REPORT

1995 DUNDAS STREET EAST

MISSISSAUGA, ONTARIO

PEDESTRIAN WIND STUDY
RWDI # 2403758
December 11, 2024

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed 1995 Dundas Street East in Mississauga, Ontario (Image 1). The assessment was based on the wind-tunnel testing conducted for the proposed development site under the Existing and Proposed configurations of the site and surroundings (Image 2). The results were analysed using the regional wind climate records (Image 3) and evaluated against the Mississauga 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:

- Existing wind speeds at the site and in the surrounding areas are suitable for the intended pedestrian use and meet the wind safety criterion in all areas assessed throughout the year.
- With the proposed development in place, most assessed areas around the site are expected to experience wind conditions similar to the Existing configuration year-round. Wind speeds are predicted to increase around building corners; however, the conditions remain appropriate for the intended sidewalk use in the summer. In the winter, uncomfortable wind conditions are expected in several areas.
- Wind conditions at the northeast entrance are anticipated to be moderately above the acceptable level in the summer and uncomfortable in the winter. The other entrance at the middle of the east façade is expected to have wind conditions suitable for pedestrian use throughout the year.
- Wind conditions are predicted to be elevated for passive pedestrian use in the most assessed areas on Levels 5, 13 and 17.
- The pedestrian wind safety criterion is expected to be met at the majority of the assessed locations around the site. Exceptions include the area around the northeast corner of the project and several localized areas on Levels 5, 13, and 17.

The potential wind impact of the recently proposed landscaping and updated massing are discussed in the report. Additional wind control measures have been provided for areas associated with elevated wind activities.

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1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed 1995 Dundas Street East in Mississauga, Ontario. 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 will be constructed at the northwest corner of the intersection of Dundas Street East and Universal Drive (Image 1). The development will consist of two mixed-use residential condominium towers (A and B), of 24 and 25 storeys, respectively, with a 4-storey podium on underground parking. Outdoor amenity areas are proposed on 5, 13th and 17th Level.

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 Mississauga Pedestrian Wind Criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including two of the building entrances, public sidewalks around the site, and outdoor terraces on Levels 5, 13, and 17.

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); and,

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

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 126 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 and reviewed by Landeal Asset Management Inc. 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.

