REPORT

1840-1850 BLOOR STREET

MISSISSAUGA, ON

PEDESTRIAN WIND STUDY
RWDI # 2000889
December 9, 2019

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed 1840-1850 Bloor Street building in Mississauga, ON (Image 1). Based on our wind tunnel testing for the proposed development under the Existing and Proposed configurations (Images 2A through 2B), and the local wind records (Image 3), the potential wind comfort conditions are predicted as shown on site plans in Figures 1A through 2B, while the associated wind speeds are listed in Table 1.

These results can be summarized as follows:

- Wind conditions that meet the safety criterion are predicted at all locations and for all configurations assessed.
- Existing conditions are comfortable for standing or walking in the summer and generally comfortable for walking in the winter. These conditions are appropriate for the intended use of most areas and are typical for this area of Mississauga. Uncomfortable wind speeds occur to the east and west of Building B during the winter months.
- With the addition of the proposed development to the site, wind speeds are still expected to be comfortable for the intended use throughout the year, with calmer wind speeds close to the proposed building perimeters. Potentially higher-than-desired wind speeds are predicted in the outdoor amenity area in the summer. The pre-existing areas of uncomfortable wind speeds in the Existing configuration are anticipated to improve in the presence of the proposed development.
- In the summer, wind speeds on the Level 4 amenity terrace are anticipated to be comfortable for the intended use in most areas; however, higher-than-desired wind speeds are expected in the northwest area, to the east of the base of Building D. Elevated wind conditions predicted in the winter months may be considered acceptable as the outdoor amenity terrace would not be used frequently during this time.

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1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed 1840-1850 Bloor Street in Mississauga, Ontario. This report presents the project objectives, background and approach, and discusses of the results from RWDI's assessment and provides conceptual wind control measures, where necessary.

1.1 Project Description

The project (site shown in Image 1) is located on the south side of Bloor Street between Fieldgate Drive and Markland Drive. The proposed building is 57 m tall and consists of two 18-storey buildings (Buildings D and C) connected by a 4-storey podium with outdoor amenity spaces

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 appropriate criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including two main building entrances, pedestrian areas on and around the development and public sidewalks along Bloor Street West.

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

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

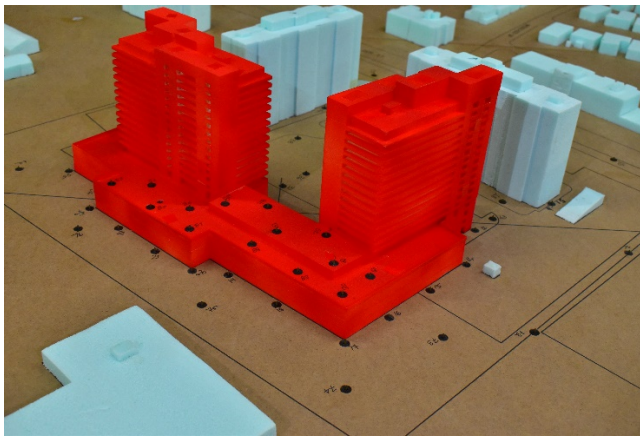
To assess the wind environment around the proposed project, a 1:300 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

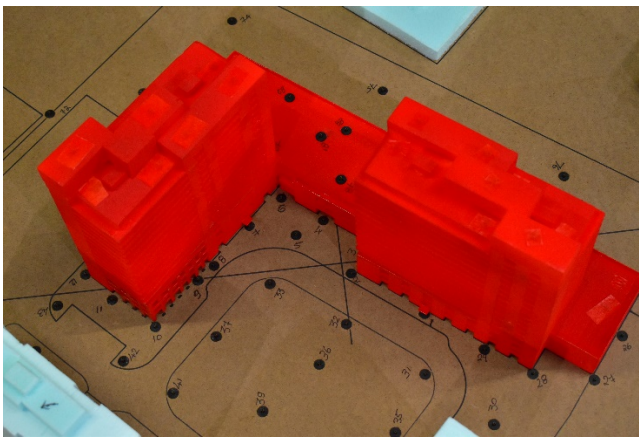
A - Existing: Existing site with existing surroundings (Image 2A); and,

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

The wind tunnel model included all relevant surrounding buildings and topography within an approximate 360 m radius of the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modeled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 91 wind speed sensors (i.e., 77 sensors at grade and 14 sensors on the building) 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. 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. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site.

