REPORT
5500 DUNDAS STREET WEST

TORONTO, ONTARIO

PEDESTRIAN WIND ASSESSMENT

PROJECT # 2600994
DECEMBER 18, 2025

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 residential development at 5500 Dundas Street West in Toronto, 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) application.

The project site is located at the north side of Dundas Street West, between Paulart Drive and The East Mall Crescent surrounded by low-rise suburban neighbourhoods (Image 1).

The project is a residential development that will consist of two (2) mixed-use residential low-rise towers (14 and 16-storeys). The buildings will have a tower-on-podium type of massing (Image 2), which is favourable for reducing wind impacts at ground level. Key areas of interest for this assessment include the public sidewalks and properties near the project site, proposed residential and commercial entrances, the outdoor amenities on the ground and 5th floor (Image 3).

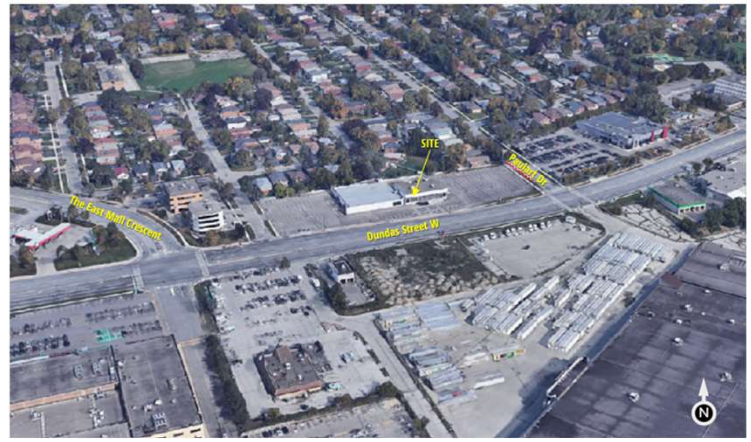


Image 1: Aerial view of the existing site and surroundings (Source: Google Maps)

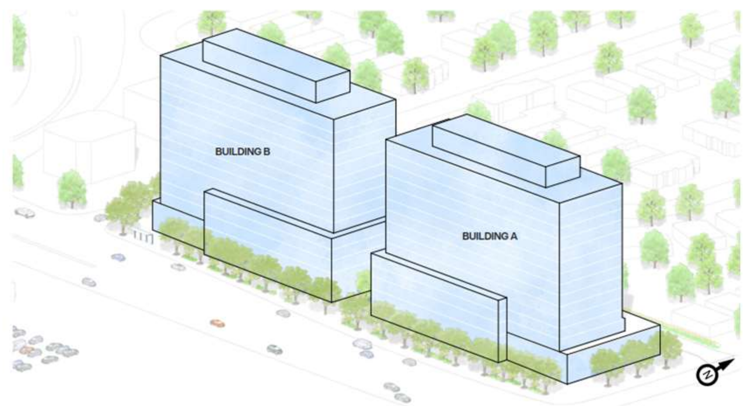


Image 2: Conceptual massing

1. INTRODUCTION

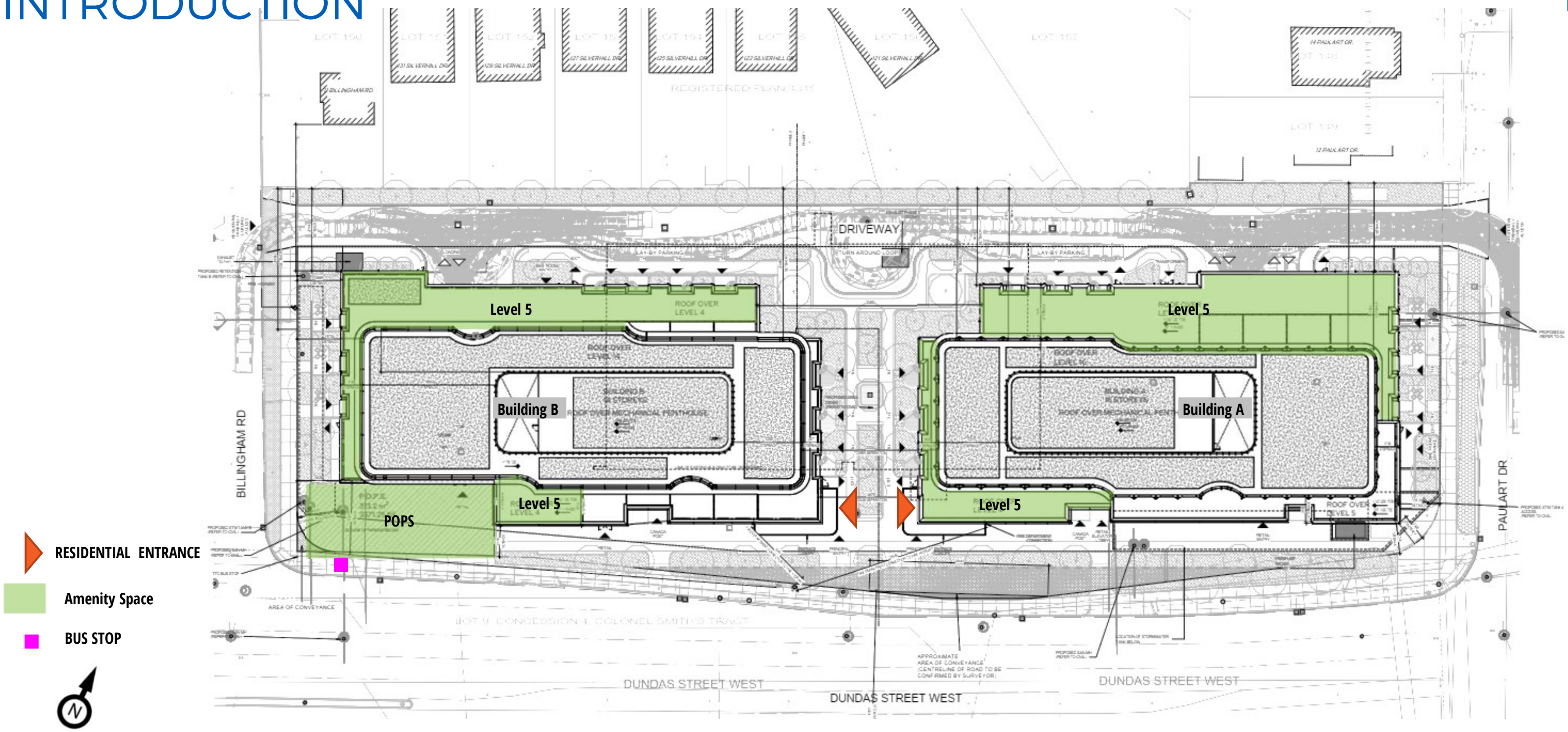


Image 3: Site Plan identifying Key Outdoor Areas of Interest

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 Billy Bishop Toronto City Airport;
- 3D model of the proposed project received on November 23, 2025, and updated plans received on December 5, and December 11, 2025;
- 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 criteria specified in the *Pedestrian Level Wind Study Terms of Reference Guide (June 2022)* prepared by the City of Toronto.

