REPORT

1022 GALLAGHER RD & 235 PLAINS RD E

BURLINGTON, ONTARIO

PEDESTRIAN WIND COMFORT ASSESSMENT

PROJECT #2601953
February 17, 2026

SUBMITTED TO

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1. INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained to conduct a pedestrian wind assessment for the proposed project at 1022 Gallagher Road and 235 Plains Road East 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 at the southwest corner of the intersection of Plains Road East and Gallagher Road. The site is currently occupied by residential homes and is primarily surrounded by low- and mid-rise suburban neighbourhoods in all directions (Image 1).

The proposed development consists of an 8-storey residential building featuring outdoor amenity spaces at grade and on multiple elevated terrace levels. Key areas of interest for this assessment include:

- Residential entrance areas
- At-grade outdoor amenity space
- Terraces and elevated amenity areas above grade
- Public sidewalks and pedestrian walkways surrounding the site

Images 2 and 3 illustrate the building massing and site plan, respectively.

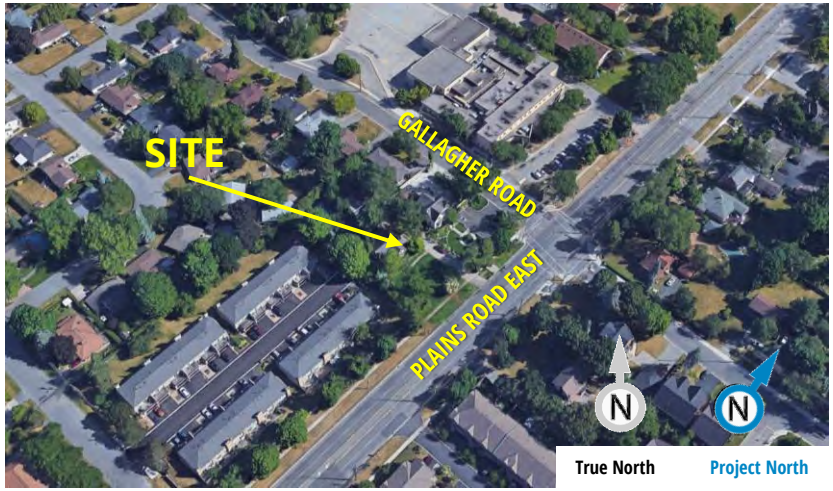


Image 1: Aerial view of the existing site and surroundings
Source: Google Maps

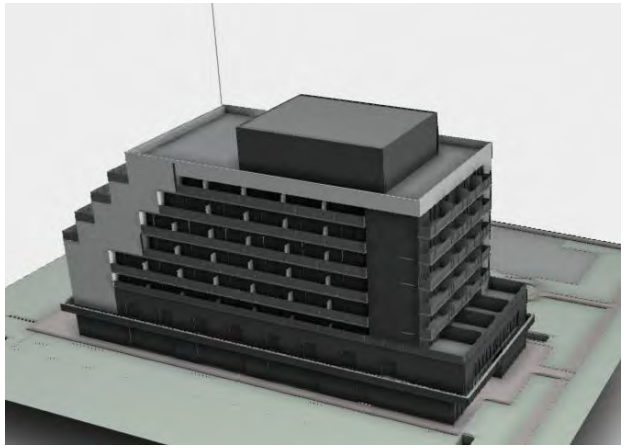
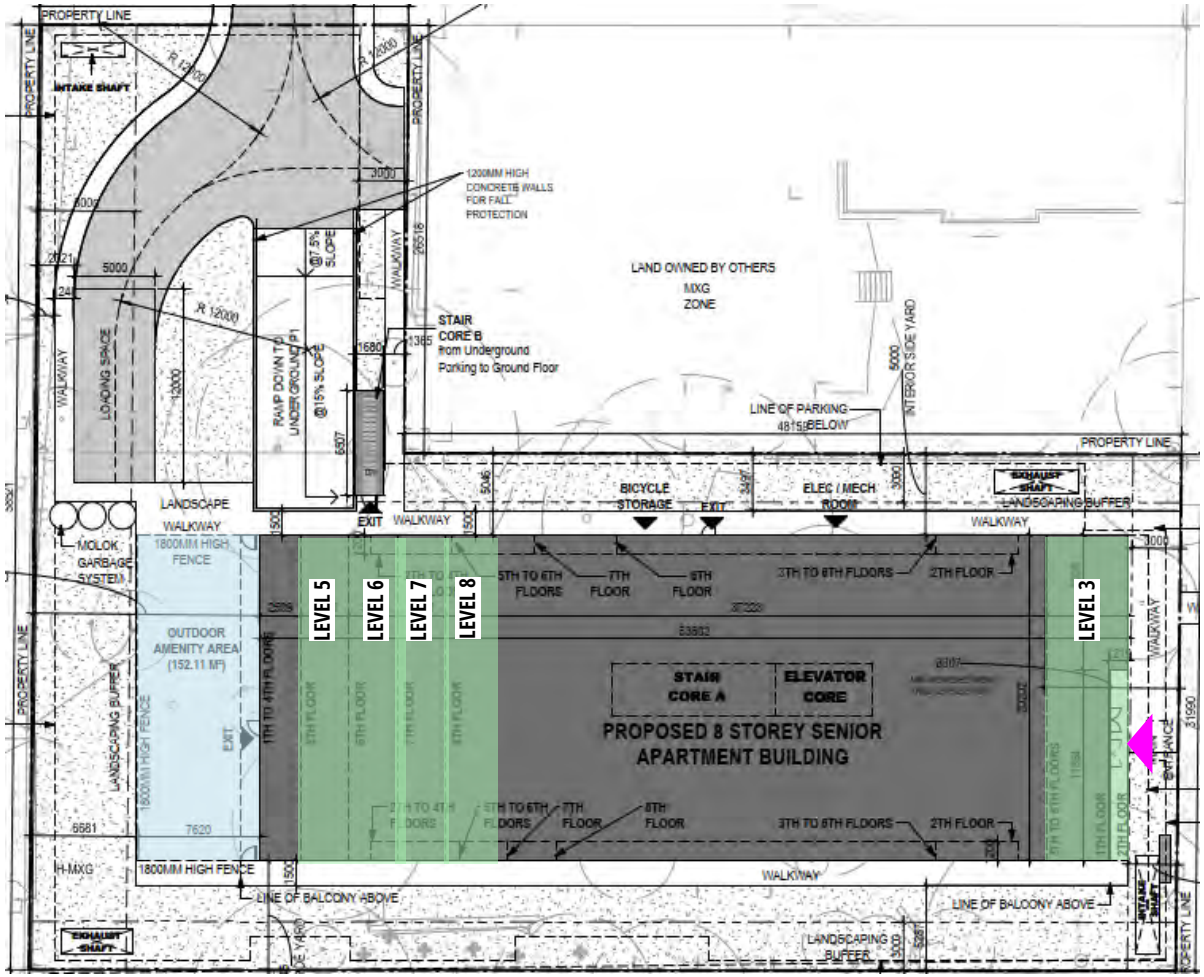


