

THEAKSTON ENVIRONMENTAL

Consulting Engineers

596 Glengarry Cr., P.O. Box 390
Fergus Ontario N1M 3E2

Telephone: (519) 787-2910

Line 2: (519) 787-2918

www.theakston.com

spollock@theakston.com

April 16, 2024

Preliminary Pedestrian Level Wind Assessment

700 Paris Street

Sudbury, Ontario

Theakston Project No. 23037 (22898)

Submitted To:

**Panoramic Properties
Angelo Butera, President
9582 Beaverdam Road
Niagara Falls, ON
L2E 6S4**

Submitted By:

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

Stephen Pollock, P.Eng.

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1. EXECUTIVE SUMMARY

Based upon our analysis, wind conditions on and around the proposed 700 Paris Street Development site are considered mainly suitable for standing, or better, throughout the year in the existing setting.

The proposed 700 Paris Street Development occupies a portion of a block of land bound by Facer Street to the north, Bell Park Road to the east, and Paris Street to the west, within the City of Sudbury, Ontario. The former St. Joseph's Health Centre currently occupies the site and will be removed.

The 700 Paris Street Development involves a proposal to construct 3 residential buildings, 20, 16 and 12 storeys in height. Outdoor Amenity Space is proposed on the 13th floor of Building A, the 13th, 14th, and 20th floors of Building B, and at-grade and at the 3rd floor of Building C.

With inclusion of the proposed Development, prevailing pedestrian comfort conditions are predicted to remain comfortable and suitable for mainly standing, or better, under normal to high ambient wind conditions. Localised areas proximate to the north and southmost corners of the Development and in the gaps between the buildings will realise windier conditions on occasion. Additional mitigation is recommended for the Main Entrances and Outdoor Amenity Spaces to improve pedestrian comfort conditions and extend the useability of the areas into the shoulder seasons. To the extent mitigation may be warranted is best assessed through quantitative analysis.

The overall upset to pedestrian comfort conditions with inclusion of the proposed Development is well managed by the proposed Development's wind mitigative design features, resulting in conditions that are, in many cases, similar to the existing setting.

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

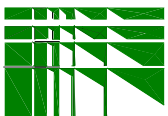
Kindest regards,



Emily Prevost, EIT



Stephen Pollock, P.Eng



2. INTRODUCTION

Panoramic Properties has retained Theakston Environmental Consulting Engineers to conduct a preliminary pedestrian level wind assessment for the proposed residential development at 700 Paris Street, Sudbury, Ontario, herein referred to as the proposed Development. The assessment is based upon project plans prepared by ACK Architects Studio Inc. The objective of this preliminary 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.

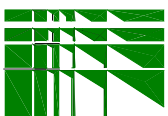
3. SITE INFORMATION & PROPOSED DEVELOPMENT

The proposed Development occupies a block of land south of Facer Street, bounded by Paris Street to the west and Bell Park Road to the east, within the City of Sudbury, Ontario, as shown in Figure 1. The site is currently occupied by the former St. Joseph's Health Care, pictured below, which will be removed.



700 Paris Street existing site, looking north from adjacent parking lot (Google)

The Development involves a proposal to construct 3 residential buildings, denoted Building A, Building B, and Building C. The buildings are 16, 20, and 12 storeys in



height, respectively. Outdoor Amenity Spaces are proposed at the 13th floor of Building A, 13th, 14th, and 20th floors of Building B, and at-grade and at the 3rd floor of building C. The Main Residential Entrances to the buildings are proposed along the northwest façades, accessed via a private driveway parallel to Paris and Facer Streets. The site plan is shown in Figure 2.

4. SURROUNDING AREA

Low-rise residential buildings, open spaces, and mature vegetation, for all intents and purposes, surround the site.

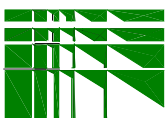
Lands to the immediate north of the proposed Development are occupied by low-rise, single detached houses and mature vegetation. Mature vegetation, low rise concession buildings and open spaces associated with Bell Park occupy the land to the immediate east through south of the proposed Development which slopes down towards Ramsey Lake. A municipal parking lot occupies the land southwest of the proposed Development, accessed via Paris Street. Lands to the immediate west of Paris Street are comprised of rocky hillside and vegetation, with low-rise, single detached houses beyond.

The suburban landscape has mitigative effects upon the wind climate to varying degrees, providing surface roughness that reduces the wind's energy at the pedestrian level. Conversely, the more open areas of Ramsey Lake present a relatively smooth surface to approaching winds, affording wind the opportunity to accelerate.

