

85-97 WATERLOO ROAD

MACQUARIE PARK, NSW

PEDESTRIAN WIND STUDY

RWDI # 2305660

25 June 2024

SUBMITTED TO

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DOCUMENT CONTROL

Version	Status	Date (DD/MM/YYYY)	Prepared By	Reviewed By
A	Initial	25/06/2024	RWV	AMC

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RWDI

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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 License 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 was retained to conduct a pedestrian wind assessment for the proposed 85-97 Waterloo Road located in Macquarie Park, NSW. The pedestrian-level wind microclimate assessment was conducted for the following configurations of the site:

Existing Configuration: Existing site with existing / under-construction surrounding buildings.

Proposed Configuration: Proposed Development with existing surrounding buildings.

The wind conditions at the pedestrian level on 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 area. The wind speeds have been evaluated against the City of Ryde Development Control Plan (2014) for pedestrian wind comfort and the AWES Criteria for pedestrian wind safety. The results of this project are summarised as follows:

- Wind speeds exceeding the safety limits are not expected in the existing site conditions scenario.
- The existing site wind conditions are generally calm and expected to be suitable for intended pedestrian use throughout the year.
- With the inclusion of the Proposed Development, wind speeds exceeding the safety limits are observed at one location on the grade level, between Building C and E. In the rest of the locations at grade and above-grade levels, the wind speeds are within the safety limits.
- Pedestrian comfort analysis shows varying wind conditions ranging from sitting through strolling use conditions within and around the Proposed Development. Most areas align with intended uses; however, a slightly higher wind speed is noted at the Building F entrance might impact the perception of comfort.
- Wind conditions on the terrace are expected to be suitable for occupant's passive use throughout the year. However, there are a few isolated locations at Level 2 in Building A, Level 3 in Building C, and Level 4 in Building E are expected to be windy for occupant's passive use.
- Balconies are well-sheltered, and conditions are expected to be suitable for occupant's passive use at all buildings throughout the year.

Based on these findings from the wind tunnel study, the following in-principle wind mitigation strategies can be incorporated in the design of the development:

- It is recommended to include a 2 m (approx.) tall porous screen / artwork between Buildings C & E.
- Retention of the proposed landscape will further enhance wind comfort conditions around the site.

With the inclusion of these measures, it is anticipated that the wind conditions around the various accessible outdoor spaces within and surrounding the development will align more favourably with their intended uses.

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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 located at 85-97 Waterloo Road in Macquarie Park, NSW. This report presents the project objectives, discusses the results from RWDI's assessment, and, where necessary, provides conceptual wind control measures to address adverse wind conditions.

The proposed development comprises of six new BTR buildings ranging between 10 to 20 storeys and a new 3 storey amenities building, known as the 'Club House'. The site is situated within the Waterloo Park Precinct under the Macquarie Park Place Precinct Strategy. It is located approximately 350 m south of the Macquarie University Station and 750 m north-west of the Macquarie Park Metro Station. Image 1 below provides an aerial context map of the site.



 Site Boundaries



Image 1: Site Location and Surrounding Context

The objective of the study is to assess the wind comfort and safety conditions along pedestrian areas within and around the study site and provide recommendations for minimising adverse wind effects, if needed. This quantitative assessment is 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 with the appropriate criteria to gauge the 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 buildings, and the various outdoor amenity spaces on ground and upper levels.

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: -

- 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 a radius of 360 m around the project 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 165 specially designed wind speed sensors to measure mean and gust wind speeds at a full-scale height of approximately 1.5 m above local ground in pedestrian areas throughout the study site. The placement of wind measurement sensors was based on our experience and understanding of the pedestrian usage for this site. Wind speeds were measured for 36 directions in 10-degree increments. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model.

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 (AWES-QAM-2019).



Image 2A: Wind Tunnel Study Model – Existing Configuration

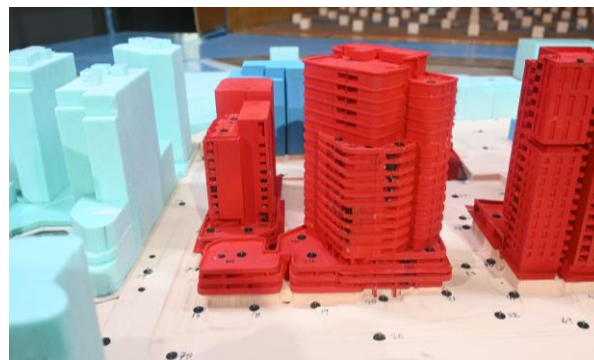
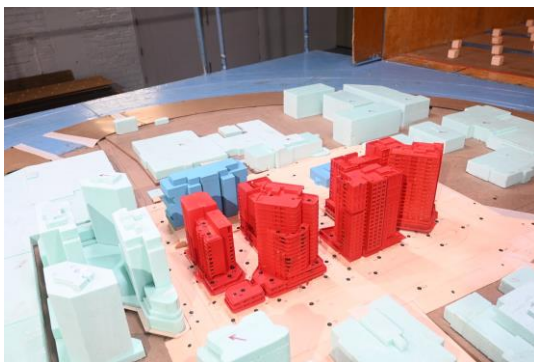
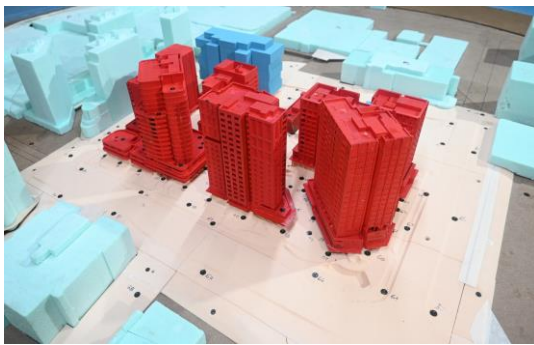


Image 2B: Wind Tunnel Study Model - Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Sydney International Airport between 1995 and 2022 (inclusive) were analysed annually to assess the wind conditions in the study area. Image 3 graphically depicts the directional distributions of wind frequencies and speeds for the year. Winds from the northeast, south, west and north-west are predominant throughout the year as indicated by the wind rose. Strong winds of a mean speed greater than 10 m/s measured at the airport (at an anemometer height of 10 m) occur for 7.8% of the time throughout the year.

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, as described in Section 2.3.

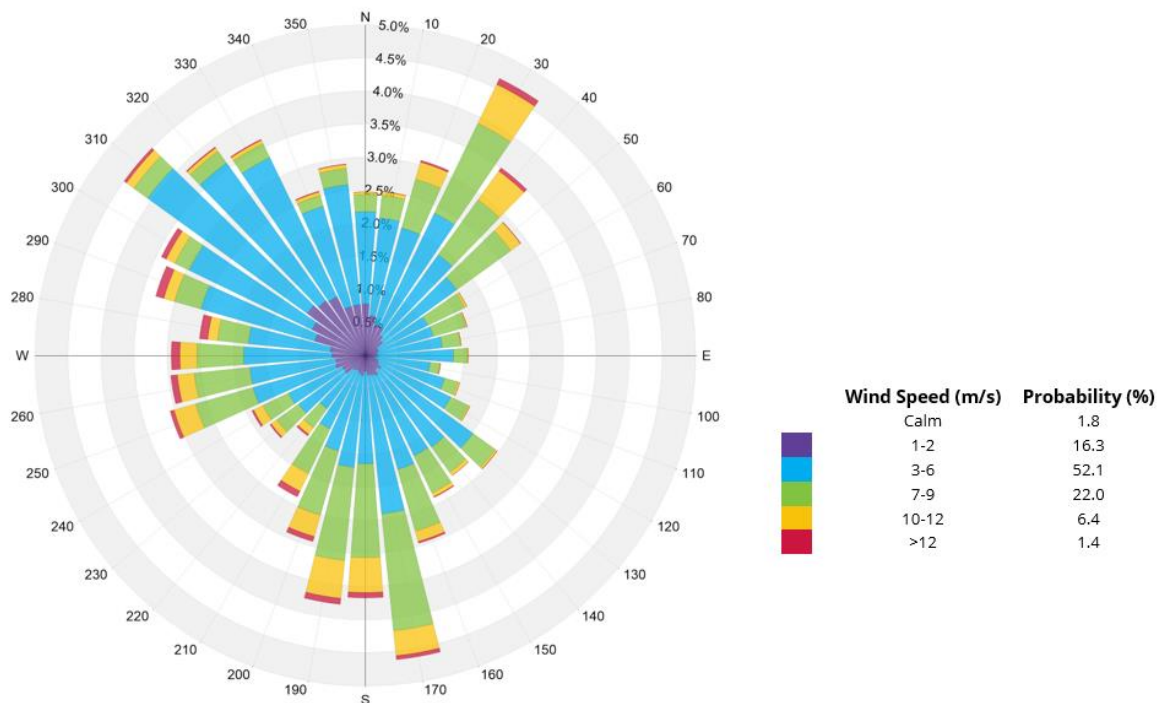


Image 3: Directional Distribution of Winds Approaching Sydney International Airport (1995 – 2022)

