REPORT

1200 KING ROAD DEVELOPMENT

BURLINGTON, ONTARIO

PEDESTRIAN WIND COMFORT ASSESSMENT

PROJECT #2306527
February 25, 2026

SUBMITTED TO

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1. INTRODUCTION

RWDI AIR Inc. (RWDI) was retained to conduct a pedestrian wind assessment for the proposed project at 1200 King Road in Burlington, Ontario. The objective of this assessment is to provide an evaluation of the potential wind impact of the proposed development in support of the Zoning By-law Amendment (ZBA) and Official Plan Amendment (OPA).

The project site is located east of Waterdown Road and is bounded by King Road to the east, Highway 403 to the north, Canadian National (CN) Aldershot rail yard/Aldershot GO Station to the west, and Lakeshore West Line to the south. The project site is surrounded by low-rise suburban neighbourhoods in all directions apart from the north, where open fields exist (Image 1). Hamilton Harbour is approximately 2 km to the south.

The site area is approximately 49.1 hectares with a net developable area of 35.82 hectares. The majority of the non-developed land is in the western half which would remain as a part of the Natural Heritage System. The development comprises 26 blocks of land, of which 14 blocks will have buildings of various heights and uses (Images 2 and 3).

Note that existing or proposed landscaping was not included in the assessment. The inclusion of such elements is expected to result in improved wind conditions.



Image 1: Aerial View of the Existing Site and Surroundings
Source: Google Maps

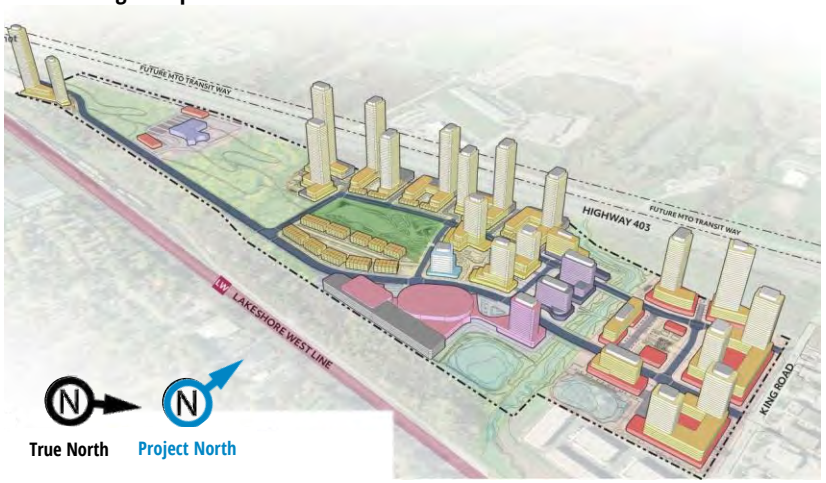
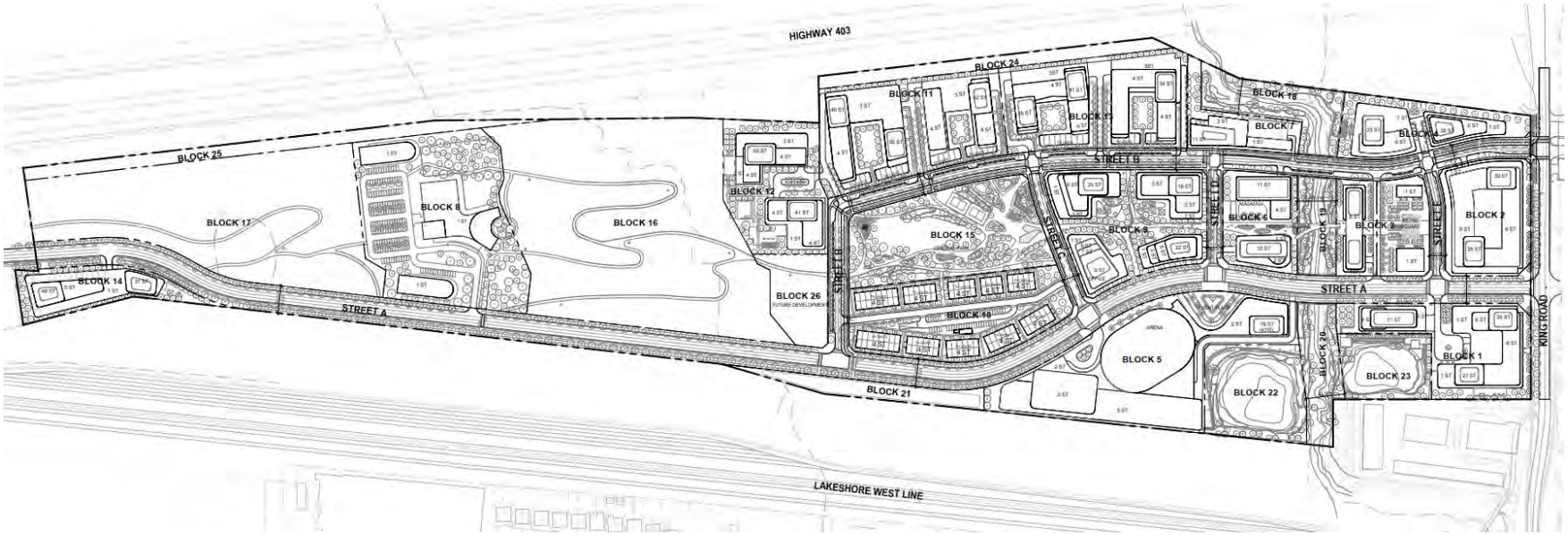


Image 2: 3D Massing of the Proposed Development

1. INTRODUCTION



True North Project North

Image 3: Masterplan of the Development

2. METHODOLOGY

2.1 Objective

The objective of this assessment is to provide an evaluation of the potential impact of the proposed development on wind conditions in pedestrian areas on and around it based on Computational Fluid Dynamics (CFD) modelling. The assessment is based on the following:

- A review of the regional long-term meteorological data from John C. Munro Hamilton International Airport;
- A 3D model received on January 19, 2026;
- The use of *Orbital Stack*, an in-house CFD tool;
- RWDI's engineering judgment, experience, and expert knowledge of wind flows around buildings[1-3]; and,
- The City of Burlington wind comfort and safety criteria.

Note that other microclimate issues such as those relating to cladding and structural wind loads, door operability, air quality, snow impact, noise, vibration, etc. are not part of the scope of this assessment.

