

FINAL REPORT

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251 – 261 SPRINGVALE ROAD

GLEN WAVERLEY, VIC

PEDESTRIAN WIND STUDY

RWDI # 2003838

July 28, 2021

SUBMITTED TO

Mathew Wilson
Associate Director
wilson@pppartners.com.au

SUBMITTED BY

Anu Cherian, M.Tech
Project Engineer
anu.cherian@rwdi.com

Krishan Jayyaratnam, MEng, CEng MIMechE
Senior Project Engineer
krishan.jayyaratnam@rwdi.com

Michael Pieterse, M.A.Sc., CPEng., P.Eng.
Senior Project Manager | Associate
michael.pieterse@rwdi.com

Kevin Peddie, B.E.(Aero), MSEM, CPEng, NER
Director of Projects | Associate
kevin.peddie@rwdi.com

HongXing Springvale Road Pty Ltd

c/o

Planning & Property Partners
13/1 Collins Street,
Melbourne VIC 3000

RWDI Australia Pty Ltd

ABN 86 641 303 871



rwdi.com



EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the Proposed Development at 251 – 261 Springvale road in Glen Waverley, Victoria. The pedestrian level wind microclimate assessment has been conducted for the existing Site as well as with the inclusion of the Proposed Development (Existing and Proposed configurations respectively), to understand the effect of the Proposed Development on the wind conditions in the local surrounding area. The expected wind conditions are based on combining the measured results from a boundary-layer wind tunnel test with historical meteorological records for the area. Winds are predominantly from the north, south, and southwest throughout the year. The results of the assessment were compared primarily against the Pedestrian Wind Criteria nominated in the Melbourne Planning Scheme DDO10 as a Gust Equivalent Mean-based criteria, which is the direction that councils are transitioning to which provides a better representation of conditions experienced. Reference is also made to the criteria specified in the Monash Planning Scheme, DDO12 which only considers gust wind speeds. The following is a summary of the expected wind conditions based on the outcomes of the assessment:

- Wind conditions at the majority of locations on-Site and off-Site at grade level in the existing scenario would be suitable for their intended pedestrian uses. The windier conditions along the footpath of O'Sullivan Road are suitable for active pedestrians. Safety exceedances are found on the opposite side from the Site of Springvale Road.
- With the incorporation of the Proposed Development, wind conditions on-Site and off-Site would remain largely consistent with the Existing configuration with some areas becoming calmer (such as several areas to the northwest along O'Sullivan Road). Some localised areas would become windier as a result of the inclusion of the Proposed Development; however, would remain suitable for the intended active pedestrian use along Springvale Road and O' Sullivan Road. The safety exceedances observed for the Existing configuration would still exist for the Proposed configuration and would not worsen, therefore mitigation would not be required.
- The wind conditions at amenity/terrace locations on Levels 10, 19 and 21 and all balconies would be appropriate for the intended occupant use throughout the year. Higher wind speeds would be found at Level 3 at isolated locations around southwest and southeast corners. We recommend taller balustrades with landscaping which would be beneficial to reduce the wind speeds.

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1 INTRODUCTION

RWDI Australia Pty Ltd (RWDI) was retained to conduct a pedestrian wind assessment for the Proposed Development at 251 – 261 Springvale road in Glen Waverley, Victoria. This report presents the project objectives, discusses the results from RWDI's wind tunnel assessment and, where necessary, provides conceptual wind control measures.

1.1 Proposed Development Description

The Proposed Development Site (shown in Image 1) is located west of Springvale, situated adjacent to the existing Galleria tower road as shown in Image 1. The existing Site consists of a one storey retail building, which would be demolished for the construction of Proposed Development. The Proposed Development is of approximately 60 m tall comprising of retail and residential apartments with amenity spaces at podium and balconies. The main entrances to the Proposed Development are located on the west and east facades at grade level.



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

1.2 Objectives

The objective of the study was to assess the effect of the Proposed Development on wind speeds in pedestrian areas and provide recommendations for minimising adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the Proposed Development 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 walkways and footpaths around the Proposed Development entrances and amenity spaces.

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the Proposed Development, a 1:300 scale model was constructed for the wind tunnel tests for the following configurations:

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

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

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 360 m radius of the 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 82 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 1.5 m above the concerned levels in pedestrian accessible areas throughout the Site. Wind speeds were measured for 36 directions at 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 Australasian Wind Engineering Society (AWES) guidance, our experience and understanding of the pedestrian usage for this Site.



Image 2A: Wind Tunnel Study Model - Existing Configuration

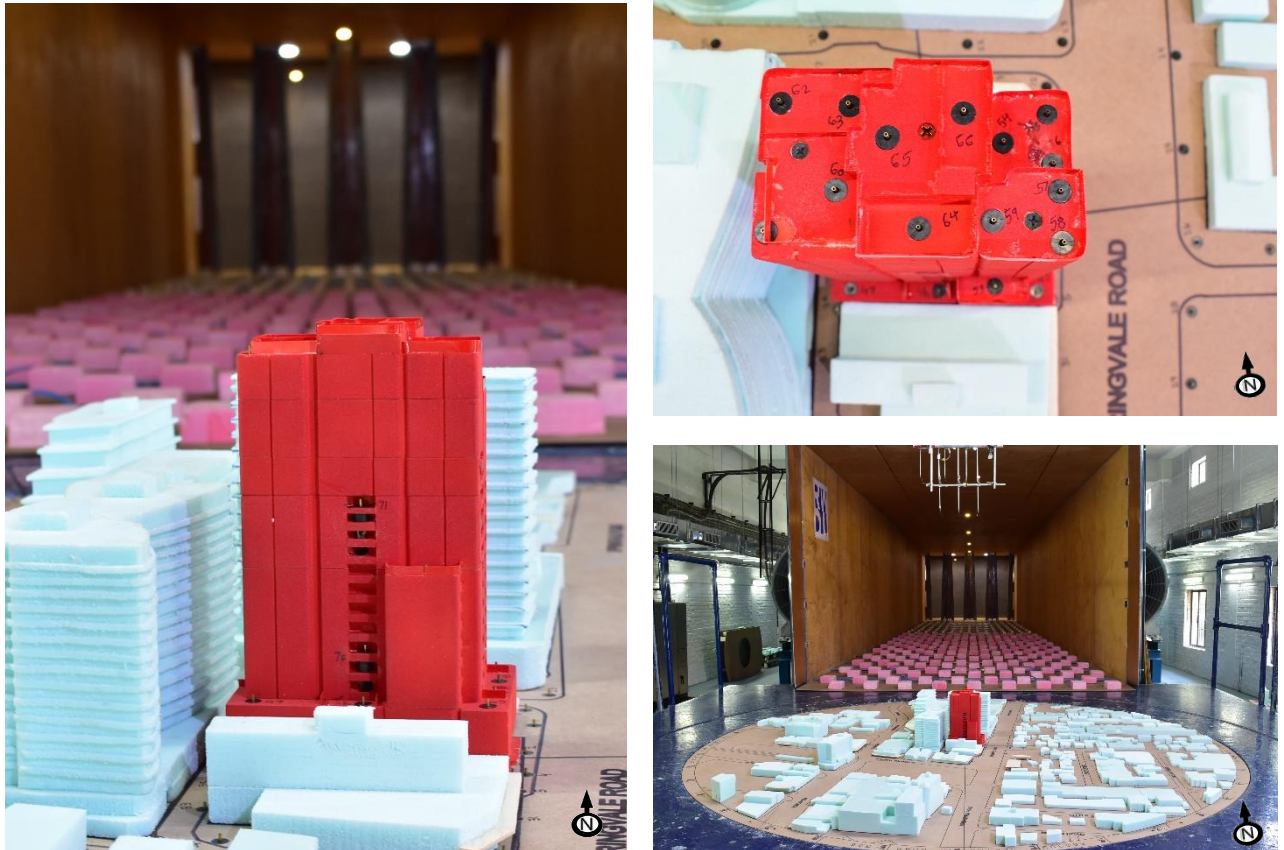


Image 2B: Wind Tunnel Study Model - Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Melbourne Airport between 1998 and 2018, inclusive, were analyzed on an annual basis. Image 3 graphically depicts the annual directional distribution of wind frequencies and speeds.

Winds from the north are predominant with occasional winds from the southerly and south-westerly directions throughout the year, as indicated by the wind rose below. Strong winds of a mean speed greater than 10 m/s measured at the airport (at an anemometer height of 10 m) occur for 10.7% of the time on an annual basis.

