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October 4, 2024

Oakville Argus Cross LP
c/o Clarence Zichen Qian
Distrikt
90 Wingold Avenue, Unit 1
Toronto, Ontario M6B 1P5
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Re: Pedestrian Wind Study Results for Oakville TOC
217 Cross Ave
RWDI Reference No. 2306816

Dear Clarence,

Rowan Williams Davies & Irwin Inc. (RWDI) has prepared this letter to comment on the potential wind conditions that may result from recent design changes to the proposed project at 217 Cross Avenue in Oakville, Ontario.

RWDI conducted an initial pedestrian wind assessment using computational fluid dynamics tools for the then-proposed development in August 2023. More detailed pedestrian wind studies using physical models in a wind tunnel followed in November 2023 and January 2024. Our findings are summarized in the following report based on the drawings received by RWDI on and prior to January 16, 2024:

> *Report – Pedestrian Wind Comfort Assessment – 217 Cross Ave, Oakville, RWDI #2306816, January 26, 2024, by Henrique D.L. Gambassi, Hanqing Wu and Scott Bell.*

With the proposed buildings in place, wind speeds were expected to be appropriate for pedestrian use at most locations during the summer, with uncomfortable wind conditions only anticipated in the corridors between Towers A and B and between Towers B and C as well as on the Level 7 terrace around the northeast corner of Tower A. During the winter, however, elevated wind speeds were predicted across the site due to the height and exposure of the towers to the stronger winter winds, resulting in uncomfortable or even unsafe wind conditions at and above grade.

Updated Tower Designs

The design has been advanced since the wind assessments, as suggested by the updated drawings received by RWDI on September 25, 2024. Image 1 compares the current site plan with that used for the latest wind-tunnel modelling. While the general building layout and massing remain similar, there are several changes that may potentially alter the local wind conditions on and around the project site.

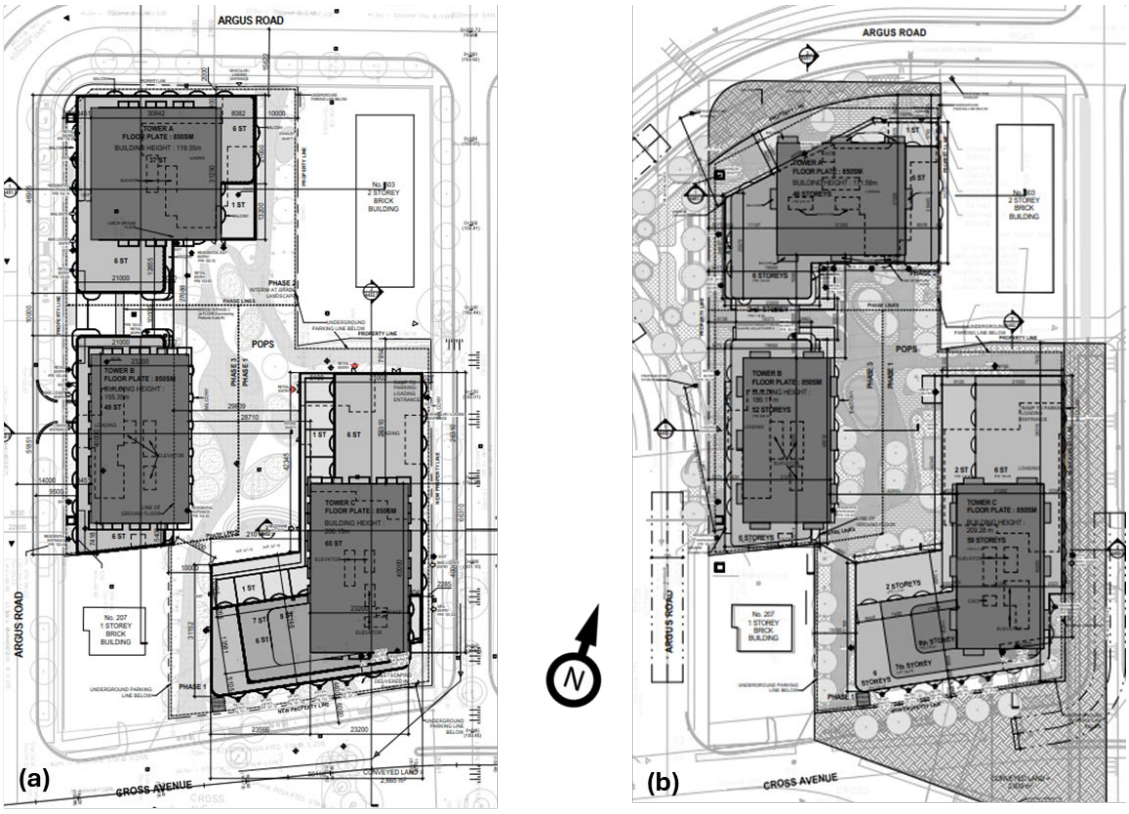


Image 1: Site Plans (a) used in the January 26, 2024 report and (b) Received on September 25, 2024

- The heights of the proposed Towers A, B and C are changed from 37, 49 and 65 storeys in Image 1(a) to 46, 52 and 59 storeys, respectively in Image 1(b). The floor dimensions are also changed slightly, but the rectangular plans remain for all three towers. Due to the substantial heights and slender shapes of the proposed towers, these proposed changes are considered minor and not expected to significantly affect the predicted wind conditions.

- As shown in Image 1(b), Tower A is shifted to the east, creating more podium or tower setback along Argus Road and reducing the direct impact of downwashing winds. The northwest corner of the podium is chamfered and set back from the intersection, which is also positive for wind reduction when compared to the original design of the 90-degree corner right at the intersection. These positive features are expected to generate similar or slightly improved wind conditions around Tower A, despite the height increase.

- It is also positive for wind control by relocating the main entrance for Tower A to a recessed area in the middle of the north façade and eliminating the retail entrances along the corridor between Towers A and B.

- The expansion of the 2nd floor bridge between Towers A and B is expected to work as a podium extension for both towers, reducing the wind speeds along the corridor and in the outdoor space to the east.

- Wind conditions on the proposed podium terraces are expected to be similar to those predicted in the wind tunnel report and appropriate in most areas during the summer, except for local areas around the corners of Tower A and on the open terrace north of Tower C.

- After the wind tunnel testing, several wind control measures were contemplated by the design team, including landscaping on and around the site, wind screens along the site perimeter and gateway features between the proposed tower podia, plus tall guardrails, local wind screens, planters and pergolas for podium terraces. These features can be further developed in the later design stages.

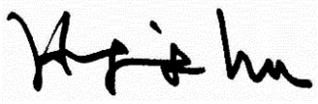
Concluding Remarks

In summary, the current building design has a general massing similar to that modelled in the wind tunnel. Overall, the wind predictions presented in RWDI's January 26, 2024 report remain valid. Design changes, such as chamfered Tower A podium, relocation of Tower A main entrance and expansion of the 2nd floor bridge, are generally positive for wind reduction.

It is our understanding that, as design progresses, additional wind-tunnel tests will be conducted to quantify the wind conditions and to refine wind control strategies. In the interest of time, we trust this memo satisfies the current requirements for the city submission. Should you have any questions or require additional information, please do not hesitate to contact us.

Yours truly,

RWDI



Hanqing Wu, Ph.D., P.Eng.
Senior Technical Director / Principal

Scott Bell
Project Manager

Statement of Limitations

This letter was prepared by Rowan Williams Davies & Irwin Inc. ("RWDI") for Oakville Argus Cross LP ("Client"). The findings and conclusions presented in this letter have been prepared for the Client and are specific to the 217 Cross Ave project described herein ("Project"). The conclusions and recommendations contained in this letter are based on the information available to RWDI when this letter was prepared. Because the contents of this letter may not reflect the final design of the Project or subsequent changes made after the date of this letter, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in the previous report and this letter have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in the previous report and this letter have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report/letter 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 letter carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

ATTACHMENTS

REPORT

217 CROSS AVENUE

OAKVILLE, ON

PEDESTRIAN WIND STUDY
RWDI # 2306816
January 26, 2024

SUBMITTED TO

Oakville Argus Cross LP

CC TO:

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed 217 Cross Avenue in Oakville, ON. The assessment was based on the wind-tunnel testing conducted for the proposed development under the Existing and Proposed configurations of the site and surroundings. The results were analysed using the regional wind climate records and evaluated against the RWDI Pedestrian Wind Criteria for pedestrian comfort (pertaining to common wind speeds conducive to different levels of human activity) and pedestrian safety (pertaining to infrequent but strong gusts that could affect a person's footing). The predicted wind conditions are presented in Figures 1A through 3B, and Table 1, and are summarized as follows:

- The Wind Safety Criterion is met at all assessed locations in the Existing configuration. In the Proposed configuration, the Safety Criterion is expected to be exceeded in the POPS between the three proposed towers, near the northwest corner of Tower A, between Towers A and B, between Towers B and C, and at the intersection of Cross Avenue and Argus Road. The criterion is also predicted to be exceeded at locations on the Level 7 terraces of Towers A and C.