2.2 CFD for Wind Simulation

CFD is a numerical technique that can be used for simulating wind flows in complex environments. For this analysis, CFD techniques were used to generate a virtual wind tunnel where flows around the site and its surroundings were simulated in full scale. The computational domain that covered the site and its surroundings was divided into millions of small cells where calculations were performed, yielding a prediction of wind conditions across the entire study domain. CFD excels as a tool for wind modelling, Presenting design advice appropriate for this stage of the planning approvals process, comparing different design and site scenarios, resolving complex flow physics, and helping diagnose problematic wind conditions.

While the computational modelling method used in the current assessment does not explicitly simulate the transient behaviour of turbulent wind, its effects were estimated based on other calculated quantities. RWDI has found this approach to be appropriate for the assessment of typical wind comfort conditions. Wind safety issues, which relate to transient, higher-speed gusts, are discussed qualitatively, based on the CFD predictions and our extensive wind-tunnel experience for similar projects.

To quantify the transient behaviour of wind and refine any conceptual mitigation measures, a more detailed assessment would be required at later design stages, such as the Site Plan, using either a boundary-layer wind tunnel or transient computational modelling.

2. METHODOLOGY

2.3 Simulation Model

CFD simulations were completed for two scenarios:

- Existing: Existing site and surroundings; and
- Proposed: Proposed masterplan development with the existing surroundings.

The computer model of the proposed masterplan development is shown in Image 4, and the Existing and Proposed scenarios are shown in Images 5a and 5b, respectively. The 3D models were simplified to include only the necessary building and terrain details that would affect the local wind flows in the area and around the site. Landscaping and other smaller architectural and accessory features were not included in the computer model to provide more conservative wind conditions (as is the norm for this level of assessment).

The wind approaching the modelled area were simulated for 16 directions (starting at 0°, at 22.5° increments around the compass), accounting for the effects of the atmospheric boundary layer and terrain impacts. Wind data were obtained in the form of ratios of wind speeds at approximately 1.5 m above concerned levels, to the mean wind speed at a reference height. The data was then combined with meteorological records obtained from John C. Munro Hamilton International Airport to determine the wind speeds and frequencies in the simulated areas.

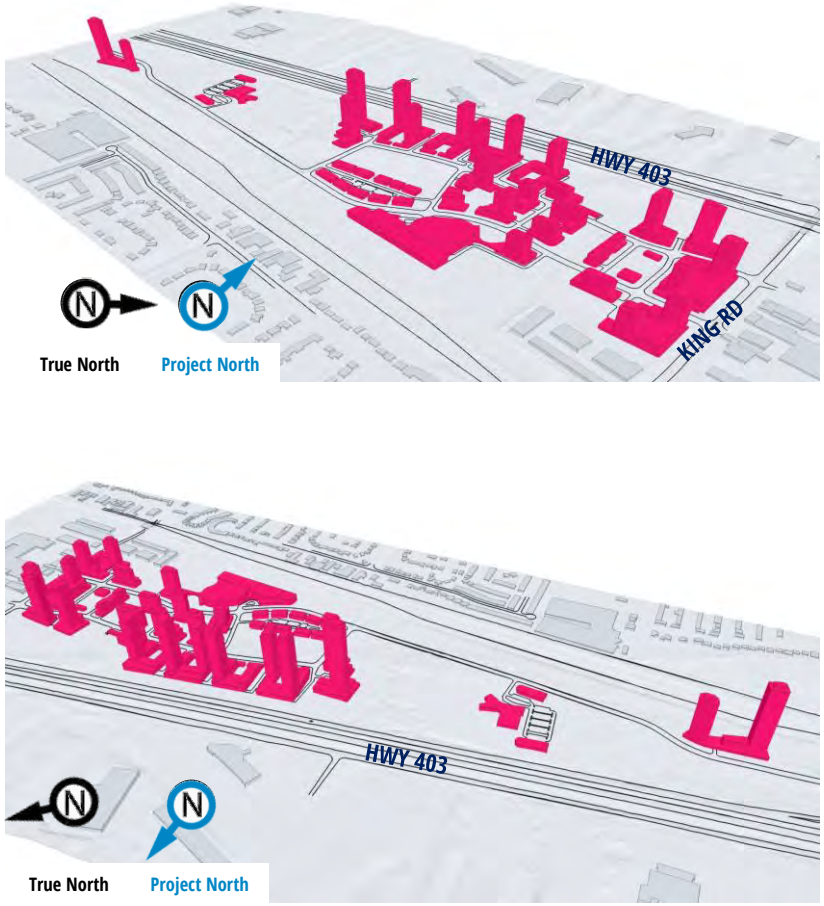
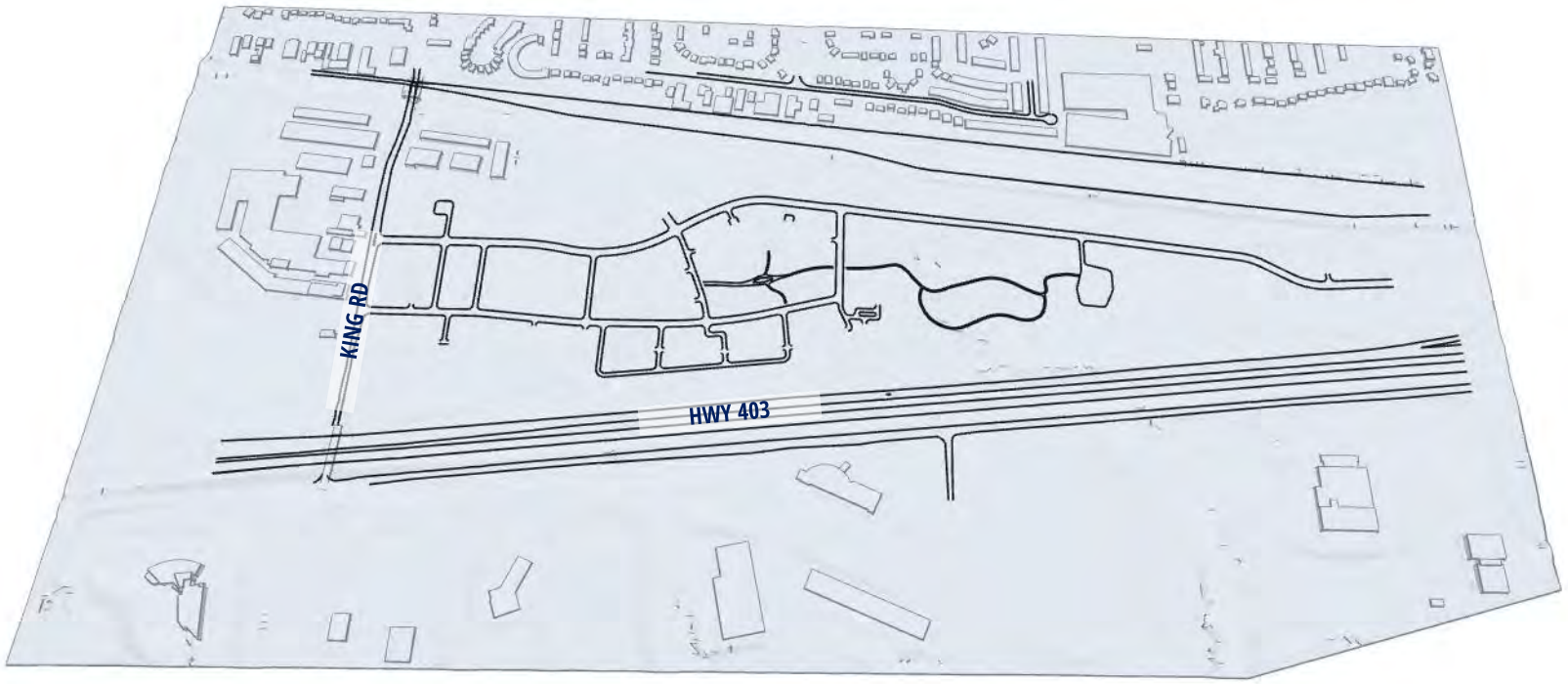