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

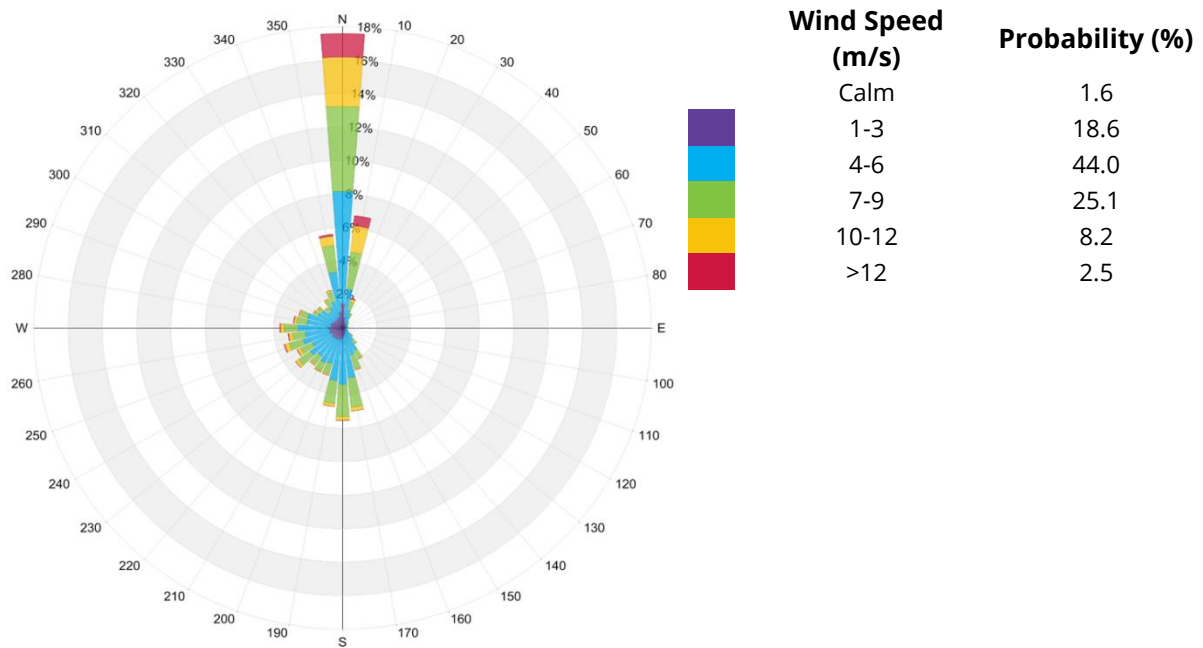


Image 3: Directional Distribution of Winds Approaching Melbourne Airport From 1998 to 2018

2.3 Pedestrian Wind Criteria

The pedestrian wind criteria outlined in Schedule 10 of the Melbourne Planning Scheme were used as the basis of assessing pedestrian wind comfort in the current study. The comfort and safety conditions for this criterion are based on mean wind speeds (or gust-equivalent mean wind speed) and 3 second gust speeds, respectively. An annual exceedance of 20% of the time is considered for the mean wind speeds, while an annual exceedance of 0.1% of the time (approximately nine hours per year) is used for the gust speeds. Only gust speeds need to be considered in the wind safety criterion, these are rare events which deserve special attention in city planning and building design due to their potential safety impact on pedestrians.

It should be noted that the wind comfort criteria represent an average wind tolerance and can be subjective in a way that regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can affect a person's perception of the wind climate. Therefore, comparisons of wind speeds for different Site and surrounding configurations are the most objective way of assessing the local pedestrian wind conditions.

The Melbourne pedestrian wind criteria are summarised in the table below.

Comfort Category	Mean Wind Speed (m/s) 20% exceedance threshold
Comfortable for Sitting	≤ 3
Comfortable for Standing	3 - 4
Comfortable for Walking	4 - 5
Uncomfortable	> 5
Safety Criterion	3-Second Gust Speed (m/s) 0.1% exceedance threshold
Exceeded	> 20

Reference is also made to the gust-based criteria specified in the Monash Planning Scheme, DDO12, which state that wind comfort levels need to be appropriate to the uses of the affected spaces, including outdoor spaces on adjoining public and private land:

- All publicly accessible areas, including footpaths, must fall within safe walking criteria (wind gusts below 16 metres/second);
- All external waiting areas, including building entries and shopfronts, must fall within short term stationary criteria (wind gusts below 13 metres/second); and,
- All public and private seating areas, including parks and outdoor cafes, must fall within long term stationary criteria (wind gusts below 10 metres/second).

3 RESULTS AND DISCUSSION

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

In our discussion of the anticipated wind conditions, reference will be made to the following generalised wind flow patterns. If these buildings/wind combinations occur for prevailing winds, there is a greater potential for increased windiness in pedestrian areas:

- Buildings tend to intercept the stronger winds at higher elevation and redirect them to the ground level (Downwashing flows, Image 4a).
- Due to the pressure differential on either side of corner of a building, the wind could accelerate around the corner (Image 4b).
- When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to channeling effect caused by the narrow gap (Image 4c).

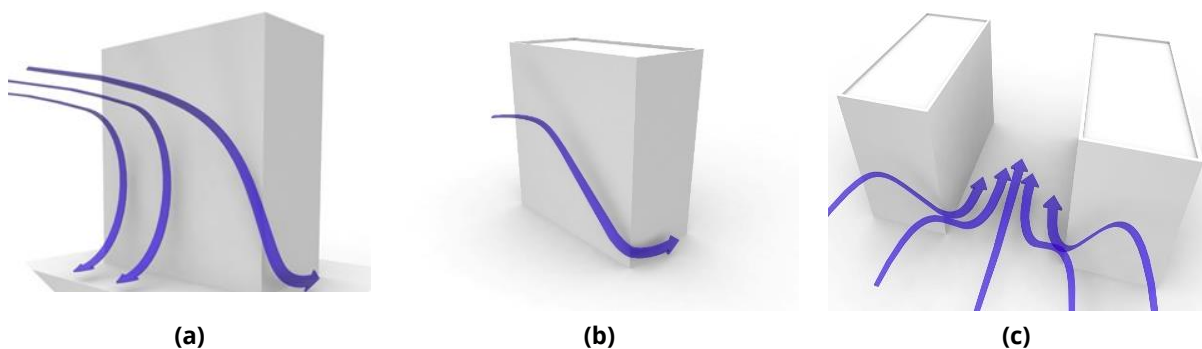


Image 4: General wind patterns – (a) downwashing, (b) corner accelerations, (c) channelling

Dense landscaping tends to reduce wind speeds downwind of their location to a large extent and may be used upwind of areas where reduced wind activity is desired. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

The findings of this study are consistent for both criteria considered. It is noted that the wind speeds in the Wind Safety (i.e., Gust) column of Table 1 are directly comparable to the criteria of the Monash Planning Scheme.

3.1 Wind Comfort - Grade Level (Locations 1 through 41)

Wind conditions comfortable for walking are appropriate for footpaths, walkways and service lanes 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 likely to linger. Wind speeds comfortable for sitting are preferred for areas intended for passive activities.

3.1.1 Existing Configuration

The wind speeds around the Site are comfortable for sitting or standing use at the majority sensor locations. Wind speeds suitable for walking use occur at off-Site areas (sensor locations 12, 16, 17, 19, 21, 23 – 25 and 33 in Figure 1A) due to acceleration of the downwashed winds by channelling. The walking conditions in this area would be appropriate as pedestrians will be active along footpaths and less likely to remain in one area for a prolonged period. Higher-than-desired uncomfortable wind speeds along of O'Sullivan Road (sensor locations 18 and 20 as in Figure 1A) are unsuitable for any pedestrian activity and would require mitigation.

The wind speeds assessed at grade level were found to exceed the safety criterion at off-Site sensor locations, along the opposite side to the Site of Springvale road (sensor locations 24 – 26 in Figure 2A).

3.1.2 Proposed Configuration

With the completion of the Proposed Development, wind speeds would be similar to the Existing configuration on-Site and off-Site as in the Existing configuration and would be comfortable for sitting or standing use in the majority of areas including along perimeter of the Proposed Development. Wind speeds suitable for walking use would be found along O'Sullivan Road and Springvale road (sensor locations 8, 17 – 25, 28 and 29 in Figure 1B). These conditions are appropriate for footpaths where pedestrians are active, and represent an improvement at most locations along O'Sullivan Road where previously conditions that are uncomfortable for any use in the Existing Configuration improve to conditions suitable for walking.

