February 29, 2012

Mr. Kevin Wassermuhl
Assistant Development Manager
Edenshaw Developments Limited
260 Brunel Road
Mississauga, ON
L4Z 1T5

Dear Mr. Wassermuhl:

Re: 2120 Hurontario Street, Mississauga, Ontario
Qualitative Pedestrian Wind Assessment
GmE File Ref.: 11-104-DTPLW

1. INTRODUCTION

Gradient Microclimate Engineering Inc. (GmE) was retained by Gordon Woods Developments Limited (c/o Edenshaw Developments Limited) to undertake a qualitative pedestrian wind assessment for a proposed mixed-use development at 2120 Hurontario Street in Mississauga, Ontario. The site is bound by commercial-use lots to the north, Hurontario Street to the east, a retail plaza to the south, and Grange Drive to the west. This report provides a qualitative assessment of pedestrian wind comfort for the noted site based on architectural drawings by Page+Steele / IBI Group Architects, recent site imagery, experience with similar past projects in the Greater Toronto Area (GTA), and statistical knowledge of the GTA wind climate. A qualitative wind assessment, as opposed to a more elaborate wind tunnel or computational study, is intended to identify potential pedestrian comfort issues at an early design stage, and to develop mitigation strategies as may be necessary.

2. TERMS OF REFERENCE

The focus of this qualitative pedestrian wind assessment is the proposed residential development to be located at 2120 Hurontario Street in Mississauga, Ontario. The development site is located in a suburban area approximately 2.5 kilometers (km) north of the shores of Lake Ontario. The near field surroundings of the site comprise a dense arrangement of low-rise dwellings to the east, through the south, to the west, as well as mixed low and high-rise residential and commercial developments to the northwest, through the north, to the east. More distant (far field) surroundings comprise generally suburban developments to the north, through the south, to the west; and low density mixed high-rises to the north.

Upon completion, the proposed development will comprise two high-rise towers, a six-storey connecting podium, and separate three-storey townhouses. Tower A, situated towards the northeast corner of the site, is planned to rise 31-storeys above grade; while Tower B, situated towards the southeast corner of the site, is planned to rise 22-storeys above grade. Along the western boundary of the site, 24 townhouse units are planned to front onto Grange Drive.

Figure 1 illustrates the site location and relevant surrounding context, while Figure 2 illustrates the ground floor plan and wind sensitive pedestrian areas considered in this qualitative assessment.

