REPORT

251 – 261 SPRINGVALE ROAD

GLEN WAVERLEY, VIC

PEDESTRIAN WIND STUDY
RWDI # 2003838
July 10, 2025

SUBMITTED TO

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DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Final	28/07/2021	ANUC	KJ
B	Retests for design updates in response to Condition 5 of Planning Permit	06/05/2024	ANUC	AMC
C	Update for Review of Town Planning Submission Drawings	18/10/2024	ANUC	AMC
D	Updated issue date	10/07/2025	ANUC	AMC

NOTE

QUALITY ASSURANCE

RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015. This management system has been externally certified by SAI Global and Licence No. QEC 13457 has been issued for the following scope: The provision of consultancy services in acoustic engineering, air quality and wind engineering; and the sale, service, support and installation of acoustic monitoring and related systems and technologies.

EXECUTIVE SUMMARY

RWDI Australia Pty Ltd (RWDI) was engaged 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 was conducted for the following configurations of the site:

Existing Configuration:	Existing site with existing surrounding buildings;
Proposed Configuration:	Proposed Development with existing surrounding buildings.

The pedestrian level wind conditions within and around the proposed development were predicted using the results from a boundary-layer wind tunnel test combined with historical meteorological wind records for the region. The wind speed results have been evaluated against the Monash Planning Scheme criteria that consider pedestrian safety pertaining to infrequent but strong gusts that could affect a person's footing and pedestrian comfort pertaining to common wind speeds conducive to different levels of human activity.

The results of the test can be summarised as follows:

Pedestrian Safety:

The wind speeds in the study area were found to meet the wind safety criterion at all on-site measured locations for both existing and proposed configurations of the site. However, wind speeds exceeding the safety criteria were observed across the site along Springvale Road at three locations for both configurations. These exceedances are governed by the existing surrounding buildings and improve with the presence of the proposed development.

Pedestrian Comfort:

- Existing Configuration:
  Wind speeds around the site in the existing configuration generally allow for comfortable sitting or standing use in most areas. Higher winds suitable for walking use are observed to the north along O'Sullivan Road and Springvale Road. Some areas along O'Sullivan Road between the existing Sky Garden Building and 52-54 O'Sullivan development exceed the wind comfort criteria.
- Proposed Configuration:
  - With the proposed development, ground-level wind conditions are anticipated to remain consistent with those of the existing site, generally conducive to passive sitting or standing activities.
  - Wind conditions along O'Sullivan Road are expected to improve compared to the existing site, with only one location exceeding comfort criteria.
  - All areas within the proposed development, including entrances, private balconies, and the rooftop terrace, are expected to meet the relevant comfort criteria.

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1 INTRODUCTION

RWDI Australia Pty Ltd. (RWDI) was retained to conduct a pedestrian wind assessment on and around the Proposed Development at 251 – 261 Springvale Road in Glen Waverley, Victoria. This report presents the project objectives, background, and approach, and discusses the results from RWDI's wind tunnel assessment. Commentary on conceptual wind control measures is also provided, if necessary.

The Proposed Development Site, shown within its existing surrounding context in Image 1, is bounded by Springvale Road to the east, O'Sullivan Road to the north, and the Glenway Arcade to the west. The existing site consists of a single storey building which would be demolished for the construction of Proposed Development. The Proposed Development is approximately 70 m in height and integrates retail facilities on the ground floor and residential apartments with accompanying amenity spaces on higher levels. Entrances to the development are situated along Springvale Road and Glenway Arcade.

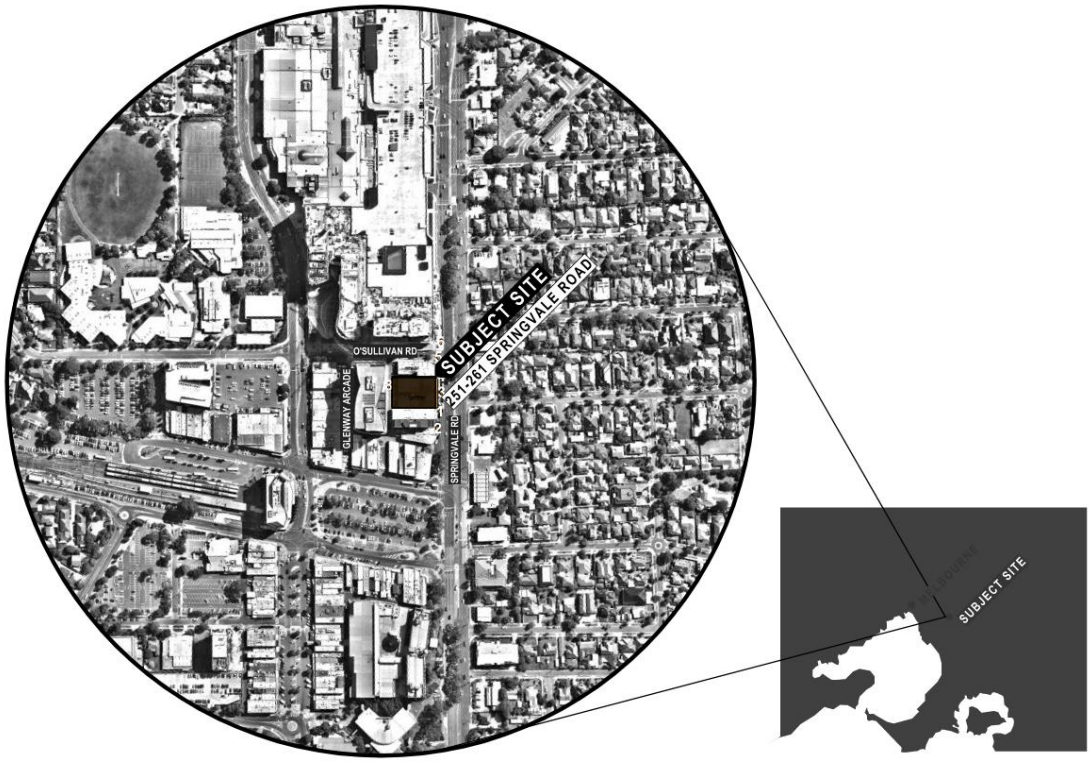

Image 1: Aerial View of Site and Surroundings

(Source: Plus Architecture)

The objective of the study was to assess the wind speeds in pedestrian areas on and around the proposed development and provide recommendations for minimising adverse wind 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 key outdoor pedestrian-accessible areas of interest associated with the development include the pedestrian footpaths around the site, entrances to the building, and the various outdoor amenity spaces.

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

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

Existing Configuration: Existing Site with Existing Surrounding Buildings (Image 2A); and
Proposed Configuration: Proposed Development with Existing Surrounding Buildings (Image 2B).

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 360 m radius of the study site. This encompassed both existing structures and those currently under construction, with an expectation that these would likely be present or completed by the time the proposed subject development concludes. Additionally, the wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were simulated in RWDI's wind tunnel incorporating spires and roughness blocks.

The wind tunnel model was instrumented with 56 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 sensors was based on our experience and our understanding of pedestrian usage for this site. Wind speeds were measured for 36 directions in 10-degree increments. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model. The placement of wind measurement locations using Irwin sensors was based on our experience and understanding of the pedestrian usage for this site. Note that no vegetation was included as part of the configuration tests in accordance with AWES Guidelines. The method for testing scale models in the wind tunnel is consistent with internationally recognised good practice, and meets the requirements set out in the Australasian Wind Engineering Society Quality Assurance Manual (2019).

