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**Preliminary Pedestrian Level Wind Study
Barrie Waterfront Development Holdings Inc.
55 Dunlop Street West Development
Barrie, Ontario**

Theakston Project No. 19481

Submitted To:

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1. EXECUTIVE SUMMARY

Based upon our analysis, wind conditions on and around the proposed 55 Dunlop Street West Development Site are considered generally suitable for walking or better in winter and activities requiring longer exposures during the balance of the seasons, in the existing setting.

The Proposed Development occupies a portion of a block of land bounded by Dunlop Street West to the north, Mary Street to the west, Simcoe Street to the south, and Maple Avenue to the east. One through three storey retail/residential buildings and related open areas currently occupy the site. The development site shares the block with low-rise commercial, the Bus Station, and green space associated with the same.

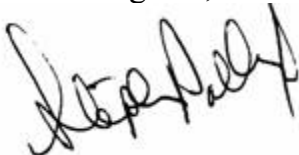
The 55 Dunlop Street West Development involves a proposal to construct 30 and 34 storey towers including 6 storey base buildings assigned to street related retail and parking. The buildings are organized about a Pedestrian Arcade with a driveway that provides vehicular access from Mary Street and Maple Avenue to ground parking and services.

With inclusion of the proposed development, prevailing pedestrian comfort conditions are predicted to remain comfortable and suitable for walking, standing, or better, year round under normal to high ambient wind conditions. Several areas will realise an upset to pedestrian comfort conditions that is for the most part well managed by the proposed Development's wind mitigative design features, with exception. The Pedestrian Arcade and portions of the outdoor amenity spaces are predicted to realise windy conditions on the occasion of high ambient northwesterly and/or westerly winds.

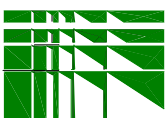
Comfort conditions expected at the proposed Development Site are considered better than those required to suit an urban context, based upon qualitative analysis. Additional wind mitigation is needed for the Pedestrian Arcade and recommended for the rooftop amenities, as discussed in the following.

Should you have questions or comments, please do not hesitate to call.

Kindest regards,



Stephen Pollock, P.Eng



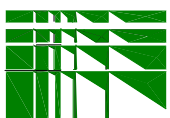
2. INTRODUCTION

We have been retained to conduct a preliminary pedestrian level wind study for the proposed mixed-use residential development at 55 Dunlop Street West in Barrie, Ontario, herein referred to as the 55 Dunlop Street West Development. The assessment is based upon project plans prepared by Oleson Worland Architect and Scott Shields Architects Inc. The objective of this primary analysis is to estimate pedestrian level wind conditions resulting from inclusion of the proposed development, relative to comfort and safety. The analysis is based upon the historical wind conditions and our experience with similar microclimatic analyses that were conducted on other properties in the area and/or on similar projects. The qualitative assessment utilises numerical analysis of local wind data predicted at the site and provides a synopsis of pedestrian comfort conditions anticipated on, and adjacent to, the property. It is a precursor to physical scale model testing, the quantitative analysis that will further define anticipated wind conditions, and mitigation, should such measures be required.

3. SITE INFORMATION & PROPOSED DEVELOPMENT

The Proposed Development occupies a block of land bounded by Dunlop Street West to the north, Mary Street to the West, Maple Avenue to the East and Simcoe Street to the south. The Barrie Bus Terminal occupies the south extents of the block and is separated by a driveway. The site is currently occupied by a near contiguous massing of 1 through 3 storey street retail/commercial buildings, some with residential above, related parking and limited vegetation (Figure 1). Note: Barrie's street orientation was influenced by proximity to Kempenfelt Bay, and as such the north/south orientated streets in the subject site area are offset from north by approximately 30 degrees west.

It is proposed that the site be redeveloped to include 34 and 30 storey buildings denoted Tower A and Tower B respectively. The project is phased with Phase 1 occupying the eastmost portion of the site and accommodating Tower B. The buildings are organized about a Pedestrian Arcade that extends from Dunlop Street West through to a Drive Aisle the penetrates the podiums at the south development boundary along Maple Avenue and near the south development boundary along Mary Street. The base buildings are 6 storeys in height, the ground floors assigned to street related retail, residential lobbies building services, and access to parking, the floors above parking, and the roof outdoor amenity and private terraces. The gap between the base buildings accommodating the Pedestrian Arcade is bridged at the 2nd level and above to accommodate vehicular circulation within the parking structure.

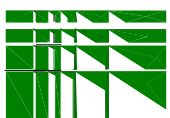


Tower B steps back from the Dunlop Street West and Maple Avenue façades of the base building by approximately 3.3m and features a slight counterclockwise rotation with increasing height. Tower A steps back from the Dunlop Street West façade approximately 15m, is flush with the Maple Avenue façade, and features a slight clockwise rotation with increasing height (Figure 2).

4. SURROUNDING AREA

Residential, commercial, institutional development, related open areas, and mature vegetation, as indicated in Figure 1, for all intents and purposes, surround the site. Lands to the immediate south of the Development site accommodate the Barrie Bus Terminal buildings, which are 1 and 2 storeys in height, with relatively open lands assigned to parks, the City of Barrie Marina, and Kempenfelt Bay beyond. An easterly progression introduces Heritage Park with the north shore of Kempenfelt Bay beyond, into the picture. To the immediate east at 15 Maple Avenue is a 14 storey slab style apartment building with a mix of lower density low to mid-rise residential and commercial buildings beyond. Progression to the north introduces 2 storey buildings, for the most part, that accommodate street related retail, several with residential above, which gradually transitions into single-family dwellings. With progression to the west Dunlop Street West remains a street related retail/residential mix with a greater propensity toward low-density residential with progression away from the site. Continuing from the west to the south again introduces a mix of predominantly low-rise residential and commercial buildings interspersed with schools, churches, parks, with the exception of the Water View and Grand Harbour towers along Toronto Street.