2.3 Pedestrian Wind Criteria

2.3.1 Wind Safety

To assess excessive gust speeds that can adversely affect the balance and footing of a pedestrian, the criterion for pedestrian safety is based on the guidelines of the Australasian Wind Engineering Society (2014). This is also in accordance with the requirements of the City of Ryde DCP 2014. The guidelines dictate that if the **maximum average 3-second gust speeds of more than 23 m/s occur for more than 9 hours (0.1% of the time) on an annual basis**, the wind conditions are considered severe. Wind control measures, in the form of an architectural or built-form response, are typically required at locations where winds exceed the wind safety criterion.

2.3.2 Wind Comfort

The City of Ryde Development Control Plan (2014) sets out standards for compliance to facilitate a comfortable environment for designated pedestrian activities. The standards detail the requirements related to pedestrian wind comfort, with the objective of mitigating adverse wind effects generated by tall buildings. The standard requires that a new building must not cause wind speeds around it to exceed the category for the intended use of the area, as set out in the table below.

Table: Pedestrian Wind Comfort Criteria

Comfort Category	GEM Speed (m/s)	Description
Sitting	≤ 3.5	Calm or light breezes desired for outdoor seating areas intended for long-duration stay such as dining areas, amphitheatres etc.
Standing	≤ 5.5	Gentle breezes suitable for main retail centres and retail streets, parks, communal recreational areas and locations where pedestrians may linger.
Strolling	≤ 7.5	Moderate winds that would be appropriate for strolling along footpaths and other pedestrian accessways and where the objective is not to linger.
Walking	≤ 10	High winds generally suitable for infrequently used laneways, easements, private balconies.
Uncomfortable	> 10	None of comfort categories above are met - Represents conditions that might be dangerous to the elderly and children and are of a considerable discomfort to others

Notes:

- (1) GEM Speed = max (Mean Speed, Gust Speed/1.85)
- (2) Gust Speed = Mean Speed + 3*RMS Speed
- (3) Wind conditions are comfortable if the predicted GEM speeds are within the respective thresholds for at least 95% of the time between 6:00 and 22:00. Nightly hours are excluded from the wind analysis for comfort since limited usage of outdoor spaces is anticipated.

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on site plans in Figures 1.1A through 2.2B 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. Note that wind tunnel tests have been carried out without any form of wind ameliorations or vegetation/landscaping to establish a baseline understanding of the wind conditions around the site, as per guidelines.

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 these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and uncomfortable or potentially unsafe conditions. Design details such as setting back a tower from the edges of a podium, deep canopies close to ground level, windscreens / tall trees with dense landscaping, etc. as shown in Image 4 can help to reduce the high wind activity. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

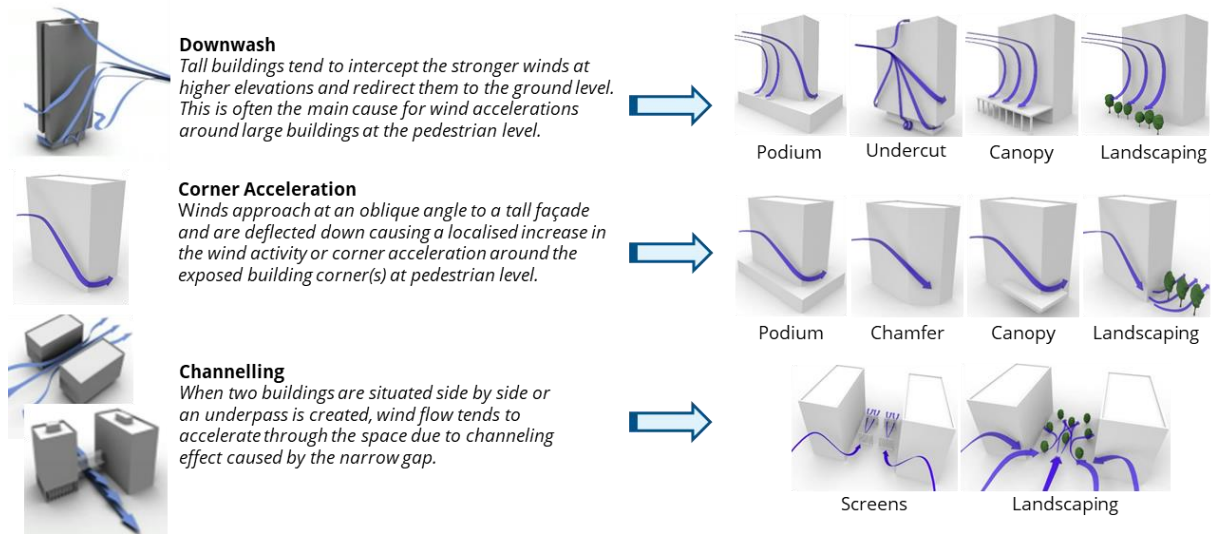


Image 4: General Wind Flows around Buildings and Examples of Wind Control Measures

3.2 Existing Configuration

3.2.1 Wind Safety

Wind speeds were found to meet the wind safety criterion at all locations assessed around the existing site (Figure 2.1A). Therefore, no safety concerns are anticipated for pedestrians in and around the existing site in relation to the wind forces in the areas assessed.

3.2.2 Wind Comfort

The site consists of existing buildings and is surrounded by mid to high-rise structures. Wind conditions are, therefore, observed to be typically calm and suitable for standing use at most locations throughout the year (Figure 1.1B). Higher wind speeds suitable for active pedestrian use (strolling use) are also expected at a few off-site locations to the southwest along Waterloo Road and along parts of Banda Road and Banfield Road.

3.3 Proposed Configuration

3.3.1 Wind Safety

Wind speeds at most locations around the site were observed to be within the acceptable thresholds for wind safety (Figure 2.1B). However, a minor exceedance was observed between Buildings C and E due to the channelling of southerly winds (Sensor 23).

3.3.2 Wind Comfort

With the inclusion of the Proposed Development, the following key average wind effects and conditions are noted within and around the development:

- Wind conditions around the Proposed Development range between sitting use in relatively sheltered areas through to strolling use at locations where the regional winds align with the proposed through-site links. The wind conditions for the Proposed Configuration generally align with the intended use of most areas within and around the development site, offering a comfortable environment for the various activities.
- Wind conditions around the primary lobby entrances for all buildings are noted to be comfortable for their intended use. However, the strolling use conditions observed at the Building F entrance are likely to be perceived as windy, as individuals exiting the controlled indoor environment typically have a heightened perception of winds.
- Wind conditions are expected to be generally suitable for the intended use of the various communal terraces located in Buildings A to G (Figure 1.2B). However, wind speeds suitable for active strolling use are expected around a few isolated locations on the communal terraces of Level 2 in Building A, Level 3 in Building C, and Level 4 in Building E (Sensors 103, 121, and 139).
- Wind conditions within most private balconies were observed to be comfortable for passive sitting to standing use throughout the year. However, note that wind comfort on balconies can exhibit notable variability based on the wind direction and position of an individual relative to the balustrade, partitions, screens, and other structural elements.