Image 2: 3D Model of the proposed development

1. INTRODUCTION



Residential Entrance **Outdoor Amenity Area** **Outdoor Terrace**

Image 3: Floor Plan Identifying Key Areas of Interest

True North Project North

RWDI Project #2601953
February 17, 2026

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 Hamilton International Airport;
- Architectural plans of the proposed project received on January 15, 2026, and a 3D model received on January 16, 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 wind and microclimate issues such as those relating to cladding and structural wind loads, door operability, snow impact, 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.

In order to quantify the transient behaviour of wind and refine any conceptual mitigation measures, a more detailed assessment would be required using either boundary-layer wind tunnel or transient computational modelling.

2. METHODOLOGY

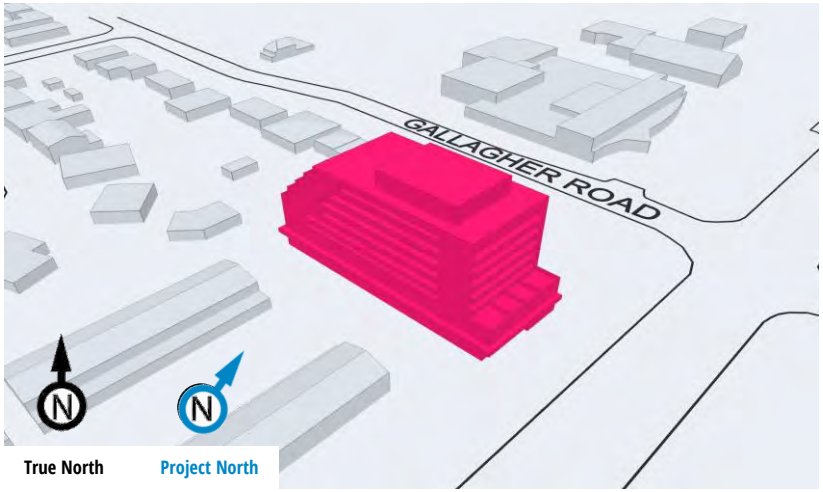
2.3 Simulation Model

CFD simulations were completed for two scenarios:

- Existing: Existing site and surroundings; and
- Proposed: Proposed 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 Hamilton International Airport to determine the wind speeds and frequencies in the simulated areas.