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

2.2 CFD in Urban Wind Modelling

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 early design advice, 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 three scenarios:

- Existing: Existing site and surroundings,
- Proposed: Proposed development with the existing surroundings, and
- Future: Proposed project with future surroundings.

The computer model of the proposed building is shown in Image 4, and the Existing, Proposed and Future configurations with the proximity model are shown in Images 5a, 5b, and 5c, 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 in order 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 1.5m above concerned levels, to the mean wind speed at a reference height. The data was then combined with meteorological records obtained from Billy Bishop Toronto City Airport to determine the wind speeds and frequencies in the simulated areas.

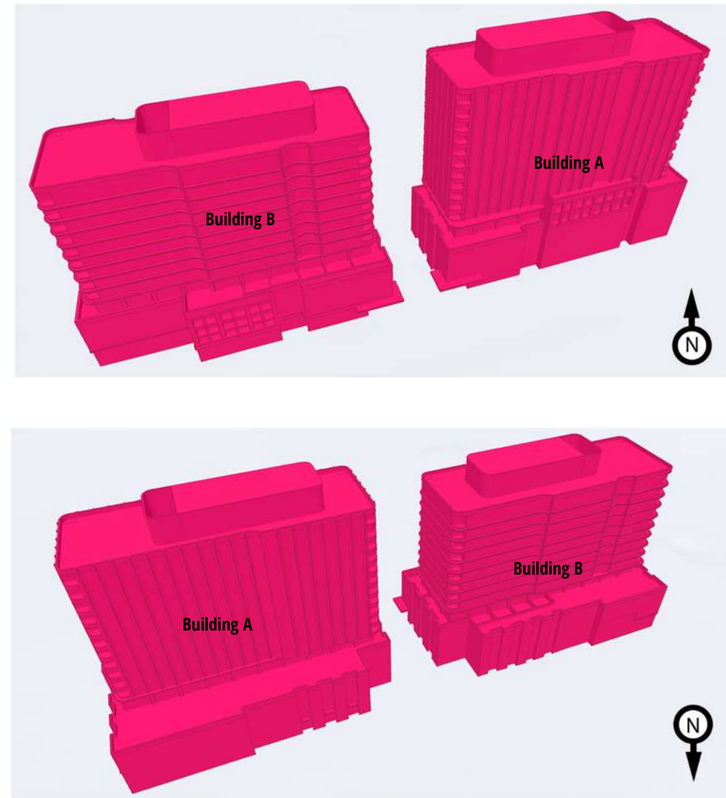


Image 4: Computer model of the proposed project

2. METHODOLOGY

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

2. METHODOLOGY

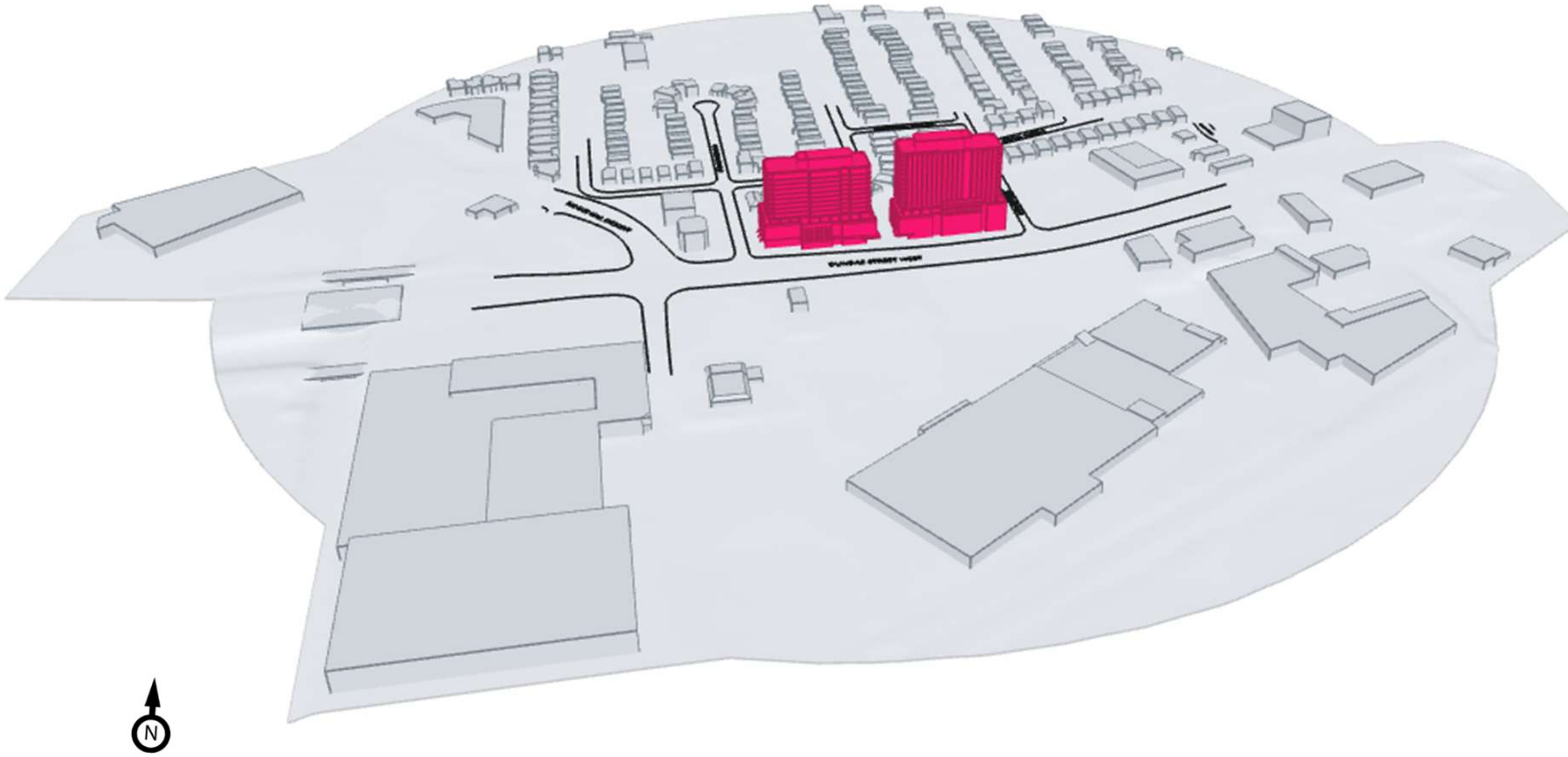


Image 5b: Computer model of the proposed building and existing surroundings

2. METHODOLOGY

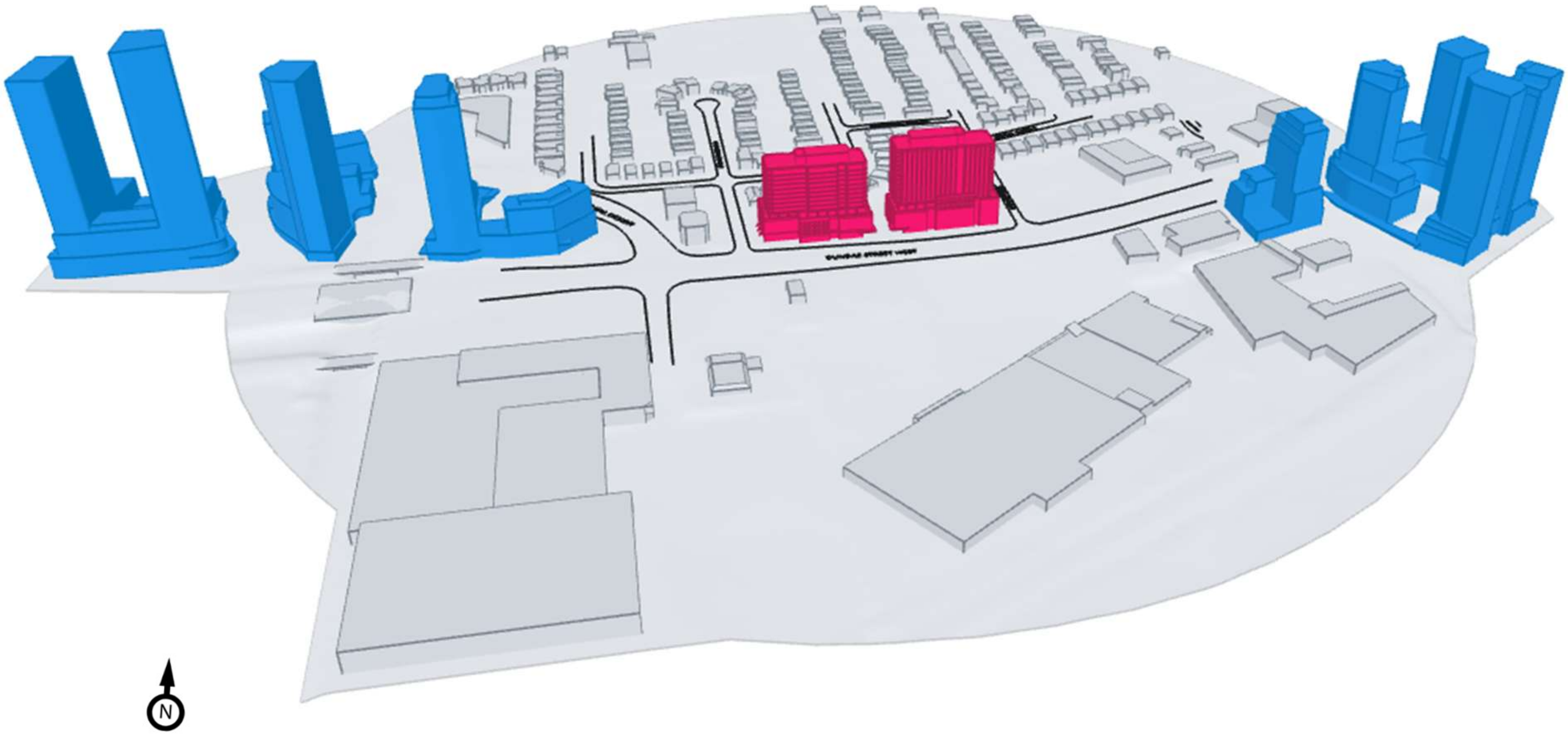


Image 5c: Computer model of the proposed building with existing and future surroundings

3. METEOROLOGICAL DATA