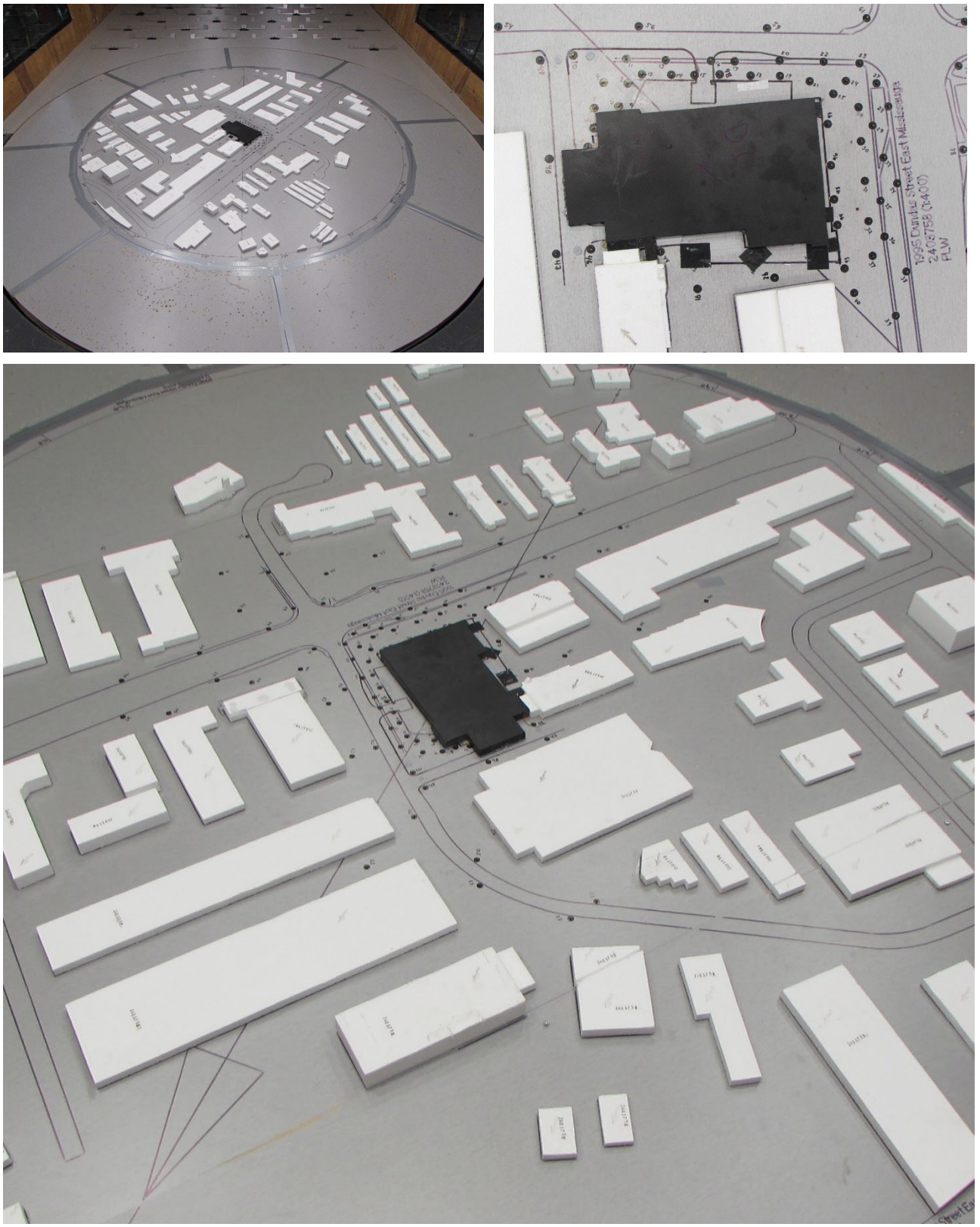


Image 2A: Wind Tunnel Study Model – Existing Configuration

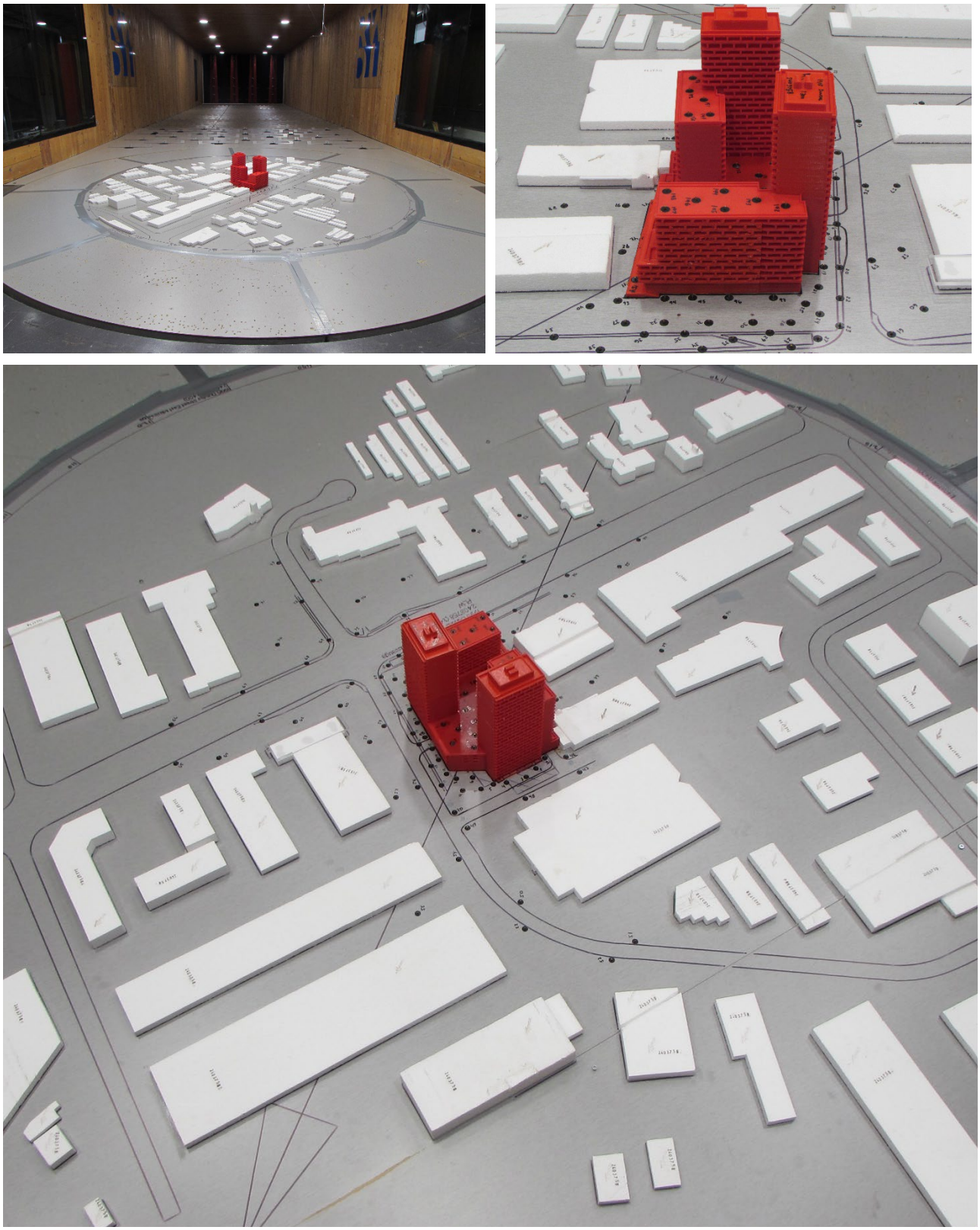
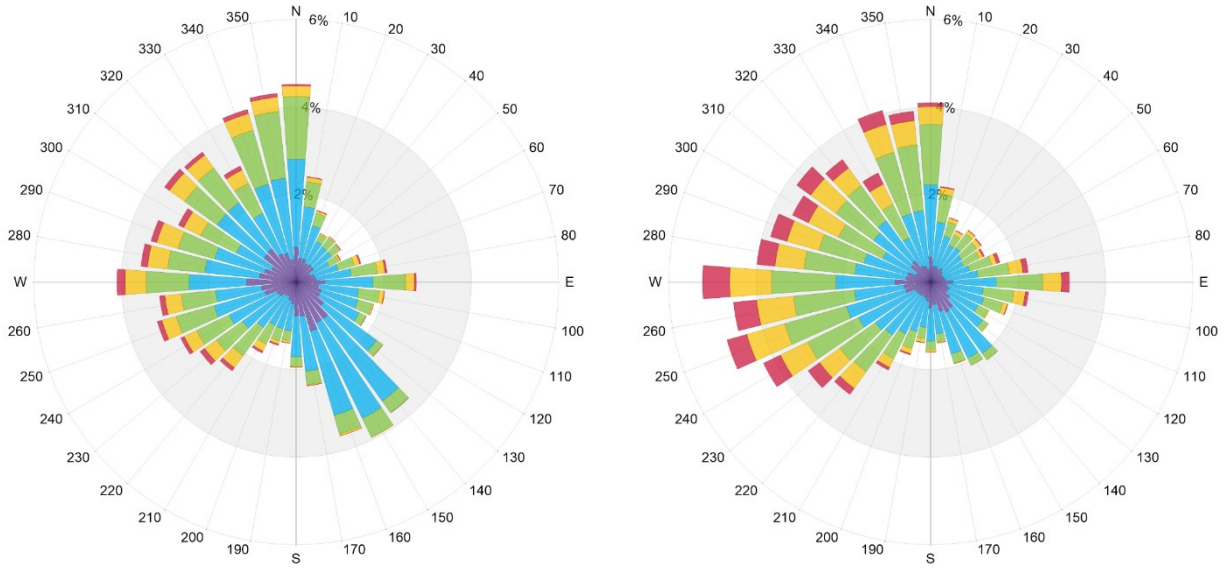


Image 2B: Wind Tunnel Study Model – Proposed Configuration

2.2 Wind Climate Data

Wind statistics recorded at Toronto Pearson International Airport between 1994 and 2024, 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. Wind from the southwest, west and northwest directions are predominant during both summer and winter. During the winter season, the winds from the east direction are also frequent, as indicated by the wind roses. The winds from the southeast are frequent during the summer, but typically of low speeds. Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10 m) occur for 8.9% and 18.3% of the time during the summer and winter seasons, respectively, and they are primarily from the southwest through north-northwest directions. 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.



Wind Speed (km/h)	Probability (%) Summer	Winter
Calm	4.2	2.9
1-10	23.8	17.0
11-20	41.0	34.9
21-30	22.0	26.9
31-40	7.0	12.3
>40	1.9	6.0

Image 3: Directional Distribution of Winds Approaching Toronto Pearson International Airport Between 1994 and 2024

2.3 Mississauga Pedestrian Wind Criteria

The Mississauga pedestrian wind criteria, developed in June 2014, are specified in the Urban Design Terms of Reference, "Pedestrian Wind Comfort and Safety Studies". The following defines the criteria in detail.

The following defines the criteria in detail.

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	≤ 15	Gentle breezes suitable for main building entrances and bus stops
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 most activities, and wind mitigation is typically recommended

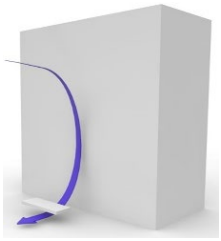
Notes:
(1) GEM Speed = max (Mean Speed, Gust Speed/1.85) and Gust Speed = Mean Speed + 3*RMS Speed.
(2) GEM speeds listed above are based on a seasonal exceedance of 20% of the time between 6:00 and 23:00.

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.

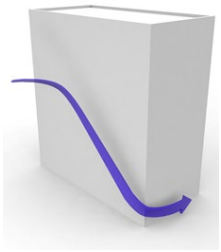
2.4 General Wind Flow Mechanisms

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



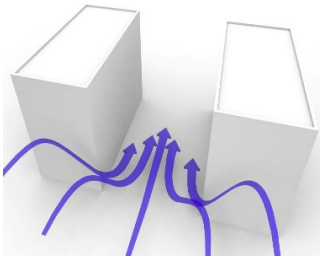
DOWNWASHING

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)

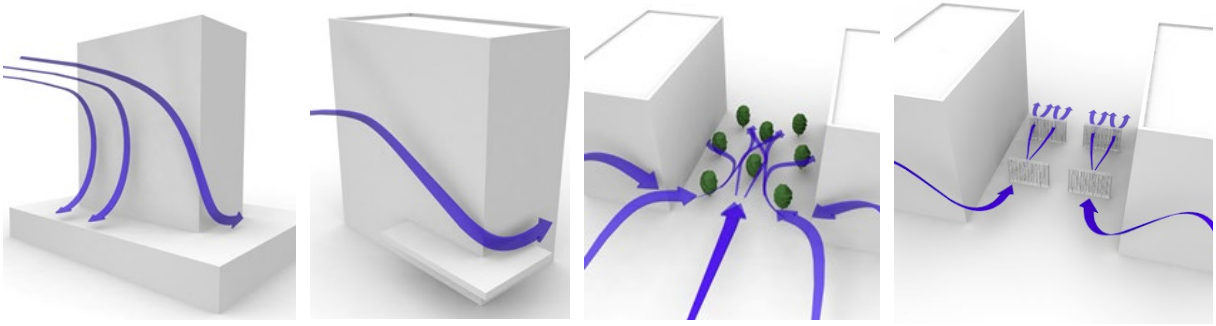


Image 5: Common Wind Control Measures

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.