5. METEOROLOGICAL DATA

Historical weather data recorded at the Greater Sudbury Airport for the period between 2012 and 2021 were analysed for the seasons, and the resulting wind roses presented as velocity and percent frequency in Figure 3. The airport is approximately 21km to the northeast of the site, which, considered in concert with the site's distance from Ramsey Lake, 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 Greater Sudbury Airport are most likely to occur from the southwest and the northwest through northeast quadrant, with a far less significant northeast through southeast 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 a suburban macroclimate, are 63% of the mean values indicated on the wind rose. For urban and rural macroclimates, the values are 52% and 78%, respectively.

The macroclimate for the subject site is considered suburban. Figure 3 depicts wind velocity categories relative to directionality at the airport with winds greater than 30km/h occurring approximately 3% of the time during the summer and 8% during the winter, and emanating from the aforementioned quadrants during both the winter and summer seasons, with calm conditions occurring approximately 1% of the time during the summer and winter.

6. COMFORT CRITERIA

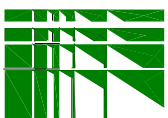
The assignment of pedestrian comfort takes into consideration pedestrian safety and comfort attributable to mean and gust wind speeds. Gusts have a significant bearing on safety, while winds flowing at or near mean velocities have a greater influence upon comfort. The effects of mean and gust wind conditions are described as suitable for Sitting, Standing, or Walking when said categories are realised 80% of the time, or greater, and Uncomfortable over 20% of the time.

For a point to be rated as suitable for Sitting, for example, the wind conditions must be less than 10 km/h 80% of the time, or greater. 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 15km/h, also occurring 80% of the time or greater. 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 20km/h, again occurring over 80% of the time. 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 20km/h, occurring 20% of the time or greater. These winds would set trees in motion, cause inconvenience when walking, and are not generally suitable to activities.



Safety concerns are generally associated with gust wind speeds at or beyond 90km/h and occurring more than 9 times a year. Such conditions are sufficient to affect a person's balance, however, they are difficult to predict with confidence in a qualitative wind assessment.

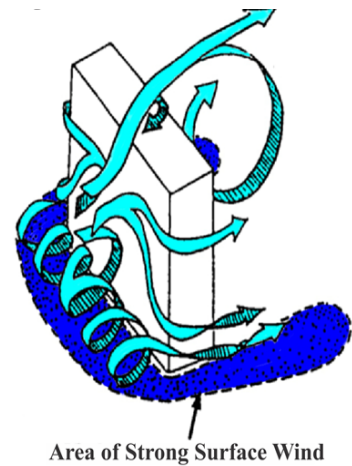
Many variables contribute to a person's perception of the wind environment beyond the seasonal variations presented. While people are generally more tolerant of wind during the summer months, than during the winter, due to the wind cooling effect, people become acclimatized to a particular wind environment. 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 considered in this qualitative microclimatic assessment of pedestrian level winds. The results of such analyses have afforded a knowledge base that allows an estimation of pedestrian level wind conditions.

The site and surrounds, in the present circumstances as a mix of suburban residential neighbourhoods, mature vegetation, and open spaces, have a sympathetic relationship with the existing wind climate. Suburban 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 suburban 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. Wind tends to split upon impact with a high-rise building, as pictured, with portions flowing up and over the building without consequence to the pedestrian level, along the facades of the building, around the corners and beyond, or 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. It is reasonable to expect the 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.

Wind approaching façades at skewed angles will, for the most part, split upon contact with the building and flow along the façades. Wind approaching at near right angles to the building generally result 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.

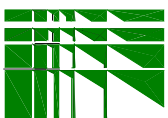
Discussion of Northerly Winds

Northerly winds make up a moderate percentage of the prevailing wind climate, tend to be of mid- to high velocity, with a higher percentage of stronger winds expected in the winter and spring seasons. Northerly winds are preconditioned upon approach by low-rise residential houses, associated open spaces, mature vegetation, and a rock cut, that will induce some turbulence into the wind's approach flow, reducing the wind's energy realized at the pedestrian level.

Proposed Setting

Northerly winds approaching the site at higher streamlines will come into contact with the upper levels of the north and northwest façades of the proposed Development. The winds will display a propensity to split upon contact with the building's northmost corners to flow up and over the rooftops, along the façades of the buildings, around the corners and beyond, with portions, depending upon the angle of incidence, downwashing towards the pedestrian level. The winds that deflect to flow up and around the proposed Development at elevations above the pedestrian level will have little consequence on the pedestrian level wind climate. Downwash to the pedestrian level is well mitigated by the skewed angle of northerly winds impact, balconies, podiums, stepped façades and canopies, however, downwash that finds its way to the pedestrian level will be redirected along the façades of the buildings, around the corners, and through the gaps between, before dissipating over the coarser terrain of Bell Park.