Urban intensification is in various stages of approval in the area. Most notable is The 5 Points, a 20 storey apartment building to the north at 2-12 Dunlop Street West, with others considerably more removed, and as such not likely to influence pedestrian comfort conditions on site. For assessment purposes, neighbouring properties that are seeking site plan approval are considered in their existing configuration until such time as approval has been granted.





55 Dunlop Street West Development Site Looking West from Maple Avenue

5. METEOROLOGICAL DATA

For studies in the City of Barrie, historical weather data recorded at the Barrie - Oro Airport are analysed for the seasons, and the resulting wind roses are presented as velocity and percent frequency in Figure 3. Barrie - Oro Airport is approximately 15km to the northeast of the site, which considered in concert with the site's distance from Lake Simcoe indicate the wind climate at the proposed Development is well represented by said Airport. From the historical wind data it is apparent that winds can occur from any direction, however, the data indicates the directional characteristics of strong winds at Barrie - Oro Airport are most likely to occur from the west by northwest with a far less significant northeasterly and southwesterly component.

The Historical meteorological data presented in the wind roses is measured at an elevation of 10m. This data is numerically processed with AERMET, a meteorological processor that considers wind speed and direction. Thus, representative ground level velocities at a height of 2m, for an urban macroclimate, are 52% of the mean values indicated on the wind rose, (for suburban and rural macroclimates the values are 63% and 78% respectively).

The macroclimate for the subject site is considered suburban. Figure 3 also depicts wind velocity categories relative to directionality at the airport with strong winds, greater than 30km/h, occurring approximately 1% of the time during the summer and 4% during the winter, and emanating from the aforementioned quadrants during both the winter and

summer seasons, with calm conditions occurring approximately 7% of the time during the summer and 6% of the time during winter.

6. COMFORT CRITERIA

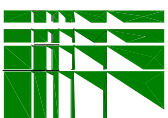
The assignment of pedestrian comfort takes into consideration pedestrian safety and comfort attributable to mean and gust wind speeds. Gusts have a significant bearing on safety, as they can affect a person's balance, while winds flowing at or near mean velocities have a greater influence upon comfort. The effects of mean and gust wind conditions are described as suitable for Sitting or Standing or Walking over 80% of the time. In order for a point to be rated as suitable for Sitting, for example, the wind conditions must be less than 10 km/h. The rating would include conditions ranging from calm up to wind speeds that would rustle tree leaves or wave flags slightly. As the name infers, the category is recommended for outdoor space such as terraces and patios where people might sit for extended periods and generally applied to the summer months.

The Standing category is slightly more tolerant of wind, including wind speeds from calm up to 14km/h. In this situation, the wind would rustle tree leaves and, on occasion, move smaller branches while flags would be partially extended. This category would be suitable for locations where people might sit for short periods or stand in relative comfort, such as building entrances and drop-off areas. The Walking category includes wind speeds from calm up to 19km/h. These winds would set tree limbs in motion, lift leaves, litter and dust, and the locations are suitable for sidewalks and parking. The Uncomfortable category covers a broad range of wind conditions, including wind speeds above 19km/h. These winds would set trees in motion, cause inconvenience when walking, and are not generally suitable to activities. Safety concerns are associated with wind speeds that are beyond the uncomfortable category, being sufficient to affect a person's balance.

Many variables contribute to a person's perception of the wind environment beyond the seasonal variations presented. While people are generally more tolerant of wind during the summer months, than during the winter, due to the wind cooling effect, people become acclimatized to a particular wind environment. Persons dwelling near the shore of an ocean, large lake or open field are more tolerant of wind than someone residing in a sheltered wind environment.

7. PEDESTRIAN LEVEL WIND ASSESSMENT

Variables beyond the orientation and conformation of a proposed development must be considered in predicting wind speed and occurrence at a given location. These include the previously discussed historical wind climate, surrounding terrain, and neighbouring

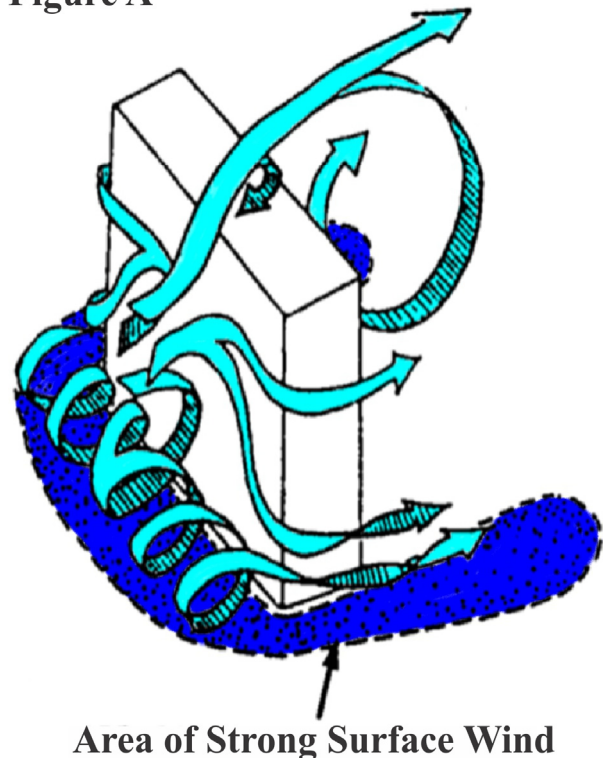


buildings, each of which is quantified and/or analysed in the microclimatic analysis of pedestrian level winds. The results of such quantitative analyses have afforded a knowledge base that allows an estimation of pedestrian level wind conditions.