Image 2A: Wind Tunnel Study Model – Existing Configuration





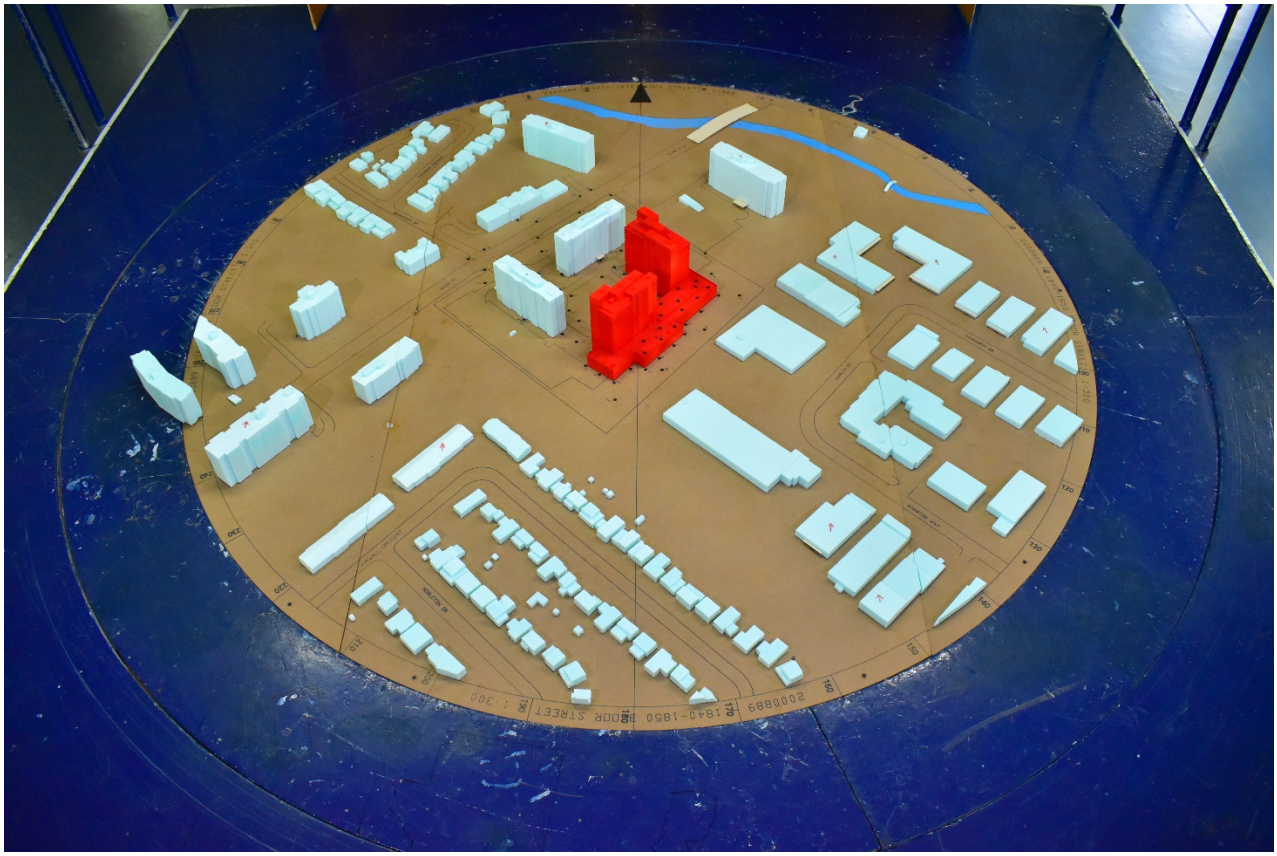
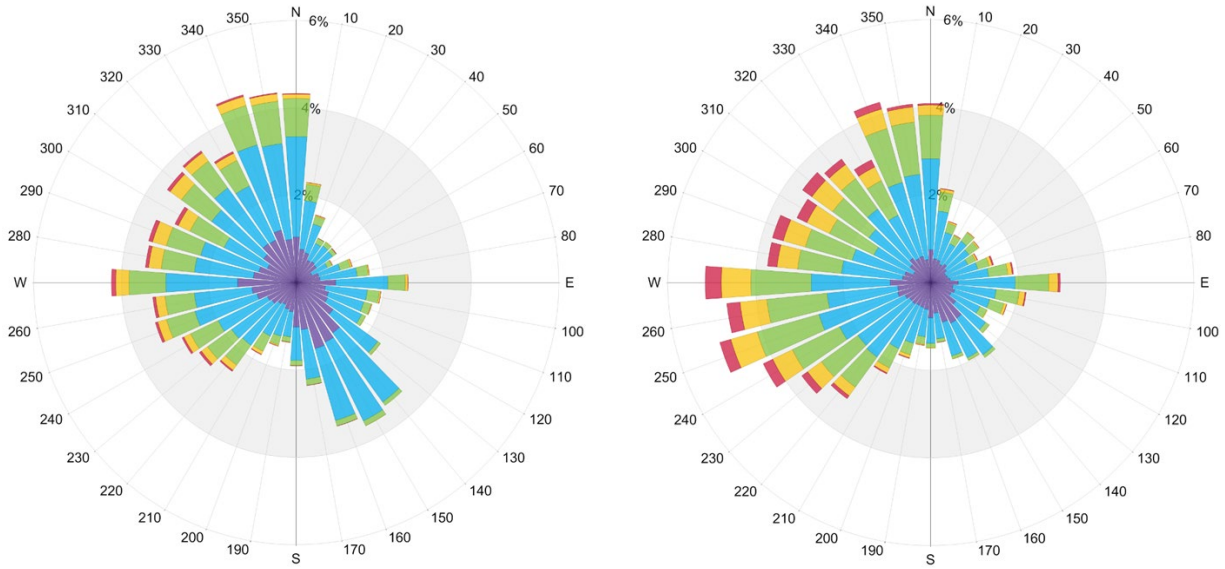