3.1 Grade Level (Locations 1 through 94 and 124 to 126)

Wind conditions comfortable for walking are appropriate for sidewalks and walkways as pedestrians are 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 passive activities, such as outdoor amenity areas above grade during the summer when these areas are typically in use. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

3.1.1 Existing Configuration

For all the areas on and around the project site, existing wind speeds are comfortable for sitting or standing in summer and walking or lower in the winter (Figures1A and 2A). Wind speeds that meet the safety criterion are anticipated at all areas assessed in the Existing configuration (Figure 3A).

3.1.2 Proposed Configuration

With the addition of the proposed development, wind speeds in most areas remain similar to those in the Existing configuration, though some areas close to the building perimeter are predicted to experience elevated wind conditions. The proposed project includes two towers (A and B) that are significantly taller than the surrounding buildings, resulting in increased wind speeds at and above grade. While the large podium helps mitigate some downwashing wind flow, it also creates high wind activity on the podium where low wind speeds are often required.

In the summer, wind conditions remain comfortable for standing in most areas, with slightly elevated wind speeds suitable for walking near the building corners (Figure 1B). During the winter, wind speeds increase due to seasonally stronger winds in Mississauga, and conditions suitable for walking are expected at more locations compared to the summer (Figure 2B). These conditions are appropriate for the intended use of the sidewalks and walkways on and around the site year-round. However, uncomfortable wind conditions are predicted to occur at locations near the northeast and southeast corners of the site, plus a few locations along the sidewalks of Proposed Future Street and Universal Drive across from the project site (Figure 2B).

The main entrances are located near Location 12, at the northeast corner, and Location 94, in the middle of the east façade. As the prevailing winds come from the west and northwest, winds are expected to accelerate around the northeast corner at Location 12, potentially creating uncomfortable and unsafe conditions. The entrance at the middle of the east façade is predicted to be comfortable for sitting or standing throughout the year which is suitable for entrances (Figures 1B and 2B).

Wind speeds that meet the safety criterion are anticipated at all assessed grade-level locations, except for the area near the northeast building corner and the adjacent sidewalks along Universal Drive (Locations 5, 7-13, and 52, as shown in Figure 3B). These elevated wind conditions are primarily caused by the prevailing winds from the west and northwest, which strike Tower A and redirect downward to the corner area.

To reduce wind speeds around the northeast corner of the project, RWDI recommends several strategies. Wide canopies should be implemented to wrap around the northeast corner of Tower A. Additionally, extensive windscreens and/or coniferous/marcescent landscaping elements near the corner and along the sidewalks can effectively diffuse the energy of accelerating winds. To further mitigate high wind speeds in the open area northeast of the project, it would be beneficial to install free-standing canopies, trellises, and porous windscreens. Incorporating evergreen species will allow for wind reduction during colder months. Examples of these wind control strategies are illustrated in the accompanying Image 6.

Moreover, to lower wind speeds at the north corner entrance (Location 12), relocating the entrance away from the building corner can be considered, if feasible. Alternatively, the entrance could be recessed into the building façade, or with vertical barriers at least 2 meters tall installed on both sides of the doors to create localized areas of shelter. Large canopies above the entrance would also contribute positively by reducing downwashing winds (See Image 6).

Image 6: Wind Control Measures

3.2 Outdoor Amenity on Levels 5, 13 and 17 (Locations 95 through 123)

It is generally desirable for wind conditions on areas intended for passive activities to be comfortable for sitting more than 80% of time in the summer. During the winter, the area would not be used frequently, and increased wind activity would be considered acceptable.

During the summer season, wind conditions on the Level 5 outdoor amenity area atop the podium of Towers A and B, as well as on the Level 13 and Level 17 terraces of Tower B and Tower A, respectively, are mostly predicted to be comfortable for walking, which is higher than the sitting criterion. Additionally, uncomfortable wind conditions are expected at the corner of Tower B on Level 5 (Locations 100 and 101) due to northerly winds accelerating around the corner. In the winter, additional uncomfortable locations are expected on Levels 5, 13, and 17 (see Figure 2B) due to seasonally stronger winds. Wind speeds exceed the pedestrian wind safety criterion at several terrace locations (see Figure 3B).

The amenity area could benefit from wind control measures to achieve low wind speeds suitable for relaxed activities in both summer and winter, while also alleviating the predicted wind safety exceedance. As shown by the examples in Image 7, the design team may consider implementing tall parapets or railings at least 2 meters high along the perimeters of the amenity areas to reduce high wind speeds. Additionally, localized landscaping/hardscaping elements, such as impermeable screens, partitions, planters, and trellises or canopies, can further reduce wind speeds and create sheltered zones within the designated amenity area that could serve as seating and gathering spaces.

Image 7: Examples of Wind Control Measures Over the Outdoor Amenity Area Above Grade

3.3 Updated Massing and Landscape Plan

RWDI received the updated drawings and landscape plan on December 10 and 11, 2024, respectively (Images 8 through 10). All the proposed design changes, especially the relocated main entrance of Building A, now positioned in the middle of the east façade beside the entrance of Building B (Image 8), and the sunken outdoor amenity area on Level 3 (Image 9), represent a positive approach and are expected to significantly improve wind conditions in the respective areas.

The hard and soft landscaping elements designed at ground level, such as the canopy at the base of Tower A with the wind screen at its corner, planters with coniferous and deciduous trees along the sidewalks, and the trellis in the open area to the north, and a fence gate and an overhead canopy wrapping around the northeast corner will help to shelter against undesirable winds directed from Building A and improve uncomfortable conditions (see Image 8).

The recessed outdoor amenity area on Level 3 will greatly reduce the strength of prevailing winds from north and westerly directions. Additionally, the proposed landscaping features, such as trellises to protect patrons from downwashing wind flows, decorative screen and coniferous planting around the designated seating areas, are expected to further improve the likelihood of comfortable wind speeds.

The proposed landscaping / hardscaping elements, such as 1.8 m tall glass screens, coniferous and/or deciduous trees and evergreen planters, and trellises in the amenity area on the 5th floor of the podium, as well as on the 13th and 17th floor of Towers B and A, respectively, are a positive approach and will reduce exposure to high winds and thereby improve wind conditions to be more suitable for prolonged passive use, especially in the summer.

RWDI will continue working with the design team to provide additional guidance on the placement of wind control measures and, if necessary, the effectiveness of the proposed wind control features can be evaluated quantitatively through wind tunnel testing.