Northerly winds approaching the site in lower streamlines will similarly contact the north façade of Building C and, the northmost corners and adjacent façades of Buildings



A and B, where the wind streamlines will split and flow along the northwest façades of the buildings, around corners, in gaps, and beyond.

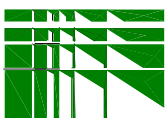
As a result, conditions along the northwest façades of the buildings are mainly predicted suitable for standing on the occasion of northerly winds, with localised conditions suitable for walking near the northeast corner of Building C, the southwest corners of Building B and Building A, and in the gaps between the buildings. Areas along the southeast façades of the proposed Development, as well as south of Building A, are within the aerodynamic shade region of the Development for northerly winds and as a result will realise conditions suitable for sitting throughout much of the year.

The Main Entrances to the proposed Development are located centrally along the northwest façades of the buildings and are subjected to northerly winds that are redirected to flow along the buildings' façades. The Entrances are well removed from the corners and are protected from downwash by canopies, balconies, and/or podiums, and will be suitable for standing most of the time, walking on the occasion of high ambient northerly winds, and are considered appropriate for their intended use most of the time. Mitigation is recommended in order to achieve more comfortable conditions throughout the year and can include recessing the Entrances into their façades such that wind cannot act upon the door leaves, utilizing revolving or sliding doors, incorporating wind screens perpendicular to the façades, including coniferous and/or marcescent vegetation, raised planter beds populated with dense vegetation, trellises, and others.

The proposed Development is well removed from Paris Street and Facer Street and, as such, sidewalk conditions are predicted to remain similar to those of the existing setting, suitable for standing or walking, appropriate to their intended use with the inclusion of the proposed Development. Bell Park Road will realise protection from northerly winds with the inclusion of the proposed Development. Localized areas near the northeast corner of Building C, and near the gaps between the buildings, will experience windier conditions, suitable for standing or walking, however they remain appropriate for their intended use.

Discussion of Westerly Winds

Westerly winds make up a smaller percentage of the prevailing wind climate, occurring slightly more frequently during the summer and fall months. They tend to be of lower velocity and are preconditioned upon approach by rocky terrain with mature vegetation and low-rise residential houses with mature vegetation beyond, providing some surface roughness to winds, decreasing the wind's energy realised at the pedestrian level upon approach.



Proposed Setting

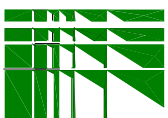
Westerly winds approaching in higher streamlines will similarly contact the westmost corners of the buildings, and/or the northwest façades of the buildings at a skewed angle. These winds will split to flow along the adjacent façades, around the corners and beyond, and to a lesser extent up and over the buildings. Portions of the westerly wind climate will also downwash towards the pedestrian level, however this is well mitigated by the skewed angle of approach, stepped façades, podiums, balconies and canopies that will interrupt winds before reaching the pedestrian level. Downwash that does reach the pedestrian level will be limited, but that which does occur will be redirected to flow along the façades of the buildings, around the corners, between the gaps, and beyond over Bell Park.

Winds approaching the site in lower streamlines similarly contact the westmost corners and façades of the buildings and will split to flow along the respective façades, around the corners and through the gaps between, resulting in localised windy conditions.

As a result, conditions along the Paris Street façades of the buildings are mainly predicted suitable for standing on the occasion of westerly winds, with localised conditions suitable for walking at the northwest corners of Buildings A, B, and C, the southmost corners of Building A, and in the gaps between the buildings. Areas along the eastern Bell Park façades of the proposed Development are within the aerodynamic shade region of the Development and will realise conditions suitable for sitting throughout much of the year. Areas leeward to the gaps or near Building A's southmost corners will be windy, but are expected to remain suitable to the intended purpose.

The Main Entrances located along the northwest façades of the buildings will be subjected to winds redirected to flow along the façades and, as a result, will be windy at times, however, they are predicted suitable for standing most of the time, and appropriate for their intended use. This rating is partially attributed to the Entrances being well removed from the corners and protected from downwash by the balconies, canopies, and/or stepped condition at the podium. Mitigation, as described above, is recommended at the Main Entrances.

Similar to northerly winds, the proposed Development is well removed from Paris Street and Facer Street and, as such, sidewalk conditions are expected to remain similar to the existing setting, suitable for their intended use, with inclusion of the proposed Development on the occasion of westerly winds. Bell Park Road will be in the aerodynamic shade region of the proposed Development for westerly winds, resulting in sitting conditions in these areas, with localized sections near the gaps in buildings experiencing higher wind speeds due to the funneling of winds between the buildings, resulting in conditions predicted suitable for walking.



Discussion of Southerly Winds

Southerly winds make up a moderate percentage of the prevailing wind climate, tend to be of lower velocity, and are preconditioned on approach by an open parking lot to the southwest, affording wind the opportunity to accelerate, and mature vegetation and low-rise building to the southeast, introducing some turbulence to the approaching wind and reducing the wind's energy at the pedestrian level.