Image 2A: Wind Tunnel Study Model – Existing Configuration

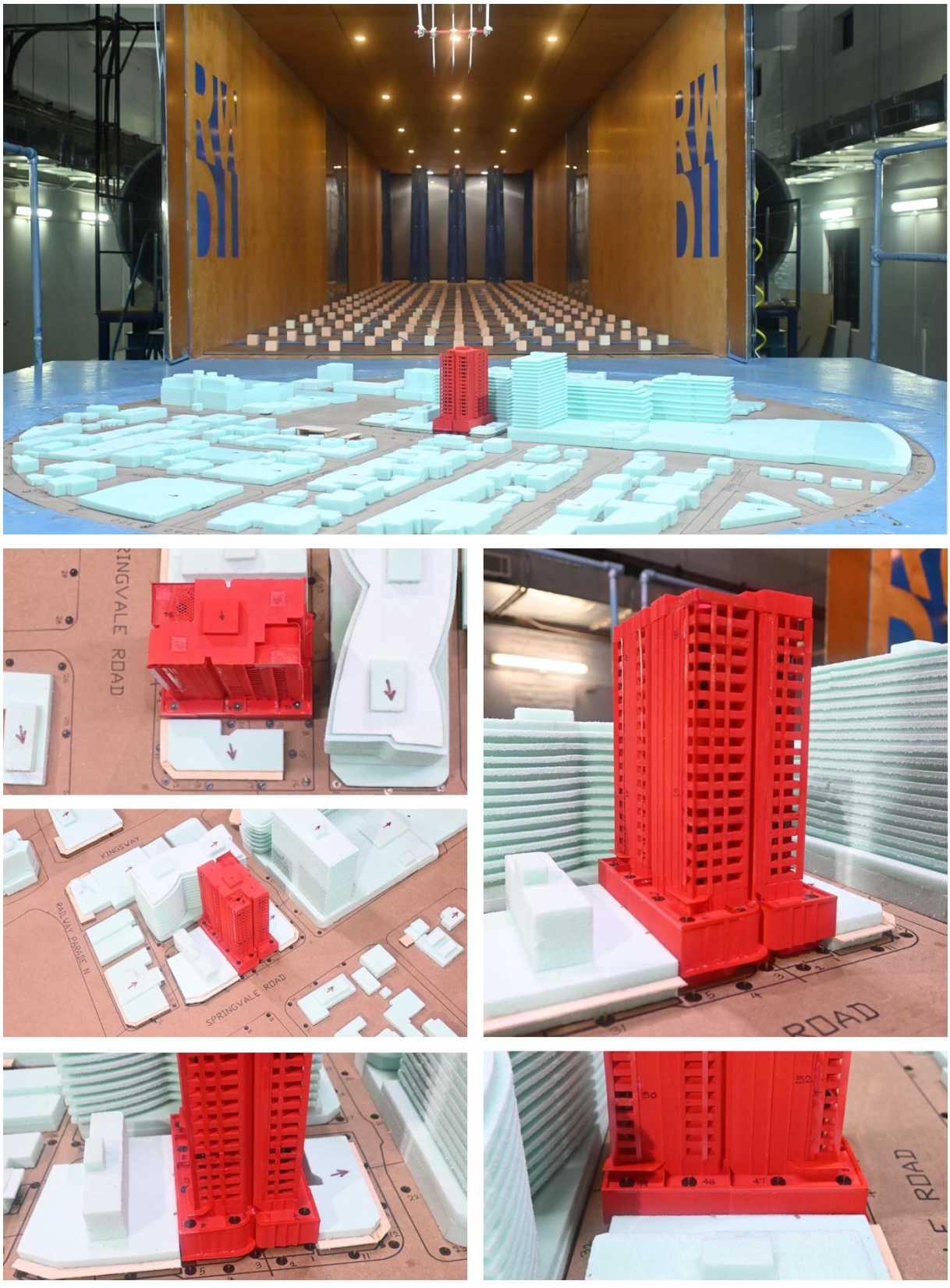

Image 2B: Wind Tunnel Study Model – Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Moorabbin Airport between 1995 and 2022 (inclusive) were analysed to assess the wind conditions in the study area. The observation site was used due to its closer proximity to the subject site compared to the Melbourne International Airport.

Image 3 graphically depicts the annual directional distributions of wind frequencies and speeds recorded at the station. The general directionality of wind is similar to that observed at Melbourne International Airport with the northerly winds being the predominant wind direction throughout the year. Winds from the southwest and southeast are common during the summers with the westerly winds being more prevalent in winters. The intensity of winds observed at the Moorabbin Airport is generally less severe than the winds noted at the Melbourne International Airport. This is primarily due to the regional winds traversing over the urban terrain of Melbourne and a general shift in the local winds closer to the Bay. Strong winds of a mean speed greater than 10 m/s measured at the airport (at an anemometer height of 10 m) occur for 10.1% of the time on an annual basis and primarily originate from the north.

Time-history of the wind for the period above was combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds at the site. The full-scale wind predictions were then compared with the wind criteria for pedestrian comfort and safety, as described in Section 2.3.

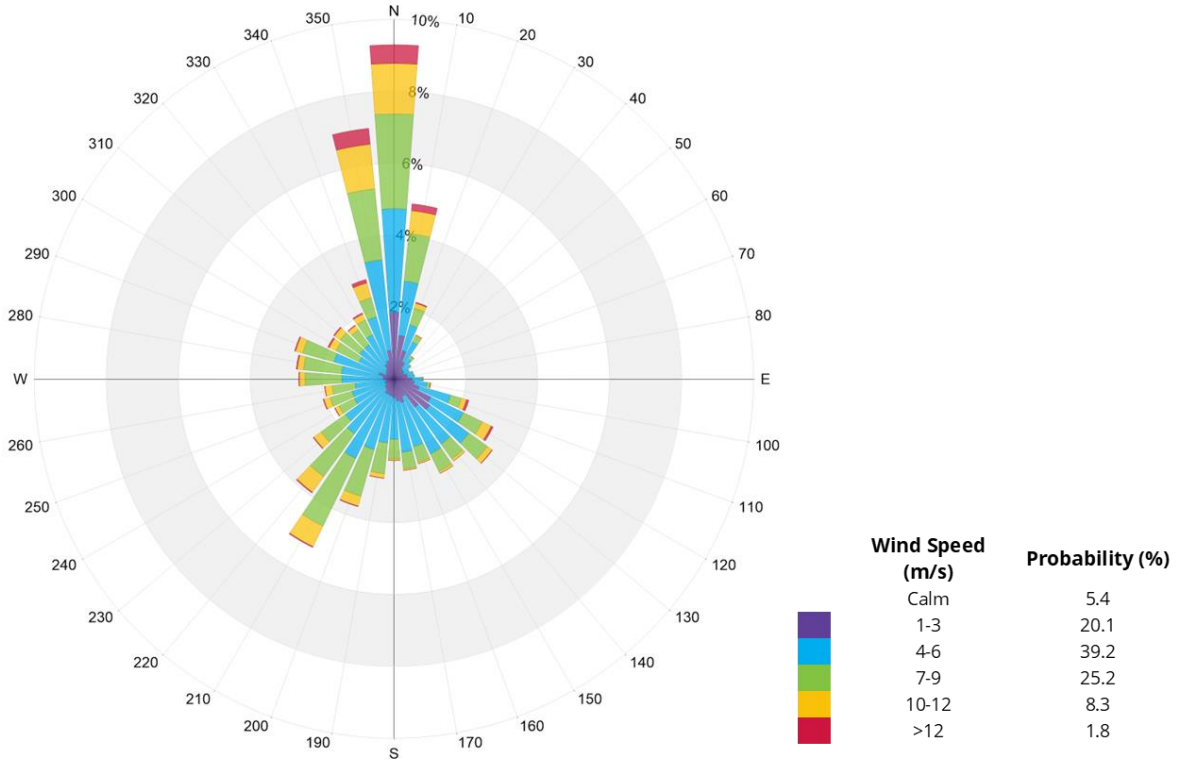

Image 3: Directional Distribution of Winds Approaching Moorabbin Airport From 1995 to 2022