Wind speeds at the main entrances to the Proposed Development (sensor locations 2, 3 and 7 as in Figure 1B) would be suitable for the intended pedestrian use with conditions comfortable for sitting or standing use throughout the year.

The addition of the Proposed Development would not have a significant effect on the safety exceedances along Springvale Road (sensor locations 24 – 26 as in Figure 2B); however, these exceedances would remain consistent or lower in terms of the number of hours of exceedance than the Existing configuration (Table 1). Therefore, mitigation is not required.

3.2 Wind Comfort – Above Grade Level (Locations 42 through 82)

It is generally desirable for wind conditions at amenity spaces intended for passive activities to be suitable for sitting or standing use more than 80% of the time during appropriate weather conditions. The Proposed Development would have amenity spaces at multiple levels:

- Level 3 (sensor locations 42 to 51);
- Level 10 (sensor location 52 and 53);
- Level 19 (sensor location 54 to 56);
- Level 21 (sensor location 57 to 59, 62 and 63); and,
- Balconies (sensor locations 67 to 82).

Additionally, sensors were instrumented at other rooftop areas non-trafficable to residents to understand the wind conditions in these spaces, including:

- Level 21 (sensor location 60 and 61) – understood to be plant area; and,

- Level 22 (sensor location 64 to 66) – understood to be non-trafficable roof area.

The wind conditions on all the amenity spaces on Levels 10, 19 and 21 on the Proposed Development would be comfortable for sitting and standing conditions throughout the year which would be appropriate for the intended occupant use. The assessment of wind conditions on the balconies is based on wind speed measurements on representative balcony locations on the study model. Balconies are mainly proposed on the west and east facades of the Proposed Development with a few along the north and south elevations. The wind conditions on the balconies would also be suitable for sitting and standing conditions at all locations throughout the year which is appropriate.

The wind speeds at Level 3 would have conditions comfortable for sitting or standing at the majority of locations with isolated walking conditions at the southeast and southwest corners (sensor locations 45 and 47 in Figure 1B) due to the unobstructed south westerly prevailing winds accelerating around these corners. These conditions would be too windy for passive use of the areas and would require mitigation by increasing the height of the balustrades (to at least 1.5 m, or higher if possible) with landscaping of 2 m height at the corners as shown in Image 6. Additionally, localised landscaping around any designated seating areas would be beneficial. Wind speeds at all terrace/amenity, and balcony locations above grade met the safety criterion.

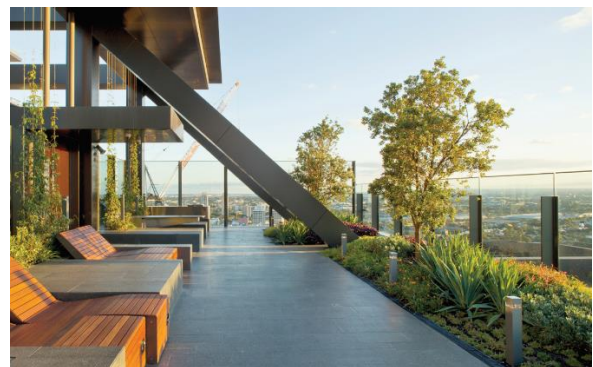


Image 6: Examples of mitigation measures above grade level

Conditions at other rooftop areas non-trafficable to residents were generally comfortable for sitting or standing. One location at Level 21 (sensor location 61 in Figures 1B and 2B) was found to have windier conditions marginally exceeding the safety criterion, however this is understood to be plant area and thus not of significant concern based on presently planned usage of the space.

4 CONCLUSIONS

The meteorological data for the Site indicates that winds are predominantly from the north, south, and southwest directions throughout the year. The combination of the wind tunnel data with this meteorological data enables an understanding of the expected wind conditions within and around the subject development and has been compared with the criteria presented in the Melbourne Planning Scheme (DDO10) and Monash Planning Scheme (DDO12). A summary of these findings is detailed below:

- Wind conditions at the existing Site at grade level were comfortable for the pedestrian use at majority of the sensor locations. Higher wind speeds occur along the footpath of O'Sullivan Road (off-Site) and safety exceedances were found along Springvale Road.
- The inclusion of the Proposed Development was found to have a minimal effect on the wind speeds on-Site and off-Site at grade, with sitting or standing conditions in the majority of areas. Localised increases in wind speeds would occur along the east side of Springvale Road; however, these would remain acceptable for the intended active pedestrian use. Conversely, there would be calmer wind conditions to the north along O'Sullivan Road. Safety exceedances would remain in the same areas as the Existing configurations; however, would not be made worse by the completion of the Proposed Development. Therefore, no mitigation is required.
- The wind conditions at amenity/terrace locations on Levels 10, 19 and 21 and all balconies would be appropriate for the intended occupant use throughout the year. Higher wind speeds would be found at Level 3 at isolated locations around southwest and southeast corners. We recommend taller balustrades with landscaping which would be beneficial to reduce the wind speeds.

5 APPLICABILITY OF RESULTS

The drawings and information listed below were used to construct the scale model of the proposed development at 251-261 Springvale Road, Glen Waverley. The wind conditions presented in this report pertain to the Proposed Development as detailed in the architectural massing design drawings listed in the table 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)
20032_A0000.dwg	AutoCAD drawing	17/07/2020

6 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.
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FIGURES