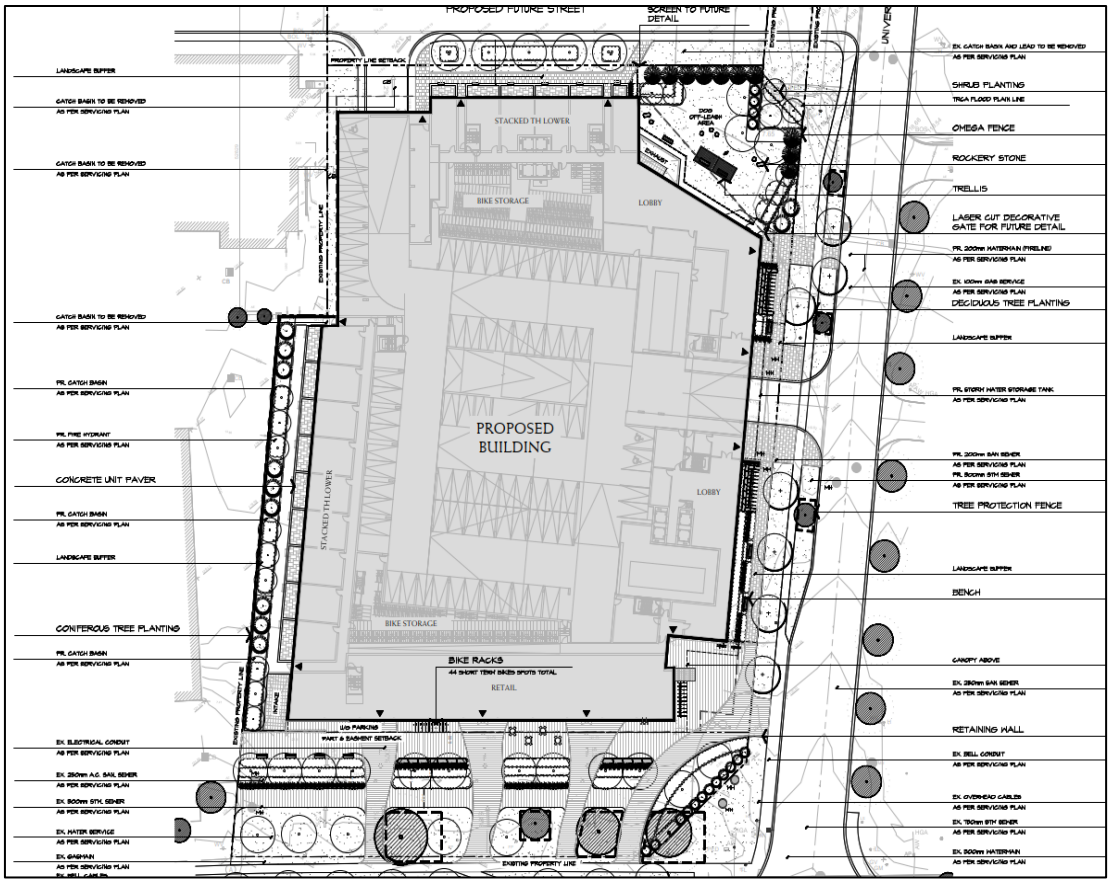


Image 8: Proposed design changes at grade level

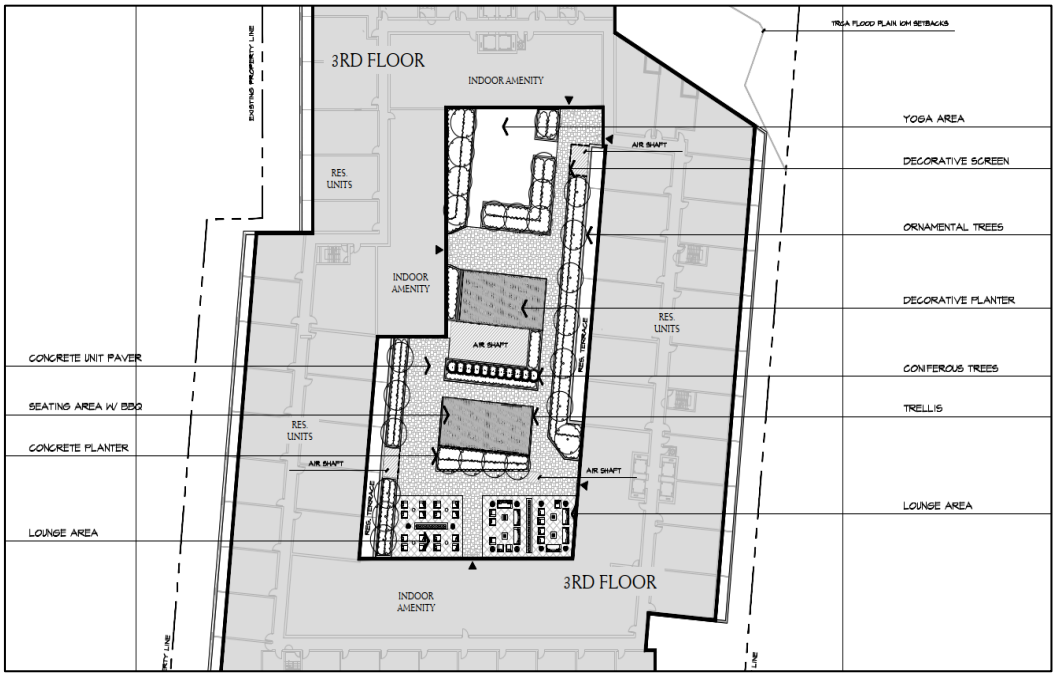


Image 9: Proposed lowered outdoor amenity area on Level 3

Image 10: Proposed landscape plan on Levels 5 and 13 of Tower B, and Level 17 of Tower A

4 STATEMENT OF LIMITATIONS

4.1 Limitations

This report entitled **1995 Dundas Street East** was prepared by Rowan Williams Davies & Irwin, Inc. ("RWDI") for **Landeal Asset Management Inc**. ("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.

4.2 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 **RAW Architects** and used to construct the scale model of the proposed **1995 Dundas Street East** project **("Project Data**")

File Name	File Type	Date Received (dd/mm/yyyy)
20240911 Updated CoordSet	PDF	11/09/2024
20240912 Revised3DModelSet	CAD	13/09/2024
1 - 22072 - 1995 Dundas - Architectural Set (Updated)	PDF	10/12/2024
3730-1995 Dundas St. E DEC 2024 (Landscape plan)	PDF	11/12/2024

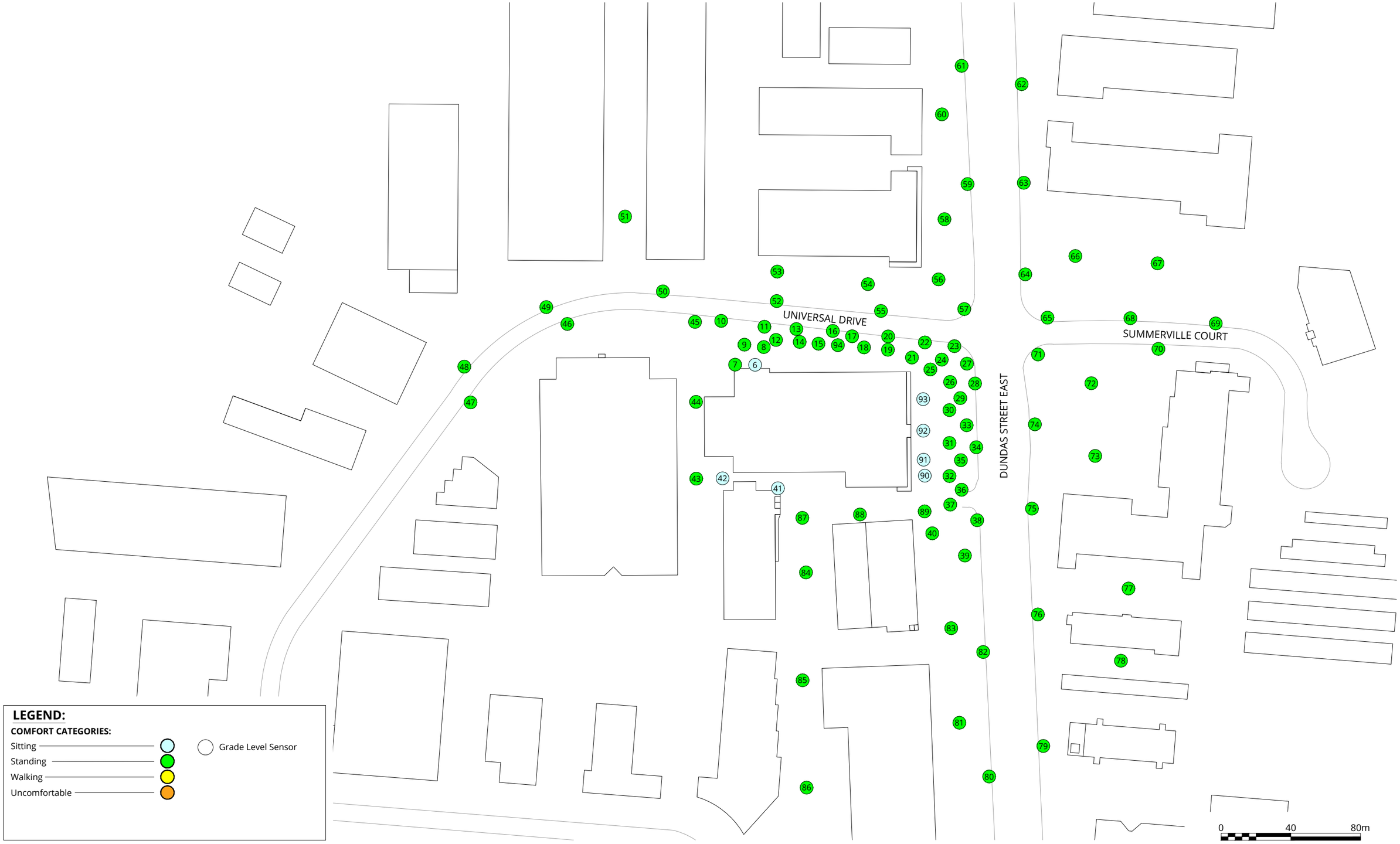
The recommendations and conclusions are based on the assumption that the Project Data and Climate Data are accurate and complete. RWDI assumes no responsibility for any inaccuracy or deficiency in information it has received from others. In addition, the recommendations and conclusions in this report 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