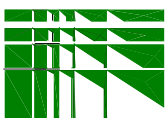
Proposed Setting

Southerly winds approaching the site in higher streamlines will contact the southmost corners of the buildings and southeast façades at a skewed angle where they will split to varying degrees to flow along the adjacent façades. Downwash acting upon Buildings A and C will be limited due to the angle of incidence. Building B presents a broader façade to southerly winds, making it slightly more susceptible, however it features stepped conditions to the southwest, resulting in a modest contribution to winds realised at the pedestrian level.

Southerly winds, approaching at or near the pedestrian level will be significantly moderated upon approach by the landscape of Bell Park, comprised of a mature mix of deciduous and coniferous trees. Southerly winds, once upon Building A, will be redirected along the southeast and southwest façades of Building A, through the gap between Buildings A and B, and beyond. This will result in windy conditions in the gap between Buildings A and B and at the westmost corner of Building A. The gap between Buildings B and C is for the most part within the aerodynamic shade region of Building B and as such will be more comfortable, suitable for the intended purpose most of the time, on the occasion of southerly winds.

As such, conditions along the Bell Park Road façades of the buildings are mainly predicted suitable for standing on the occasion of southerly winds, with localised conditions suitable for walking near the southeast corner of Building A, the northeast corner of Building C, and the gaps between the buildings. Areas along the Paris Street façades of the proposed Development are within the aerodynamic shade region of the Development for southerly winds and as such will realise conditions suitable for sitting throughout much of the year, with localized areas near the west corner of Building A and between the buildings experiencing windier conditions, expected to be suitable for walking.

The Main Entrances located along the Paris Street façades of the buildings are in the aerodynamic shade region of the proposed Development, for southerly winds, and as such, are expected to be comfortable, suitable for sitting, and appropriate for their intended use.



Conditions along Bell Park Road will be exposed to larger portions of the southerly wind climate that are directed to flow around the proposed Development, resulting in conditions that are windy from time to time, but are expected to remain suitable for standing through most of the year. Paris Street and Facer Street are predominantly in the aerodynamic shade region of the proposed development for southerly winds, and as such, will realize conditions suitable for their intended purpose.

Discussion of Easterly Winds

Easterly winds are infrequent and, as indicated by the historical weather data, are of moderate velocity, however they are often associated with storms. The approach terrain over Bell Park consists of mainly mature vegetation, a few low-rise buildings, open spaces, and Ramsey Lake beyond. Although easterly winds are afforded the opportunity to accelerate over Ramsey Lake, the mature vegetation induces turbulence, reducing the wind's energy at the pedestrian level.

Proposed Setting

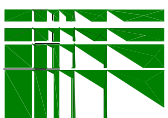
Easterly winds approaching the proposed Development in upper streamlines will contact the eastmost corners and southeast façades of the proposed Development where they will split to flow around the façades or downwash towards the pedestrian level below. Downwash will similarly be well mitigated by the wind's skewed angle of incidence, and the buildings' stepped façades, podiums and balconies.

Easterly winds approaching near the pedestrian level will similarly split upon contact with the proposed Development, flowing along the southeast façades, around the corners, between the buildings, and beyond towards Paris Street.

As a result, conditions along the southeast façades of the buildings are mainly predicted suitable for standing on the occasion of easterly winds, with localised conditions suitable for walking between the buildings, around the northeast corner of Building C and the southmost corner of Building A. Areas along the Paris Street façades of the proposed Development are within the aerodynamic shade region of the Development for easterly winds and as such will realise conditions suitable for sitting.

The Main Entrances along the northwest façades of the buildings are located within the aerodynamic shade region of the Development for easterly winds, and as such will be suitable for sitting and appropriate for their intended use.

Bell Park Road will be exposed to easterly winds that are directed to flow along the proposed Development, resulting in windier conditions than the existing site, but are considered suitable for standing most of the time, and appropriate for the intended use.



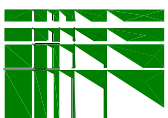
Paris Street is in the aerodynamic shade region of the proposed Development for easterly winds and will realize comfortable conditions also suitable for its' intended purpose.

Discussion of Ordinal Winds

Ordinal Winds approaching from the northwest, northeast, southeast, and southwest also make up an appreciable percentage of the prevailing wind climate, particularly from the southwest and to a lesser degree, northeast, and can be of higher velocity, as depicted in Figure 3.