Image 2B: Wind Tunnel Study Model – Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Toronto Pearson International Airport between 1988 and 2018, 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 southwest, west and northwest directions are predominant during both summer and winter. During the winter season, the prevailing winds from the east direction are also frequent, as indicated by the wind roses. The southeast winds are frequent in the summer, but typically of low wind 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 4.6% and 11.2% of the time during the summer and winter seasons, respectively.

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



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

Wind Speed (km/h)	Probability (%) Summer	Winter
Calm	5.8	3.9
1-10	31.7	22.8
11-20	42.3	39.8
21-30	15.5	22.2
31-40	3.7	8.0
>40	0.9	3.2

Image 3: Directional Distribution of Winds Approaching Toronto Pearson International Airport from 1988 to 2018

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 criterion 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);
(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.

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on a site plan in Figures 1A through 2B, located in the "Figures" section of this report. These conditions and the associated wind speeds are also represented in Table 1, located in the "Tables" section of this report. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

Wind conditions that meet the safety criterion are predicted at all locations and for all configurations assessed.

3.1 Grade Level (Locations 1 through 77)

Wind conditions comfortable for 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 passive activities, such as the outdoor amenity area to the north of the building.

3.1.1 Existing Configuration

In the existing configuration, summer conditions are generally comfortable for standing or walking (Figure 1A). Seasonally stronger wind speeds during the winter months (Figure 2A) result in conditions that are windier, with conditions suitable for walking at most locations and three uncomfortable locations (Locations 46, 49 and 71, Figure 2A) to the east and west of Building B. These conditions can be considered appropriate for most areas and are typical for this area of Mississauga.

3.1.2 Proposed Configuration

The addition of the proposed building is expected to generally improve the wind conditions in both summer and winter. In the summer (Figure 1B), conditions around the proposed building are anticipated to improve from standing to sitting close to the building perimeters. Slightly higher-than-desired wind speeds, comfortable for walking, are expected in the outdoor amenity area to the north of the building. A reduction in wind speeds can be achieved using a combination of hard and soft landscaping elements, as discussed in Section 3.3 below. In the winter (Figure 2B), wind speeds are predicted to be comfortable for sitting or standing close to the building perimeters and typically comfortable for walking elsewhere on and around the site. The pre-existing areas of uncomfortable wind speeds in the winter are anticipated to improve in the presence of the proposed development (Locations 46, 49, and 71, Figures 2A and 2B).

Main entrances of the proposed building are situated near Locations 1 and 7 in Figures 1B through 2B. Wind speeds at these entrances are anticipated to be comfortable for sitting at these entrances year-round, which is appropriate for the intended use of these areas.

