

THEAKSTON ENVIRONMENTAL Consulting Engineers 596 Glengarry Cr., P.O. Box 390 Fergus Ontario N1M 3E2

Telephone: (519) 787-2910 Facsimile: (519) 787-2918 www.theakston.com spollock@theakston.com

May 21, 2019

Preliminary Pedestrian Level Wind Study 6710 Hurontario Street Mississauga, Ontario

Theakston Project No. 19505

Submitted To:

Flato Developments Inc. c/o Glen Schnarr & Associates Inc. 700-10 Kingsbridge Garden Circle, Mississauga, Ontario L5R 3K6

Submitted By:

Theakston Environmental Consulting Engineers 596 Glengarry Crescent Fergus, Ontario N1M 3E2

Stephen Pollock, P.Eng.

1. EXECUTIVE SUMMARY

The proposed 6710 Hurontario Street Development, herein referred to as the Development, involves a proposal to build a 9 storey mixed-use building containing office space, a banquet hall and a hotel with shared facilities on lands that are currently unoccupied to the southwest of Hurontario Street and southeast of Skyway Drive in the City of Mississauga. Based upon our analysis, wind conditions on and around the proposed Development are predicted to be suitable for walking, standing, or better, year round, under normal to high ambient wind conditions.

The surrounding lands pertinent to prevailing winds currently realised on and about the Development, for all intents and purposes, present a relatively smooth rural or open terrain to approaching winds, affording winds opportunity to accelerate upon approach. As such, wind conditions along Hurontario Street, proximate to the Development, as well as on open portions of the subject site, are windy, suitable for walking from time to time during the winter months, and this is directly attributable to the setting. Insertion of a large building into an open setting can prove challenging, from a pedestrian comfort perspective, understanding that winds that formerly flowed over the site must be redirected to flow over and around the Development. The proposed Development utilises wind friendly design elements. These include the orientation and conformation of the building relative to the surroundings and prevailing wind directions, stepped façades, podiums, canopies, landscaping, and others. When considered in concert, these elements allow much of the impending wind climate opportunity to flow over and around, as opposed to down, the These elements effectively reduce the incidence of downwash, and related building. pedestrian level wind effects, attributable to the proposed Development.

With the introduction of the new building, there will be a realignment of winds over the site at the pedestrian level. This is well managed by the layout of the proposed Development, and as such, comfort conditions are predicted similar to those in the current setting over most of the site for much of the prevailing wind climate. Under strong or gusty wind conditions, higher than the prevailing average ground level wind will be encountered over portions of the site adjacent to the building's windward corners, although the site will remain suitable to the area's intended purpose. Comfort conditions expected at the proposed Development site are considered appropriate to the surrounding context, based upon qualitative analysis.

The Patio, recessed into the southeast façade of the Banquet Hall, will be exposed to easterly through southerly winds that are deflected to flow along the building, resulting in moderately windy conditions from time to time. Comfort conditions suitable for sitting are appropriate for patios and will be realised during the summer, however, said conditions are not expected to prevail, and as such the area may be inappropriate for the intended purpose from time to time during the summer and shoulder seasons. Should it be desirable to improve comfort conditions to a rating as suitable for sitting during the summer, a



mitigation plan will be required and this should be developed in consultation with the wind consultant.

Additional wind mitigation beyond the above-mentioned is not required

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

Kindest Regards,

Stephen Pollock P.Eng



2. INTRODUCTION

Jennifer Spalton of Glen Schnarr & Associates Inc. requested a preliminary pedestrian level wind study for the proposed 6710 Hurontario Street Development, based upon project plans prepared by IBI Group 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 considers historical meteorological data of wind conditions for the Mississauga area, architectural plans dated April 11, 2019, our experience with similar microclimatic analyses that were conducted on other properties in the area, and/or similar projects, and our understanding of wind flows around buildings. 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 often 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

The 6710 Hurontario Street property occupies an approximately 1.83 acre portion of the block of lands bound by Hurontario Street to the northeast, Courtneypark Drive West to the southeast, Maritz Drive to the southwest and Skyway Drive to the northwest in the City of Mississauga. The property is rectangular in shape, fronts Hurontario Street, is currently unoccupied and for all intents and purposes considered flat.

The proposed Development is comprised of a 9 storey hotel with a 2 storey office podium to the northeast fronting Hurontario Street and a 1 storey banquet hall podium extending to the southwest. An outdoor patio area is proposed on the southeast side of the banquet hall, recessed into the façade with a Brise Soleil above. Vehicular access is proposed via a driveway off Hurontario Street, (6000 Road Easement) extending along the southeast boundary of the site to the underground parking access at the southwest end. The main entrance to the 9 storey hotel is accessed via the driveway on the southeast side of the building under a canopy. The entrance to the office lobby is proposed off Hurontario Street.