The proposed Development considered as a whole, is orientated with the long axis nearly parallel with the southwest and northeast wind directions, resulting in said winds coming into contact with relatively narrow façades, with the balance of the site being in the aerodynamic shade region of the windward building. Windy conditions would be expected along the southwest façade of Building A, in the event of high ambient southwesterly winds, as winds split upon impact and flow along the façade, around the corners and beyond. Similarly, the windward façade of Building C will experience windy conditions in the event of high ambient northeasterly winds, as wind splits upon contact to flow along the façade and around the corners, with the remainder of the site being situated in the aerodynamic shade region, experiencing much calmer conditions, once beyond the respective corners. As such, wind conditions resulting from said ordinal winds are expected to pose a less significant influence upon pedestrian comfort than the cardinal winds discussed above.

Winds approaching from the northwest and southeast make up a considerably smaller percentage of the wind climate, and are of mid - to higher velocity, particularly from the northwest. Northwesterly and southeasterly winds will contact the proposed Development at nearly right angles, to a lesser extent for Buildings B and C, increasing the propensity of downwash to the pedestrian level. However, downwash was effectively mitigated by the buildings being punctuated with balconies, stepped podiums and canopies above the entrances. Downwash that reaches the pedestrian level will be redirected along the respective façades, around the corners, between the buildings, and beyond, resulting in pedestrian comfort conditions that are very similar to those discussed for the cardinal directions.



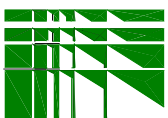
Discussion of Outdoor Amenity Space

Outdoor Amenity Space is proposed on the 13th floor of Building A, the 13th, 14th, and 20th floors on Building B, and at-grade and at the 3rd floor of Building C. The amenity spaces are, for the most part, higher than the neighbouring surroundings and, as a result, are exposed to large portions of the wind climate that are not as effectively moderated upon approach compared to the windward ground level.

The proposed rooftop amenity space on the 13th floor of Building A is located along the northeast façade within the eastmost corner. The Amenity Space is located within the aerodynamic shade region of the 14th through 16th floors of Building A on the occasion of winds emanating from the near northwest through southwest, which make up a significant portion of the wind climate. The Amenity Space is similarly within the aerodynamic shade region of Building B for winds emanating from the near northeast, which make up a considerable portion of the wind climate, particularly in the spring and summer. As a result, the Amenity Space is predicted to experience comfortable conditions, suitable for sitting, under the above described wind conditions.

Conversely, the Amenity Space will be exposed to winds from the near north as well as southeast quadrant being redirected by the windward façades of Building A and Building B to flow along the façades and through the gap, resulting in windy conditions at times. Winds from the southeast quadrant occur less frequently, tend to be of lower velocity, and are not predicted to have a significant influence on the Amenity Space overall. However, northerly winds will result in windy conditions from time to time and, as a result, 2.0m high glass wind screens are recommended around the perimeter of the space. Porous wind screens with a porosity in the order of 30% would be considered a viable alternative to solid screens. The need for and extent of mitigation necessary is best determined through quantitative analysis.

Outdoor Amenity Spaces are proposed for Building B at the 13th and 14th floors along the southwest façade and a covered Roof Top Terrace at the 20th floor along the southeast façade, at the southmost corner of the building. Similar to above, the Amenity Spaces are located within the aerodynamic shade region of Building B for winds emanating from the northeast, which makes up a considerable portion of the wind climate, particularly in the spring and summer. They will also realise protection from Building A on the occasion of winds from the southwest, which make up a significant portion of the wind climate. The Amenity Space is predicted to experience comfortable conditions, suitable for sitting, under these wind conditions. Conversely, they will be exposed to winds from the remaining directions flowing along the northwest and southeast façades of Buildings A and B and through the gap between and, as a result,

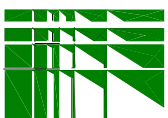


2.0m high wind screens situated around the perimeter of the Amenity Spaces is recommended.

The 20th floor Covered Roof Top Terrace of Building B is located within the aerodynamic shade region of Building B for winds emanating from the west through north to northeast. The Rooftop Terrace will be exposed to winds emanating from the remaining compass points, unmitigated as it approaches over the lower surrounds. The Roof Top Terrace is covered, reducing exposure, however, 2.0m high wind screens are recommended to achieve conditions seasonally appropriate for the area's intended use. If more comfortable conditions are desired, coniferous vegetation, raised planter beds populated with coarse plantings, trellises, and/or others can be included in the mitigation plan.

Outdoor Amenity Spaces are proposed for Building C at-grade along the northwest façade, proximate to the northmost corner, and at the 3rd floor, along the southeast façade. The at-grade Patio Area will be protected by the Development for winds emanating from the east through south to southwest, however it is exposed to the remaining directions, which makes up much of the prevailing wind climate. Locating Amenity Spaces away from corners is preferable when practical. Consideration of existing and proposed landscape features will result in more comfortable conditions, however, the area is expected to be windy, and mitigation including wind screens, coniferous plantings, raised planter beds populated with coarse plantings, trellises, and others is recommended to achieve seasonally appropriate conditions for the area's intended use.