3.2 Level 4 Amenity Terrace (Locations 78 through 91)

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

Summer conditions (Figure 2A) on the level 4 amenity terrace are expected to be generally comfortable for standing with some areas comfortable for walking (Locations 78, 80, 81, Figure 1B). Wind speeds well-suited to walking are higher than desired for an outdoor terrace and an improvement in conditions can be achieved using a combination of hard and soft landscaping elements, as discussed in Section 3.3 below. Elevated wind conditions predicted in the winter months (Figure 2B) may be considered appropriate as these areas would not be used frequently during that time.

3.3 Wind Control Recommendations

To improve the grade-level wind conditions, a combination of hard and soft landscaping are recommended. These measures include trees, windscreens, canopies and other vegetation. Strategic placement of these elements in the amenity space to the north of the proposed building and around the northeast and southwest of the building can help to improve conditions during the summer months.

To improve conditions on the terrace in the summer, consider taller parapets or guardrails (minimum 2 m tall, solid or at most 30% porous) along the north end of the terrace perimeter, or dense landscaping of equivalent height. Additionally, a trellis or canopy (solid or at most 30% porous) above the area to the east of the base of Building D can help to deflect or disperse any vertical winds flowing onto the terrace. Examples of these wind control measures are shown in Image 4 and conceptual guardrail and trellis/canopy locations are shown in Image 5.

Image 4: Examples of Wind Control Measures

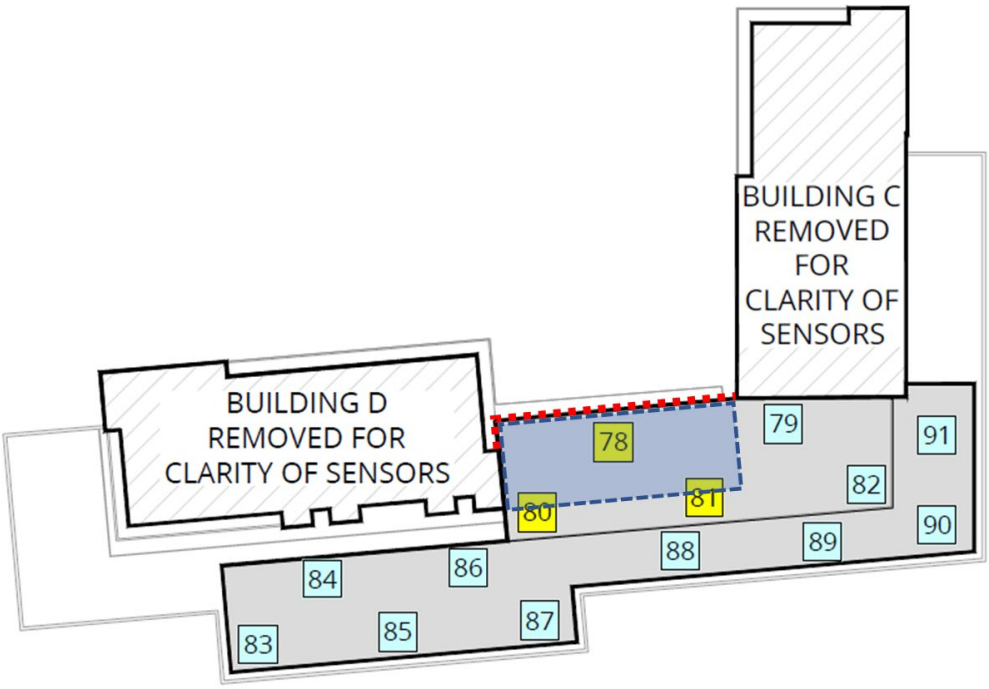


Image 5: Conceptual Recommendations for Tall Guardrail (Red) and Canopy/Trellis (Blue)