4. SURROUNDING AREA

The 6710 Hurontario Street property is surrounded to prevailing windward directions by rural open areas and agricultural lands, as well as low-rise commercial and industrial lands, as indicated in Figure 1. There is no significant urban development in the immediate



surroundings, however, rural commercial-industrial lands present a relatively smooth terrain that will afford winds opportunity to accelerate upon approach. Lands to the north through east of the site beyond Hurontario Street are predominantly low-rise commercial-industrial buildings. To the southeast of the site, beyond the immediate open agricultural lands, are the 5 storey Fairfield Inn & Suites and 6 storey Residence Inn hotel buildings and the 6 storey Bank of Montreal building. To the south through west of the site, beyond Maritz Drive, lay the low-rise Walmart Canada Logistics buildings with Fletcher's Creek, part of the Credit River watershed, that runs, more or less in a north-south direction and supports mature vegetation, beyond. Open Greenfield lands extend to the northwest of the development site, however, these will likely be developed in the foreseeable future as indicated by construction at the north corner of Maritz Drive and Skyway Drive.

As such, the pertinent site exposures are, for all intents and purposes, considered rural or open, for lands in the immediate surrounds and extending to the northwest, and suburban for lands beyond to the remaining compass points. With respect to pedestrian level wind comfort, the areas of concern include the building entrances, outdoor patio areas, and Hurontario Street sidewalk.



View of the 6710 Hurontario Street Development Site looking Southwest. (Google)



Theakston Environmental

5. METEOROLOGICAL DATA

For studies in the City of Mississauga, historical weather data recorded at the Pearson International Airport were analysed for the summer and winter seasons, May through October and November through April respectively, and the resulting wind roses are presented as velocity and percent frequency in Figure 3. The velocities presented in the wind roses are measured at an elevation of 10m. 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). Historical weather data recorded at the Toronto Island Airport was also considered in this analysis.

Although mainly rural/open, the macroclimate for this area is dependent upon wind direction and varies, to a degree, with direction. Note: Winds approaching from over the rooftops of large single store buildings and related expansive parking lots realise limited turbulence inducing resistance resulting in a terrain type that is between rural and suburban, with very large buildings displaying more of a propensity towards open. Winds from the north through west are predominant during the summer months with northerly and westerly directions most significant, as indicated in Figure 3 - Summer. Winds from the same quadrants dominate the winter with westerly directions most significant during the winter, as indicated in Figure 3 -Winter. Figure 3 also depicts wind velocity categories relative to directionality at the airport with strong winds, greater than 28km/h (8.3m/s) occurring approximately 6% of the time during the summer and 14% during the winter, and emanating from the aforementioned quadrants during both the winter and summer seasons, with calm conditions occurring approximately 6% of the time.

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 <u>Sitting</u>, 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 <u>Standing</u> 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 <u>Walking</u> 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 <u>Uncomfortable</u> 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 rural, industrial, commercial and agricultural lands 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.



Large buildings may exacerbate wind conditions within their immediate vicinity, to varying Figure A degrees, by redirecting wind currents to the ground level and along streets and open areas. In general, wind will split upon impact with a large 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 (Figure A). Conversely, points situated to the leeside, 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 site condition. resulting existing in an improvement over the existing conditions at some points, with more windy conditions at others.



Discussion of Northerly Winds

Northerly winds make up a significant percentage of the prevailing wind climate; they tend to be of moderate velocity, and are preconditioned upon approach by large single story commercial/industrial buildings that support large open parking lots with limited vegetation along the verges of the streets that consists predominantly of young deciduous trees. The immediate commercial/industrial terrain presents a relatively smooth approach that allows the wind's energy realised at the pedestrian level to be maintained or increase. Hurontario Street is the proposed Development northeast development boundary and is 6 lanes wide at the site. Hurontario Street, and the windward vacant lands beyond, afford the wind opportunity to approach the pedestrian level after passing over the industrial buildings along Superior Boulevard.

As such, comfort conditions along the Hurontario Street sidewalk proximate to the 6710 Hurontario Street development site, and on the development site proper, will be windy at times, but remain suitable for Walking during the winter months and for activities requiring longer exposures during the summer.