- In the existing configuration, wind conditions on the sidewalks around the project site are appropriate throughout the year, except at one location between two existing buildings to the northwest, where uncomfortable wind conditions are expected during the winter.

- In the proposed configuration, wind speeds are expected to remain appropriate for pedestrian use at most locations during the summer, with uncomfortable wind conditions only anticipated in the corridors between Towers A and B and between Towers B and C. During the winter, however, elevated wind speeds are predicted at several locations across the site due to the height and exposure of the towers to the stronger winter winds.

- Wind speeds at most residential and retail entrances are anticipated to be appropriate during the summer. Speeds are expected to be higher than recommended at the retail entrances between Towers A and B and at the southeast residential entrance of Tower B. In the winter, elevated wind speeds are anticipated at most entrances of Towers A and B and at the corner entrance of Tower C close to the gap formed with Tower B.

- Wind conditions at most locations on the above-grade terraces of Tower A (Level 7) and Tower C (Levels 7 and 8) are generally expected to be comfortable during the summer. Higher-than-ideal speeds are predicted around the northern corners of Tower A (Level 7) and at some locations on the north part of the Level 7 terrace of Tower C. Increased wind speeds are anticipated in the winter, however, this may not be a serious concern since limited use of the terraces is anticipated in the colder months of the year.

- We note that since the wind tunnel test was completed, the design team has proposed several additional wind control features to improve wind conditions at grade and on the Level 7 terraces. The new additions are outlined and their potential wind reduction effects are discussed in Section 3.3.

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Figure 2A: Pedestrian Wind Comfort Conditions – Existing Configuration – Winter
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Figure 3A: Pedestrian Wind Safety Conditions – Existing Configuration – Annual
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Table 1: Pedestrian Wind Comfort and Safety Conditions

1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed 217 Cross Avenue project in Oakville, ON. This report presents the project objectives, approach and the main results from RWDI's assessment and provides conceptual wind control measures, where necessary. Our Statement of Limitations as it pertains to this study can be found in Section 4 of this report.

1.1 Project Description

The proposed development site is located south of the Queen Elizabeth Way, on Cross Avenue and Argus Road. The site is surrounded by low-rise buildings and parking lots in all directions (Image 1). The proposed project will consist of three high-rise towers: A at 36 stories, B at 48 stories, and C at 64 stories, each with a 6/7-storey podium.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations for minimizing adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to the RWDI Criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including public sidewalks, building entrances, and outdoor amenities.

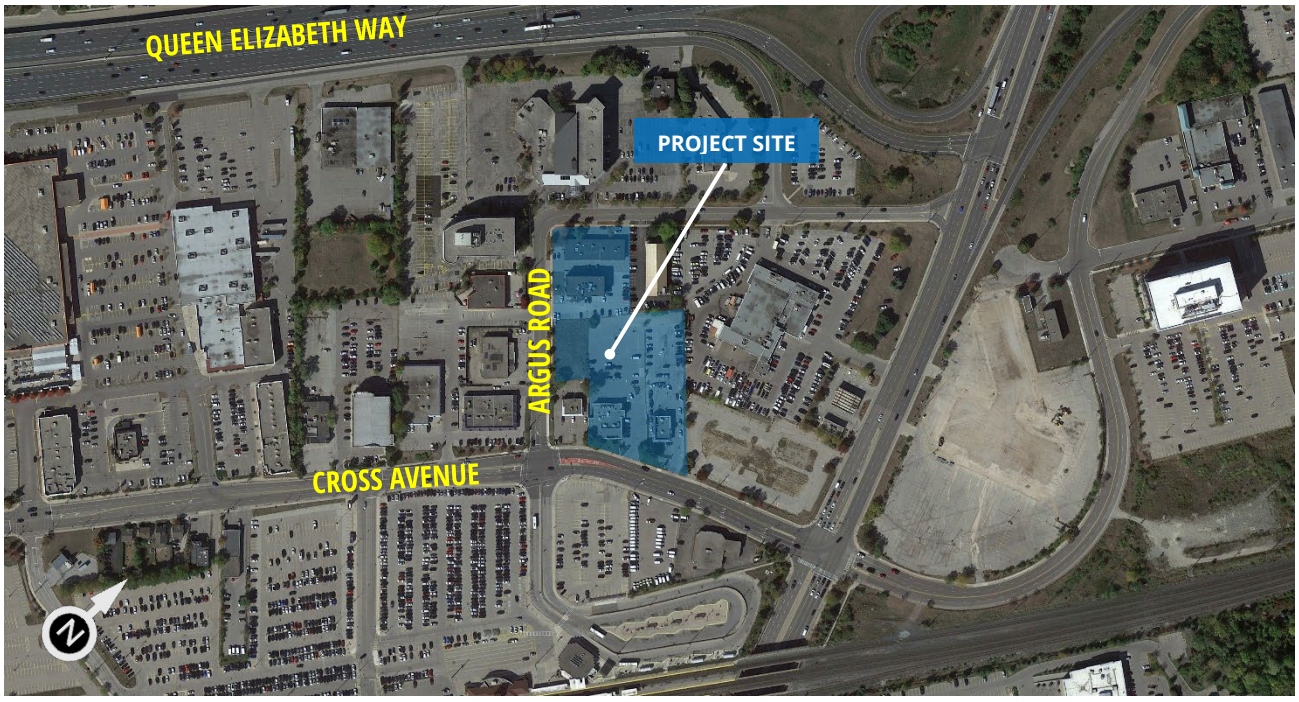


Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed project, a 1:400 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

A - Existing: Existing site with existing surroundings (Image 2A),

B - Proposed: Proposed project with existing surroundings (Image 2B), and,

The wind tunnel model included all relevant surrounding buildings and topography within an approximate 480 m radius around the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 106 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 1.5 m above local grade in pedestrian areas throughout the study site. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site. Wind speeds were measured for 36 directions in 10-degree increments. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model.