Wind statistics recorded at Billy Bishop Toronto City Airport between 1994 and 2024, inclusive, were analyzed for four seasonal periods as required by the City of Toronto – spring (March to May), summer (June to August), fall (September to November) and winter (December to February). Image 6 graphically depicts the seasonal directional distributions of wind frequencies and speeds.

Winds from the east-northeast and westerly directions are predominant in all four seasons, as indicated by the wind roses. Strong winds of a mean speed greater than 30km/h measured at the airport (at an anemometer height of 10m) occur primarily from these directions and are most common in the winter, followed by spring, fall and summer in decreasing order of frequency.

Wind statistics were combined with the simulated wind data to predict the full-scale wind conditions, which were then compared with the wind criteria.

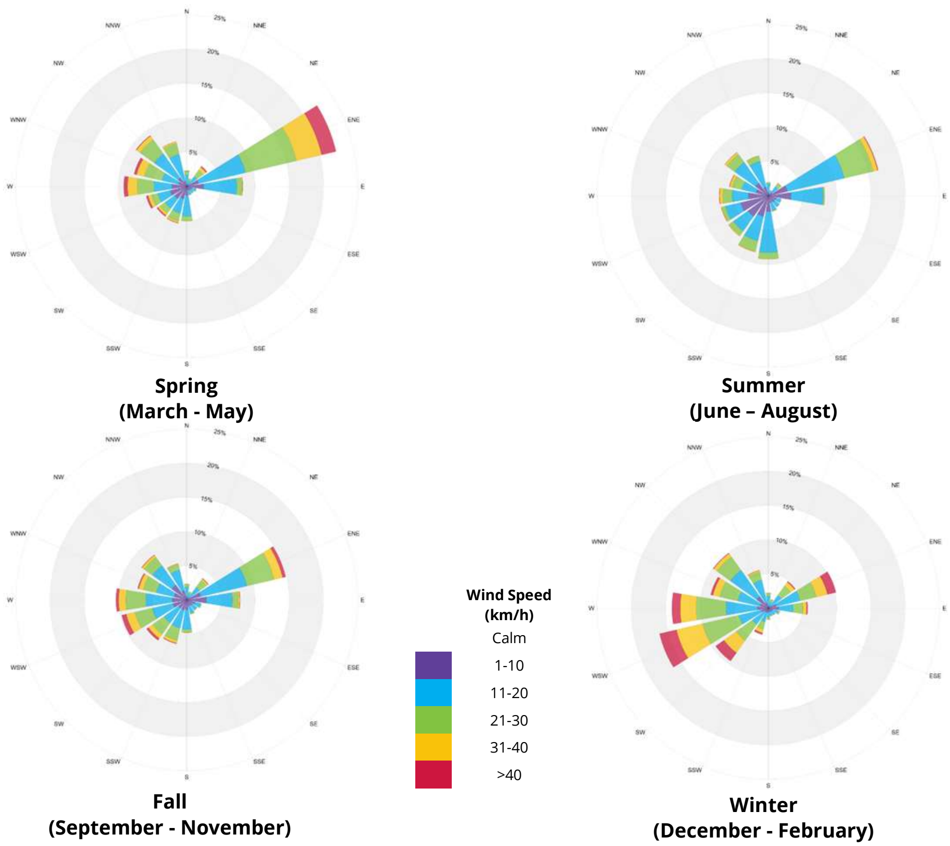


Image 6: Directional distribution of winds approaching Billy Bishop Toronto City Airport (1994-2024)

4. WIND CRITERIA

The criteria specified in the *Pedestrian Level Wind Study Terms of Reference Guide (June 2022)* prepared by the City of Toronto are used in the current study and presented below. The criteria consider pedestrian comfort (pertaining to common wind speeds conducive to different levels of human activity) and safety (pertaining to infrequent but strong gusts that could affect a person's footing).