The site and the surrounds, in the present circumstances as a mix of suburban and urban residential neighbourhoods, commercial and industrial developments, and open spaces, have a sympathetic relationship with the existing wind climate. Urban development provides turbulence inducing surface roughness that can be wind friendly, while open settings afford wind the opportunity to accelerate as the wind's boundary layer profile thickens at the pedestrian level, owing to lack of surface roughness. Transition zones from open to urban settings can prove problematic, as winds exacerbated by the open setting are redirected to flow over, down, around and between buildings.

High-rise buildings may exacerbate wind conditions within their immediate vicinity, to varying degrees, by redirecting wind currents to the ground level and along streets and open areas. In general, wind will split upon impact with a high-rise building, with portions flowing down the face of the building to the pedestrian level as downwash, where it is deflected, or otherwise redirected to flow along the building and around its corners, creating localized zones of increased pedestrian level wind. Conversely, points situated to the leeward, or in the wake of buildings will often enjoy an improvement in pedestrian comfort. As such, it is reasonable to expect inclusion of the proposed development will alter wind conditions under specific wind directions and velocities from those of the existing site condition, resulting in an improvement over the existing conditions at some points, with more windy conditions at others.

Figure A



Discussion of Northerly Winds

Existing Setting

Northerly winds make up a less significant percentage of the prevailing wind climate; they tend to be of moderate velocity, and are preconditioned upon approach for the most

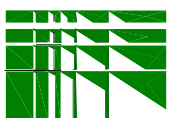
part by 2 storey buildings flanking Dunlop Street West that accommodate street related retail with residential above, which gradually transitions into single-family dwellings with progression to the north. The terrain to the north of the site presents a relatively consistent, moderately coarse approach, which will induce turbulence into the wind's approach flow, significantly reducing the wind's energy realized at the site, particularly at the pedestrian level.

The proposed Development site is for all intents and purposes in the aerodynamic shade region of the above-mentioned. This will result in comfortable conditions along Dunlop Street West proximate to the Development site, suitable for standing or walking along the street in winter, and for activities requiring longer exposures during the remaining seasons. Maple Avenue will realise similar conditions proximate to the proposed development site, however, the 14 storey apartment building at 15 Maple Avenue will cause a downwash of northerly winds to the pedestrian level where they will continue around the building's northwest corner and ultimately over the street. This will result in moderately windy conditions along Maple Avenue adjacent to the Bus Station and in the Bus Station parking lot, on the occasion of northerly winds. Mary Street is in the aerodynamic shade region of the existing 1 and 2 storey buildings along Dunlop Street West (and Mary Street) and as such will be comfortable, suitable for standing during the winter months in the existing setting.

Proposed Setting

Northerly winds approaching in higher streamlines will come into contact with Tower B at a skewed angle. As such the northmost corner will split the flow causing the wind streamlines to continue along the façades of the building, around the corners, and beyond, without significant influence upon the pedestrian level. Tower A will be in the aerodynamic shade region of Tower B with northerly winds and as such will be isolated from said winds and related effects. Northerly winds with westerly components will display a greater propensity toward downwash, however, the narrow façades of the towers that are punctuated with balconies will encourage wind to flow around as opposed to down the towers. Nonetheless downwash will occur, a portion of which will come into contact with the stepped conditions at the 3rd and 4th levels, where it will deflect to flow around the buildings at elevations well above the pedestrian level. Downwash that finds its way to the pedestrian level will be limited, for the above discussed reasons, and as such is not predicted to cause an appreciable influence upon pedestrian comfort conditions realised along the flanking streets and neighbouring properties.

Northerly winds approaching from over the rooftops and the windward low-density residential and commercial neighbourhoods will come into contact with the northmost corner of the 6 storey base building where the wind streamlines will split with portions being deflected to flow up and over the rooftop, and/or along the façades of the



building. The southwesterly flow along the Dunlop Street West façade will be moderate, given the windward terrain, and will be further moderated by the irregular texture of the façades. The southwesterly flow will continue along the building, around the corner, and ultimately along Mary Street. This will result in moderately windy conditions at the intersection and leeward portion of Mary Street, however, the wind's streamlines will quickly expand and dissipate over the 1 and 2 storey buildings and parking lots to the leeward side of the corner. Given the windward terrain, wind mitigative design features incorporated into the proposed Development, and historical wind climate, pedestrian comfort conditions along Dunlop Street West and Mary Street will remain comfortable, suitable for walking or better during the winter months, and appropriate to the areas' intended purpose.

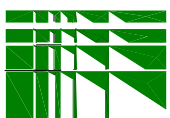
Similarly, the Maple Avenue façade of the proposed Development's base building will deflect northerly winds to flow along the street. This flow will combine with winds deflected by the neighbouring 14 storey apartment building at 15 Maple Avenue to continue along the street. As such inclusion of the proposed Development will cause an increase in winds realised in the gap between the proposed and neighbouring building. This will result in windy conditions along Maple Avenue adjacent to the Bus Station and in the Bus Station driveway, on the occasion of high ambient northerly winds, however, the windward terrain, wind mitigative design features incorporated into the proposed Development, and historical wind climate will again result in pedestrian comfort conditions that are predicted to remain suitable for walking during the winter and for activities requiring longer exposures during the balance of the seasons, and appropriate to the areas' intended purpose.

A Pedestrian Arcade is proposed in the gap between the Phase 1 and Phase 2 buildings. Said gap will be one storey in height, the gap being bridged to accommodate vehicular circulation in the parking structure between the buildings. Given the windward terrain, wind mitigative design features of the proposed Development, and landscaping, pedestrian comfort conditions along the Pedestrian Arcade in the gap between the buildings will be comfortable, generally suitable for standing during the winter months and sitting during the Summer.

