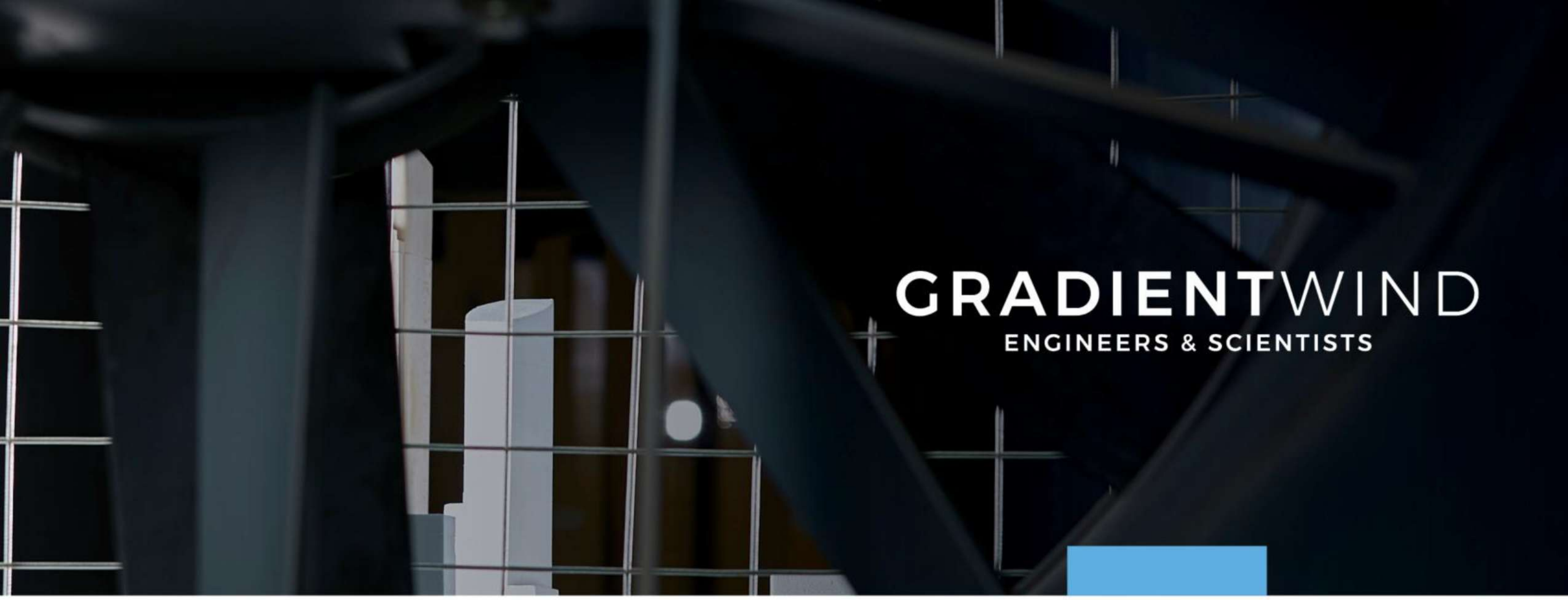
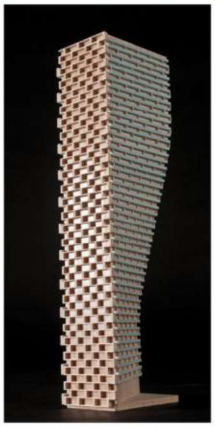


PEDESTRIAN LEVEL WIND STUDY

1052, 1060, 1064 St. Laurent Boulevard
Ottawa, Ontario

Report: 25-116-PLW



February 5, 2026

PREPARED FOR
1001182489 Ontario Inc.
1469 Youville Drive
Orleans, ON K1C 4R1

PREPARED BY
Justin Denne, M.A.Sc., Junior Wind Scientist
David Huitema, M.Eng., P.Eng., CFD Lead Engineer

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
GRADIENTWIND.COM

EXECUTIVE SUMMARY

This report describes a pedestrian level wind (PLW) study undertaken to satisfy Official Plan Amendment and Zoning By-Law Amendment application submission requirements for the proposed residential development located at 1052, 1060, and 1064 St. Laurent Boulevard in Ottawa, Ontario (hereinafter referred to as "subject site" or "proposed development"). Our mandate within this study is to investigate pedestrian wind conditions within and surrounding the subject site, and to identify areas where wind conditions may interfere with certain pedestrian activities so that mitigation measures may be considered, where required.

The study involves simulation of wind speeds for selected wind directions in a three-dimensional (3D) computer model using the computational fluid dynamics (CFD) technique, combined with meteorological data integration, to assess pedestrian wind comfort and safety within and surrounding the subject site according to City of Ottawa wind comfort and safety criteria. The results and recommendations derived from these considerations are detailed in the main body of the report (Section 5), illustrated in Figures 3A-9, and summarized as follows:

1) Most grade-level areas within and surrounding the subject site are predicted to experience conditions that are considered acceptable for the intended pedestrian uses throughout the year. Specifically, conditions over nearby transit stops, neighbouring surface parking, most surrounding sidewalks, and most proposed walkways, surface parking, bicycle parking, and vicinity of most building access points, are considered acceptable.

    a. Wind conditions are predicted to exceed the walking comfort threshold to the south of the proposed development over the intersection of St. Laurent Boulevard and Queen Mary Street during the spring and winter by 2% and 3%, respectively. Given the marginal exceedance of the walking comfort threshold and noting that the windier area is effectively isolated to over the roadway surface, the noted region of wind conditions may be considered as satisfactory.

    b. The walking comfort threshold is exceeded beneath the podium during the spring, autumn, and winter, impacting the drive aisle and north walkway. The design team may consider vertical walls within the drive aisle orientated along the travel direction (project east-west), particularly near the entrance from St. Laurent Boulevard, as well as tall planters along the east elevation of the proposed development, and elements such as wind screens, solid artwalls, or tall planters along the north elevation of the outdoor amenity. Notably, the inclusion of a garage door to the west exit from beneath the podium would be expected to eliminate these uncomfortable conditions.

c. During the typical use period, wind comfort conditions within proposed outdoor amenity are predicted to be suitable for mostly sitting, with standing conditions to the north. If required by programming, wind conditions may be improved by implementing targeted mitigation as described in Section 5.1.

d. It is recommended to recess building access points to the north wing beneath the podium by at least 2 m into the building façade, and to relocate the main entrance beneath the podium to the northeast corner of the vestibule.

2) Regarding the common amenity terrace serving the proposed development at Level 10, which was modelled with 1.8-m-tall perimeter wind screens, conditions during the typical use period are predicted to be suitable for a mix of mostly standing and strolling.

   a. The extent of mitigation is dependent on the programming of the terrace. It is recommended to increase the height of the perimeter wind screen along the west and southwest perimeters (that is, greater than 1.8 m in height as measured from the local walking surface) in combination with inboard mitigation targeted around designated seating areas as described in Section 5.2. A mitigation strategy may be developed in coordination with the building and landscape architect as the design progresses towards the Site Plan Control application stage.

3) The foregoing statements and conclusions apply to common weather systems, during which no dangerous wind conditions, as defined in Section 4.4, are expected anywhere over the subject site. During extreme weather events, (for example, thunderstorms, tornadoes, and downbursts), pedestrian safety is the main concern. However, these events are generally short-lived and infrequent and there is often sufficient warning for pedestrians to take appropriate cover.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by 1001182489 Ontario Inc. to undertake a pedestrian level wind (PLW) study to satisfy Official Plan Amendment and Zoning By-Law Amendment application submission requirements for the proposed residential development located at 1052, 1060, and 1064 St. Laurent Boulevard in Ottawa, Ontario (hereinafter referred to as "subject site" or "proposed development"). Our mandate within the current study is to investigate pedestrian wind conditions within and surrounding the subject site for the revised architectural massing design, and to identify areas where wind conditions may interfere with certain pedestrian activities so that mitigation measures may be considered, where required.

Our work is based on industry standard computer simulations using the computational fluid dynamics (CFD) technique and data analysis procedures, City of Ottawa wind comfort and safety criteria, architectural drawings prepared by Project 1 Studio Inc. in October 2025, surrounding street layouts and existing and approved future building massing information obtained from the City of Ottawa, as well as recent satellite imagery.

2. TERMS OF REFERENCE

The subject site is located at 1052, 1060, and 1064 St. Laurent Boulevard in Ottawa, situated on a parcel of land bordered by St. Laurent Boulevard followed by low-rise commercial massing and surface parking to the east, a low-rise commercial building followed by Queen Mary Street and additional low-rise commercial massing to the south, low-rise dwellings to the west, and low-rise commercial massing with surface parking to the north. The proposed development is a mixed-use residential building comprising a nominally rectangular 30-storey tower inclusive of a 9-storey podium.

Above the underground parking levels, the ground floor includes retail space along the east elevation, indoor amenity space along the west elevation, and a residential lobby central to the space. A drive aisle extends west from St. Laurent Boulevard beneath the podium, providing access to a loading space, surface parking, bicycle parking, and a ramp to the underground parking. The residential lobby is accessible via a primary access point located beneath the podium as well as secondary access points centrally located along the east and south elevations. A grade-level outdoor amenity is programmed along the west elevation, adjacent to the indoor amenity spaces.

Levels 2-30 are reserved for residential occupancy. The building steps back from the southwest elevation at Level 5, the northwest north, east, and southeast elevations at Level 7, and the north elevation at Level 10. Atop the 9-storey podium and within the Level 10 step-back from the west elevation, an outdoor amenity terrace is programmed, accessible via an indoor amenity.

The near-field surroundings (defined as an area within 200 metres (m) of the subject site) comprise low-rise commercial massing with surface parking from the north clockwise to the south and low-rise dwellings from the south clockwise to the north. Notably, the schoolyard belonging to Queen Mary Street Public School is located approximately 80 m to the west. The far-field surroundings (defined as an area beyond the near-field but within a 2-kilometre (km) radius of the subject site) are primarily characterized by low-rise massing in all directions with isolated mid- and high-rise buildings throughout the far-field located along higher density corridors such as Montreal Road, the Queensway, and Vanier Parkway. Notably, the St. Laurent Shopping Centre is located approximately 300 m to the south, and the Queensway extends east-west approximately 700 m to the south.

Site plans for the proposed and existing massing scenarios are illustrated in Figures 1A and 1B, while Figures 2A-2H illustrate the computational models used to conduct the study. The existing massing scenario includes the existing massing and any developments approved by the City of Ottawa.

3. OBJECTIVES

The principal objectives of this study are to (i) determine pedestrian level wind conditions at key areas within and surrounding the development site; (ii) identify areas where wind conditions may interfere with the intended uses of outdoor spaces; and (iii) recommend suitable mitigation measures, where required.

4. METHODOLOGY

The approach followed to quantify pedestrian wind conditions over the site is based on CFD simulations of wind speeds across the subject site within a virtual environment, meteorological analysis of the Ottawa area wind climate, and synthesis of computational data with City of Ottawa wind comfort and safety criteria[1]. The following sections describe the analysis procedures, including a discussion of the noted pedestrian wind criteria.

4.1 Computer-Based Context Modelling

A computer based PLW study was performed to determine the influence of the wind environment on pedestrian comfort over the proposed development site. Pedestrian comfort predictions, based on the mechanical effects of wind, were determined by combining measured wind speed data from CFD simulations with statistical weather data obtained from Ottawa Macdonald-Cartier International Airport. The general concept and approach to CFD modelling is to represent building and topographic details in the immediate vicinity of the subject site on the surrounding model, and to create suitable atmospheric wind profiles at the model boundary. The wind profiles are designed to have similar mean and turbulent wind properties consistent with actual site exposures.

An industry standard practice is to omit trees, vegetation, and other existing and planned landscape elements from the model due to the difficulty of providing accurate seasonal representation of vegetation. The omission of trees and other landscaping elements produces slightly stronger wind speeds.

4.2 Wind Speed Measurements

The PLW analysis was performed by simulating wind flows and gathering velocity data over a CFD model of the site for 16 wind directions. The CFD simulation model was centered on the proposed development, complete with surrounding massing within a radius of 480 m. The process was performed for two context massing scenarios, as noted in Section 2. Mean and peak wind speed data obtained over the subject site for each wind direction were interpolated to 36 wind directions at 10° intervals, representing the full compass azimuth.