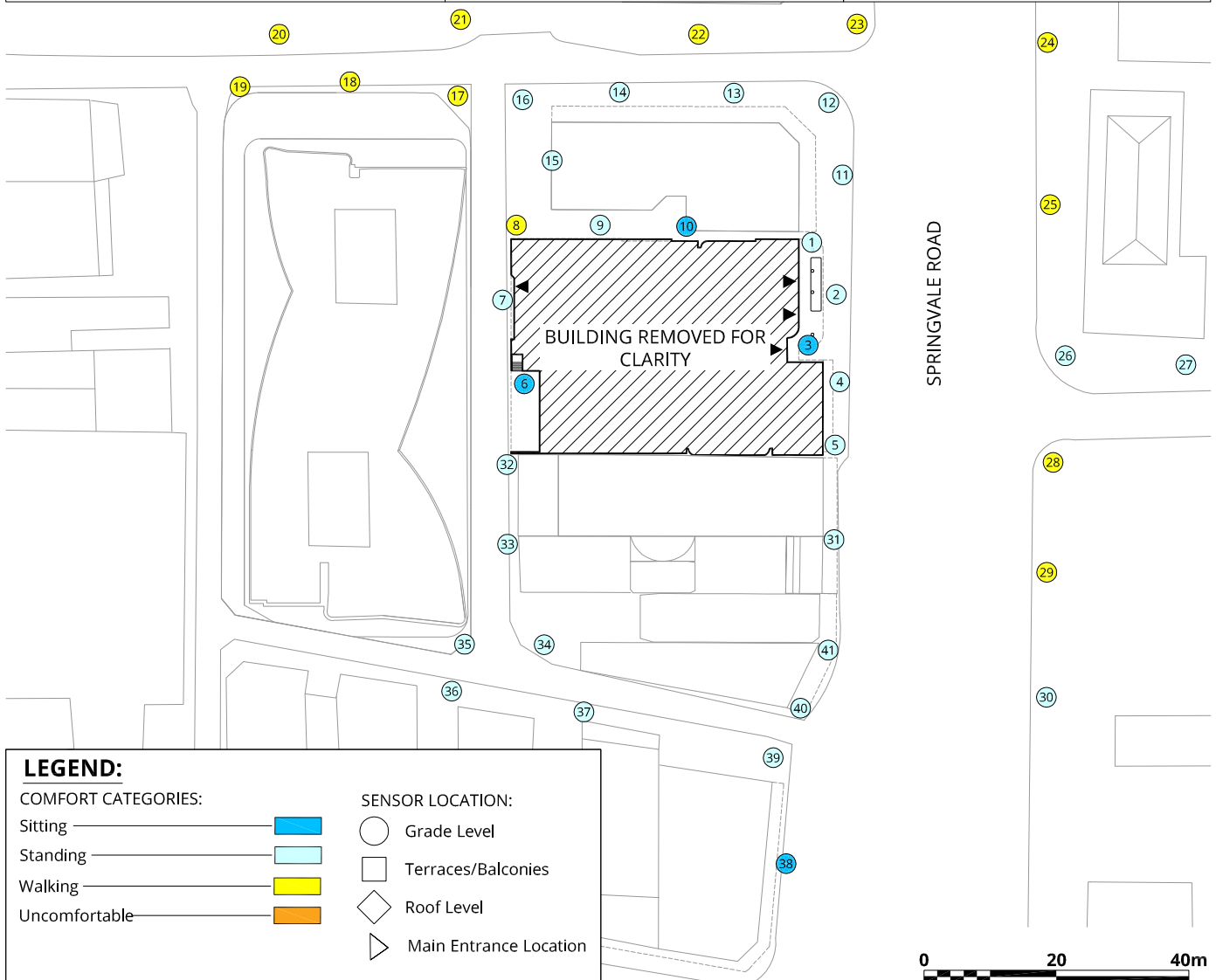
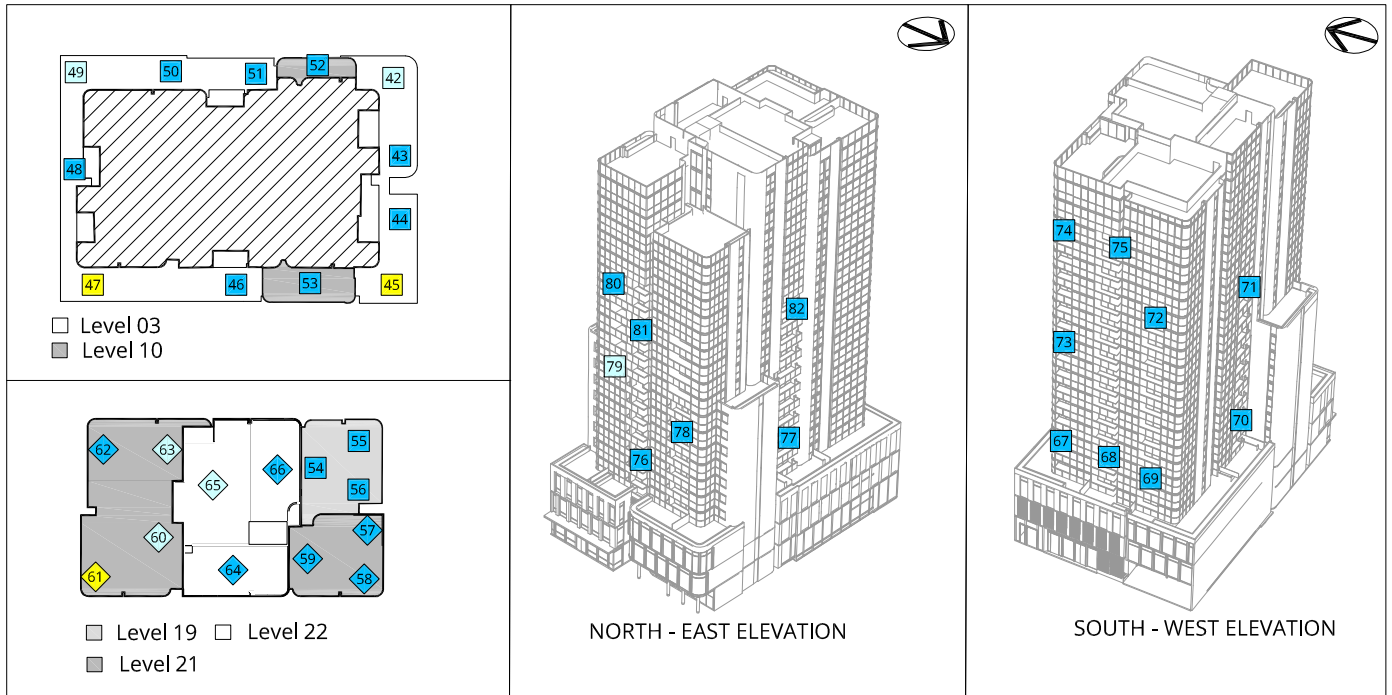
Pedestrian Wind Comfort Conditions
 Existing Configuration
 Annual (January to December, 6:00 to 23:00)
 251-261 Springvale Road - Glen Waverly, VIC

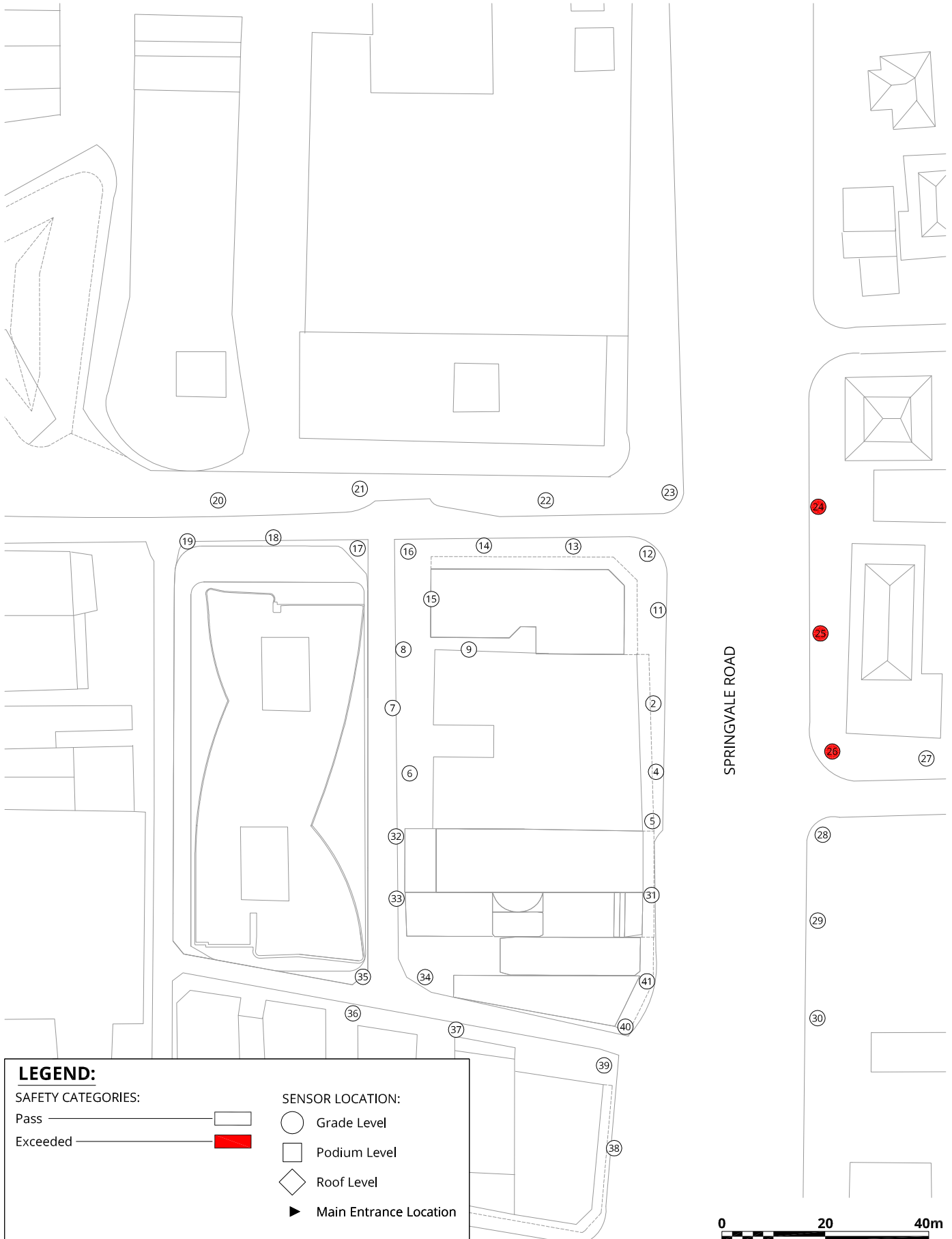


Project #2003838

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Approx. Scale: 1:1000	
Date Revised: Mar. 22, 2021	










LEGEND:


SAFETY CATEGORIES:


Pass ———— 


Exceeded - - - - 

SENSOR LOCATION:

 Grade Level

 Podium Level

 Roof Level

 Main Entrance Location

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

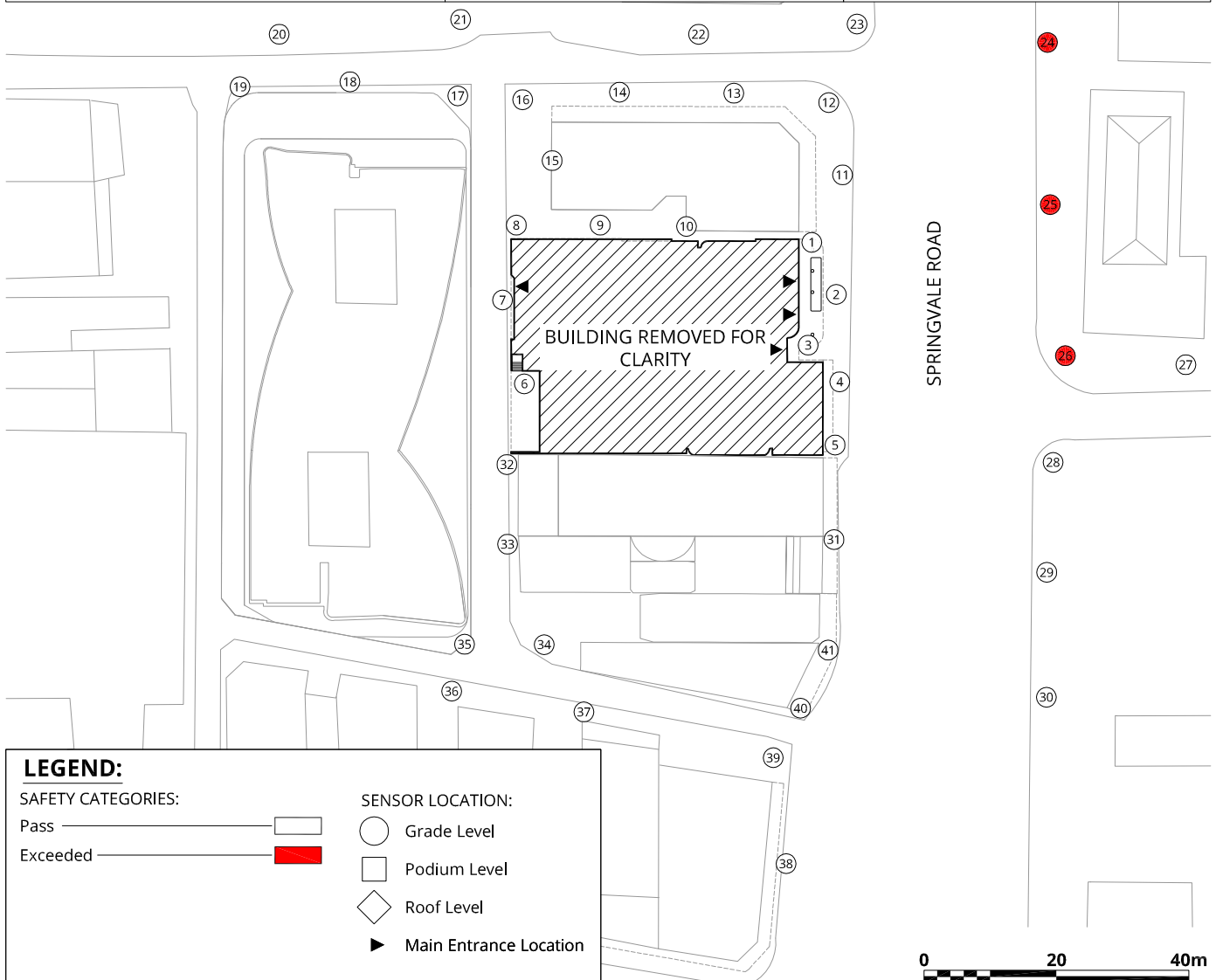
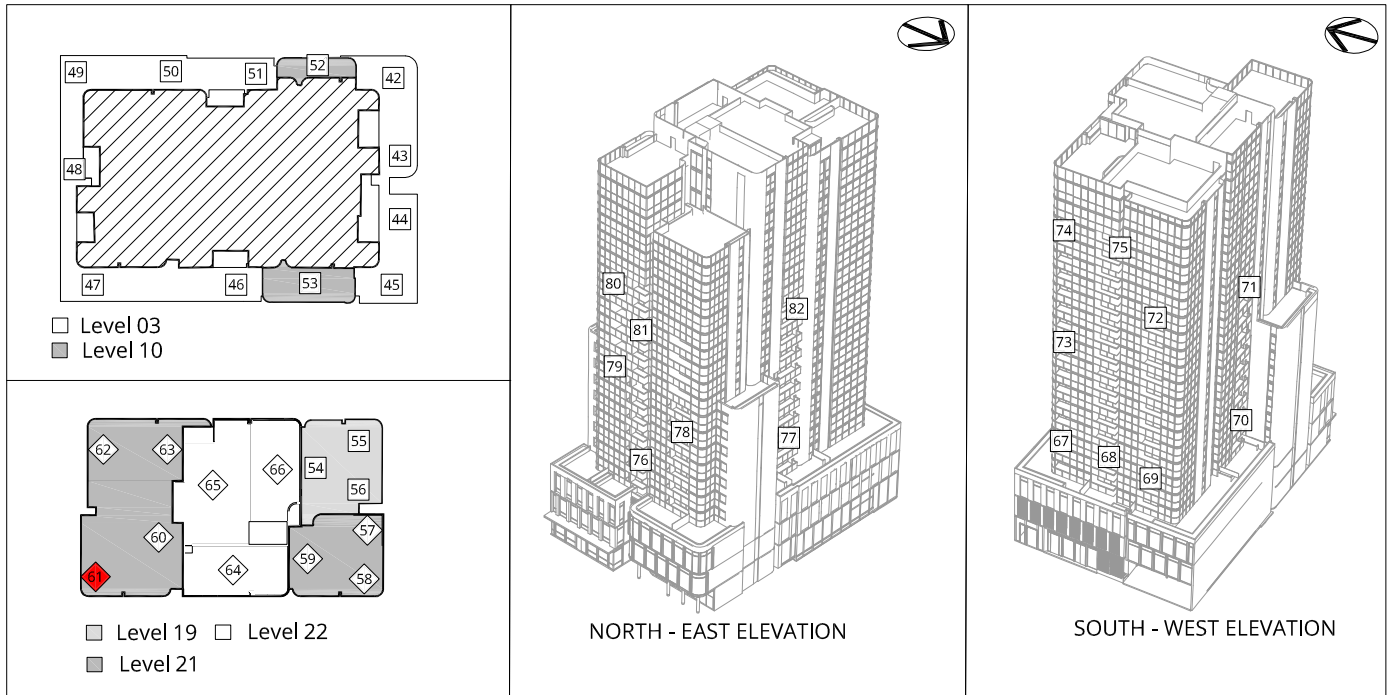
251-261 Springvale Road - Glen Waverly, VIC



Project #2003838


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Date Revised: Mar. 22, 2021	






LEGEND:

SAFETY CATEGORIES:

Pass 

Exceeded 

SENSOR LOCATION:

