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July 21, 2020

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**Re: Pedestrian Wind Conditions – Letter of Opinion
314-316 Batavia Place and 295-297 Albert Street
RWDI Reference No. 2004426**

Dear Mr. Zhang,

RWDI has prepared this letter to present our opinion on the potential pedestrian wind conditions on and around the proposed development at 314-316 Batavia Place and 295-297 Albert Street in Waterloo, Ontario. Our opinions presented herein are based on a qualitative assessment of the wind conditions in the context of the regional long-term meteorological data, our engineering judgement, understanding of wind flows around buildings and our experience with quantitative wind studies in Waterloo.

BUILDING AND SITE INFORMATION

The proposed development will be located at the southeast end of Batavia Place, within a city block bordered by Albert St, Hickory St W, Lester St and Columbia St W (see Image 1).

Currently, the site is occupied by four houses. The surrounding buildings are low-rise houses and other mid- to high-rise developments under construction (i.e. 311-312 Batavia Place) or recently built to the west (i.e. around Lester Street) and south.

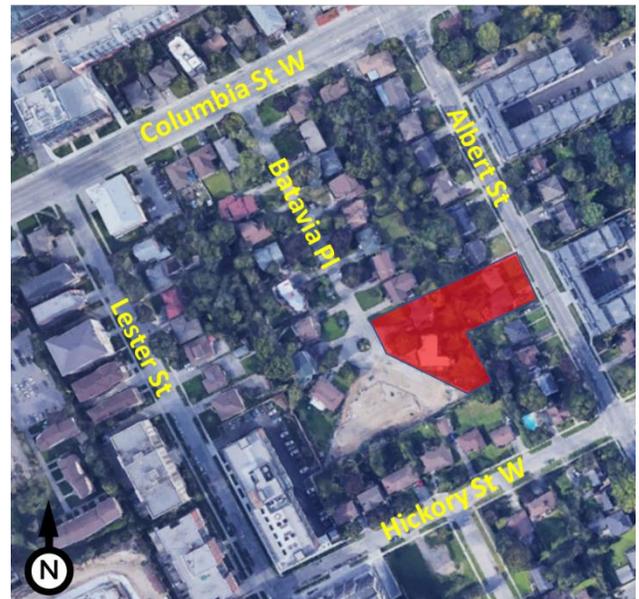


Image 1 – Aerial View of Site
(Image Courtesy of Google Earth™)



Based on the drawings received by RWDI on July 7 and July 14, 2020, the proposed development will be a six-storey building with parking space on Level 1 (see Images 2 and 3).

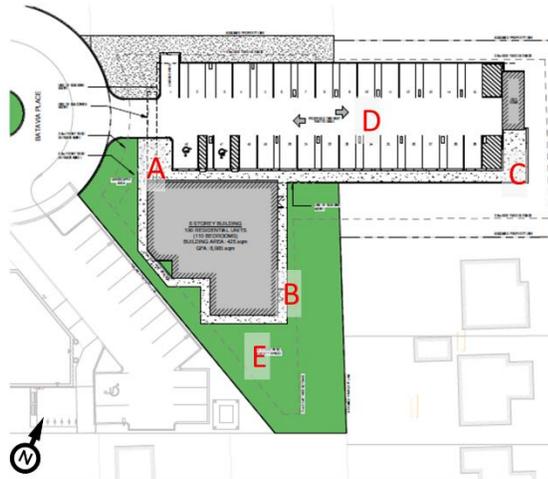


Image 2 – Site Plan



Image 3 – 3D Rendering

The main entrance to the building will front onto Batavia Place (location “A” in Image 2), with secondary entrances/exits along other facades (locations “B” and “C” in Image 2). Other pedestrian areas include public sidewalks along Albert Street and Batavia Place, a Level 1 parking area (location “D” in Image 2), and an outdoor amenity area at grade level south of the proposed building (location “E” in Image 2).