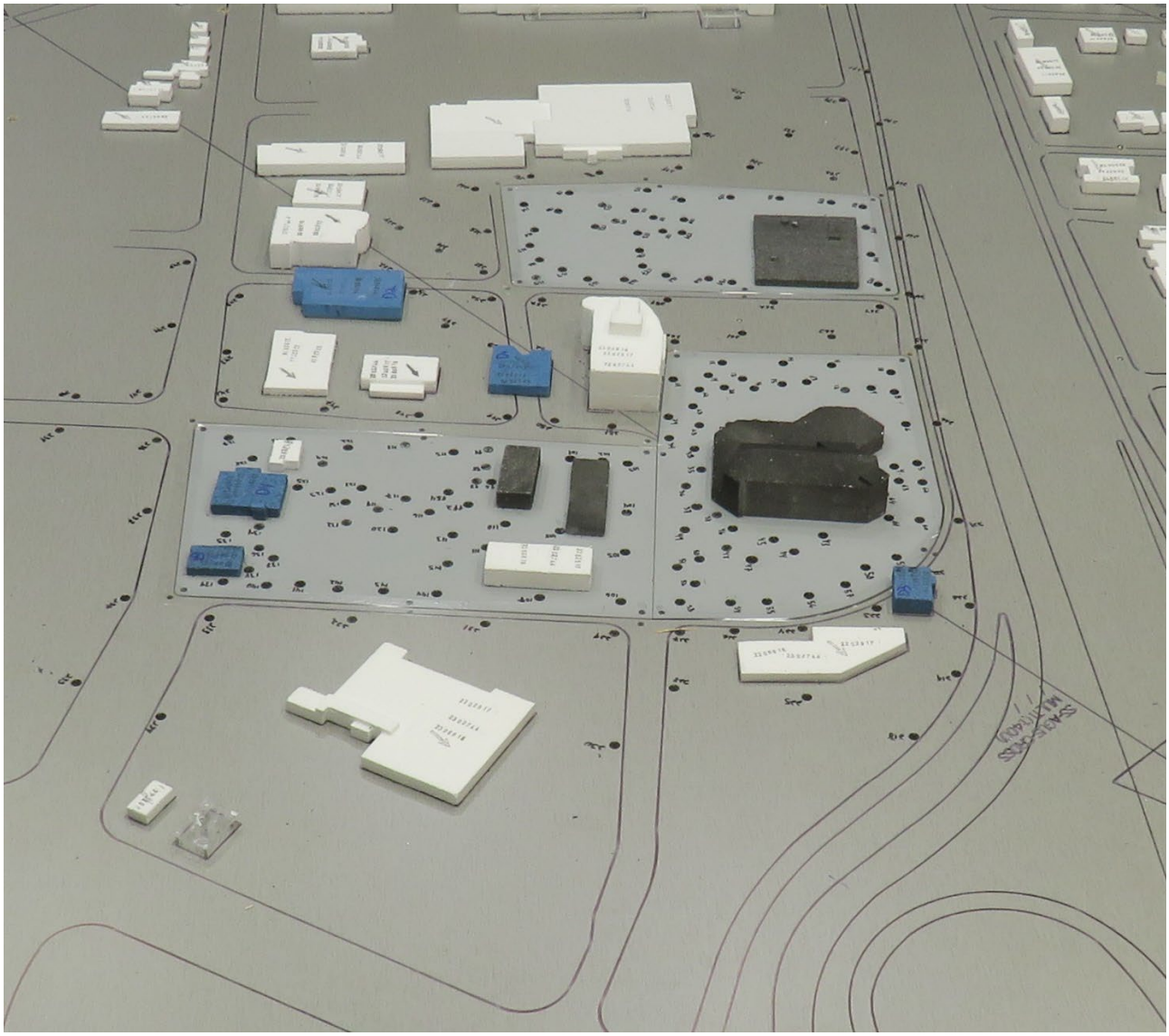


Image 2A: Wind Tunnel Study Model – Existing Configuration

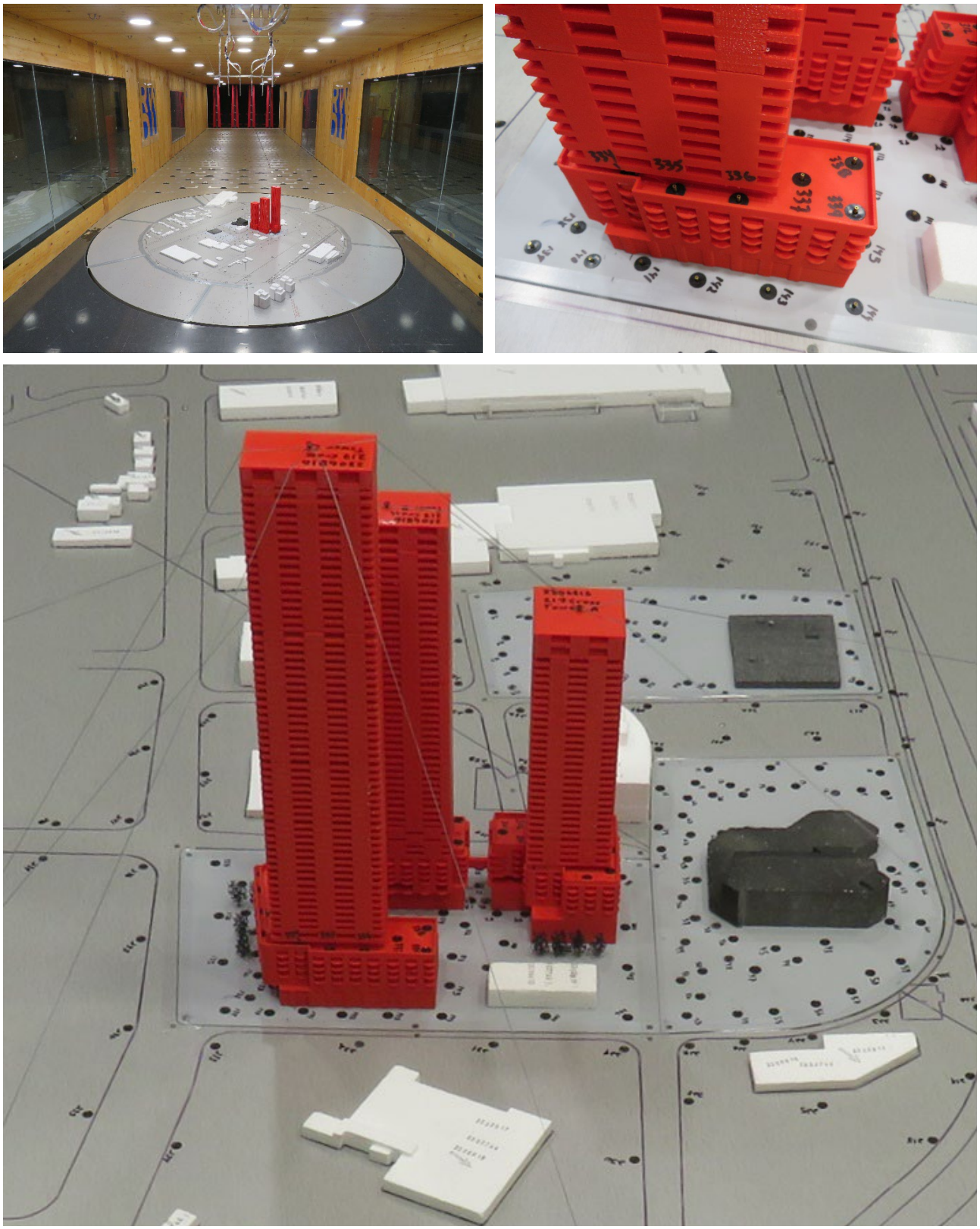
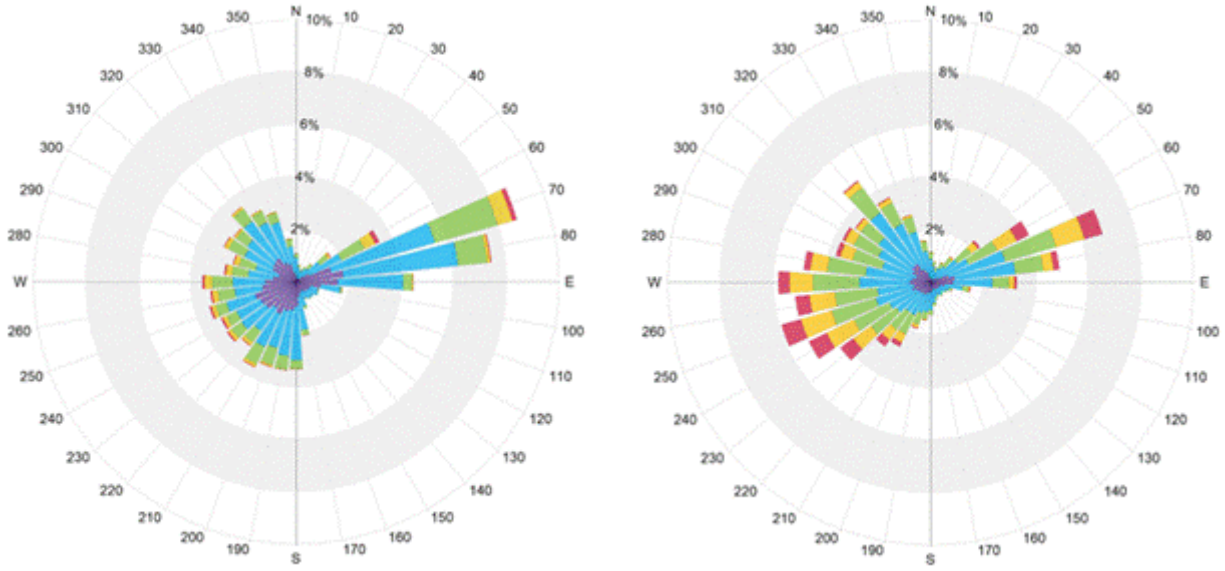


Image 2B: Wind Tunnel Study Model – Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Billy Bishop Toronto City Airport between 1990 and 2020, inclusive, were analyzed for the Summer (May through October) and Winter (November through April) seasons. Image 3 graphically depicts the directional distributions of wind frequencies and speeds for these two seasons. Winds from the east-northeast and westerly 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) occur for 4.3% and 17.2% of the time during the summer and winter seasons, respectively.

Wind statistics were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the wind criteria for pedestrian comfort and safety.



Summer (May – October) Winter (November – April)

Wind Speed (km/h)	Probability (%) Summer	Winter
Calm	5.6	2.6
1-10	30.4	17.1
11-20	43.3	37.8
21-30	16.3	25.3
31-40	3.4	11.4
>40	0.9	5.8

Image 3: Directional Distribution of Winds Approaching Billy Bishop Toronto City Airport between 1990 and 2020

2.3 RWDI Pedestrian Wind Criteria

The RWDI pedestrian wind criteria, which have been developed by RWDI through research and consulting practice since 1974, are used in the current study. These criteria have been widely accepted by municipal authorities as well as by the building design and city planning community. Regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can affect a person's perception of the wind climate. Therefore, comparisons of wind speeds for the existing and proposed building configurations are the most objective way in assessing local pedestrian wind conditions. In general, the combined effect of mean and gust speeds on pedestrian comfort can be quantified by a Gust Equivalent Mean (GEM).

Comfort Category	GEM Speed (km/h)	Description
Sitting	≤ 10	Calm or light breezes desired for outdoor restaurants and 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 that would be 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 of this magnitude are considered a nuisance for all pedestrian activities, and wind mitigation is typically recommended

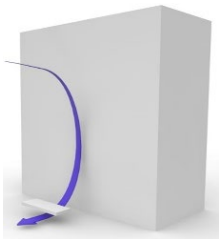
Notes:
(1) GEM Speed = max (Mean Speed, Gust Speed/1.85) and *Gust Speed = Mean Speed + 3*RMS Speed*;
(2) Wind conditions are considered to be comfortable if the predicted GEM speeds are within the respective thresholds for at least 80% of the time between 6:00 and 23:00. Nightly hours between 0:00 and 5:00 are excluded from the wind analysis for comfort since limited usage of outdoor spaces is anticipated; and,
(3) Instead of standard four seasons, two periods of summer (May to October) and winter (November to April) are adopted in the wind analysis, because in a cold climate such as that found in Oakville, there are distinct differences in pedestrian outdoor behaviours between these two-time periods.