Image 4: Computer Model of the Proposed Development

2. METHODOLOGY



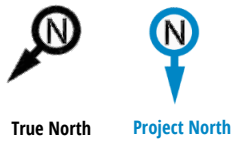


Image 5a: Computer Model of the Existing Site and Extended Surroundings

2. METHODOLOGY



Image 5b: Computer Model of the Proposed Development and Extended Surroundings

3. METEOROLOGICAL DATA

Wind statistics recorded at John C. Munro Hamilton International Airport between 1990 and 2020, inclusive, were analyzed for the summer (May to October) and winter (November to April) months. Image 6 graphically depicts the directional distributions of wind frequencies and speeds for these periods.

Winds from the northeast and southwest directions are predominant in both summer and winter, as indicated by the wind roses.

Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10 m) are more frequent in the winter (red and yellow bands in Image 6). These winds potentially could be the source of uncomfortable or severe wind conditions, depending on the site exposure and development design.

Wind statistics were combined with the simulated data to predict the wind conditions at the project site and assessed against the wind criteria for pedestrian comfort.

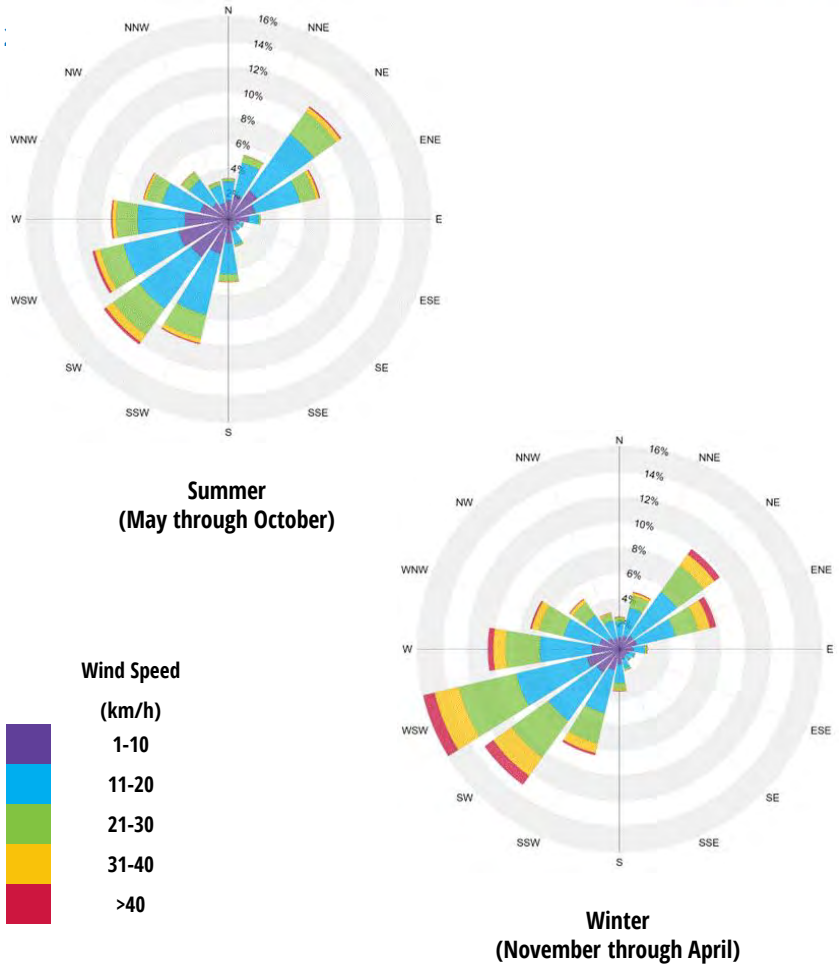


Image 6: Directional Distribution of Wind Approaching John C. Munro Hamilton International Airport (1990 to 2020)

4. WIND CRITERIA

The Burlington pedestrian wind criteria, developed in March 2020, are specified in the Guidelines and Terms of Reference, "Pedestrian Level Wind Study". The table to the right defines the criteria for both wind comfort and safety.

4.1 Pedestrian Comfort

Pedestrian comfort is associated with common wind speeds conducive to different levels of human activity. Wind conditions are considered suitable for sitting, standing, leisurely walking or fast walking if the associated mean wind speeds (see table) are expected for at least four out of five days (80% of the time). The assessment considers winds occurring between 6 AM and midnight. Limited usage of outdoor spaces is anticipated in the excluded period. Speeds that exceed the criterion for Fast Walking are categorized as Uncomfortable. These criteria for wind forces represent average wind tolerance. They are sometimes subjective and regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can also affect people's perception of the wind climate.

4.2 Pedestrian Safety

Pedestrian safety is associated with excessive Gust Speeds that can adversely affect a person's balance and footing (based on an annual exceedance of 9 hours or 0.1% of the time). These are usually infrequent events but deserve special attention due to the potential impact on pedestrian safety.