METEOROLOGICAL DATA

Long-term wind statistics at the Waterloo Region International Airport were analyzed for the summer (May through October) and winter (November through April) seasons (see Image 4). Winds from the south-southwest through northwest and east directions are predominant in the summer, while winds from the westerly directions are most frequent in the winter. Strong winds occur more often in the winter and they are typically from the westerly directions throughout the year.

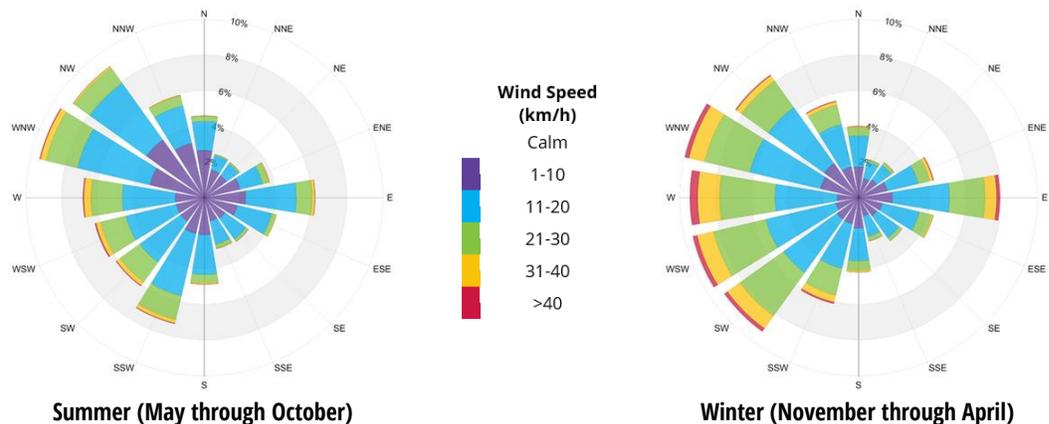


Image 4 – Directional Distribution of Winds – Waterloo Region International Airport (1987-2017)



PEDESTRIAN WIND ASSESSMENT

To provide an opinion on the overall wind conditions expected around the proposed development, RWDI reviewed the following:

- long-term meteorological data for the area, as described above;
- drawings and renderings of the proposed development;
- information regarding the surroundings; and,
- the results of our experience in the area.

This information, in conjunction with our engineering judgement, allow us to summarize the expected wind conditions as outlined below.

Public Sidewalks Around the Development

The mid-rise buildings to the west of the project site, along Lester street, will provide some protection from the prevailing westerly winds. Wind conditions along the Batavia Place and Albert Street sidewalks are expected to be similar to what is currently experienced and are predicted to be suitable for pedestrian use throughout the year.

Main Entrance

The main entrance is located near the building corner (see "A" in Image 2), where winds from the southwest through northwest can downwash from the building façade above and accelerate around this building corner. Also, the main entrance will be exposed to the strong northwesterly winds during winter. Wind conditions are predicted to be higher than desired for the main entrance. Installing a porous wind screen or planters on the west side of the entrance would be beneficial to improving wind conditions, the height of the wind screen or planters should be at least taller than the height of the entrance doors. In addition, recessing this entrance into the vestibule could also help improve pedestrian comfort.

Secondary Entrances

The bike storage room entrance is located at the southeast corner of the building (see "B" in Image 2). Due to the sheltering provided by the proposed building from the prevailing westerly winds, wind conditions are predicted to be comfortable for the intended use.



The Albert Street entrance located at the east side of the building (see “C” in Image 2) is recessed and has a canopy above it. These are positive design features that will help minimize wind impacts. Wind conditions at the Albert Street entrance are expected to be comfortable for the intended use throughout the year.

Level 1 Parking Lot

Due to the westerly winds channeling through the parking area under the building, slightly higher wind speeds are expected at the Level 1 parking lot (see “D” in Image 2). However, since pedestrian using the parking lot will be active and less likely to remain in one area for prolonged periods of time, these wind conditions are considered acceptable.

