

July 21, 2015

Richard Dabrus
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**Re: Pedestrian Wind Review – Letter of Opinion
William Thomas Building
Hamilton, Ontario
RWDI Project #1502914**

Dear Mr. Dabrus:

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 William Thomas Building located in Hamilton, Ontario. 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 drawings received by RWDI in June and July, 2015, combined with our experience with wind flows around buildings.

BUILDING AND SITE INFORMATION

The proposed development will be located on a street block bordered by James, Rebecca, Hughson and King William Streets in Hamilton, Ontario (Image 1). The development will consist of a 20 storey building for a total height of approximately 64 m. The tower has a rectangular floor plan with the long axis in an east-west direction. The tower will set back from James Street at the 5th floor and be separated from other three streets (Image 2). Pedestrian areas on and around the development include residential and retail entrances, sidewalks and a potential outdoor amenity space on the podium.



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



Image 2 – Northwest View

Immediately around the site is a mixture of low-rise buildings and parking lots. Tall buildings exist to the south and southwest along King and Main Streets. Hamilton Harbour is located to the north of the site, Lake Ontario to the distant northeast and the Niagara Escarpment to the south.

The nearest weather station with comprehensive long-term wind records is Hamilton International Airport (see wind roses in Image 3). Winds from the south-southwest through west-northwest, northeast and east-northeast directions are predominant in the summer when all winds are considered. The right wind rose shows the winter data, indicating the predominance of winds from the southwest, west-southwest, west, northeast and east-northeast during this season. Strong winds (yellow and red bands) are also from these directions, with a considerably higher frequency in the winter than the summer.

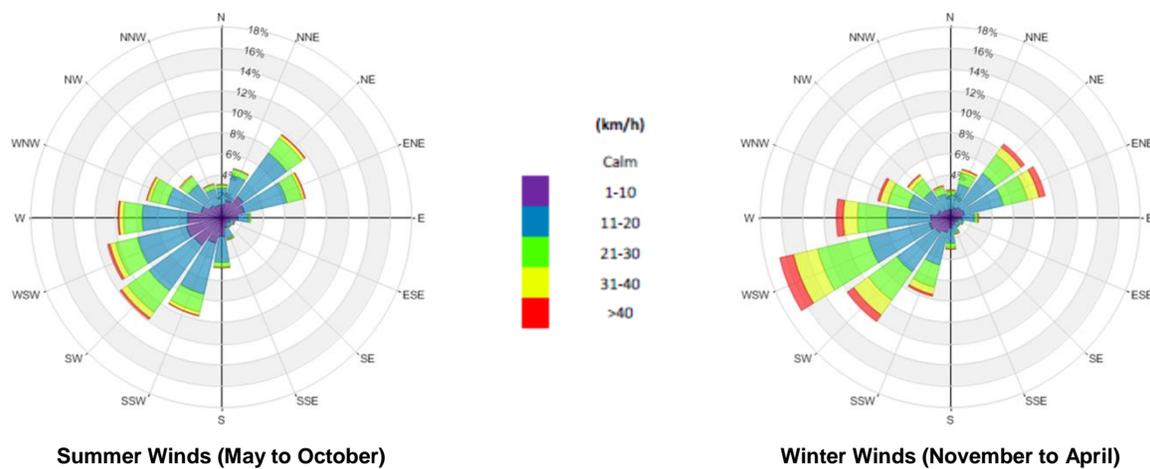


Image 3 – Direction Distribution (%) of Winds (Blowing From) - Hamilton International Airport (1970 to 2011)

PEDESTRIAN WIND ASSESSMENT

In order to provide an opinion on the overall wind conditions expected on and around the proposed development, RWDI reviewed the long-term meteorological data for the area, up-to-date drawings of the proposed development and information regarding the surroundings. These data, in conjunction with our past experience in the area and our engineering judgment, allowed us to summarize the expected wind conditions at the project site. Our findings are summarized as below:

- The existing tall buildings in downtown Hamilton reduce the prevailing south and southwest winds from reaching the development site. Future buildings in the surrounding areas will further improve the wind conditions.
- The proposed building will be taller than its immediate surroundings. Tall buildings tend to intercept the stronger winds at higher elevations and redirect these flows down to grade. Such a *Downwashing Flow* (Image 4a) is often the main cause for wind flow accelerations at the street level. An effective measure to reduce the direct impact of the downwashing flow is to include a large podium around the tower, as shown in Image 4b. The inclusion of a podium structure as shown in the current design of the William Thomas Building is a positive design feature from a wind perspective (Image 2). The effect of the podium will be enhanced by the existing low buildings abutting the development to the south and north.