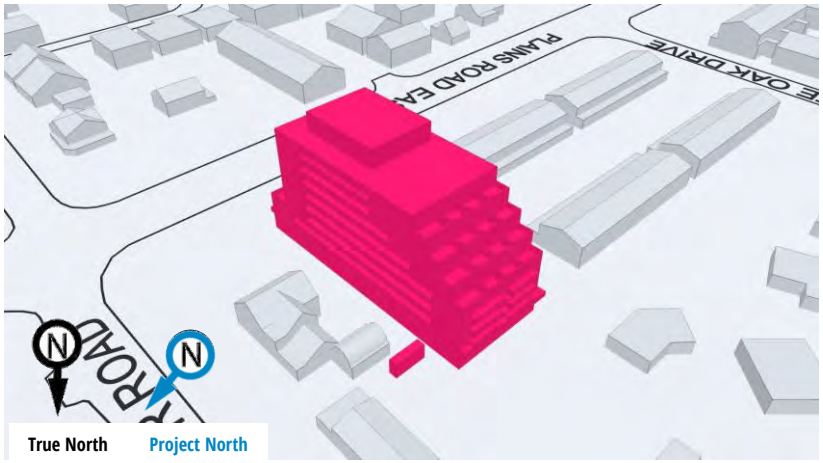


Image 4: Computer model of the proposed development

2. METHODOLOGY



Image 5a: Computer model of the existing site and extended surroundings

2. METHODOLOGY

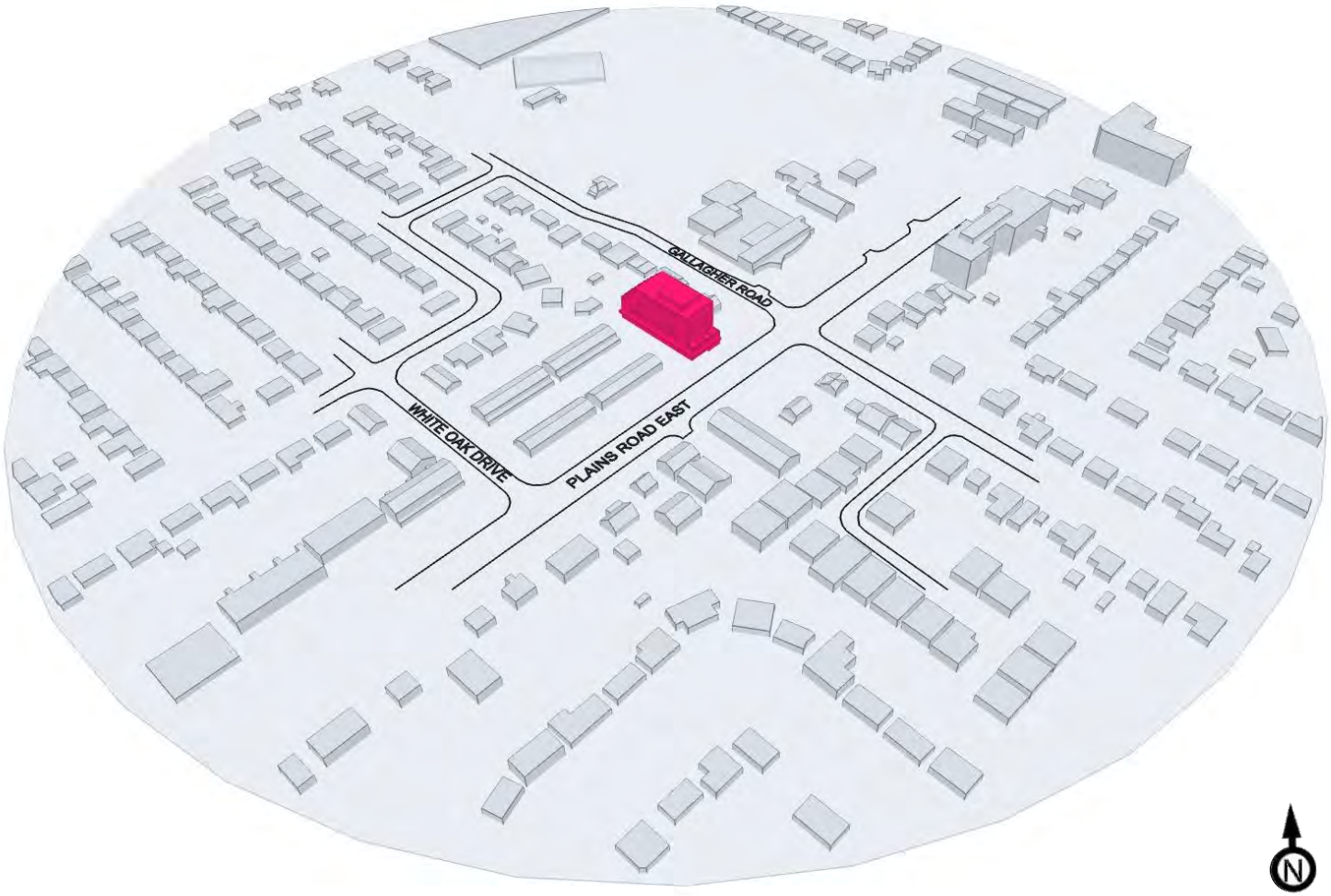


Image 5b: Computer model of the proposed development and extended surroundings

3. METEOROLOGICAL DATA

Wind statistics recorded at Hamilton International Airport between 1994 and 2024, 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 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.