Discussion of Westerly Winds

Existing Setting

Westerly winds make up a very significant percentage of the prevailing wind climate; they tend to be of moderate to higher velocity, but are preconditioned upon approach for the most part by a similar terrain to northerly winds. Dunlop Street West to the west of the proposed Development site remains a street related retail/residential mix with a greater propensity toward low-density residential with progression away from the site. The



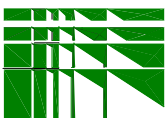
residential neighbourhoods support mature deciduous and coniferous trees, which considered in concert with the dwellings, introduce significant roughness to winds, moderating westerly winds upon approach.

The proposed Development site is for all intents and purposes in the aerodynamic shade region of the above-mentioned. This will result in comfortable conditions along Dunlop Street West proximate to the Development site, suitable for standing or walking along the street in winter, and for activities requiring longer exposures during the remaining seasons. Mary Street will realise similar conditions proximate to the proposed Development site, however the 14 storey apartment building at 15 Maple Avenue will cause a downwash of westerly winds to the pedestrian level where they will continue along Maple Avenue, around the building's southwest corner and ultimately over Simcoe Street. This will result in moderately windy conditions along Maple Avenue, and at said corner, on the occasion of high ambient westerly winds.

Proposed Setting

Similar to northerly winds, westerly winds approaching in higher streamlines will come into contact with Towers A and B at a skewed angle. As such, the westmost corners of the towers will split the flow, causing the wind streamlines to continue along the façades of the buildings, around the corners, and beyond, without significant influence upon the pedestrian level. Westerly winds with southerly components will display a greater propensity toward downwash, however, as indicated by the Wind Roses of Figure 3, winds from said directions seldom occur. The narrow façades of the towers, that are punctuated with balconies, will encourage wind to flow around as opposed to down the towers, however, downwash that does occur from Tower A will find its way to the pedestrian level where it will deflect to flow along Mary Street, around the southwest corner and beyond. The upset to existing pedestrian comfort conditions realised will be moderated by the windward terrain, which when considered along with the proposed Development's wind mitigative design features, and wind climate, will result in the towers causing limited influence upon pedestrian comfort conditions realised along the flanking streets and at neighbouring properties.

Westerly winds approaching from over the rooftops and the windward low-density residential and commercial neighbourhoods will come into contact with the westmost corner of the 6 storey base building where the wind streamlines will split with portions being deflected to flow down and around the building. The northeasterly flow along the Dunlop Street West façade will be moderate, given the windward terrain, and will continue along the street and ultimately around the corner at the intersection of Maple Avenue. This will result in windy conditions along the sidewalk adjacent to the proposed Development, from time to time, however, a rating as suitable for walking during the winter months and for standing during the summer is expected and as such the area remains suitable to the intended purpose. Once beyond the Maple Avenue



intersection the wind will dissipate over the neighbouring buildings' rooftops with less significant portions of the flow being deflected to continue along the respective streets.

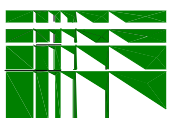
The southeasterly flow will similarly progress along the Mary Street façade of the building, around the corner and over lands associated with the Bus Station. This will result in windy conditions along the leeward portion of Mary Street, around the corner and beyond. The wind's streamlines will quickly expand and dissipate over the Bus Station buildings and driveways to the leeward side of the corner.

Given the windward terrain, wind mitigative design features incorporated into the proposed Development and historical wind climate, pedestrian comfort conditions along Dunlop Street West and Maple Avenue will remain comfortable, suitable for walking or better during the winter months, and appropriate to the areas' intended purpose. The Mary Street façade of the proposed Development's base building will realise relatively more windy conditions, given the orientation and conformation of the proposed Development relative to the historically significant portion of the wind climate. The pedestrian comfort conditions are predicted to remain suitable for walking during the winter most of the time, for standing during the summer and for walking or standing during the shoulder seasons, and as such remain appropriate to the areas' intended purpose.

The Pedestrian Arcade proposed in the gap between the Phase 1 and Phase 2 buildings will realise relatively windier conditions on the occasion of westerly winds. Flow through the gap is attributed to the interaction of two phenomena. The first, winds being directed into the gap directly, and the second, to wind flowing over and around the building creating a negative pressure over the roof and to the leeward side of the proposed Development. The latter will cause suction pressures to form within the gap, resulting in an accelerated flow through the Pedestrian Arcade. On the occasion of high ambient westerly winds, windy, potentially uncomfortable wind conditions may be realised in the Pedestrian Arcade, making access and egress through the opening difficult from time to time.

Discussion of Southerly Winds

Southerly winds make up a less significant percentage of the prevailing wind climate, tend to be of lower velocity, and are mitigated by low-rise residential and commercial buildings interspersed with schools, churches, parks, with exception; the Water View and Grand Harbour towers on Toronto Street about 300m away introduce an urban component.



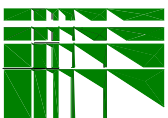
Existing Setting

The proposed Development site is for all intents and purposes in the aerodynamic shade region of the above-mentioned as well as 1 to 3 storey buildings along Mary Street. This will result in comfortable wind conditions along Mary Street, once removed from the intersection with Simcoe Street, and adjacent to the proposed Development site, with pedestrian comfort ratings as suitable for standing along the sidewalks of the street in winter, and for activities requiring longer exposures, during the remaining seasons. Dunlop Street West is in the aerodynamic shade region of the existing buildings flanking the street and as such will be comfortable, suitable to the area's intended purpose. Maple Avenue is similarly in the aerodynamic shade region of buildings flanking the street and will also be comfortable, with exception. The façade adjacent to the 14 storey 15 Maple Avenue Apartment building will be moderately windy from time to time, however, the wind will dissipate over the driveway and buildings flanking the south side of Dunlop Street West, resulting in only a localised wind effect.

