REPORT

2072 LAKESHORE ROAD

BURLINGTON, ONTARIO

PEDESTRIAN WIND STUDY

RWDI # 2401745

June 3, 2024

SUBMITTED TO

Acamar Dwelling Corp.
Attention: Gabriel DiMartino
gdimartino@trinitypoint.com

SUBMITTED BY

Kamran Shirzadeh, M.E.Sc., E.I.T.
Technical Coordinator
Karman.Shirzadeh@rwdi.com

Neetha Vasan, M.A.Sc., LEED A.P.
Senior Specialist / Associate
Neetha.Vasan@rwdi.com

Jordan Gilmour, P.Eng.
Project Delivery Manager
Jordan.Gilmour@rwdi.com

RWDI
600 Southgate Drive
Guelph, Ontario, Canada N1G 4P6
T: 519.823.1311
F: 519.823.1316

CANADA'S BEST MANAGED COMPANIES Platinum member

This document is intended for the sole use of the party to whom it is addressed and may contain information that is privileged and/or confidential. If you have received this in error, please notify us immediately. Accessible document formats provided upon request.
® RWDI name and logo are registered trademarks in Canada and the United States of America
© 2024 Rowan Williams Davies & Irwin Inc. ("RWDI") ALL RIGHTS RESERVED

EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed 2072 Lakeshore Road in Burlington, 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. In accordance with the *Pedestrian Level Wind Study Guidelines and Terms of Reference* (March 2020) (Guideline) published by the City of Burlington, the wind tunnel test results were analyzed using wind climate records from Hamilton International Airport and evaluated against the Wind Comfort and Safety Criteria specified in the local guidelines. The predicted wind conditions are presented in Figures 1A through 3C and Table 1, and are summarized as follows:

- The wind conditions on and around the existing site are comfortable for the intended pedestrian use throughout the year, except near a localized area to the west of the site along Lakeshore Road near existing building (currently under construction) that can be uncomfortable during the winter.
- With the proposed building in place, increased wind speeds are predicted locally around the building perimeter, but the conditions offsite are not expected to be affected substantially.
- The predicted wind conditions with the addition of the proposed project are comfortable for the intended pedestrian use at all assessed areas during the summer, and most areas in the winter. In the winter, due to the seasonally stronger winds, uncomfortable conditions are predicted locally at the west corner of the building due to the southwesterly winds. The off-site uncomfortable conditions are expected to be ameliorated by the addition of the proposed project.
- Wind speeds on the amenity areas on Level 2 and the podium rooftop are expected to be higher than desired for the proposed programming (seating and dining) during the summer and winter.
- The addition of the known future developments around the site are expected to slightly reduce wind speeds on site; however, it can increase wind speeds to the east of the site (near the future addition).
- The pedestrian wind safety criterion is met at most of the assessed areas in the Existing configuration, except one location near an existing building. With the addition of the proposed development, wind conditions at all locations assessed at the grade level are expected to meet the criterion, with conditions at one location on Level 3 exceeding the safety threshold. The addition of the future developments is expected to improve the conditions and wind safety criterion is predicted to be met at all areas assessed at grade and above grade.
- Wind control strategies applicable to each area of interest are discussed in the main body of the report.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1 INTRODUCTION 1

1.1 Project Description 1

1.2 Objectives 1

2 BACKGROUND AND APPROACH 2

2.1 Wind Tunnel Study Model 2

2.2 Wind Climate Data 6

2.3 Wind Comfort and Safety Criteria 7

2.4 General Wind Flow Mechanisms 8

3 RESULTS AND DISCUSSION 9

3.1 Existing Configuration 9

3.2 Proposed Configuration 9

3.2.1 Grade Level (Locations 1 through 56) 9

3.2.2 Above-Grade Outdoor Areas (Locations 57 through 63) 10

3.3 Future Configuration 10

3.4 Wind Control Strategies 11

4 STATEMENT OF LIMITATIONS 12

5 REFERENCES 14

LIST OF FIGURES

Figure 1A: Pedestrian Wind Comfort Conditions – Existing Configuration – Summer
Figure 1B: Pedestrian Wind Comfort Conditions – Proposed Configuration – Summer
Figure 1C: Pedestrian Wind Comfort Conditions – Future Configuration – Summer

Figure 2A: Pedestrian Wind Comfort Conditions – Existing Configuration – Winter
Figure 2B: Pedestrian Wind Comfort Conditions – Proposed Configuration – Winter
Figure 2C: Pedestrian Wind Comfort Conditions – Future Configuration – Winter

Figure 3A: Pedestrian Wind Safety Conditions – Existing Configuration – Annual
Figure 3B Pedestrian Wind Safety Conditions – Proposed Configuration – Annual
Figure 3C: Pedestrian Wind Safety Conditions – Future Configuration – Annual

LIST OF TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed 2072 Lakeshore Road in Burlington, 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 on the southeast corner of Lakeshore Road and Pearl Street, north of Old Lakeshore Road (Image 1). The development is a 27-storey residential condo that includes a two-storey podium planned for commercial use. A retail patio is proposed on Level 2 and an outdoor amenity area is proposed on Level 3 (podium rooftop).

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 Wind Comfort and Safety Criteria adopted by the City of Burlington. The assessment focused on critical pedestrian areas, including nearby public sidewalks, building entrance, above grade patio and amenity area.



Image 1: Aerial View of Site and Surroundings (Photo Credit: 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,

C - Future: Proposed project with existing and future surroundings (Image 2C).

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 63 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 1.5m 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.