Safety Criterion	Gust Speed (km/h)	Description
Exceeded	> 90	Excessive gust speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is typically required.

Notes:
(1) Based on an annual exceedance of 9 hours or 0.1% of the time for 24 hours a day; and,
(2) Only gust speeds need to be considered in the Wind Safety Criterion. These are usually rare events but deserve special attention in city planning and building design due to their potential safety impact on pedestrians.

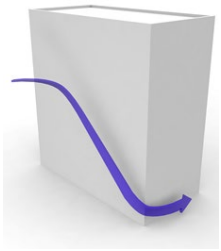
2.4 General Wind Flow Mechanisms

In the discussion of wind conditions, reference is made to the following wind flow mechanisms (Image 4):



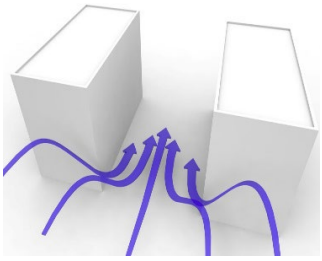
DOWNWASHING

Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. This is often the main cause for wind accelerations around large buildings at the pedestrian level.



CORNER ACCELERATION

When wind moves around the buildings a localized increase in the wind activity or corner acceleration can be expected around the exposed building corners at pedestrian level. The effect is intensified when the wind approaches at an oblique angle to a tall façade and are deflected down and around the exposed corners.



CHANNELLING EFFECT

Wind flow tends to accelerate through the space between buildings, under bridges or in passages through buildings due to channelling effect caused by the narrow gap. The effect is intensified if the channel is aligned with the predominant wind direction.

Image 4: General Wind Flow Mechanisms

If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity. Design details such as setting back a tall tower from the edges of a podium, deep canopies close to ground level, wind screens, tall trees with dense landscaping, etc. (Image 5) can help reduce wind speeds. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

Podium/tower setback, canopy, landscaping and wind screens (left to right)

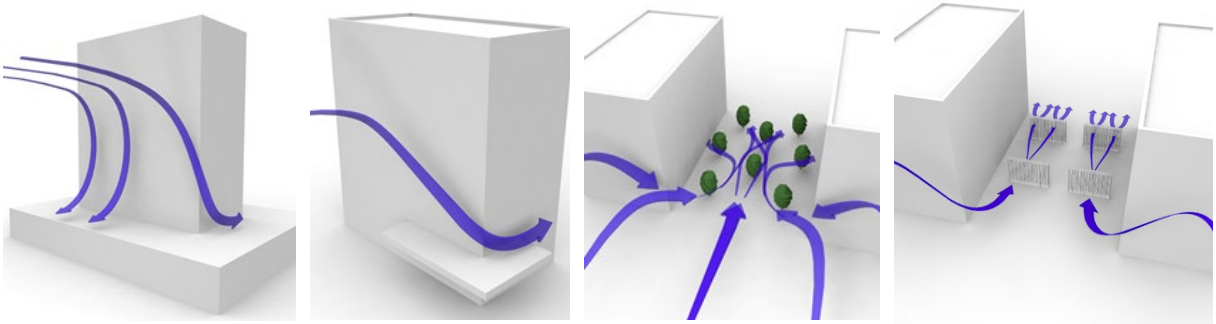


Image 5: Common Wind Control Measures

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on site plans in Figures 1A through 3B located in the "Figures" section of this report and the associated wind speeds are presented in Table 1, located in the "Tables" section of this report. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

3.1 Existing Configuration

The existing buildings on site are low-rise and do not redirect winds to create any notable impact. Wind conditions on and around the site are generally comfortable for sitting or standing in the summer (Figure 1A) and comfortable for strolling or walking in the winter (Figure 2A). Uncomfortable wind conditions occur at one location between two existing buildings to the northwest during the winter (Location 59 in Figure 2A). Wind speeds at all areas near the project site meet the Wind Safety Criterion (Figure 3A).

3.2 Proposed Configuration

The proposed buildings are taller than the immediate surroundings in all wind directions. As a result, winds intercepted by the towers at high elevations are expected to downwash to the ground level, accelerating around building corners and through the gaps between the towers. The resultant on-site wind speeds at grade are expected to be generally higher than those in the Existing Scenario. These effects are expected to be moderated by the podia of the towers, which act as horizontal breaks for downwashing winds (see Image 5). Towers A and B also partially shelter Tower C (the tallest tower) from the westerly winds, which is positive. The rounded corners of the podia are also a useful feature that helps to reduce the extent of the areas of high wind activity around the corners.

3.2.1 Wind Safety

The Wind Safety Criterion is met at all assessed locations in the Existing configuration (Figure 3A). In the Proposed configuration, the Safety Criterion is expected to be exceeded in the POPS between the three proposed towers (Locations 17 and 23), near the northwest corner of Tower A (Location 10 in Figure 3B), between Towers A and B (Locations 4,5, and 6 in Figure 3B), between Towers B and C (Locations 30 and 31 in Figure 3B), and at the intersection of Cross Avenue and Argus Road (Location 34 in Figure 3B). The criterion is also predicted to be exceeded at locations on the Level 7 terraces of Tower A (Locations 84, 85, 87, and 89 in Figure 3B) and Tower C (Location 103 in Figure 3B).

3.2.2 Wind Comfort

3.2.2.1 Sidewalks and Walkways

Wind speeds on most sidewalks around the site are expected to be comfortable for standing or strolling in the summer (Figure 1B). Uncomfortable wind conditions are anticipated at localized areas between Towers A and B, and between Towers B and C (Locations 5 and 30 in Figure 1B). In the winter, wind speeds are predicted to be generally higher. Speeds comfortable for walking or lower are still predicted in some areas close to Towers B and C.

However, uncomfortable wind speeds are anticipated over large regions around all towers (Figure 2B). Conditions further away from the proposed buildings are anticipated to remain similar to the existing scenario.

3.2.2.2 Building Entrances

Wind conditions at almost all entrances considered in this assessment are anticipated to be comfortable for sitting or standing in the summer (Figure 1B). Higher-than-ideal wind speeds are anticipated at the retail entrances between Towers A and B and at the residential entrance on the southeast side of Tower B (Locations 3, 4 and 28 in Figure 1B). In the winter, conditions at most entrances of Tower C are still predicted to be adequate; however, higher-than-ideal wind speeds are predicted at retail entrances between the Towers A and B and at most entrances along the west façade of both towers (Figure 2B).

3.2.2.3 Privately-Owned Publicly Accessible Spaces (POPS)

Wind conditions at the plaza between the towers are expected to be generally comfortable for standing or strolling in the summer, and comfortable for walking in the winter. These wind speeds are adequate for active uses and pedestrians passing by but are higher than ideal for passive activities. Improved conditions are expected with the addition of landscaping.

3.2.2.4 Levels 7 and 8 Terraces

In the summer, wind speeds on the podium rooftops are anticipated to be comfortable for sitting or standing in most parts of the terraces (Figure 1B). Higher speeds occur on the north side of the Level 7 terraces; however, uncomfortable conditions are only anticipated near the northeast corner of the Level 7 Terrace of Tower A. In the winter, elevated wind speeds are predicted on most areas on the terraces (Figure 2B); however, high wind speeds in the winter may not be a serious concern if limited use of the terraces is expected in the colder months of the year.

3.3 Design Updates

Since the wind tunnel test has been conducted, the design has been updated to include several wind control elements. These elements include wind screens and gateway features to slow winds down at grade, and a large overhead feature between Towers A and B to reduce the impact of downwashing winds on the POPS space between the three towers (Image 6). In combinations, these features would help to improve wind conditions near targeted areas. Several wind screens are also planned on the Level 7 terraces, including partitions / wind screens and a pergola structure on the Level 7 Terrace of Tower C (Image 7). These are positive features that should help to create sheltered zones for occupants.

Considering the impact of the towers on the wind environment around them, additional efforts to improve wind conditions may be required, especially where the Safety Criterion is predicted to be exceeded. RWDI can quantify the effectiveness of the proposed wind control features through an additional wind tunnel test and provide additional suggestions.