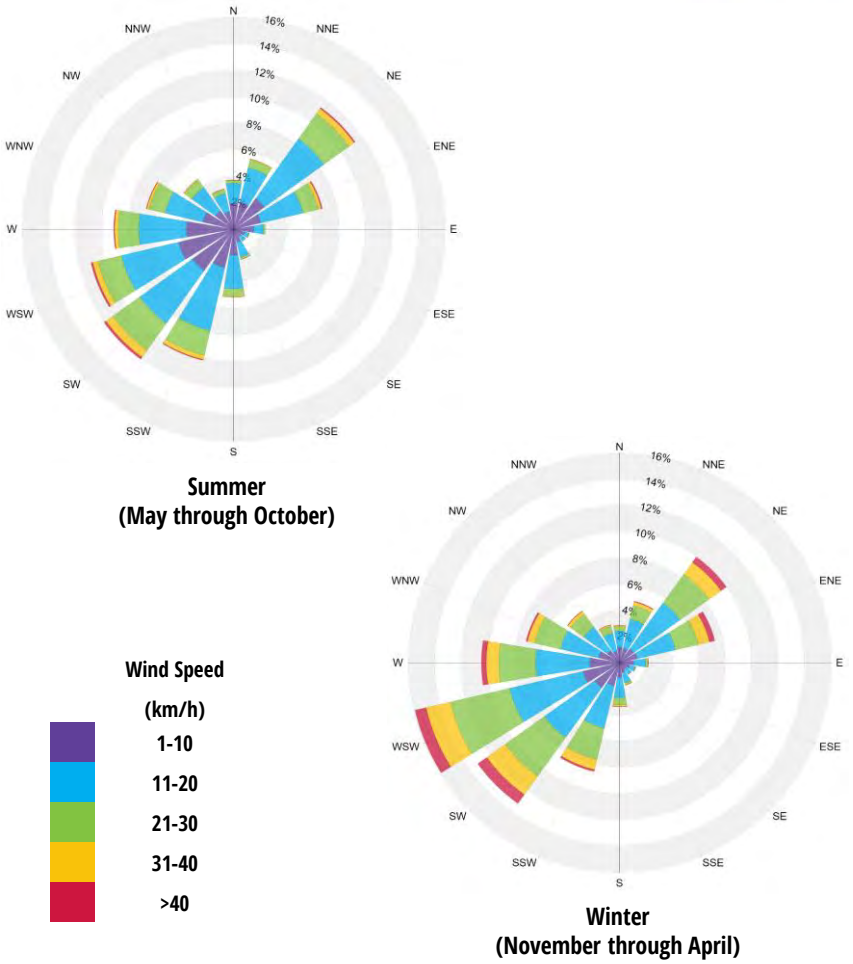


Image 6: Directional distribution of wind approaching Hamilton International Airport (1994 to 2024)

4. WIND CRITERIA

The *Wind Impact Criteria* specified in the *Pedestrian Level Wind Study Guidelines and Terms of Reference* (Guidelines) adopted by the City of Burlington in March 2020 are used in this study. The table to the right presents the criteria.

4.1 Pedestrian Comfort

Pedestrian comfort is associated with common wind speeds conducive to different levels of human activity. The assessment considers winds occurring between 6 AM and 11 PM as required by the Guidelines. 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**). Speeds that exceed the criterion for Fast Walking are categorized as Uncomfortable.

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.

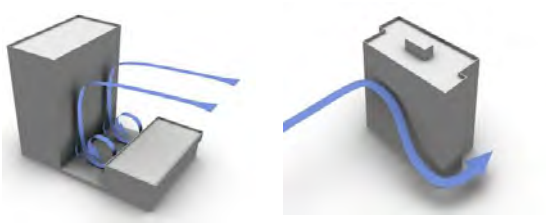
Comfort Category	GEM Speed (km/h)	Description
Sitting	≤ 10	Calm or light breezes • Appropriate for dedicated seating areas such as cafes, patios, and outdoor amenity areas
Standing	≤ 14	Gentle breezes • Appropriate for main building entrances, bus stops, and other places where pedestrians may linger
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 generally 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 move around exposed building corners, causing a localized increase in wind activity due to *Corner Acceleration*. Stepped massing, and canopies that are on the windward sides of buildings can diffuse downwash and reduce the potential wind impact on the ground level. These flow patterns are illustrated in Image 7.



Downwashing *Corner Acceleration*

Image 7: General wind flow patterns

5.2 Simulation Results

The predicted seasonal wind comfort conditions for the Existing and Proposed scenarios are presented in Images 8 and 9, respectively, while those for the main entrance, amenity area at grade and above-grade areas are presented in Images 10, 11 and 13. 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.