The Outdoor Amenity Space proposed along the 3rd level southeast façade of Building C is located within the aerodynamic shade region of Building C for winds emanating from the north through west to southwest, making up a significant portion of the prevailing wind climate, resulting in comfortable conditions suitable for sitting, much of the time. The Amenity Space will be exposed to northeasterly winds flowing along the façade, which are common in the spring and summer. Incorporating a porous screen wall (30% porosity) along the northeast façade of the building across the width of the Amenity Space would redirect northeasterly winds to flow around the Amenity Space, resulting in more comfortable conditions throughout the year, if desired. Winds emanating from the remaining compass points occur less frequently and are not likely to significantly influence comfort conditions.



Discussion of Residential Entrances

The Main Residential Entrances to the proposed Development are located centrally along the northwest, Paris Street, façades of the buildings. Downwash is moderated by balconies, overhangs, stepped façades, and canopies. The Entrances will be exposed to winds from the northwest quadrant, while they are sheltered by the proposed Development for winds emanating from the southeast quadrant. They are well removed from the buildings' corners, reducing the impact of winds from the remaining directions flowing along the façades, and around the corners. As a result, pedestrian comfort conditions at the Entrances are generally predicted to be suitable for standing most of the time, walking on the occasion of high ambient winds, and are considered appropriate for their intended use most of the time.

Comfort conditions appropriate for standing or better are preferable at building Entrances, and conditions suitable for walking are appropriate for the related sidewalks. A mitigation plan is recommended for the Entrances in order to achieve conditions more appropriate for their intended use throughout the year and can include recessing the entrances into the façades, utilizing revolving or sliding doors, incorporating wind screens perpendicular to the facades, including coniferous/marcescent vegetation, raised planter beds populated with dense plantings, trellises, and/or others.

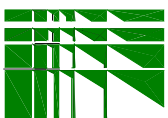
With consideration of the aforementioned mitigative features, the Main Residential Entrances to the proposed Development are predicted to be comfortable and suitable for their intended use throughout the year.

8. MITIGATION STRATEGIES

The proposed 700 Paris Street 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 an overall wind mitigative design that assists in moderating the upset in winds with inclusion of the building, causing limited influence upon pedestrian comfort conditions realised along the flanking streets and at neighbouring properties. The proposed Development's wind mitigative design features include:

- podiums,
- stepped massing,
- textured façades,
- balconies,



- overhangs,
- canopies,
- landscaping,

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

Additional mitigation is recommended for the Main Entrances and Outdoor Amenity Spaces to achieve conditions that are suitable for the intended uses, as described within.

Comfort conditions expected at, and around, the proposed Development site, with the above-described mitigation in place, are considered suitable to the context, based upon qualitative analysis. Quantitative wind tunnel analysis is best suited to the determination of pedestrian comfort conditions and wind mitigation requirements.