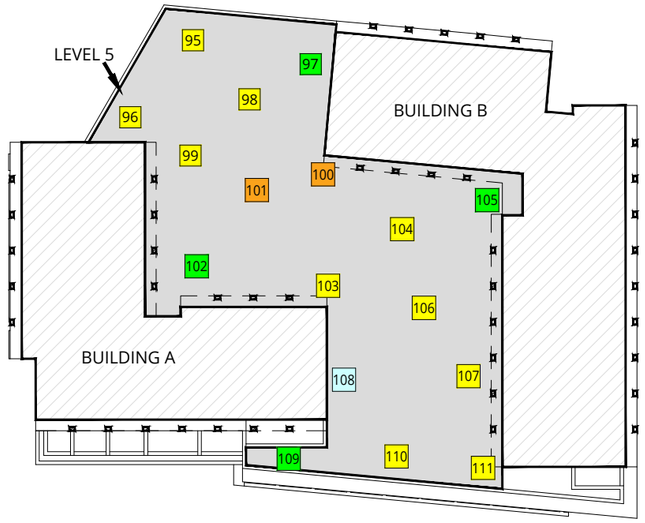
Pedestrian Wind Comfort Conditions
Existing Configuration
Summer (May to October, 6:00 to 23:00)

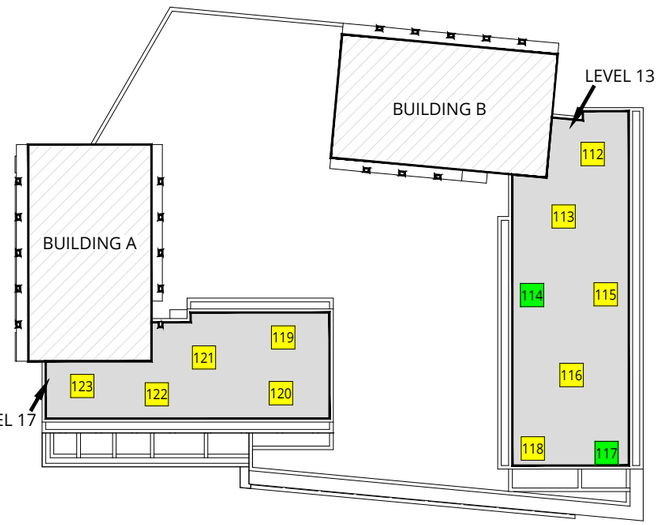
1995 Dundas Street East - Mississauga, ON

True North

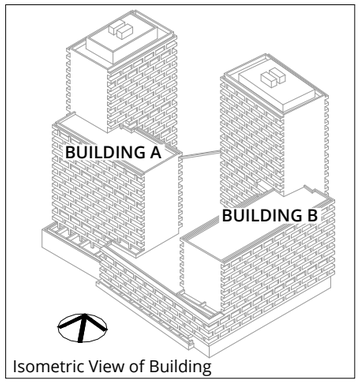
Project #2403758

Drawn by: ALJM	Figure: 1A
Approx. Scale:	1:2000
Date Revised:	Sep. 25, 2024





Outdoor Amenity Levels
Approx. Scale: 1:1000



LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Walking
- Uncomfortable

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

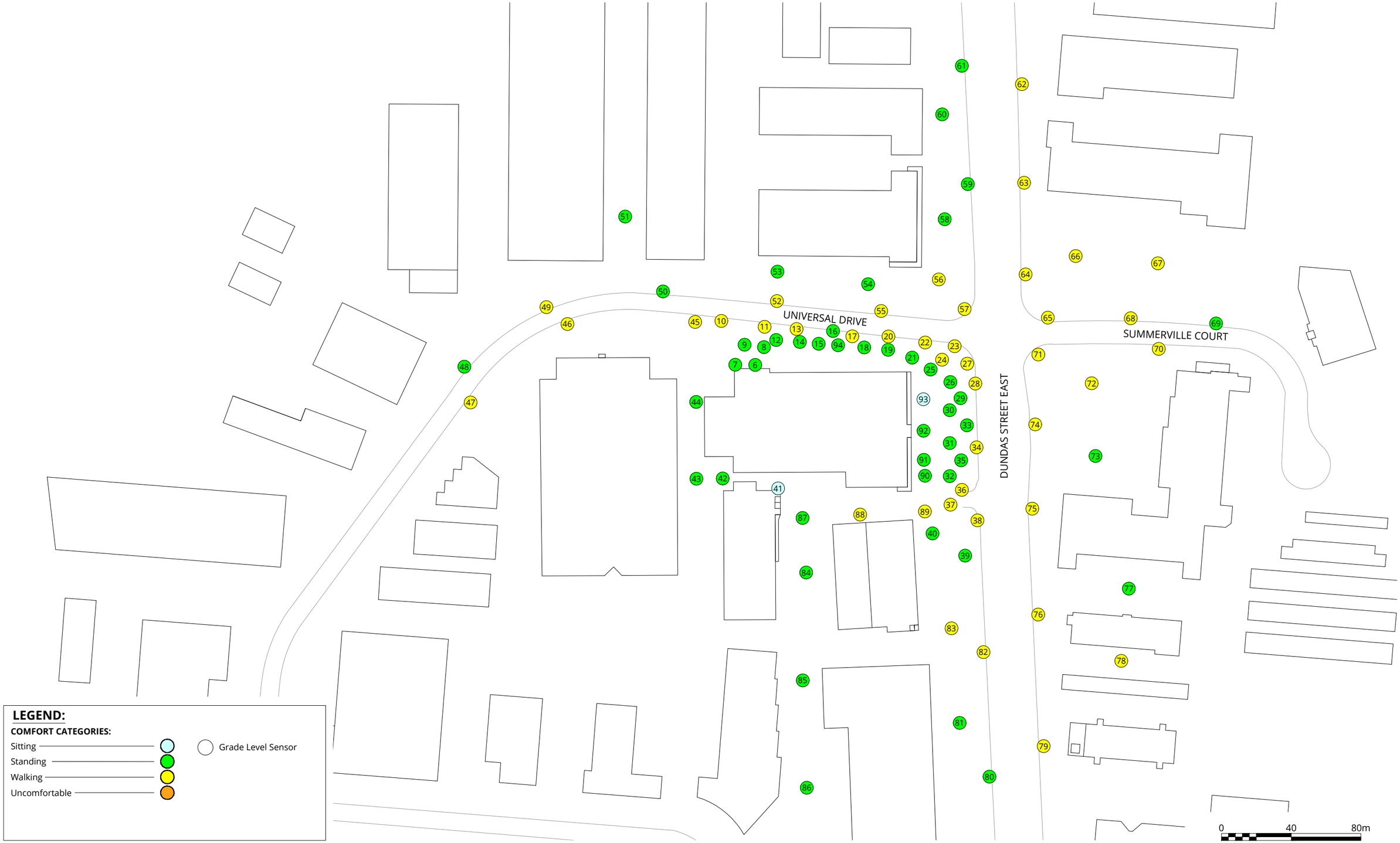
Pedestrian Wind Comfort Conditions
Proposed Configuration
Summer (May to October, 6:00 to 23:00)