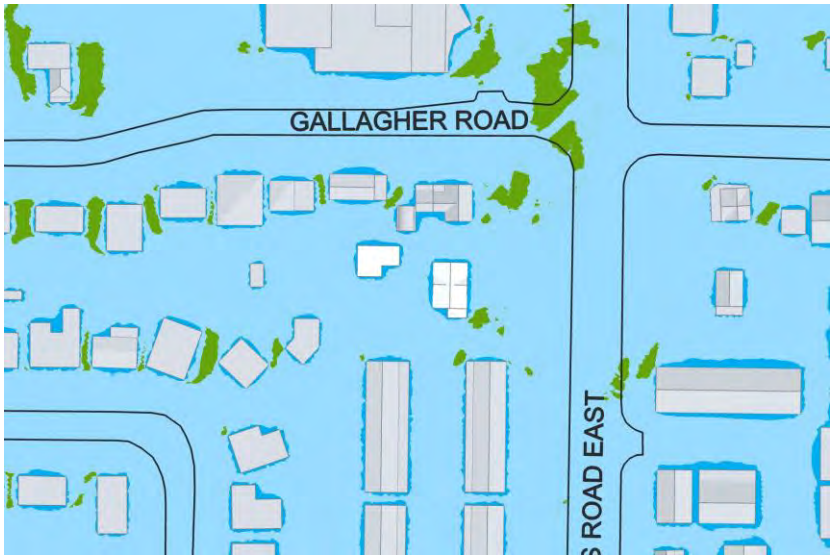
The assessment against the Safety Criterion (Section 4) was conducted qualitatively based on the predicted wind conditions and our extensive experience with wind tunnel assessments in Burlington.

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.

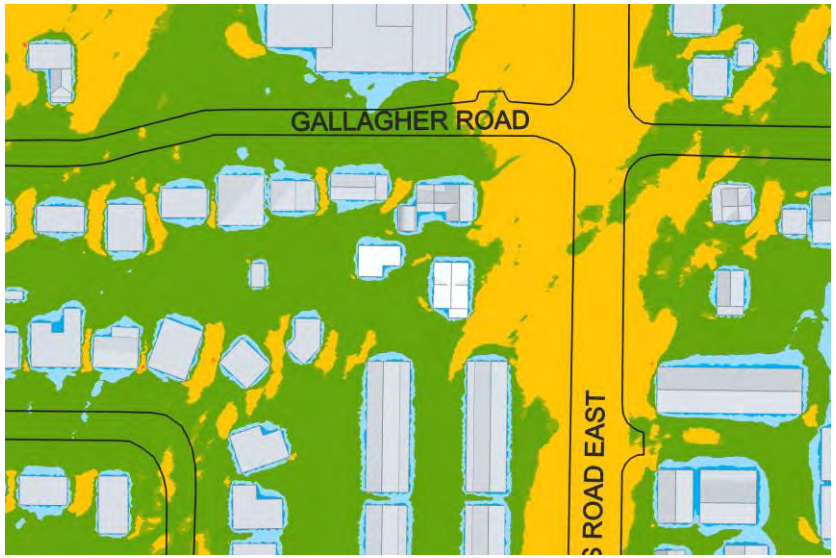
Target Conditions

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 balconies, especially during the summer when these areas are typically in use.

5. RESULTS AND DISCUSSION



(a) SUMMER



(b) WINTER

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

SAFETY: The criterion will be met at all areas assessed

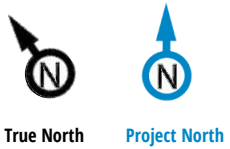
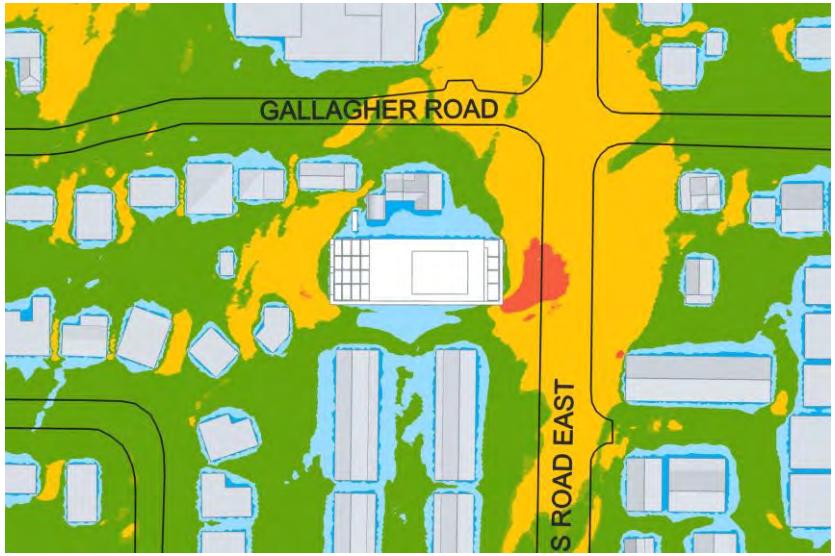


Image 8: Predicted wind conditions – EXISTING – GROUND LEVEL

5. RESULTS AND DISCUSSION



(a) SUMMER



(b) WINTER

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

SAFETY: The criterion will be met at all areas assessed

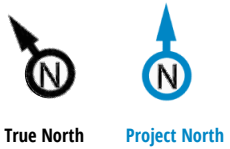


Image 9: Predicted wind conditions – PROPOSED – GROUND LEVEL

5. RESULTS AND DISCUSSION

Note that in the following discussion references to wind directions are based on true north, while project north has been considered for references to the project site and buildings.