2.3 Pedestrian Wind Criteria

The pedestrian wind criteria specified in Monash Planning Scheme (58.04-4 - Standard D17) were used as the basis for assessing pedestrian wind comfort in the current study. This comfort and safety conditions for the criteria are based on gust equivalent mean speeds and 3-second gust speeds, respectively. An annual exceedance of 20% of the time is considered to assess wind comfort while an annual exceedance of 0.1% of the time (approximately 9 hours per year) is used for the gust speeds to assess wind safety. 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 overall perception of the wind climate. Therefore, comparisons of wind speeds for the existing and proposed site configurations are the most objective way of assessing the impact of the development on the local wind microclimate. The following table summarises the pedestrian wind criteria:

Table: Pedestrian Wind Comfort and Safety Conditions

Comfort Category	GEM Speed (m/s) 20% exceedance threshold
Comfortable for Sitting	≤ 3
Comfortable for Standing	3 - 4
Comfortable for Walking	4 - 5
Uncomfortable	> 5
Notes: (1) GEM Speed = max (Mean Speed, Gust Speed/1.85) and *Gust Speed = Mean Speed + 3*RMS Speed*;	
Safety Criterion	**3-Second Gust Speed (m/s) 0.1% exceedance threshold**
Exceeded	> 20

Based on the wind comfort categories, wind conditions comfortable for walking are appropriate for footpaths, walkways, and service lanes as pedestrians are likely to be more active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing use are preferred at main entrances, bus stops, or communal outdoor terraces etc. where individuals are likely to linger. Wind speeds conducive to sitting are preferred for areas intended for long-duration activities such as café and outdoor dining. For private balconies, typically the standing comfort criterion or better is recommended. However, the usage of these spaces is elective and, therefore, can be considered suitable if assessed to be comfortable for walking use.

It is essential to highlight that the safety criterion proposed in the Monash Planning Scheme leans towards a conservative stance when compared to widely accepted standards in other regions. For instance, the wind safety criteria outlined in the Australasian Wind Engineering Society Guidelines for Pedestrian Wind Effects (2014) and by Melbourne (1971) rely on a peak 3-second gust wind speed of 23m/s, with an exceedance threshold of 0.1% of the time during the year. These criteria are the most widely used and agreed-upon safety standard in Australia and Asia Pacific. Moreover, alternative widely embraced criteria, such as those recommended by Soligo et al. (1998) and Arens et al. (2013), propose a peak 3-second gust of 25m/s (with an exceedance threshold of 0.1% of the time during the year). These criteria are more widely used around the globe (e.g. Auckland). Therefore, it is advisable to contextualise the wind safety findings presented herein with respect to these widely utilised criteria.

3 RESULTS AND DISCUSSION

The wind conditions without any form of amelioration or mitigation 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 represented in Table 1 located in the "Tables" section of this report. The following is a discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

3.1 Generalised Wind Flows

In our discussion of wind conditions on and around the Proposed Development, reference may be made to the following generalised wind flows (see Image 4). If specific combinations of building and wind patterns coincide with prevailing winds, there is a higher potential for increased wind activity, resulting in uncomfortable or potentially unsafe conditions. To mitigate these effects, design considerations such as strategically setting back a tower from the edges of a podium, implementing deep canopies at ground level, utilising wind screens, incorporating tall trees with dense landscaping etc. (as demonstrated in Image 4) can effectively reduce high wind activity. The selection and effectiveness of these measures will depend on factors such as the site's exposure and orientation concerning prevailing wind directions, as well as the size and massing of the proposed buildings.

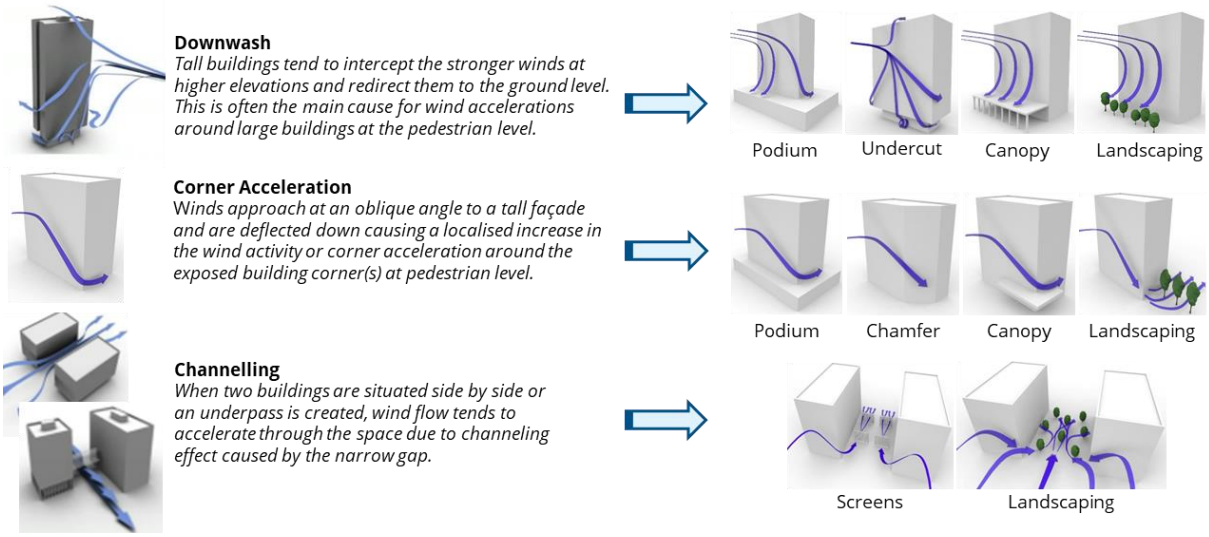

Image 4: General Wind Flows around Buildings and Examples of Wind Control Measures

3.2 Pedestrian Safety

Wind speeds exceeding the safety criteria are observed along Springvale Road (Sensors 24 – 26) for both the existing and proposed configurations of the site. These exceedances are caused by neighbouring structures. However, with the inclusion of the proposed development, a slight reduction in the number of hours and wind speeds exceeding the criteria is observed.

3.3 Pedestrian Comfort

Wind conditions suitable for walking or strolling use are appropriate for footpaths, walkways and areas where pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing use are preferred at building entrances & drop-off areas, bus stops and communal outdoor terraces. Wind speeds comfortable for sitting use are preferred for areas intended for passive long-duration activities such as outdoor dining or café seating. For private balconies, wind conditions are deemed comfortable if these meet the walking criteria.

3.3.1 Existing Configuration

- The wind speeds around the site for the existing configuration were observed to be generally comfortable for sitting or standing use at the majority of locations.
- Higher winds suitable for walking use were observed to the north of the site along O'Sullivan Road and Springvale Road. These are typically suitable for active frontages.
- Wind speeds exceeding the comfort criteria were observed on the along O'Sullivan Road between the existing Sky Garden Building and 52-54 O'Sullivan development.