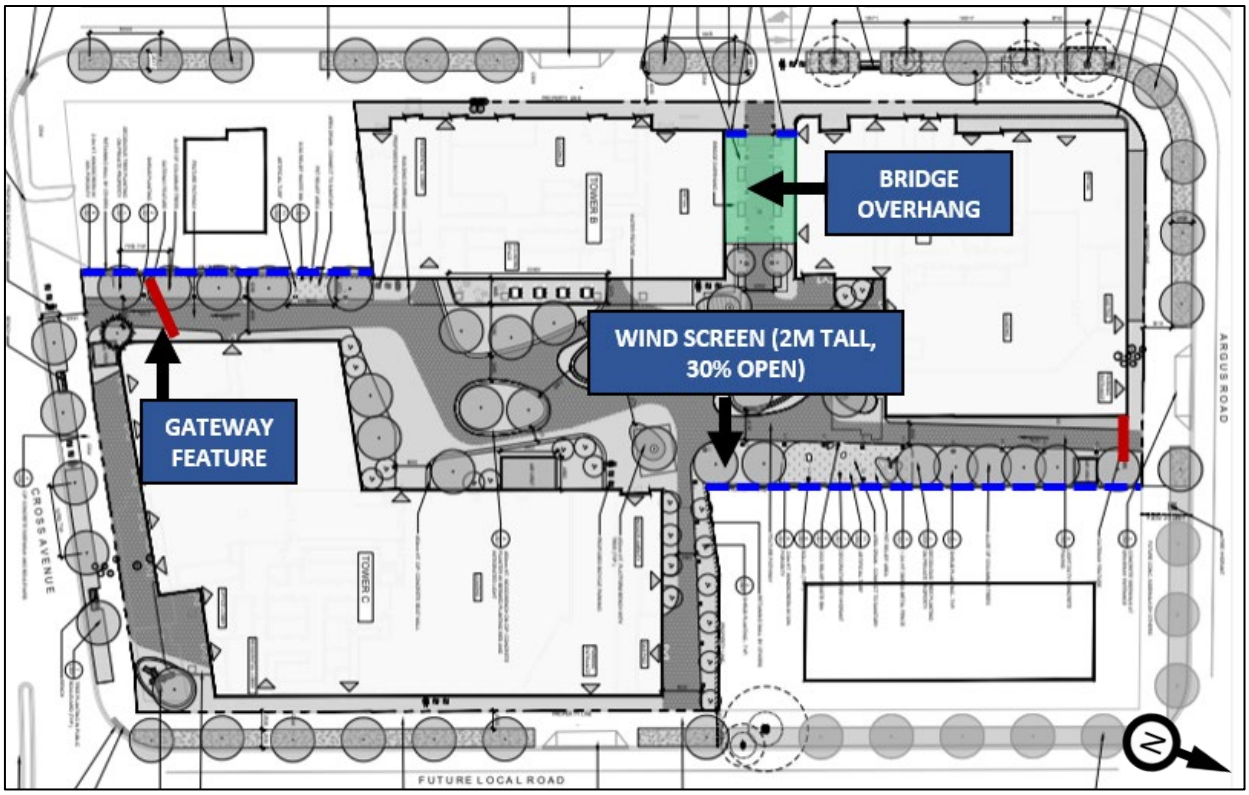


Image 6: wind control features added to the ground level after the wind tunnel test

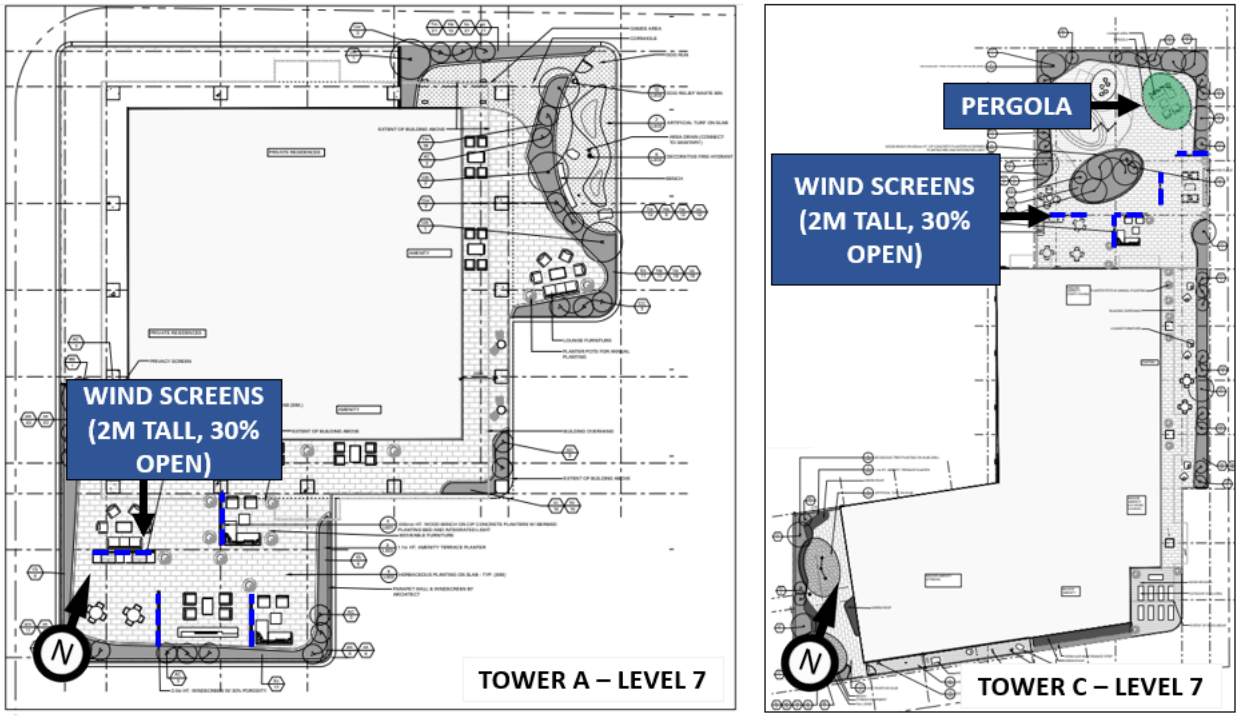


Image 7: wind control features added to Level 7 Terraces after the wind tunnel test

4 STATEMENT OF LIMITATIONS

Limitations

This report was prepared by Rowan Williams Davies & Irwin, Inc. ("RWDI") for Distrikt ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared.

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.

Design Assumptions

RWDI confirms that the pedestrian wind assessment (the "**Assessment**") discussed herein was performed by RWDI in accordance with generally accepted professional standards at the time when the Assessment was performed and in the location of the Project. No other representations, warranties, or guarantees are made with respect to the accuracy or completeness of the information, findings, recommendations, or conclusions contained in this Report. This report is not a legal opinion regarding compliance with applicable laws.

The findings and recommendations set out in this report are based on the following information disclosed to RWDI. Drawings and information listed below were received from the Client and used to construct the scale model of the proposed development **("Project Data**")

File Name	File Type	Date Received (dd/mm/yyyy)
_Landscape_SPA_2024-01-24	.PDF	24/01/2024
2024-01-12 BDPQ_SITE_19072_Cross+Argus_ZBA-SPA_Issued for Coordination	.PDF	16/01/2024
2023-09-20 - Landscape Model w Topo	.3DM	20/09/2023
19072_Cross + Argus Massing Model	.3DM	20/09/2023
2023-09-12 Cross Argus Rezoning-SPA Package PDF	.PDF	12/09/2023

The recommendations and conclusions are based on the assumption that the Project Data and Climate Data are accurate and complete. RWDI assumes no responsibility for any inaccuracy or deficiency in information it has received from others. In addition, the recommendations and conclusions in this report are partially based on historical data and can be affected by a number of external factors, including but not limited to Project design, quality of materials and construction, site conditions, meteorological events, and climate change. As such, the conclusions and recommendations contained in this report do not list every possible outcome.

The opinions in this report can only be relied upon to the extent that the Project Data and Project Specific Conditions have not changed. Any change in the Project Data or Project Specific Conditions not reflected in this report can impact and/or alter the recommendations and conclusions in this report. Therefore, it is incumbent upon the Client and/or any other third party reviewing the recommendations and conclusions in this report to contact RWDI in the event of any change in the Project Data and Project Specific Conditions in order to determine whether any such change(s) may impact the assumptions upon which the recommendations and conclusions were made.

