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Tel: 519.823.1311  
Fax: 519.823.1316

Rowan Williams Davies & Irwin Inc.  
650 Woodlawn Road West  
Guelph, Ontario, Canada  
N1K 1B8

December 4, 2015

Bemice Cheung  
St. Thomas Developments  
P: (416) 922-5363  
[bcheung@stthomasdevelopments.com](mailto:bcheung@stthomasdevelopments.com)

**Re: Pedestrian Wind Conditions – Letter of Opinion**  
**88 Queen Street East**  
**Toronto, Ontario**  
**RWDI Reference Number: 1600713**

Dear Bemice,

As per your request, Rowan Williams Davies & Irwin Inc. (RWDI) has prepared this letter to present our opinion of pedestrian wind conditions around the proposed 88 Queen Street East project in Toronto. The following discussions describe the potential pedestrian wind conditions around the proposed development based on a review of the local wind climate and the updated design information received by RWDI on October 27, 2015, combined with our experience with wind flows around buildings.

## Building and Site Information

The proposed development is located on the north portion of the street block bordered by Queen, Dalhousie, Shuter and Mutual Streets (Image 1). It consists of a 29-storey residential tower with a 7-storey podium, plus a mechanical floor for a total height of approximately 94.5m (Image 2). Pedestrian areas on and around the development include public sidewalks, residential and retail entrances, a public park, an outdoor amenity on the top of the podium at Level 8 and private balconies and terraces at various levels.



**Image 1** - Aerial view of the development site and surroundings (courtesy of Google earth™)



**Image 2** – Perspective view from north



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The entire street block is currently a parking lot. There are several towers of similar height near the development site. The further surroundings consist of dense tall buildings in the downtown core of Toronto to the south through west to north directions and a mix of mid and low-rise buildings to other directions.

Long-term wind statistics for Toronto indicate that, during both summer (May through October) and winter (November through April) seasons, winds from the southwest through north-northwest, east-northeast and east directions are predominant. Strong winds (red and yellow bands in Image 3) occur more often in the winter and they are typically from the westerly directions, with occasionally easterly storms in both the summer and winter seasons.

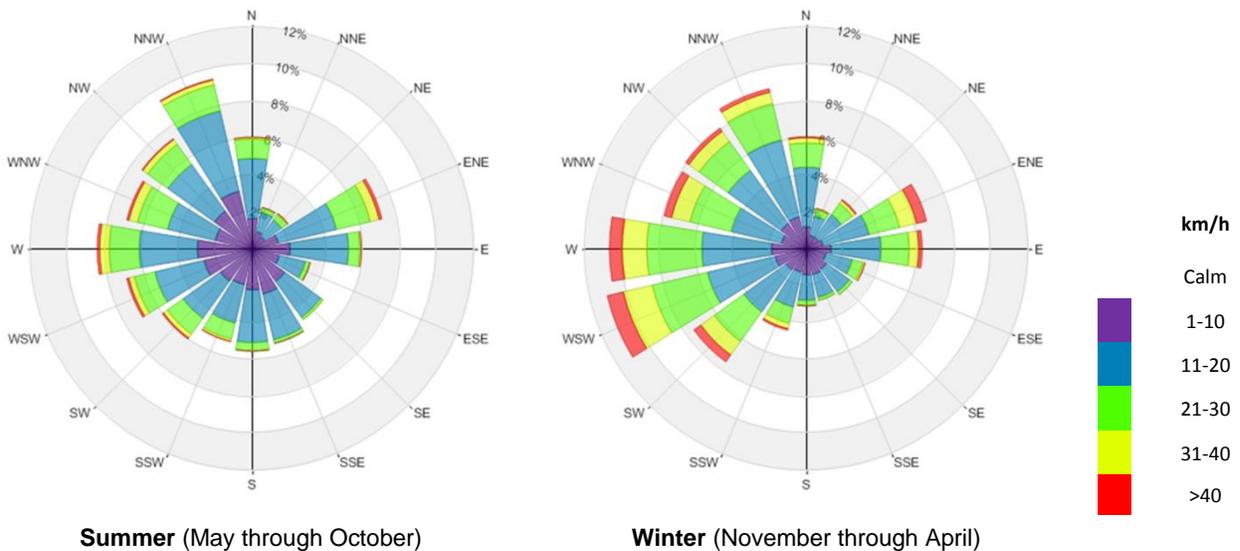


Image 3 – Directional distribution of winds (blowing from): based on data from Pearson and Island Airports

### Pedestrian Wind Assessment

In order to provide an opinion on the overall wind conditions expected around the proposed development, RWDI reviewed long-term meteorological data for the area, updated drawings of the proposed development and information regarding the surroundings. These data, in conjunction with our past experience in the Toronto area and our engineering judgement, allowed us to summarize the expected wind conditions as below:

- The proposed tower is considerably taller than its surroundings. It will intercept stronger winds at higher elevations and deflect them down to the ground. The proposed 7-storey podium west of the tower (Image 2) is a positive design feature for wind control, as they will reduce the direct impact of these downwashing flows. The irregular balconies (Image 2) are also positive in reducing the downwashing flows.
- The dense buildings in the downtown Toronto will shelter the development from the prevailing winds from the southwest to northwest directions (Image 3).
- As a result, any wind impact caused by the proposed development is expected to be localized. In other words, the general wind conditions in the neighbourhood will not be affected significantly.