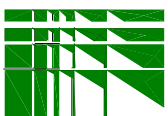
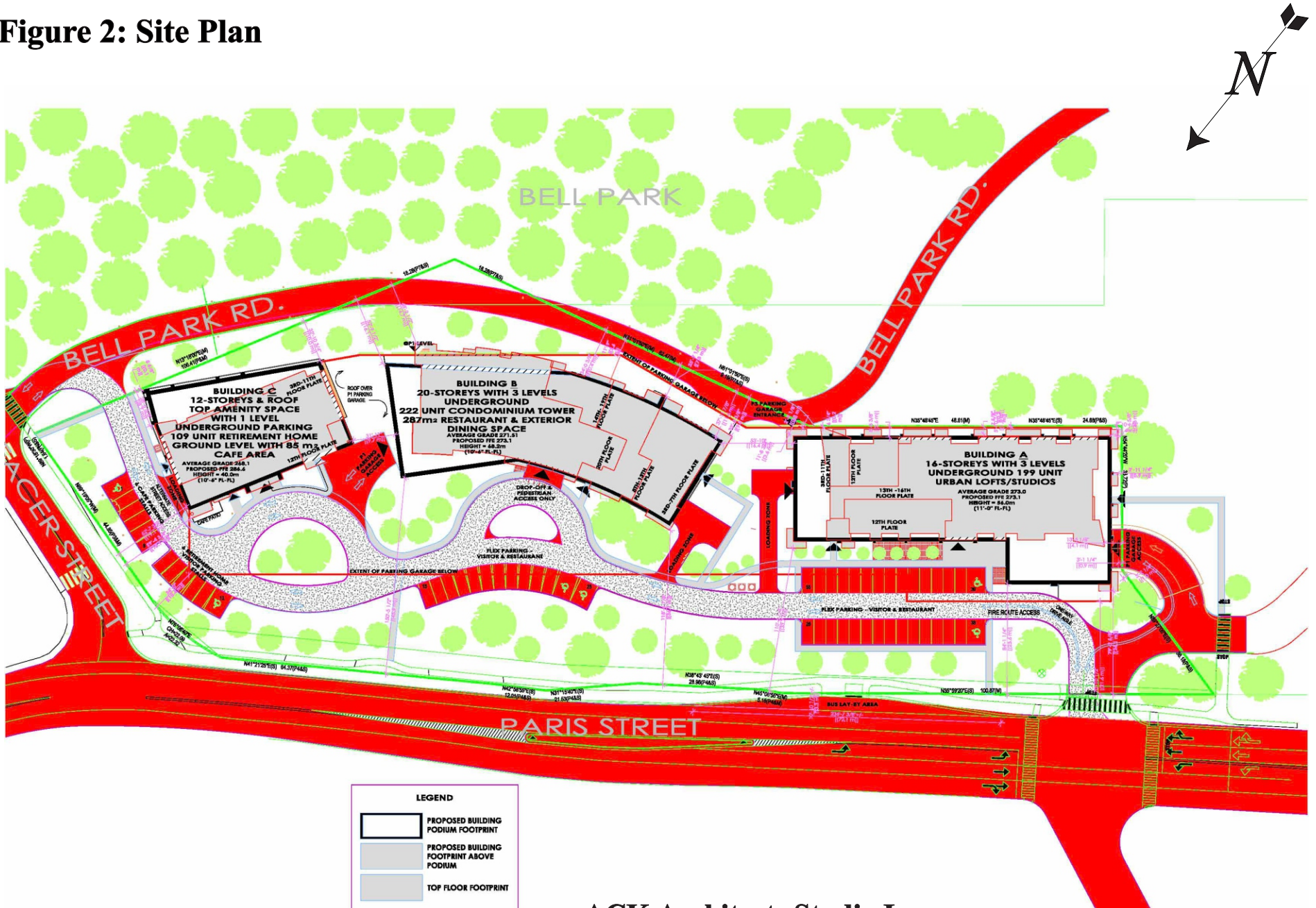


Figure 1: Site Aerial Photo



Figure 2: Site Plan



ACK Architects Studio Inc.



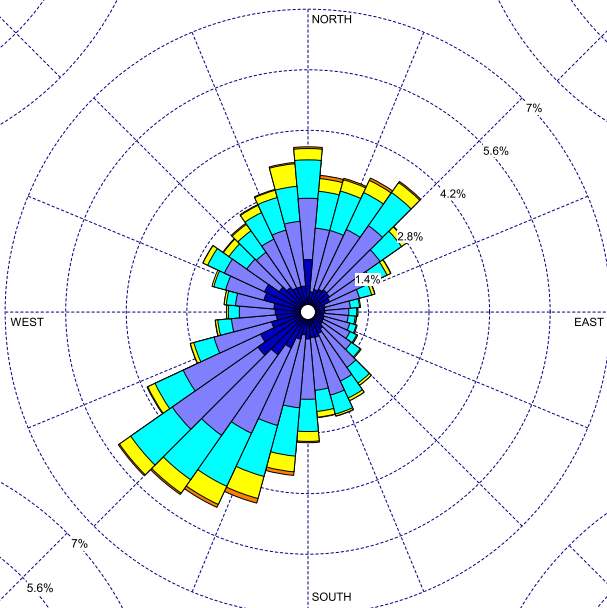
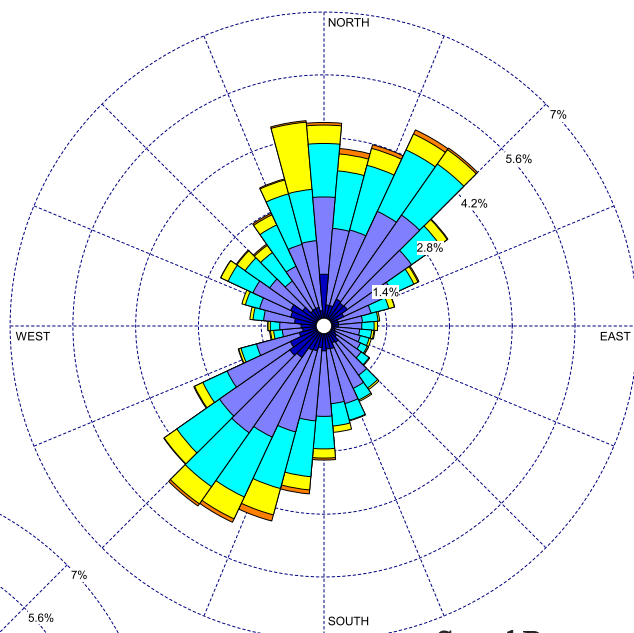
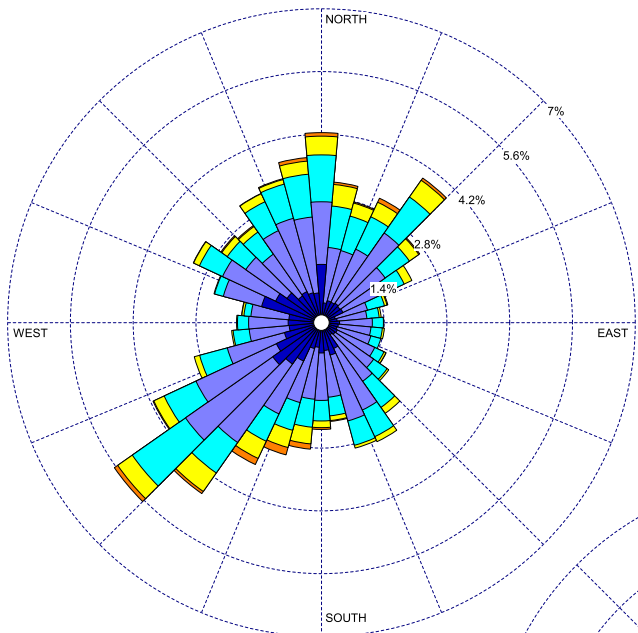
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Environmental**

