and corner articulations) to smaller architectural and landscaping features such as canopies, screens and coniferous/marcescent trees.
- Due to the increased elevation and exposure, relatively high wind speeds are also expected on the podium terraces, where calm wind conditions are often desired for passive activities during the summer. These wind conditions can be improved by taller guardrails, trellises, screens and other landscaping elements.
- Wind tunnel testing is recommended at a later design stage to quantify these wind conditions and, if necessary, to develop wind control solutions.

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.

Maja Bokara, PGCert, EP
Project Manager

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



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STATEMENT OF LIMITATIONS

This letter was prepared by RWDI AIR Inc. for Arcadis Professional Services (Canada) Inc. ("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.