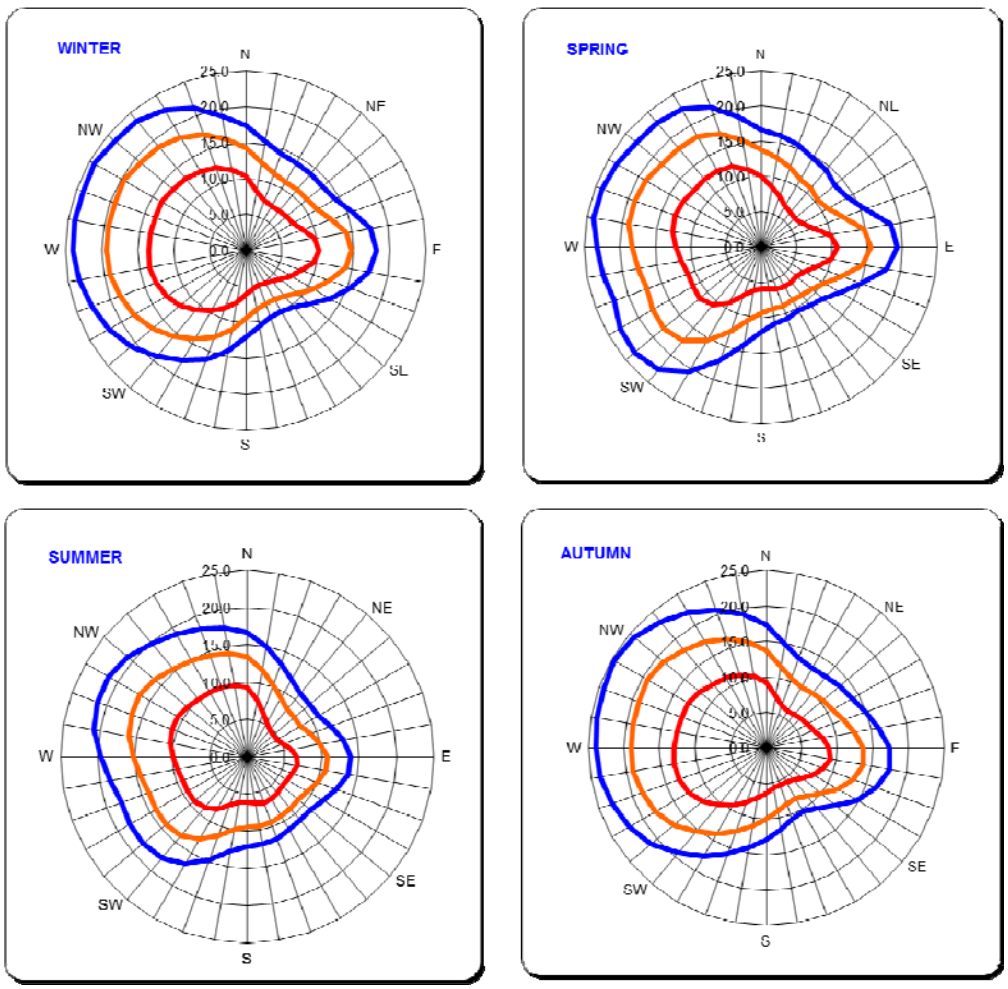
3. METHODOLOGY

The essential aspects of a wind analysis include: (i) consideration of the statistical properties of the local wind climate (ii) consideration of the massing of the site (i.e. the shape and orientation of the buildings); and (iii) prediction of anticipated pedestrian comfort conditions based on in-house experience.

3.1 Greater Toronto Area Wind Climate

A statistical model of the GTA wind climate is illustrated on the following page. The seasonal model is based on data obtained from Pearson International Airport, and shows the wind speeds at three probability levels (i.e. inner curve – once per month, middle curve – once per year, outer curve – once in ten years), as a function of wind direction. The plotted data indicates that the prominent wind directions in the GTA occur from the southwest, west, northwest and east directions during all seasons; and that wind conditions during the summer and autumn are calmer than the winter and spring. In wind engineering, the stated wind direction describes the wind origin; indicating that a north winds blows from north to south.

SEASONAL DISTRIBUTION OF WINDS FOR VARIOUS PROBABILITIES, PEARSON INTERNATIONAL AIRPORT, TORONTO, ONTARIO



Notes:

1. Radial distances indicate wind speed in meters/second.
2. A point along the innermost contour represents the wind speed exceeded on average 0.1% of the time within a 10° sector centered on that direction.
3. The middle and outermost contours represent probability levels of 0.01% and 0.001% respectively.

3.2 Massing vs. Climate – Geometric Effects

The physical features of a site that influence the local wind microclimate include: the density of surrounding buildings, the massing of the study site, and the geometry of the study building. Urban development over time typically increases the density of surrounding buildings, which can provide greater shielding to wind and calmer wind conditions at grade. In some circumstances, the introduction of taller buildings can cause gusting, channeling and downwash effects.

For this site, pedestrian comfort at grade will be primarily influenced by winds originating from the western and eastern wind directions. Although the remaining wind directions have a lower statistical frequency of occurrence, wind flows from multiple low probability wind directions can cumulatively affect pedestrian comfort. The shape and massing of this tower provide some aerodynamic benefits for wind comfort at the pedestrian level. More specifically, the slender profiles of the towers will limit downwash of higher level wind flows to the ground level, as compared to towers with larger footprints. In addition, the frontages of the podium at the street level are partially protected from downwash winds by tower setbacks above the podium.

As an added benefit, the buildings surrounding the site are mainly medium to low-rise in height, and will not deflect a significant amount of higher velocity upper level winds to the ground. In contrast, the moderately large spacing (60-100 meters typical) between the surrounding towers may result in localized wind gusting effects at grade. Specific wind conditions for the study site are discussed in Section 4.

3.3 Pedestrian Wind Comfort Criteria

The pedestrian comfort criteria used by *GmE*, which correspond to industry accepted standards, are based on the correlation between a variety of pedestrian activity types, and acceptable wind speed ranges for those activities. More specifically:

- Wind conditions are considered to be comfortable for *sitting* when gust wind speeds less than or equal to 14 kilometers per hour (km/h) occur at least 70% of the time;
- Wind conditions are considered to be comfortable for *standing and strolling* when gust wind speeds less than or equal to 22 km/h, occur at least 80% of the time;
- Wind conditions are considered to be comfortable for *walking* when gust wind speeds less than or equal to 30 km/h occur at least 80% of the time.