5.3 Existing Scenario

The existing site is currently occupied by residential buildings and is mostly surrounded by low-rise buildings, with a school building across Gallagher Road to the north. Therefore, there are no structures that would redirect wind to create unfavourable conditions on the site. Wind conditions at most areas in the Existing scenario are comfortable for standing in the summer, with slightly higher winds comfortable for leisurely walking or fast walking in the winter (Images 8a and 8b).

Wind conditions at all areas on and near the project site are expected to meet the safety criterion.

5.4 Proposed Scenario

5.4.1 Sidewalks and Neighbouring Properties

The proposed project is taller than most buildings that currently exist in the vicinity of the site; however, at 8 storeys, the height is not considered substantial from a wind impact perspective. The proposed building has a stepped massing which will act as horizontal breaks for downwashing flows and thereby reduce the wind impact of the building on grade level areas. The proposed development is not expected to have a notable impact on wind conditions farther away.

Wind conditions are expected to be comfortable for sitting or standing at most areas around the site in the summer (Image 9b). Slightly higher wind speeds are predicted at the eastern and western corners of the proposed building and along Plains Road East (green regions), where conditions are predicted to be comfortable for leisurely walking. These conditions are appropriate for sidewalk or walkway use.

During the winter months, slightly higher wind speeds are expected around the site with conditions comfortable for leisurely walking or fast walking at most locations with reduced wind speeds comfortable for standing predicted close to the building perimeter (Image 9b). Potentially, uncomfortable conditions are predicted at a localized area near the southeast building corner and along the sidewalks of Plains Road East due to corner accelerated wind flows.

All areas near the proposed project are anticipated to meet the wind safety criterion.

5.4.2 Main Entrance on Plains Road East

The main residential entrance is recessed, under the building overhang. As a result, wind conditions along the building perimeter, including the main entrance are expected to be comfortable for sitting or standing throughout the year (Image 10). These conditions are appropriate for an entrance location.

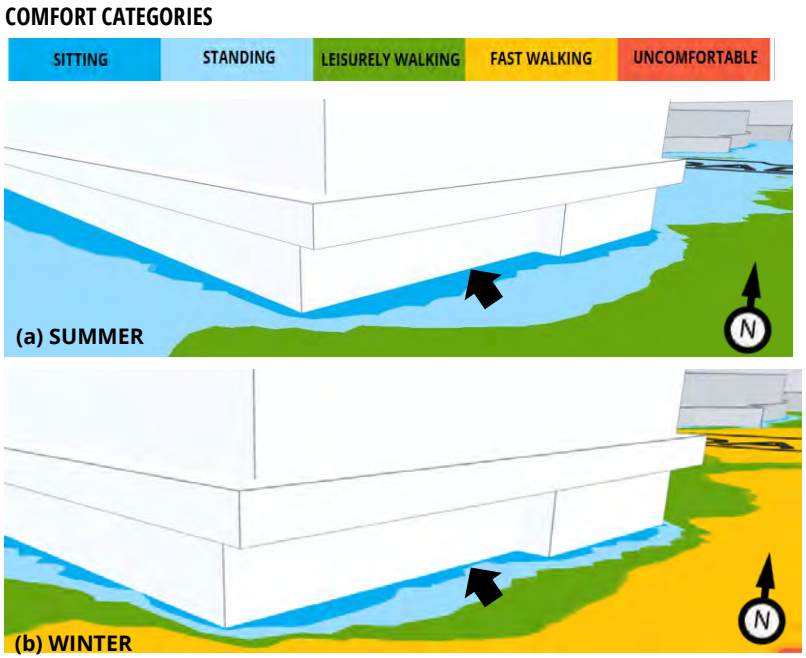


Image 10: Predicted Wind Conditions – MAIN ENTRANCE

5.4.3 Outdoor Amenity Area at Grade

The outdoor amenity area is located on the west side of the building. Wind conditions are expected to be comfortable for sitting or standing in the summer (Image 11a). Areas near the western corners of the space may be slightly breezy from time to time with conditions comfortable for leisurely walking predicted. Higher winds comfortable for leisurely walking or fast walking are predicted at most locations in this space during the winter (Image 11b), These wind conditions may not be of concern as the space would not be frequented in the colder months. The proposed 1.8m tall perimeter fencing and any landscaping around and within the space was not included in the CFD simulation but is expected to help reduce wind speeds especially during the summer months when this space will be frequented.