---

[1] City of Ottawa Terms of References: Wind Analysis
https://documents.ottawa.ca/sites/documents/files/wind_analysis_tor_en.pdf

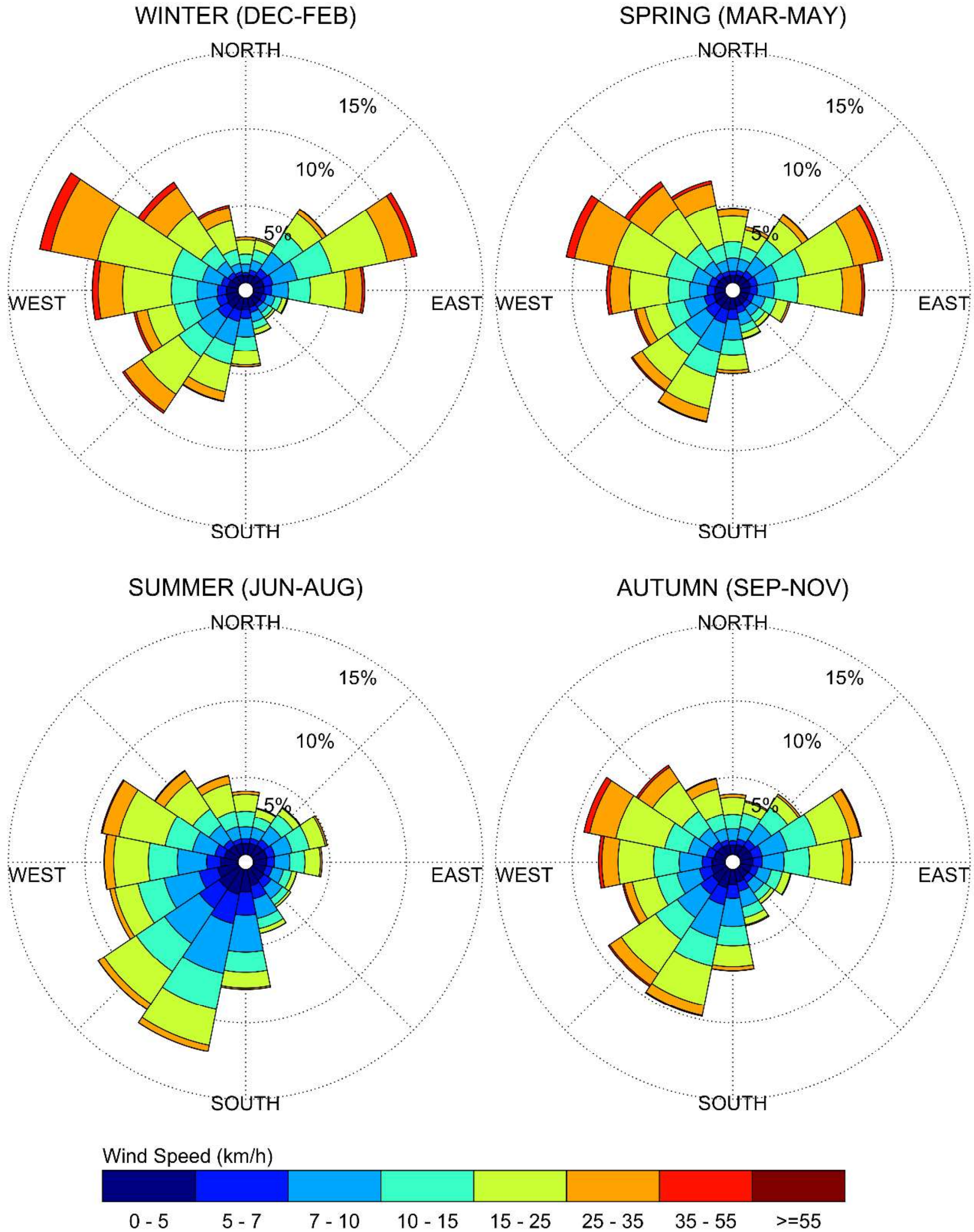
Measured wind speeds approximately 1.5 m above local grade and the common amenity terrace serving the proposed development at Level 10 were referenced to the wind speed at gradient height to generate mean and peak velocity ratios, which were used to calculate full-scale values. Gradient height represents the theoretical depth of the boundary layer of the earth's atmosphere, above which the mean wind speed remains constant. Further details of the wind flow simulation technique are presented in Appendix A.

4.3 Historical Wind Speed and Direction Data

A statistical model for winds in Ottawa was developed from approximately 40 years of hourly meteorological wind data recorded at Ottawa Macdonald-Cartier International Airport and obtained from Environment and Climate Change Canada. Wind speed and direction data were analyzed during the appropriate hours of pedestrian usage (that is, between 06:00 and 23:00) and divided into four distinct seasons, as stipulated in the wind criteria. Specifically, the spring season is defined as March through May, the summer season is defined as June through August, the autumn season is defined as September through November, and the winter season is defined as December through February, inclusive.

The statistical model of the Ottawa area wind climate, which indicates the directional character of local winds on a seasonal basis, is illustrated on the following page. The plots illustrate seasonal distribution of measured wind speeds and directions in kilometers per hour (km/h). Probabilities of occurrence of different wind speeds are represented as stacked polar bars in sixteen azimuth divisions. The radial direction represents the percentage of time for various wind speed ranges per wind direction during the measurement period. The prominent wind speeds and directions can be identified by the longer length of the bars. For Ottawa, the most common winds occur for westerly wind directions, followed by those from the east, while the most common wind speeds are below 36 km/h. The directional prominence and relative magnitude of wind speed changes somewhat from season to season.

SEASONAL DISTRIBUTION OF WIND
OTTAWA MACDONALD-CARTIER INTERNATIONAL AIRPORT



Notes:

1. Radial distances indicate percentage of time of wind events.
2. Wind speeds are mean hourly in km/h, measured at 10 m above the ground.

4.4 Pedestrian Wind Comfort and Safety Criteria – City of Ottawa

Pedestrian wind comfort and safety criteria are based on the mechanical effects of wind without consideration of other meteorological conditions (that is, temperature and relative humidity). The comfort criteria assume that pedestrians are appropriately dressed for a specified outdoor activity during any given season. Five pedestrian comfort classes based on 20% non-exceedance mean wind speed ranges are used to assess pedestrian comfort: (1) Sitting; (2) Standing; (3) Strolling; (4) Walking; and (5) Uncomfortable. The gust speeds, and equivalent mean speeds, are selected based on the Beaufort scale, which describes the effects of forces produced by varying wind speed levels on objects. Wind conditions suitable for sitting are represented by the colour blue, standing by green, strolling by yellow, and walking by orange; uncomfortable conditions are represented by the colour magenta. Specifically, the comfort classes, associated wind speed ranges, and limiting criteria are summarized as follows:

PEDESTRIAN WIND COMFORT CLASS DEFINITIONS

Wind Comfort Class	Mean Speed (km/h)	Description
SITTING	≤ 10	Mean wind speeds no greater than 10 km/h occurring at least 80% of the time. The equivalent gust wind speed is approximately 16 km/h.
STANDING	≤ 14	Mean wind speeds no greater than 14 km/h occurring at least 80% of the time. The equivalent gust wind speed is approximately 22 km/h.
STROLLING	≤ 17	Mean wind speeds no greater than 17 km/h occurring at least 80% of the time. The equivalent gust wind speed is approximately 27 km/h.
WALKING	≤ 20	Mean wind speeds no greater than 20 km/h occurring at least 80% of the time. The equivalent gust wind speed is approximately 32 km/h.
UNCOMFORTABLE	> 20	Uncomfortable conditions are characterized by predicted values that fall below the 80% target for walking. Brisk walking and exercise, such as jogging, would be acceptable for moderate excesses of this criterion.

Regarding wind safety, the pedestrian safety wind speed criterion is based on the approximate threshold that would cause a vulnerable member of the population to fall. A 0.1% exceedance gust wind speed of 90 km/h is classified as dangerous. From calculations of stability, it can be shown that gust wind speeds of 90 km/h would be the approximate threshold wind speed that would cause an average elderly person in good health to fall. Notably, pedestrians tend to be more sensitive to wind gusts than to steady winds for lower wind speed ranges. For strong winds approaching dangerous levels, this effect is less important because the mean wind can also create problems for pedestrians.

Experience and research on people's perception of mechanical wind effects has shown that if the wind speed levels are exceeded for more than 20% of the time, the activity level would be judged to be uncomfortable by most people. For instance, if a mean wind speed of 10 km/h (equivalent gust wind speed of approximately 16 km/h) were exceeded for more than 20% of the time most pedestrians would judge that location to be too windy for sitting. Similarly, if mean wind speed of 20 km/h (equivalent gust wind speed of approximately 32 km/h) at a location were exceeded for more than 20% of the time, walking or less vigorous activities would be considered uncomfortable. As these criteria are based on subjective reactions of a population to wind forces, their application is partly based on experience and judgment.

Once the pedestrian wind speed predictions have been established throughout the subject site, the assessment of pedestrian comfort involves determining the suitability of the predicted wind conditions for discrete regions within and surrounding the subject site. This step involves comparing the predicted comfort classes to the target comfort classes, which are dictated by the location type for each region (that is, a sidewalk, building entrance, amenity space, or other). An overview of common pedestrian location types and their typical windiest target comfort classes are summarized on the following page. Depending on the programming of a space, the desired comfort class may differ from this table.

TARGET PEDESTRIAN WIND COMFORT CLASSES FOR VARIOUS LOCATION TYPES

Location Types	Target Comfort Classes
Primary Building Entrance	Standing
Secondary Building Access Point	Walking
Public Sidewalk / Bicycle Path	Walking
Outdoor Amenity Space	Sitting / Standing
Café / Patio / Bench / Garden	Sitting / Standing
Transit Stop (Without Shelter)	Standing
Transit Stop (With Shelter)	Walking
Public Park / Plaza	Sitting / Standing
Garage / Service Entrance	Walking
Parking Lot	Walking
Vehicular Drop-Off Zone	Walking

5. RESULTS AND DISCUSSION

The following discussion of the predicted pedestrian wind conditions for the subject site is accompanied by Figures 3A-6B, which illustrate wind conditions at grade level for the proposed and existing massing scenarios and by Figures 8A-D, which illustrate wind conditions over the common amenity terrace serving the proposed development at Level 10. Conditions are presented as continuous contours of wind comfort throughout the subject site and correspond to the comfort classes presented in Section 4.4.

Wind comfort conditions are also reported for the typical use period, which is defined as May to October, inclusive. Figures 7 and 9 illustrate wind comfort conditions at grade level and within the noted amenity terrace serving the proposed development, respectively, during this period, consistent with the comfort classes illustrated in Section 4.4.

The details of these conditions are summarized in the following pages for each area of interest.

5.1 Wind Comfort Conditions – Grade Level

The mostly low-rise suburban environs and limited built-up massing within the near field exposes the subject site to prevailing winds in the area, particularly winds from the east and west. Following the introduction of the proposed development, prevailing winds are predicted to downwash over the tower's east and west facades to grade, accelerating around the north and south corners of the development and channeling beneath podium. Following preliminary results and in coordination with the design team, several mitigation measures were implemented to improve the baseline wind conditions; specifically, 1.8-m-tall wind screens have been incorporated along the north and south perimeters of the subject site to deter corner acceleration, a 3-m-deep canopy has been introduced along the west elevation of the building above grade level to deflect downwash and limit flow entrainment beneath the podium, a series of equidistant 1-m-deep vertical fins beneath the podium along the south elevation of the north wing to diffuse channelling winds, and façade revisions to introduce articulation along the north elevation of the south wing to help limit corner acceleration beneath the podium. Following the implementation of the noted mitigation elements, the overall wind conditions within and surrounding the proposed development, particularly beneath the podium as well as over Queen Mary Street and the commercial plaza to the north have improved. The results presented in the current study correspond to the results following the introduction of these measures.

Following the introduction of the proposed development, wind conditions that may be considered occasionally uncomfortable for walking are predicted to the south of the proposed development over the intersection of St. Laurent Boulevard and Queen Mary Street during the spring and winter, and beneath the podium during the spring, autumn, and winter.

The windier region of conditions over Queen Mary Street are predicted to be suitable for walking at least 78% and 77% of the time during the spring and winter, representing exceedances of 2% and 3% of the walking comfort threshold. Given the marginal exceedance of the walking threshold and noting that the windier area is primarily located over the roadway surface, the noted region of wind conditions may be considered as satisfactory.

The wind conditions that may be considered uncomfortable for walking beneath the podium are predicted to impact the drive aisle and north walkway. During the spring season, conditions are predicted to be suitable for walking approximately 73% of the spring, representing an exceedance of 7% of the walking criterion. During the autumn months, the uncomfortable region is also suitable for walking approximately 77% of the autumn, representing an exceedance of 3%. The conditions during the spring and autumn are mostly located over the drive aisle with limited impact to pedestrian walkways. During the winter season, conditions are suitable for walking at least 72% of the winter months, representing an 8% exceedance of the walking threshold.

Additional mitigation measures that may be considered by the design team include vertical walls within the drive aisle orientated along the travel direction (that is, project east-west), particularly near the entrance from St. Laurent Boulevard, as well as tall planters along the east elevation of the proposed development, and tall planters and screening elements (wind screens, solid artwalls, tall planters, etc.) along the north elevation of the outdoor amenity to further hinder flow entrainment beneath the podium.