3.3.2 Proposed Configuration

- Wind conditions with the inclusion of the proposed development were observed to be similar to the existing site at majority of ground level locations with most areas suitable for passive sitting to standing use.
- Wind speeds at the main entrances along Springvale Road and the secondary entrance to the development along the Glenway Arcade are expected to be comfortable for the intended pedestrian use of these spaces (target criteria: standing use).
- Wind conditions along O'Sullivan Road are expected to improve with the inclusion of the proposed development, compared to the existing site, with only one location noted to exceed the wind comfort criteria (Sensor 21). It is noted that Sensor 21 was borderline uncomfortable in the existing configuration, and this increase in wind speed is marginal.
- The wind conditions within most private balconies and terraces are expected to be suitable for passive sitting to standing use throughout the year (target: walking use). Slightly higher winds suitable for active walking are expected at the southeastern corner of Level 3 (Sensor 46).
- Wind comfort conditions within the Outdoor Communal terrace on Level 20 are expected to be comfortable for long-duration sitting use throughout the year (target: standing use).

4 STATEMENT OF LIMITATIONS

Limitations

This report entitled '*251 – 261 Springvale Road Pedestrian Wind Study'* was prepared by RWDI Australia Pty Ltd ("RWDI") for HongXing Springvale Road Pty Ltd c/o Deloitte DPS ("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 utilise the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

Design Assumptions

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

The findings and recommendations set out in this report are based on the following information disclosed to RWDI. Drawings and information listed below were received from Plus Architecture and used to construct the scale model of the *251 – 261 Springvale* development **("Project Data**").

File Name	File Type	Date Received (dd/mm/yyyy)
12668 240328 Springvale Road_Model	IFC	28/03/2024

RWDI have reviewed the updated Town Planning drawings dated October 2024 and confirm that they are generally consistent with the Project Data used to construct the wind tunnel model with only minor, inconsequential changes to the built form noted. The results presented in this report are therefore in our opinion applicable to the current design of the Project.

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

5 REFERENCES

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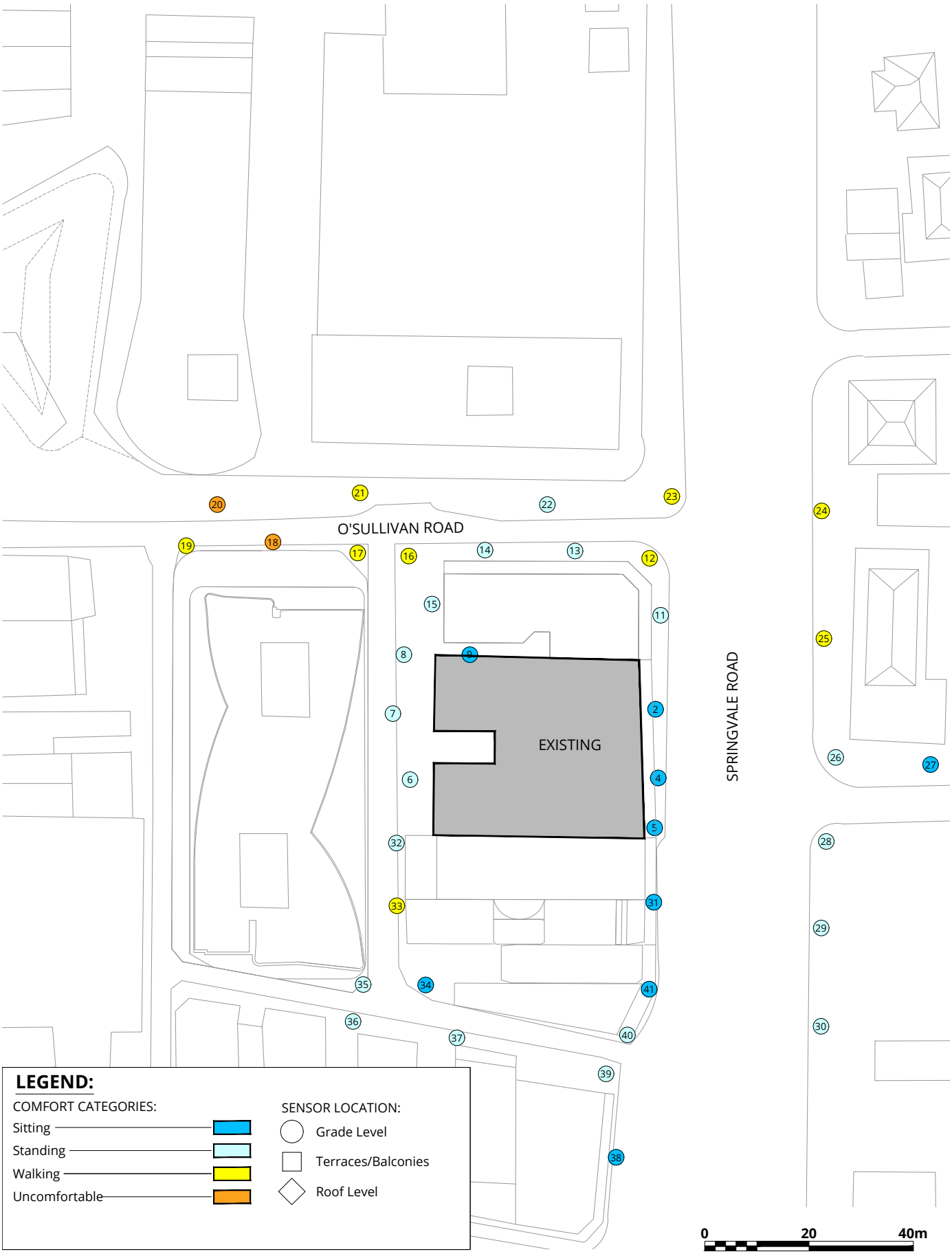
FIGURES



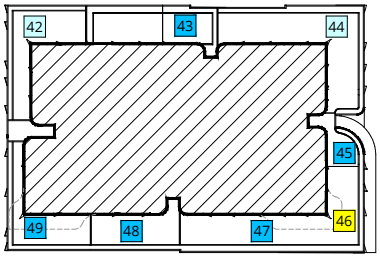
Pedestrian Wind Comfort Conditions
Existing Configuration
Annual (January to December, 0:00 to 23:00)

True North

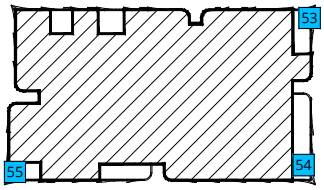
Drawn by: MBR	Figure: 1A
Approx. Scale:	1:1000
Date Revised:	May 2, 2024