Proposed Setting

Southerly winds approaching in higher streamlines will come into contact with Tower A and Tower B at a skewed angle. As such the southmost corners will split the flow causing the wind streamlines to continue along the façades of the towers, around the corners, and beyond, without significant influence upon the pedestrian level. Should downwash occur, it will come into contact with the stepped conditions at the 7th levels, where it will deflect to flow around the towers at elevations well above the pedestrian level. Given the significant stepped conditions, downwash that does occur will not likely find its way to the pedestrian level and as such is not predicted to cause an influence upon pedestrian comfort conditions realised along the flanking streets and neighbouring properties.

Southerly winds approaching from over the rooftops and the windward low-density residential and commercial neighbourhoods such as the Service Ontario building and Bus Station will come into contact with the southmost corner of the 6 storey base building where the wind streamlines will split with portions being deflected to flow up and over the rooftop, and/or along the façades of the building. The northwesterly flow along the Mary Street West façade will be moderate, given the windward terrain, and will be further moderated by the irregular texture of the façades. The northeasterly flow will continue along the building, around the corner, and ultimately over Maple Avenue. This will result in slightly windy conditions along the Bus Station driveway and leeward portion of Maple Avenue, however, the wind's streamlines will quickly expand and dissipate over the 1 and 2 storey buildings and parking lots to the leeward side of the 15 Maple Avenue apartment building. Given the windward terrain, wind mitigative design features incorporated into the proposed Development and historical wind climate, pedestrian comfort conditions along Mary Street and Maple Avenue will remain comfortable, suitable for walking or standing during the winter months, and for



activities requiring longer exposures during the summer months, and appropriate to the areas' intended purpose.

Dunlop Street West will be in the aerodynamic shade region of the proposed Development and as such is predicted to remain comfortable, suitable for standing during the winter and for activities requiring longer exposures during the balance of the seasons, and appropriate to the area's intended purpose. Note: the Dunlop Street West and Mary Street intersection will realise an increase in windiness from time to time, however this will not be inordinate and the area's pedestrian comfort will remain appropriate to the intended purpose.

The Pedestrian Arcade proposed in the gap between the Phase 1 and Phase 2 buildings is isolated from winds emanating from southerly directions by the subject building and as such will be comfortable, generally suitable for standing during the winter months and sitting during the Summer.

Discussion of Easterly Winds

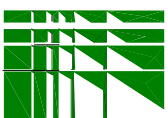
Easterly winds are infrequent, and as indicated by the historical weather data, of light to moderate velocity, however they are often associated with storms. The approach terrain comprised of Kempenfelt Bay and Heritage Park are effectively open, given they present little surface roughness to winds, and as such wind will be afforded opportunity to accelerate on approach. This may result in the site realising slightly higher velocity winds than those recorded at the Barrie – Oro Airport, the airport being in a rural setting with a stand of trees to the east which may moderate winds realised at the airport weather station.

Existing Setting

The proposed Development site is for all intents and purposes in the aerodynamic shade region of the above-mentioned 14 storey apartment building at 15 Maple Avenue. This building, considered in concert with the neighbouring buildings in the immediate neighbourhood, will result in comfortable conditions along Maple Avenue, Dunlop Street West, and Mary Street, proximate to the Development site, suitable for standing or walking along the respective streets adjacent to the site in winter, and for activities requiring longer exposures during the remaining seasons.

Proposed Setting

Similar to the above, easterly winds approaching in higher streamlines will come into contact with Towers A and B at a skewed angle. As such the eastmost corners will split the flow causing the wind streamlines to continue along the façades of the towers, around the corners, and beyond, without significant influence upon the pedestrian level. Should downwash occur, it will come into contact with the stepped conditions at the 7th



levels, where it will deflect to flow around the towers at elevations well above the pedestrian level. Given the significant stepped conditions downwash that does occur will not likely find its way to the pedestrian level and as such the towers as proposed are not predicted to cause an influence upon pedestrian comfort conditions realised along the flanking streets and neighbouring properties.

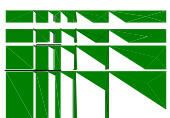
Easterly winds approaching from over Kempenfelt Bay and Heritage Park will come into contact with the 14 storey apartment building at 15 Maple Avenue and the 10 storey apartment building at 6 Bayfield Street. These buildings, when considered in concert, present a broad “ L” shaped massing to easterly winds that will effectively deflect easterly winds to flow to the north and south of the proposed Development, essentially creating an aerodynamic shade region over the lower levels of the proposed Development. Consideration of the moderate easterly wind climate and immediate windward terrain, the site and adjacent streets will realise comfortable conditions, suitable for the respective areas’ intended purpose.

The Pedestrian Arcade proposed in the gap between the Phase 1 and Phase 2 buildings is isolated from winds emanating from easterly directions by the subject building as well as the 14 storey apartment building at 15 Maple Avenue, and as such, will be comfortable, generally suitable for standing during the winter months and sitting during the Summer.

Discussion of Ordinal Winds

Ordinal Winds approaching from northwesterly, northeasterly, southeasterly, and southwesterly directions will contact the façades of the proposed development at near right angles. This generally results in the propensity for a downwash of wind to the pedestrian level, the magnitude of which is dependent upon several variables. Those variables commanding primary consideration are the building height, and the effective width of the presented façade. It is intuitively obvious that short and/or narrow façades will reduce the propensity for downwash, and the relatively narrow façades of the proposed Development’s towers presented to ordinal winds will display a marked tendency to deflect wind to flow around the buildings.

Mitigation of downwash is well understood and was applied through design whereby the building façades are stepped at the 7th level. This, in addition to the buildings being punctuated with balconies, overhangs and other design features, as discussed in the Mitigation Strategies Section of this report, were employed to mitigate the effects of winds at the pedestrian level. At the pedestrian and amenities levels, landscape features incorporating raised planters, coarse plantings, fencing, screen walls and other features help to control pedestrian comfort conditions.