Public Sidewalks along St. Laurent Boulevard and Queen Mary Street: Following the introduction of the proposed development and with the exception of the noted conditions that may be considered uncomfortable for walking to the south of the proposed development, wind comfort conditions over the nearby sidewalks along St. Laurent Boulevard and Queen Mary Street are predicted to be suitable for walking, or better, during the spring and winter, becoming suitable for strolling, or better, during the summer and autumn. Under the existing massing scenario, wind comfort conditions over the noted nearby sidewalks are predicted to be suitable for standing, or better, throughout the year.

Transit Stops along St. Laurent Boulevard: Under the existing massing scenario, conditions in the vicinity of the nearby transit stops along St. Laurent Bouleveard are predicted to be suitable for standing, or better, throughout the year. Following the introduction of the proposed development, wind comfort conditions in the vicinity of the southbound transit stop along St. Laurent Boulevard are predicted to be suitable for standing, or better, throughout the year, which is considered acceptable. Of note, the noted transit stop is expected to be fitted with a typical transit shelter and has been relocated in the proposed site plan to mostly central along the façade of the south wing of the building. Wind conditions in the vicinity of the northbound transit stop along St. Laurent Boulevard are predicted to be suitable for standing, or better, throughout the year and are considered acceptable.

Neighbouring Surface Parking Lots: Under the existing massing scenario, wind comfort conditions over nearby neighbouring surface parking lots are predicted to be suitable for standing, or better, throughout the year, becoming suitable for mostly walking, or better, following the introduction of the proposed development. The noted conditions are considered acceptable.

Proposed Outdoor Amenity: During the typical use period, conditions within proposed outdoor amenity along the west elevation of the proposed development are predicted to be suitable for mostly sitting, with standing conditions to the north. If the noted region suitable for standing will not accommodate seating or lounging activities, the noted conditions may be considered acceptable.

If required by programming, wind conditions may be improved by implementing targeted mitigation around designated seating areas to the north such as wind screens, free-standing canopies, tall planters with dense arrangements of plantings, high-back bench seating, and other common landscape elements, predominantly orientated east-west to counter winds moving parallel to the building façade. The extent of mitigation is dependent on the programming of the space.

Proposed Drive Aisle, Walkways, Surface Parking, Bicycle Parking, and Loading Area within the Subject Site: Excepting the noted uncomfortable conditions predicted beneath the podium, wind comfort conditions over the proposed drive aisle to the west of the podium, the proposed rear surface parking, and walkways to the west of the podium and along the east and south elevations are predicted to suitable for walking, or better, throughout the year.

Wind comfort conditions over the designated bicycle parking areas are predicted to be suitable for standing, or better, throughout the year and are considered acceptable. Owing to the protection of the building façade, wind conditions in the vicinity of the loading area beneath the podium are predicted to be suitable for sitting throughout the year and are considered acceptable.

Building Access Points: Owing to the protection of the building façades, wind conditions in the vicinity of most building access points serving the proposed development are predicted to be suitable for standing, or better, throughout the year. It is recommended to recess building access points to the north wing beneath the podium by at least 2 m into the building façade, and to shift the swing door at the main entrance beneath the podium to the northeast corner of the vestibule.

5.2 Wind Comfort Conditions – Level 10 Common Amenity Terrace

The Level 10 amenity terrace was modelled with 1.8-m-tall wind screens around the full terrace perimeter to deflect direct, prevailing winds. During the typical use period, wind comfort conditions over the common amenity terrace are predicted to be suitable for a mix of mostly standing and strolling, where strolling conditions are predicted central to the space and conditions suitable for sitting are predicted adjacent to the tower. The noted windier conditions are a result of downwash from the east and west facades accelerating over the terrace.

To improve wind comfort conditions within the terrace, it is recommended to increase the height of the perimeter wind screen along the west and southwest perimeters (that is, greater than 1.8-m-tall as measured from the local walking surface) in combination with inboard mitigation targeted around designated seating areas. Inboard mitigation may include wind screens, free-standing canopies with vertical components such as louvered walls, tall planters with dense arrangements of plantings, and other common landscape elements.

The extent of mitigation is dependent on the programing of the amenity terrace. A mitigation strategy may be developed in coordination with the building and landscape architects as the design of the proposed development progresses toward the Site Plan Control application stage.

5.3 Wind Safety

Within the context of typical weather patterns, which exclude anomalous localized storm events such as tornadoes and downbursts, no pedestrian areas within or surrounding the subject site are expected to experience conditions that could be considered dangerous, as defined in Section 4.4.

5.4 Applicability of Results

Pedestrian wind comfort and safety have been quantified for the specific configuration of existing and foreseeable construction around the subject site. Future changes (that is, construction or demolition) of these surroundings may cause changes to the wind effects in two ways, namely: (i) changes beyond the immediate vicinity of the subject site would alter the wind profile approaching the subject site; and (ii) development in proximity to the subject site would cause changes to local flow patterns.

6. CONCLUSIONS AND RECOMMENDATIONS

A complete summary of the predicted wind conditions is provided in Section 5 and illustrated in Figures 3A-9. Based on computer simulations using the CFD technique, meteorological data analysis of the Ottawa wind climate, City of Ottawa wind comfort and safety criteria, and experience with numerous similar developments, the study concludes the following:

1) Most grade-level areas within and surrounding the subject site are predicted to experience conditions that are considered acceptable for the intended pedestrian uses throughout the year. Specifically, conditions over nearby transit stops, neighbouring surface parking, most surrounding sidewalks, and most proposed walkways, surface parking, bicycle parking, and vicinity of most building access points, are considered acceptable.

    a. Wind conditions are predicted to exceed the walking comfort threshold to the south of the proposed development over the intersection of St. Laurent Boulevard and Queen Mary Street during the spring and winter by 2% and 3%, respectively. Given the marginal exceedance of the walking comfort threshold and noting that the windier area is effectively isolated to over the roadway surface, the noted region of wind conditions may be considered as satisfactory.

    b. The walking comfort threshold is exceeded beneath the podium during the spring, autumn, and winter, impacting the drive aisle and north walkway. The design team may consider vertical walls within the drive aisle orientated along the travel direction (project east-west), particularly near the entrance from St. Laurent Boulevard, as well as tall planters along the east elevation of the proposed development, and elements such as wind screens, solid artwalls, or tall planters along the north elevation of the outdoor amenity. Notably, the inclusion of a garage door to the west exit from beneath the podium would be expected to eliminate these uncomfortable conditions.

    c. During the typical use period, wind comfort conditions within proposed outdoor amenity are predicted to be suitable for mostly sitting, with standing conditions to the north. If required by programming, wind conditions may be improved by implementing targeted mitigation as described in Section 5.1.

d. It is recommended to recess building access points to the north wing beneath the podium by at least 2 m into the building façade, and to relocate the main entrance beneath the podium to the northeast corner of the vestibule.

2) Regarding the common amenity terrace serving the proposed development at Level 10, which was modelled with 1.8-m-tall perimeter wind screens, conditions during the typical use period are predicted to be suitable for a mix of mostly standing and strolling.

   a. The extent of mitigation is dependent on the programming of the terrace. It is recommended to increase the height of the perimeter wind screen along the west and southwest perimeters (that is, greater than 1.8 m in height as measured from the local walking surface) in combination with inboard mitigation targeted around designated seating areas as described in Section 5.2. A mitigation strategy may be developed in coordination with the building and landscape architect as the design progresses towards the Site Plan Control application stage.

3) The foregoing statements and conclusions apply to common weather systems, during which no dangerous wind conditions, as defined in Section 4.4, are expected anywhere over the subject site. During extreme weather events, (for example, thunderstorms, tornadoes, and downbursts), pedestrian safety is the main concern. However, these events are generally short-lived and infrequent and there is often sufficient warning for pedestrians to take appropriate cover.

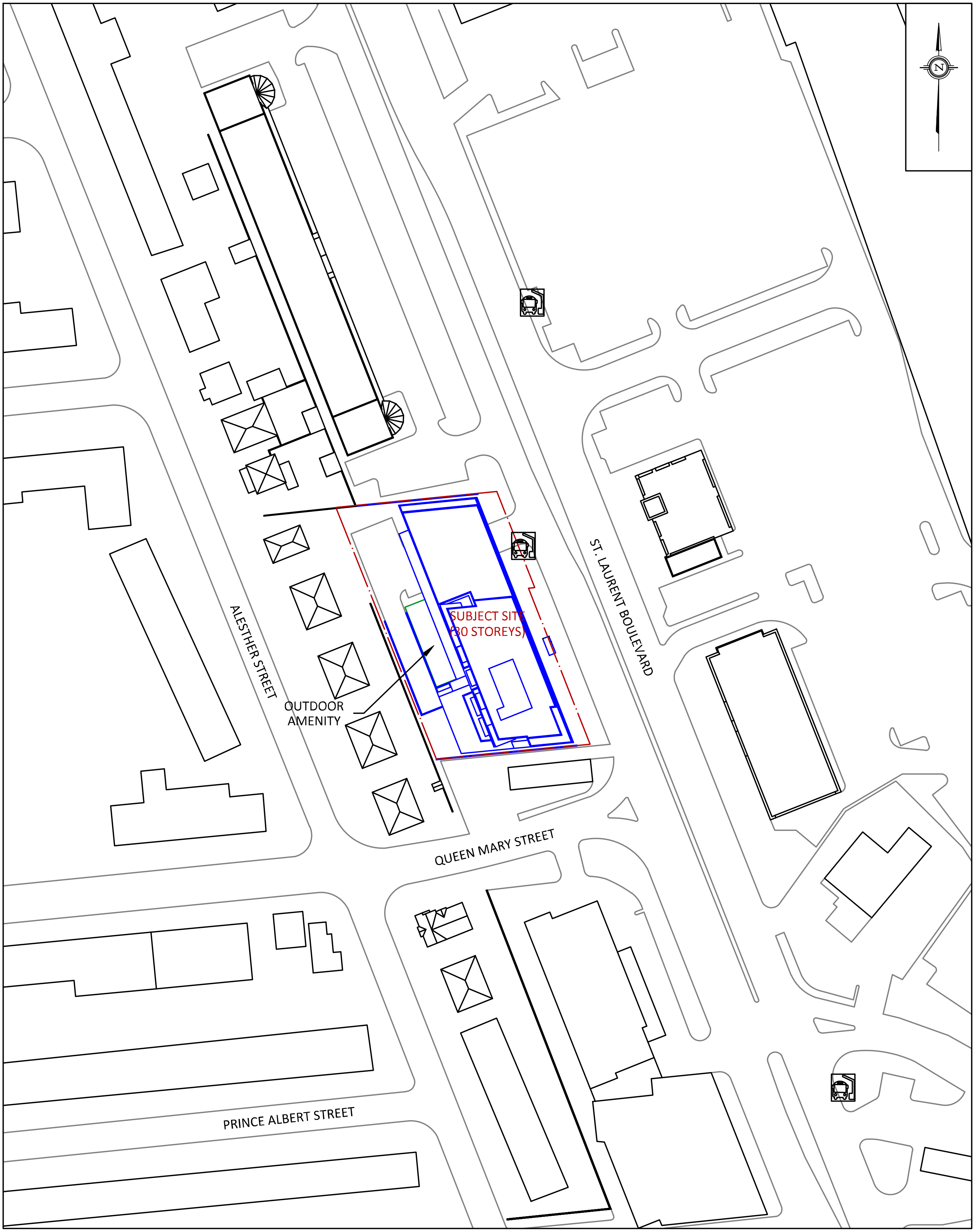
Sincerely,

Gradient Wind Engineering Inc.