Hurontario Street proximate to the site is orientated approximately North 45 degrees West and the Proposed 9 storey hotel facility respects the street alignment within 5 degrees. As such northerly winds approach the building at a sharply skewed angle and as a result will split upon contact with the northmost corner of the 2 storey podium and 9 storey hotel with almost equal portions of the wind redirected to flow along the building's respective façades. This will result in moderately windy conditions along the northeast and northwest facades of the building, however, said winds would not be inordinate, or uncomfortable, suitable for walking during the winter months and for activities requiring longer exposures during the balance of the seasons. The northeast façade of the building is an activity area where pedestrians will access and egress the building's lobby, which in turn provides access to the Hotel, Offices, Restaurant, and others. The entrance has a vestibule and is recessed into the façade of the building such that winds deflected to flow along the building will not act upon the door leafs. As such the entrance will be comfortable, suitable for standing most of the time, the sidewalk beyond the entrance will be suitable for walking during the winter months, standing during the summer. Pedestrian activities will be short in duration and as such pedestrians will be relatively tolerant of said wind conditions.

The northwest façade of the building is adjacent to and set back approximately 4.5m from the property line, aside from stair shaft exits and building services. Activities are not planned for the areas adjacent to the northwest façade of the building and as such will not influence pedestrian comfort conditions on site. Winds, once beyond the corner will diffuse rapidly into the leeward open areas. The southeast and southwest sides of the building, once beyond the immediate corners discussed above, accommodate various outdoor activity areas including a sidewalk, patio, and main entrance. The area is in the aerodynamic shade regions of the building with northerly winds and components thereof and will be comfortable, suitable for standing during the winter and sitting during the summer.

As such, with inclusion of the proposed Development the subject and neighbouring sidewalks and properties will continue to realise reasonably comfortable conditions, suitable for walking during the winter months and for activities requiring longer exposures during the summer.

Discussion of Westerly Winds

Westerly winds make up a significant percentage of the prevailing wind climate; they can be of higher velocity, particularly during the winter months, and are slightly more favourably preconditioned upon approach by immediate terrain similar to northerly winds with the exception being lowlands associated with Fletcher's Creek that support mature vegetation, however, this is followed by a mix of low-rise industrial buildings and



agricultural lands, that will afford wind opportunity to accelerate upon approach. As such, comfort conditions along Hurontario Street proximate to the proposed 6710 Hurontario Street Development are again generally comfortable, suitable for Standing during the summer months, Walking during the winter most of the time. The proposed development site for the hotel building realises similar conditions, suitable for Standing during the summer months, Walking during the winter.

Westerly winds similarly approach the building at a sharply skewed angle and as a result will split upon contact with the westmost corner with the bulk of the wind deflecting to flow along the building's northwest façade. This will result in an acceleration of winds as the wind's streamlines are channelled to flow along the 9 storey hotel building, causing windy conditions along said façade of the building that extend around the corner and over the leeward portion of Hurontario Street before diffusing over the street and the TSC building and related grounds at 59 Ambassador Drive. As such, the Hurontario Street sidewalk adjacent to the northmost corner of the proposed Development will be windy at times, but not likely uncomfortable during the winter months, areas in the aerodynamic shade region of the building, to the southeast of the corner, will be more comfortable, suitable for standing during the winter, and areas to the northwest will be essentially the same. The windy conditions realised at said corner will dissipate into the leeward open setting of the street, and as such will not cause appreciable upset to the opposite sidewalk of the street or the TSC building's sidewalks.

The northeast and southeast façades of the building, the activity area accommodating access and egress, are ideally situated in the building's recirculation cavity, and as such will be comfortable, once beyond the northmost corner. The activities accommodated in the area will be suitable for standing during the winter and sitting during the summer. Activities are not planned for the areas adjacent to southwest façade of the building, or beyond, and as such will not influence pedestrian comfort conditions on site. Winds, once beyond the corner will diffuse rapidly into the leeward open areas.

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 preconditioned upon approach by several vacant properties that are preceded by large single storey commercial/industrial buildings that support large open parking lots with limited vegetation along the verges of the streets. The immediate commercial/industrial terrain presents a relatively smooth approach that is similar to northerly winds and allows the wind's energy realised at the pedestrian level to be maintained or increase. The vacant windward lands, large buildings and proposed Development site afford the wind opportunity to accelerate upon approach resulting in windy conditions along the Hurontario Street sidewalk proximate to the 6710 Hurontario



Street development site, and on the development site proper, however, the respective areas are expected to be more comfortable than those associated with northerly winds, and will remain suitable for Walking during the winter months and for activities requiring longer exposures during the summer.