For the current development, wind speeds comfortable for walking are appropriate for sidewalks and walkways, lower wind speeds comfortable for standing are required at entrances and bus-stops. Calm wind speeds suitable for sitting are desired on amenity terraces, but higher wind speeds may be considered appropriate in the winter, when such areas will get little to no use in the severe cold climate in Toronto.

Comfort Category	GEM Speed (km/h)	Description (Based on seasonal compliance of 80%)
Sitting	≤ 10	Calm or light breezes desired for outdoor seating areas where one can read a paper without having it blown away
Standing	≤ 14	Gentle breezes suitable for main building entrances, bus stops, and other places where pedestrians may linger
Strolling	≤ 17	Moderate winds appropriate for window shopping and strolling along a downtown street, plaza or park
Walking	≤ 20	Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering
Uncomfortable	> 20	Strong winds considered a nuisance for all pedestrian activities. Wind mitigation is typically recommended

Safety Criterion	Gust Speed (km/h)	Description (Based on annual exceedance of 9 hrs or 0.1% of time)
Exceeded	> 90	Excessive gusts that can adversely affect one's balance and footing. Wind mitigation is typically required

5. RESULTS AND DISCUSSION

5.1 Wind Flow around Buildings

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*. 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. *Podium* massing, low roofs and canopies diffuse downwash and reduce the potential wind impact on the ground level. These flow patterns are illustrated in Image 7.

Critical wind flows around the proposed project are shown in Image 8.

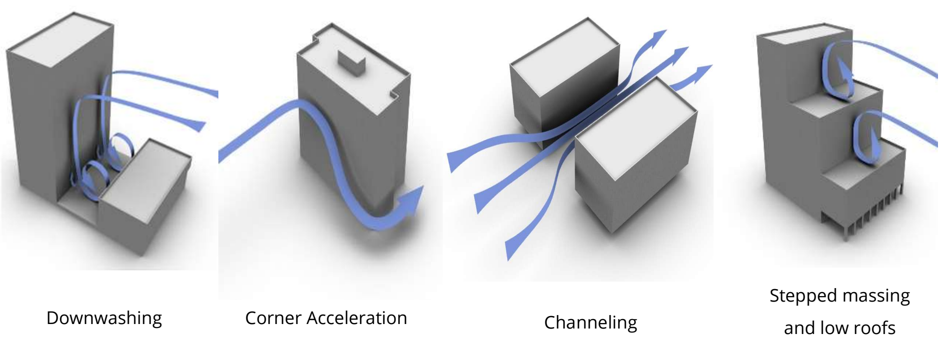


Image 7: General wind flow patterns

5.2 Simulation Results

The predicted seasonal wind comfort conditions at the grade level for the Existing, Proposed and Future configurations are presented in Images 9 through 12 and results for the podium roof are presented in Images 13 and 14. The results are presented as colour contours of wind speeds calculated based on the wind criteria (Section 4). The contours represent wind speeds at a horizontal plane approximately 1.5 m above the concerned level.

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 Toronto.

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. The discussion includes recommendations for wind control to reduce the potential of high wind speeds for the design team's consideration.