LICENSED PROFESSIONAL ENGINEER
D. T. HUITEMA
100561777
February 05, 2026
PROVINCE OF ONTARIO

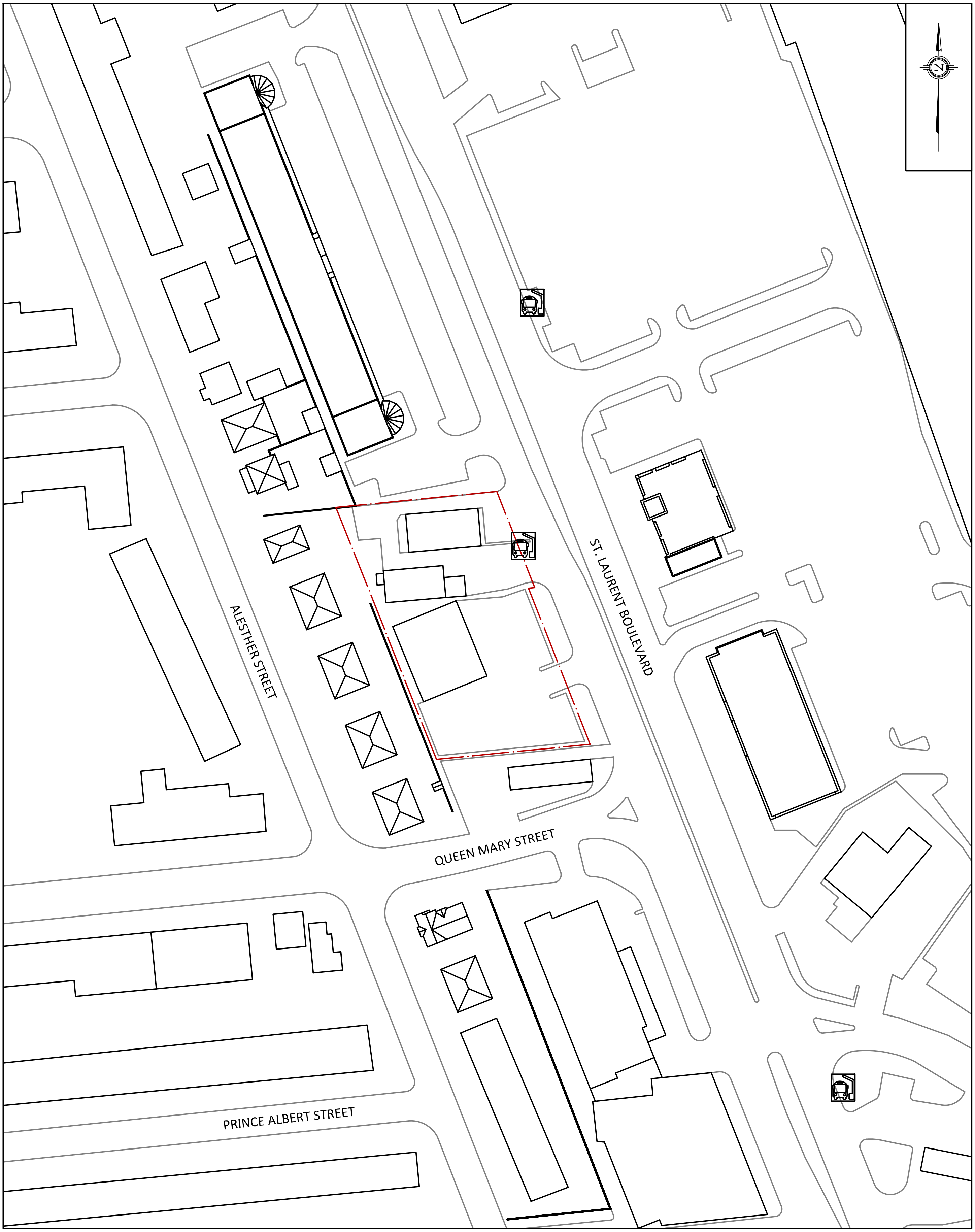
Justin Denne, M.A.Sc.
Junior Wind Scientist

David Huitema, M.Eng., P.Eng.
CFD Lead Engineer



GRADIENTWIND
ENGINEERS & SCIENTISTS
127 WALGREEN ROAD, OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT: 1052, 1060, AND 1064 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY		DESCRIPTION: FIGURE 1A: PROPOSED SITE PLAN AND SURROUNDING CONTEXT
SCALE: 1:1500	DRAWING NO.: 25-116-PLW-1A	
DATE: OCTOBER 29, 2025	DRAWN BY: T.K.	



GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD, OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT: 1052, 1060, AND 1064 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY		DESCRIPTION: FIGURE 1B: EXISTING SITE PLAN AND SURROUNDING CONTEXT	
SCALE: 1:1500	DRAWING NO.: 25-116-PLW-1B		
DATE: OCTOBER 29, 2025	DRAWN BY: T.K.		