Grade-Level Outdoor Amenity Space

The outdoor amenity space at grade level is located at the south side of the building (see location “E” in Image 2). In the summer, when the outdoor amenity space is expected to be used most frequently, the northwesterly winds are predicted to channel between the proposed building and the adjacent six-storey building (311-312 Batavia Place), as shown in Image 5. In addition, the easterly winds are also expected to accelerate around the southeast building corner. Due to the channeling winds and corner-acceleration winds, wind speeds at the outdoor amenity space are anticipated to be higher than desired for passive activities.

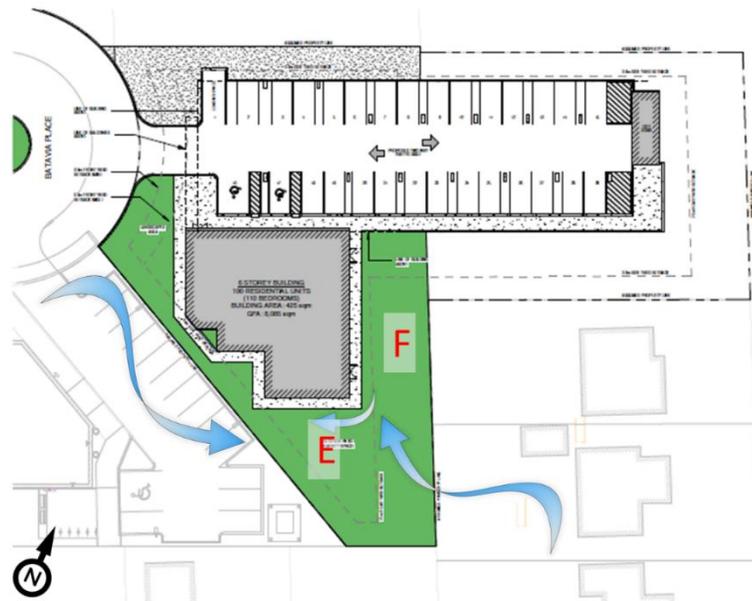


Image 5 – Wind Flow Around the Outdoor Amenity Space

If lower wind speeds are desired at the outdoor amenity space, the following mitigation measures should be considered.

- Relocate the outdoor amenity space to the leeward side (see "F" in Image 5), to provide sheltering from the channeling winds.
- Add landscaping and/or porous screen/fence to the west and south of the outdoor amenity space. As a general guideline, the wind sheltering distance that a porous screen or fence can provide is about five to ten times the screen/fence's height, as shown in Image 6.
- Install a trellis or canopy close to the south building façade to protect the outdoor amenity area from easterly winds downwashing from the building.

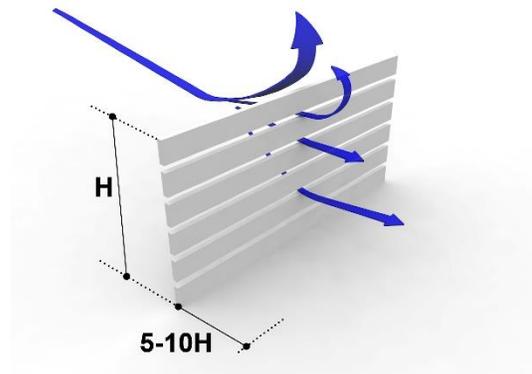


Image 6 – Wind Sheltering Distance Provided by a Porous Screen or Fence

CONCLUSION

Based on the height of the proposed development, positive design features, and mid-rise surroundings, appropriate wind conditions are predicted at the public sidewalks, Albert Street entrance, bike storage room entrance and the Level 1 parking lot. However, higher than desired wind speeds are expected at the main entrance and the outdoor amenity space. Options have been provided for improving wind conditions at the main entrance and outdoor amenity space.



Parker Zhang
2744375 Ontario Ltd.
RWDI#2004426
JULY 21, 2020

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 truly,

RWDI

A handwritten signature in black ink that reads "Leo Yi Zeng".

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A handwritten signature in black ink that reads "Claire Finoro".

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