4 APPLICABILITY OF RESULTS

The wind conditions presented in this report pertain to the model of the 1840-1850 Bloor Street building constructed using the drawings and information listed below. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
120303_Bloor- 3D export	.dwg	08/11/2019
120303_Bloor-Sheet - A-003 - CONCEPT SITE PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-102 - UNDERGROUND GARAGE PLAN - LEVEL P1	.dwg	08/11/2019
120303_Bloor-Sheet - A-103 - LEVEL 1 GROUND FLOOR PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-104 - LEVEL 2 FLOOR PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-105 - LEVEL 3 FLOOR PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-106 - LEVEL 4 FLOOR PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-107 - LEVEL 5-18 FLOOR PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-108 - MAIN ROOF - MECHANICAL PENTHOUSE	.dwg	08/11/2019
120303_Bloor-Sheet - A-109 - ROOF PLAN	.dwg	08/11/2019
120303_Bloor-Sheet - A-201 - NORTH BUILDING ELEVATION	.dwg	08/11/2019
120303_Bloor-Sheet - A-202 - EAST BUILDING ELEVATION	.dwg	08/11/2019
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120303_Bloor-Sheet - A-204 - WEST BUILDING ELEVATION	.dwg	08/11/2019
120303_Bloor-Sheet - A-301 - NORTH - SOUTH BUILDING - D SECTION	.dwg	08/11/2019
120303_Bloor-Sheet - A-302 - EAST - WEST BUILDING - D SECTION	.dwg	08/11/2019
120303_Bloor-Sheet - A-303 - EAST - WEST BUILDING - C SECTION	.dwg	08/11/2019
120303_Bloor-Sheet - A-304 - NORTH - SOUTH BUILDING - C SECTION	.dwg	08/11/2019

5 REFERENCES

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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.