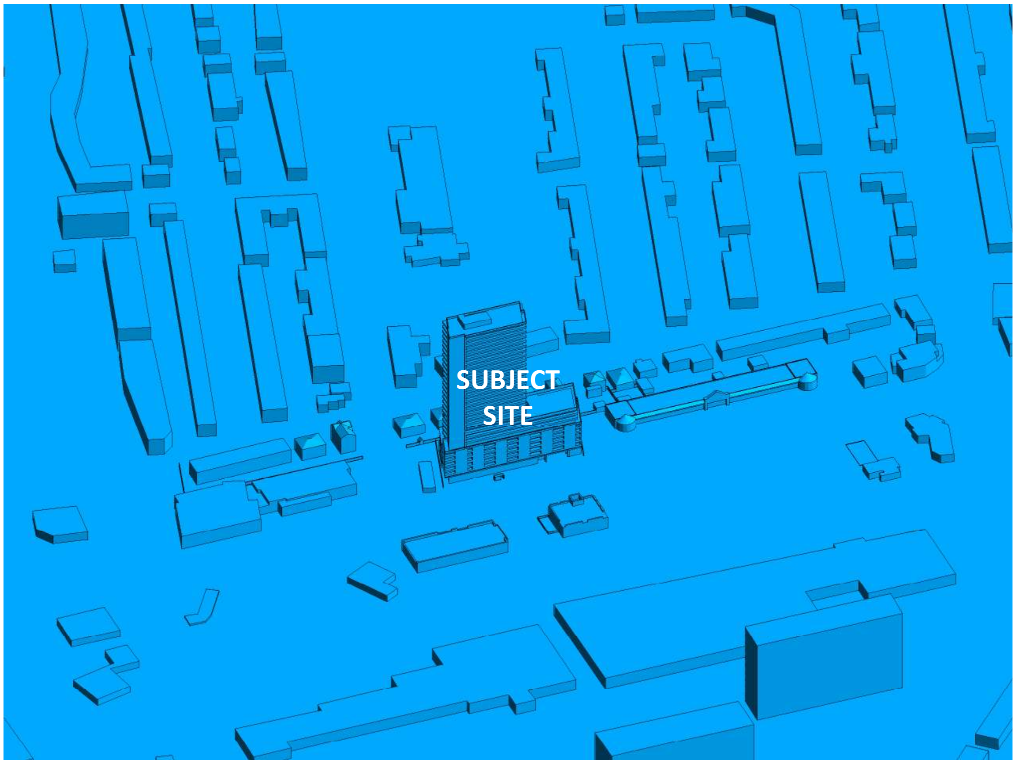


FIGURE 2A: COMPUTATIONAL MODEL, PROPOSED MASSING, EAST PERSPECTIVE

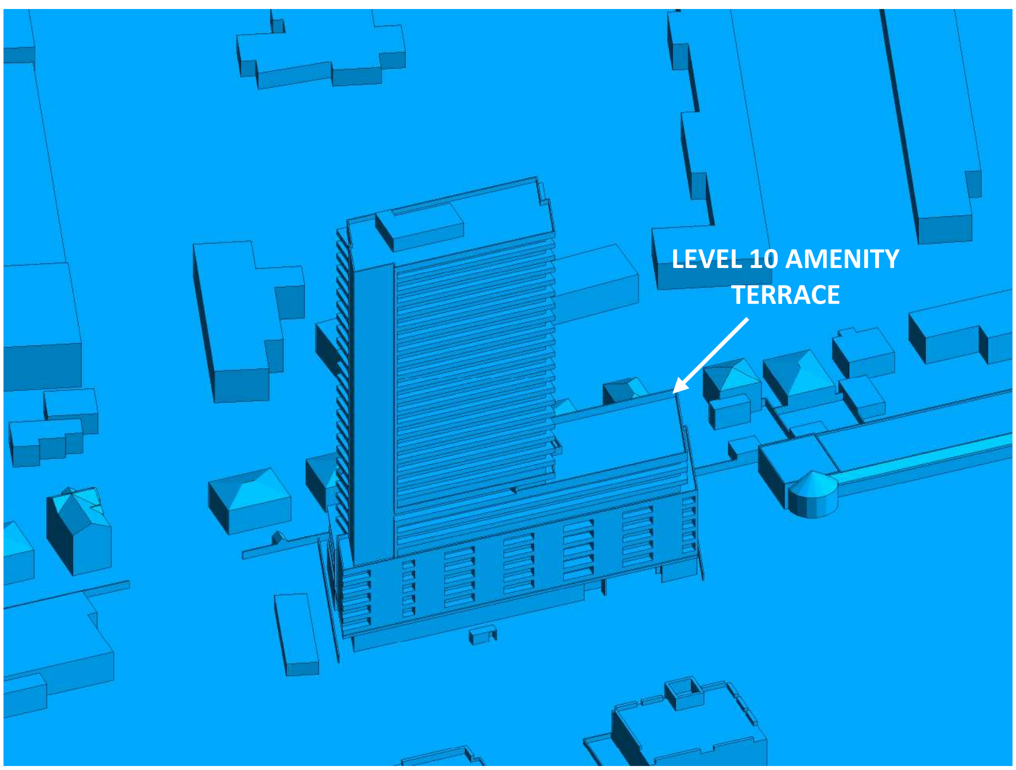


FIGURE 2B: CLOSE UP OF FIGURE 2A

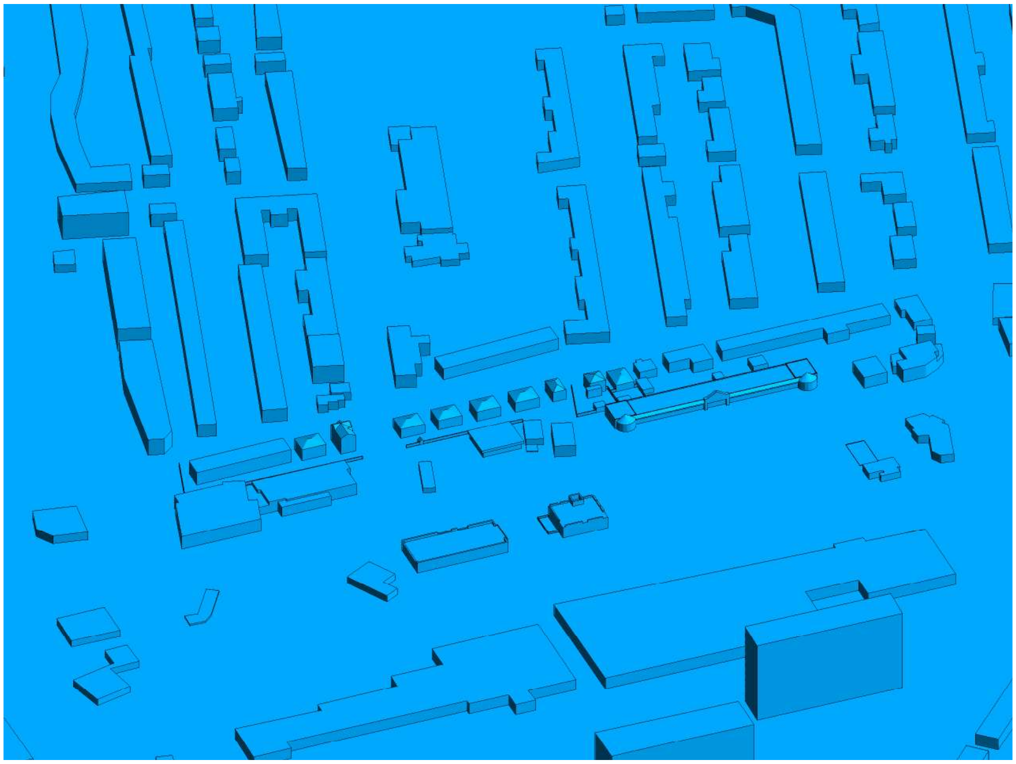


FIGURE 2C: COMPUTATIONAL MODEL, EXISTING MASSING, EAST PERSPECTIVE

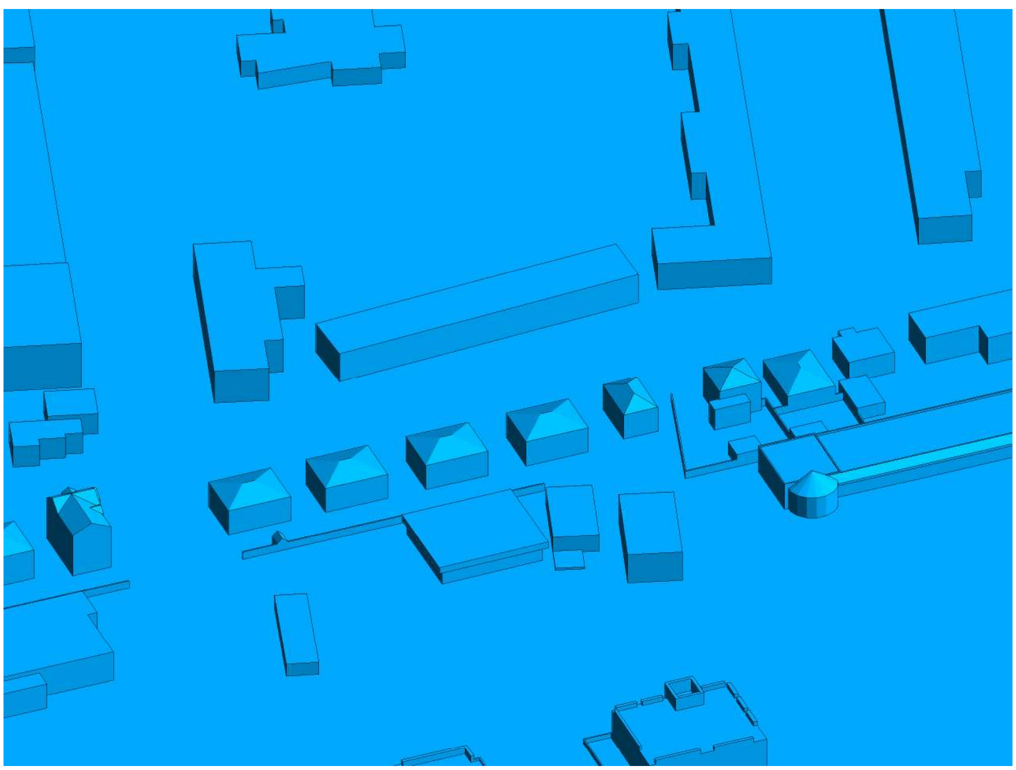


FIGURE 2D: CLOSE UP OF FIGURE 2C

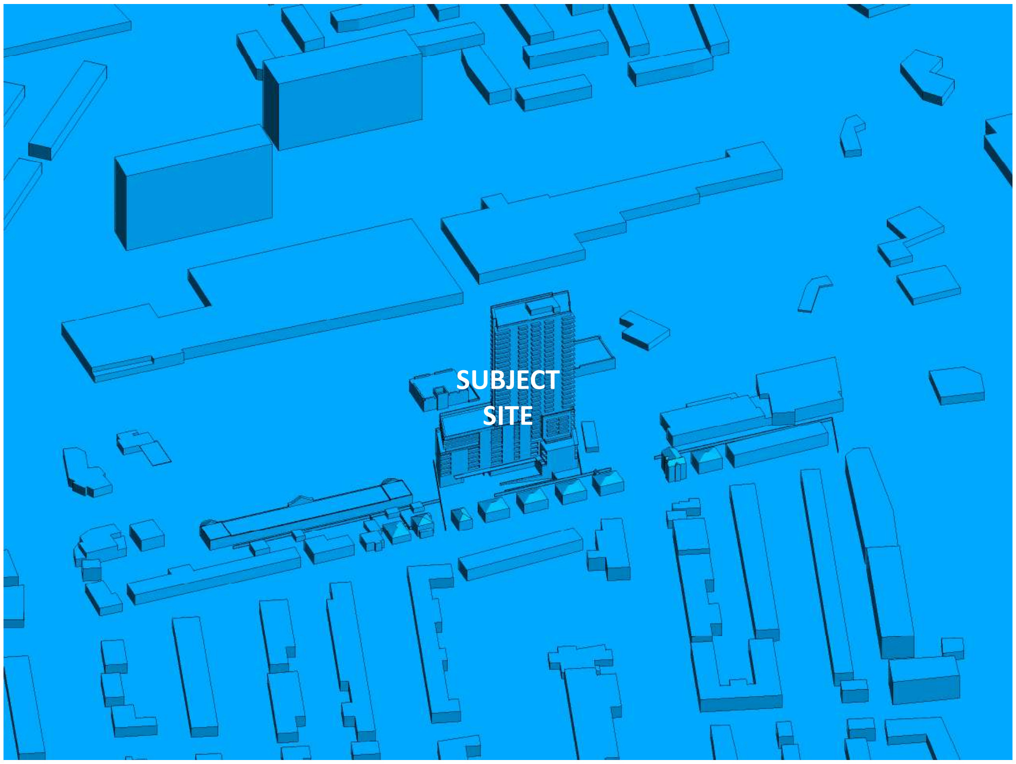


FIGURE 2E: COMPUTATIONAL MODEL, PROPOSED MASSING, WEST PERSPECTIVE

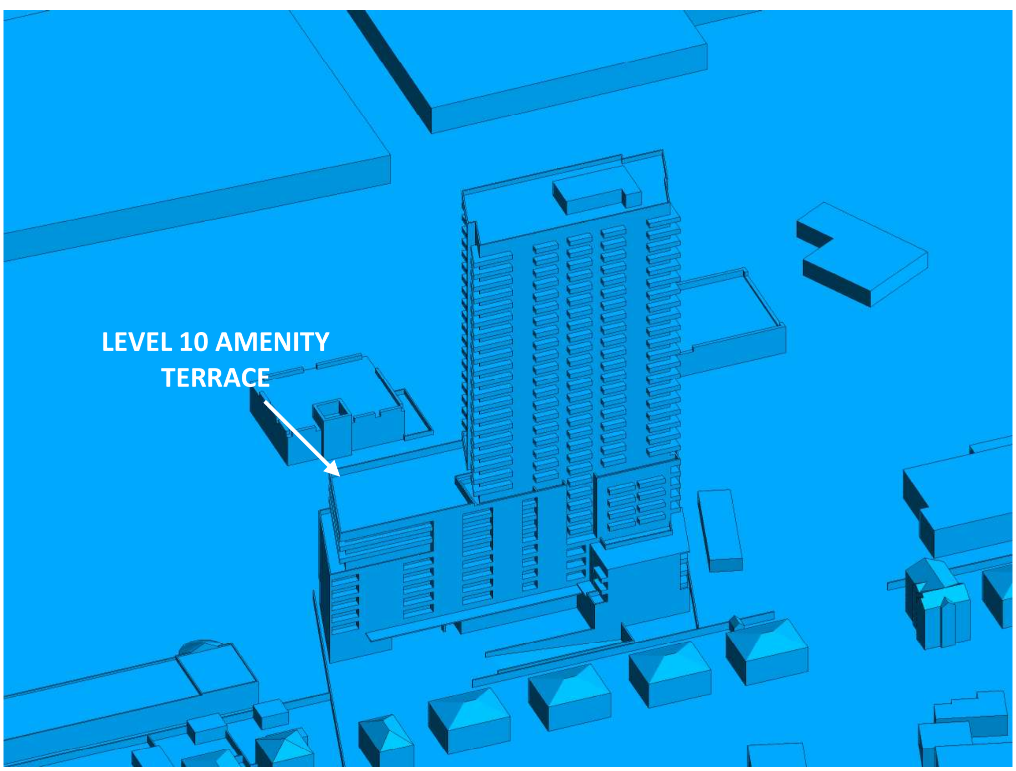


FIGURE 2F: CLOSE UP OF FIGURE 2E

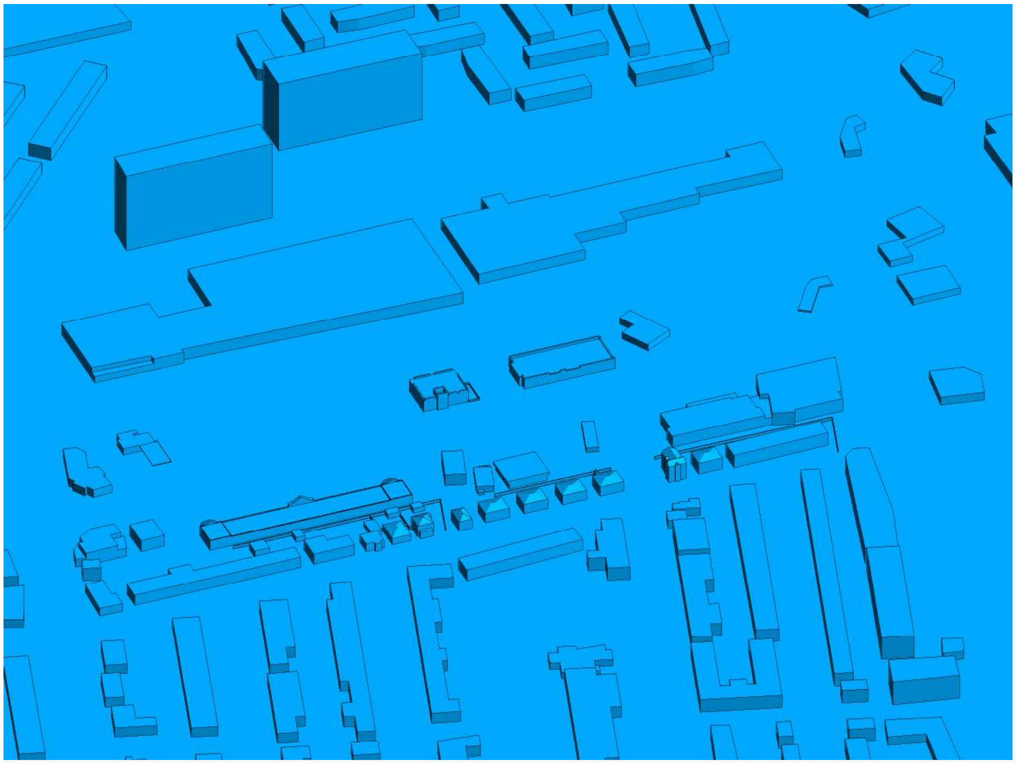


FIGURE 2G: COMPUTATIONAL MODEL, EXISTING MASSING, WEST PERSPECTIVE

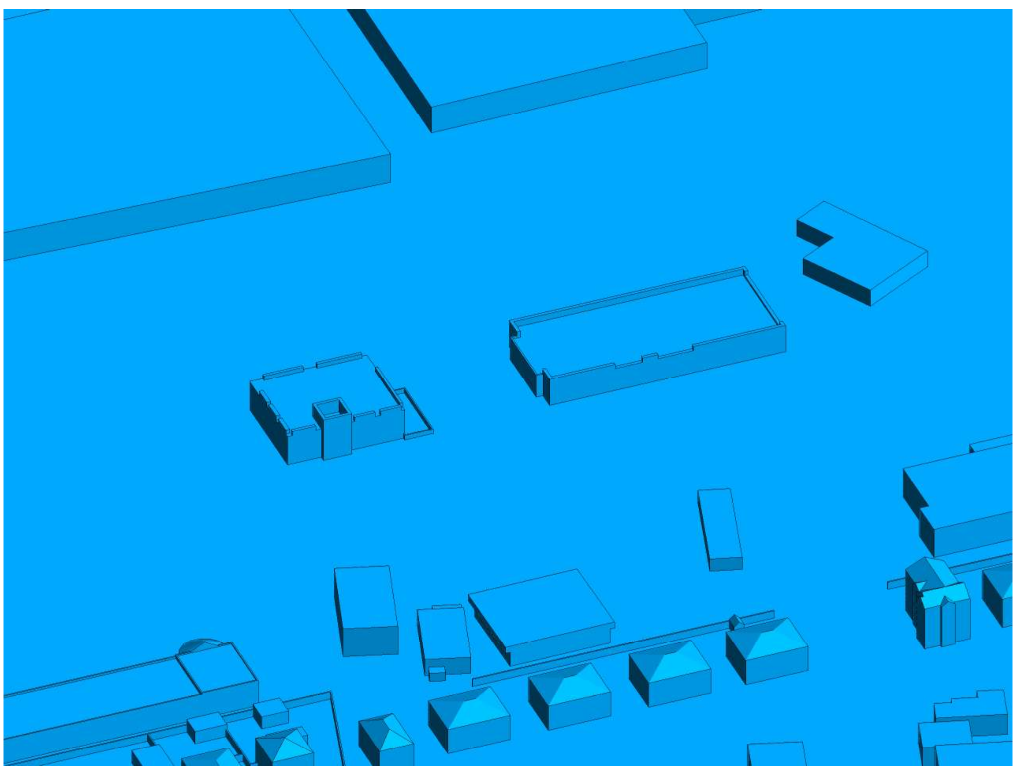


FIGURE 2H: CLOSE UP OF FIGURE 2G

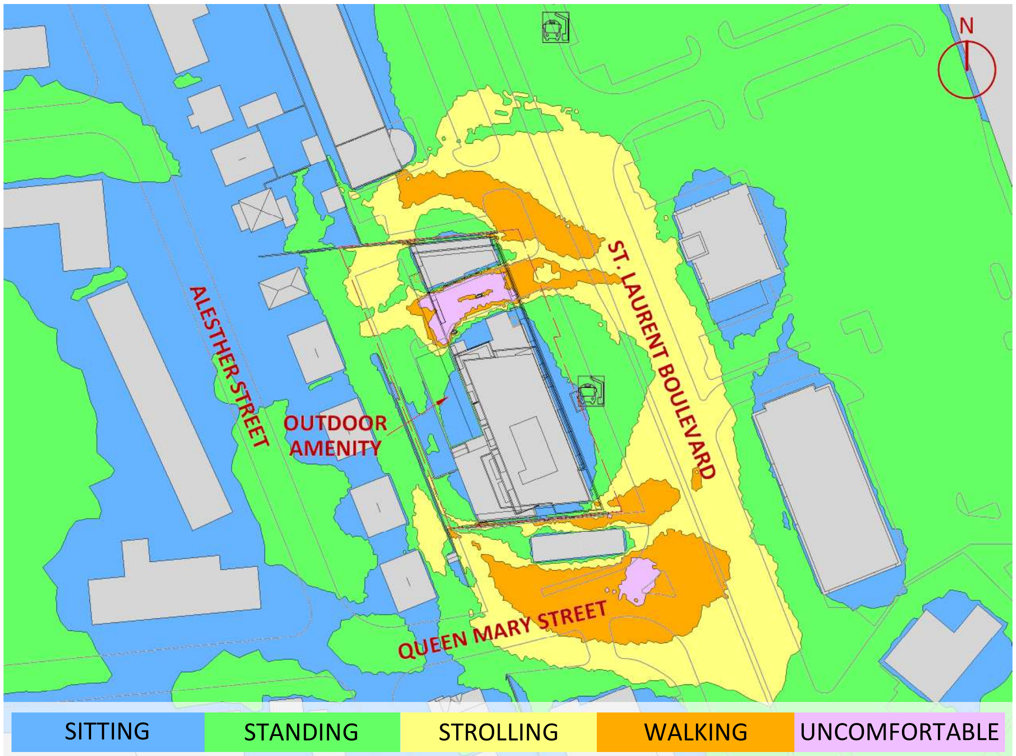


FIGURE 3A: SPRING – WIND COMFORT, GRADE LEVEL – PROPOSED MASSING

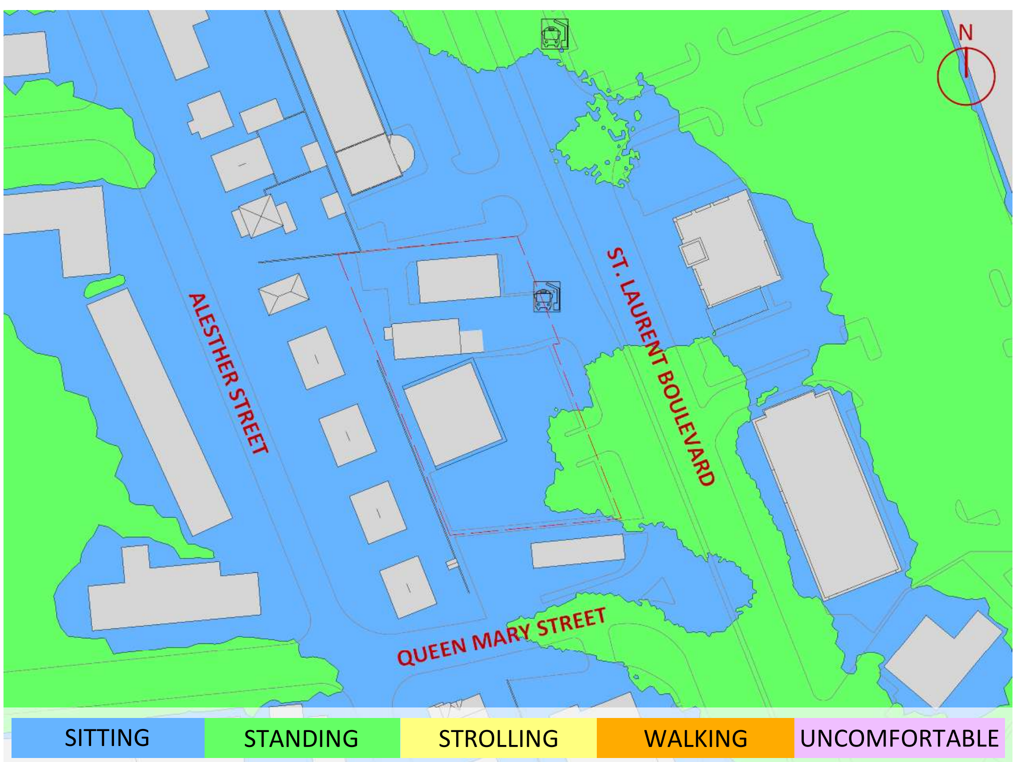


FIGURE 3B: SPRING – WIND COMFORT, GRADE LEVEL– EXISTING MASSING

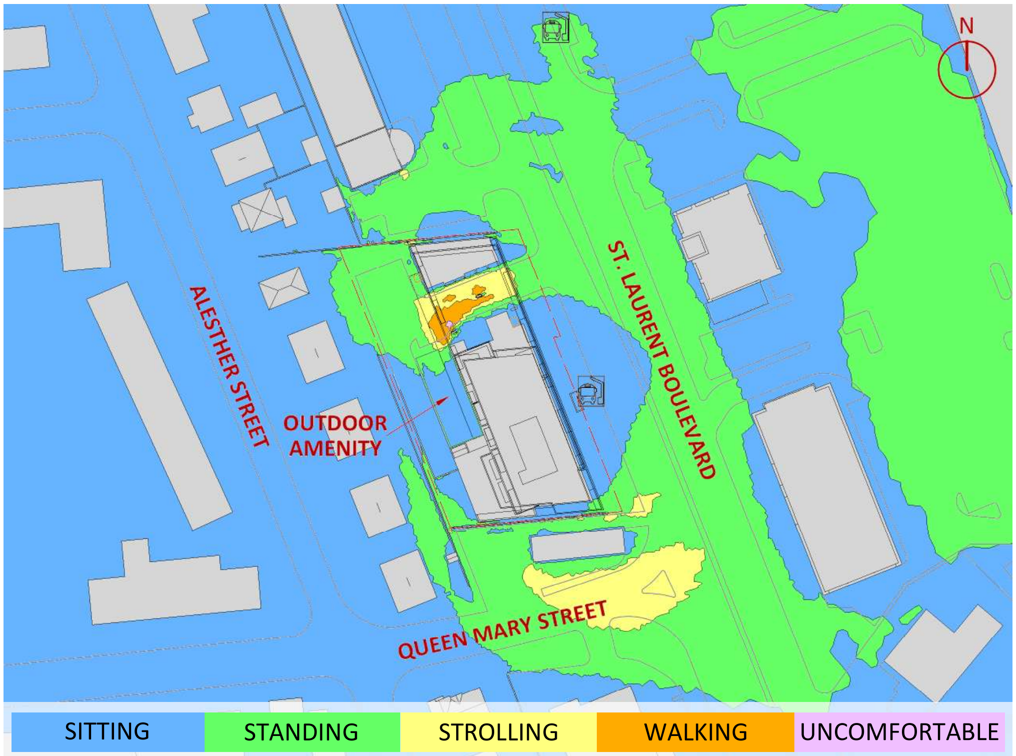


FIGURE 4A: SUMMER – WIND COMFORT, GRADE LEVEL – PROPOSED MASSING

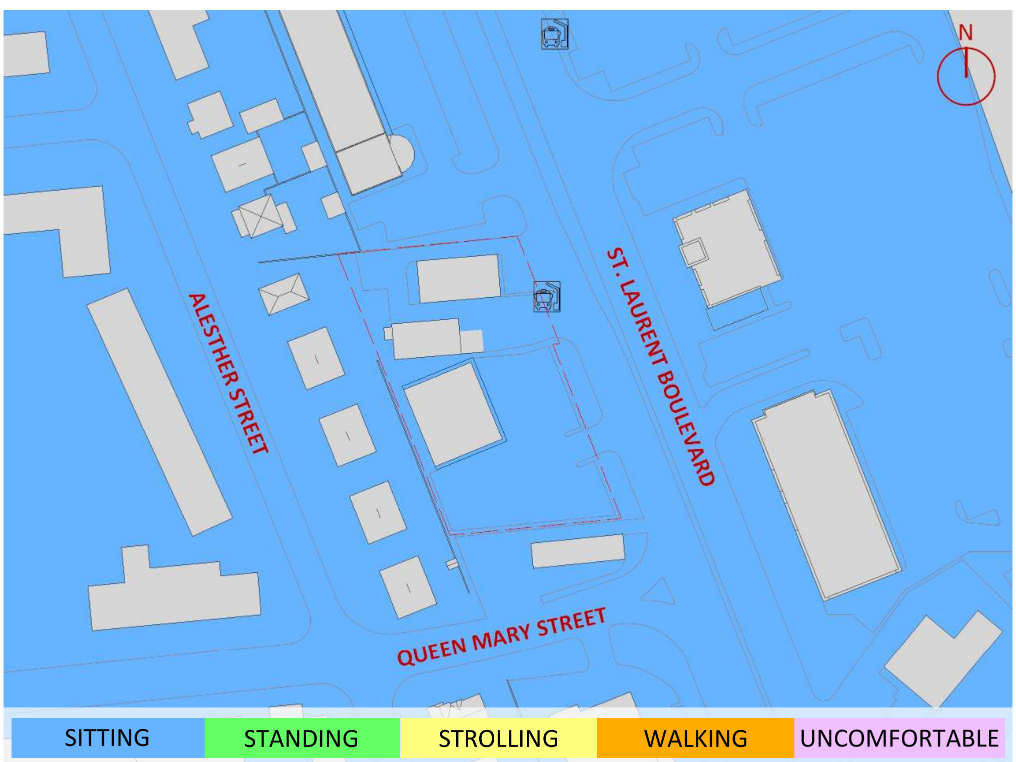


FIGURE 4B: SUMMER – WIND COMFORT, GRADE LEVEL– EXISTING MASSING

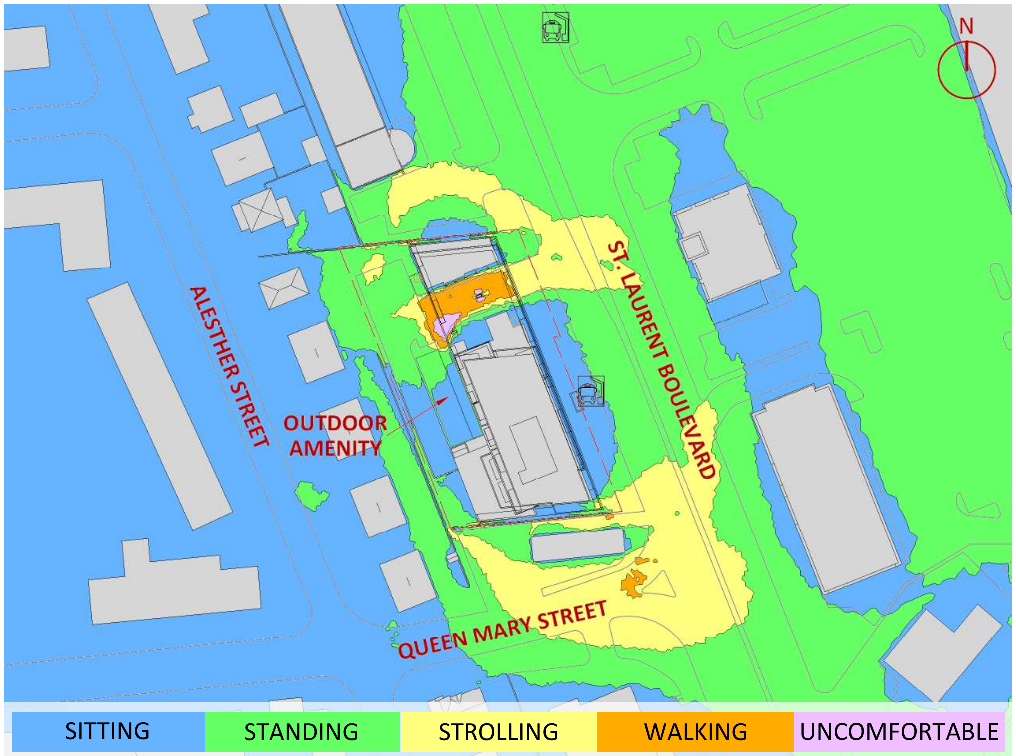


FIGURE 5A: AUTUMN – WIND COMFORT, GRADE LEVEL – PROPOSED MASSING

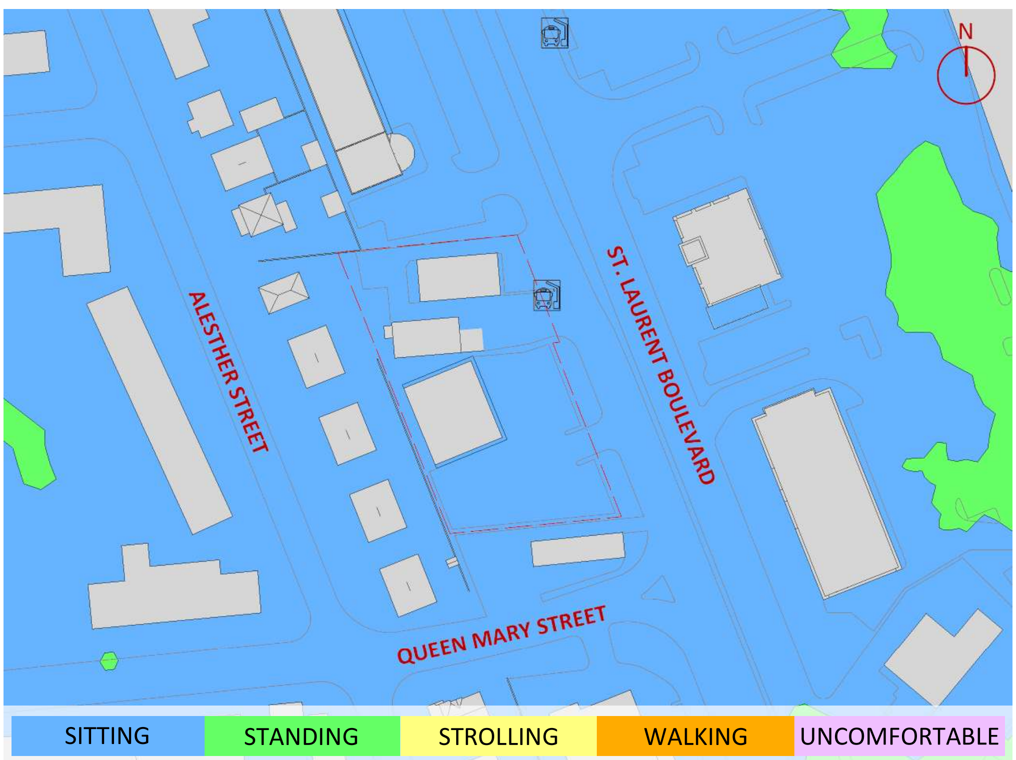


FIGURE 5B: AUTUMN – WIND COMFORT, GRADE LEVEL– EXISTING MASSING

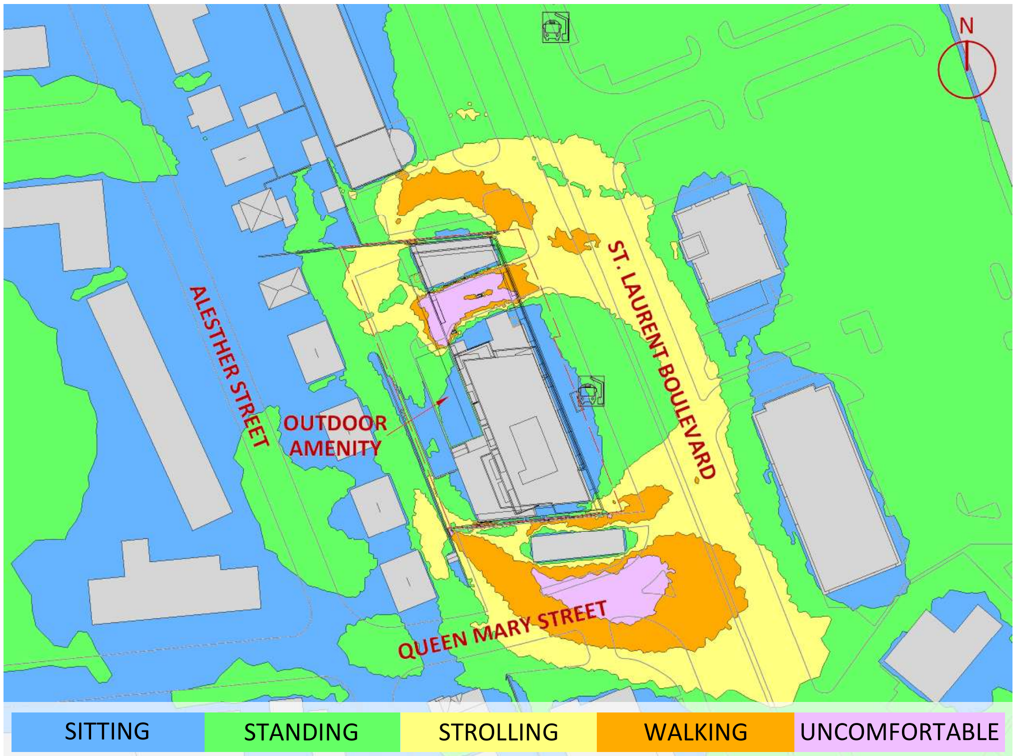


FIGURE 6A: WINTER – WIND COMFORT, GRADE LEVEL – PROPOSED MASSING

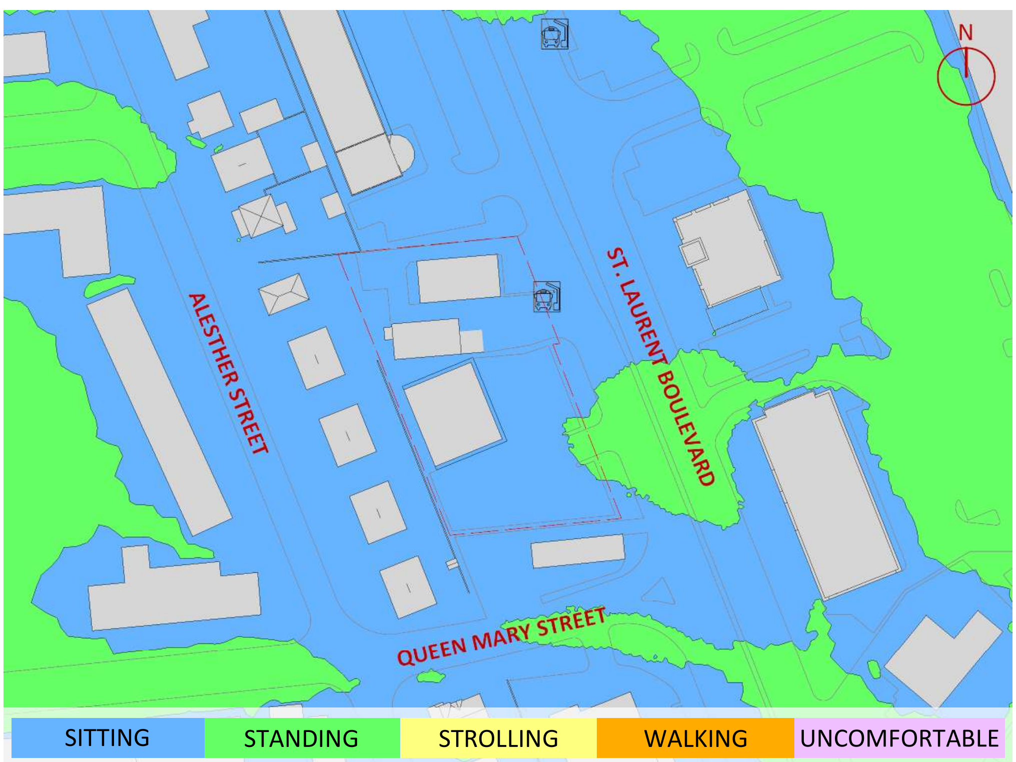