○ Grade Level

□ Podium Level

◇ Roof Level

▶ Main Entrance Location

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TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
1	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.2	-	Standing	14.3	-	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		3.2	-14%	Standing	13.7	-14%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	3.1	-	Standing	13.8	-10%	Pass	
2	Summer	Existing	2.9	-	Sitting	13.5	-	Pass
		Proposed	3.9	34%	Standing	14.8	10%	Pass
	Winter	Existing	3.2	-	Standing	14.7	-	Pass
Proposed		3.9	22%	Standing	16.4	12%	Pass	
Annual	Existing	2.9	-	Sitting	14.1	-	Pass	
	Proposed	3.7	28%	Standing	15.7	11%	Pass	
3	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.8	-30%	Sitting	10.7	-31%	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		2.2	-46%	Sitting	9.4	-44%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.3	-39%	Sitting	10.2	-37%	Pass	
4	Summer	Existing	2.7	-	Sitting	13.3	-	Pass
		Proposed	4.1	52%	Walking	15.1	14%	Pass
	Winter	Existing	3.1	-	Standing	14.5	-	Pass
Proposed		3.7	19%	Standing	14.2	-	Pass	
Annual	Existing	2.7	-	Sitting	13.9	-	Pass	
	Proposed	3.7	37%	Standing	14.4	-	Pass	
5	Summer	Existing	2.8	-	Sitting	13.1	-	Pass
		Proposed	4.2	50%	Walking	15.7	20%	Pass
	Winter	Existing	3.1	-	Standing	14.3	-	Pass
Proposed		3.2	-	Standing	14.2	-	Pass	
Annual	Existing	2.8	-	Sitting	13.7	-	Pass	
	Proposed	3.4	21%	Standing	14.9	-	Pass	
6	Summer	Existing	3.7	-	Standing	14.0	-	Pass
		Proposed	2.5	-32%	Sitting	9.6	-31%	Pass
	Winter	Existing	3.3	-	Standing	13.1	-	Pass
Proposed		2.0	-39%	Sitting	8.7	-34%	Pass	
Annual	Existing	3.3	-	Standing	13.4	-	Pass	
	Proposed	2.1	-36%	Sitting	9.1	-32%	Pass	
7	Summer	Existing	3.5	-	Standing	13.3	-	Pass
		Proposed	4.1	17%	Walking	13.8	-	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety			
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating	
	Winter	Existing	3.3	-	Standing	13.4	-	Pass	
		Proposed	2.9	-12%	Sitting	12.6	-	Pass	
	Annual	Existing	3.2	-	Standing	13.3	-	Pass	
		Proposed	3.3	-	Standing	13.0	-	Pass	
	8	Summer	Existing	4.2	-	Walking	16.5	-	Pass
			Proposed	4.4	-	Walking	16.5	-	Pass
Winter		Existing	4.1	-	Walking	17.1	-	Pass	
		Proposed	4.3	-	Walking	15.8	-	Pass	
Annual		Existing	3.9	-	Standing	16.8	-	Pass	
		Proposed	4.1	-	Walking	15.9	-	Pass	
9	Summer	Existing	3.0	-	Sitting	14.2	-	Pass	
		Proposed	3.4	13%	Standing	15.5	-	Pass	
	Winter	Existing	3.5	-	Standing	15.8	-	Pass	
		Proposed	3.2	-	Standing	13.1	-17%	Pass	
	Annual	Existing	3.1	-	Standing	15.1	-	Pass	
		Proposed	3.1	-	Standing	14.2	-	Pass	
10	Summer	Existing	-	-	N/A	-	-	-	
		Proposed	2.7	42%	Sitting	12.0	33%	Pass	
	Winter	Existing	-	-	N/A	-	-	-	
		Proposed	2.6	13%	Sitting	12.2	23%	Pass	
	Annual	Existing	-	-	N/A	-	-	-	
		Proposed	2.5	25%	Sitting	12.1	29%	Pass	
11	Summer	Existing	4.2	-	Walking	17.7	-	Pass	
		Proposed	4.1	-	Walking	16.9	-	Pass	
	Winter	Existing	4.1	-	Walking	17.6	-	Pass	
		Proposed	3.9	-	Standing	16.4	-	Pass	
	Annual	Existing	3.8	-	Standing	17.6	-	Pass	
		Proposed	3.8	-	Standing	16.5	-	Pass	
12	Summer	Existing	5.0	-	Walking	19.6	-	Pass	
		Proposed	4.3	-14%	Walking	16.7	-15%	Pass	
	Winter	Existing	4.4	-	Walking	18.1	-	Pass	
		Proposed	4.0	-	Standing	16.3	-10%	Pass	
	Annual	Existing	4.4	-	Walking	18.9	-	Pass	
		Proposed	3.9	-11%	Standing	16.3	-14%	Pass	
13	Summer	Existing	3.9	-	Standing	14.6	-	Pass	
		Proposed	4.0	-	Standing	14.6	-	Pass	
	Winter	Existing	3.9	-	Standing	15.6	-	Pass	

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Annual	Proposed	3.7		Standing	14.4		Pass
		Existing	3.6	-	Standing	15.1	-	Pass
		Proposed	3.7		Standing	14.3		Pass
14	Summer	Existing	3.6	-	Standing	16.0	-	Pass
		Proposed	3.9		Standing	14.7		Pass
	Winter	Existing	4.2	-	Walking	17.7	-	Pass
		Proposed	3.9		Standing	15.9	-10%	Pass
	Annual	Existing	3.7	-	Standing	17.0	-	Pass
		Proposed	3.7		Standing	15.3	-10%	Pass
15	Summer	Existing	3.5	-	Standing	14.9	-	Pass
		Proposed	3.5		Standing	15.2		Pass
	Winter	Existing	3.3	-	Standing	12.9	-	Pass
		Proposed	3.2		Standing	12.5		Pass
	Annual	Existing	3.3	-	Standing	13.7	-	Pass
		Proposed	3.2		Standing	14.0		Pass
16	Summer	Existing	4.6	-	Walking	16.6	-	Pass
		Proposed	4.1	-11%	Walking	15.6		Pass
	Winter	Existing	4.9	-	Walking	17.7	-	Pass
		Proposed	4.1	-16%	Walking	15.9	-10%	Pass
	Annual	Existing	4.6	-	Walking	17.1	-	Pass
		Proposed	3.9	-15%	Standing	15.6		Pass
17	Summer	Existing	4.8	-	Walking	19.8	-	Pass
		Proposed	4.3	-10%	Walking	16.7	-16%	Pass
	Winter	Existing	4.8	-	Walking	18.0	-	Pass
		Proposed	4.3	-10%	Walking	16.8		Pass
	Annual	Existing	4.6	-	Walking	18.5	-	Pass
		Proposed	4.1	-11%	Walking	16.6	-10%	Pass
18	Summer	Existing	5.5	-	Uncomfortable	20.0	-	Pass
		Proposed	5.2		Uncomfortable	18.0	-10%	Pass
	Winter	Existing	5.1	-	Uncomfortable	18.4	-	Pass
		Proposed	4.8		Walking	17.7		Pass
	Annual	Existing	5.1	-	Uncomfortable	19.0	-	Pass
		Proposed	4.8		Walking	17.6		Pass
19	Summer	Existing	4.6	-	Walking	17.4	-	Pass
		Proposed	4.4		Walking	16.5		Pass
	Winter	Existing	4.8	-	Walking	17.7	-	Pass
		Proposed	4.7		Walking	17.6		Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Annual	Existing	4.5	-	Walking	17.4	-	Pass
		Proposed	4.4		Walking	16.9		Pass
20	Summer	Existing	5.5	-	Uncomfortable	20.6	-	Exceeded
		Proposed	5.2		Uncomfortable	18.5	-10%	Pass
	Winter	Existing	5.1	-	Uncomfortable	18.1	-	Pass
		Proposed	4.9		Walking	17.3		Pass
	Annual	Existing	5.1	-	Uncomfortable	19.0	-	Pass
		Proposed	4.9		Walking	17.8		Pass
21	Summer	Existing	5.1	-	Uncomfortable	18.1	-	Pass
		Proposed	5.4		Uncomfortable	18.6		Pass
	Winter	Existing	5.1	-	Uncomfortable	17.2	-	Pass
		Proposed	4.8		Walking	16.9		Pass
	Annual	Existing	4.9	-	Walking	17.4	-	Pass
		Proposed	4.8		Walking	17.7		Pass
22	Summer	Existing	4.4	-	Walking	16.4	-	Pass
		Proposed	4.7		Walking	16.8		Pass
	Winter	Existing	3.8	-	Standing	15.2	-	Pass
		Proposed	3.9		Standing	15.1		Pass
	Annual	Existing	3.9	-	Standing	15.8	-	Pass
		Proposed	4.1		Walking	16.0		Pass
23	Summer	Existing	5.1	-	Uncomfortable	19.2	-	Pass
		Proposed	4.7		Walking	18.3		Pass
	Winter	Existing	4.8	-	Walking	20.2	-	Exceeded
		Proposed	4.5		Walking	19.7		Pass
	Annual	Existing	4.6	-	Walking	19.8	-	Pass
		Proposed	4.3		Walking	19.0		Pass
24	Summer	Existing	4.6	-	Walking	22.0	-	Exceeded
		Proposed	4.7		Walking	20.8		Exceeded
	Winter	Existing	5.5	-	Uncomfortable	24.4	-	Exceeded
		Proposed	5.3		Uncomfortable	22.8		Exceeded
	Annual	Existing	4.8	-	Walking	23.1	-	Exceeded
		Proposed	4.7		Walking	21.9		Exceeded
25	Summer	Existing	3.9	-	Standing	22.9	-	Exceeded
		Proposed	4.2		Walking	22.3		Exceeded
	Winter	Existing	5.3	-	Uncomfortable	25.2	-	Exceeded
		Proposed	5.1		Uncomfortable	24.2		Exceeded
	Annual	Existing	4.2	-	Walking	23.9	-	Exceeded
		Proposed	4.3		Walking	23.2		Exceeded