Figure 3: Wind Roses - Greater Sudbury Airport (2012 - 2021)

Historical Directional Distribution of Winds @ 10m height
Between the Hours of 6:00 - 23:00

A) Winter (December - February)

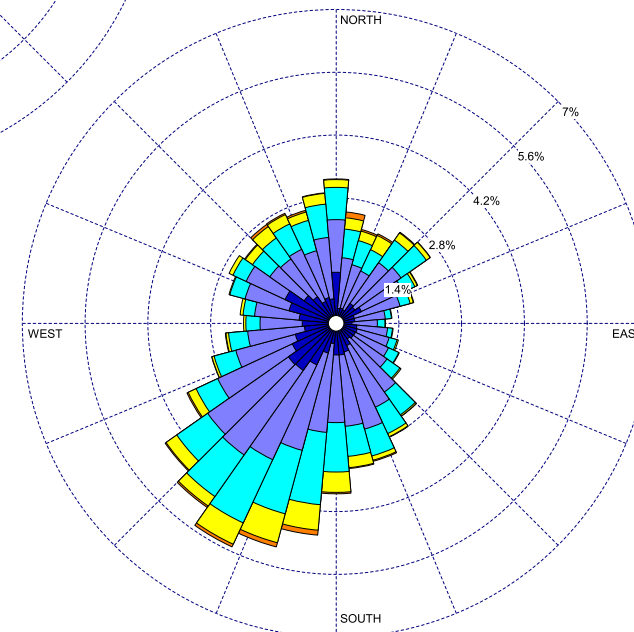
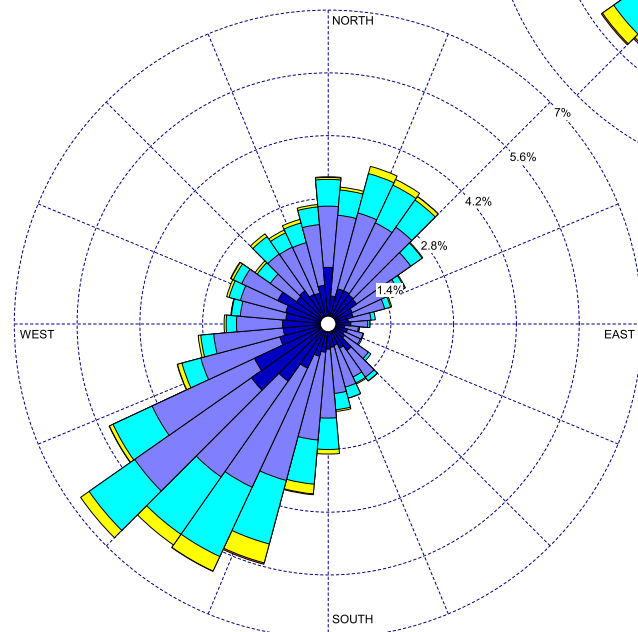
B) Spring (March - May)



Speed Range

- 1 - 10km/h
- 11 - 20km/h
- 21 - 30km/h
- 31 - 40km/h
- > 40km/h

E) Annual



D) Summer (June - August)

D) Fall (September - November)