FIGURE 6B: WINTER – WIND COMFORT, GRADE LEVEL– EXISTING MASSING

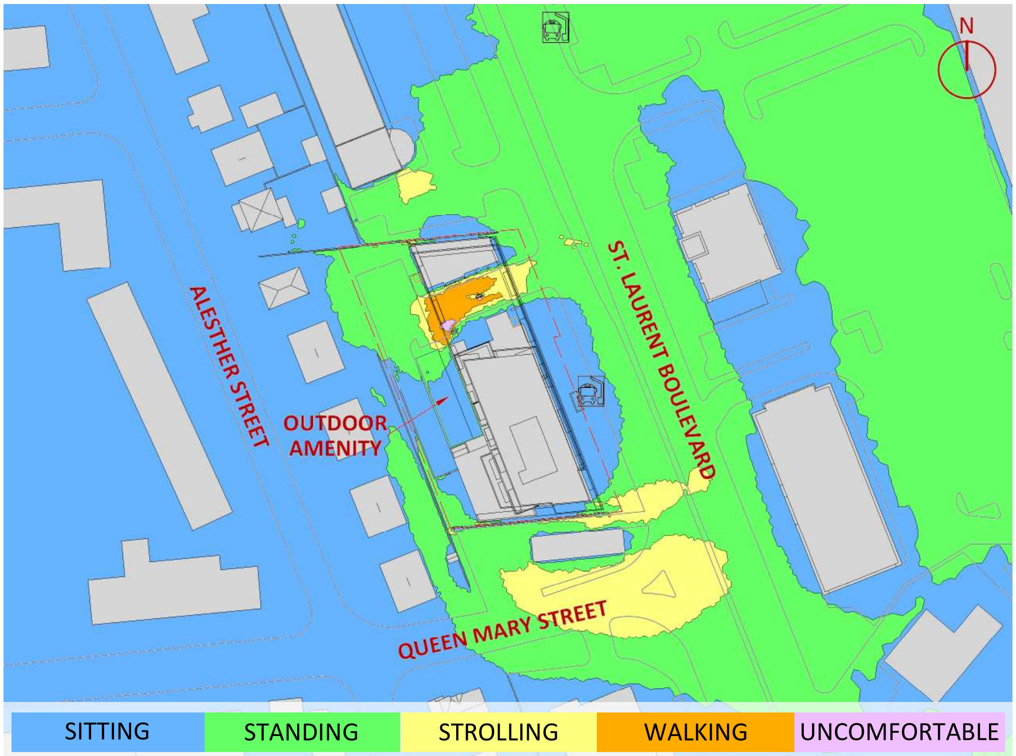


FIGURE 7: TYPICAL USE PERIOD – WIND COMFORT, GRADE LEVEL – PROPOSED MASSING

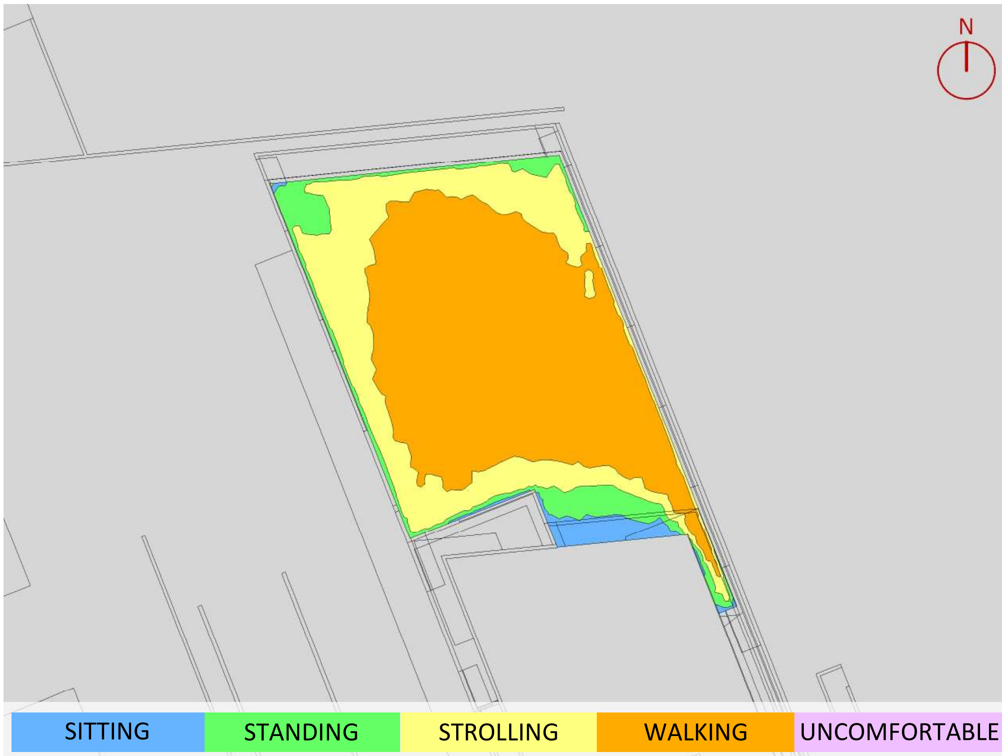


FIGURE 8A: SPRING – WIND COMFORT, LEVEL 10 AMENITY TERRACE

FIGURE 8B: SUMMER – WIND COMFORT, LEVEL 10 AMENITY TERRACE

FIGURE 8C: AUTUMN – WIND COMFORT, LEVEL 10 AMENITY TERRACE

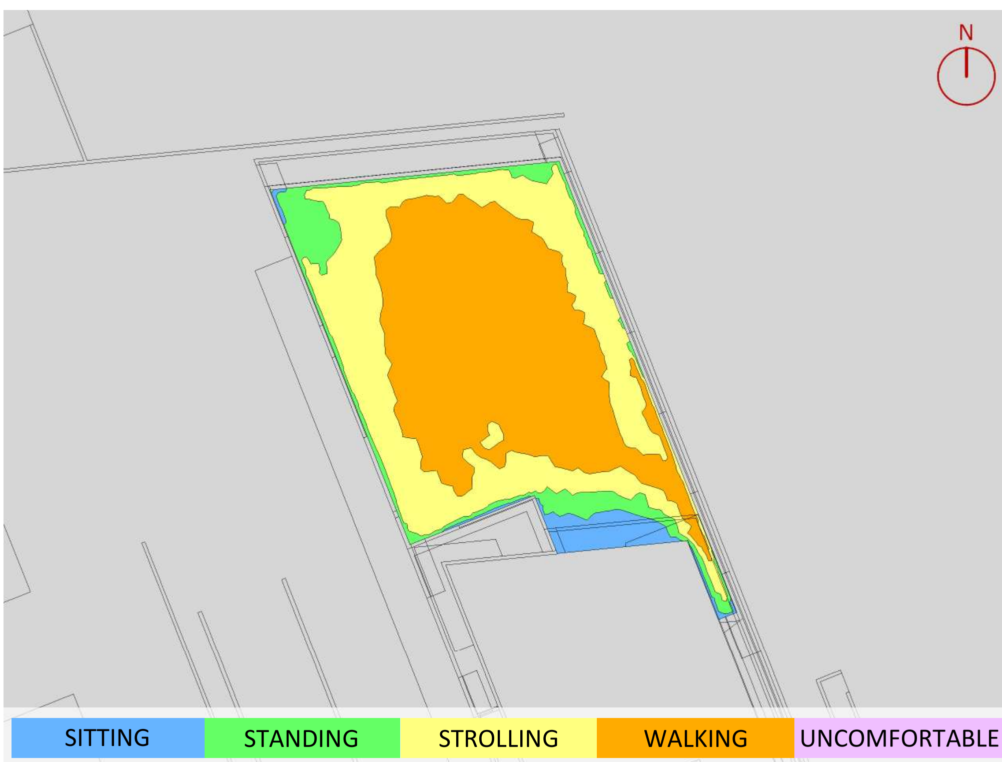


FIGURE 8D: WINTER – WIND COMFORT, LEVEL 10 AMENITY TERRACE

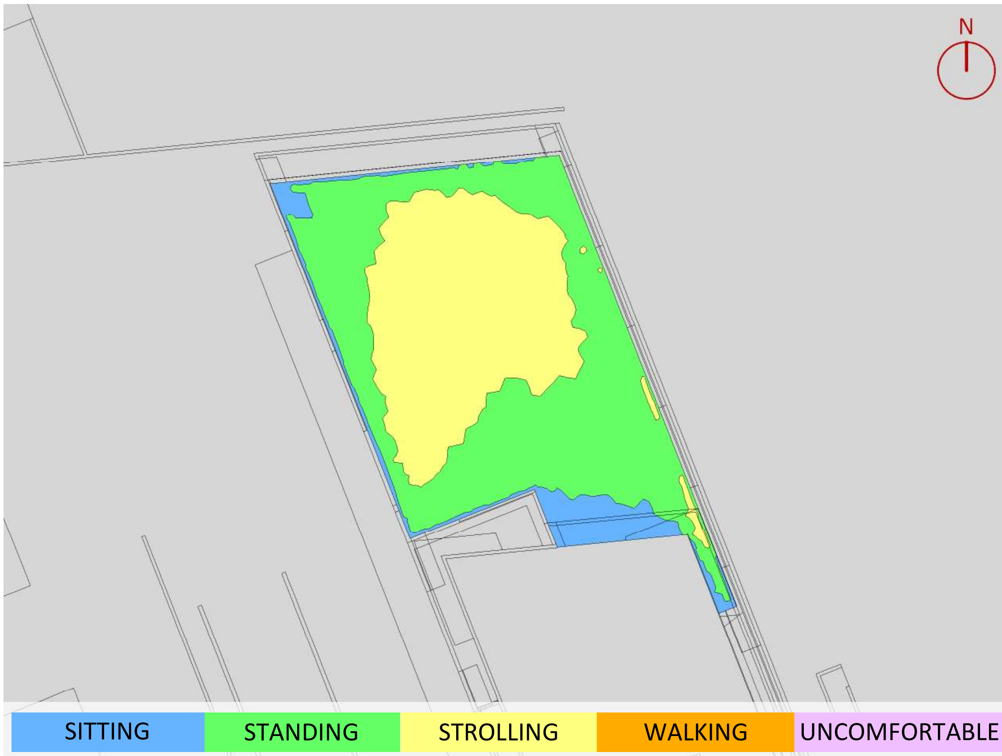
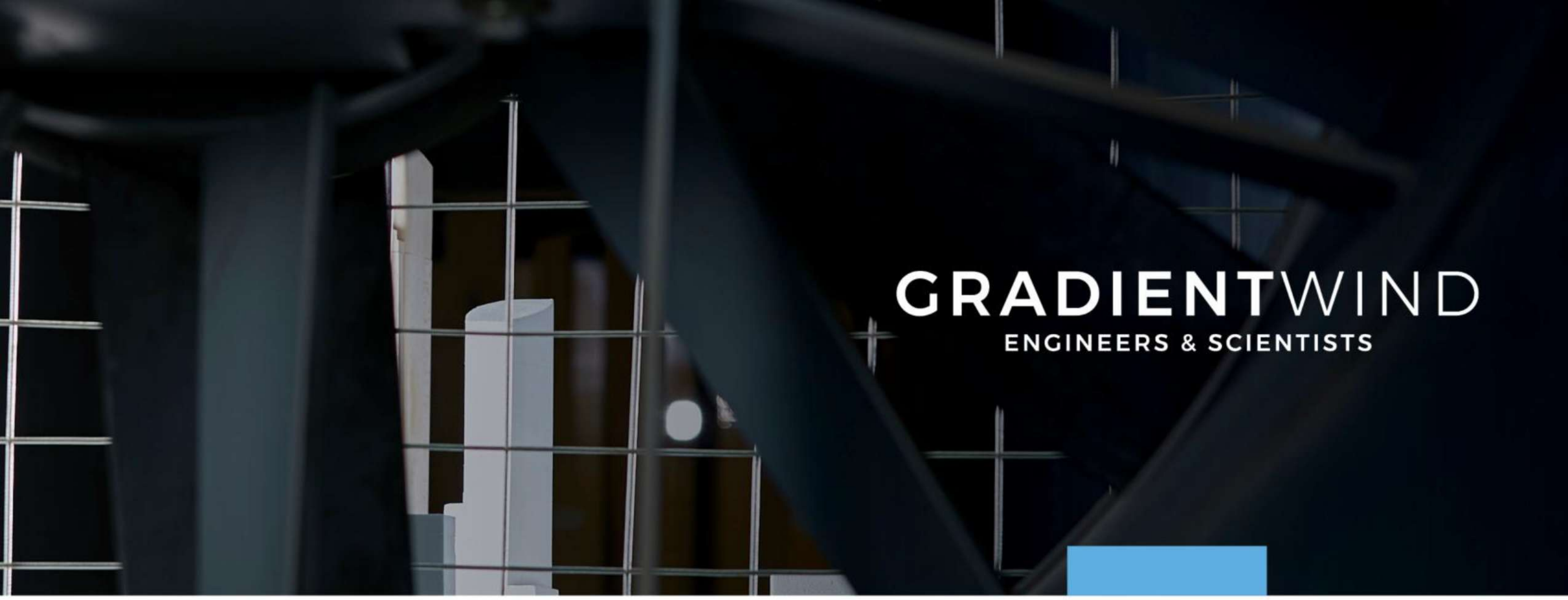
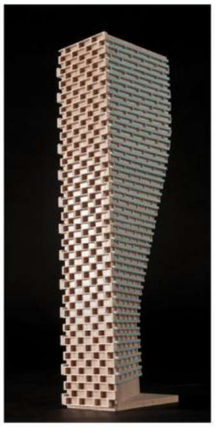


FIGURE 9: TYPICAL USE PERIOD – WIND COMFORT, LEVEL 10 AMENITY TERRACE





APPENDIX A

SIMULATION OF THE ATMOSPHERIC BOUNDARY LAYER

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
GRADIENTWIND.COM

SIMULATION OF THE ATMOSPHERIC BOUNDARY LAYER

The atmospheric boundary layer (ABL) is defined by the velocity and turbulence profiles according to industry standard practices. The mean wind profile can be represented, to a good approximation, by a power law relation, Equation (1), giving height above ground versus wind speed (1), (2).

$$U = U_g \left(\frac{Z}{Z_g}\right)^{\alpha} \qquad \text{Equation (1)}$$

where $\boldsymbol{U}$ = mean wind speed, $\boldsymbol{U_g}$ = gradient wind speed, $\boldsymbol{Z}$ = height above ground, $\boldsymbol{Z_g}$ = depth of the boundary layer (gradient height), and α is the power law exponent.