3.4 Design Advice and Recommendations

Following wind mitigation measures are recommended to reduce wind impacts around the site:

- It is recommended to include a 2 m tall porous screen / artwork (up to 50% open) to the south of Sensor 23 between Buildings C & E to mitigate the channelling southerly winds (examples shown in Image 5).
- It is recommended to retain the proposed landscape design to reduce wind further and improve overall wind comfort conditions around the site.

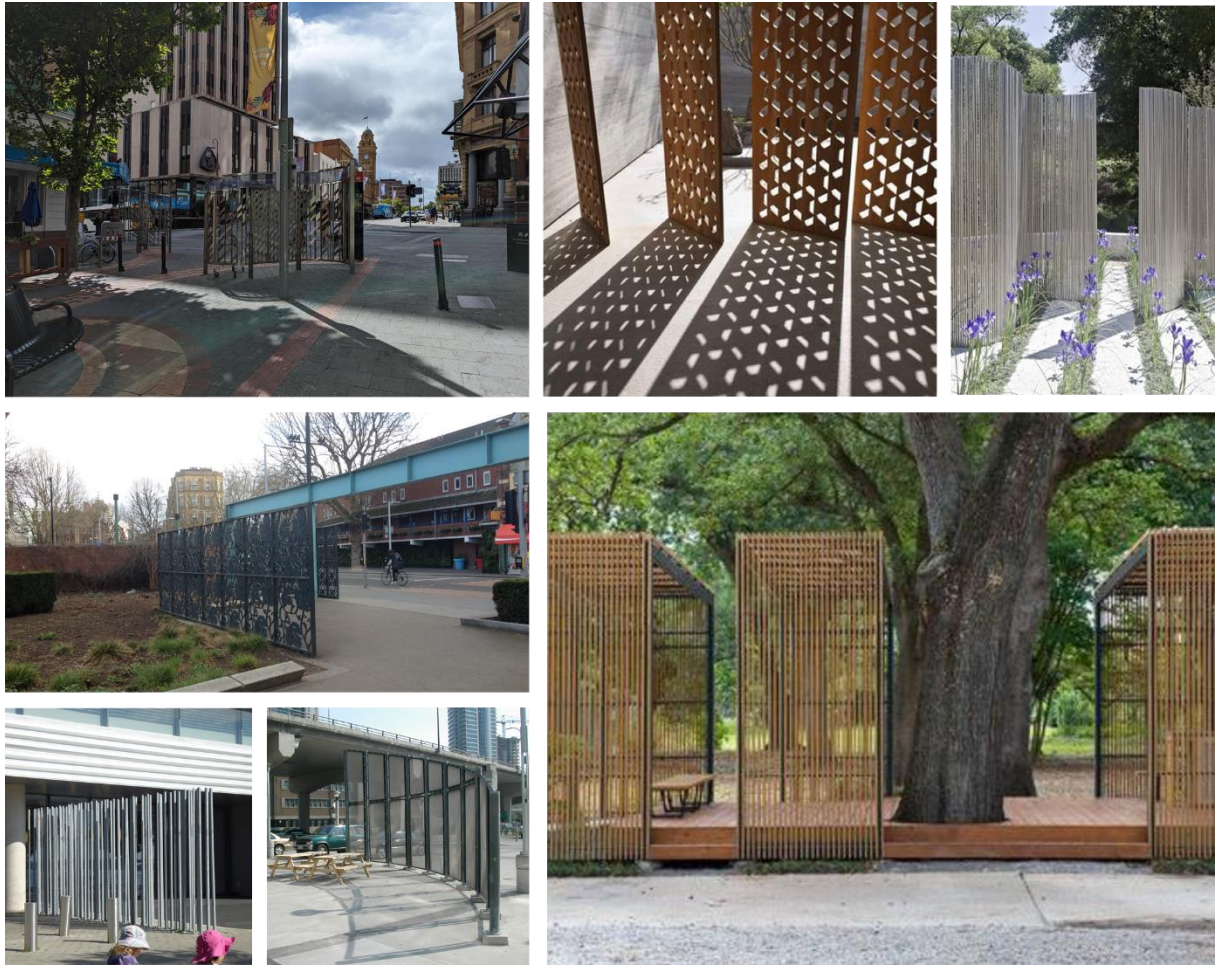


Image 5: Examples of Wind Screening for the Channel Between Buildings C & E

4 STATEMENT OF LIMITATIONS

Limitations

This report entitled '85-97 Waterloo Road Pedestrian Wind Study' was prepared by Rowan Williams Davies & Irwin, Inc. ("RWDI") for Goodman ("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 Goodman and used to construct the scale model of the 85-97 Waterloo Road ("Project Data")

File Name	File Type	Date Received (dd/mm/yyyy)
13202_85 - 97 Waterloo Road Macquarie Park - MAIN FILE_D	SketchUp	06/05/2024
DA2102 Buiding A, B & C - Ground Floor	AutoCAD drawing	06/05/2024
DA2103 Buiding A, B & C - Level 01	AutoCAD drawing	06/05/2024
DA2104 Buiding A, B & C - Level 02	AutoCAD drawing	06/05/2024
DA2105 Buiding A, B & C - Level 03	AutoCAD drawing	06/05/2024
DA2106 Buiding A, B & C - Level 04	AutoCAD drawing	06/05/2024
DA2107 Buiding A, B & C - Level 05 -10	AutoCAD drawing	06/05/2024
DA2108 Buiding A, B & C - Level 11	AutoCAD drawing	06/05/2024

DA2109 Building A, B & C - Level 12	AutoCAD drawing	06/05/2024
DA2110 Building A, B & C - Level 13	AutoCAD drawing	06/05/2024
DA2111 Building A, B & C - Level 14	AutoCAD drawing	06/05/2024
DA2112 Building A, B & C - Level 15 - 18	AutoCAD drawing	06/05/2024
DA2113 Building A, B & C - Level 19	AutoCAD drawing	06/05/2024
DA2114 Building A, B & C - Level 20	AutoCAD drawing	06/05/2024
DA2202 Building E, F & G - Level 01	AutoCAD drawing	06/05/2024
DA2203 Building E, F & G - Level 02	AutoCAD drawing	06/05/2024
DA2204 Building E, F & G - Level 03	AutoCAD drawing	06/05/2024
DA2205 Building E, F & G - Level 04	AutoCAD drawing	06/05/2024
DA2206 Building E, F & G - Level 05	AutoCAD drawing	06/05/2024
DA2207 Building E, F & G - Level 06	AutoCAD drawing	06/05/2024
DA2208 Building E, F & G - Typical Level 07 - 13	AutoCAD drawing	06/05/2024
DA2209 Building E, F & G - Level 14	AutoCAD drawing	06/05/2024
DA2210 Building E, F & G - Level 15	AutoCAD drawing	06/05/2024
DA2211 Building E, F & G - Level 16	AutoCAD drawing	06/05/2024
DA2212 Building E, F & G - Typical Level 17 - 19	AutoCAD drawing	06/05/2024
DA2213 Building E, F & G - Level 20	AutoCAD drawing	06/05/2024
DA2214 Building E, F & G - Level 21	AutoCAD drawing	06/05/2024
DA2215 Building E, F & G - Level 22	AutoCAD drawing	06/05/2024
DA3100 Building A - Elevation	AutoCAD drawing	06/05/2024
DA3101 Building A - Elevation	AutoCAD drawing	06/05/2024
DA3102 Building B - Elevation	AutoCAD drawing	06/05/2024
DA3103 Building B - Elevation	AutoCAD drawing	06/05/2024
DA3104 Building C - Elevation	AutoCAD drawing	06/05/2024
DA3105 Building C - Elevation	AutoCAD drawing	06/05/2024
DA3106 Building D - Elevation	AutoCAD drawing	06/05/2024
DA3200 Building E - Elevation	AutoCAD drawing	06/05/2024
DA3201 Building E - Elevation	AutoCAD drawing	06/05/2024
DA3202 Building F - Elevation	AutoCAD drawing	06/05/2024
DA3203 Building F - Elevation	AutoCAD drawing	06/05/2024



DA3204 Building G - Elevation	AutoCAD drawing	06/05/2024
DA3205 Building G - Elevation	AutoCAD drawing	06/05/2024

The recommendations and conclusions are based on the assumption that the Project Data and Climate Data are accurate and complete. RWDI assumes no responsibility for any inaccuracy or deficiency in the information it has received from others. In addition, the recommendations and conclusions in this report are partially based on historical data and can be affected by a number of external factors, including but not limited to Project design, quality of materials and construction, site conditions, meteorological events, and climate change. As such, the conclusions and recommendations contained in this report do not list every possible outcome.