251-261 Springvale Road - Glen Waverly, VIC

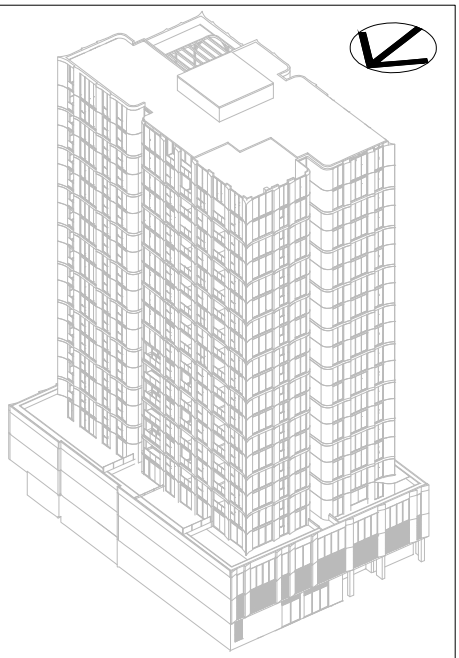
Project #2003838



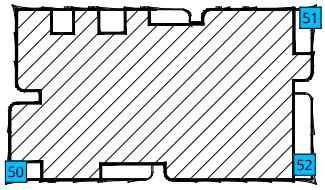
Level 03



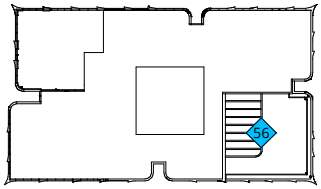
Level 18



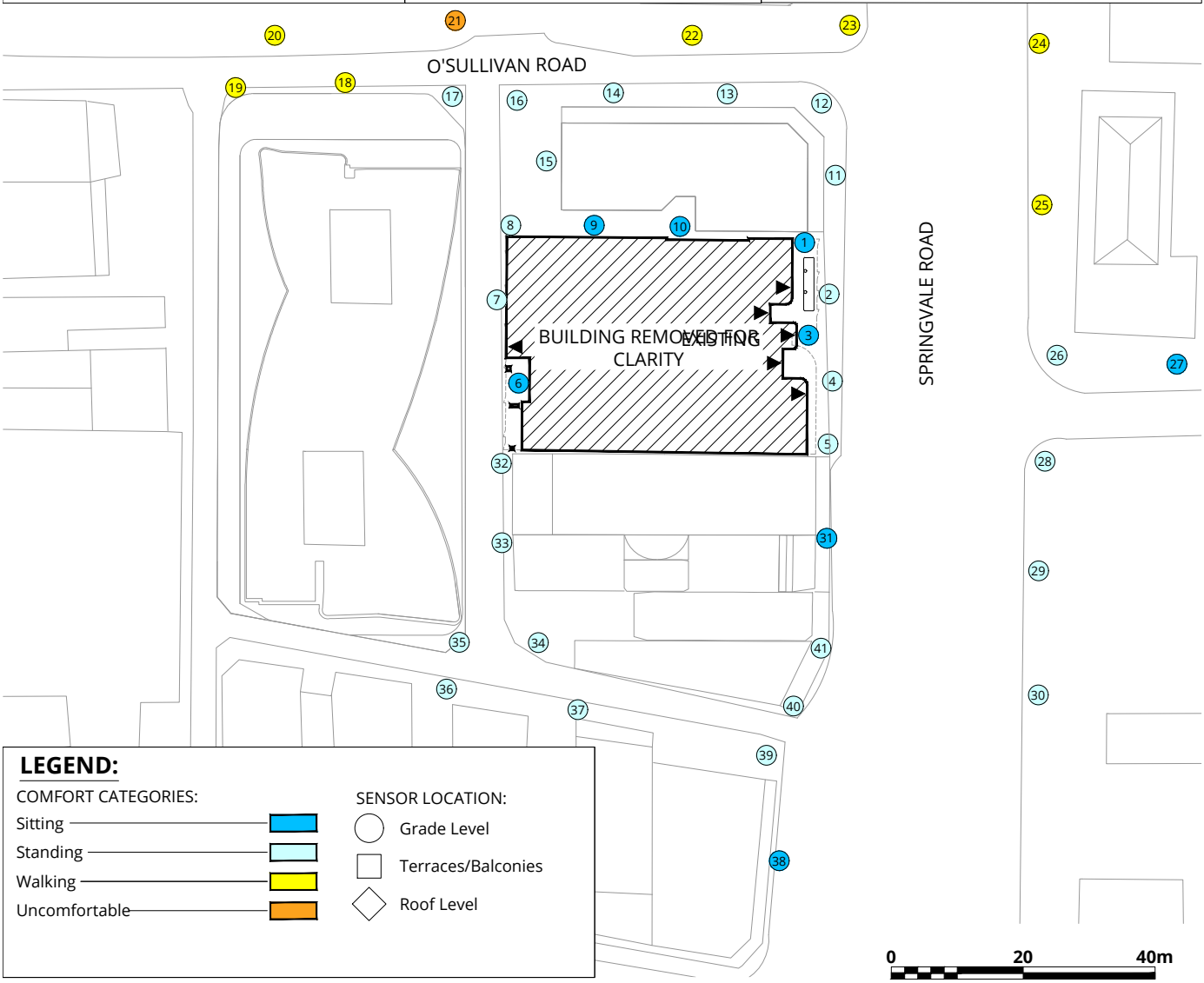
Isometric View of Building



Level 08



Roof



LEGEND:

COMFORT CATEGORIES:

- Sitting
- Standing
- Walking
- Uncomfortable

SENSOR LOCATION:

- Grade Level
- Terraces/Balconies
- Roof Level

0 20 40m

Pedestrian Wind Comfort Conditions

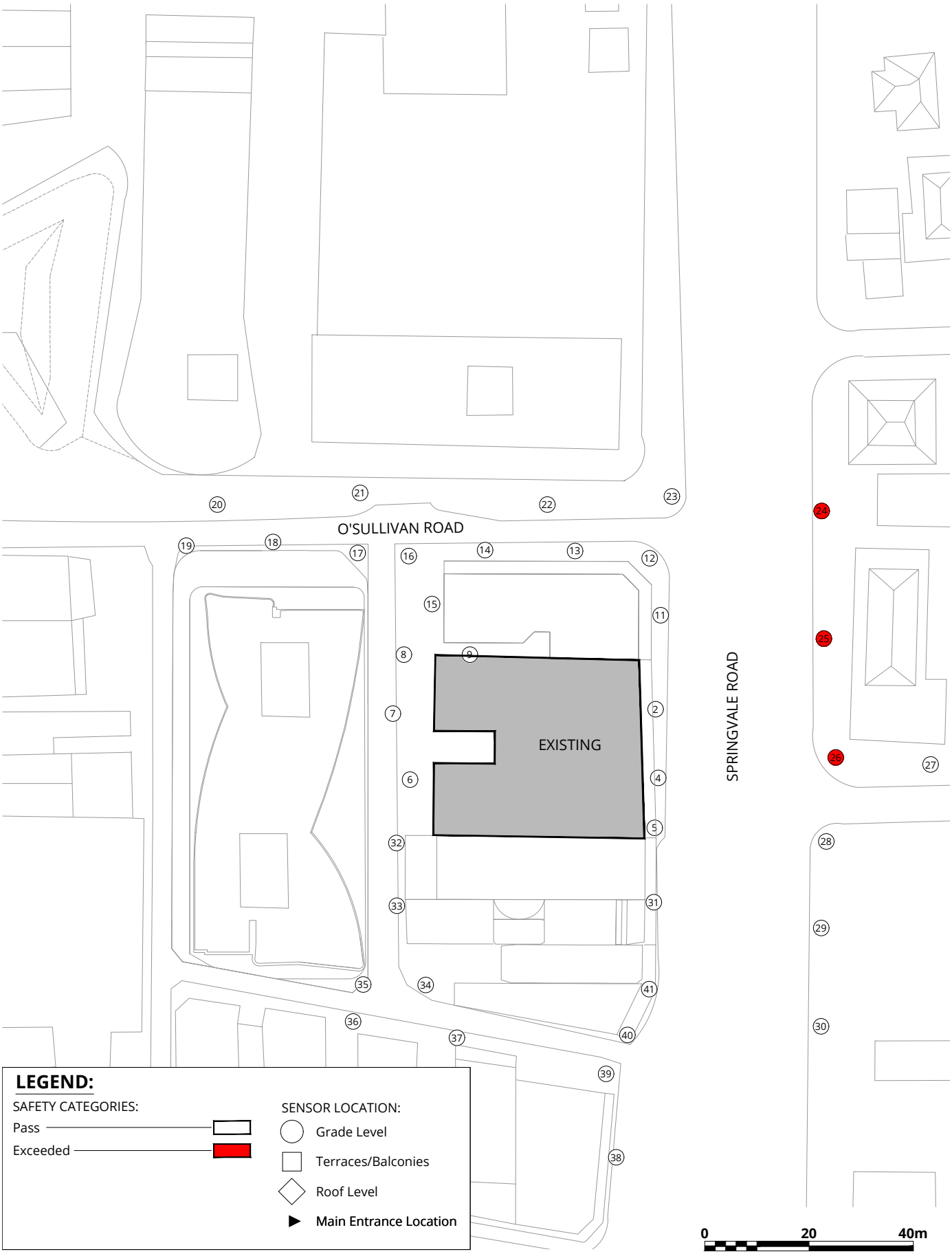
Proposed Configuration
Annual (January to December, 0:00 to 23:00)