1995 Dundas Street East - Mississauga, ON

True North

Project #2403758

Drawn by: ALJM	Figure: 1B
Approx. Scale:	1:2000
Date Revised:	Sep. 25, 2024



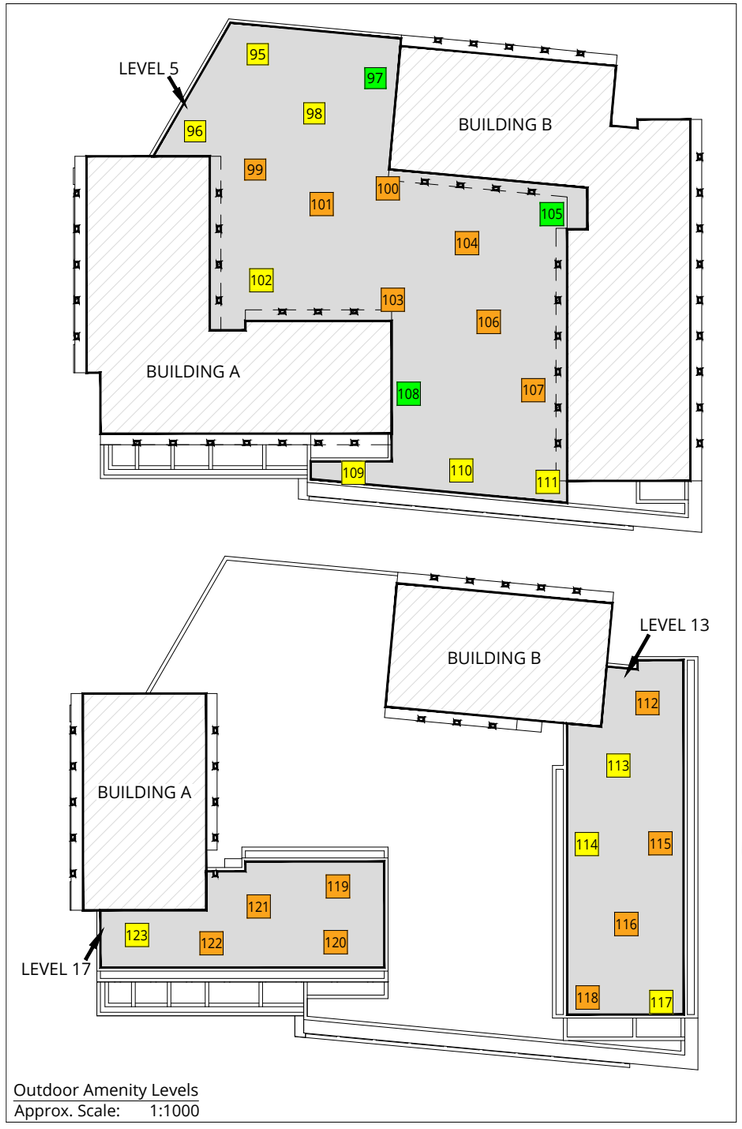
Pedestrian Wind Comfort Conditions
Existing Configuration
Winter (November to April, 6:00 to 23:00)

1995 Dundas Street East - Mississauga, ON

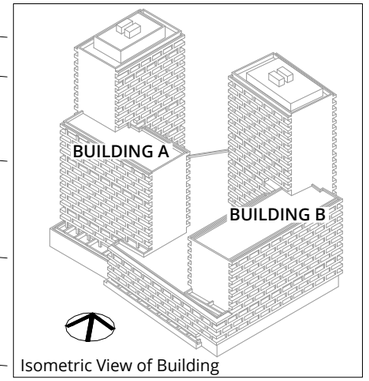
True North

Project #2403758

Drawn by: ALJM	Figure: 2A
Approx. Scale:	1:2000
Date Revised:	Sep. 25, 2024



Outdoor Amenity Levels
Approx. Scale: 1:1000



Isometric View of Building

LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Walking
- Uncomfortable

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

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

1995 Dundas Street East - Mississauga, ON

True North

Project #2403758

Drawn by: ALJM	Figure: 2B
Approx. Scale:	1:2000
Date Revised:	Sep. 25, 2024

LEGEND:

SAFETY CATEGORIES:

Acceptable

Exceeded

Grade Level Sensor

Pedestrian Wind Safety Conditions

Existing Configuration

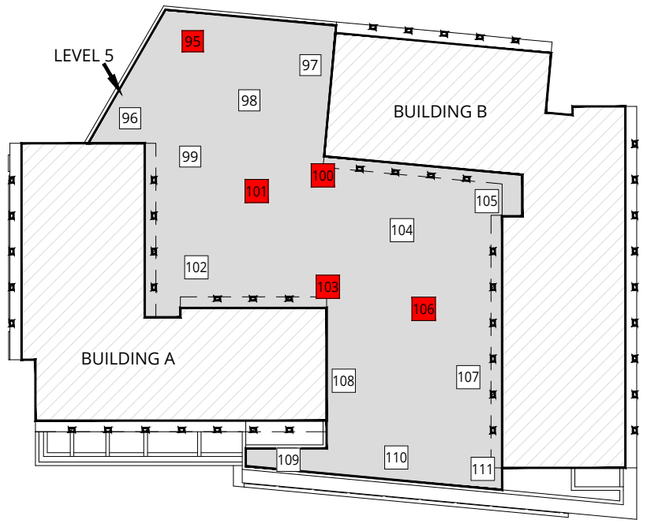
Annual (January to December, 0:00 to 23:00)

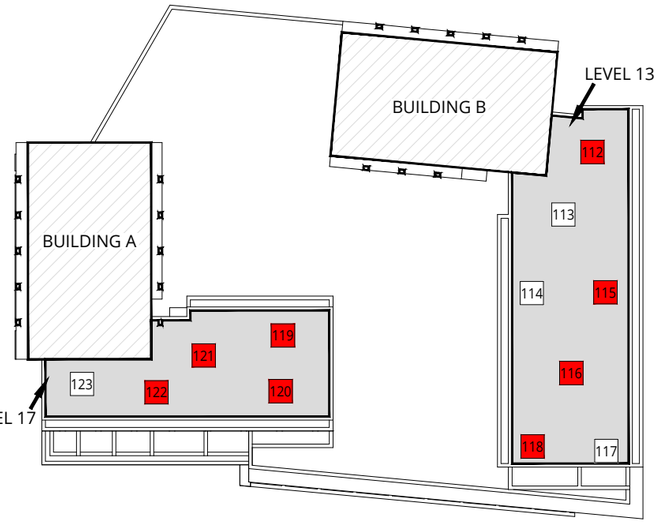
1995 Dundas Street East - Mississauga, ON