Discussion of Outdoor Amenity

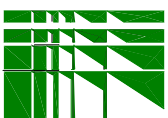
Outdoor Amenity areas are proposed on the roof of the podiums at the 7th level along the north and east sides of Tower A and the west and south sides of Tower B. The 6 storey podiums are for the most part higher than the neighbouring surroundings and as such will realise wind streamlines from most historically significant directions that are not significantly exacerbated or moderated by the surroundings. As such the rooftop amenity spaces will realise wind conditions representative of their height, which will not be inordinate. Further, the amenity spaces, or portions thereof, will be in the aerodynamic shade regions of the subject towers, with winds emanating from specific directions. This will result in comfortable conditions, suitable for the intended purpose much of the time.

Conversely, the amenity spaces are exposed to winds approaching from specific compass points that will be exacerbated by the towers proper. Northwesterly winds make up an appreciable percentage of the prevailing wind climate and will be deflected to flow through the gap between the towers. This will result in an acceleration of winds that will be realised in the amenity space between the towers. On the occasion of strong winds emanating from the northwesterly quadrant, portions of the amenity spaces situated between the towers will realise windy conditions. The amenity spaces are predicted to be suitable for the intended purpose, sitting, during the summer months, most of the time, but portions of the spaces will realise conditions that are less appropriate, on occasion.

A mitigation plan should be incorporated into the amenity areas' landscaping plan to accommodate activities requiring longer exposure. This might include raised planters, screen walls, arbours, trellises, and others, that will moderate winds acting in the area and result in pedestrian comfort conditions that are appropriate to the area more of the time.

Discussion of Residential Entrances

The residential entrance to Tower A is approximately midway along its Mary Street façade and the entrance to Tower B is along Maple Avenue. Mary Street will be susceptible to winds emanating from the westerly quadrant, which make up a significant portion of the prevailing wind climate and can be strong. As such the Mary Street façade of the proposed Development's base building will realise windy conditions from time to time, and the pedestrian comfort conditions along the sidewalk adjacent to the entrance are predicted suitable for walking during the winter most of the time, for standing during the summer, and for walking or standing during the shoulder seasons, and as such remain appropriate for the sidewalk's intended purpose. Comfort conditions appropriate for standing are preferable at entrances, and as such the entrance will realise less than ideal



conditions from time to time. It is recommended that the Mary Street entrance be recessed into the façade of the building such that winds deflected to flow along the street will not act upon the door leafs. Further, a vestibule might be employed to isolate the Residential Lobby from winds that may act upon the entrance doors on occasion.

Tower B's residential entrance along Maple Avenue will realise relatively more comfortable conditions understanding the street is in the aerodynamic shade region of much or the the prevailing wind climate. As such the entrance will realise comfort conditions that are suitable for standing most of the time. The sidewalks providing access to the entrance were discussed above and found to be comfortable and appropriate to the area's intended purpose.

The retail entrances remain to be assigned but will be positioned as appropriate along the flanking streets. The entrances will realise wind conditions as discussed above, the most appropriate wind direction to consider being westerly winds. As such the doors should be positioned such that the prevailing wind climate will not catch the doors, blowing them open against the jambs, and where practical, corner locations should be avoided.

8. MITIGATION STRATEGIES

The 55 Dunlop Street West Development plans establish a context for development in terms of height, massing, and location that allow the prediction of wind issues/problems that may persist once built.

The proposed Development employs wind mitigative design features that include:

- parapet walls
- balconies
- stepped massing
- landscaping
- textured façades

and others, that will increase surface roughness apparent to the wind.

Comfort conditions expected at the proposed Development site are considered better than those required to suit the context, based upon qualitative analysis.

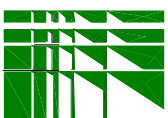
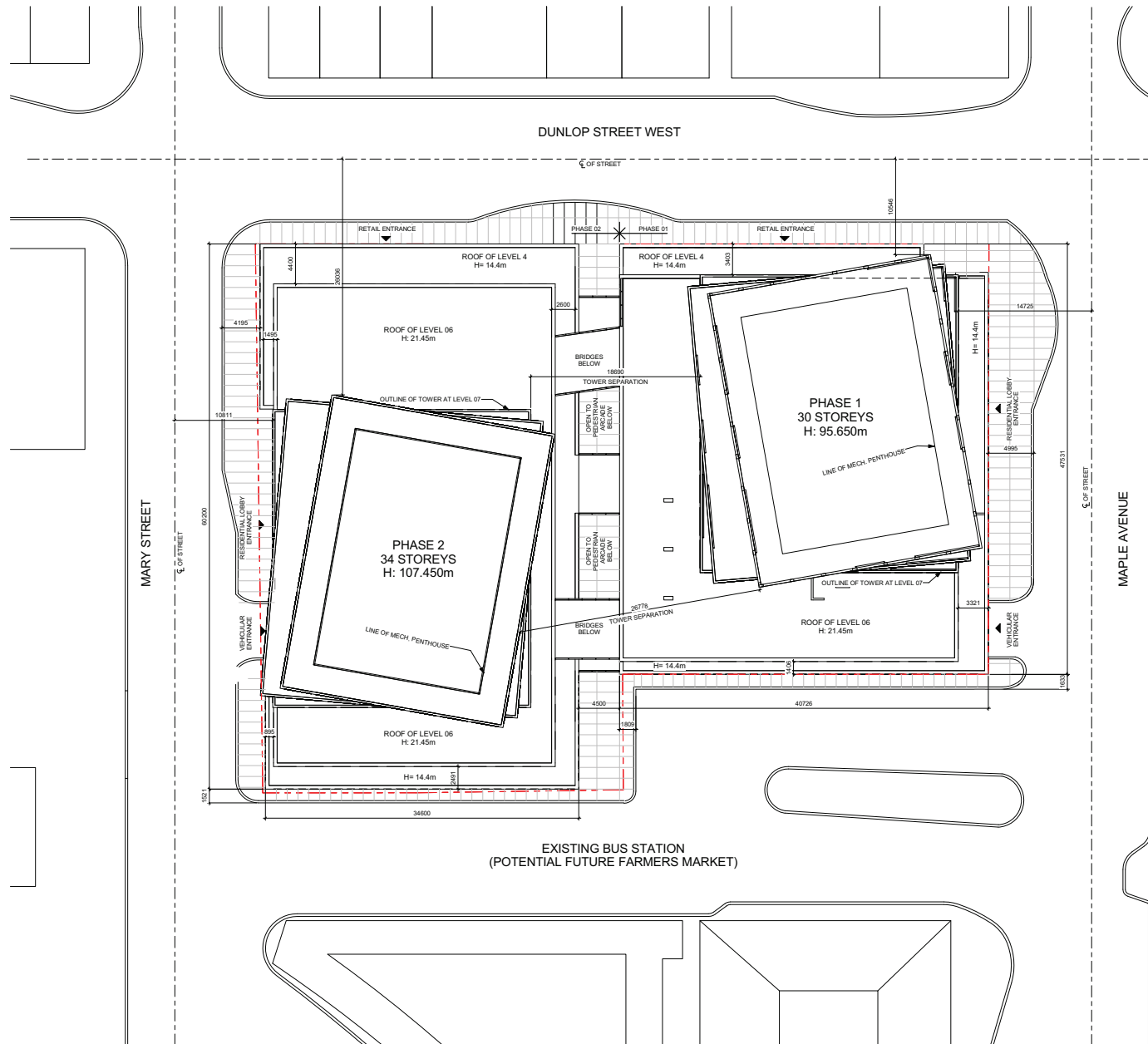