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
26	Summer	Existing	3.7	-	Standing	21.0	-	Exceeded
		Proposed	3.7	-	Standing	20.8	-	Exceeded
	Winter	Existing	4.8	-	Walking	23.4	-	Exceeded
		Proposed	4.8	-	Walking	22.8	-	Exceeded
Annual	Existing	3.9	-	Standing	21.9	-	Exceeded	
	Proposed	3.9	-	Standing	21.9	-	Exceeded	
27	Summer	Existing	3.3	-	Standing	12.6	-	Pass
		Proposed	3.6	-	Standing	12.8	-	Pass
	Winter	Existing	3.1	-	Standing	13.4	-	Pass
		Proposed	3.2	-	Standing	12.6	-	Pass
Annual	Existing	3.0	-	Sitting	12.9	-	Pass	
	Proposed	3.2	-	Standing	12.5	-	Pass	
28	Summer	Existing	4.0	-	Standing	18.3	-	Pass
		Proposed	4.4	10%	Walking	17.9	-	Pass
	Winter	Existing	4.4	-	Walking	20.4	-	Exceeded
		Proposed	4.6	-	Walking	19.6	-	Pass
Annual	Existing	3.9	-	Standing	19.1	-	Pass	
	Proposed	4.3	10%	Walking	18.7	-	Pass	
29	Summer	Existing	4.3	-	Walking	16.5	-	Pass
		Proposed	4.4	-	Walking	16.2	-	Pass
	Winter	Existing	4.2	-	Walking	18.0	-	Pass
		Proposed	4.3	-	Walking	17.2	-	Pass
Annual	Existing	4.0	-	Standing	17.2	-	Pass	
	Proposed	4.1	-	Walking	16.6	-	Pass	
30	Summer	Existing	3.9	-	Standing	14.3	-	Pass
		Proposed	3.9	-	Standing	14.5	-	Pass
	Winter	Existing	3.9	-	Standing	15.4	-	Pass
		Proposed	3.8	-	Standing	15.5	-	Pass
Annual	Existing	3.7	-	Standing	14.9	-	Pass	
	Proposed	3.7	-	Standing	14.7	-	Pass	
31	Summer	Existing	3.2	-	Standing	12.1	-	Pass
		Proposed	3.5	-	Standing	14.5	20%	Pass
	Winter	Existing	3.0	-	Sitting	12.9	-	Pass
		Proposed	3.1	-	Standing	12.1	-	Pass
Annual	Existing	3.0	-	Sitting	12.5	-	Pass	
	Proposed	3.1	-	Standing	13.1	-	Pass	
32	Summer	Existing	4.0	-	Standing	15.1	-	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Winter	Proposed	3.9		Standing	14.1		Pass
		Existing	3.0	-	Sitting	13.3	-	Pass
		Proposed	3.1		Standing	13.0		Pass
	Annual	Existing	3.2	-	Standing	14.3	-	Pass
		Proposed	3.4		Standing	13.5		Pass
	33	Summer	Existing	5.1	-	Uncomfortable	18.6	-
Proposed			4.3	-16%	Walking	16.2	-13%	Pass
Winter		Existing	3.9	-	Standing	16.3	-	Pass
		Proposed	3.6		Standing	15.2		Pass
Annual		Existing	4.1	-	Walking	17.4	-	Pass
		Proposed	3.7	-10%	Standing	15.5	-11%	Pass
34	Summer	Existing	3.4	-	Standing	16.2	-	Pass
		Proposed	3.6		Standing	16.3		Pass
	Winter	Existing	3.1	-	Standing	12.0	-	Pass
		Proposed	3.5	13%	Standing	15.8	32%	Pass
	Annual	Existing	3.1	-	Standing	14.3	-	Pass
		Proposed	3.4	10%	Standing	15.7	10%	Pass
35	Summer	Existing	3.8	-	Standing	20.7	-	Exceeded
		Proposed	3.7		Standing	15.0	-28%	Pass
	Winter	Existing	3.4	-	Standing	14.5	-	Pass
		Proposed	3.5		Standing	14.3		Pass
	Annual	Existing	3.4	-	Standing	17.9	-	Pass
		Proposed	3.4		Standing	14.4	-20%	Pass
36	Summer	Existing	4.5	-	Walking	16.8	-	Pass
		Proposed	4.4		Walking	16.4		Pass
	Winter	Existing	3.6	-	Standing	15.3	-	Pass
		Proposed	4.0	11%	Standing	16.2		Pass
	Annual	Existing	3.8	-	Standing	15.8	-	Pass
		Proposed	4.0		Standing	16.2		Pass
37	Summer	Existing	3.8	-	Standing	14.3	-	Pass
		Proposed	3.7		Standing	14.1		Pass
	Winter	Existing	3.3	-	Standing	13.1	-	Pass
		Proposed	3.3		Standing	13.6		Pass
	Annual	Existing	3.3	-	Standing	13.7	-	Pass
		Proposed	3.3		Standing	13.7		Pass
38	Summer	Existing	2.8	-	Sitting	11.9	-	Pass
		Proposed	2.6		Sitting	12.5		Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Winter	Existing	3.0	-	Sitting	12.1	-	Pass
		Proposed	2.8	-	Sitting	12.1	-	Pass
	Annual	Existing	2.8	-	Sitting	11.9	-	Pass
		Proposed	2.6	-	Sitting	12.2	-	Pass
39	Summer	Existing	3.6	-	Standing	13.3	-	Pass
		Proposed	3.6	-	Standing	13.6	-	Pass
	Winter	Existing	3.5	-	Standing	14.0	-	Pass
Proposed		3.3	-	Standing	12.7	-	Pass	
Annual	Existing	3.4	-	Standing	13.4	-	Pass	
	Proposed	3.3	-	Standing	13.1	-	Pass	
40	Summer	Existing	3.9	-	Standing	14.7	-	Pass
		Proposed	4.1	-	Walking	15.9	-	Pass
	Winter	Existing	3.5	-	Standing	13.5	-	Pass
Proposed		3.5	-	Standing	14.1	-	Pass	
Annual	Existing	3.4	-	Standing	14.0	-	Pass	
	Proposed	3.6	-	Standing	15.1	-	Pass	
41	Summer	Existing	3.4	-	Standing	13.9	-	Pass
		Proposed	3.7	-	Standing	16.8	21%	Pass
	Winter	Existing	3.3	-	Standing	14.2	-	Pass
Proposed		3.3	-	Standing	14.4	-	Pass	
Annual	Existing	3.2	-	Standing	13.9	-	Pass	
	Proposed	3.3	-	Standing	15.3	10%	Pass	
42	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.9	129%	Standing	17.4	93%	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		4.1	86%	Walking	18.0	82%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	3.8	100%	Standing	17.6	89%	Pass	
43	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.1	121%	Standing	13.2	110%	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		2.6	44%	Sitting	11.2	60%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.8	87%	Sitting	12.1	83%	Pass	
44	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.6	13%	Sitting	10.2	23%	Pass
Winter	Existing	-	-	N/A	-	-	-	
	Proposed	2.3	-	Sitting	10.3	17%	Pass	

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	2.3	10%	Sitting	10.1	19%	Pass
45	Summer	Existing	-	-	N/A	-	-	-
		Proposed	5.9	195%	Uncomfortable	20.8	177%	Exceeded
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.5	106%	Standing	18.5	180%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	4.3	139%	Walking	19.8	175%	Pass
46	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.8	75%	Sitting	11.8	64%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	2.2	29%	Sitting	9.8	29%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	2.3	44%	Sitting	11.0	49%	Pass
47	Summer	Existing	-	-	N/A	-	-	-
		Proposed	4.9	206%	Walking	17.9	129%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	4.3	105%	Walking	18.5	115%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	4.3	139%	Walking	17.9	116%	Pass
48	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.7	29%	Sitting	10.8	24%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	2.5		Sitting	10.4	11%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	2.5	19%	Sitting	10.6	18%	Pass
49	Summer	Existing	-	-	N/A	-	-	-
		Proposed	4.5	221%	Walking	15.7	112%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.8	100%	Standing	14.1	74%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	3.9	144%	Standing	14.7	88%	Pass
50	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.4	127%	Standing	17.4	115%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.0	58%	Sitting	13.1	47%	Pass
	Annual	Existing	-	-	N/A	-	-	-

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
		Proposed	3.0	87%	Sitting	15.5	85%	Pass
51	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.0	87%	Sitting	11.9	45%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	2.7	35%	Sitting	10.9	22%	Pass
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.6	53%	Sitting	11.3	31%	Pass	
52	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.8	87%	Sitting	14.1	70%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.6	71%	Standing	15.5	67%	Pass
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	3.0	76%	Sitting	15.0	72%	Pass	
53	Summer	Existing	-	-	N/A	-	-	-
		Proposed	3.4	48%	Standing	13.0	23%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	2.7		Sitting	11.8		Pass
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.8	17%	Sitting	12.4	14%	Pass	
54	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.8	47%	Sitting	17.2	81%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.4	48%	Standing	17.1	63%	Pass
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.9	45%	Sitting	17.0	72%	Pass	
55	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.5	47%	Sitting	13.5	71%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.1	48%	Standing	14.7	71%	Pass
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.6	44%	Sitting	13.9	67%	Pass	
56	Summer	Existing	-	-	N/A	-	-	-
		Proposed	2.4	85%	Sitting	15.0	81%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.3	65%	Standing	16.8	81%	Pass
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.6	73%	Sitting	15.9	81%	Pass	