GmE 's criteria are based on gust wind speeds, since people are most sensitive to wind gusts rather than to constant wind speeds. These criteria are applied according to the intended use of the outdoor area. For example, an entrance to a building should be suitable for standing or strolling, but need not be suitable for sitting.

4. ANTICIPATED PEDESTRIAN COMFORT

Based on the consideration of the building's geometry, surrounding building massing, and relationship to the local wind climate, the following statements summarize our opinion of how these considerations will affect pedestrian comfort in key areas.

Sidewalks along Hurontario Street (Figure 2, Locations 1 and 4)**:** The sidewalks along the west side of Hurontario Street will be exposed to moderately accelerated winds due to channeling effects between the proposed towers and the existing high-rise residential building on the east side of Hurontario Street. Due to partial alignment with higher probability westerly wind directions, pedestrian comfort conditions suitable for standing are expected to occur during the late spring, summer and early autumn periods; while conditions suitable for walking are expected throughout the remainder of the year.

Retail Entrances along Hurontario Street (Figure 2, Locations 2 and 3)**:** These retail entrances will be exposed to similar geometric and climatic effects as mentioned in the previous statement. However, closer proximity to the building façade will naturally mitigate the conditions, providing conditions suitable for sitting in the summer, standing during the spring and autumn, and walking during the winter.

Loading and Parking Zones (Figure 2, Locations 5, 6 and 10)**:** While location 5 is shielded from many higher probability wind directions, locations 6 and 10 will be exposed to turbulent wake effects from higher probability westerly winds that accelerate around the southwest corners of Towers A and B. While location 5 will experience wind conditions suitable for standing throughout the year, locations 6 and 10 will likely experience conditions suitable for standing during the summer, and for walking during the remaining seasons.

Main Entrance Court (Figure 2, Locations 7, 8 and 9): The partially enclosed geometry of the entrance court will serve to protect the main residential entrances from direct ground level wind flows. However, due to the dual tower configuration of the site, large scale vortex formation between the towers may occur for common westerly wind directions. As such, we anticipate that wind conditions will be suitable for standing during the late spring, summer and early autumn, and suitable for walking during the remaining seasonal periods. Despite being moderately windy, the expected conditions remain suitable for residential entrances equipped with vestibules.

Townhouse Blocks (Figure 2, Locations 12 through 16): Wind conditions along the north side of the townhouses (Locations 12 and 13) will experience moderate sporadic gusting resulting from close proximity to Tower B, and significant alignment with higher probability westerly wind directions. Wind conditions suitable for standing will occur during the spring, summer and autumn, while conditions suitable for walking are expected during the winter. The wind conditions at Locations 14, 15 and 16 will likely be suitable for standing, or better, throughout the year due greater separation distance from the towers, and the dense low rise blockage of surrounding buildings.

Perimeter Sidewalks and Laneways: Although occasional wind gusting is expected to occur along the perimeter streets and sidewalks, the wind conditions are expected to remain suitable for walking, or better, on an annual basis.

Existing vs. Future Conditions: The addition of the proposed tower is expected to result in some minor reductions to pedestrian comfort: as compared to the existing conditions. These reductions will be a direct result of increased wind gusting and channeling effects at ground level. Despite the changes, the current uses of pedestrian areas, including perimeter sidewalks and surrounding building entrances, will not be significantly affected.

Within the context of typical weather patterns, excluding anomalous local storm events, such as thunderstorms, tornadoes and downbursts, no dangerous or consistently strong wind conditions are expected anywhere over the subject site on an annual basis. During such events, wind conditions are influenced by specific local meteorological conditions and building geometries that cannot be predicted through a conventional statistical analysis.

5. SUMMARY

Based on our review of architectural drawings, surrounding building massing, and the statistical wind climate for the Mississauga area, we believe that the wind conditions within ground level areas will be generally acceptable for the intended pedestrian uses on an annual basis. The conditions are expected to be comfortable over many areas; and acceptable in all areas for common pedestrian activities classified as sitting, standing and walking. Of particular interest, no areas over the study site are likely to experience conditions too windy for walking, or that could be considered unsafe for elderly persons.

The foregoing analysis and statements are based on experience and knowledge of wind flow patterns in suburban settings. While the statements and conclusions relating to pedestrian safety are expected to be reliable for the site as a whole, a more precise evaluation of comfort would require a wind tunnel study complete with a statistical wind comfort analysis. As such, this assessment is intended to assure adequate pedestrian safety relating to wind, as well as to provide general guidance relating to pedestrian comfort around the subject site.