Figure 1: Site Aerial Photo



Figure 2: Site Plan



General Notes

1. ALL DIMENSIONS IN MILLIMETRES.
2. VERIFY ALL DIMENSIONS.
3. DO NOT SCALE DRAWINGS.
4. CHECK DRAWINGS AGAINST SPECIFICATIONS.
5. USE THE LATEST REVISED DRAWINGS ONLY.
6. REPORT ANY DISCREPANCIES, DISCOVERED ERRORS OR OMISSIONS TO THE ARCHITECT BEFORE PROCEEDING.
7. DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECT AND MUST BE RETURNED UPON COMPLETION OF WORK.

True North Project North

Zoning Matrix		
	Permitted	Proposed
Zoning Category	Central Area Commercial C1-1	Central Area Commercial C1-1
Lot Area	4,340.33 sq.m	4,340.33 sq.m
Uses	Commercial, Residential	Commercial, Residential
Front Yard (Eunings)	-	-
Back Yard	-	-
Side Yard R (Maple)	-	-
Side Yard L (Mary)	-	-
Building Height	45m	Phase 01: 55.650m Phase 02: 107.450m
Lot Coverage	-	100%
Total Unit Count	-	495
Parking Requirements	1 Parking space/Residential unit, not required for Commercial use	2 Parking space/Residential unit Residential Parking Provided: 495 Non-Res. Parking Provided: 4 Total Parking Provided: 499
Gross Floor Area (Total)	600% Lot Area	Total Zoning Area (TZA): 39,087.67 sq.m Residential TZA: 1,643.61 sq.m Comm./Retail TZA: 37,444.06 sq.m
P.S.I.	6.0x	6.0m
Landscape Buffer Requirements	continuous, min. width of 3m along side and rear lot lines	Urban streetscape
Loading Station	1	4

1 Preconsultation Application Oct.17/2018
No. Issue Date

Oleson Worland
architect

SCOTT SHIELDS ARCH. Scott Shields Architects Inc.
24 Mercer Street
Toronto, ON
M 5 V 1 H 3
t. 416.924.2177
f. 416.924.7398

Project
BARRIE TOWERS

Address
55 Dunlop St. W.