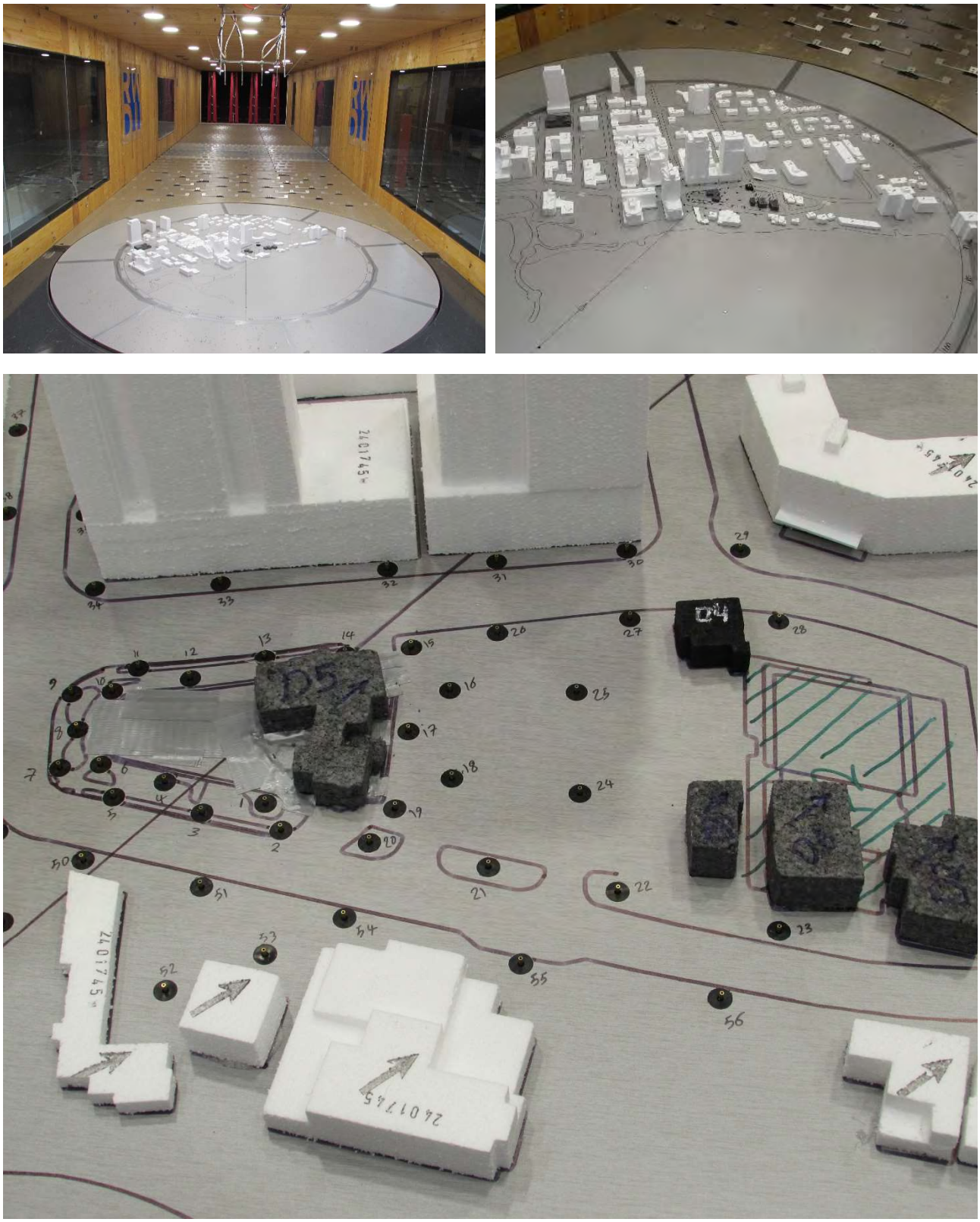


Image 2A: Wind Tunnel Study Model – Existing Configuration

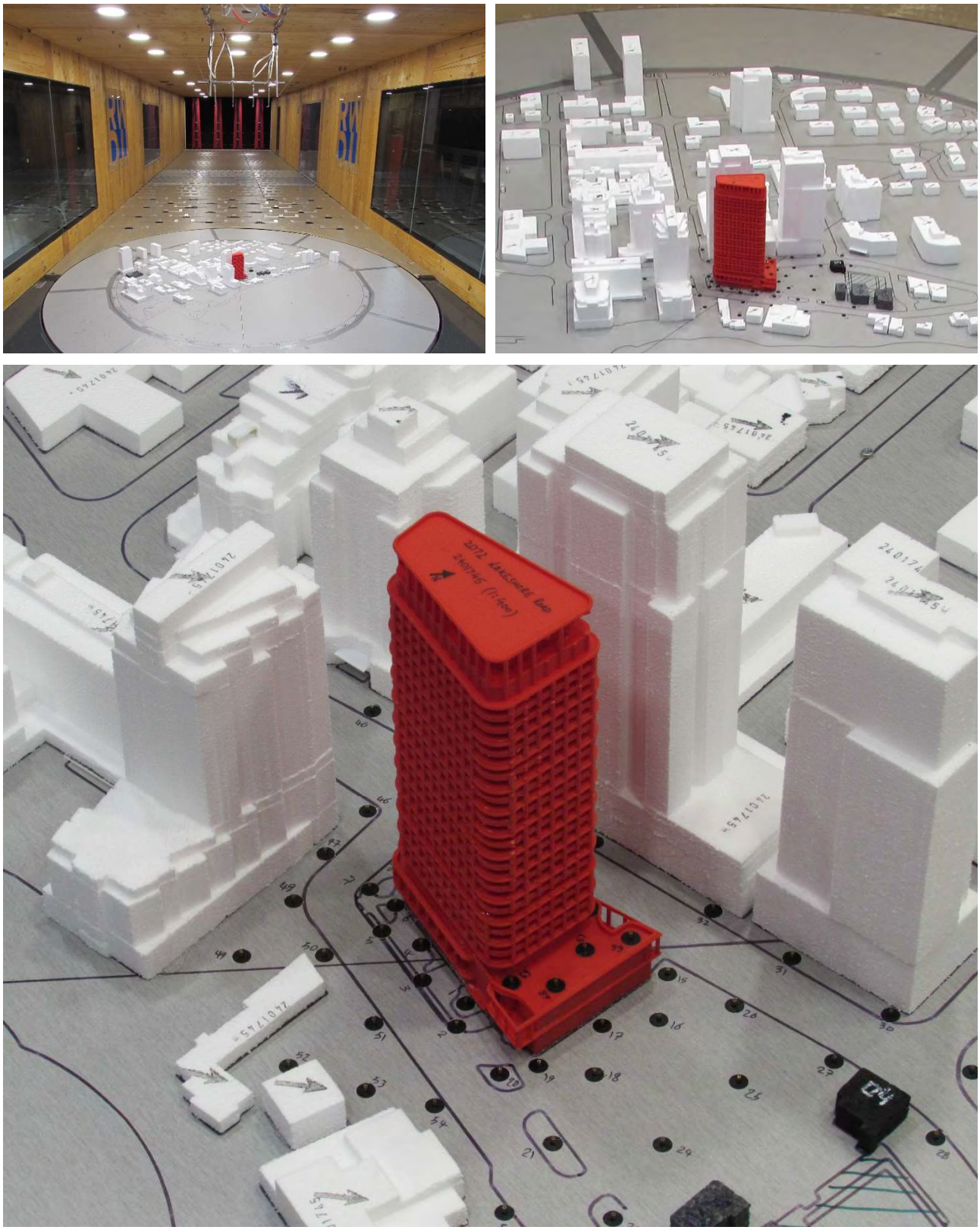


Image 2B: Wind Tunnel Study Model – Proposed Configuration

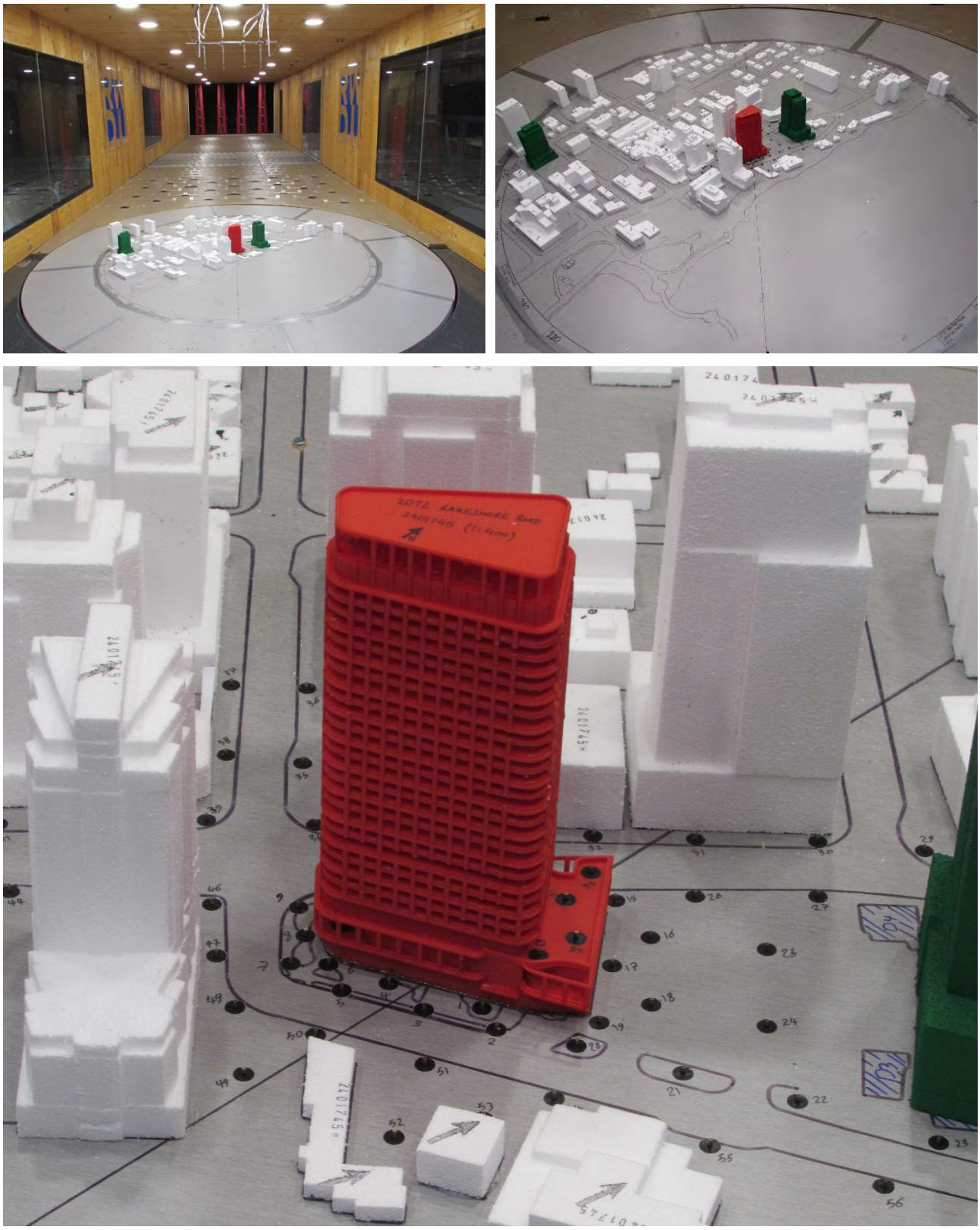
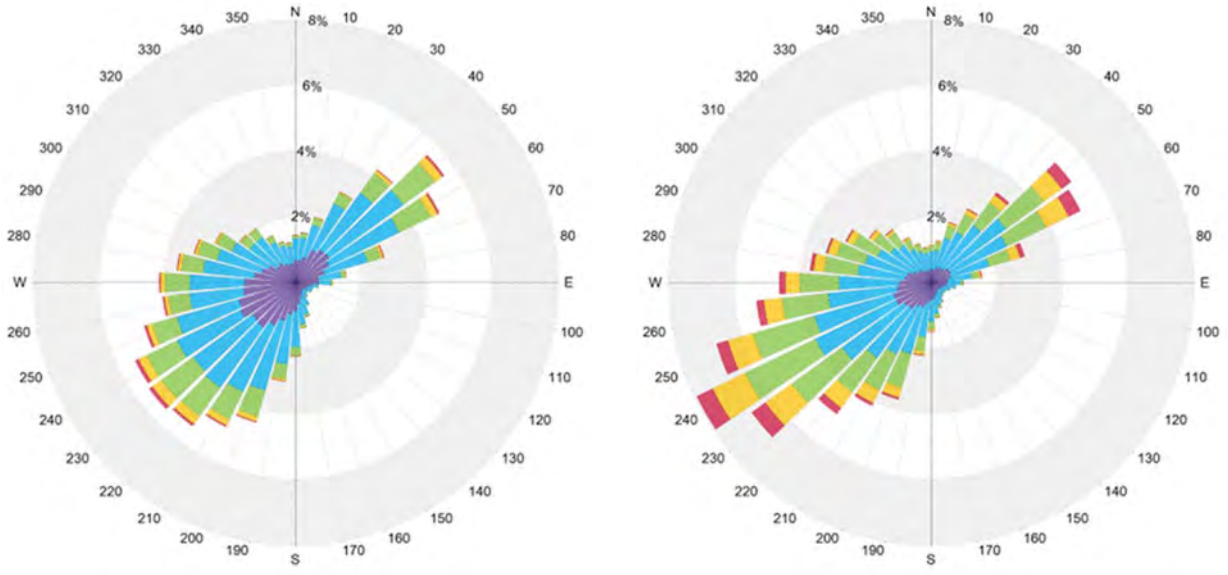


Image 2C: Wind Tunnel Study Model – Future Configuration

2.2 Wind Climate Data

Wind statistics recorded at Hamilton International 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 northeast and southwest directions are predominant in both summer and winter, as indicated by the wind roses. Strong winds of a mean speed greater than 30 km/h, measured at the airport (at an anemometer height of 10 m), occur for 3.8% and 12.6% 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	3.9	2.3
1-10	33.7	21.7
11-20	43.1	39.5
21-30	15.5	23.9
31-40	3.0	9.0
>40	0.8	3.6

Image 3: Directional Distribution of Winds Approaching Hamilton International Airport between 1990 and 2020

2.3 Wind Comfort and Safety Criteria

The criteria specified in the *Pedestrian Level Wind Study Guidelines and Terms of Reference (March 2020)* (Guideline) prepared by the City of Burlington are 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).