Image 4a – Downwashing Flow

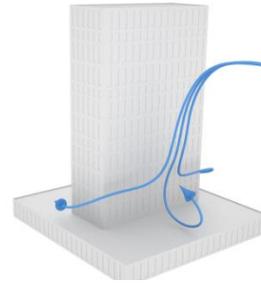


Image 4b – Large Podium for Wind Control

- The proposed development has a limited street exposure and the tower steps back from James Street at the 5th floor (Images 2 and 5). The proposed podium structure has the same height as the existing building to the immediate north and is slightly shorter than the existing building to the south. Due to the tower orientation, the prevailing southwest and west winds tend to accelerate towards the east end of the building (Image 5), resulting in a limited wind impact on James Street. The proposed tower also shelters the James Street sidewalks and entrances from the northeasterly winds, which are also frequent in both seasons.

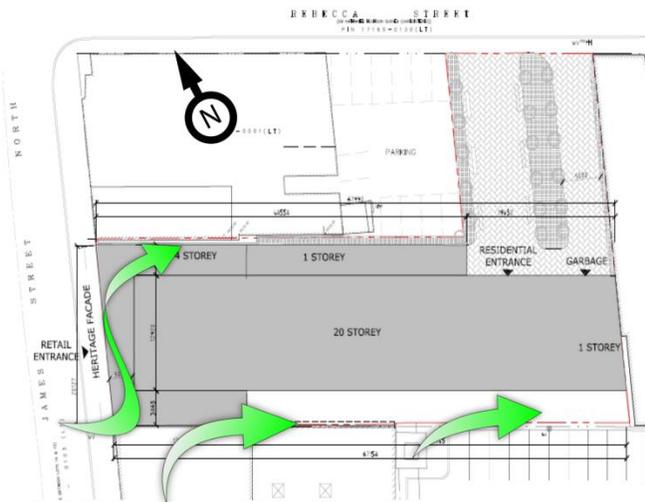


Image 5 – Ground Floor Plan

- As a result, the existing wind conditions on the sidewalks along James Street will not be significantly affected by the proposed development. Suitable wind conditions are predicted along the sidewalks and around the retail entrances throughout the year.
- The residential entrance is located on the north side of the building (Image 5) and, therefore, sheltered by the building from the prevailing southwest and west winds. The tower is located away from Rebecca Street and separated by the existing low buildings and the proposed landscaping along driveways. Suitable wind conditions are predicted for the residential entrance and the wind conditions on sidewalks along Rebecca Street and other adjacent streets will not be negatively affected by the proposed development.
- It is not clear if the area on the podium will be used as a public amenity. Wind speeds on the podium are expected to be higher than desired for passive pedestrian activities (e.g., sitting) even in the summer, due to increased wind exposure at higher elevations and winds being redirected down by the tower. If these areas are planned for pedestrian use, wind control measures in the form of trellises, canopies, wind screens, tall parapets and landscaping can be considered.



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CONCLUSION

The location, orientation of the development, as well as the inclusion of a podium in the design, are positive design features that would reduce the wind impact of the William Thomas Building on the surrounding areas. In general, wind conditions at the retail and residential entrances and on the adjacent sidewalks are expected to be similar to those that currently exist and are considered suitable for the intended use. However, to ensure suitable wind conditions on any amenity space at the podium level, additional wind control measures in the form of screen walls, higher parapets together with trellises, canopies and landscaping, should be considered.

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.

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Technical Director / Principal

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