True North

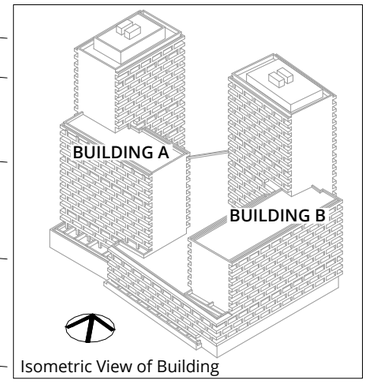
Project #2403758

Drawn by: ALJM	Figure: 3A
Approx. Scale:	1:2000
Date Revised:	Sep. 25, 2024





Outdoor Amenity Levels
Approx. Scale: 1:1000



Isometric View of Building

LEGEND:

SAFETY CATEGORIES:

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

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

1995 Dundas Street East - Mississauga, ON

True North

Project #2403758

Drawn by: ALJM	Figure: 3B
Approx. Scale:	1:2000
Date Revised:	Sep. 25, 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	-	-	-	-	-	-
	Proposed	13	Standing	15	Standing	80	Pass
2	Existing	-	-	-	-	-	-
	Proposed	15	Standing	18	Walking	86	Pass
3	Existing	-	-	-	-	-	-
	Proposed	16	Walking	20	Walking	88	Pass
4	Existing	-	-	-	-	-	-
	Proposed	16	Walking	20	Walking	83	Pass
5	Existing	-	-	-	-	-	-
	Proposed	16	Walking	20	Walking	94	Exceeded
6	Existing	10	Sitting	12	Standing	51	Pass
	Proposed	11	Standing	13	Standing	71	Pass
7	Existing	12	Standing	14	Standing	57	Pass
	Proposed	18	Walking	22	Uncomfortable	92	Exceeded
8	Existing	12	Standing	15	Standing	58	Pass
	Proposed	17	Walking	21	Uncomfortable	94	Exceeded
9	Existing	13	Standing	15	Standing	60	Pass
	Proposed	20	Walking	25	Uncomfortable	96	Exceeded
10	Existing	13	Standing	16	Walking	62	Pass
	Proposed	19	Walking	23	Uncomfortable	91	Exceeded
11	Existing	13	Standing	16	Walking	65	Pass
	Proposed	20	Walking	25	Uncomfortable	96	Exceeded
12	Existing	12	Standing	15	Standing	58	Pass
	Proposed	18	Walking	23	Uncomfortable	93	Exceeded
13	Existing	13	Standing	16	Walking	65	Pass
	Proposed	18	Walking	22	Uncomfortable	95	Exceeded
14	Existing	12	Standing	15	Standing	60	Pass
	Proposed	11	Standing	12	Standing	67	Pass
15	Existing	12	Standing	15	Standing	60	Pass
	Proposed	10	Sitting	12	Standing	61	Pass
16	Existing	13	Standing	15	Standing	62	Pass
	Proposed	13	Standing	15	Standing	66	Pass
17	Existing	13	Standing	16	Walking	63	Pass
	Proposed	13	Standing	15	Standing	64	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
18	Existing	12	Standing	14	Standing	58	Pass
	Proposed	12	Standing	14	Standing	59	Pass
19	Existing	11	Standing	13	Standing	48	Pass
	Proposed	19	Walking	23	Uncomfortable	72	Pass
20	Existing	14	Standing	16	Walking	62	Pass
	Proposed	16	Walking	18	Walking	71	Pass
21	Existing	14	Standing	15	Standing	58	Pass
	Proposed	16	Walking	17	Walking	73	Pass
22	Existing	14	Standing	17	Walking	64	Pass
	Proposed	19	Walking	21	Uncomfortable	78	Pass
23	Existing	15	Standing	17	Walking	64	Pass
	Proposed	18	Walking	21	Uncomfortable	80	Pass
24	Existing	14	Standing	16	Walking	60	Pass
	Proposed	19	Walking	20	Walking	78	Pass
25	Existing	14	Standing	15	Standing	59	Pass
	Proposed	16	Walking	18	Walking	72	Pass
26	Existing	13	Standing	15	Standing	58	Pass
	Proposed	17	Walking	19	Walking	77	Pass
27	Existing	14	Standing	16	Walking	62	Pass
	Proposed	18	Walking	20	Walking	80	Pass
28	Existing	14	Standing	16	Walking	60	Pass
	Proposed	16	Walking	19	Walking	77	Pass
29	Existing	13	Standing	15	Standing	57	Pass
	Proposed	16	Walking	18	Walking	74	Pass
30	Existing	12	Standing	14	Standing	54	Pass
	Proposed	14	Standing	16	Walking	74	Pass
31	Existing	12	Standing	14	Standing	56	Pass
	Proposed	14	Standing	16	Walking	80	Pass
32	Existing	12	Standing	14	Standing	59	Pass
	Proposed	15	Standing	18	Walking	82	Pass
33	Existing	13	Standing	15	Standing	60	Pass
	Proposed	16	Walking	18	Walking	80	Pass
34	Existing	13	Standing	16	Walking	62	Pass
	Proposed	15	Standing	19	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
35	Existing	12	Standing	15	Standing	60	Pass
	Proposed	15	Standing	18	Walking	79	Pass
36	Existing	13	Standing	16	Walking	63	Pass
	Proposed	16	Walking	20	Walking	82	Pass
37	Existing	13	Standing	16	Walking	60	Pass
	Proposed	16	Walking	19	Walking	78	Pass
38	Existing	14	Standing	16	Walking	62	Pass
	Proposed	14	Standing	18	Walking	73	Pass
39	Existing	13	Standing	15	Standing	59	Pass
	Proposed	13	Standing	16	Walking	66	Pass
40	Existing	12	Standing	14	Standing	61	Pass
	Proposed	13	Standing	15	Standing	78	Pass
41	Existing	7	Sitting	8	Sitting	35	Pass
	Proposed	10	Sitting	12	Standing	54	Pass
42	Existing	10	Sitting	13	Standing	55	Pass
	Proposed	17	Walking	20	Walking	78	Pass
43	Existing	12	Standing	14	Standing	56	Pass
	Proposed	18	Walking	21	Uncomfortable	85	Pass
44	Existing	13	Standing	15	Standing	58	Pass
	Proposed	19	Walking	23	Uncomfortable	85	Pass
45	Existing	13	Standing	16	Walking	63	Pass
	Proposed	16	Walking	20	Walking	75	Pass
46	Existing	14	Standing	16	Walking	65	Pass
	Proposed	13	Standing	16	Walking	60	Pass
47	Existing	13	Standing	16	Walking	62	Pass
	Proposed	13	Standing	15	Standing	58	Pass
48	Existing	12	Standing	15	Standing	62	Pass
	Proposed	13	Standing	15	Standing	59	Pass
49	Existing	14	Standing	16	Walking	63	Pass
	Proposed	13	Standing	15	Standing	58	Pass
50	Existing	13	Standing	15	Standing	62	Pass
	Proposed	13	Standing	15	Standing	58	Pass
51	Existing	13	Standing	15	Standing	61	Pass
	Proposed	12	Standing	15	Standing	63	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
52	Existing	13	Standing	16	Walking	66	Pass
	Proposed	20	Walking	24	Uncomfortable	98	Exceeded
53	Existing	12	Standing	13	Standing	56	Pass
	Proposed	16	Walking	19	Walking	73	Pass
54	Existing	13	Standing	15	Standing	63	Pass
	Proposed	18	Walking	21	Uncomfortable	83	Pass
55	Existing	14	Standing	16	Walking	65	Pass
	Proposed	18	Walking	20	Walking	79	Pass
56	Existing	13	Standing	16	Walking	64	Pass
	Proposed	14	Standing	16	Walking	66	Pass
57	Existing	15	Standing	17	Walking	65	Pass
	Proposed	17	Walking	20	Walking	79	Pass
58	Existing	11	Standing	13	Standing	51	Pass
	Proposed	12	Standing	14	Standing	61	Pass
59	Existing	12	Standing	14	Standing	58	Pass