5. RESULTS AND DISCUSSION

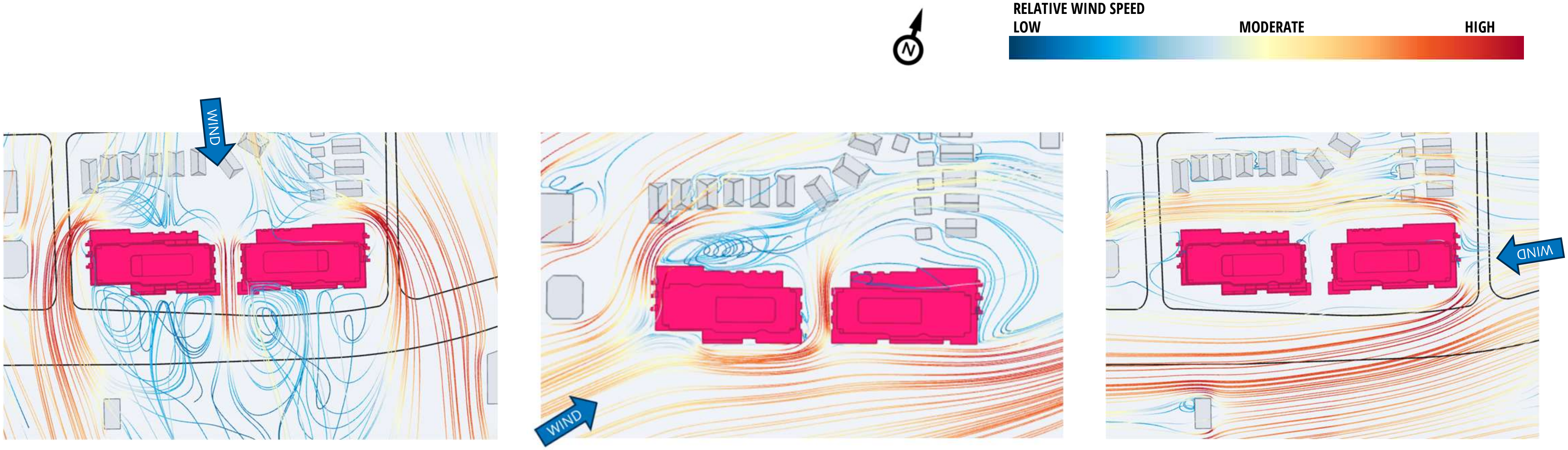


Image 8: Critical wind flow paths on the project site

5. RESULTS AND DISCUSSION

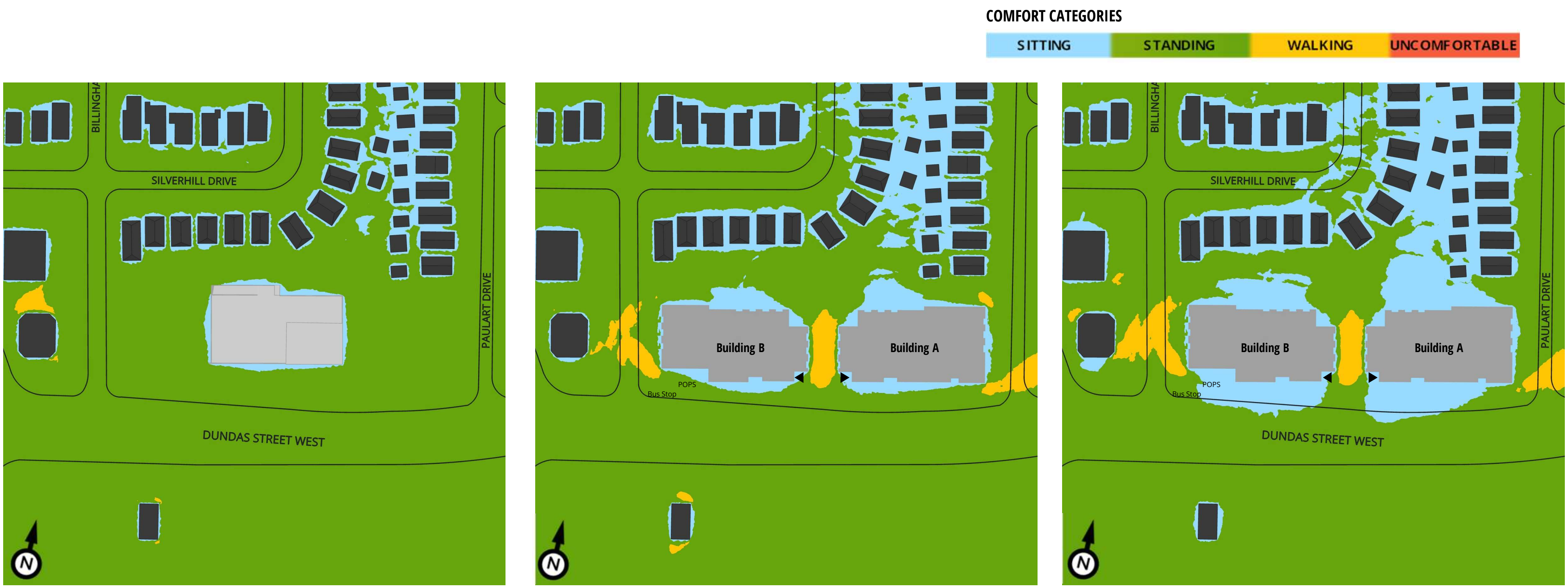
(a) EXISTING SCENARIO

(b) Proposed SCENARIO

(c) FUTURE SCENARIO

Image 9: Predicted Wind Comfort Conditions – Grade Level - SPRING

5. RESULTS AND DISCUSSION



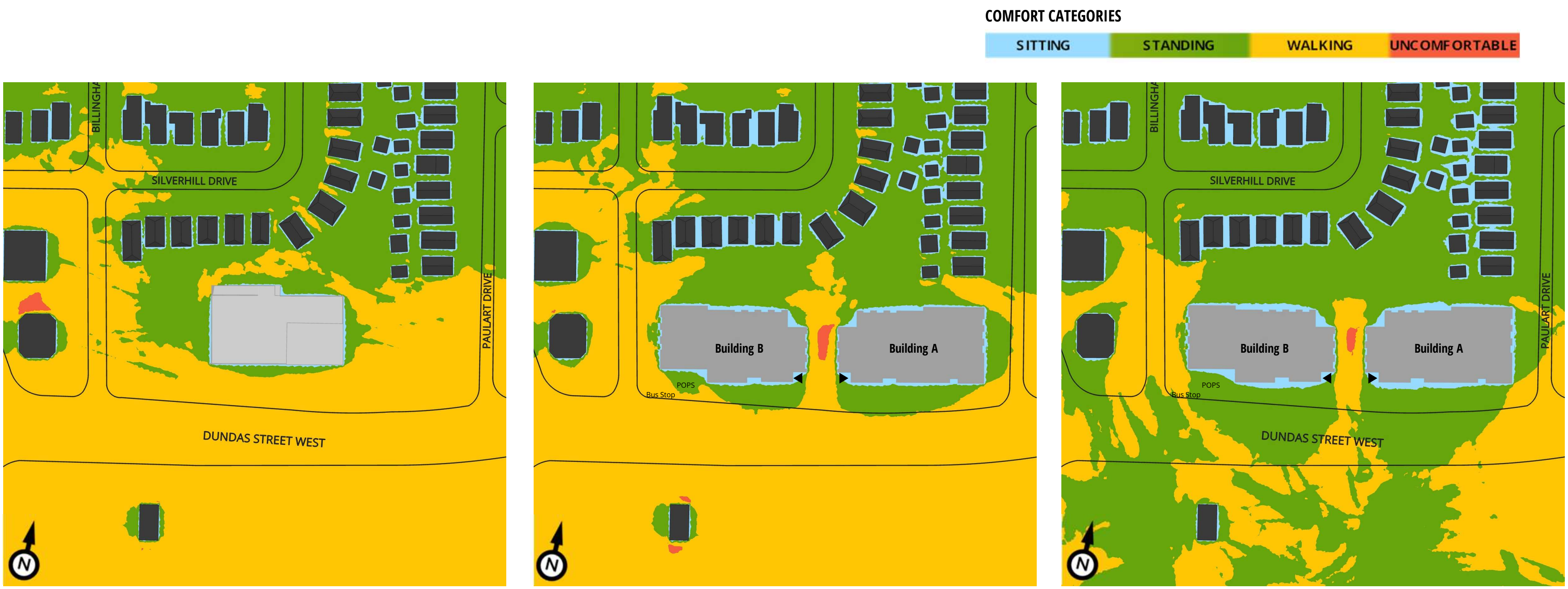
(a) EXISTING SCENARIO

(b) Proposed SCENARIO

(c) FUTURE SCENARIO

Image 10: Predicted Wind Comfort Conditions – Grade Level - SUMMER

5. RESULTS AND DISCUSSION