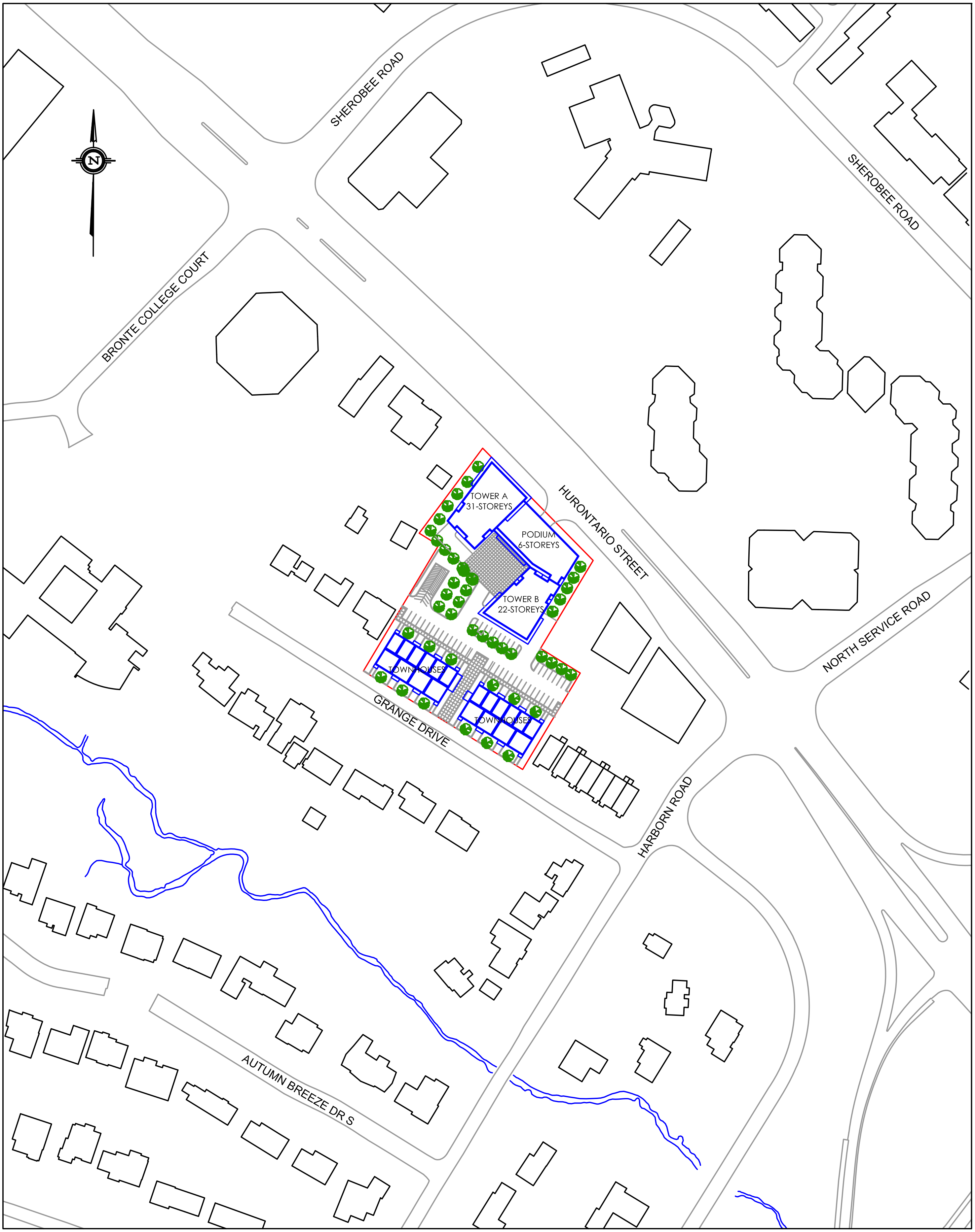
This concludes our pedestrian level wind assessment and report. Please advise us of any questions or comments.

Yours truly,

Gradient Microclimate Engineering Inc.