Comfort Category	GEM Speed (km/h)	Description
Sitting	≤ 10	Calm or light breezes • Appropriate for dedicated seating areas such as cafés, 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 speed winds • 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 required

Notes:

(1) GEM is defined as the maximum mean wind speed or gust speed divided by 1.85 (whichever is larger). Gust speed can be directly measured in a wind tunnel or represented by mean wind speed + 3*RMS (Root Mean Square) wind speed.

(2) GEM speeds listed above are based on a seasonal exceedance of 20% of the time between 06:00 and 23:00. The criterion has been met if the wind speeds occur at least four out of five days.

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

Notes:

(1) Based on an annual exceedance of 9 hours or 0.1% of the time for 24 hours a day.

(2) Gust speed can be directly measured in a wind tunnel or represented by mean wind speed + 3*RMS wind speed.

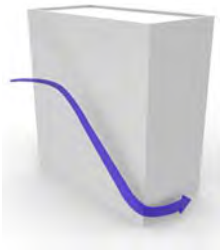
2.4 General Wind Flow Mechanisms

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



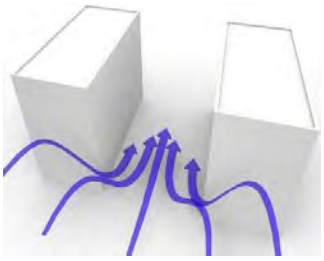
DOWNWASHING

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)

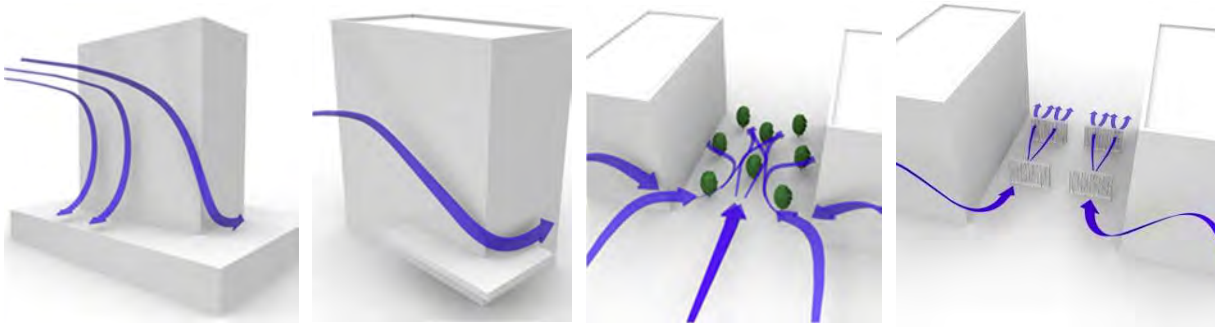


Image 5: Common Wind Control Measures

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on site plans in Figures 1A through 3C 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.

Generally, wind conditions comfortable for fast or leisurely walking are appropriate for sidewalks and walkways as pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing are preferred at main entrances where pedestrians are apt to linger. Wind speeds comfortable for sitting are preferred for areas intended for prolonged passive activities, such as dining areas in outdoor amenities, especially in the summer when these areas would be more frequented. 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 building onsite is low-rise; the wind conditions on and around the site are mostly being influenced by the taller neighbouring buildings as they can induce down washing and corner accelerated flows. In the summer, wind conditions at ground level are generally comfortable for standing with higher wind speeds comfortable for leisurely walking near the taller buildings along Lakeshore Road and at the west end of the proposed site (Figure 1A). During the winter, higher wind speeds occur due to the seasonal wind climate in Burlington; wind speeds around the site generally are comfortable for standing with higher wind speeds near the existing taller buildings comfortable for leisurely or fast walking (Figure 2A). Uncomfortable conditions may occur locally near tall existing building (currently under construction) to the west of the site on Lakeshore Road (Location 44 in Figure 2B).

Wind conditions are expected to meet the wind safety criterion at most areas assessed; the exception is one location on Lakeshore Road near the existing building to the west of the project site (Location 45 in Figure 3B).

3.2 Proposed Configuration

The proposed building is comparable in height to some of the taller buildings in the immediate surroundings and in the directions from which the prevailing winds approach. Therefore, the project is not expected to significantly alter the wind conditions on and around the site, except for a few localized areas at the east end of the proposed site.

3.2.1 Grade Level (Locations 1 through 56)

Wind conditions at most areas on and around the proposed development are expected to be comparable to the conditions around the existing site. During the summer, wind conditions are predicted to be comfortable for standing, with higher winds conductive to leisurely walking near the western corner of the proposed building and along the sidewalks on Lakeshore Road near the tall existing buildings (Figure 1A). During the winter, wind speeds along Lakeshore and Old Lakeshore Roads are comfortable for leisurely walking or fast walking (Figure 2A). Uncomfortable wind conditions can locally occur near the western corner of the building facing Old Lakeshore Road due to the channeling and corner acceleration of the southwesterly winds. Suggestions for wind control are discussed in Section 3.4.

The main residential lobby entrance of the proposed building is situated on the south façade, near Location 1 in the figures. The entrance is situated away from the windier parts of the site and located under a canopy. The predicted wind conditions at the entrance are comfortable for sitting or standing throughout the year and would be suitable for the intended use.

We understand that retail entrances are proposed along the south and north facades of the building. Wind conditions predicted in these areas are comfortable for standing in the summer, which is appropriate for entrances. However, wind speeds are expected to be comfortable for leisurely walking in the winter, which is appropriate for transitory areas, but higher than desired for entrance areas where people are expected to wait outside. If there are retail entrances near the western corner of the building, it should be noted that the wind speeds expected there are higher than desired for entrances. Suggestions for wind control are discussed in Section 3.4.

The blockage provided by the proposed building is expected to ameliorate the existing wind conditions near the tall building to the west across Old Lakeshore Road that were predicted to exceed the wind safety threshold (See Section 3.1 and Figure 3A). As a result, all areas assessed at grade are expected to meet the wind safety criterion (Figure 3B).

3.2.2 Above-Grade Outdoor Areas (Locations 57 through 63)

It is generally desirable for wind conditions on areas intended for passive activities to be comfortable for sitting or standing more than 80% of the time in the summer; conditions conducive to sitting are ideal in areas intended for seated uses like dining or lounging. During the winter, the area would not be used frequently, and increased wind activity would be considered appropriate.

Wind speeds on the retail patio at the western end of Level 2 are predicted to be comfortable for standing during the summer (Figure 1B), which is higher than desired for the proposed programming (seating and dining); during the winter, wind speeds comfortable for standing or leisurely walking are expected (Figure 2B).

On Level 3, on the larger amenity area at the east end, wind speeds are expected to be comfortable for standing throughout the year. Wind speeds at the tower corners are predicted to be slightly higher and comfortable for leisurely walking during the summer and potentially uncomfortable during the winter (northeast corner). The wind safety criterion is also expected to be exceeded at the northeast corner of the tower (Location 59 in Figure 3B). Suggestions for wind control are discussed in Section 3.4.

3.3 Future Configuration

The addition of the known future buildings in the area is expected to marginally reduce the wind speeds on-site; slightly higher wind speeds are expected near the future building to the east of the site. The overall wind conditions would remain comparable to those in the Proposed Configuration (Figures 1C and 2C).
Wind conditions are expected to meet the pedestrian wind safety criterion at all grade and above grade areas assessed (Figure 3C). The wind conditions exceeding the criterion predicted at the northeast corner of the tower on Level 3 is expected to be ameliorated with the wind blockage provided by the future building located to the east of the site.

3.4 Wind Control Strategies

Improved wind conditions at grade are achievable through the use of architectural and landscaping features. Installing architectural screens at the western corner of the building is recommended to disrupt the wind flows accelerating around this corner that have the potential to create uncomfortable conditions. These screens should be at least 2 m tall, perpendicular to the building facade and be designed with some porosity to wind (around 30% open) to slow down winds as they pass through it. Alternatively, a cluster of screens with random orientations can be considered that can block the wind flow but allow pedestrians to walk between them. In addition, if retail entrances are proposed near the identified windy areas, it is recommended to recess them into the building facade or, alternatively, to add wind screens on both sides of these entrances to create sheltered doorways. These features with the help of landscaping along the nearby sidewalks can reduce the wind speeds to desirable levels throughout the year. The above said strategies for wind control at the entrances are applicable for the retail entrance on the north and south facades as well. Examples of these wind control features are shown in Image 6. RWDI can provide further guidance on the placement of these features.