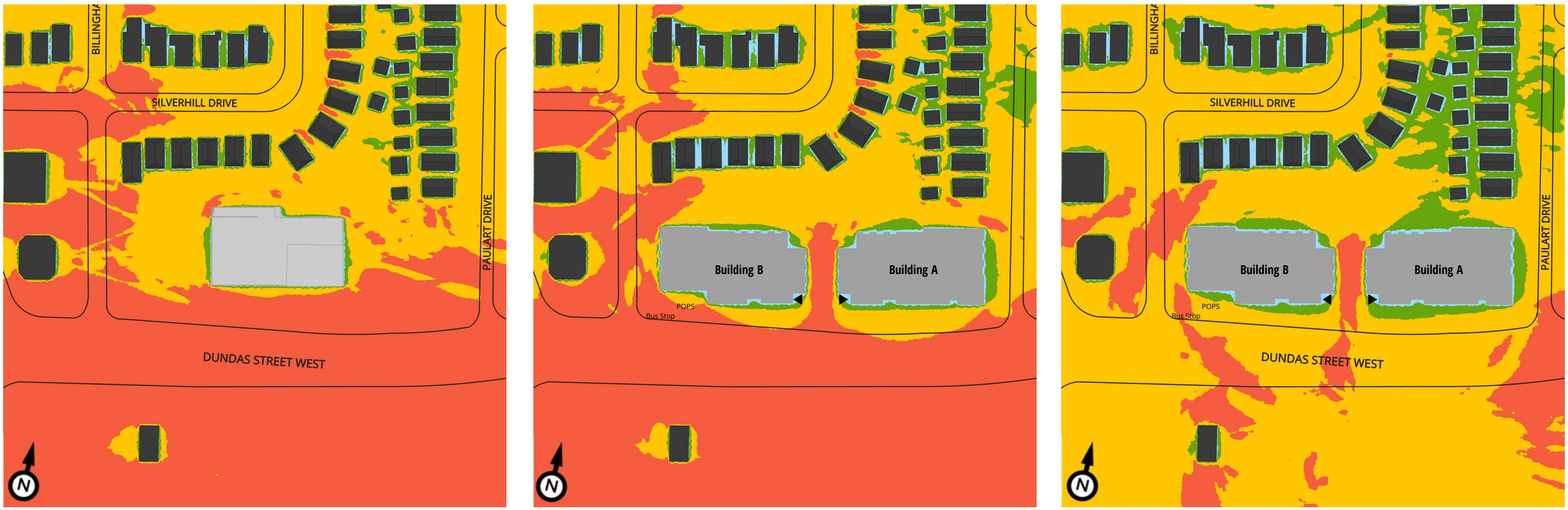
(a) EXISTING SCENARIO **(b) Proposed SCENARIO** **(c) FUTURE SCENARIO**

Image 11: Predicted Wind Comfort Conditions – Grade Level - FALL

5. RESULTS AND DISCUSSION

COMFORT CATEGORIES

SITTING | STANDING | WALKING | UNCOMFORTABLE



(a) EXISTING SCENARIO **(b) Proposed SCENARIO** **(c) FUTURE SCENARIO**

Image 12: Predicted Wind Comfort Conditions – Grade Level - WINTER

5. RESULTS AND DISCUSSION

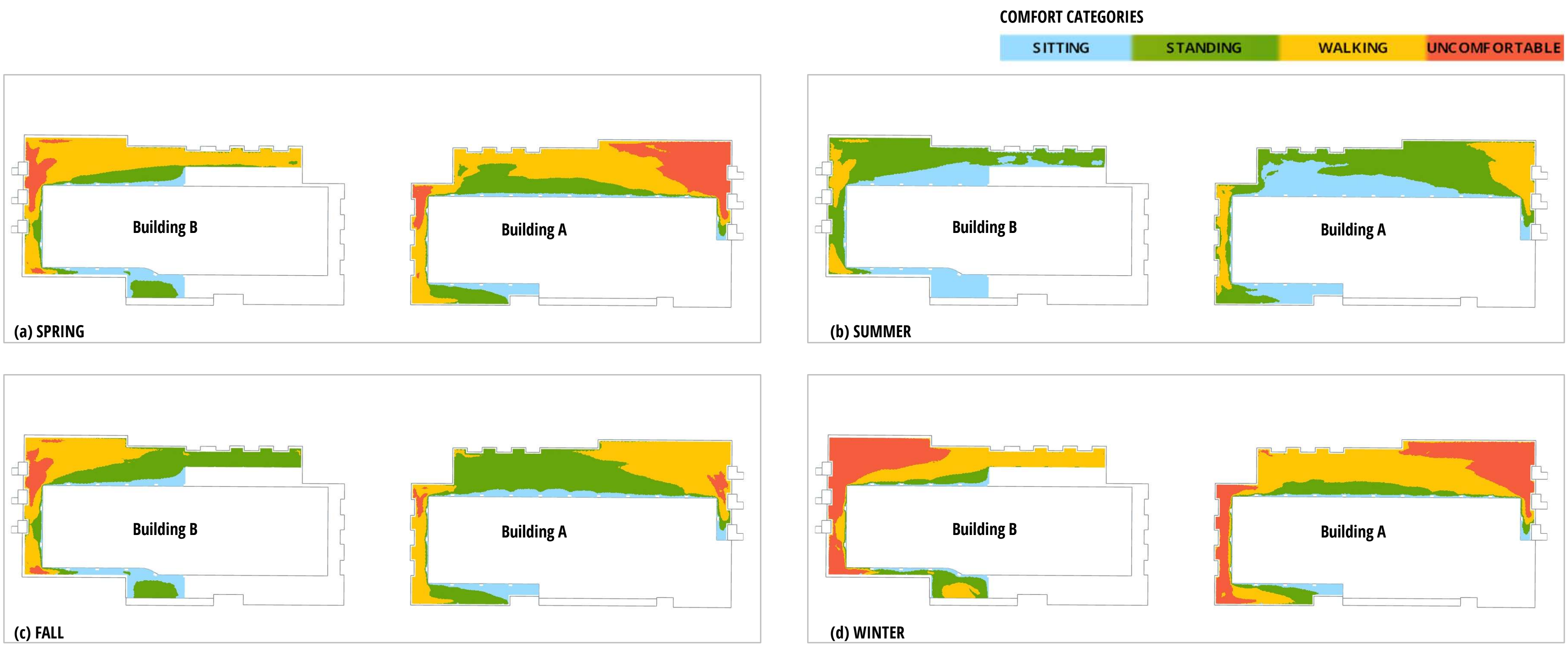


Image 13: Predicted Wind Comfort Conditions – Podium Level – PROPOSED CONFIGURATION