Adam Welburn,
Senior Technologist, Project Manager
GmE 11-104-DTPLW-R2

Vincent Ferraro, M.Eng., P.Eng.
Principal



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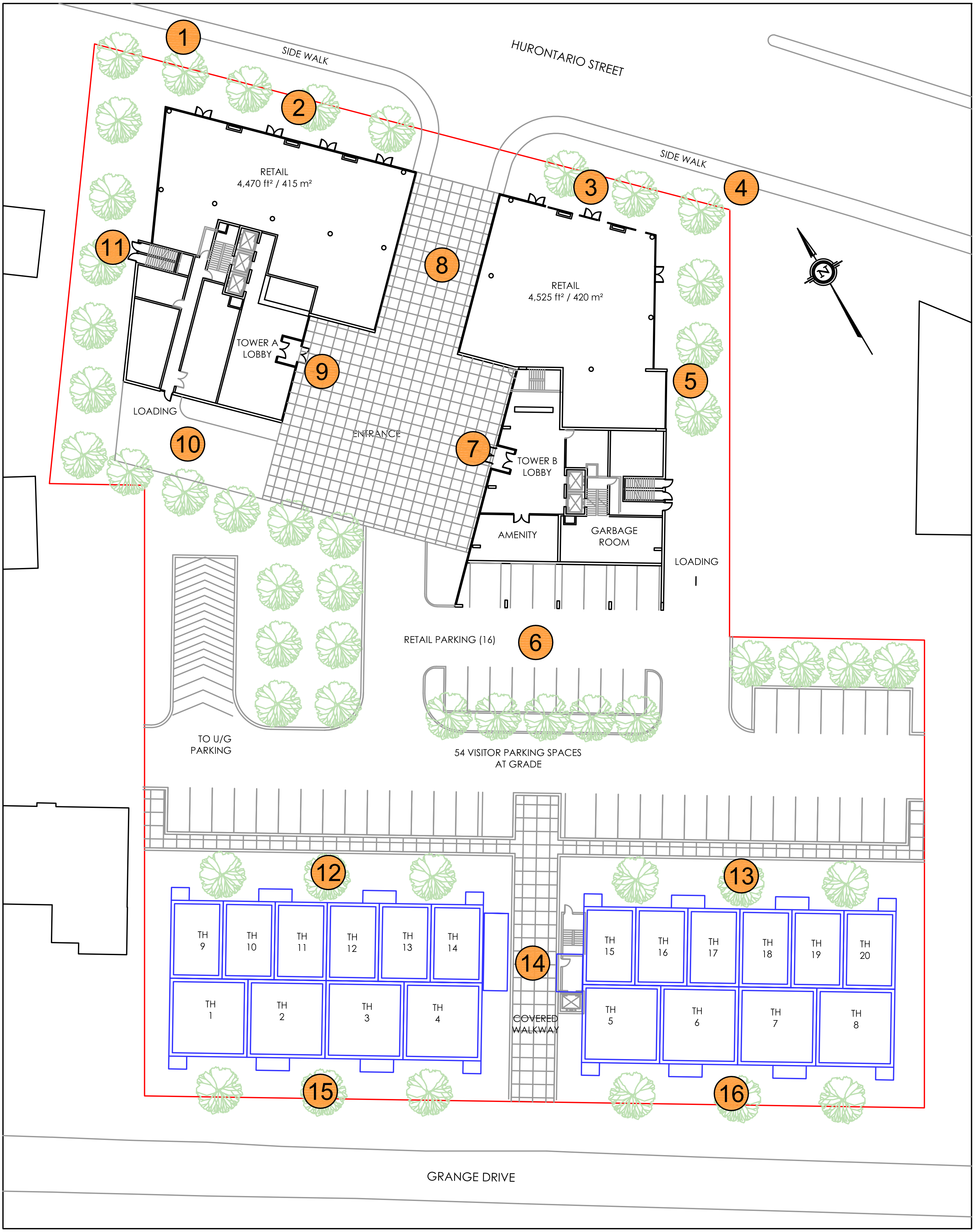
GmE
Gradient Microclimate Engineering Inc

PROJECT HURONTARIO STREET & GRANGE DRIVE, MISSISSAUGA - WIND STUDY	
SCALE 1:2500 (APPROX.)	DRAWING NO. GME11-104-DTPLW-1
DATE JANUARY 10, 2012	DRAWN BY A.D.W.

DESCRIPTION

FIGURE 1:
SITE LOCATION AND SURROUNDING CONTEXT PLAN



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PROJECT HURONTARIO STREET & GRANGE DRIVE, MISSISSAUGA - WIND STUDY		DESCRIPTION
SCALE 1:800 (APPROX.)	DRAWING NO. GME11-104-DTPLW-2	
DATE JANUARY 10, 2012	DRAWN BY A.D.W.	

FIGURE 2:
SITE PLAN ILLUSTRATING PEDESTRIAN SENSITIVE LOCATIONS