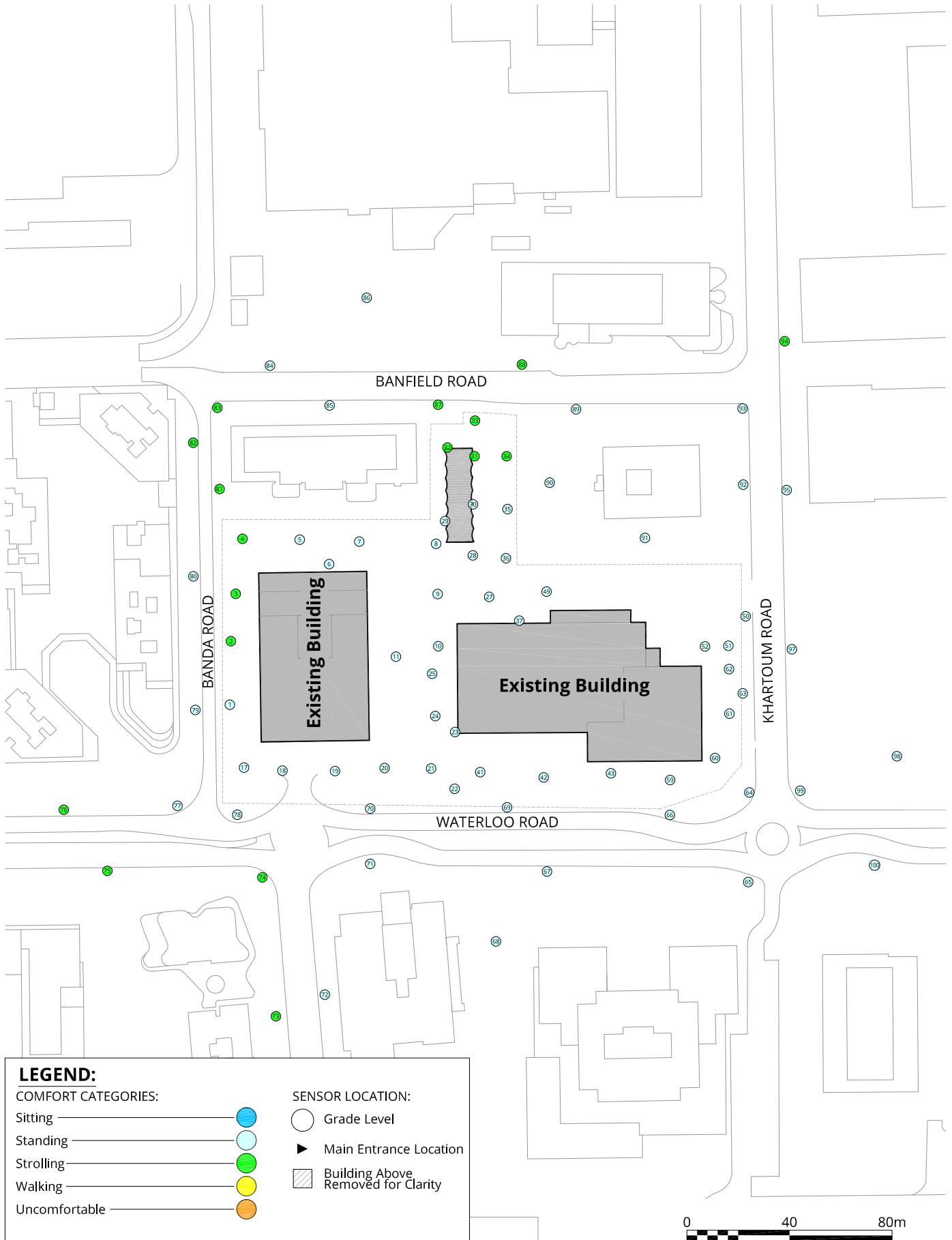
The opinions in this report can only be relied upon to the extent that the Project Data and Project Specific Conditions have not changed. Any change in the Project Data or Project Specific Conditions not reflected in this report can impact and/or alter the recommendations and conclusions in this report.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

5 REFERENCES

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FIGURES



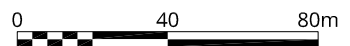
LEGEND:

COMFORT CATEGORIES:

- Sitting ———— ●
- Standing ———— ●
- Strolling ———— ●
- Walking ———— ●
- Uncomfortable ———— ●

SENSOR LOCATION:

- Grade Level
- ▶ Main Entrance Location
- Building Above Removed for Clarity



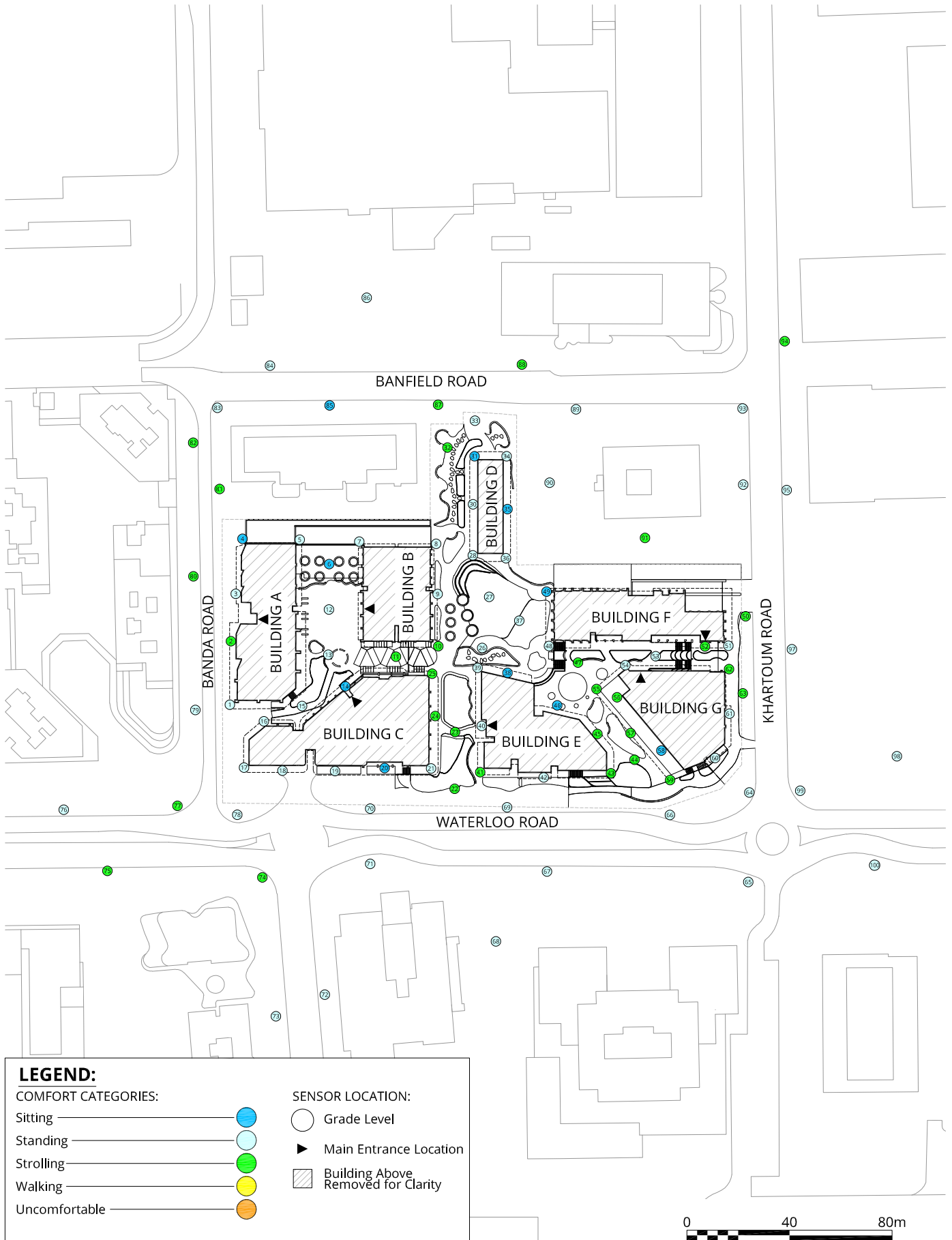
Pedestrian Wind Comfort Conditions
 Existing - Grade
 Annual (January to December, 6:00 to 22:00)
 85-97 Waterloo Road - Macquarie park, NSW