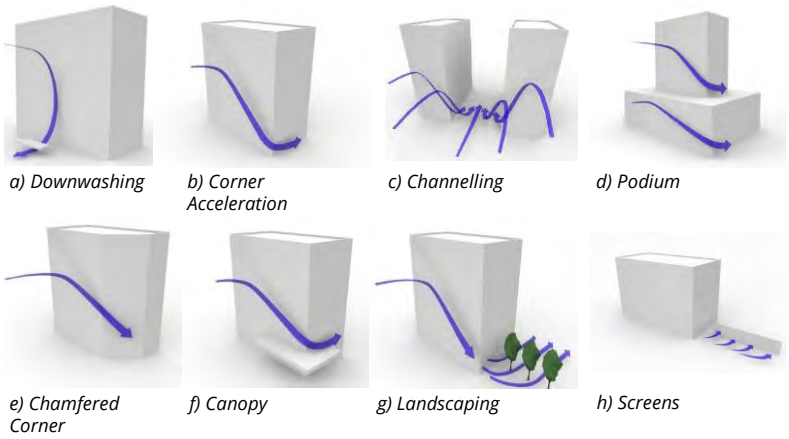
Comfort Category	GEM Speed (km/h)	Description
Sitting	≤ 10	Calm or light breezes Appropriate for dedicated seating areas such as cafes, patios, and outdoor amenity areas
Standing	≤ 14	Gentle breezes Appropriate for main building entrances, bus stops, and other places where pedestrians may linger
Leisurely Walking	≤ 17	Moderate winds Appropriate for shopping and strolling along retail streets and parks
Fast Walking	≤ 20	Relative higher wind speeds Appropriate for areas where pedestrians are walking, running, or cycling without lingering
Uncomfortable	> 20	Strong winds Inappropriate due to nuisance for all pedestrian activities Wind mitigation measures are required

Safety Criterion	Gust Speed (km/h)	Description
Exceeded	> 90	Excessive gust speeds Adverse effect on pedestrian's balance and footing Wind mitigation is required

5. RESULTS AND DISCUSSION

5.1 General Wind Flow Mechanisms

Wind tends to flow over buildings of uniform height, without disruption. Buildings that are taller than their surroundings tend to intercept and redirect winds around them. The mechanism in which winds are directed down the height of a building is called *Downwashing*. These flows subsequently accelerate around exposed building corners (*Corner Acceleration*). When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to *channelling* effect caused by the narrow gap. Podiums, chamfered corners, canopies, and large trees/screens can help reduce the impact of tall buildings at ground level. These flow patterns are illustrated in Image 7.



a) Downwashing *b) Corner Acceleration* *c) Channelling* *d) Podium*

e) Chamfered Corner *f) Canopy* *g) Landscaping* *h) Screens*

Image 7: General Wind Flow Patterns

5.2 Simulation Results

The predicted seasonal wind comfort conditions for the Existing scenario are presented in Images 8 and 9. The Proposed scenario discussion will be presented in two sections, east and west, as shown in Image 10. The predicted seasonal wind comfort conditions for the east and west sections are presented in Images 11 and 12, respectively. The results are presented as colour contours of wind speeds calculated based on the wind criteria outlined in Section 4. The contours represent wind speeds at a horizontal plane 1.5 m above the levels of interest.

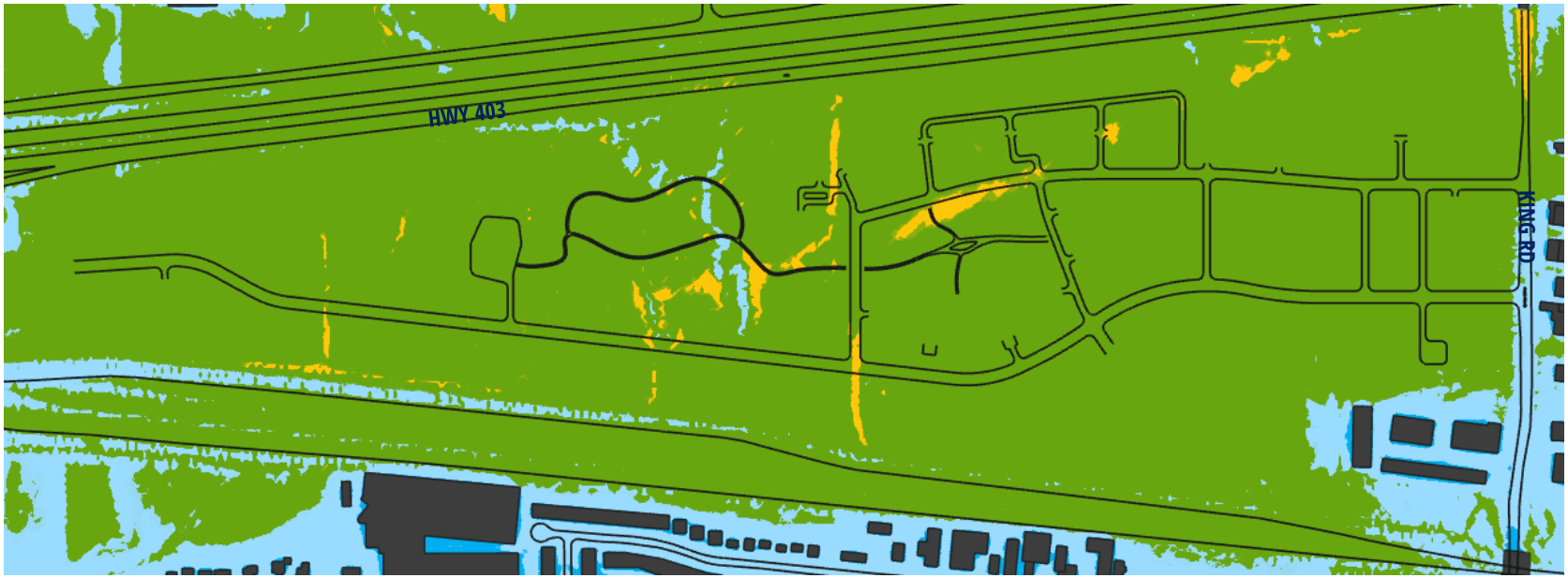
The assessment against the Safety Criterion (Section 4) was conducted qualitatively based on the predicted wind conditions and our extensive experience with wind tunnel assessments in Burlington.