5. RESULTS AND DISCUSSION

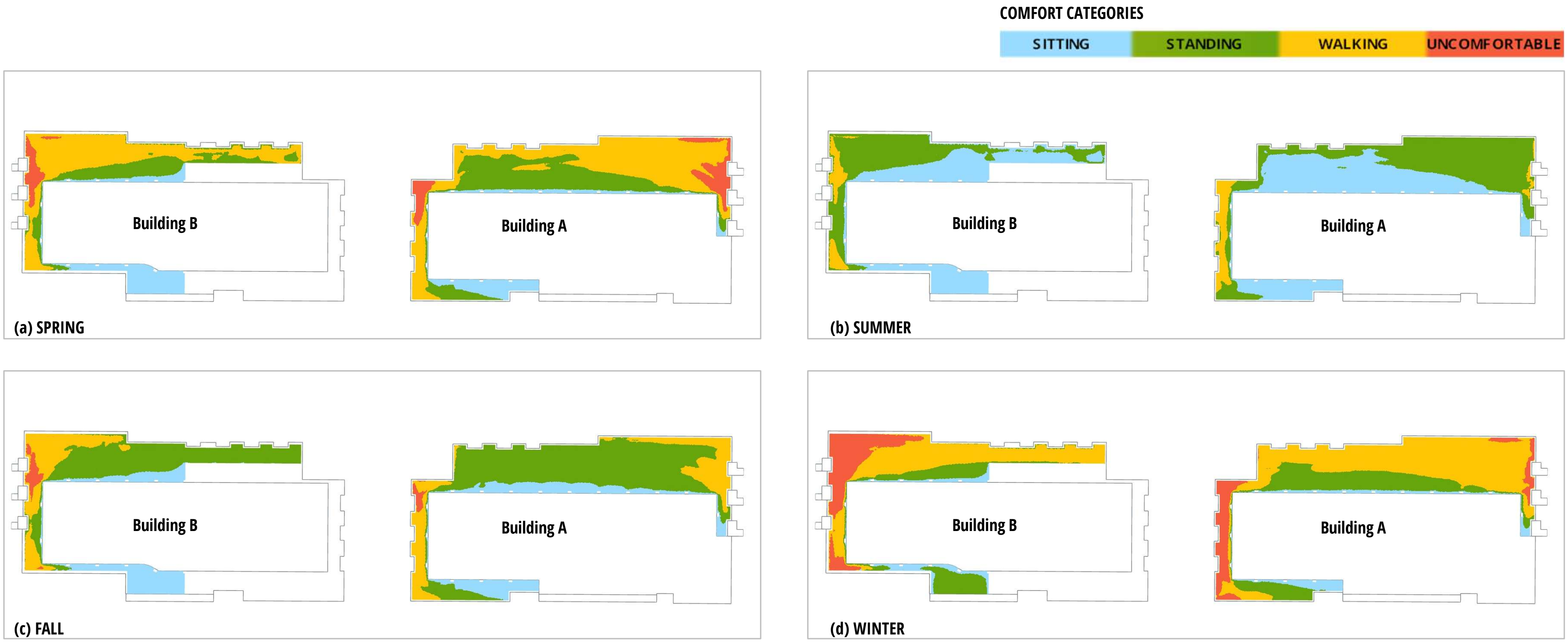


Image 14: Predicted Wind Comfort Conditions – Podium Level – FUTURE CONFIGURATION

5. RESULTS AND DISCUSSION

5.3 Ground Level

5.3.1 Existing Scenario

The existing building on the site is low rise and similar in height to the neighbouring buildings and therefore will not redirect winds to create any notable impact. Results for this scenario are presented in Images 9a through 12a. Wind conditions around the site are comfortable for standing during the summer and comfortable for standing or walking during the fall and spring. Higher wind speeds are expected in the winter; conditions would be comfortable for walking in the built areas, and potentially uncomfortable conditions along the south side of the site, along Dundas Street and the bus stop. Wind activity on and around the site is expected to meet the annual safety criterion.

5.3.2 Proposed Scenario

Wind conditions predicted for this scenario are presented in Images 9b through 12b. The addition of the proposed tall buildings in a low-rise context will result in the tall buildings being exposed to the prevailing wind. Downwashing, corner acceleration, and channeling of the preexisting strong winds in the area can result in localized areas of increased wind activity immediately around and between the proposed buildings. Positively, the proposed towers will also shelter and reduce wind activity in areas downwind. The project is not expected to worsen wind conditions on neighbouring properties to the west, north or east.

MAIN ENTRANCES: The principal residential entrances are proposed at the southwest corner of Building A and the southeast corner of Building B, on façades facing the area between the two proposed buildings. Wind speeds near these entrances are expected to be comfortable for sitting or standing throughout the year (Images 9b, 10b, 11b, and 12b), which is appropriate for the intended use.

SIDEWALKS: During the spring, summer and fall, wind speeds at most areas around the site are expected to be comfortable for standing or walking. Uncomfortable wind conditions may occur between proposed buildings during the spring and fall due to channeling of the northeast winds (Images 10b and 11b). In the winter, high speeds comfortable for walking or uncomfortable conditions are expected at most areas and can lead to the exceedance of the annual safety criterion.

BUS STOP: Wind speeds at the bus stop southwest of the site are expected to be comfortable for standing in the summer, for walking in the spring and fall, and uncomfortable in the winter, similar to the existing conditions (Images 9b through 12b). The project is not expected to worsen wind conditions at the bus stop.

PRIVATELY OWNED PUBLICLY ACCESSIBLE SPACE (POPS): During the summer, wind speeds in the POPS located at the southwest corner of Building B are predicted to be comfortable for sitting or standing (Image 10b), which is suitable for the intended use. During the spring and fall, higher wind speeds comfortable for standing or walking are expected (Images 9b and 11b); these conditions are appropriate for occasional or active uses, and higher than desirable for prolonged seating. In the winter, uncomfortable wind conditions may occur due to exposure to the preexisting strong seasonal southwesterly winds (Image 12b).

RECOMMENDATIONS: The preexisting high wind speeds can get exaggerated around the proposed buildings. To reduce wind activity during the winter, large clusters of evergreen trees and/or wind screens (minimum 2 m tall and no more than 30% porous) are recommended to be considered in the POPS and the area between the buildings. These measures can help diffuse wind acceleration and reduce localized wind activity in the identified areas. Image 15 presents examples of these wind control features. We recommend confirming the wind conditions through testing at a later design stage so that the wind control solutions may be developed appropriately.

5. RESULTS AND DISCUSSION

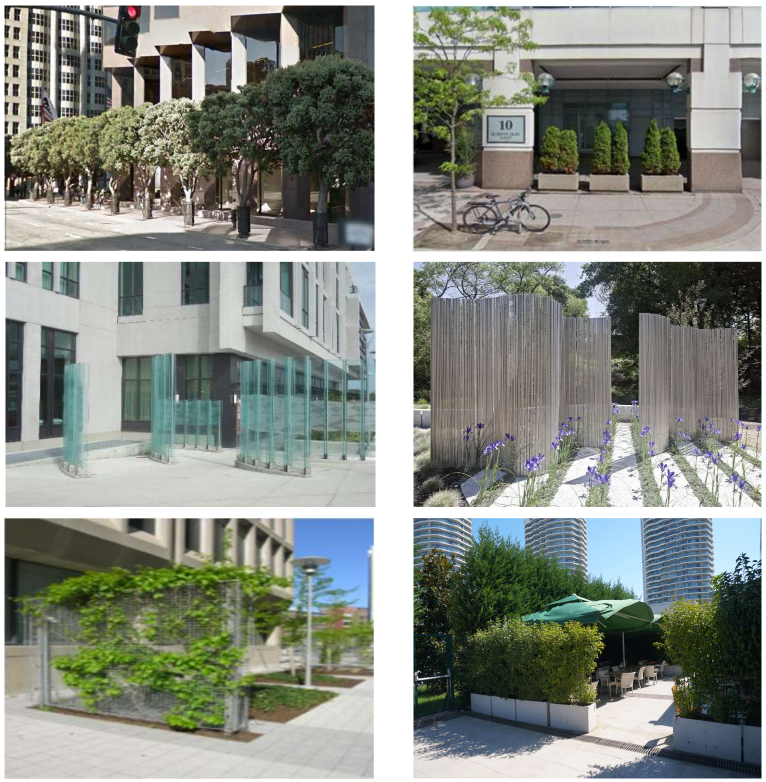


Image 15: Wind control examples at grade

5.3.3 Future Scenario

This scenario assesses the impact of future developments located to the east and west of the proposed project (Image 5c), which are expected to provide additional shelter from the dominant winds.