5 REFERENCES

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FIGURES

ARGUS ROAD

CROSS AVENUE

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Strolling
- Walking
- Uncomfortable

Grade Level Sensor

0 25 50m

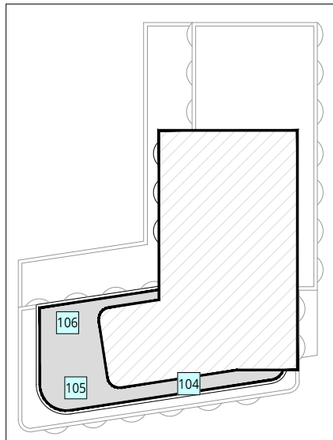
Pedestrian Wind Comfort Conditions
Existing Configuration
Summer (May to October, 6:00 to 23:00)

217 Cross Avenue - Oakville, ON

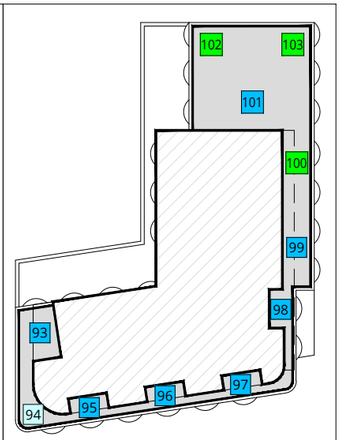
True North

Project #2306816

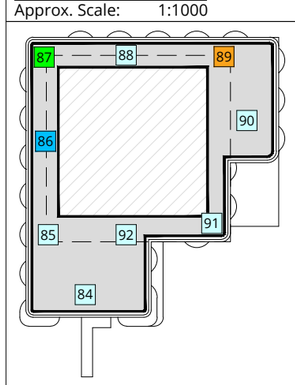
Drawn by:	GRE	Figure:	1A
Approx. Scale:	1:1250		
Date Revised:	Nov. 2, 2023		



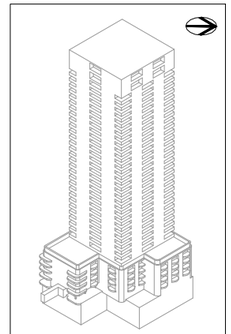
Tower C - Level 8 Terrace
Approx. Scale: 1:1000



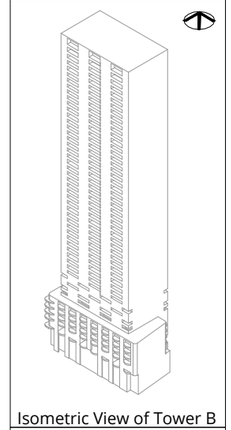
Tower C - Level 7 Terrace
Approx. Scale: 1:1000



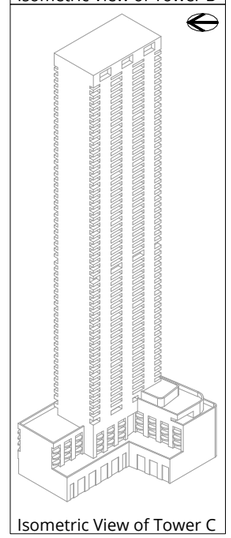
Tower A - Level 7 Terrace
Approx. Scale: 1:1000



Isometric View of Tower A



Isometric View of Tower B



Isometric View of Tower C

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Strolling
- Walking
- Uncomfortable

- Grade Level Sensor
- Terrace Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location
- Marcescent Tree

0 25 50m

Pedestrian Wind Comfort Conditions

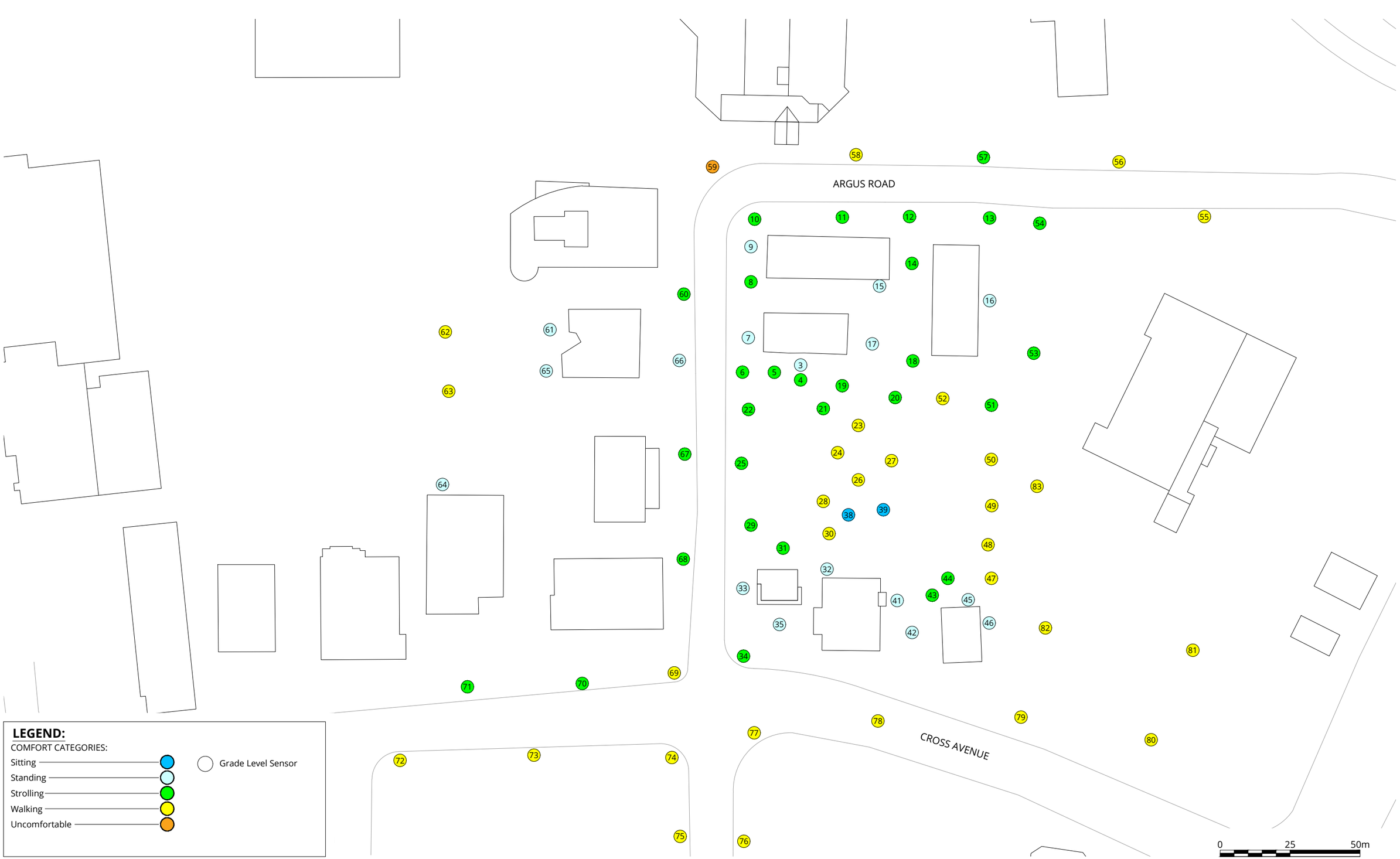
Proposed Configuration
Summer (May to October, 6:00 to 23:00)

217 Cross Avenue - Oakville, ON

True North

Project #2306816

Drawn by:	GRE	Figure:	1B
Approx. Scale:	1:1250		
Date Revised:	Nov. 2, 2023		



LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Strolling
- Walking
- Uncomfortable

Grade Level Sensor

Pedestrian Wind Comfort Conditions

Existing Configuration

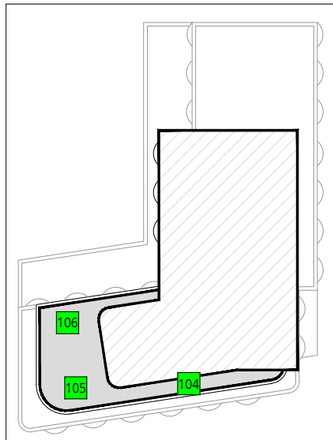
Winter (November to April, 6:00 to 23:00)

217 Cross Avenue - Oakville, ON

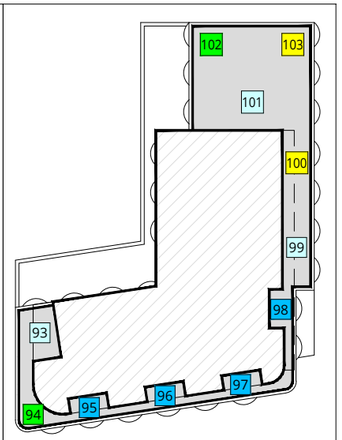
True North

Project #2306816

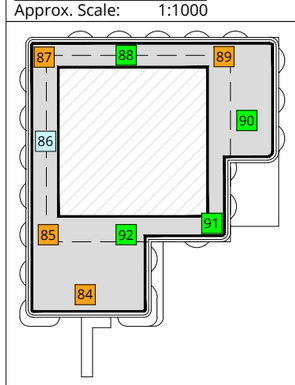
Drawn by:	GRE	Figure:	2A
Approx. Scale:	1:1250		
Date Revised:	Nov. 2, 2023		



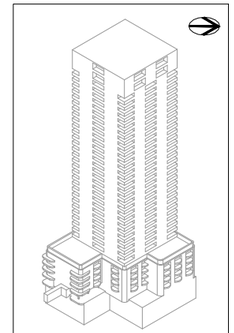
Tower C - Level 8 Terrace
Approx. Scale: 1:1000



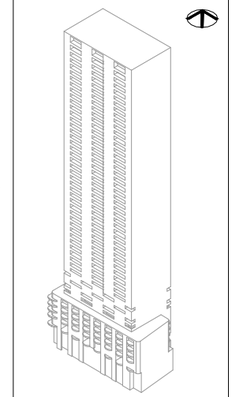
Tower C - Level 7 Terrace
Approx. Scale: 1:1000