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Bernice Cheung  
St. Thomas Developments  
RWDI Proposal #1600713  
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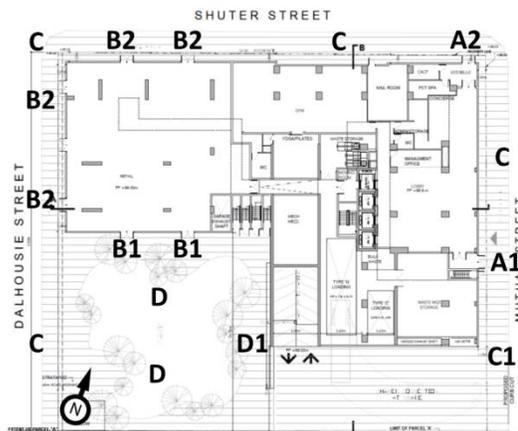


Image 4a – Ground floor plan

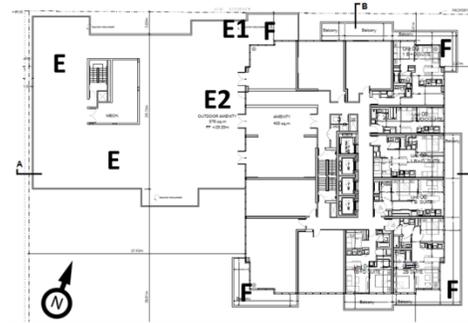


Image 4b – Level 8 plan

- The main entrances to the tower are located on Mutual Street (A1 in Image 4a) and near the corner of Shuter and Mutual Streets (A2). Both entrances are designed with vestibules, where residents can wait indoors on windy days. The Mutual Street entrance A1 will be sheltered by the proposed building from the westerly winds and the proposed canopy and landscaping (Image 2) will further reduce the winds from easterly directions. Therefore, suitable wind conditions are expected at A1 throughout the year.
- The entrance A2, however, is located at a more exposed tower corner where strong winds may cause issues to pedestrian comfort and door operability. It is recommended that the entrance be relocated away from the corner, recessed from the main façade protected by wind screens and/or equipped with sliding doors. Wind tunnel tests can be used to quantify these wind conditions and, if necessary, to develop wind control solutions.
- Entrances to the retail space are under the 7-storey podium, on the west side of the proposed tower. While the south entrances (B1) are expected to have suitable wind conditions throughout the year, the entrances along Shuter and Dalhousie Streets (B2) may see slightly higher wind speeds from time to time in the winter. The general conditions are still considered appropriate for the intended use.
- Sidewalks around the development are predicted to have suitable wind conditions throughout the year (C in Image 4a). Higher wind speeds are expected at tower corners (near C1, A2 and D1), but they will likely meet the wind safety and comfort criteria, given the local wind directionality and dense surroundings.
- The proposed park on the southwest portion of the site (D) will be sheltered by the existing and proposed buildings and by the proposed landscaping. Suitable wind conditions are expected in the summer when this area will be frequented. Higher wind speeds in the winter are acceptable due to reduced usage. Note that no passive activity shall be planned around the area close to the southwest corner of the proposed tower (D1) where high wind activity is expected.
- As shown in Image 4b, there is an amenity space at Level 8 west of the proposed tower (E). During the summer, wind conditions are expected to be comfortable in general, but may be perceived slightly windy for passive activities such as sitting. In addition to tall railings along the perimeter, wind mitigation may include screens and canopies around the northwest tower corner



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(E1) and a large trellis along the west façade above the entrances (E2). Localized landscaping can also be developed around any seating area.

- Private balconies and terraces at higher levels are exposed to higher wind speeds. The potential wind conditions may not be appropriate for the planned use, especially at tower corners (F in Figure 4b). Typical wind control measures may include vertical elements such as tall railings, landscaping, screens and partitions, depending upon the size and location of these balconies.

## Conclusion

Several positive wind control features have been included in the design of the proposed development, such as the large podium, canopies, landscaping and irregular balconies. Given the local wind directionality and dense surroundings, it is our opinion that the proposed development will not cause any significant wind impact on its surrounding streets and suitable wind conditions are expected on sidewalks, at the proposed park, and around most entrances. Higher-than-desired wind speeds are predicted around the entrance at the northeast corner of the tower, on the podium amenity space as well as at private balconies and terraces around tower corners. Conceptual wind mitigation measures are described in the letter for consideration. Wind tunnel testing should be conducted to quantify these wind conditions and, if necessary to develop wind control solutions.

We trust this satisfies your requirements for the project. Should you have any questions or require additional information, please do not hesitate to contact us.

Yours very truly,

**ROWAN WILLIAMS DAVIES & IRWIN Inc.**

A handwritten signature in black ink, appearing to read 'Hanqing Wu', written in a cursive style.

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

A handwritten signature in black ink, appearing to read 'Dan Bacon', written in a cursive style.

Dan Bacon  
Senior Project Manager / Associate