Project #2305660

Drawn by: SSU	Figure: 1.1A
Approx. Scale: 1:2000	
Date Revised: June 19, 2024	





Pedestrian Wind Comfort Conditions Proposed - Grade Annual (January to December, 6:00 to 22:00) 85-97 Waterloo Road - Macquarie park, NSW	True North 	Drawn by: SSU	Figure: 1.1 B	
		Approx. Scale: 1:2000		
		Date Revised: June 19, 2024		

Project #2305660



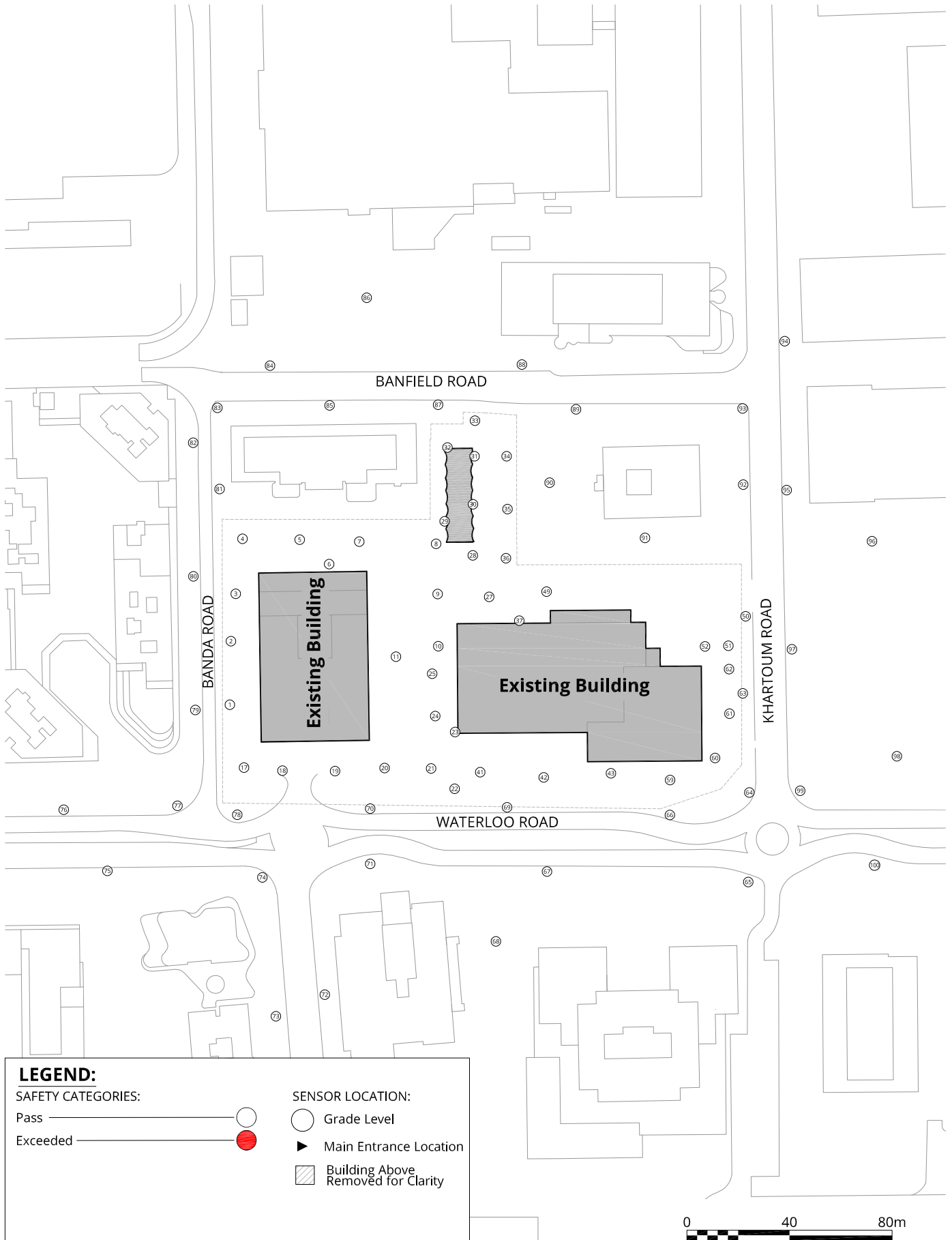
Pedestrian Wind Comfort Conditions
 Proposed - Terrace & Balcony
 Annual (January to December, 6:00 to 22:00)
 85-97 Waterloo Road - Macquarie park, NSW



Project #2305660

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Approx. Scale: 1:1250	
Date Revised: June 19, 2024	





LEGEND:

SAFETY CATEGORIES:

Pass ———— ○

Exceeded ———— ●

SENSOR LOCATION:

○ Grade Level

▶ Main Entrance Location

▨ Building Above Removed for Clarity

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

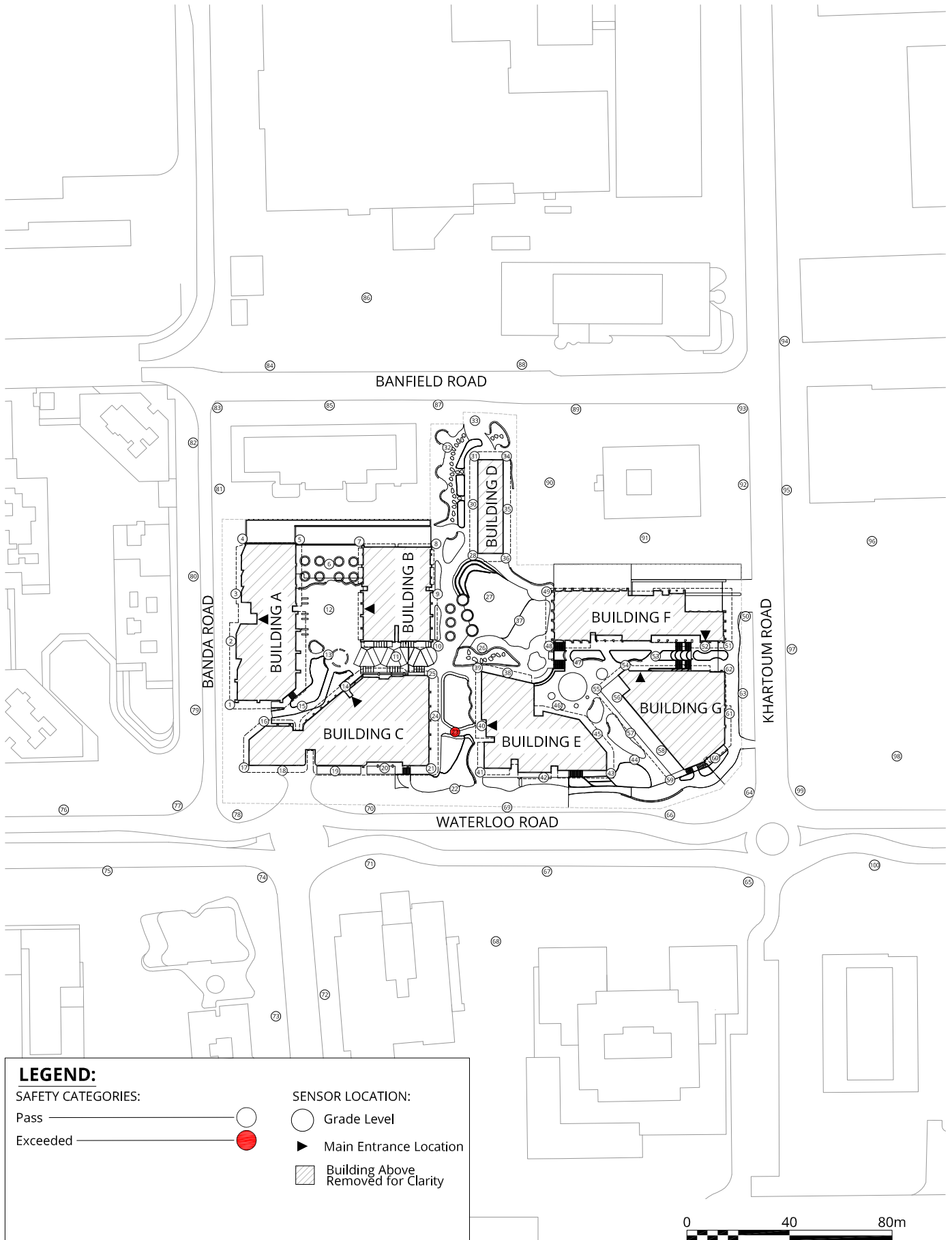
85-97 Waterloo Road - Macquarie park, NSW



Project #2305660

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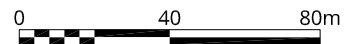
LEGEND:

SAFETY CATEGORIES:

- Pass
- Exceeded

SENSOR LOCATION:

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



Pedestrian Wind Safety Conditions

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

85-97 Waterloo Road - Macquarie park, NSW

True North



Project #2305660

Drawn by: SSU	Figure: 2.1 B
Approx. Scale: 1:2000	
Date Revised: June 7, 2024	





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TABLES



Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
1	Summer	Existing	5.1	Standing				
		Proposed	3.5	Sitting				
	Winter	Existing	5.5	Standing				
		Proposed	3.9	Standing				
	Annual	Existing	5.1	Standing			16.3	Pass
		Proposed	3.6	Standing			12.1	Pass
2	Summer	Existing	5.7	Strolling				
		Proposed	5.4	Standing				
	Winter	Existing	6.3	Strolling				
		Proposed	6.5	Strolling				
	Annual	Existing	5.8	Strolling			18.8	Pass
		Proposed	5.7	Strolling			19.0	Pass
3	Summer	Existing	5.9	Strolling				
		Proposed	4.7	Standing				
	Winter	Existing	6.2	Strolling				
		Proposed	4.4	Standing				
	Annual	Existing	5.8	Strolling			18.1	Pass
		Proposed	4.4	Standing			12.9	Pass
4	Summer	Existing	6.7	Strolling				
		Proposed	3.7	Standing				
	Winter	Existing	6.5	Strolling				
		Proposed	3.3	Sitting				
	Annual	Existing	6.3	Strolling			18.0	Pass
		Proposed	3.4	Sitting			10.2	Pass
5	Summer	Existing	5.0	Standing				
		Proposed	5.9	Strolling				
	Winter	Existing	5.2	Standing				
		Proposed	5.3	Standing				
	Annual	Existing	4.9	Standing			15.2	Pass
		Proposed	5.3	Standing			17.0	Pass
6	Summer	Existing	5.8	Strolling				
		Proposed	3.5	Sitting				
	Winter	Existing	5.1	Standing				
		Proposed	3.6	Standing				
	Annual	Existing	5.2	Standing			15.6	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
		Proposed	3.4	Sitting	10.8	Pass		
7	Summer	Existing	5.0	Standing				
		Proposed	5.8	Strolling				
	Winter	Existing	5.3	Standing				
		Proposed	4.6	Standing				
	Annual	Existing	5.0	Standing			15.9	Pass
		Proposed	4.9	Standing			16.0	Pass
8	Summer	Existing	5.1	Standing				
		Proposed	4.3	Standing				
	Winter	Existing	4.9	Standing				
		Proposed	3.6	Standing				
	Annual	Existing	4.8	Standing			14.5	Pass
		Proposed	3.8	Standing			11.9	Pass
9	Summer	Existing	4.8	Standing				
		Proposed	5.4	Standing				
	Winter	Existing	4.9	Standing				
		Proposed	5.0	Standing				
	Annual	Existing	4.6	Standing			16.6	Pass
		Proposed	5.1	Standing			15.7	Pass
10	Summer	Existing	4.5	Standing				
		Proposed	6.0	Strolling				
	Winter	Existing	4.7	Standing				
		Proposed	5.6	Strolling				
	Annual	Existing	4.3	Standing			15.6	Pass
		Proposed	5.6	Strolling			16.3	Pass
11	Summer	Existing	4.3	Standing				
		Proposed	6.1	Strolling				
	Winter	Existing	4.7	Standing				
		Proposed	6.4	Strolling				
	Annual	Existing	4.3	Standing			16.3	Pass
		Proposed	6.1	Strolling			20.1	Pass
12	Summer	Existing	-	-				
		Proposed	4.7	Standing				
	Winter	Existing	-	-				
		Proposed	5.1	Standing				

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Existing Proposed	– 4.7	– Standing	– 15.0	– Pass
13	Summer	Existing Proposed	– 4.5	– Standing		
	Winter	Existing Proposed	– 5.3	– Standing		
	Annual	Existing Proposed	– 4.8	– Standing	– 15.4	– Pass
14	Summer	Existing Proposed	– 3.2	– Sitting		
	Winter	Existing Proposed	– 3.8	– Standing		
	Annual	Existing Proposed	– 3.4	– Sitting	– 11.3	– Pass
15	Summer	Existing Proposed	– 4.3	– Standing		
	Winter	Existing Proposed	– 6.3	– Strolling		
	Annual	Existing Proposed	– 5.0	– Standing	– 17.6	– Pass
16	Summer	Existing Proposed	– 4.6	– Standing		
	Winter	Existing Proposed	– 4.9	– Standing		
	Annual	Existing Proposed	– 4.6	– Standing	– 14.3	– Pass
17	Summer	Existing Proposed	4.8 4.5	Standing Standing		
	Winter	Existing Proposed	5.6 5.3	Strolling Standing		
	Annual	Existing Proposed	5.0 4.7	Standing Standing	16.9 16.3	Pass Pass
18	Summer	Existing	4.4	Standing		
		Proposed	5.3	Standing		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety					
			Speed	Rating	Speed	Rating				
	Winter	Existing	5.5	Standing						
		Proposed	5.5	Standing						
	Annual	Existing	4.8	Standing			16.8	Pass		
		Proposed	5.2	Standing			17.9	Pass		
	19	Summer	Existing	4.1			Standing			
			Proposed	5.1			Standing			
Winter		Existing	5.2	Standing						
		Proposed	5.1	Standing						
Annual		Existing	4.5	Standing			16.3			Pass
		Proposed	5.0	Standing			16.0			Pass
20	Summer	Existing	4.2	Standing						
		Proposed	2.8	Sitting						
	Winter	Existing	5.2	Standing						
		Proposed	2.9	Sitting						
	Annual	Existing	4.5	Standing					16.6	Pass
		Proposed	2.8	Sitting					9.1	Pass
21	Summer	Existing	4.4	Standing						
		Proposed	5.1	Standing						
	Winter	Existing	4.8	Standing						
		Proposed	5.0	Standing						
	Annual	Existing	4.4	Standing					14.8	Pass
		Proposed	4.9	Standing					14.6	Pass
22	Summer	Existing	4.4	Standing						
		Proposed	5.9	Strolling						
	Winter	Existing	4.3	Standing						
		Proposed	5.7	Strolling						
	Annual	Existing	4.2	Standing					13.3	Pass
		Proposed	5.6	Strolling					16.9	Pass
23	Summer	Existing	4.5	Standing						
		Proposed	7.8	Walking						
	Winter	Existing	4.4	Standing						
		Proposed	7.7	Walking						
	Annual	Existing	4.2	Standing					13.1	Pass
		Proposed	7.7	Walking					23.7	Exceeded
24	Summer	Existing	4.4	Standing						