True North

Drawn by: MBR	Figure: 1B
Approx. Scale:	1:1000
Date Revised:	May 2, 2024

251-261 Springvale Road - Glen Waverly, VIC

Project #2003838



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

251-261 Springvale Road - Glen Waverly, VIC

Project #2003838

True North

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Approx. Scale:	1:1000
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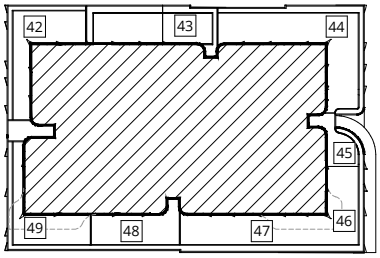
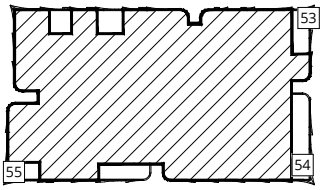


Level 03



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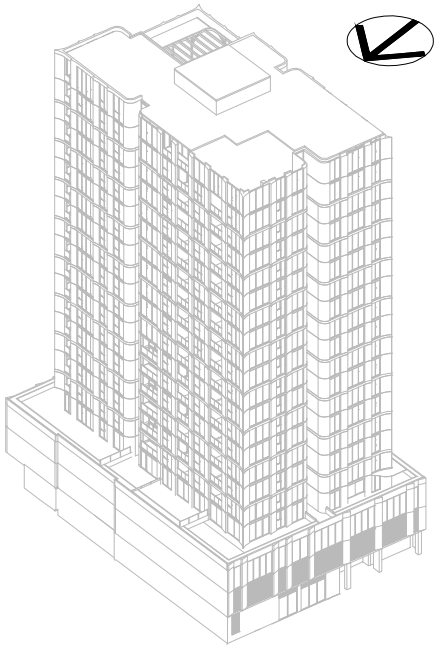
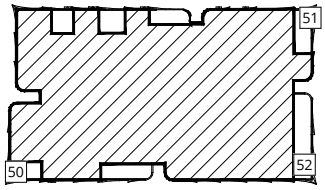


Isometric View of Building



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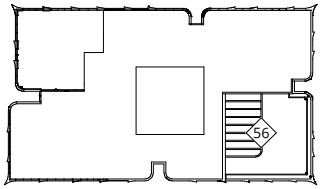
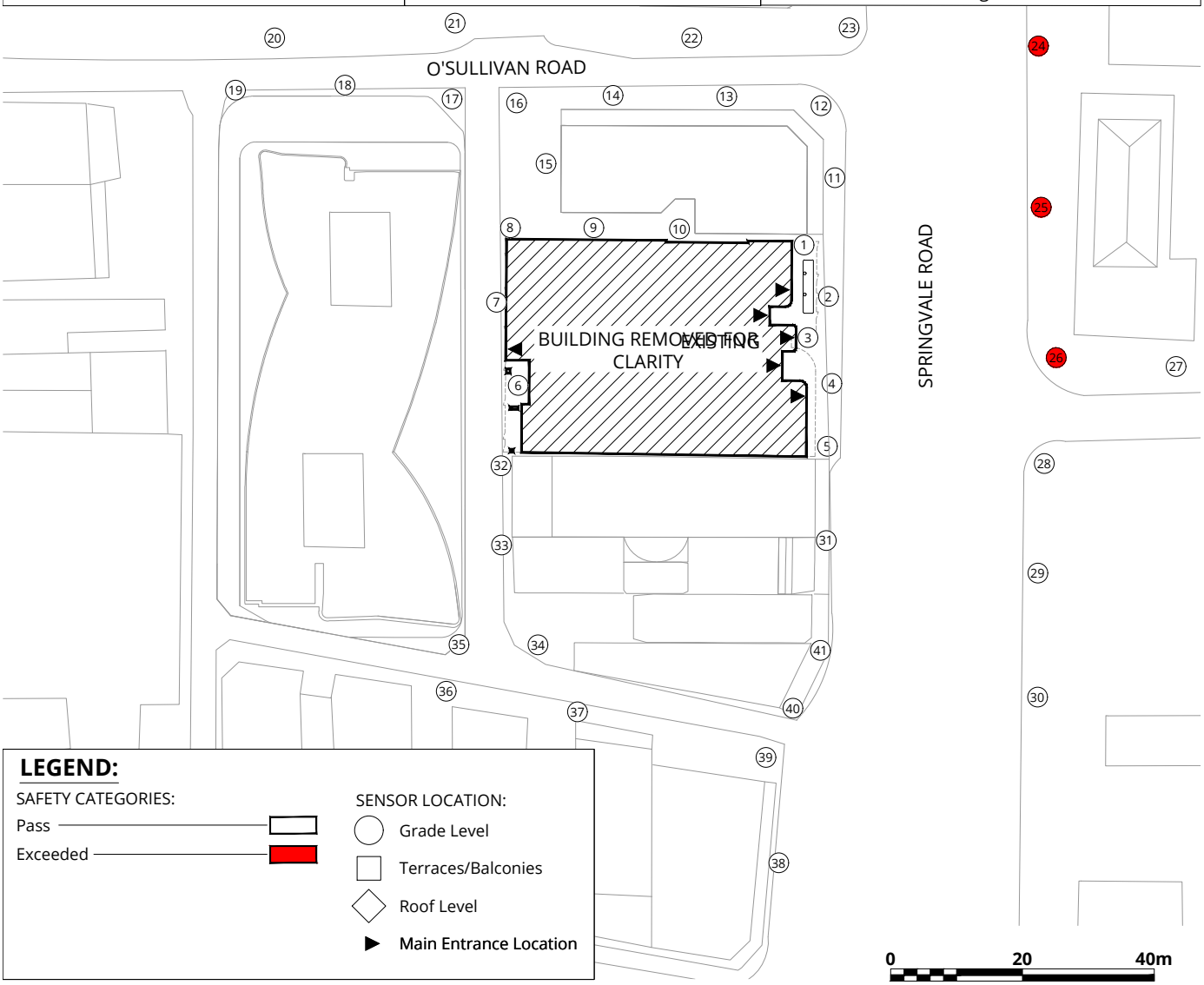


Roof



LEGEND:

SAFETY CATEGORIES:

Pass

Exceeded

SENSOR LOCATION:

Grade Level

Terraces/Balconies

Roof Level

Main Entrance Location

Pedestrian Wind Safety Conditions

Proposed Configuration

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

251-261 Springvale Road - Glen Waverly, VIC

Project #2003838

True North

Drawn by: MBR	Figure: 2B
Approx. Scale:	1:1000
Date Revised:	May 2, 2024

FIGURES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
1	Summer	Existing	-	N/A	-	-
		Proposed	2.2	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.9	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.1	Sitting	10.2	Pass
2	Summer	Existing	2.4	Sitting	-	-
		Proposed	3.3	Standing	-	-
	Winter	Existing	2.9	Sitting	-	-
		Proposed	3.6	Standing	-	-
	Annual	Existing	2.6	Sitting	13.3	Pass
		Proposed	3.4	Standing	15.5	Pass
3	Summer	Existing	-	N/A	-	-
		Proposed	2.5	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.4	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.4	Sitting	10.4	Pass
4	Summer	Existing	2.4	Sitting	-	-
		Proposed	3.4	Standing	-	-
	Winter	Existing	2.8	Sitting	-	-
		Proposed	3.2	Standing	-	-
	Annual	Existing	2.6	Sitting	12.9	Pass
		Proposed	3.4	Standing	13.2	Pass
5	Summer	Existing	2.6	Sitting	-	-
		Proposed	3.8	Standing	-	-
	Winter	Existing	2.8	Sitting	-	-
		Proposed	3.0	Sitting	-	-
	Annual	Existing	2.7	Sitting	12.6	Pass
		Proposed	3.4	Standing	13.7	Pass
6	Summer	Existing	3.4	Standing	-	-
		Proposed	1.9	Sitting	-	-
	Winter	Existing	3.0	Sitting	-	-
		Proposed	1.7	Sitting	-	-
	Annual	Existing	3.2	Standing	13.2	Pass
		Proposed	1.8	Sitting	7.2	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
7	Summer	Existing	3.2	Standing	-	-
		Proposed	3.8	Standing	-	-
	Winter	Existing	3.1	Standing	-	-
		Proposed	3.0	Sitting	-	-
	Annual	Existing	3.2	Standing	12.9	Pass
		Proposed	3.4	Standing	13.2	Pass
8	Summer	Existing	3.9	Standing	-	-
		Proposed	3.3	Standing	-	-
	Winter	Existing	4.0	Standing	-	-
		Proposed	3.4	Standing	-	-
	Annual	Existing	3.9	Standing	16.8	Pass
		Proposed	3.3	Standing	14.2	Pass
9	Summer	Existing	2.7	Sitting	-	-
		Proposed	2.9	Sitting	-	-
	Winter	Existing	3.2	Standing	-	-
		Proposed	2.9	Sitting	-	-
	Annual	Existing	2.9	Sitting	14.3	Pass
		Proposed	2.9	Sitting	14.2	Pass
10	Summer	Existing	-	N/A	-	-
		Proposed	2.0	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.9	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.0	Sitting	8.0	Pass
11	Summer	Existing	3.5	Standing	-	-
		Proposed	3.2	Standing	-	-
	Winter	Existing	3.7	Standing	-	-
		Proposed	3.3	Standing	-	-
	Annual	Existing	3.6	Standing	17.7	Pass
		Proposed	3.3	Standing	15.3	Pass
12	Summer	Existing	4.6	Walking	-	-
		Proposed	3.8	Standing	-	-
	Winter	Existing	4.1	Walking	-	-
		Proposed	3.3	Standing	-	-
	Annual	Existing	4.4	Walking	19.3	Pass
		Proposed	3.6	Standing	15.6	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
13	Summer	Existing	3.6	Standing	-	-
		Proposed	3.7	Standing	-	-
	Winter	Existing	3.6	Standing	-	-
		Proposed	3.5	Standing	-	-
	Annual	Existing	3.6	Standing	14.9	Pass
		Proposed	3.6	Standing	14.1	Pass
14	Summer	Existing	3.4	Standing	-	-
		Proposed	3.8	Standing	-	-
	Winter	Existing	4.2	Walking	-	-
		Proposed	3.8	Standing	-	-
	Annual	Existing	3.8	Standing	17.6	Pass
		Proposed	3.8	Standing	16.4	Pass
15	Summer	Existing	3.2	Standing	-	-
		Proposed	3.5	Standing	-	-
	Winter	Existing	3.1	Standing	-	-
		Proposed	3.4	Standing	-	-
	Annual	Existing	3.1	Standing	14.2	Pass
		Proposed	3.5	Standing	14.9	Pass
16	Summer	Existing	4.4	Walking	-	-
		Proposed	3.7	Standing	-	-
	Winter	Existing	4.7	Walking	-	-
		Proposed	3.8	Standing	-	-
	Annual	Existing	4.6	Walking	16.6	Pass
		Proposed	3.8	Standing	15.0	Pass
17	Summer	Existing	4.6	Walking	-	-
		Proposed	3.8	Standing	-	-
	Winter	Existing	4.8	Walking	-	-
		Proposed	3.6	Standing	-	-
	Annual	Existing	4.7	Walking	19.0	Pass
		Proposed	3.7	Standing	15.8	Pass
18	Summer	Existing	5.4	Uncomfortable	-	-
		Proposed	4.8	Walking	-	-
	Winter	Existing	5.0	Walking	-	-
		Proposed	4.5	Walking	-	-
	Annual	Existing	5.3	Uncomfortable	19.0	Pass
		Proposed	4.6	Walking	17.2	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
19	Summer	Existing	4.6	Walking	-	-
		Proposed	4.0	Standing	-	-
	Winter	Existing	4.6	Walking	-	-
		Proposed	4.4	Walking	-	-
	Annual	Existing	4.6	Walking	17.1	Pass
		Proposed	4.3	Walking	16.5	Pass
20	Summer	Existing	5.2	Uncomfortable	-	-
		Proposed	5.0	Walking	-	-
	Winter	Existing	5.0	Walking	-	-
		Proposed	4.7	Walking	-	-
	Annual	Existing	5.2	Uncomfortable	19.0	Pass
		Proposed	4.8	Walking	17.8	Pass
21	Summer	Existing	5.0	Walking	-	-
		Proposed	5.3	Uncomfortable	-	-
	Winter	Existing	5.1	Uncomfortable	-	-
		Proposed	4.9	Walking	-	-
	Annual	Existing	5.0	Walking	17.3	Pass
		Proposed	5.2	Uncomfortable	17.9	Pass
22	Summer	Existing	4.2	Walking	-	-
		Proposed	4.4	Walking	-	-
	Winter	Existing	3.7	Standing	-	-
		Proposed	3.7	Standing	-	-
	Annual	Existing	3.9	Standing	16.0	Pass
		Proposed	4.1	Walking	15.2	Pass
23	Summer	Existing	4.7	Walking	-	-
		Proposed	4.5	Walking	-	-
	Winter	Existing	4.4	Walking	-	-
		Proposed	4.2	Walking	-	-
	Annual	Existing	4.6	Walking	19.4	Pass
		Proposed	4.3	Walking	17.9	Pass
24	Summer	Existing	4.3	Walking	-	-
		Proposed	4.3	Walking	-	-
	Winter	Existing	5.3	Uncomfortable	-	-
		Proposed	5.2	Uncomfortable	-	-
	Annual	Existing	4.6	Walking	22.6	Exceeded
		Proposed	4.7	Walking	22.3	Exceeded