Drawing
SITE PLAN

Project number 24601
Date Feb. 18, 2019
Drawn by
Checked by

A0.2

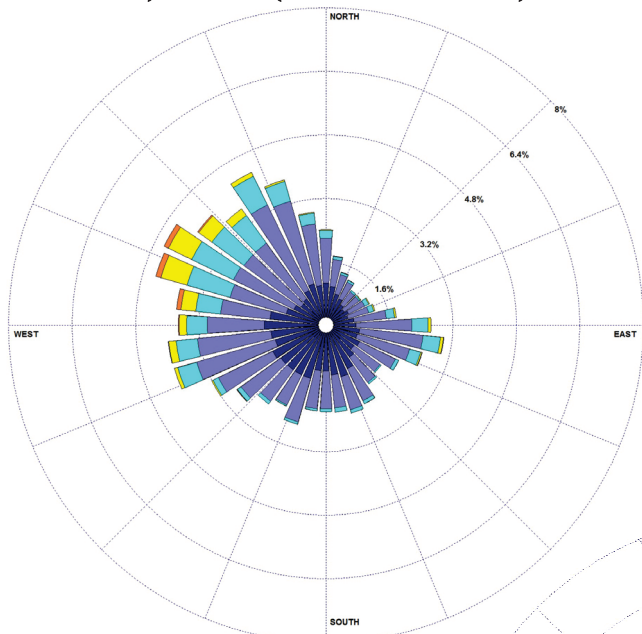
Scale 1 : 200



**Theakston
Environmental**

Figure 3: Windroses - Barrie - Oro Airport

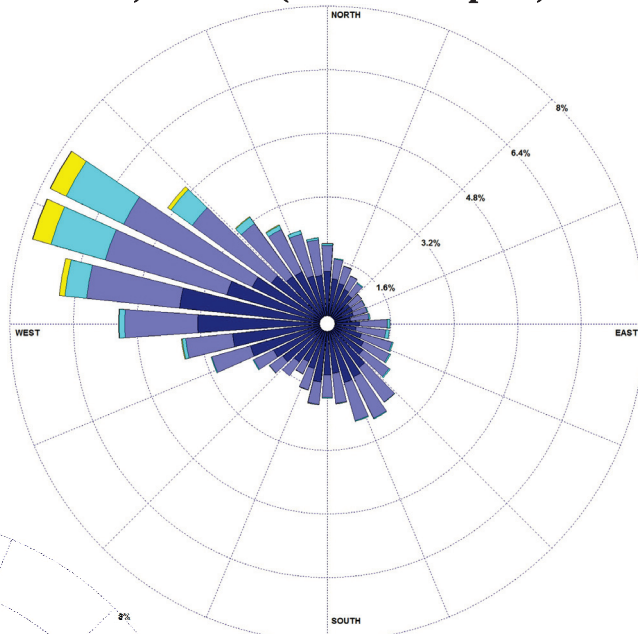
A) Winter (Nov 16 to Mar 31)



Winter Speed Range

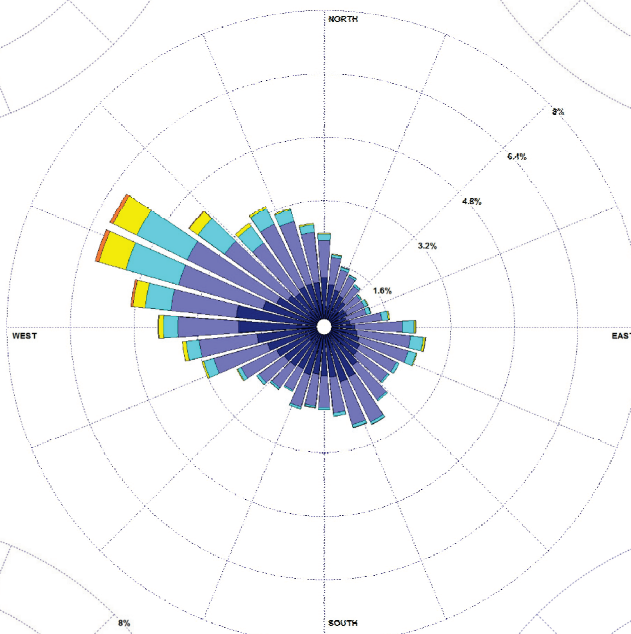
●	Calm	6%
●	1 - 10km/h	38%
●	11 - 20km/h	42%
●	21 - 30km/h	11%
●	31 - 40km/h	3%
●	> 40km/h	> 1%

C) Summer (June 16 to Sept 15)

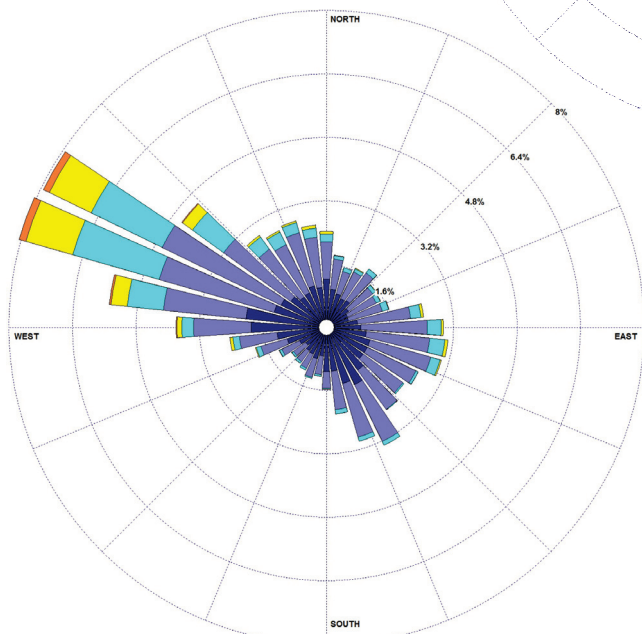


Summer Speed Range

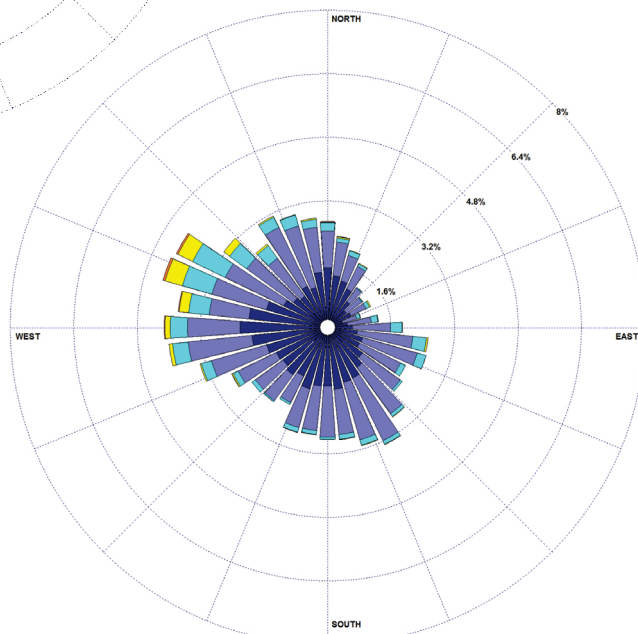
●	Calm	7%
●	1 - 10km/h	51%
●	11 - 20km/h	35%
●	21 - 30km/h	6%
●	31 - 40km/h	1%
●	> 40km/h	> 1%



E) Annual



B) Spring (Apr 1 to June 15)



D) Fall (Sept 16 to Nov 15)