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
57	Summer	Existing Proposed	- 2.8	- 115%	N/A Sitting	- 12.1	- 64%	- Pass
	Winter	Existing Proposed	- 2.9	- 61%	N/A Sitting	- 11.3	- 38%	- Pass
	Annual	Existing Proposed	- 2.7	- 80%	N/A Sitting	- 11.4	- 46%	- Pass
58	Summer	Existing Proposed	- 2.5	- 67%	N/A Sitting	- 12.3	- 52%	- Pass
	Winter	Existing Proposed	- 3.2	- 68%	N/A Standing	- 13.3	- 51%	- Pass
	Annual	Existing Proposed	- 2.7	- 69%	N/A Sitting	- 12.9	- 52%	- Pass
59	Summer	Existing Proposed	- 2.8	- 40%	N/A Sitting	- 12.6	- 52%	- Pass
	Winter	Existing Proposed	- 2.8	- 27%	N/A Sitting	- 12.2	- 33%	- Pass
	Annual	Existing Proposed	- 2.7	- 35%	N/A Sitting	- 12.2	- 39%	- Pass
60	Summer	Existing Proposed	- 3.6	- 57%	N/A Standing	- 16.7	- 70%	- Pass
	Winter	Existing Proposed	- 3.9	- 56%	N/A Standing	- 16.3	- 51%	- Pass
	Annual	Existing Proposed	- 3.6	- 57%	N/A Standing	- 16.1	- 56%	- Pass
61	Summer	Existing Proposed	- 4.7	- 147%	N/A Walking	- 19.8	- 164%	- Pass
	Winter	Existing Proposed	- 5.3	- 165%	N/A Uncomfortable	- 21.3	- 160%	- Exceeded
	Annual	Existing Proposed	- 4.8	- 153%	N/A Walking	- 20.6	- 164%	- Exceeded
62	Summer	Existing Proposed	- 3.0	- 43%	N/A Sitting	- 12.4	- 51%	- Pass
	Winter	Existing Proposed	- 2.9	- 38%	N/A Sitting	- 12.1	- 39%	- Pass
	Annual	Existing Proposed	- 2.8	- 40%	N/A Sitting	- 12.1	- 44%	- Pass
63	Summer	Existing Proposed	- 3.4	- 162%	N/A Standing	- 13.0	- 91%	- Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Winter	Existing Proposed	- 3.5	- 119%	N/A Standing	- 13.9	- 88%	- Pass
	Annual	Existing Proposed	- 3.3	- 136%	N/A Standing	- 13.4	- 89%	- Pass
64	Summer	Existing Proposed	- 2.4	- 71%	N/A Sitting	- 11.6	- 61%	- Pass
	Winter	Existing Proposed	- 2.9	- 53%	N/A Sitting	- 11.9	- 51%	- Pass
	Annual	Existing Proposed	- 2.6	- 62%	N/A Sitting	- 11.6	- 53%	- Pass
65	Summer	Existing Proposed	- 3.3	- 50%	N/A Standing	- 13.3	- 62%	- Pass
	Winter	Existing Proposed	- 3.3	- 50%	N/A Standing	- 12.9	- 47%	- Pass
	Annual	Existing Proposed	- 3.2	- 52%	N/A Standing	- 12.9	- 54%	- Pass
66	Summer	Existing Proposed	- 3.1	- 82%	N/A Standing	- 11.9	- 55%	- Pass
	Winter	Existing Proposed	- 3.1	- 63%	N/A Standing	- 13.0	- 55%	- Pass
	Annual	Existing Proposed	- 2.9	- 71%	N/A Sitting	- 12.3	- 52%	- Pass
67	Summer	Existing Proposed	- 1.4	-	N/A Sitting	- 5.8	- -30%	- Pass
	Winter	Existing Proposed	- 1.3	- -35%	N/A Sitting	- 5.2	- -42%	- Pass
	Annual	Existing Proposed	- 1.3	- -24%	N/A Sitting	- 5.4	- -37%	- Pass
68	Summer	Existing Proposed	- 2.4	- 26%	N/A Sitting	- 9.2	-	- Pass
	Winter	Existing Proposed	- 1.7	- -26%	N/A Sitting	- 8.4	- -15%	- Pass
	Annual	Existing Proposed	- 1.9	-	N/A Sitting	- 8.9	-	- Pass
69	Summer	Existing Proposed	- 1.8	- -14%	N/A Sitting	- 9.4	- 15%	- Pass
	Winter	Existing	-	-	N/A	-	-	-

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Annual	Proposed	1.3	-38%	Sitting	7.1	-17%	Pass
		Existing	-	-	N/A	-	-	-
		Proposed	1.5	-25%	Sitting	8.6	-	Pass
70	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.7	-15%	Sitting	7.1	-26%	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		1.5	-35%	Sitting	6.2	-42%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	1.5	-25%	Sitting	6.6	-35%	Pass	
71	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.5	-	Sitting	7.2	24%	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		1.5	-	Sitting	7.2	14%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	1.4	-	Sitting	7.1	16%	Pass	
72	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.9	19%	Sitting	8.1	-	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		1.6	-20%	Sitting	6.9	-22%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	1.6	-	Sitting	7.7	-	Pass	
73	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.9	-	Sitting	9.3	-	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		1.9	-17%	Sitting	7.6	-23%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	1.8	-10%	Sitting	8.4	-11%	Pass	
74	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.8	12%	Sitting	10.9	27%	Pass
	Winter	Existing	-	-	N/A	-	-	-
Proposed		2.3	15%	Sitting	11.7	22%	Pass	
Annual	Existing	-	-	N/A	-	-	-	
	Proposed	2.0	18%	Sitting	11.3	26%	Pass	
75	Summer	Existing	-	-	N/A	-	-	-
	Proposed	2.0	25%	Sitting	7.8	-	Pass	
Winter	Existing	-	-	N/A	-	-	-	
	Proposed	1.9	-10%	Sitting	8.1	-16%	Pass	

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.9	-	Sitting	7.8	-13%	Pass
76	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.6	-	Sitting	6.0	-22%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	1.3	-32%	Sitting	5.4	-39%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.4	-18%	Sitting	5.7	-30%	Pass
77	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.9	-10%	Sitting	10.2	-	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	1.6	-33%	Sitting	7.1	-31%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.7	-19%	Sitting	8.9	-	Pass
78	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.8	-	Sitting	7.5	14%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	1.6	23%	Sitting	6.9	13%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.6	14%	Sitting	7.1	11%	Pass
79	Summer	Existing	-	-	N/A	-	-	-
		Proposed	4.6	229%	Walking	17.4	129%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	3.1	72%	Standing	15.5	87%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	3.6	125%	Standing	16.5	109%	Pass
80	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.8	-	Sitting	6.6	-11%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	1.6	-16%	Sitting	6.5	-20%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.6	-	Sitting	6.4	-18%	Pass
81	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.8	29%	Sitting	7.1	22%	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	1.5	15%	Sitting	6.3	17%	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.6	23%	Sitting	6.7	20%	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort			Wind Safety		
			Speed (m/s)	% Change	Rating	Speed (m/s)	% Change	Rating
82	Summer	Existing	-	-	N/A	-	-	-
		Proposed	1.6	-20%	Sitting	7.1	-	Pass
	Winter	Existing	-	-	N/A	-	-	-
		Proposed	1.8		Sitting	7.4	-	Pass
	Annual	Existing	-	-	N/A	-	-	-
		Proposed	1.6	-16%	Sitting	7.2	-	Pass

Seasons	Months	Hours	Wind Comfort (m/s)		Wind Safety (m/s)	
Summer	November - April	0:00 - 23:00	≤ 3	Sitting	≤ 20	Pass
Winter	May - October	0:00 - 23:00	≤ 4	Standing	> 20	Exceeded
Annual	January - December	0:00 - 23:00	≤ 5	Walking		
			> 5	Uncomfortable		

Configurations	
Existing	Existing site and surroundings
Proposed	Project with existing surroundings