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
25	Summer	Existing	3.5	Standing	-	-
		Proposed	4.3	Walking	-	-
	Winter	Existing	5.0	Walking	-	-
		Proposed	4.8	Walking	-	-
	Annual	Existing	4.1	Walking	24.1	Exceeded
		Proposed	4.5	Walking	22.0	Exceeded
26	Summer	Existing	3.4	Standing	-	-
		Proposed	3.5	Standing	-	-
	Winter	Existing	4.5	Walking	-	-
		Proposed	4.5	Walking	-	-
	Annual	Existing	3.8	Standing	21.9	Exceeded
		Proposed	3.9	Standing	21.4	Exceeded
27	Summer	Existing	3.0	Sitting	-	-
		Proposed	3.2	Standing	-	-
	Winter	Existing	2.8	Sitting	-	-
		Proposed	2.7	Sitting	-	-
	Annual	Existing	2.9	Sitting	11.4	Pass
		Proposed	2.9	Sitting	11.6	Pass
28	Summer	Existing	3.8	Standing	-	-
		Proposed	3.9	Standing	-	-
	Winter	Existing	4.1	Walking	-	-
		Proposed	4.3	Walking	-	-
	Annual	Existing	3.9	Standing	18.6	Pass
		Proposed	4.0	Standing	18.2	Pass
29	Summer	Existing	4.0	Standing	-	-
		Proposed	4.0	Standing	-	-
	Winter	Existing	3.9	Standing	-	-
		Proposed	3.8	Standing	-	-
	Annual	Existing	3.9	Standing	15.8	Pass
		Proposed	3.9	Standing	15.5	Pass
30	Summer	Existing	3.6	Standing	-	-
		Proposed	3.5	Standing	-	-
	Winter	Existing	3.5	Standing	-	-
		Proposed	3.4	Standing	-	-
	Annual	Existing	3.6	Standing	14.2	Pass
		Proposed	3.4	Standing	13.4	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
31	Summer	Existing	3.0	Sitting	-	-
		Proposed	2.9	Sitting	-	-
	Winter	Existing	2.7	Sitting	-	-
		Proposed	2.8	Sitting	-	-
	Annual	Existing	2.9	Sitting	11.4	Pass
		Proposed	2.9	Sitting	13.1	Pass
32	Summer	Existing	3.7	Standing	-	-
		Proposed	4.2	Walking	-	-
	Winter	Existing	2.8	Sitting	-	-
		Proposed	3.4	Standing	-	-
	Annual	Existing	3.2	Standing	15.5	Pass
		Proposed	3.8	Standing	14.8	Pass
33	Summer	Existing	4.7	Walking	-	-
		Proposed	4.1	Walking	-	-
	Winter	Existing	3.8	Standing	-	-
		Proposed	3.8	Standing	-	-
	Annual	Existing	4.3	Walking	18.3	Pass
		Proposed	3.9	Standing	16.2	Pass
34	Summer	Existing	3.2	Standing	-	-
		Proposed	3.1	Standing	-	-
	Winter	Existing	2.8	Sitting	-	-
		Proposed	3.2	Standing	-	-
	Annual	Existing	3.0	Sitting	14.7	Pass
		Proposed	3.1	Standing	14.7	Pass
35	Summer	Existing	3.6	Standing	-	-
		Proposed	3.8	Standing	-	-
	Winter	Existing	3.2	Standing	-	-
		Proposed	3.9	Standing	-	-
	Annual	Existing	3.5	Standing	19.5	Pass
		Proposed	3.8	Standing	17.4	Pass
36	Summer	Existing	4.2	Walking	-	-
		Proposed	3.9	Standing	-	-
	Winter	Existing	3.4	Standing	-	-
		Proposed	3.6	Standing	-	-
	Annual	Existing	3.8	Standing	16.0	Pass
		Proposed	3.7	Standing	15.6	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
37	Summer	Existing	3.5	Standing	-	-
		Proposed	3.5	Standing	-	-
	Winter	Existing	3.1	Standing	-	-
		Proposed	3.5	Standing	-	-
	Annual	Existing	3.3	Standing	14.1	Pass
		Proposed	3.5	Standing	15.3	Pass
38	Summer	Existing	2.4	Sitting	-	-
		Proposed	2.3	Sitting	-	-
	Winter	Existing	2.6	Sitting	-	-
		Proposed	2.6	Sitting	-	-
	Annual	Existing	2.5	Sitting	10.3	Pass
		Proposed	2.4	Sitting	11.6	Pass
39	Summer	Existing	3.3	Standing	-	-
		Proposed	3.2	Standing	-	-
	Winter	Existing	3.1	Standing	-	-
		Proposed	2.9	Sitting	-	-
	Annual	Existing	3.2	Standing	12.2	Pass
		Proposed	3.1	Standing	11.9	Pass
40	Summer	Existing	3.6	Standing	-	-
		Proposed	3.6	Standing	-	-
	Winter	Existing	3.1	Standing	-	-
		Proposed	3.0	Sitting	-	-
	Annual	Existing	3.4	Standing	13.8	Pass
		Proposed	3.3	Standing	14.4	Pass
41	Summer	Existing	3.1	Standing	-	-
		Proposed	3.4	Standing	-	-
	Winter	Existing	2.8	Sitting	-	-
		Proposed	3.2	Standing	-	-
	Annual	Existing	3.0	Sitting	13.2	Pass
		Proposed	3.3	Standing	14.9	Pass
42	Summer	Existing	-	N/A	-	-
		Proposed	4.3	Walking	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	3.3	Standing	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	3.8	Standing	19.7	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
43	Summer	Existing	-	N/A	-	-
		Proposed	2.8	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.5	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.6	Sitting	10.9	Pass
44	Summer	Existing	-	N/A	-	-
		Proposed	3.6	Standing	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	3.3	Standing	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	3.5	Standing	18.7	Pass
45	Summer	Existing	-	N/A	-	-
		Proposed	1.5	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.5	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	1.5	Sitting	6.9	Pass
46	Summer	Existing	-	N/A	-	-
		Proposed	5.5	Uncomfortable	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	3.5	Standing	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	4.5	Walking	19.2	Pass
47	Summer	Existing	-	N/A	-	-
		Proposed	2.7	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.1	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.4	Sitting	11.4	Pass
48	Summer	Existing	-	N/A	-	-
		Proposed	2.2	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.0	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.1	Sitting	10.1	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
49	Summer	Existing	-	N/A	-	-
		Proposed	3.3	Standing	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.4	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.9	Sitting	12.2	Pass
50	Summer	Existing	-	N/A	-	-
		Proposed	1.3	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.4	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	1.3	Sitting	5.7	Pass
51	Summer	Existing	-	N/A	-	-
		Proposed	1.9	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.7	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	1.8	Sitting	14.0	Pass
52	Summer	Existing	-	N/A	-	-
		Proposed	2.6	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.9	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.3	Sitting	11.5	Pass
53	Summer	Existing	-	N/A	-	-
		Proposed	1.9	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.0	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.0	Sitting	9.8	Pass
54	Summer	Existing	-	N/A	-	-
		Proposed	2.1	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.7	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	1.9	Sitting	10.2	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
55	Summer	Existing	-	N/A	-	-
		Proposed	1.5	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	1.5	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	1.5	Sitting	7.5	Pass
56	Summer	Existing	-	N/A	-	-
		Proposed	2.4	Sitting	-	-
	Winter	Existing	-	N/A	-	-
		Proposed	2.1	Sitting	-	-
	Annual	Existing	-	N/A	-	-
		Proposed	2.2	Sitting	9.5	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