For the model, U_g is set to 6.5 metres per second (m/s), which approximately corresponds to the 60% mean wind speed for Ottawa based on historical climate data and statistical analyses. When the results are normalized by this velocity, they are relatively insensitive to the selection of gradient wind speed.

Z_g is set to 540 m. The selection of gradient height is relatively unimportant, so long as it exceeds the building heights surrounding the subject site. The value has been selected to correspond to our physical wind tunnel reference value.

α is determined based on the upstream exposure of the far-field surroundings (that is, the area that is not captured within the simulation model).

Table 1 presents the values of α used in this study, while Table 2 presents several reference values of α. When the upstream exposure of the far-field surroundings is a mixture of multiple types of terrain, the α values are a weighted average with terrain that is closer to the subject site given greater weight.

TABLE 1: UPSTREAM EXPOSURE (ALPHA VALUE) VS TRUE WIND DIRECTION

Wind Direction (Degrees True)	Alpha Value (α)
0	0.24
22.5	0.24
45	0.23
67.5	0.23
90	0.23
112.5	0.25
135	0.24
157.5	0.23
180	0.23
202.5	0.23
225	0.23
247.5	0.24
270	0.24
292.5	0.24
315	0.24
337.5	0.23

TABLE 2: DEFINITION OF UPSTREAM EXPOSURE (ALPHA VALUE)

Upstream Exposure Type	Alpha Value (α)
Open Water	0.14-0.15
Open Field	0.16-0.19
Light Suburban	0.21-0.24
Heavy Suburban	0.24-0.27
Light Urban	0.28-0.30
Heavy Urban	0.31-0.33

The turbulence model in the computational fluid dynamics (CFD) simulations is a two-equation shear-stress transport (SST) model, and thus the ABL turbulence profile requires that two parameters be defined at the inlet of the domain. The turbulence profile is defined following the recommendations of the Architectural Institute of Japan for flat terrain (3).