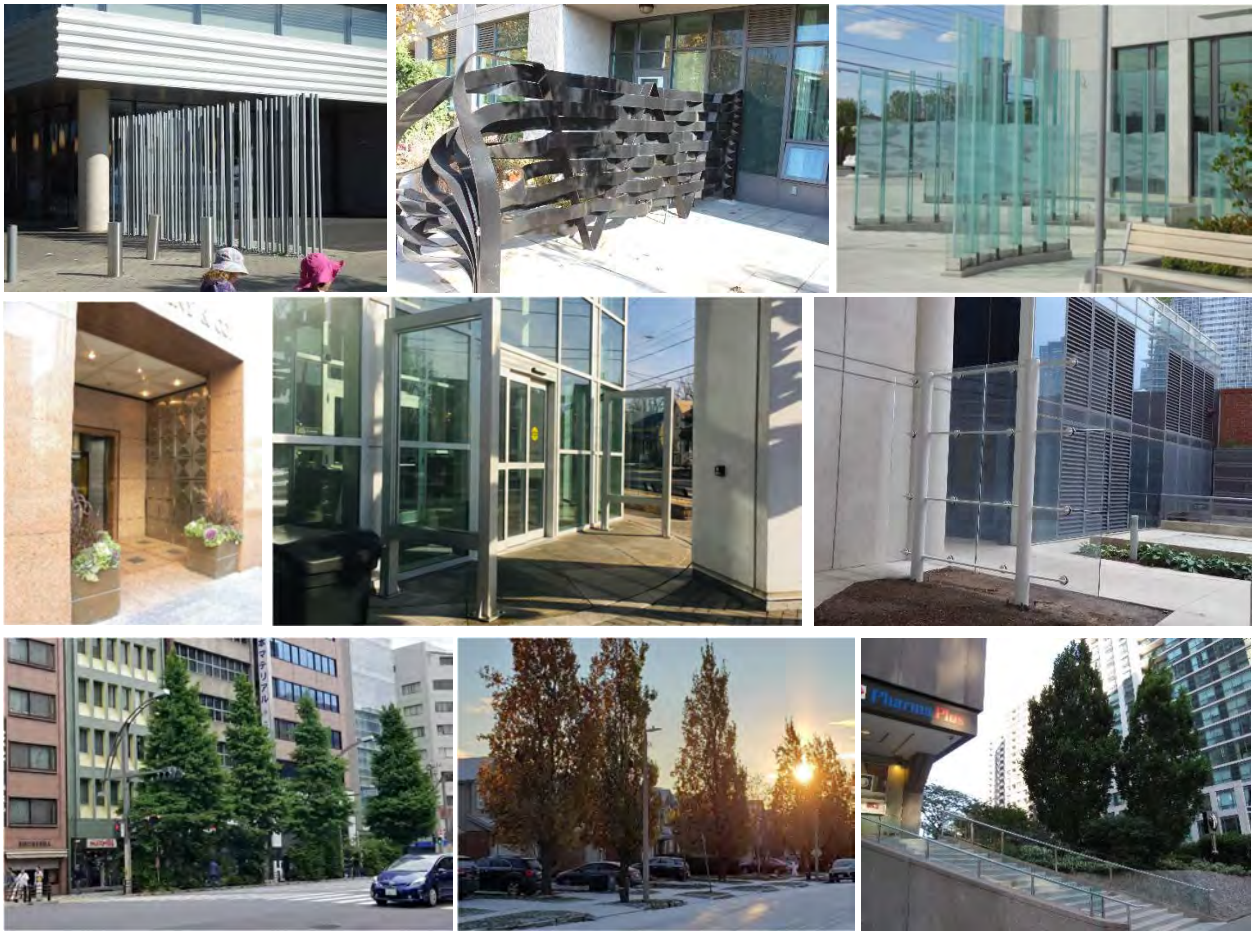


Image 6: Wind Control Features Applicable to the Ground Level

If lower wind speeds are desired on Level 2, the design team may consider adding tall porous elements in the form of screens or landscaping around the perimeter to reduce the exposure of this area to prevailing winds; alternatively tall vertical elements like privacy screens and planters can be used throughout the area to disrupt the wind flows. On Level 3, an overhead feature like a trellis or porous canopy above the main gathering area is recommended alongside the other wind control strategies similar to those recommended for Level 2. Some examples of these wind control features are shown in Image 7. RWDI can assist with the design and location of wind control features as the project evolves.

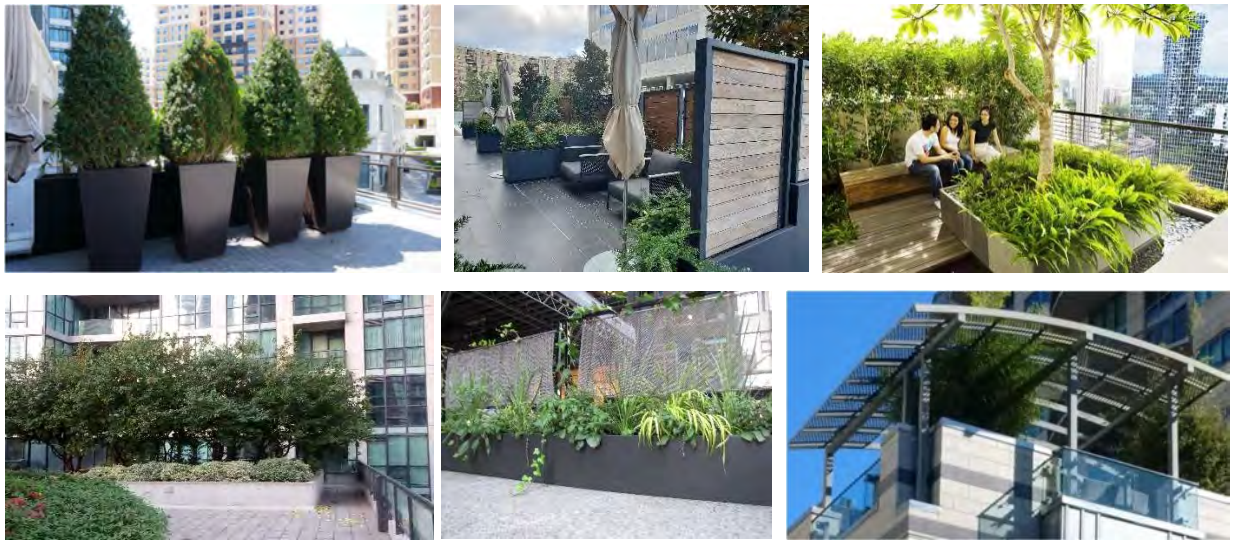


Image 7: Wind Control Features Applicable to Above Grade Outdoor Areas

4 STATEMENT OF LIMITATIONS

Limitations

This report was prepared by Rowan Williams Davies & Irwin, Inc. ("RWDI") for Acamar Dwelling Corp ("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 Graziani & Corazza Architects Inc. and used to construct the scale model of the proposed 2072 Lakeshore Road **("Project Data**")

File Name	File Type	Date Received (dd/mm/yyyy)
2069.22.x.2072. Lakeshore Road, Burlington - Mar.08.2024 - 3D Model - V 2013	SketchUp	01/05/2024

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

1. ASCE Task Committee on Outdoor Human Comfort (2004). *Outdoor Human Comfort and Its Assessment*, 68 pages, American Society of Civil Engineers, Reston, Virginia, USA.

2. Williams, C.J., Hunter, M.A. and Waechter, W.F. (1990). "Criteria for Assessing the Pedestrian Wind Environment," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol.36, pp.811-815.

3. Williams, C.J., Soligo M.J. and Cote, J. (1992). "A Discussion of the Components for a Comprehensive Pedestrian Level Comfort Criteria," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol.41-44, pp.2389-2390.

4. Soligo, M.J., Irwin, P.A., and Williams, C.J. (1993). "Pedestrian Comfort Including Wind and Thermal Effects," *Third Asia-Pacific Symposium on Wind Engineering*, Hong Kong.

5. Soligo, M.J., Irwin, P.A., Williams, C.J. and Schuyler, G.D. (1998). "A Comprehensive Assessment of Pedestrian Comfort Including Thermal Effects," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol.77&78, pp.753-766.

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

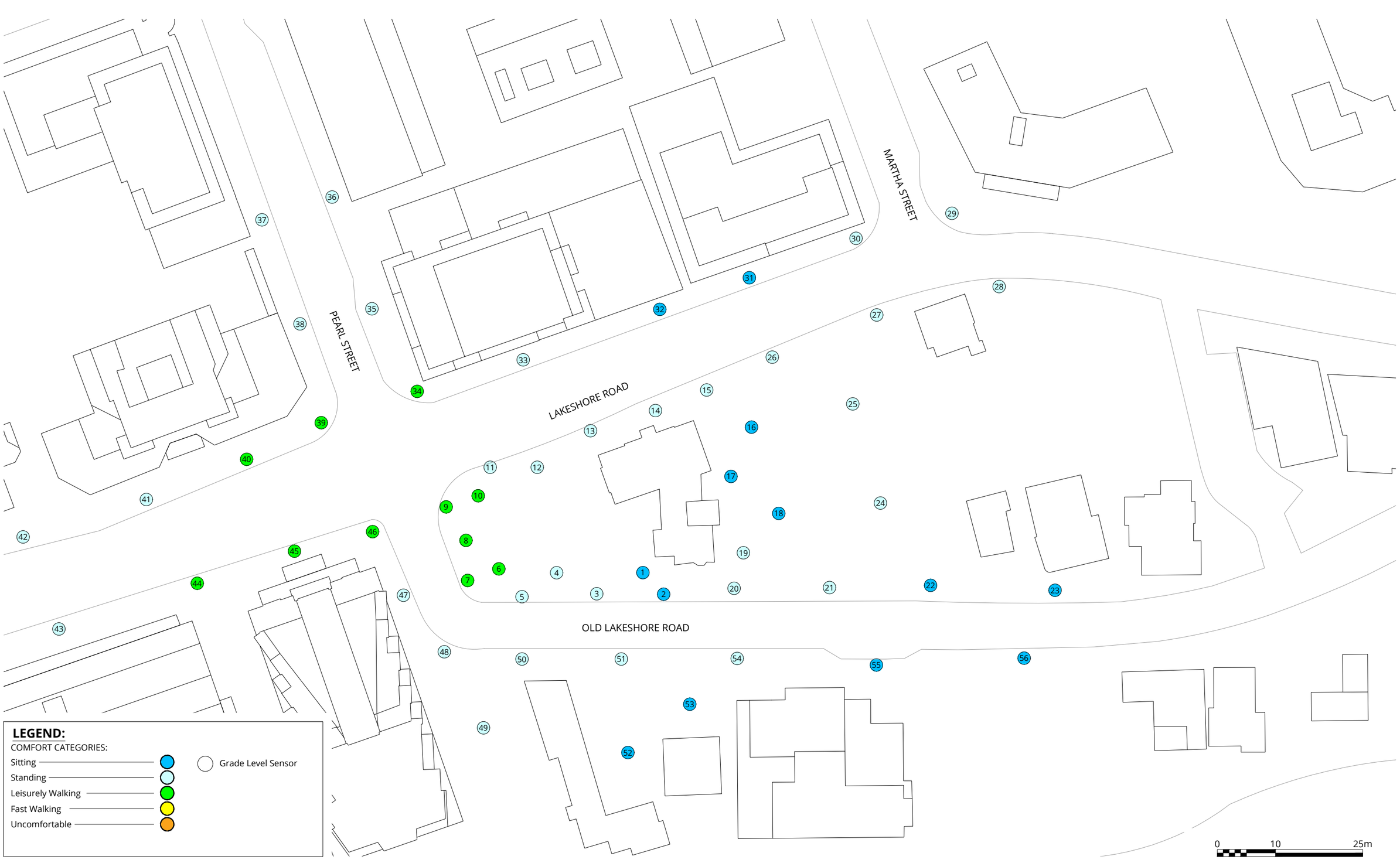
7. Lawson, T.V. (1973). "Wind Environment of Buildings: A Logical Approach to the Establishment of Criteria", *Report No. TVL 7321*, Department of Aeronautic Engineering, University of Bristol, Bristol, England.