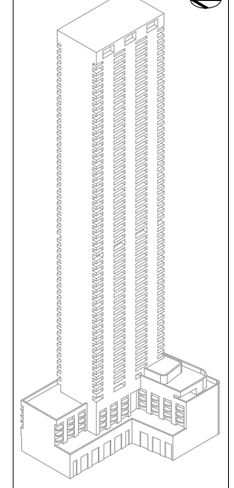
Tower A - Level 7 Terrace
Approx. Scale: 1:1000



Isometric View of Tower A



Isometric View of Tower B



Isometric View of Tower C

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Strolling
- Walking
- Uncomfortable

- Grade Level Sensor
- Terrace Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location
- Marcescent Tree

0 25 50m

Pedestrian Wind Comfort Conditions

Proposed Configuration
Winter (November to April, 6:00 to 23:00)

217 Cross Avenue - Oakville, ON

True North

Project #2306816

Drawn by:	GRE	Figure:	2B
Approx. Scale:	1:1250		
Date Revised:	Nov. 2, 2023		

LEGEND:

SAFETY CATEGORIES:

Pass

Exceeded

Grade Level Sensor

Pedestrian Wind Safety Conditions

Existing Configuration

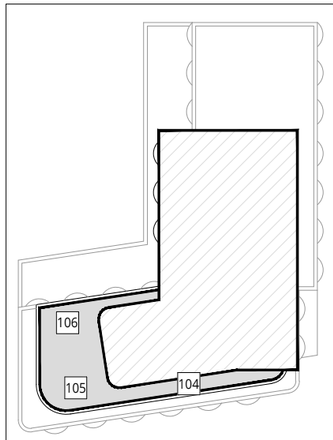
Annual (January to December, 0:00 to 23:00)

217 Cross Avenue - Oakville, ON

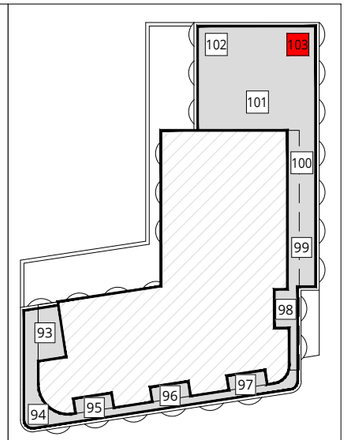
True North

Project #2306816

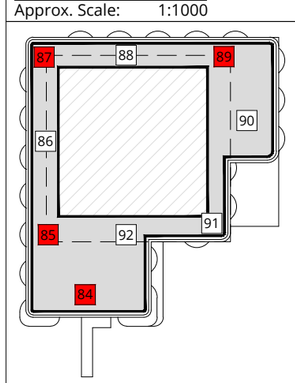
Drawn by:	GRE	Figure:	3A
Approx. Scale:	1:1250		
Date Revised:	Nov. 2, 2023		



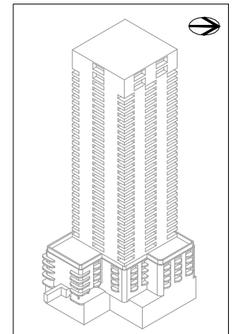
Tower C - Level 8 Terrace
Approx. Scale: 1:1000



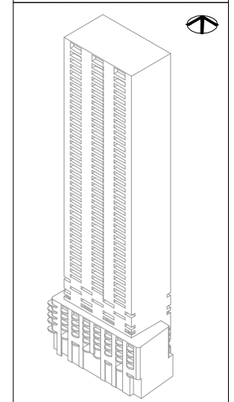
Tower C - Level 7 Terrace
Approx. Scale: 1:1000



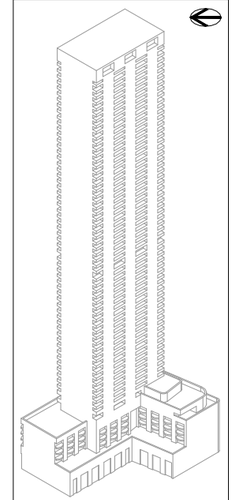
Tower A - Level 7 Terrace
Approx. Scale: 1:1000



Isometric View of Tower A



Isometric View of Tower B



Isometric View of Tower C

LEGEND:

SAFETY CATEGORIES:

Pass

Exceeded

Grade Level Sensor

Terrace Level Sensor

Building Above Removed for Clarity

Main Entrance Location

Marcescent Tree

0 25 50m

Pedestrian Wind Safety Conditions
Proposed Configuration
Annual (January to December, 0:00 to 23:00)