Southerly winds will similarly come into contact with the southmost corners of the Banquet Hall and 2 storey Office Podium, where they will split to flow along the building's respective façades, however, given the height of the respective façades, much of the flow will continue up and over the roof of said building without significantly influencing the pedestrian level. Southerly winds upon contact with the southmost corner of the 9 storey hotel building will also split with portions flowing along the façades and beyond without significantly influencing the pedestrian level. As such, only the aforementioned lower portions of the hotel complex can be expected to influence pedestrian comfort conditions realised on site and in the immediate surroundings, and the upset will not be appreciable.

Southerly winds deflected to flow along the Banquet Hall's southeast façade will continue around the corner, beneath the entrance canopy and into the inside corner where the hotel meets the office podium where said winds will continue up and over the podium and beyond. This will result in moderately windy, but not inordinate, winds in the vehicular drop off valet parking area, however the area will remain appropriate to the intended purpose with pedestrian comfort conditions suitable for standing much of the time, walking on the occasion of higher ambient winter winds.

The Patio recessed into the southeast façade of the Banquet Hall will be exposed to southerly winds that are deflected to flow along the building, resulting in moderately windy conditions from time to time. Comfort conditions suitable for sitting are appropriate for patios and will be realised during the summer, however, said conditions are not expected to prevail, and as such the area may be inappropriate for the intended purpose from time to time during the summer and shoulder seasons. Should it be desirable to improve comfort conditions to a rating as suitable for sitting during the summer, a mitigation plan will be required and this should be developed in consultation with the wind consultant. Alternately, development of the neighbouring property to the south may introduce blockage that will moderate winds in the area, making it more appropriate to the intended purpose.

The northeast façade of the building, the area accommodating access and egress from Hurontario Street, is again ideally situated in the building's recirculation cavity, and as such will be comfortable. The activities accommodated in the area will be suitable for standing or sitting during the winter and sitting during the summer. Winds, once beyond the corner, will diffuse rapidly over Hurontario Street resulting in a localised windy area, however, the leeward areas of the street will realise more comfortable conditions.



Pedestrian comfort conditions along the Hurontario Street sidewalk remain appropriate to the intended purpose. Activities are not planned for the areas adjacent to the southwest façade of the building and as such will not influence pedestrian comfort conditions on site.

Discussion of Easterly Winds

Easterly winds are infrequent, however, they can be strong, are often associated with storms, and are preconditioned upon approach by terrain that is similar to that realised by northerly winds. The large single storey commercial/industrial buildings present a relatively smooth approach to winds, which along with Hurontario Street, allows the wind's energy realised at the pedestrian level to be maintained or increase. This terrain and wind climate results in comfort conditions along the Hurontario Street sidewalk proximate to the 6710 Hurontario Street development site, and on the development site proper, that will be windy at times, but remain suitable for Walking during the winter months and for activities requiring longer exposures during the summer.

Easterly winds approach the building at a sharply skewed angle and as a result will split upon contact with the eastmost corner of the 2 storey podium and 9 storey hotel with portions of the wind redirected to flow along the building's respective façades. This will result in moderately windy conditions along the northeast and southeast façades of the building, however, said winds would not be inordinate, or uncomfortable, suitable for walking during the winter months and for activities requiring longer exposures during the balance of the seasons.

Pedestrians will access and egress the building's lobby from the northeast Hurontario Street façade, however, the entrance has a vestibule and is recessed into the façade of the building such that winds deflected to flow along the building will not act upon the door leafs. As such the entrance will be comfortable, suitable for standing most of the time, the sidewalk beyond the entrance will be suitable for walking during the winter months, standing during the summer. Pedestrian activities will be short in duration and as such pedestrians will be relatively tolerant of said wind conditions.

Easterly winds will similarly come into contact with the eastmost corners of the 2 storey Office Podium and Banquet Hall, where they will split to flow along the building's respective façades, however, given the height of the façades, much of the flow will continue up and over the roof of said buildings without significantly influencing the pedestrian level. Easterly winds upon contact with the eastmost corner of the 9 storey hotel building will also split with portions flowing along the façades and beyond without significantly influencing the pedestrian level. As such, only the aforementioned lower portions of the hotel complex wind can be expected to influence pedestrian comfort



conditions realised on site and in the immediate surroundings, and the upset will not be appreciable.