Compared to the Proposed Scenario, an overall reduction in wind speeds is predicted on the project site (see Images 9 through 12). Wind speeds are expected to continue to be comfortable for sitting or standing during the summer (Image 10c) and comfortable for standing or walking during the spring and fall across most areas of the site (Images 9c and 11c). Relative to the proposed scenario, the lower wind speed categories are expected across a larger area in the Future configuration, representing an improvement relative to the windier conditions predicted under the Proposed Scenario. During the winter, areas of higher seasonal wind speeds rated as uncomfortable are expected to occur in fewer and more localized locations compared to the Proposed Scenario. Wind conditions comfortable for sitting or standing are expected near most of the entrances in all seasons. Wind speeds comfortable for sitting or standing are expected in a larger area of the POPS, compared to the Proposed configuration, during the spring, summer, and fall (Images 9c, 10c, and 11c) which is suitable for the intended use., and comfortable for standing or walking during the winter (Image 12c).

5. RESULTS AND DISCUSSION

5.4 Level 5 Amenity Space

5.4.1 Proposed Scenario

Predicted seasonal wind conditions for the Level 5 amenity areas are shown in Image 13. The podium roof areas would be subjected to strong wind activity due to the elevation and resulting exposure to the southwest and northeast winds, as well as winds redirected by the towers. Wind speeds comfortable for sitting or standing are expected in most areas in the summer, and some areas in the fall. Conditions in the spring and winter are expected to be too windy for passive activities. Wind control measures are recommended to be considered to reduce wind speeds to appropriate levels in the shoulder seasons.

5.4.2 Future Scenario

Compared to the Proposed Scenario, slightly reduced wind speeds are expected (Image 14). Wind control measures will continue to be required to achieve appropriate conditions for seasonal use.

5.4.3 Recommendations

While conditions comfortable for standing are considered appropriate for general passive uses, winds comfortable for sitting are ideal in areas intended for prolonged use for seating, dining and lounging. To reduce wind speeds throughout the area, we suggest installing tall guardrails (at least 2 m tall, solid or up to 30% porous) around the amenity perimeter. We also recommended incorporating additional vertical features (wind screens, partitions, or landscaping that are at least 1.5 m tall) throughout the spaces, especially around any designated seating areas to further reduce wind exposure. Image 16 presents examples of these wind control features.

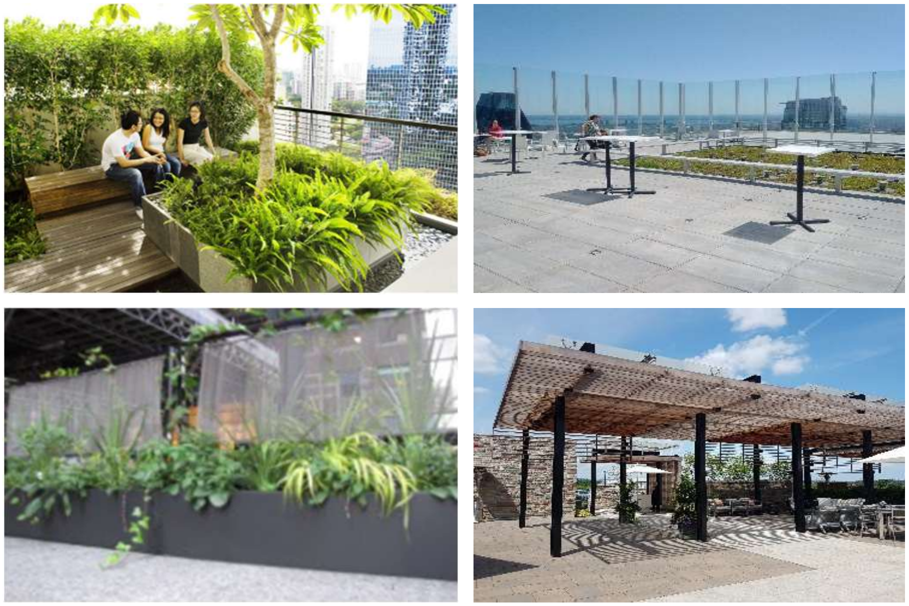


Image 16: Wind control examples for above-grade amenity areas

6. SUMMARY

RWDI was retained to provide an assessment of the potential pedestrian level wind impact of the proposed development at 5500 Dundas Street West in Toronto, 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 Toronto. Our findings are summarized as follows:

- The proposed site is occupied and surrounded by low rise buildings and therefore has no significant impact on wind conditions. The preexisting conditions on the site are characterized by low speeds in the summer, moderate to high speeds in the spring and fall, and higher speeds creating uncomfortable conditions in the winter.

- The proposed addition of a tall two-tower development is expected to redirect winds in a way that would shelter downwind areas and reduce wind activity from the preexisting conditions immediately around the site and increase wind speeds locally at the building corners and in the area between the proposed towers.

- Wind conditions at most areas at ground level, including the POPS and sidewalks, are expected to be appropriate for the intended usage in the spring, summer and fall, and windier than ideal in the winter due to the preexisting strong wind activity in the area.

- The wind conditions at the main entrances for the residential buildings are appropriate year-round for the intended use.

- The proposed low podium will help moderate wind impacts at ground level to a large extent, but the podium roof itself will be windy as a result.

- The proposed future developments on east and west of the site can help shelter the project site from the prevailing winds and reduce wind activity around the site to a notable degree.

- Wind control strategies have been provided to improve wind conditions at grade level and on the above-grade amenity areas to be appropriate for prolonged use for relaxed activities like sitting, dining and lounging.

- We recommend confirming the wind conditions through testing at a later design stage so that the wind control solutions may be developed appropriately.

- RWDI will continue to help guide the placement of wind control features to achieve appropriate levels of wind comfort based on the programming of the various outdoor spaces as the design develops.

6. DESIGN ASSUMPTIONS

The findings/recommendations in this report are based on the building geometry and architectural drawings communicated to RWDI between November and December 2025, listed below. 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)
20251210 - 5500 Dundas Street West - Issued for ZBA - Landscape - Part1	PDF	12/11/2025
251122_5500 Dundas model	DWG	11/23/2025
251122_5500 Dundas_drawing package	PDF	11/23/2025

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.

7. STATEMENT OF LIMITATIONS

This report was prepared by Rowan Williams Davies & Irwin Inc. for FCHT Holdings (Ontario) Corporation ("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.