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FIGURES

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

1840-1850 Bloor Street - Mississauga, ON

True North

Project #2000889

Drawn by: DF	Figure: 1A
Approx. Scale:	1:1500
Date Revised:	Dec. 5, 2019

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

1840-1850 Bloor Street - Mississauga, ON

Project #2000889

True North

Drawn by:	DF	Figure:	1B
Approx. Scale:	1:1500		
Date Revised:	Dec. 5, 2019		

Pedestrian Wind Comfort Conditions

Existing Configuration

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

1840-1850 Bloor Street - Mississauga, ON

True North

Project #2000889

Drawn by:	DF	Figure:	2A
Approx. Scale:	1:1500		
Date Revised:	Dec. 5, 2019		

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

1840-1850 Bloor Street - Mississauga, ON

Project #2000889

True North

Drawn by: DF	Figure: 2B	
Approx. Scale: 1:1500		
Date Revised: Dec. 5, 2019		

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	15	Standing	19	Walking	75	Pass
	Proposed	12	Standing	14	Standing	63	Pass
2	Existing	15	Standing	18	Walking	80	Pass
	Proposed	13	Standing	16	Walking	64	Pass
3	Existing	15	Standing	18	Walking	77	Pass
	Proposed	12	Standing	15	Standing	63	Pass
4	Existing	14	Standing	17	Walking	73	Pass
	Proposed	11	Standing	14	Standing	63	Pass
5	Existing	14	Standing	18	Walking	75	Pass
	Proposed	14	Standing	17	Walking	71	Pass
6	Existing	14	Standing	17	Walking	72	Pass
	Proposed	7	Sitting	9	Sitting	35	Pass
7	Existing	13	Standing	17	Walking	68	Pass
	Proposed	11	Standing	13	Standing	53	Pass
8	Existing	13	Standing	16	Walking	66	Pass
	Proposed	12	Standing	13	Standing	56	Pass
9	Existing	13	Standing	16	Walking	65	Pass
	Proposed	11	Standing	13	Standing	54	Pass
10	Existing	13	Standing	16	Walking	62	Pass
	Proposed	16	Walking	20	Walking	78	Pass
11	Existing	14	Standing	16	Walking	64	Pass
	Proposed	11	Standing	14	Standing	55	Pass
12	Existing	14	Standing	16	Walking	66	Pass
	Proposed	14	Standing	17	Walking	67	Pass
13	Existing	13	Standing	16	Walking	66	Pass
	Proposed	9	Sitting	11	Standing	48	Pass
14	Existing	13	Standing	16	Walking	65	Pass
	Proposed	14	Standing	16	Walking	69	Pass
15	Existing	13	Standing	16	Walking	65	Pass
	Proposed	12	Standing	14	Standing	55	Pass
16	Existing	14	Standing	17	Walking	66	Pass
	Proposed	12	Standing	14	Standing	59	Pass
17	Existing	14	Standing	17	Walking	67	Pass
	Proposed	15	Standing	17	Walking	71	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
18	Existing	14	Standing	17	Walking	69	Pass
	Proposed	11	Standing	12	Standing	47	Pass
19	Existing	14	Standing	17	Walking	70	Pass
	Proposed	9	Sitting	10	Sitting	41	Pass
20	Existing	14	Standing	17	Walking	68	Pass
	Proposed	12	Standing	14	Standing	53	Pass
21	Existing	14	Standing	17	Walking	69	Pass
	Proposed	10	Sitting	12	Standing	48	Pass
22	Existing	14	Standing	17	Walking	70	Pass
	Proposed	10	Sitting	13	Standing	63	Pass
23	Existing	14	Standing	17	Walking	71	Pass
	Proposed	13	Standing	16	Walking	74	Pass
24	Existing	15	Standing	18	Walking	75	Pass
	Proposed	10	Sitting	12	Standing	49	Pass
25	Existing	14	Standing	17	Walking	70	Pass
	Proposed	16	Walking	20	Walking	83	Pass
26	Existing	14	Standing	17	Walking	72	Pass
	Proposed	11	Standing	14	Standing	56	Pass
27	Existing	15	Standing	18	Walking	77	Pass
	Proposed	17	Walking	20	Walking	86	Pass
28	Existing	16	Walking	20	Walking	84	Pass
	Proposed	16	Walking	18	Walking	81	Pass
29	Existing	16	Walking	19	Walking	78	Pass
	Proposed	13	Standing	16	Walking	72	Pass
30	Existing	15	Standing	18	Walking	74	Pass
	Proposed	17	Walking	20	Walking	81	Pass
31	Existing	16	Walking	19	Walking	78	Pass
	Proposed	15	Standing	18	Walking	73	Pass
32	Existing	14	Standing	17	Walking	71	Pass
	Proposed	16	Walking	19	Walking	79	Pass
33	Existing	14	Standing	17	Walking	72	Pass
	Proposed	15	Standing	19	Walking	74	Pass
34	Existing	12	Standing	15	Standing	63	Pass
	Proposed	12	Standing	14	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
35	Existing	16	Walking	19	Walking	75	Pass
	Proposed	16	Walking	18	Walking	71	Pass
36	Existing	15	Standing	18	Walking	77	Pass
	Proposed	16	Walking	19	Walking	72	Pass
37	Existing	13	Standing	16	Walking	66	Pass
	Proposed	16	Walking	19	Walking	77	Pass
38	Existing	17	Walking	20	Walking	83	Pass
	Proposed	14	Standing	17	Walking	74	Pass
39	Existing	15	Standing	19	Walking	78	Pass
	Proposed	15	Standing	18	Walking	70	Pass
40	Existing	16	Walking	20	Walking	81	Pass
	Proposed	15	Standing	18	Walking	71	Pass