217 Cross Avenue - Oakville, ON

True North

Project #2306816

Drawn by:	GRE	Figure:	3B
Approx. Scale:	1:1250		
Date Revised:	Nov. 2, 2023		

TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
1	Existing	-	-	-	-	-	-
	Proposed	11	Standing	16	Strolling	57	Pass
2	Existing	-	-	-	-	-	-
	Proposed	10	Sitting	14	Standing	49	Pass
3	Existing	11	Standing	14	Standing	55	Pass
	Proposed	19	Walking	26	Uncomfortable	83	Pass
4	Existing	11	Standing	15	Strolling	57	Pass
	Proposed	18	Walking	29	Uncomfortable	98	Exceeded
5	Existing	11	Standing	16	Strolling	58	Pass
	Proposed	23	Uncomfortable	31	Uncomfortable	93	Exceeded
6	Existing	12	Standing	16	Strolling	55	Pass
	Proposed	17	Strolling	21	Uncomfortable	91	Exceeded
7	Existing	9	Sitting	13	Standing	50	Pass
	Proposed	12	Standing	15	Strolling	54	Pass
8	Existing	11	Standing	15	Strolling	60	Pass
	Proposed	12	Standing	15	Strolling	58	Pass
9	Existing	10	Sitting	14	Standing	56	Pass
	Proposed	12	Standing	17	Strolling	66	Pass
10	Existing	11	Standing	15	Strolling	60	Pass
	Proposed	18	Walking	24	Uncomfortable	93	Exceeded
11	Existing	11	Standing	15	Strolling	59	Pass
	Proposed	12	Standing	18	Walking	77	Pass
12	Existing	11	Standing	15	Strolling	57	Pass
	Proposed	15	Strolling	23	Uncomfortable	80	Pass
13	Existing	12	Standing	16	Strolling	59	Pass
	Proposed	15	Strolling	23	Uncomfortable	78	Pass
14	Existing	11	Standing	15	Strolling	56	Pass
	Proposed	15	Strolling	21	Uncomfortable	81	Pass
15	Existing	8	Sitting	11	Standing	50	Pass
	Proposed	11	Standing	14	Standing	50	Pass
16	Existing	10	Sitting	13	Standing	54	Pass
	Proposed	13	Standing	16	Strolling	78	Pass
17	Existing	10	Sitting	12	Standing	46	Pass
	Proposed	14	Standing	20	Walking	91	Exceeded
18	Existing	13	Standing	17	Strolling	60	Pass
	Proposed	14	Standing	20	Walking	77	Pass
19	Existing	12	Standing	16	Strolling	58	Pass
	Proposed	15	Strolling	22	Uncomfortable	87	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
20	Existing	13	Standing	17	Strolling	62	Pass
	Proposed	18	Walking	22	Uncomfortable	79	Pass
21	Existing	12	Standing	17	Strolling	62	Pass
	Proposed	13	Standing	15	Strolling	76	Pass
22	Existing	12	Standing	17	Strolling	59	Pass
	Proposed	10	Sitting	13	Standing	48	Pass
23	Existing	13	Standing	18	Walking	62	Pass
	Proposed	17	Strolling	20	Walking	97	Exceeded
24	Existing	13	Standing	18	Walking	62	Pass
	Proposed	15	Strolling	19	Walking	87	Pass
25	Existing	12	Standing	16	Strolling	55	Pass
	Proposed	10	Sitting	16	Strolling	66	Pass
26	Existing	13	Standing	18	Walking	61	Pass
	Proposed	15	Strolling	18	Walking	79	Pass
27	Existing	13	Standing	18	Walking	63	Pass
	Proposed	11	Standing	16	Strolling	72	Pass
28	Existing	13	Standing	18	Walking	61	Pass
	Proposed	17	Strolling	20	Walking	89	Pass
29	Existing	12	Standing	16	Strolling	57	Pass
	Proposed	14	Standing	25	Uncomfortable	86	Pass
30	Existing	12	Standing	18	Walking	62	Pass
	Proposed	21	Uncomfortable	27	Uncomfortable	97	Exceeded
31	Existing	11	Standing	16	Strolling	56	Pass
	Proposed	11	Standing	17	Strolling	94	Exceeded
32	Existing	10	Sitting	14	Standing	50	Pass
	Proposed	15	Strolling	22	Uncomfortable	82	Pass
33	Existing	10	Sitting	14	Standing	52	Pass
	Proposed	14	Standing	25	Uncomfortable	89	Pass
34	Existing	13	Standing	17	Strolling	58	Pass
	Proposed	18	Walking	27	Uncomfortable	91	Exceeded
35	Existing	9	Sitting	12	Standing	48	Pass
	Proposed	12	Standing	15	Strolling	62	Pass
36	Existing	-	-	-	-	-	-
	Proposed	12	Standing	16	Strolling	63	Pass
37	Existing	-	-	-	-	-	-
	Proposed	16	Strolling	22	Uncomfortable	83	Pass
38	Existing	3	Sitting	4	Sitting	14	Pass
	Proposed	12	Standing	15	Strolling	60	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
39	Existing	3	Sitting	4	Sitting	15	Pass
	Proposed	11	Standing	14	Standing	57	Pass
40	Existing	-	-	-	-	-	-
	Proposed	11	Standing	13	Standing	57	Pass
41	Existing	11	Standing	13	Standing	55	Pass
	Proposed	11	Standing	13	Standing	57	Pass
42	Existing	10	Sitting	12	Standing	46	Pass
	Proposed	15	Strolling	20	Walking	82	Pass
43	Existing	11	Standing	15	Strolling	51	Pass
	Proposed	12	Standing	13	Standing	67	Pass
44	Existing	12	Standing	17	Strolling	61	Pass
	Proposed	7	Sitting	9	Sitting	57	Pass
45	Existing	9	Sitting	13	Standing	55	Pass
	Proposed	14	Standing	16	Strolling	71	Pass
46	Existing	10	Sitting	12	Standing	48	Pass
	Proposed	17	Strolling	21	Uncomfortable	75	Pass
47	Existing	13	Standing	19	Walking	65	Pass
	Proposed	16	Strolling	19	Walking	67	Pass
48	Existing	14	Standing	19	Walking	65	Pass
	Proposed	11	Standing	14	Standing	57	Pass
49	Existing	14	Standing	19	Walking	66	Pass
	Proposed	11	Standing	15	Strolling	60	Pass
50	Existing	13	Standing	18	Walking	64	Pass
	Proposed	14	Standing	17	Strolling	67	Pass
51	Existing	13	Standing	17	Strolling	63	Pass
	Proposed	13	Standing	17	Strolling	69	Pass
52	Existing	12	Standing	18	Walking	67	Pass
	Proposed	19	Walking	23	Uncomfortable	87	Pass
53	Existing	12	Standing	15	Strolling	53	Pass
	Proposed	14	Standing	18	Walking	74	Pass
54	Existing	12	Standing	17	Strolling	60	Pass
	Proposed	14	Standing	22	Uncomfortable	78	Pass
55	Existing	14	Standing	19	Walking	64	Pass
	Proposed	13	Standing	19	Walking	67	Pass
56	Existing	13	Standing	18	Walking	62	Pass
	Proposed	13	Standing	19	Walking	69	Pass
57	Existing	13	Standing	17	Strolling	59	Pass
	Proposed	14	Standing	21	Uncomfortable	77	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
58	Existing	13	Standing	18	Walking	60	Pass
	Proposed	17	Strolling	25	Uncomfortable	85	Pass
59	Existing	13	Standing	21	Uncomfortable	72	Pass
	Proposed	16	Strolling	21	Uncomfortable	84	Pass
60	Existing	11	Standing	15	Strolling	53	Pass
	Proposed	16	Strolling	23	Uncomfortable	81	Pass
61	Existing	9	Sitting	13	Standing	52	Pass
	Proposed	11	Standing	15	Strolling	60	Pass
62	Existing	14	Standing	19	Walking	62	Pass
	Proposed	13	Standing	17	Strolling	64	Pass
63	Existing	13	Standing	19	Walking	61	Pass
	Proposed	13	Standing	17	Strolling	61	Pass
64	Existing	10	Sitting	14	Standing	54	Pass
	Proposed	15	Strolling	19	Walking	64	Pass
65	Existing	8	Sitting	12	Standing	58	Pass
	Proposed	12	Standing	16	Strolling	61	Pass
66	Existing	10	Sitting	13	Standing	51	Pass
	Proposed	17	Strolling	22	Uncomfortable	80	Pass
67	Existing	12	Standing	15	Strolling	56	Pass
	Proposed	15	Strolling	21	Uncomfortable	78	Pass
68	Existing	11	Standing	15	Strolling	52	Pass
	Proposed	16	Strolling	24	Uncomfortable	83	Pass
69	Existing	14	Standing	18	Walking	61	Pass
	Proposed	16	Strolling	21	Uncomfortable	81	Pass
70	Existing	13	Standing	17	Strolling	60	Pass
	Proposed	14	Standing	19	Walking	73	Pass
71	Existing	12	Standing	15	Strolling	56	Pass
	Proposed	14	Standing	18	Walking	66	Pass
72	Existing	13	Standing	18	Walking	64	Pass
	Proposed	13	Standing	17	Strolling	65	Pass
73	Existing	14	Standing	18	Walking	62	Pass
	Proposed	15	Strolling	20	Walking	68	Pass
74	Existing	14	Standing	19	Walking	64	Pass
	Proposed	16	Strolling	23	Uncomfortable	73	Pass
75	Existing	14	Standing	19	Walking	62	Pass
	Proposed	15	Strolling	22	Uncomfortable	68	Pass
76	Existing	14	Standing	20	Walking	64	Pass
	Proposed	16	Strolling	23	Uncomfortable	71	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
77	Existing Proposed	14 17	Standing Strolling	19 25	Walking Uncomfortable	65 79	Pass Pass
78	Existing Proposed	14 17	Standing Strolling	18 25	Walking Uncomfortable	64 85	Pass Pass
79	Existing Proposed	15 16	Strolling Strolling	20 23	Walking Uncomfortable	63 84	Pass Pass
80	Existing Proposed	15 15	Strolling Strolling	20 20	Walking Walking	65 77	Pass Pass
81	Existing Proposed	15 15	Strolling Strolling	20 18	Walking Walking	65 68	Pass Pass
82	Existing Proposed	14 16	Standing Strolling	18 20	Walking Walking	62 76	Pass Pass
83	Existing Proposed	14 16	Standing Strolling	19 20	Walking Walking	64 78	Pass Pass
84	Existing Proposed	- 12	- Standing	- 21	- Uncomfortable	- 92	- Exceeded
85	Existing Proposed	- 13	- Standing	- 27	- Uncomfortable	- 113	- Exceeded
86	Existing Proposed	- 9	- Sitting	- 12	- Standing	- 62	- Pass
87	Existing Proposed	- 16	- Strolling	- 23	- Uncomfortable	- 94	- Exceeded
88	Existing Proposed	- 11	- Standing	- 17	- Strolling	- 74	- Pass
89	Existing Proposed	- 22	- Uncomfortable	- 30	- Uncomfortable	- 103	- Exceeded
90	Existing Proposed	- 12	- Standing	- 17	- Strolling	- 76	- Pass
91	Existing Proposed	- 13	- Standing	- 15	- Strolling	- 59	- Pass
92	Existing Proposed	- 12	- Standing	- 15	- Strolling	- 56	- Pass
93	Existing Proposed	- 9	- Sitting	- 12	- Standing	- 50	- Pass
94	Existing Proposed	- 12	- Standing	- 16	- Strolling	- 66	- Pass
95	Existing Proposed	- 7	- Sitting	- 9	- Sitting	- 41	- Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
96	Existing	-	-	-	-	-	-
	Proposed	6	Sitting	8	Sitting	32	Pass
97	Existing	-	-	-	-	-	-
	Proposed	9	Sitting	10	Sitting	51	Pass
98	Existing	-	-	-	-	-	-
	Proposed	6	Sitting	8	Sitting	35	Pass
99	Existing	-	-	-	-	-	-
	Proposed	9	Sitting	12	Standing	51	Pass
100	Existing	-	-	-	-	-	-
	Proposed	16	Strolling	20	Walking	82	Pass
101	Existing	-	-	-	-	-	-
	Proposed	9	Sitting	14	Standing	76	Pass
102	Existing	-	-	-	-	-	-
	Proposed	15	Strolling	17	Strolling	78	Pass
103	Existing	-	-	-	-	-	-
	Proposed	16	Strolling	19	Walking	106	Exceeded
104	Existing	-	-	-	-	-	-
	Proposed	13	Standing	17	Strolling	90	Pass
105	Existing	-	-	-	-	-	-
	Proposed	13	Standing	17	Strolling	77	Pass
106	Existing	-	-	-	-	-	-
	Proposed	13	Standing	15	Strolling	76	Pass

Season	Months	Hours
Summer	May - October	6:00 - 23:00 for comfort
Winter	November - April	6:00 - 23:00 for comfort
Annual	January - December	0:00 - 23:00 for safety

Configurations	
Existing	Existing site and surroundings
Proposed	Project with existing surroundings

Comfort Speed (km/h)	
(20% Seasonal Exceedance)	
≤ 10	Sitting
11 - 14	Standing
15 - 17	Strolling
18 - 20	Walking
> 20	Uncomfortable

Safety Speed (km/h)	
(0.1% Annual Exceedance)	
≤ 90	Pass
> 90	Exceeded