8. Durgin, F. H. (1997). "Pedestrian Level Wind Criteria Using the Equivalent average", *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 66, pp.215-226.

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

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

FIGURES



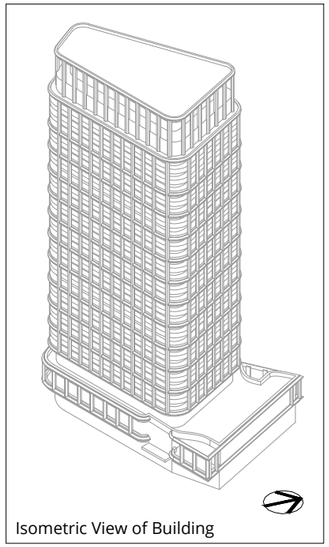
Pedestrian Wind Comfort Conditions
Existing Configuration
Summer (May to October, 6:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

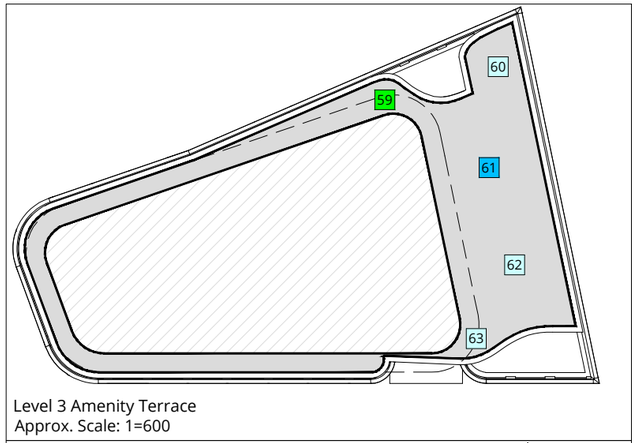
True North

Project #2401745

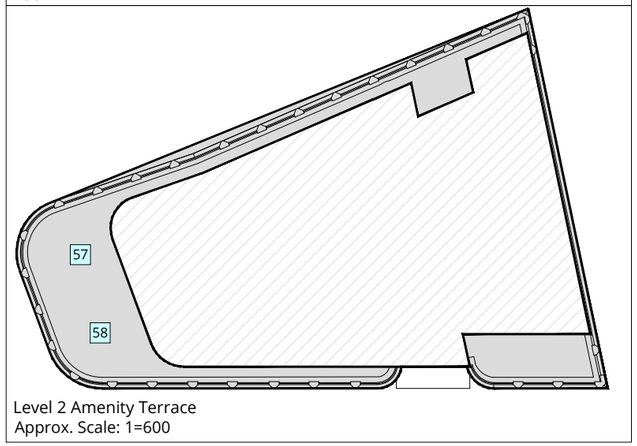
Drawn by: SAER	Figure: 1A
Approx. Scale:	1:750
Date Revised:	May 28, 2024



Isometric View of Building



Level 3 Amenity Terrace
Approx. Scale: 1=600



Level 2 Amenity Terrace
Approx. Scale: 1=600

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Leisurely Walking
- Fast Walking
- Uncomfortable

- Grade Level Sensor
- Amenity Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location

0 10 25m

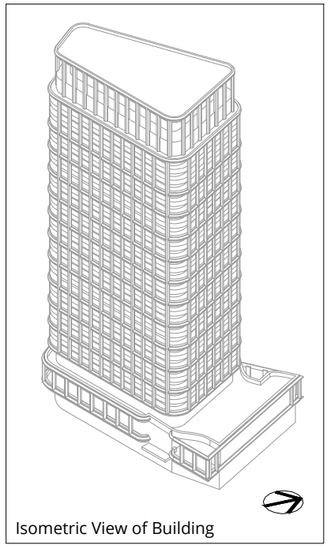
Pedestrian Wind Comfort Conditions
Proposed Configuration
Summer (May to October, 6:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

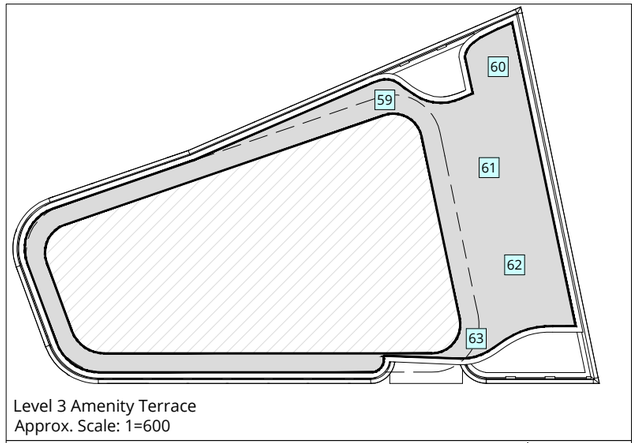
True North

Project #2401745

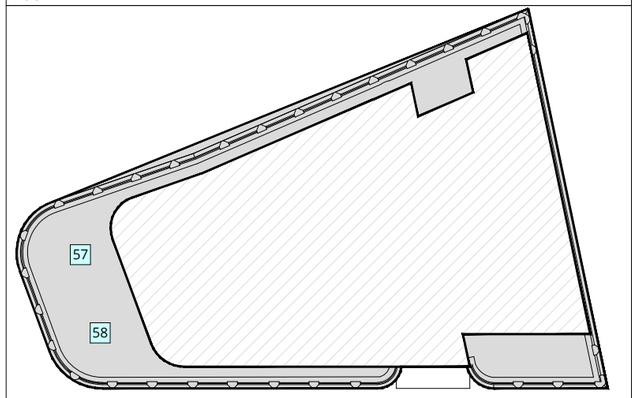
Drawn by: SAER	Figure: 1B
Approx. Scale:	1:750
Date Revised:	May 28, 2024



Isometric View of Building



Level 3 Amenity Terrace
Approx. Scale: 1=600



Level 2 Amenity Terrace
Approx. Scale: 1=600

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Leisurely Walking
- Fast Walking
- Uncomfortable

- Grade Level Sensor
- Amenity Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location

0 10 25m

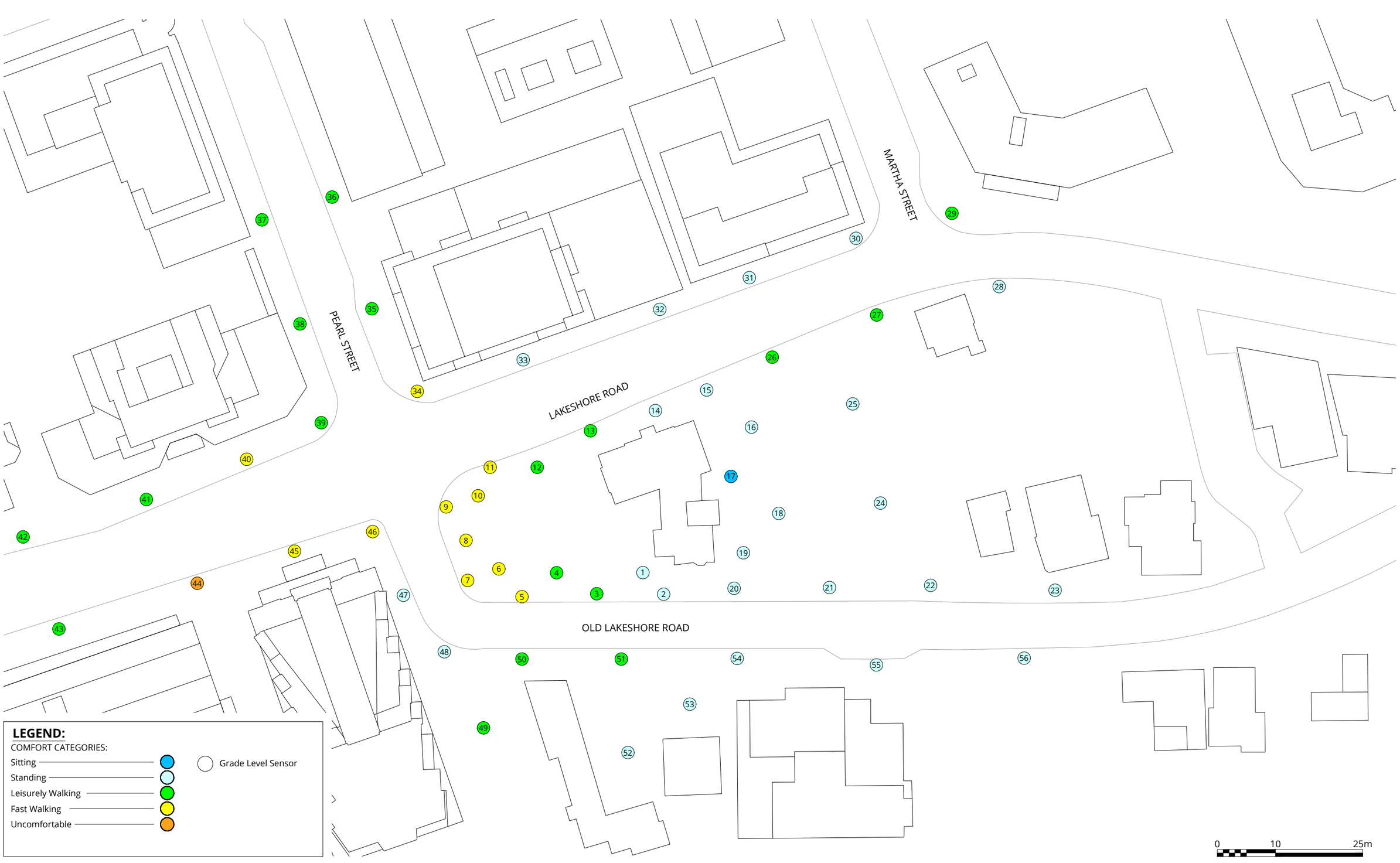
Pedestrian Wind Comfort Conditions
Future Configuration
Summer (May to October, 6:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