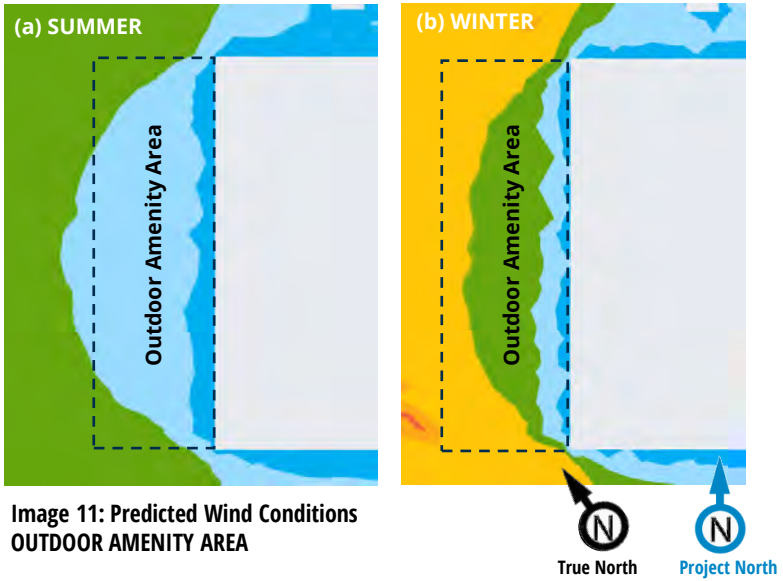


Image 11: Predicted Wind Conditions OUTDOOR AMENITY AREA

5. RESULTS AND DISCUSSION

To improved uncomfortable wind conditions, the design team may consider incorporating evergreen landscaping, tall fences or wind screens (minimum 2 m tall, solid or at most 30% porous) around the building corners. If feasible, the design team may also consider an overhead canopy along the south side of the building wrapping around the southeast building corner to diffuse the downwashing winds.

Image 12 presents examples of the wind control features recommended. RWDI can assist with the selection of wind control features as the design advances.

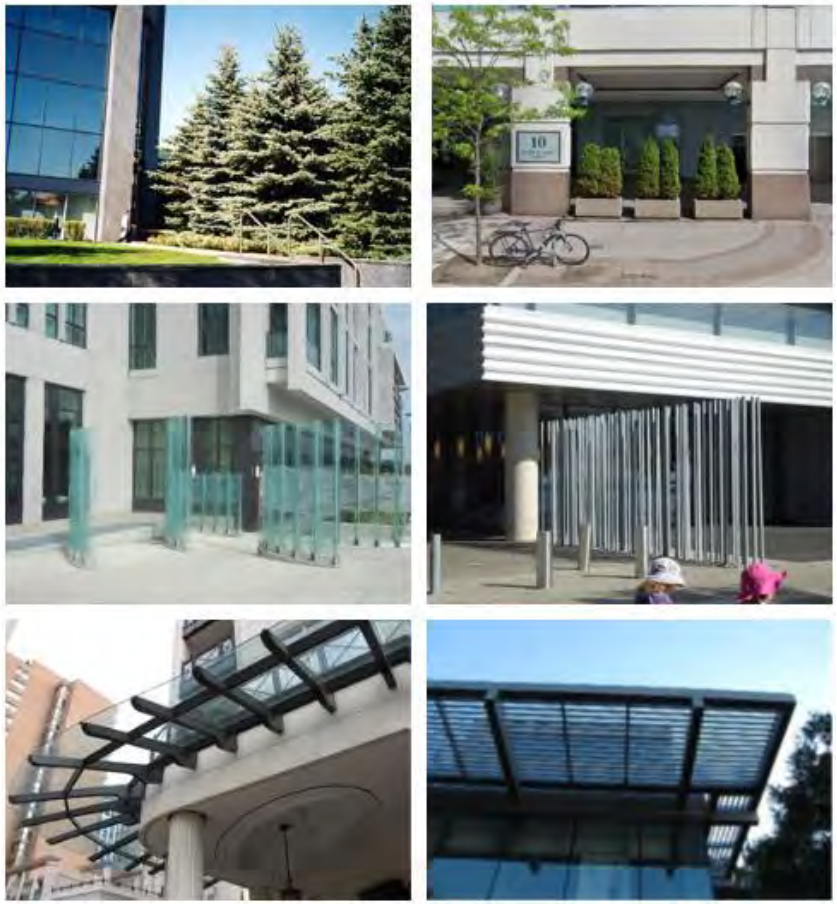
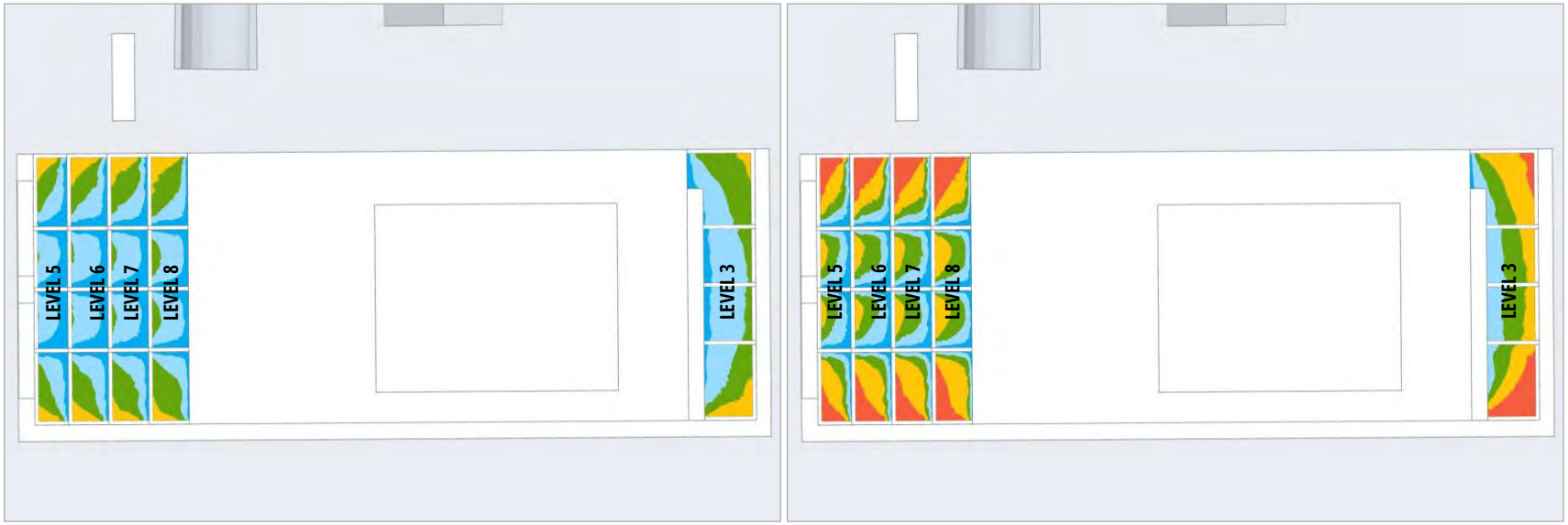