	Proposed	13	Standing	14	Standing	68	Pass
60	Existing	11	Standing	13	Standing	53	Pass
	Proposed	11	Standing	13	Standing	58	Pass
61	Existing	13	Standing	15	Standing	59	Pass
	Proposed	12	Standing	15	Standing	61	Pass
62	Existing	14	Standing	17	Walking	62	Pass
	Proposed	13	Standing	15	Standing	63	Pass
63	Existing	14	Standing	16	Walking	64	Pass
	Proposed	14	Standing	17	Walking	73	Pass
64	Existing	15	Standing	17	Walking	63	Pass
	Proposed	15	Standing	17	Walking	71	Pass
65	Existing	15	Standing	18	Walking	66	Pass
	Proposed	16	Walking	19	Walking	73	Pass
66	Existing	15	Standing	18	Walking	64	Pass
	Proposed	15	Standing	18	Walking	68	Pass
67	Existing	14	Standing	17	Walking	64	Pass
	Proposed	14	Standing	16	Walking	62	Pass
68	Existing	15	Standing	18	Walking	65	Pass
	Proposed	15	Standing	18	Walking	65	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
69	Existing	13	Standing	15	Standing	60	Pass
	Proposed	13	Standing	15	Standing	56	Pass
70	Existing	15	Standing	17	Walking	63	Pass
	Proposed	14	Standing	17	Walking	64	Pass
71	Existing	15	Standing	18	Walking	67	Pass
	Proposed	16	Walking	19	Walking	77	Pass
72	Existing	14	Standing	17	Walking	62	Pass
	Proposed	15	Standing	18	Walking	71	Pass
73	Existing	13	Standing	15	Standing	58	Pass
	Proposed	13	Standing	15	Standing	62	Pass
74	Existing	15	Standing	18	Walking	65	Pass
	Proposed	17	Walking	20	Walking	79	Pass
75	Existing	13	Standing	16	Walking	62	Pass
	Proposed	15	Standing	18	Walking	70	Pass
76	Existing	14	Standing	16	Walking	60	Pass
	Proposed	13	Standing	16	Walking	62	Pass
77	Existing	12	Standing	14	Standing	57	Pass
	Proposed	12	Standing	14	Standing	60	Pass
78	Existing	14	Standing	16	Walking	61	Pass
	Proposed	13	Standing	16	Walking	66	Pass
79	Existing	13	Standing	16	Walking	60	Pass
	Proposed	13	Standing	15	Standing	62	Pass
80	Existing	13	Standing	15	Standing	59	Pass
	Proposed	12	Standing	14	Standing	60	Pass
81	Existing	11	Standing	14	Standing	55	Pass
	Proposed	11	Standing	13	Standing	54	Pass
82	Existing	14	Standing	16	Walking	60	Pass
	Proposed	13	Standing	16	Walking	60	Pass
83	Existing	13	Standing	16	Walking	60	Pass
	Proposed	14	Standing	17	Walking	64	Pass
84	Existing	11	Standing	13	Standing	53	Pass
	Proposed	11	Standing	13	Standing	52	Pass
85	Existing	12	Standing	15	Standing	62	Pass
	Proposed	12	Standing	14	Standing	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
86	Existing	12	Standing	14	Standing	59	Pass
	Proposed	12	Standing	15	Standing	62	Pass
87	Existing	11	Standing	13	Standing	55	Pass
	Proposed	13	Standing	16	Walking	68	Pass
88	Existing	13	Standing	16	Walking	62	Pass
	Proposed	15	Standing	18	Walking	72	Pass
89	Existing	14	Standing	16	Walking	66	Pass
	Proposed	17	Walking	20	Walking	80	Pass
90	Existing	9	Sitting	11	Standing	48	Pass
	Proposed	10	Sitting	12	Standing	68	Pass
91	Existing	9	Sitting	11	Standing	46	Pass
	Proposed	10	Sitting	12	Standing	64	Pass
92	Existing	9	Sitting	11	Standing	48	Pass
	Proposed	11	Standing	12	Standing	57	Pass
93	Existing	9	Sitting	10	Sitting	45	Pass
	Proposed	10	Sitting	11	Standing	55	Pass
94	Existing	12	Standing	15	Standing	60	Pass
	Proposed	10	Sitting	12	Standing	61	Pass
95	Existing	-	-	-	-	-	-
	Proposed	17	Walking	20	Walking	91	Exceeded
96	Existing	-	-	-	-	-	-
	Proposed	18	Walking	20	Walking	82	Pass
97	Existing	-	-	-	-	-	-
	Proposed	14	Standing	15	Standing	75	Pass
98	Existing	-	-	-	-	-	-
	Proposed	18	Walking	20	Walking	90	Pass
99	Existing	-	-	-	-	-	-
	Proposed	19	Walking	22	Uncomfortable	86	Pass
100	Existing	-	-	-	-	-	-
	Proposed	23	Uncomfortable	28	Uncomfortable	102	Exceeded
101	Existing	-	-	-	-	-	-
	Proposed	21	Uncomfortable	24	Uncomfortable	93	Exceeded
102	Existing	-	-	-	-	-	-
	Proposed	15	Standing	17	Walking	81	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
103	Existing	-	-	-	-	-	-
	Proposed	20	Walking	23	Uncomfortable	93	Exceeded
104	Existing	-	-	-	-	-	-
	Proposed	19	Walking	23	Uncomfortable	89	Pass
105	Existing	-	-	-	-	-	-
	Proposed	11	Standing	13	Standing	57	Pass
106	Existing	-	-	-	-	-	-
	Proposed	20	Walking	25	Uncomfortable	93	Exceeded
107	Existing	-	-	-	-	-	-
	Proposed	18	Walking	22	Uncomfortable	87	Pass
108	Existing	-	-	-	-	-	-
	Proposed	10	Sitting	12	Standing	72	Pass
109	Existing	-	-	-	-	-	-
	Proposed	13	Standing	16	Walking	73	Pass
110	Existing	-	-	-	-	-	-
	Proposed	16	Walking	19	Walking	81	Pass
111	Existing	-	-	-	-	-	-
	Proposed	17	Walking	19	Walking	79	Pass
112	Existing	-	-	-	-	-	-
	Proposed	18	Walking	22	Uncomfortable	105	Exceeded
113	Existing	-	-	-	-	-	-
	Proposed	17	Walking	20	Walking	86	Pass
114	Existing	-	-	-	-	-	-
	Proposed	15	Standing	17	Walking	81	Pass
115	Existing	-	-	-	-	-	-
	Proposed	18	Walking	22	Uncomfortable	106	Exceeded
116	Existing	-	-	-	-	-	-
	Proposed	18	Walking	23	Uncomfortable	98	Exceeded
117	Existing	-	-	-	-	-	-
	Proposed	15	Standing	19	Walking	79	Pass
118	Existing	-	-	-	-	-	-
	Proposed	18	Walking	23	Uncomfortable	95	Exceeded
119	Existing	-	-	-	-	-	-
	Proposed	17	Walking	22	Uncomfortable	96	Exceeded

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
120	Existing	-	-	-	-	-	-
	Proposed	18	Walking	23	Uncomfortable	111	Exceeded
121	Existing	-	-	-	-	-	-
	Proposed	17	Walking	22	Uncomfortable	105	Exceeded
122	Existing	-	-	-	-	-	-
	Proposed	20	Walking	25	Uncomfortable	126	Exceeded
123	Existing	-	-	-	-	-	-
	Proposed	17	Walking	18	Walking	89	Pass
124	Existing	-	-	-	-	-	-
	Proposed	14	Standing	17	Walking	81	Pass
125	Existing	-	-	-	-	-	-
	Proposed	12	Standing	14	Standing	63	Pass
126	Existing	-	-	-	-	-	-
	Proposed	11	Standing	13	Standing	57	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 - 15	Standing
16 - 20	Walking
> 20	Uncomfortable

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