True North

Project #2401745

Drawn by: SAER	Figure: 1C
Approx. Scale:	1:750
Date Revised:	May 28, 2024

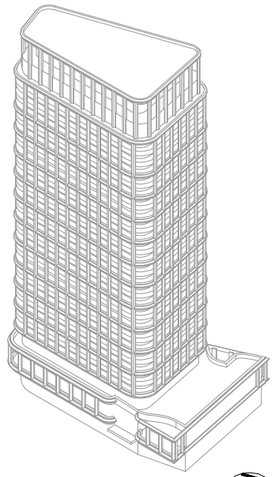


Pedestrian Wind Comfort Conditions
Existing Configuration
Winter (November to April, 6:00 to 23:00)

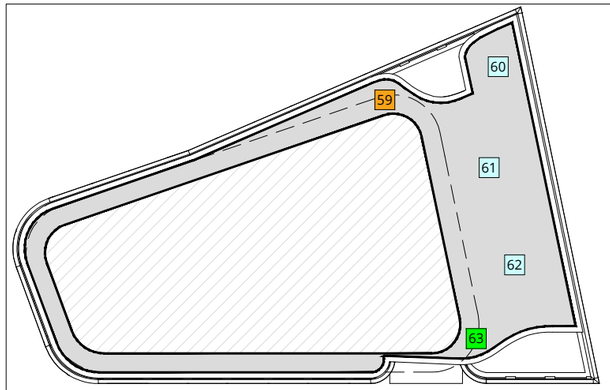
2072 Lakeshore Road - Burlington, ON

True North

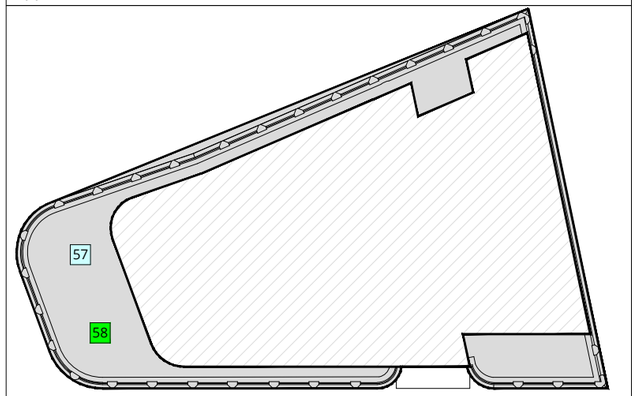
Drawn by: SAER | Figure: 2A
Approx. Scale: 1:750
Project #2401745 | Date Revised: May 28, 2024



Isometric View of Building



Level 3 Amenity Terrace
Approx. Scale: 1=600



Level 2 Amenity Terrace
Approx. Scale: 1=600

PEARL STREET

LAKESHORE ROAD

MARTHA STREET

OLD LAKESHORE ROAD

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Leisurely Walking
- Fast Walking
- Uncomfortable

- Grade Level Sensor
- Amenity Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location

0 10 25m

Pedestrian Wind Comfort Conditions

Proposed Configuration

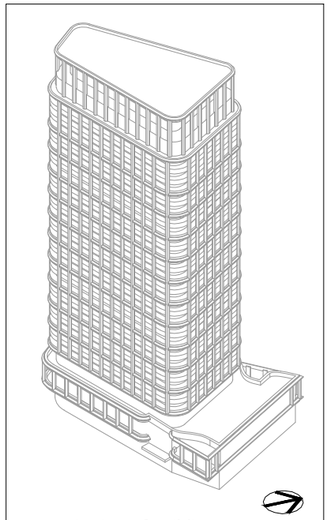
Winter (November to April, 6:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

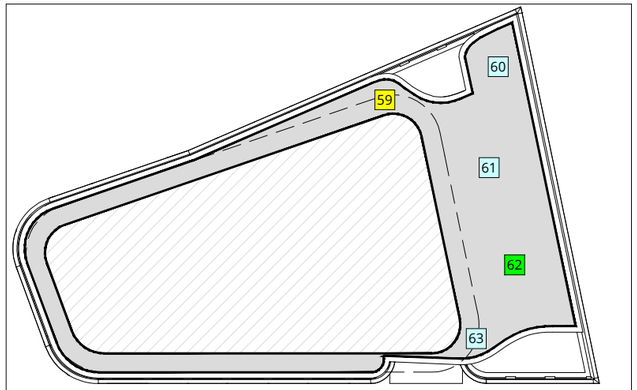
True North

Project #2401745

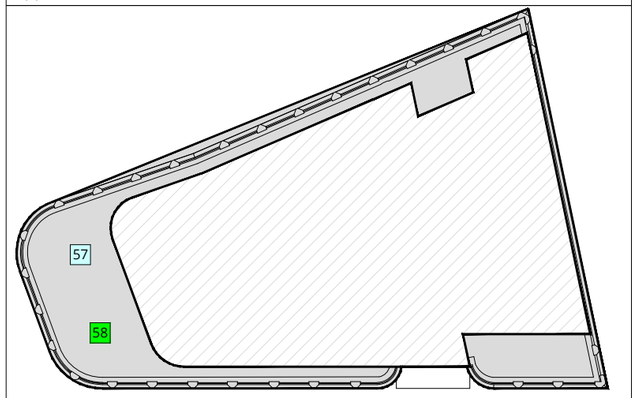
Drawn by: SAER	Figure: 2B
Approx. Scale:	1:750
Date Revised:	May 28, 2024



Isometric View of Building



Level 3 Amenity Terrace
Approx. Scale: 1=600



Level 2 Amenity Terrace
Approx. Scale: 1=600

PEARL STREET

LAKESHORE ROAD

MARTHA STREET

OLD LAKESHORE ROAD

FUTURE BUILDING

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Leisurely Walking
- Fast Walking
- Uncomfortable

- Grade Level Sensor
- Amenity Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location

0 10 25m

Pedestrian Wind Comfort Conditions

Future Configuration

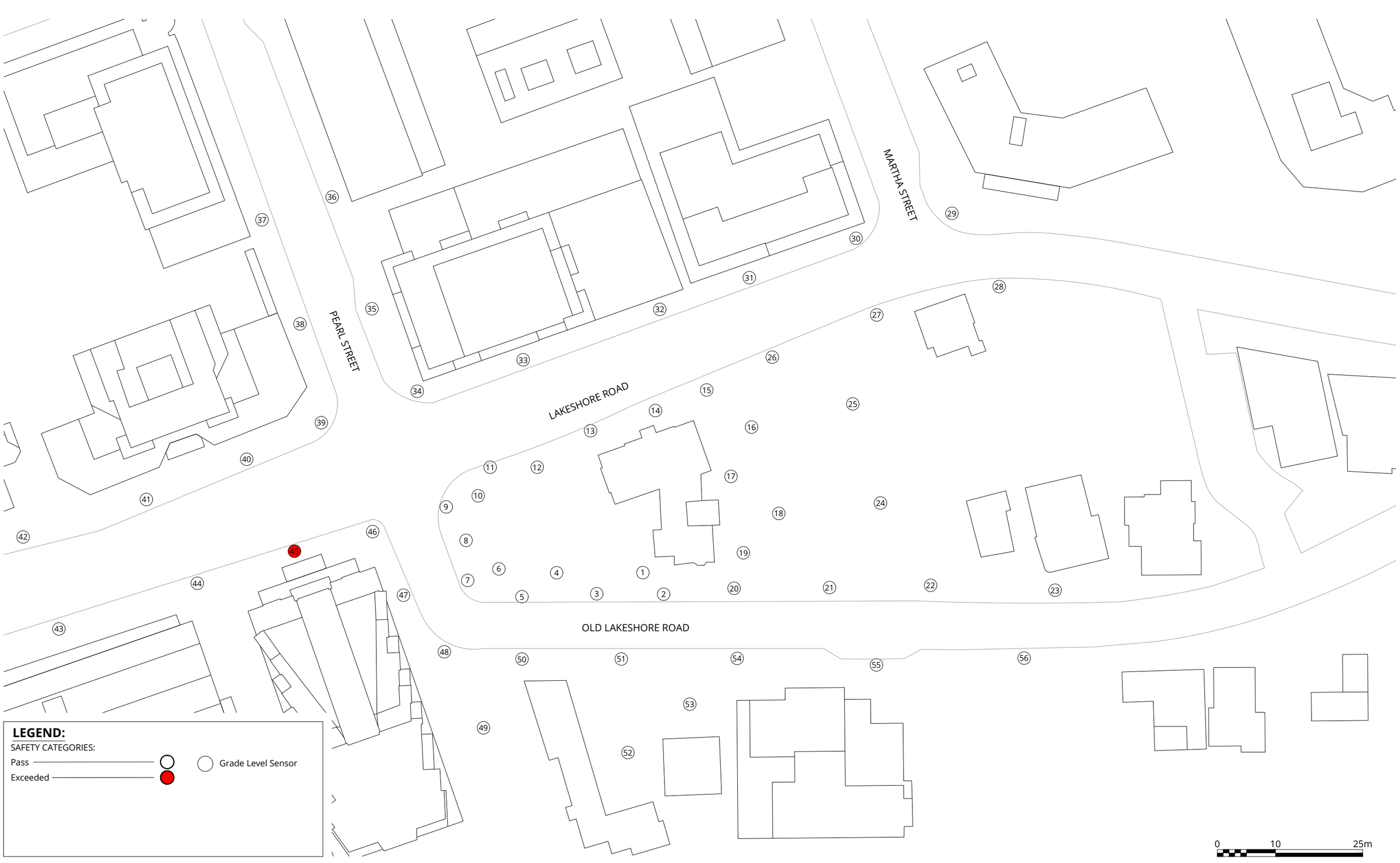
Winter (November to April, 6:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