Easterly winds deflected to flow along the 2 Storey Office Podium's southeast façade will continue around the corner, beneath the entrance canopy and into the inside corner where the hotel meets the Banquet Hall where said winds will continue up and over the hall and beyond. This will result in moderately windy, but not inordinate, winds in the vehicular drop off valet parking area, however the area will remain appropriate to the intended purpose with pedestrian comfort conditions suitable for standing much of the time, walking on the occasion of higher ambient winter winds.

The Patio recessed into the southeast façade of the Banquet Hall will also be exposed to easterly winds that are deflected to flow along the building, resulting in moderately windy conditions from time to time. Comfort conditions suitable for standing will be realised during the summer, however, said conditions are not expected to be appropriate for the intended purpose during the summer and shoulder seasons. Should it be desirable to improve comfort conditions to a rating as suitable for sitting during the summer, a mitigation plan will be required and this should be developed in consultation with the wind consultant.

As such, with inclusion of the proposed Development the subject and neighbouring sidewalks and properties will continue to realise reasonably comfortable conditions, suitable for walking during the winter months and for activities requiring longer exposures during the summer.

Discussion of Ordinal Winds

Ordinal Winds approaching from remaining directions, northwesterly, northeasterly, southeasterly, and southwesterly directions, will approach from over similar terrain types, and will contact the façades of the Proposed Development at angles less skewed than those discussed above. As such, a downwash of wind to the pedestrian level is more likely with ordinal winds, such winds emanating from directions near perpendicular to the building's façades. The magnitude of the resulting downwash is dependent upon several variables; those commanding primary consideration are the building height, and the effective width of the presented façade. It is intuitive that short and/or narrow façades reduce the propensity for downwash, and the façades of the Proposed Development will display a marked tendency to deflect wind to flow over and around, as opposed to down the building, for these directions. The relatively short building height, reasonable setbacks and/or stepped conditions, and punctuating the building façades with indentations, and other design features, as illustrated in the drawings, further mitigates the propensity of wind to flow along the building.



Of the ordinal winds, southeasterly winds will pose the most significant influence, approaching the proposed nine-storey building at an angle near perpendicular to the Hotel façade. This will result in winds flowing over, around and down the building, the latter as downwash to the pedestrian level where it will flow out from the base of the building before turning and ultimately flowing along the building, around the corners and beyond. This will result in windy conditions at the windward corners of the building, however, the wind will dissipate quickly with distances beyond the windward corners. The Figure 3 Windrose indicates southeasterly winds seldom occur during the winter and are not strong during the summer. This, in consideration with the Hotel Main Entrance being situated beneath a large canopy, negates concerns associated with southeasterly winds.

Given the size of the subject building and wind mitigative design features, the pedestrian comfort conditions are predicted to remain suitable for walking at the corners during the winter, and appropriate for activities requiring longer exposures during the balance of the seasons.

Main Building Entrances

The Main Entrance to the Hotel is located in the southeast façade of the building within a "U" shaped massing created by the Banquet Hall and 2 Storey Office podium, and set beneath a canopy. As such it is removed from most of the wind climate, and will be comfortable, suitable for standing during the winter months, much of the time. However, strong or gusty winds approaching from southerly and easterly wind directions will result in windy conditions at the entrance and along the sidewalks adjacent to the entrance, from time to time. The pedestrian comfort conditions at the entrance are rated as suitable for standing during the winter months, walking during the above-noted, and the sidewalks beyond for standing or walking, the rating also dependent upon wind directionality and strength.

The Hurontario Street façade of the building also has an entrance to the Hotel, Offices, Restaurant, and others. The entrance is protected with a vestibule and is recessed into the façade of the building such that winds deflected to flow along the building will not act upon the door leafs. As such the entrance will be comfortable, suitable for standing most of the time, and the sidewalk beyond the entrance will be suitable for walking during the winter months, standing during the summer. Pedestrian activities will be short in duration and as such pedestrians will be relatively tolerant of said wind conditions.

Pedestrian comfort conditions at the entrances will be appropriate to the intended purpose.



8. MITIGATION STRATEGIES

The Proposed Development, as reflected in the plans reviewed, employs wind mitigative design features that include:

- stepped building façades
- podiums
- canopies
- landscaping

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

Comfort conditions expected at the Proposed Development site are considered appropriate to the surrounding context, based upon qualitative analysis. Additional wind mitigation is not required with exception; should it be desirable to improve comfort conditions realised at the outdoor patio, to a rating as suitable for sitting during the summer, a mitigation plan will be required and this should be developed in consultation with the wind consultant.



Figure 1: Site Aerial Photo





Theakston Environmental

Figure 2: Site Plan







ity

Summer - May through October, 1980 to 2012





Theakston Environmental