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
	Winter	Proposed	6.3	Strolling				
		Existing	4.3	Standing				
	Proposed	5.9	Strolling					
	Annual	Existing	4.2	Standing			13.0	Pass
		Proposed	6.0	Strolling			19.5	Pass
	25	Summer	Existing	4.4			Standing	
Proposed			5.8	Strolling				
Winter		Existing	4.5	Standing				
		Proposed	5.7	Strolling				
Annual		Existing	4.2	Standing	14.4	Pass		
		Proposed	5.7	Strolling	18.0	Pass		
26	Summer	Existing	-	-				
		Proposed	4.8	Standing				
	Winter	Existing	-	-				
		Proposed	5.0	Standing				
	Annual	Existing	-	-			-	-
		Proposed	4.7	Standing			14.9	Pass
27	Summer	Existing	4.2	Standing				
		Proposed	5.8	Strolling				
	Winter	Existing	4.0	Standing				
		Proposed	5.4	Standing				
	Annual	Existing	3.9	Standing			11.6	Pass
		Proposed	5.4	Standing			15.8	Pass
28	Summer	Existing	4.3	Standing				
		Proposed	5.1	Standing				
	Winter	Existing	4.3	Standing				
		Proposed	5.5	Standing				
	Annual	Existing	4.1	Standing			12.9	Pass
		Proposed	5.1	Standing			16.2	Pass
29	Summer	Existing	5.3	Standing				
		Proposed	-	-				
	Winter	Existing	4.8	Standing				
		Proposed	-	-				
	Annual	Existing	4.8	Standing			14.7	Pass
		Proposed	-	-			-	-

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
30	Summer	Existing	4.9	Standing				
		Proposed	4.9	Standing				
	Winter	Existing	4.5	Standing				
		Proposed	3.9	Standing				
	Annual	Existing	4.5	Standing			13.8	Pass
		Proposed	4.1	Standing			13.7	Pass
31	Summer	Existing	7.6	Walking				
		Proposed	3.4	Sitting				
	Winter	Existing	6.2	Strolling				
		Proposed	2.8	Sitting				
	Annual	Existing	6.6	Strolling			18.4	Pass
		Proposed	3.0	Sitting			9.1	Pass
32	Summer	Existing	7.6	Walking				
		Proposed	7.0	Strolling				
	Winter	Existing	7.0	Strolling				
		Proposed	5.9	Strolling				
	Annual	Existing	7.0	Strolling			19.0	Pass
		Proposed	6.1	Strolling			17.9	Pass
33	Summer	Existing	7.6	Walking				
		Proposed	5.9	Strolling				
	Winter	Existing	6.2	Strolling				
		Proposed	5.0	Standing				
	Annual	Existing	6.4	Strolling			17.8	Pass
		Proposed	5.1	Standing			15.7	Pass
34	Summer	Existing	7.6	Walking				
		Proposed	4.5	Standing				
	Winter	Existing	6.3	Strolling				
		Proposed	3.8	Standing				
	Annual	Existing	6.5	Strolling			18.8	Pass
		Proposed	4.0	Standing			12.6	Pass
35	Summer	Existing	6.5	Strolling				
		Proposed	2.6	Sitting				
	Winter	Existing	5.2	Standing				
		Proposed	2.4	Sitting				

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Existing	5.5	Standing	17.4	Pass
		Proposed	2.4	Sitting	7.0	Pass
36	Summer	Existing	5.3	Standing		
		Proposed	3.7	Standing		
	Winter	Existing	4.7	Standing		
		Proposed	4.2	Standing		
	Annual	Existing	4.7	Standing	14.6	Pass
		Proposed	3.8	Standing	12.5	Pass
37	Summer	Existing	5.0	Standing		
		Proposed	5.1	Standing		
	Winter	Existing	3.9	Standing		
		Proposed	4.9	Standing		
	Annual	Existing	4.2	Standing	14.2	Pass
		Proposed	4.9	Standing	14.5	Pass
38	Summer	Existing	-	-		
		Proposed	3.9	Standing		
	Winter	Existing	-	-		
		Proposed	3.4	Sitting		
	Annual	Existing	-	-	-	-
		Proposed	3.5	Sitting	10.6	Pass
39	Summer	Existing	-	-		
		Proposed	5.9	Strolling		
	Winter	Existing	-	-		
		Proposed	5.5	Standing		
	Annual	Existing	-	-	-	-
		Proposed	5.4	Standing	16.3	Pass
40	Summer	Existing	-	-		
		Proposed	3.9	Standing		
	Winter	Existing	-	-		
		Proposed	4.3	Standing		
	Annual	Existing	-	-	-	-
		Proposed	4.0	Standing	13.6	Pass
41	Summer	Existing	4.4	Standing		
		Proposed	7.1	Strolling		
	Winter	Existing	4.4	Standing		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Proposed	7.0	Strolling	13.7	Pass
		Existing	4.2	Standing		
		Proposed	7.0	Strolling		
42	Summer	Existing	4.4	Standing	12.3	Pass
		Proposed	5.1	Standing		
	Winter	Existing	4.1	Standing		
		Proposed	5.2	Standing		
	Annual	Existing	4.1	Standing		
		Proposed	5.0	Standing		
43	Summer	Existing	4.2	Standing	13.6	Pass
		Proposed	5.8	Strolling		
	Winter	Existing	4.4	Standing		
		Proposed	6.6	Strolling		
	Annual	Existing	4.2	Standing		
		Proposed	6.0	Strolling		
44	Summer	Existing	-	-	17.0	Pass
		Proposed	6.5	Strolling		
	Winter	Existing	-	-		
		Proposed	5.6	Strolling		
	Annual	Existing	-	-		
		Proposed	5.8	Strolling		
45	Summer	Existing	-	-	19.3	Pass
		Proposed	6.7	Strolling		
	Winter	Existing	-	-		
		Proposed	6.7	Strolling		
	Annual	Existing	-	-		
		Proposed	6.4	Strolling		
46	Summer	Existing	-	-	10.6	Pass
		Proposed	4.0	Standing		
	Winter	Existing	-	-		
		Proposed	3.3	Sitting		
	Annual	Existing	-	-		
		Proposed	3.5	Sitting		
47	Summer	Existing	-	-		
		Proposed	5.9	Strolling		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Winter	Existing Proposed	– 5.8	– Strolling		
	Annual	Existing Proposed	– 5.7	– Strolling		
48	Summer	Existing Proposed	– 4.3	– Standing		
	Winter	Existing Proposed	– 3.9	– Standing		
	Annual	Existing Proposed	– 4.0	– Standing		
49	Summer	Existing Proposed	4.0 3.3	Standing Sitting		
	Winter	Existing Proposed	3.9 3.1	Standing Sitting		
	Annual	Existing Proposed	3.8 3.1	Standing Sitting		
50	Summer	Existing Proposed	5.1 7.3	Standing Strolling		
	Winter	Existing Proposed	4.9 6.8	Standing Strolling		
	Annual	Existing Proposed	4.8 6.8	Standing Strolling		
51	Summer	Existing Proposed	5.3 4.3	Standing Standing		
	Winter	Existing Proposed	4.9 4.3	Standing Standing		
	Annual	Existing Proposed	4.9 4.2	Standing Standing		
52	Summer	Existing Proposed	5.4 5.7	Standing Strolling		
	Winter	Existing Proposed	4.8 5.4	Standing Standing		
	Annual	Existing Proposed	4.9 5.6	Standing Strolling		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
53	Summer	Existing Proposed	– 3.8	– Standing	– 10.7	– Pass
	Winter	Existing Proposed	– 3.4	– Sitting		
	Annual	Existing Proposed	– 3.6	– Standing		
54	Summer	Existing Proposed	– 5.8	– Strolling	– 15.4	– Pass
	Winter	Existing Proposed	– 5.1	– Standing		
	Annual	Existing Proposed	– 5.4	– Standing		
55	Summer	Existing Proposed	– 6.8	– Strolling	– 22.3	– Pass
	Winter	Existing Proposed	– 8.0	– Walking		
	Annual	Existing Proposed	– 7.3	– Strolling		
56	Summer	Existing Proposed	– 5.1	– Standing	– 17.6	– Pass
	Winter	Existing Proposed	– 6.2	– Strolling		
	Annual	Existing Proposed	– 5.6	– Strolling		
57	Summer	Existing Proposed	– 6.5	– Strolling	– 16.7	– Pass
	Winter	Existing Proposed	– 6.1	– Strolling		
	Annual	Existing Proposed	– 6.0	– Strolling		
58	Summer	Existing Proposed	– 3.6	– Standing	–	–
	Winter	Existing Proposed	– 3.0	– Sitting		
	Annual	Existing	–	–		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
		Proposed	3.1	Sitting	9.9	Pass		
59	Summer	Existing	3.7	Standing				
		Proposed	6.5	Strolling				
	Winter	Existing	4.1	Standing				
		Proposed	6.1	Strolling				
	Annual	Existing	3.8	Standing			12.0	Pass
		Proposed	6.2	Strolling			19.4	Pass
60	Summer	Existing	4.8	Standing				
		Proposed	5.1	Standing				
	Winter	Existing	5.1	Standing				
		Proposed	5.5	Standing				
	Annual	Existing	4.8	Standing			14.9	Pass
		Proposed	5.2	Standing			16.8	Pass
61	Summer	Existing	5.1	Standing				
		Proposed	5.0	Standing				
	Winter	Existing	4.7	Standing				
		Proposed	5.2	Standing				
	Annual	Existing	4.7	Standing			14.4	Pass
		Proposed	4.9	Standing			17.1	Pass
62	Summer	Existing	5.4	Standing				
		Proposed	5.9	Strolling				
	Winter	Existing	5.0	Standing				
		Proposed	5.8	Strolling				
	Annual	Existing	5.0	Standing			14.8	Pass
		Proposed	5.8	Strolling			19.3	Pass
63	Summer	Existing	5.0	Standing				
		Proposed	6.2	Strolling				
	Winter	Existing	4.8	Standing				
		Proposed	6.6	Strolling				
	Annual	Existing	4.7	Standing			14.3	Pass
		Proposed	6.2	Strolling			19.9	Pass
64	Summer	Existing	4.7	Standing				
		Proposed	5.1	Standing				
	Winter	Existing	4.8	Standing				
		Proposed	5.3	Standing				