A detailed discussion of the expected wind conditions with respect to the prescribed criteria and applicability of the results follows in Sections 5.3. and 5.4. Possible wind control features are discussed in Section 5.5.

Target Conditions

Generally, wind speeds comfortable for fast walking or leisurely walking are appropriate for sidewalks and walkways; lower wind speeds comfortable for standing are required for main entrances where pedestrians may linger, and calm wind speeds suitable for sitting are desired in areas where passive activities are anticipated, such as the above-grade outdoor amenity/terraces, especially during the summer when these areas are typically in use.

5. RESULTS AND DISCUSSION

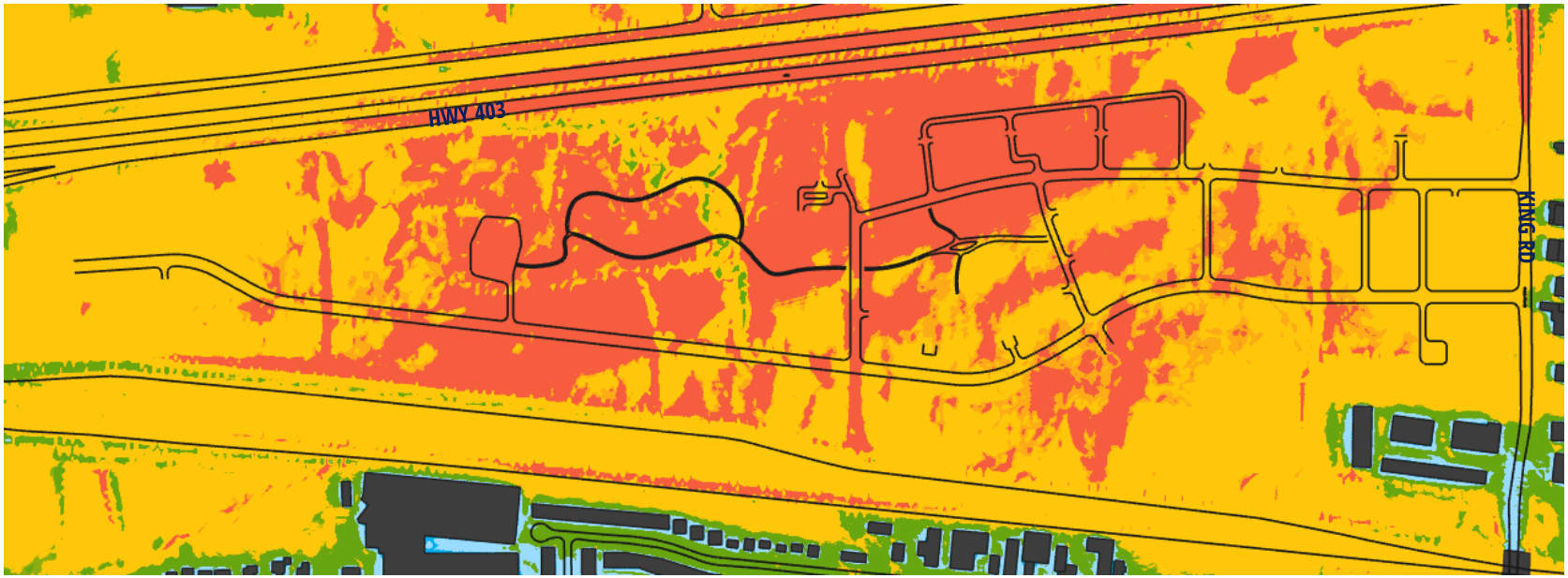