41	Existing	13	Standing	15	Standing	60	Pass
	Proposed	16	Walking	20	Walking	80	Pass
42	Existing	13	Standing	15	Standing	58	Pass
	Proposed	17	Walking	20	Walking	79	Pass
43	Existing	15	Standing	17	Walking	66	Pass
	Proposed	16	Walking	19	Walking	71	Pass
44	Existing	11	Standing	13	Standing	52	Pass
	Proposed	10	Sitting	12	Standing	50	Pass
45	Existing	12	Standing	15	Standing	59	Pass
	Proposed	11	Standing	13	Standing	52	Pass
46	Existing	18	Walking	22	Uncomfortable	83	Pass
	Proposed	16	Walking	20	Walking	77	Pass
47	Existing	12	Standing	14	Standing	55	Pass
	Proposed	13	Standing	15	Standing	76	Pass
48	Existing	12	Standing	13	Standing	51	Pass
	Proposed	14	Standing	17	Walking	66	Pass
49	Existing	18	Walking	22	Uncomfortable	86	Pass
	Proposed	15	Standing	19	Walking	76	Pass
50	Existing	13	Standing	15	Standing	63	Pass
	Proposed	12	Standing	14	Standing	60	Pass
51	Existing	13	Standing	15	Standing	75	Pass
	Proposed	13	Standing	16	Walking	72	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	71	Pass
	Proposed	12	Standing	15	Standing	65	Pass
53	Existing	16	Walking	19	Walking	79	Pass
	Proposed	14	Standing	17	Walking	74	Pass
54	Existing	17	Walking	20	Walking	85	Pass
	Proposed	15	Standing	18	Walking	79	Pass
55	Existing	11	Standing	13	Standing	56	Pass
	Proposed	10	Sitting	13	Standing	55	Pass
56	Existing	14	Standing	17	Walking	73	Pass
	Proposed	14	Standing	17	Walking	72	Pass
57	Existing	15	Standing	18	Walking	75	Pass
	Proposed	15	Standing	17	Walking	72	Pass
58	Existing	15	Standing	18	Walking	80	Pass
	Proposed	14	Standing	17	Walking	79	Pass
59	Existing	15	Standing	18	Walking	80	Pass
	Proposed	15	Standing	18	Walking	79	Pass
60	Existing	14	Standing	17	Walking	70	Pass
	Proposed	14	Standing	17	Walking	69	Pass
61	Existing	15	Standing	18	Walking	74	Pass
	Proposed	14	Standing	17	Walking	74	Pass
62	Existing	14	Standing	17	Walking	75	Pass
	Proposed	14	Standing	17	Walking	75	Pass
63	Existing	14	Standing	17	Walking	70	Pass
	Proposed	14	Standing	17	Walking	70	Pass
64	Existing	13	Standing	16	Walking	62	Pass
	Proposed	13	Standing	15	Standing	62	Pass
65	Existing	13	Standing	16	Walking	64	Pass
	Proposed	13	Standing	16	Walking	63	Pass
66	Existing	11	Standing	13	Standing	59	Pass
	Proposed	12	Standing	14	Standing	67	Pass
67	Existing	14	Standing	16	Walking	65	Pass
	Proposed	14	Standing	17	Walking	66	Pass
68	Existing	13	Standing	15	Standing	63	Pass
	Proposed	13	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
69	Existing	15	Standing	18	Walking	77	Pass
	Proposed	15	Standing	18	Walking	76	Pass
70	Existing	15	Standing	18	Walking	70	Pass
	Proposed	15	Standing	18	Walking	68	Pass
71	Existing	17	Walking	21	Uncomfortable	87	Pass
	Proposed	16	Walking	20	Walking	83	Pass
72	Existing	14	Standing	18	Walking	74	Pass
	Proposed	15	Standing	18	Walking	74	Pass
73	Existing	13	Standing	16	Walking	66	Pass
	Proposed	13	Standing	15	Standing	62	Pass
74	Existing	14	Standing	17	Walking	67	Pass
	Proposed	14	Standing	16	Walking	66	Pass
75	Existing	14	Standing	17	Walking	67	Pass
	Proposed	14	Standing	17	Walking	67	Pass
76	Existing	14	Standing	17	Walking	70	Pass
	Proposed	13	Standing	16	Walking	73	Pass
77	Existing	13	Standing	16	Walking	66	Pass
	Proposed	15	Standing	18	Walking	72	Pass
78	Existing	-	-	-	-	-	-
	Proposed	18	Walking	22	Uncomfortable	86	Pass
79	Existing	-	-	-	-	-	-
	Proposed	12	Standing	13	Standing	62	Pass
80	Existing	-	-	-	-	-	-
	Proposed	16	Walking	18	Walking	75	Pass
81	Existing	-	-	-	-	-	-
	Proposed	16	Walking	19	Walking	77	Pass
82	Existing	-	-	-	-	-	-
	Proposed	14	Standing	16	Walking	64	Pass
83	Existing	-	-	-	-	-	-
	Proposed	11	Standing	13	Standing	55	Pass
84	Existing	-	-	-	-	-	-
	Proposed	12	Standing	14	Standing	61	Pass
85	Existing	-	-	-	-	-	-
	Proposed	13	Standing	15	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	-	-	-	-	-	-
	Proposed	12	Standing	14	Standing	55	Pass
87	Existing	-	-	-	-	-	-
	Proposed	12	Standing	14	Standing	52	Pass
88	Existing	-	-	-	-	-	-
	Proposed	13	Standing	15	Standing	58	Pass
89	Existing	-	-	-	-	-	-
	Proposed	12	Standing	15	Standing	58	Pass
90	Existing	-	-	-	-	-	-
	Proposed	14	Standing	16	Walking	63	Pass
91	Existing	-	-	-	-	-	-
	Proposed	13	Standing	15	Standing	69	Pass

Seasons		Hours
Summer	May - October	6:00 - 23:00 for comfort
Winter	November - April	0:00 - 23:00 for safety

Configurations	
Existing	Existing site with existing surroundings
Proposed	Proposed building 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