True North

Project #2401745

Drawn by: SAER	Figure: 2C
Approx. Scale:	1:750
Date Revised:	May 28, 2024



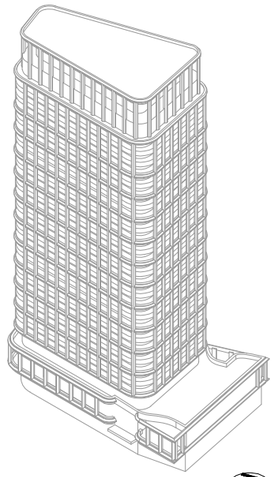
Pedestrian Wind Safety Conditions
Existing Configuration
Annual (January to December, 0:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

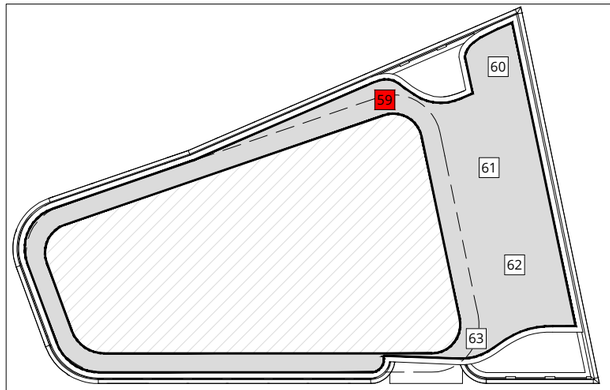
True North

Project #2401745

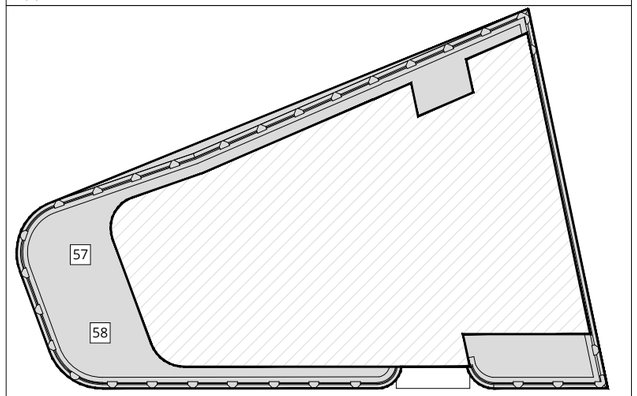
Drawn by: SAER	Figure: 3A
Approx. Scale:	1:750
Date Revised:	May 28, 2024



Isometric View of Building



Level 3 Amenity Terrace
Approx. Scale: 1=600



Level 2 Amenity Terrace
Approx. Scale: 1=600

PEARL STREET

LAKESHORE ROAD

MARTHA STREET

OLD LAKESHORE ROAD

LEGEND:

SAFETY CATEGORIES:

Pass

Exceeded

Grade Level Sensor

Amenity Level Sensor

Building Above Removed for Clarity

Main Entrance Location

0 10 25m

Pedestrian Wind Safety Conditions

Proposed Configuration

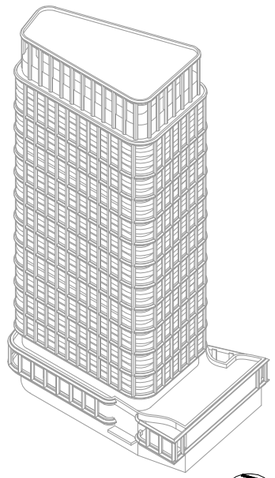
Annual (January to December, 0:00 to 23:00)

2072 Lakeshore Road - Burlington, ON

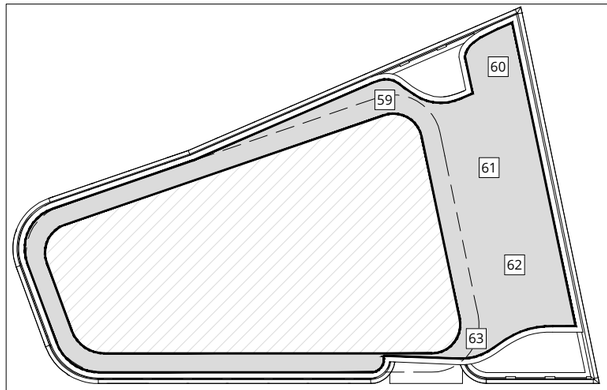
True North

Project #2401745

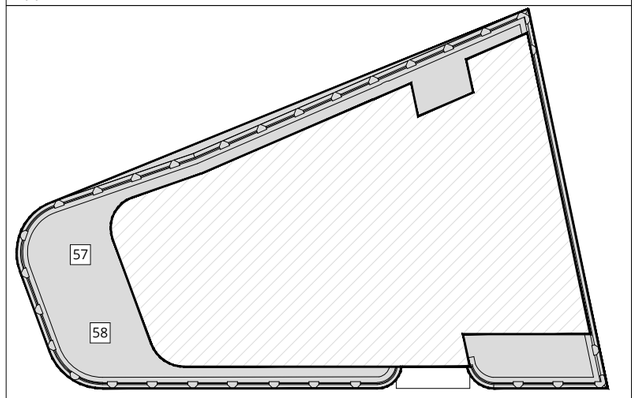
Drawn by: SAER	Figure: 3B
Approx. Scale:	1:750
Date Revised:	May 28, 2024



Isometric View of Building



Level 3 Amenity Terrace
Approx. Scale: 1=600



Level 2 Amenity Terrace
Approx. Scale: 1=600

LEGEND:

SAFETY CATEGORIES:

Pass

Exceeded

Grade Level Sensor

Amenity Level Sensor

Building Above Removed for Clarity

Main Entrance Location

0 10 25m

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

2072 Lakeshore Road - Burlington, ON

True North

Project #2401745

Drawn by: SAER	Figure: 3C
Approx. Scale:	1:750
Date Revised:	May 28, 2024

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	10	Sitting	13	Standing	59	Pass
	Proposed	10	Sitting	13	Standing	60	Pass
	Future	9	Sitting	12	Standing	51	Pass
2	Existing	10	Sitting	13	Standing	58	Pass
	Proposed	12	Standing	15	Leisurely Walking	69	Pass
	Future	10	Sitting	13	Standing	56	Pass
3	Existing	11	Standing	15	Leisurely Walking	63	Pass
	Proposed	13	Standing	18	Fast Walking	79	Pass
	Future	11	Standing	15	Leisurely Walking	72	Pass
4	Existing	13	Standing	16	Leisurely Walking	67	Pass
	Proposed	12	Standing	16	Leisurely Walking	78	Pass
	Future	11	Standing	15	Leisurely Walking	78	Pass
5	Existing	14	Standing	18	Fast Walking	72	Pass
	Proposed	15	Leisurely Walking	19	Fast Walking	77	Pass
	Future	14	Standing	18	Fast Walking	74	Pass
6	Existing	15	Leisurely Walking	19	Fast Walking	78	Pass
	Proposed	17	Leisurely Walking	21	Uncomfortable	87	Pass
	Future	16	Leisurely Walking	21	Uncomfortable	85	Pass
7	Existing	15	Leisurely Walking	19	Fast Walking	78	Pass
	Proposed	17	Leisurely Walking	21	Uncomfortable	78	Pass
	Future	16	Leisurely Walking	21	Uncomfortable	77	Pass
8	Existing	16	Leisurely Walking	20	Fast Walking	81	Pass
	Proposed	14	Standing	18	Fast Walking	68	Pass
	Future	14	Standing	17	Leisurely Walking	69	Pass
9	Existing	16	Leisurely Walking	20	Fast Walking	79	Pass
	Proposed	12	Standing	14	Standing	59	Pass
	Future	12	Standing	14	Standing	69	Pass
10	Existing	15	Leisurely Walking	19	Fast Walking	68	Pass
	Proposed	11	Standing	14	Standing	59	Pass
	Future	11	Standing	13	Standing	57	Pass
11	Existing	14	Standing	18	Fast Walking	70	Pass
	Proposed	14	Standing	17	Leisurely Walking	65	Pass
	Future	13	Standing	16	Leisurely Walking	62	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
12	Existing	13	Standing	16	Leisurely Walking	62	Pass
	Proposed	13	Standing	17	Leisurely Walking	65	Pass
	Future	13	Standing	16	Leisurely Walking	64	Pass
13	Existing	12	Standing	16	Leisurely Walking	59	Pass
	Proposed	14	Standing	18	Fast Walking	65	Pass
	Future	13	Standing	16	Leisurely Walking	66	Pass
14	Existing	11	Standing	14	Standing	60	Pass
	Proposed	12	Standing	15	Leisurely Walking	58	Pass
	Future	11	Standing	14	Standing	59	Pass
15	Existing	11	Standing	14	Standing	60	Pass
	Proposed	13	Standing	16	Leisurely Walking	68	Pass
	Future	13	Standing	16	Leisurely Walking	75	Pass
16	Existing	9	Sitting	12	Standing	53	Pass
	Proposed	9	Sitting	11	Standing	50	Pass
	Future	11	Standing	13	Standing	61	Pass
17	Existing	8	Sitting	10	Sitting	42	Pass
	Proposed	8	Sitting	10	Sitting	43	Pass
	Future	10	Sitting	12	Standing	71	Pass
18	Existing	10	Sitting	12	Standing	52	Pass
	Proposed	11	Standing	13	Standing	58	Pass
	Future	12	Standing	14	Standing	66	Pass
19	Existing	11	Standing	13	Standing	58	Pass
	Proposed	13	Standing	15	Leisurely Walking	69	Pass
	Future	13	Standing	15	Leisurely Walking	74	Pass
20	Existing	11	Standing	14	Standing	57	Pass
	Proposed	13	Standing	16	Leisurely Walking	69	Pass
	Future	13	Standing	15	Leisurely Walking	66	Pass
21	Existing	11	Standing	13	Standing	56	Pass
	Proposed	12	Standing	14	Standing	60	Pass
	Future	12	Standing	15	Leisurely Walking	70	Pass
22	Existing	10	Sitting	13	Standing	51	Pass
	Proposed	10	Sitting	12	Standing	53	Pass
	Future	13	Standing	16	Leisurely Walking	86	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
23	Existing	10	Sitting	12	Standing	50	Pass
	Proposed	9	Sitting	11	Standing	47	Pass
	Future	12	Standing	14	Standing	83	Pass
24	Existing	11	Standing	14	Standing	56	Pass
	Proposed	12	Standing	14	Standing	58	Pass
	Future	13	Standing	16	Leisurely Walking	71	Pass
25	Existing	11	Standing	14	Standing	58	Pass
	Proposed	10	Sitting	13	Standing	56	Pass
	Future	14	Standing	17	Leisurely Walking	75	Pass
26	Existing	12	Standing	15	Leisurely Walking	68	Pass
	Proposed	13	Standing	16	Leisurely Walking	68	Pass
	Future	14	Standing	17	Leisurely Walking	76	Pass
27	Existing	13	Standing	15	Leisurely Walking	65	Pass
	Proposed	12	Standing	15	Leisurely Walking	63	Pass
	Future	16	Leisurely Walking	19	Fast Walking	84	Pass
28	Existing	11	Standing	13	Standing	60	Pass
	Proposed	11	Standing	13	Standing	58	Pass
	Future	15	Leisurely Walking	18	Fast Walking	81	Pass
29	Existing	13	Standing	15	Leisurely Walking	66	Pass
	Proposed	13	Standing	15	Leisurely Walking	67	Pass
	Future	15	Leisurely Walking	17	Leisurely Walking	70	Pass
30	Existing	11	Standing	13	Standing	73	Pass
	Proposed	11	Standing	12	Standing	74	Pass
	Future	13	Standing	15	Leisurely Walking	82	Pass
31	Existing	10	Sitting	12	Standing	62	Pass
	Proposed	11	Standing	13	Standing	61	Pass
	Future	11	Standing	14	Standing	65	Pass
32	Existing	10	Sitting	11	Standing	60	Pass
	Proposed	12	Standing	14	Standing	65	Pass
	Future	11	Standing	14	Standing	63	Pass
33	Existing	11	Standing	13	Standing	65	Pass
	Proposed	14	Standing	17	Leisurely Walking	74	Pass
	Future	13	Standing	15	Leisurely Walking	69	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
34	Existing	16	Leisurely Walking	20	Fast Walking	74	Pass
	Proposed	15	Leisurely Walking	19	Fast Walking	74	Pass
	Future	14	Standing	17	Leisurely Walking	68	Pass
35	Existing	14	Standing	17	Leisurely Walking	65	Pass
	Proposed	14	Standing	17	Leisurely Walking	65	Pass
	Future	14	Standing	17	Leisurely Walking	65	Pass
36	Existing	13	Standing	16	Leisurely Walking	68	Pass
	Proposed	13	Standing	16	Leisurely Walking	70	Pass
	Future	13	Standing	16	Leisurely Walking	67	Pass
37	Existing	13	Standing	15	Leisurely Walking	75	Pass
	Proposed	12	Standing	15	Leisurely Walking	71	Pass
	Future	12	Standing	15	Leisurely Walking	67	Pass
38	Existing	14	Standing	16	Leisurely Walking	85	Pass
	Proposed	13	Standing	16	Leisurely Walking	82	Pass
	Future	13	Standing	15	Leisurely Walking	74	Pass
39	Existing	15	Leisurely Walking	17	Leisurely Walking	71	Pass
	Proposed	14	Standing	17	Leisurely Walking	69	Pass
	Future	14	Standing	17	Leisurely Walking	67	Pass
40	Existing	16	Leisurely Walking	19	Fast Walking	75	Pass
	Proposed	16	Leisurely Walking	19	Fast Walking	74	Pass
	Future	15	Leisurely Walking	18	Fast Walking	72	Pass
41	Existing	13	Standing	16	Leisurely Walking	80	Pass
	Proposed	13	Standing	16	Leisurely Walking	81	Pass
	Future	12	Standing	15	Leisurely Walking	82	Pass
42	Existing	13	Standing	16	Leisurely Walking	71	Pass
	Proposed	13	Standing	15	Leisurely Walking	69	Pass
	Future	12	Standing	15	Leisurely Walking	63	Pass
43	Existing	12	Standing	15	Leisurely Walking	67	Pass
	Proposed	11	Standing	14	Standing	58	Pass
	Future	11	Standing	14	Standing	59	Pass
44	Existing	17	Leisurely Walking	21	Uncomfortable	85	Pass
	Proposed	16	Leisurely Walking	20	Fast Walking	80	Pass
	Future	15	Leisurely Walking	19	Fast Walking	80	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
45	Existing	15	Leisurely Walking	19	Fast Walking	93	Exceeded
	Proposed	14	Standing	17	Leisurely Walking	81	Pass
	Future	13	Standing	16	Leisurely Walking	73	Pass
46	Existing	15	Leisurely Walking	19	Fast Walking	84	Pass
	Proposed	15	Leisurely Walking	18	Fast Walking	84	Pass
	Future	14	Standing	17	Leisurely Walking	77	Pass
47	Existing	11	Standing	13	Standing	54	Pass
	Proposed	14	Standing	18	Fast Walking	75	Pass
	Future	14	Standing	18	Fast Walking	71	Pass
48	Existing	11	Standing	14	Standing	58	Pass
	Proposed	14	Standing	18	Fast Walking	81	Pass
	Future	13	Standing	17	Leisurely Walking	68	Pass
49	Existing	13	Standing	16	Leisurely Walking	74	Pass
	Proposed	13	Standing	17	Leisurely Walking	80	Pass
	Future	12	Standing	15	Leisurely Walking	67	Pass
50	Existing	12	Standing	15	Leisurely Walking	71	Pass
	Proposed	12	Standing	15	Leisurely Walking	61	Pass
	Future	12	Standing	15	Leisurely Walking	58	Pass
51	Existing	11	Standing	15	Leisurely Walking	66	Pass
	Proposed	13	Standing	17	Leisurely Walking	68	Pass
	Future	12	Standing	16	Leisurely Walking	65	Pass
52	Existing	10	Sitting	13	Standing	55	Pass
	Proposed	10	Sitting	12	Standing	57	Pass
	Future	9	Sitting	12	Standing	49	Pass
53	Existing	10	Sitting	12	Standing	50	Pass
	Proposed	12	Standing	14	Standing	58	Pass
	Future	11	Standing	13	Standing	53	Pass
54	Existing	11	Standing	14	Standing	56	Pass
	Proposed	14	Standing	17	Leisurely Walking	65	Pass
	Future	13	Standing	15	Leisurely Walking	65	Pass
55	Existing	10	Sitting	13	Standing	54	Pass
	Proposed	10	Sitting	12	Standing	51	Pass
	Future	11	Standing	13	Standing	78	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
56	Existing	10	Sitting	13	Standing	54	Pass
	Proposed	10	Sitting	12	Standing	53	Pass
	Future	12	Standing	15	Leisurely Walking	70	Pass
57	Existing	-	-	-	-	-	-
	Proposed	11	Standing	13	Standing	63	Pass
	Future	11	Standing	14	Standing	61	Pass
58	Existing	-	-	-	-	-	-
	Proposed	13	Standing	17	Leisurely Walking	78	Pass
	Future	14	Standing	17	Leisurely Walking	76	Pass
59	Existing	-	-	-	-	-	-
	Proposed	17	Leisurely Walking	22	Uncomfortable	98	Exceeded
	Future	14	Standing	19	Fast Walking	74	Pass
60	Existing	-	-	-	-	-	-
	Proposed	11	Standing	14	Standing	64	Pass
	Future	11	Standing	14	Standing	68	Pass
61	Existing	-	-	-	-	-	-
	Proposed	10	Sitting	12	Standing	53	Pass
	Future	11	Standing	13	Standing	64	Pass
62	Existing	-	-	-	-	-	-
	Proposed	13	Standing	14	Standing	68	Pass
	Future	13	Standing	15	Leisurely Walking	73	Pass
63	Existing	-	-	-	-	-	-
	Proposed	14	Standing	15	Leisurely Walking	86	Pass
	Future	13	Standing	14	Standing	84	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
Future	Project with future surroundings

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

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