COMFORT: SITTING | STANDING | LEISURELY WALKING | FAST WALKING | UNCOMFORTABLE

True North | Project North

Image 8: Predicted Wind Conditions – EXISTING – SUMMER

5. RESULTS AND DISCUSSION



COMFORT: SITTING | STANDING | LEISURELY WALKING | FAST WALKING | UNCOMFORTABLE

True North | Project North

Image 9: Predicted Wind Conditions – EXISTING – WINTER

5. RESULTS AND DISCUSSION

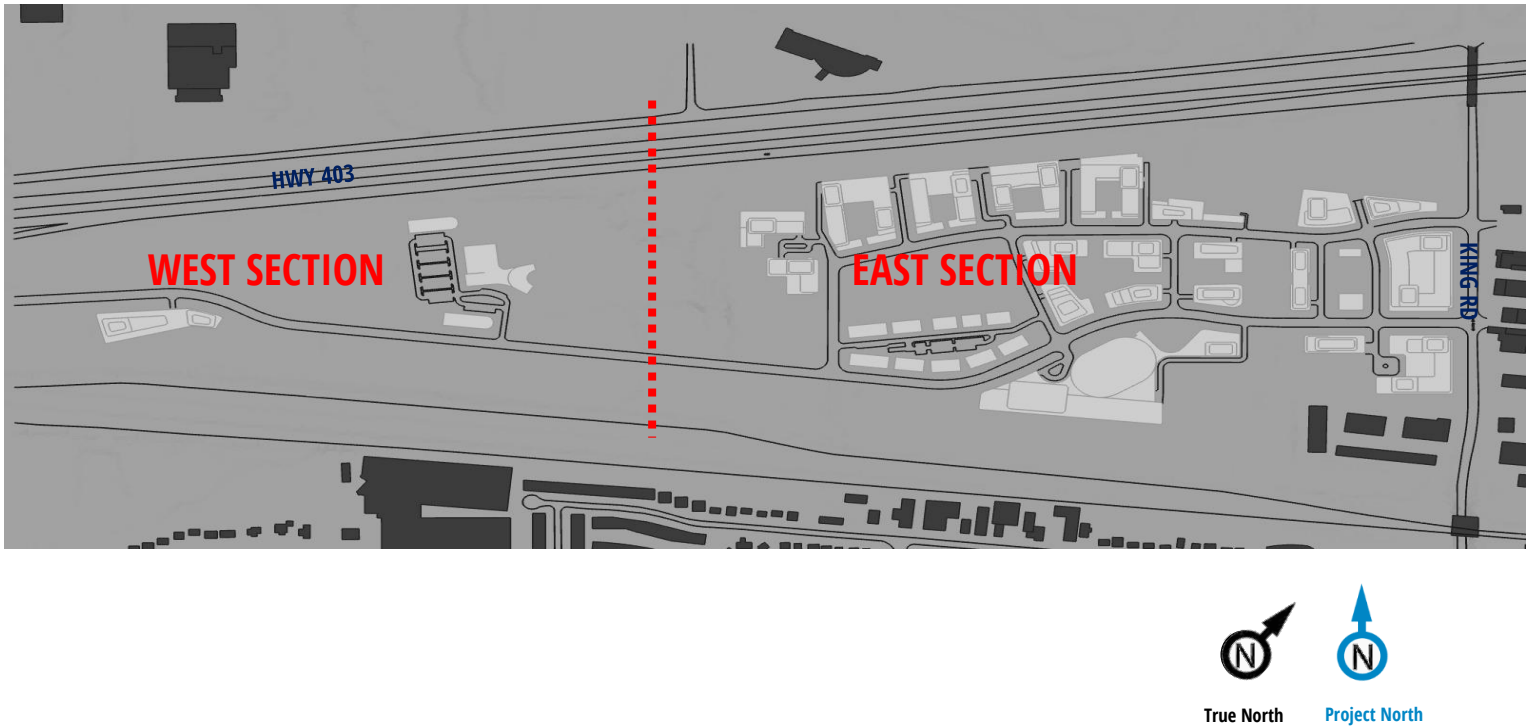
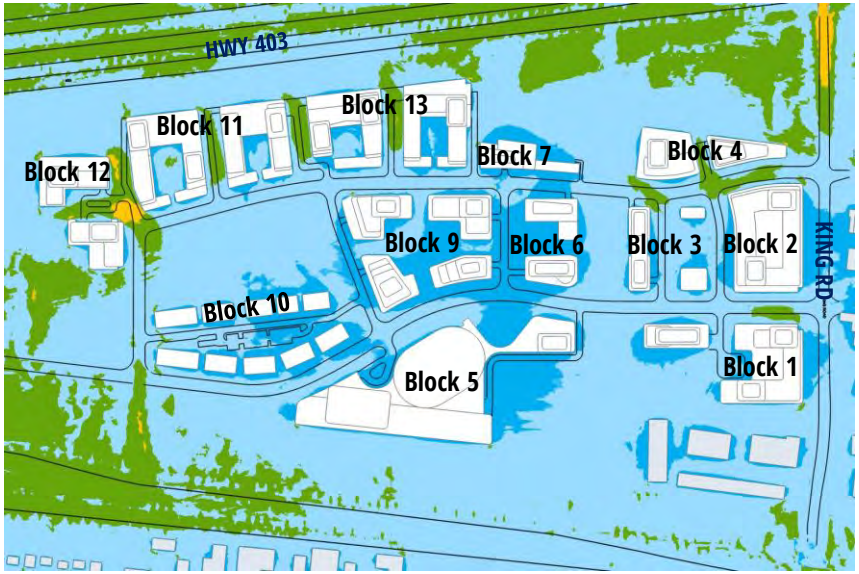
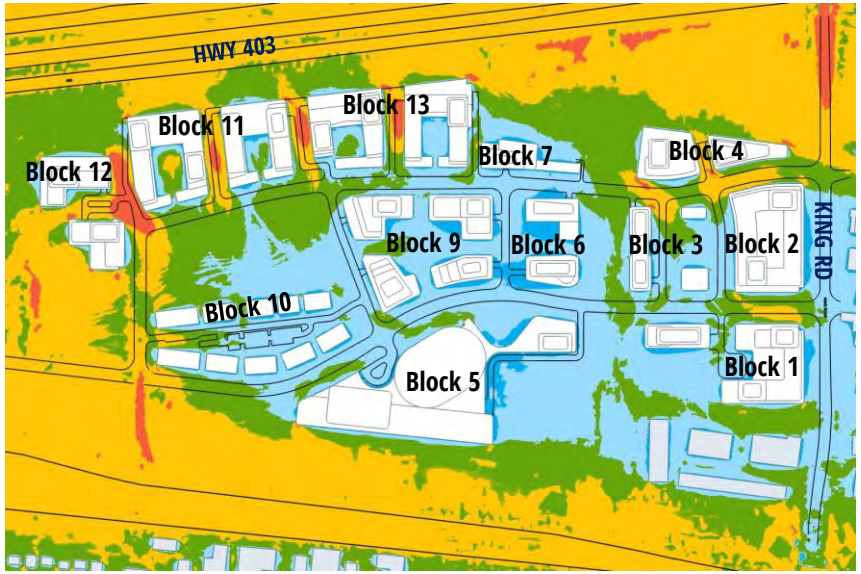


Image 10: East and West Sections Breakdown

5. RESULTS AND DISCUSSION



(a) SUMMER



(b) WINTER



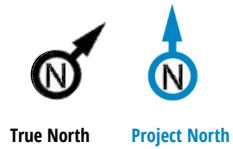
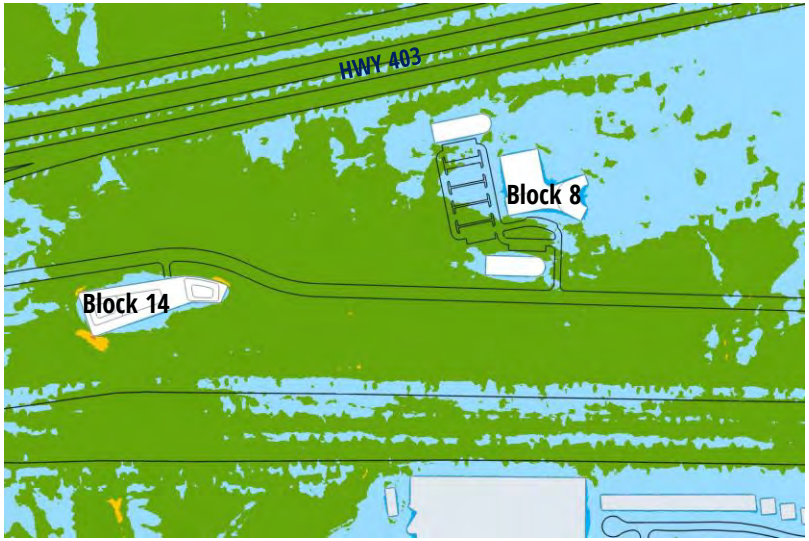
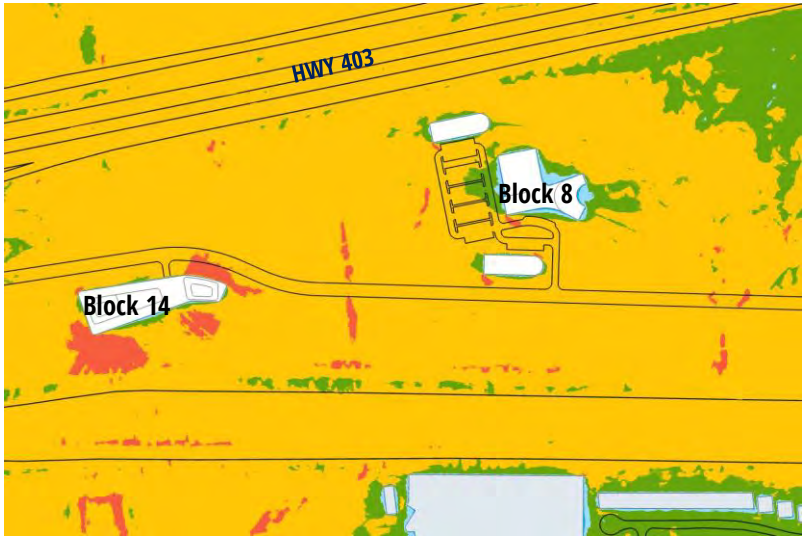