$$I(Z) = \begin{cases} 0.1\left(\dfrac{Z}{Z_g}\right)^{-\alpha-0.05}, & Z > 10\text{ m} \\ 0.1\left(\dfrac{10}{Z_g}\right)^{-\alpha-0.05}, & Z \leq 10\text{ m} \end{cases} \qquad \text{Equation (2)}$$

$$L_t(Z) = \begin{cases} 100\text{ m}\sqrt{\dfrac{Z}{30}}, & Z > 30\text{ m} \\ 100\text{ m}, & Z \leq 30\text{ m} \end{cases} \qquad \text{Equation (3)}$$

where ***I*** = turbulence intensity, $\boldsymbol{L_t}$ = turbulence length scale, ***Z*** = height above ground, and **α** is the power law exponent used for the velocity profile in Equation (1).

Boundary conditions on all other domain boundaries are defined as follows: the ground is a no-slip surface; the side walls of the domain have a symmetry boundary condition; the top of the domain has a specified shear, which maintains a constant wind speed at gradient height; and the outlet has a static pressure boundary condition.

REFERENCES

[1] P. Arya, "Chapter 10: Near-neutral Boundary Layers," in *Introduction to Micrometeorology*, San Diego, California, Academic Press, 2001.

[2] S. A. Hsu, E. A. Meindl and D. B. Gilhousen, "Determining the Power-Law Wind Profile Exponent under Near-neutral Stability Conditions at Sea," vol. 33, no. 6, 1994.

[3] Y. Tamura, H. Kawai, Y. Uematsu, K. Kondo, and T. Okhuma, "Revision of AIJ Recommendations for Wind Loads on Buildings," in *The International Wind Engineering Symposium, IWES 2003*, Taiwan, 2003.