Image 12: Wind control measures applicable to building corners

5. RESULTS AND DISCUSSION



(a) SUMMER

(b) WINTER

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

SAFETY: The criterion will be met at all areas assessed

True North Project North

Image 13: Predicted wind conditions – PROPOSED – ABOVE-GRADE LEVEL

5.4.2 Levels 3, 5, 6, 7, and 8

It is generally desirable for wind conditions in areas intended for passive activities to be comfortable for sitting or standing.

The stepped building design results in step-back terraces at Levels 3 on the eastern side of the building and Levels 5, 6, 7 and 8 on the western side of the building (see Image 3), and wind comfort results for these areas are presented in Image 13. Wind conditions on these terraces are expected to be comfortable for sitting or standing in the summer, with higher wind speeds comfortable for leisurely walking in small areas near the eastern corners on Level 3 and the western corners on Levels 5, 6, 7 and 8. These wind conditions are generally appropriate for passive activities with the corner areas becoming breezy from time to time. Low speeds comfortable for sitting may be desirable in the summer in areas planned for seating or dining.

In the winter months, wind speeds are generally expected to be comfortable for standing or leisurely walking, with higher wind speeds comfortable for fast walking predicted to occur in the same windier areas identified in the summer season. Potentially uncomfortable wind conditions may occasionally occur in small areas at the eastern corners on Level 3 and the western corners on Levels 5, 6, 7 and 8. This is considered acceptable given the limited outdoor use anticipated during colder months.

The pedestrian safety criterion is expected to be met at all areas on the balconies.

If lower speeds are desired in specific areas, we recommend increasing the height of the guardrail and incorporating landscaping or screens that are at least 1.5 m tall to the north and south of the desired areas for wind protection. It is recommended to locate seating areas within calmer wind zones that are comfortable for sitting.

Image 14 presents examples of the wind control features recommended. RWDI can assist with the selection of wind control features as the design advances.



Image 14: Examples of wind control strategies for above grade levels

6. SUMMARY

RWDI was retained to provide an assessment of the potential pedestrian level wind impact of the proposed development at 1022 Gallagher Road and 235 Plains Road East 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:

- Wind conditions at all areas on and around the existing site are suitable for the intended pedestrian use throughout the year. The pedestrian wind safety criterion is anticipated to be met at all pedestrian areas on and around the project site.
- With the addition of the proposed development wind conditions at most grade level areas, including the residential entrance, outdoor amenity area, sidewalks and walkways are expected to be generally appropriate for the intended usage.
- Potentially uncomfortable wind speeds are expected in a localized area near the exposed southeastern building corner, as well as in a small section of the sidewalk along Plains Road East in the winter.
- Wind conditions on the Levels 3, 5, 6, 7 and 8 terraces are expected to be suitable for general passive use during the summer. Higher than desired wind speeds are expected during the winter; however, this may not be a concern as these areas would not be frequented in the colder months.
- The pedestrian wind safety criterion is expected to be met at all pedestrian locations for the proposed scenario
- Recommendations for wind control measures are presented for the terrace levels and the southeast building corner, to improve the wind conditions to appropriate levels.

We recommend confirming the wind conditions through wind tunnel testing so that the wind control solutions may be developed appropriately. 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 in 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)
Architectural Package	.PDF	02/10/2026
Gallagher Road 3D	.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. 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 Rowan Williams Davies & Irwin Inc. for BryDec Developments Inc. ("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.