Image 11: Predicted Wind Conditions – PROPOSED – EAST SECTION

5. RESULTS AND DISCUSSION



(a) SUMMER



(b) WINTER



Image 12: Predicted Wind Conditions – PROPOSED – WEST SECTION

5.3 Existing Scenario

The existing site is currently vacant and is exposed to the prevailing wind directions, as such, wind conditions at most areas on and around the site are considered comfortable for leisurely walking or calmer in the summer (Image 8). During the winter, mixed wind conditions of fast walking and uncomfortable are observed at most areas assessed (Image 9).

The pedestrian safety criterion is expected to be met at all areas assessed in the existing scenario.

5.4 Proposed Scenario

The project, consisting of several buildings of various heights, will be taller than the buildings that exist in the immediate surrounding area. As a result, the project is expected to redirect winds around and between the buildings; however, potential wind impacts at grade level would be moderated by several positive features such as the large podiums and curved tower façades.

5.4.1 East Section

With the proposed development in place, wind speeds comfortable for standing or leisurely walking are expected at most areas on and around the project during the summer (Image 10a), and for fast walking or calmer during the winter (Image 10b). Wind speeds that result in uncomfortable conditions are expected to occur along the gaps between the buildings to the north (along the vehicular ways between the towers) and around exposed building corners (Blocks 12, 11 and 13) as shown in Image 11. The pedestrian safety criterion may also be exceeded at these locations. These uncomfortable wind conditions that are potentially unsafe are the result of the predominant westerly winds being intercepted by the buildings massing at higher elevations, and redirected to the grade level, subsequently accelerating around the building corners and along building gaps (Image 13). Wind control features to improve the uncomfortable conditions discussed can be found in Section 5.5. Further assessment and mitigation measures (if required) will be determined at the site plan and detailed building design stage.

Wind speeds that meet the pedestrian safety criterion are expected at all areas assessed, apart from those identified above.

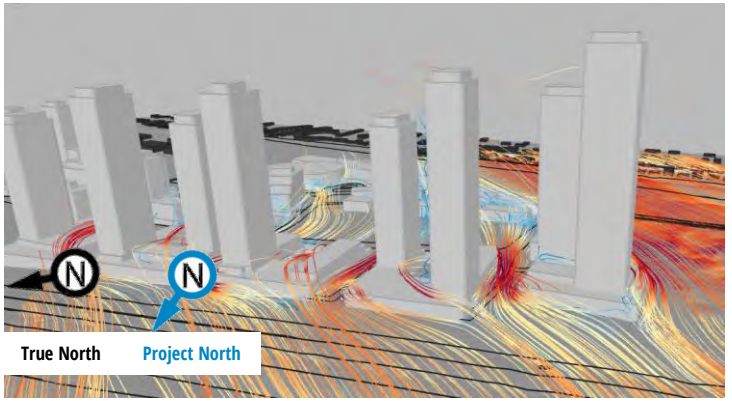


Image 13: Streamlines of Winds Approaching from W (270º)

5.4.2 West Section

As noted previously, landscaping was not included in the simulations. With the addition of the existing and proposed landscaping, improved conditions are expected around the development.

During the summer, wind conditions comfortable for standing or leisurely walking are expected at all areas assessed, with slightly elevated wind speeds and conditions comfortable for fast walking expected near the building corners of Block 14 (Image 12a). During the winter, wind conditions comfortable for fast walking are expected at most areas assessed (Image 12b). Exceptions are the areas mentioned above where uncomfortable wind speeds are anticipated. The safety criterion is expected to be met at all areas in the west section, apart from the areas near the northeast and southwest corners of building Block 14, where the criterion is expected to be exceeded. Wind control features to improve the uncomfortable conditions discussed can be found in Section 5.5. Further assessment and mitigation measures (if required) will be determined at the site plan and detailed building design stage.

5.5 Recommendations

Note that building entrances are not identified in the drawings received. We recommend placing the main entrances away from the windy corners and in areas where conditions comfortable for standing or sitting are predicted throughout the year. Additionally, the team may consider recessing the entrances to achieve comfortable levels.

To improve the wind conditions within the identified uncomfortable areas, several large-scale and small-scale wind control strategies can be considered. The large-scale solutions may include stepped low podium structures for all the tall buildings, with significant tower setbacks on all sides, the implementation of stepped massing along the height of the towers, and large setbacks at the grade level and the implementation of wide canopies wrapping around the corners.

Small-scale features may include the use of landscaping and/or hardscaping elements along the sidewalks, near building corners and along gaps between buildings, where uncomfortable wind conditions are expected. Extensive use of landscaping elements and trellises near seating and gathering areas at grade, such as parks and outdoor amenity areas is also recommended to achieve appropriate comfort levels. For landscaping to be effective for wind control in the winter, trees must be large, have dense foliage, and be able to retain their leaves in the cold months of the year (coniferous/marcescent species).

Examples of various types of mitigation options are provided in Image 14. Wind tunnel testing should be conducted at a later design stage to quantify these wind conditions and develop wind control solutions.

5. RESULTS AND DISCUSSION

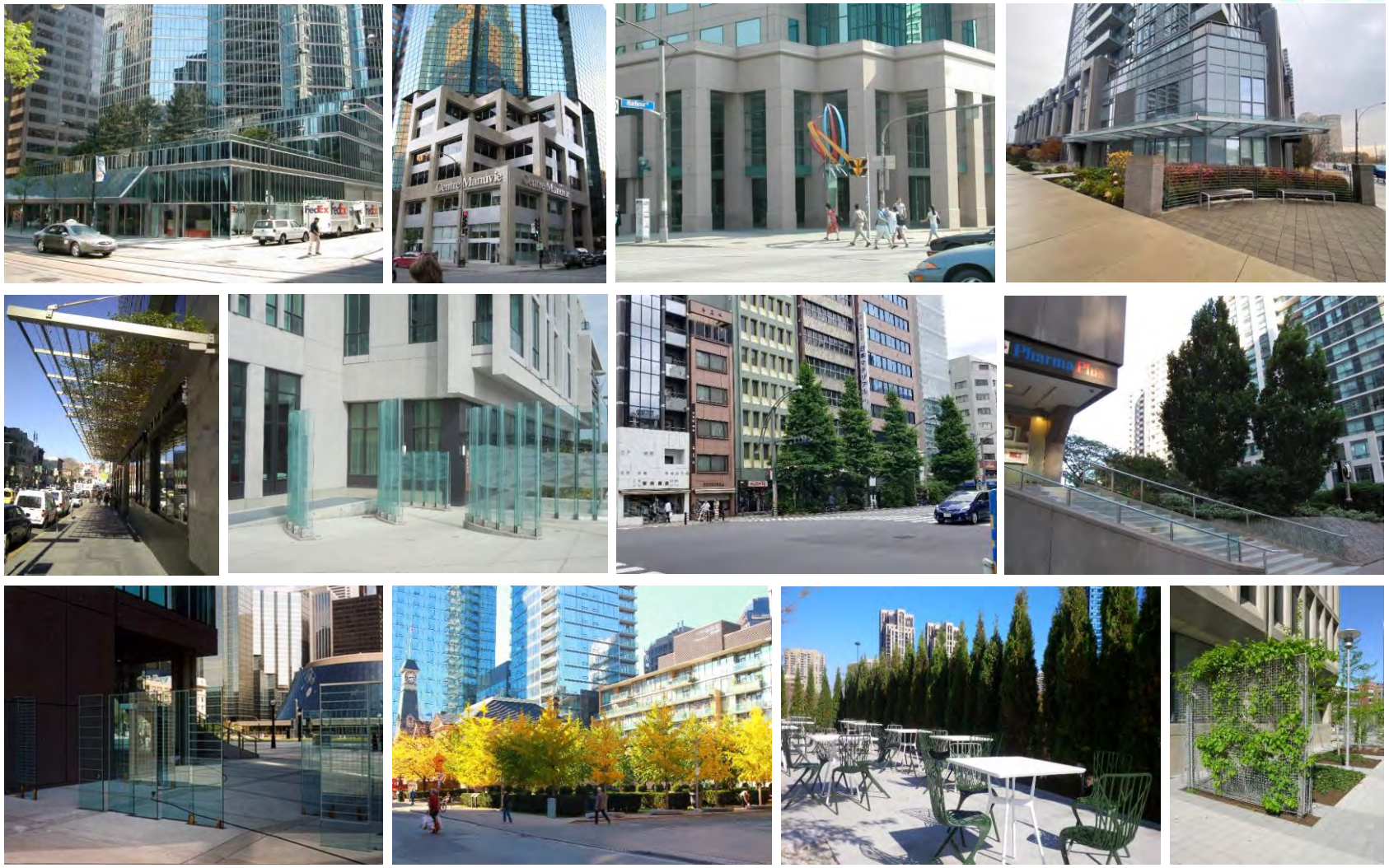


Image 14: Wind Control Measures Applicable to the Predicted Windy Areas

6. SUMMARY

RWDI was retained to provide an assessment of the potential pedestrian level wind impact of the proposed development at 1200 King Road in Burlington, Ontario. Our assessment was based on computational modelling, simulation and analysis of wind conditions for the proposed development design, in conjunction with the local wind climate data and wind criteria specified by the City of Burlington. Our findings are summarized as follows:

- The existing site is characterized by moderate to high wind speeds due to the open exposure to prevailing winds. The pedestrian safety criterion is expected to be met at all areas assessed in the existing scenario.

- The proposed development buildings of various heights and designs, which are taller than the surrounding buildings, and therefore will redirect winds to the ground level. The masterplan incorporates several positive design features, such as the large podiums and curved tower façades.

- Wind speeds along the nearby sidewalks/walkways in the proposed scenario are expected to be comfortable for the intended use throughout the year. Exceptions are localized areas along the gaps between the buildings (vehicular ways between the towers) and exposed building corners in the winter. The pedestrian wind safety criterion may also be exceeded in these areas.

- Existing or proposed landscaping was not included in the simulations. With the addition of the existing/proposed landscaping, improved conditions are expected around the development.

- Conceptual wind control strategies have been discussed in the report to improve the windy conditions at and above grade levels. A wind tunnel test should be conducted at a later design stage to quantify the predicted wind conditions and refine the recommended wind control features.

RWDI can help guide the placement of wind control features, including landscaping, to achieve appropriate levels of wind comfort based on the programming of the various outdoor spaces.

7. DESIGN ASSUMPTIONS

The findings/recommendations in this report are based on the conceptual plans and building geometry communicated to RWDI between January and February 2026. Should the details of the proposed design and/or geometry of the building change significantly, results may vary.

File Name	File Type	Date Received (mm/dd/yyyy)
23117_1200King_SITEPLAN_26-02-06	.PDF	02/09/2026
26-01-16_23117_ConceptMasterplanMassing	.SKP	01/16/2026

Changes to the Design or Environment

It should be noted that wind comfort is subjective and can be sensitive to changes in building design and operation that are possible during the life of a building. These could be, for example: outdoor programming, operation of doors, elevators, and shafts pressurizing the tower, changes in furniture layout, etc. In the event of changes to the design, construction, or operation of the building in the future, RWDI could provide an assessment of their impact on the discussions included in this report. It is the responsibility of Others to contact RWDI to initiate this process.

8. STATEMENT OF LIMITATIONS

This report was prepared by RWDI AIR Inc. for Alinea Land Corporation, c/o Doracin Terra Strategies Ltd. (“Client”). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein and authorized scope. The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

9. REFERENCES

1. H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter (2004), "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions", *ASCE Structure Congress 2004,* Nashville, Tennessee.

2. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", *Journal of Wind Engineering and Industrial Aerodynamics*, vol.104-106, pp.397-407.

3. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", *10th International Conference on Wind Engineering*, Copenhagen, Denmark.