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
	Annual	Existing	4.6	Standing	13.7	Pass		
		Proposed	5.0	Standing	14.8	Pass		
65	Summer	Existing	4.9	Standing				
		Proposed	5.0	Standing				
	Winter	Existing	5.0	Standing				
		Proposed	5.5	Standing				
	Annual	Existing	4.7	Standing			14.5	Pass
		Proposed	5.1	Standing			16.7	Pass
66	Summer	Existing	4.1	Standing				
		Proposed	5.7	Strolling				
	Winter	Existing	4.2	Standing				
		Proposed	5.4	Standing				
	Annual	Existing	4.0	Standing			12.2	Pass
		Proposed	5.4	Standing			15.7	Pass
67	Summer	Existing	4.1	Standing				
		Proposed	4.7	Standing				
	Winter	Existing	4.3	Standing				
		Proposed	4.7	Standing				
	Annual	Existing	4.1	Standing			12.9	Pass
		Proposed	4.5	Standing			13.8	Pass
68	Summer	Existing	5.2	Standing				
		Proposed	4.5	Standing				
	Winter	Existing	5.3	Standing				
		Proposed	4.6	Standing				
	Annual	Existing	5.1	Standing			16.0	Pass
		Proposed	4.4	Standing			13.9	Pass
69	Summer	Existing	4.4	Standing				
		Proposed	5.4	Standing				
	Winter	Existing	4.2	Standing				
		Proposed	5.5	Standing				
	Annual	Existing	4.1	Standing			12.8	Pass
		Proposed	5.3	Standing			16.1	Pass
70	Summer	Existing	4.1	Standing				
		Proposed	5.1	Standing				



Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
71	Winter	Existing	5.0	Standing	16.6	Pass		
		Proposed	5.5	Standing				
	Annual	Existing	4.3	Standing				
		Proposed	5.1	Standing				
	Summer	Existing	4.2	Standing				
		Proposed	4.8	Standing				
Winter	Existing	3.9	Standing					
	Proposed	5.1	Standing					
Annual	Existing	3.9	Standing	12.2	Pass			
	Proposed	4.8	Standing	15.5	Pass			
72	Summer	Existing	5.3	Standing	16.5	Pass		
		Proposed	5.0	Standing				
	Winter	Existing	5.4	Standing				
		Proposed	5.2	Standing				
	Annual	Existing	5.1	Standing				
		Proposed	4.9	Standing			16.2	Pass
73	Summer	Existing	6.1	Strolling	17.3	Pass		
		Proposed	5.8	Strolling				
	Winter	Existing	5.8	Strolling				
		Proposed	5.4	Standing				
	Annual	Existing	5.9	Strolling			17.1	Pass
		Proposed	5.5	Standing				
74	Summer	Existing	6.3	Strolling	17.4	Pass		
		Proposed	6.2	Strolling				
	Winter	Existing	6.1	Strolling				
		Proposed	6.0	Strolling				
	Annual	Existing	6.0	Strolling			16.9	Pass
		Proposed	5.9	Strolling				
75	Summer	Existing	6.3	Strolling	19.6	Pass		
		Proposed	6.0	Strolling				
	Winter	Existing	6.8	Strolling				
		Proposed	6.6	Strolling				
	Annual	Existing	6.2	Strolling			20.0	Pass
		Proposed	6.0	Strolling				
76	Summer	Existing	5.4	Standing				

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
	Winter	Proposed	5.1	Standing				
		Existing	6.4	Strolling				
	Proposed	6.2	Strolling					
	Annual	Existing	5.7	Strolling			18.4	Pass
		Proposed	5.5	Standing			18.1	Pass
	77	Summer	Existing	5.1			Standing	
Proposed			5.7	Strolling				
Winter		Existing	6.5	Strolling				
		Proposed	6.8	Strolling				
Annual		Existing	5.5	Standing	18.3	Pass		
		Proposed	6.0	Strolling	18.6	Pass		
78	Summer	Existing	5.2	Standing				
		Proposed	4.7	Standing				
	Winter	Existing	6.1	Strolling				
		Proposed	5.2	Standing				
	Annual	Existing	5.4	Standing			17.7	Pass
		Proposed	4.8	Standing			14.9	Pass
79	Summer	Existing	4.8	Standing				
		Proposed	5.4	Standing				
	Winter	Existing	4.3	Standing				
		Proposed	5.4	Standing				
	Annual	Existing	4.5	Standing			14.0	Pass
		Proposed	5.2	Standing			16.5	Pass
80	Summer	Existing	5.4	Standing				
		Proposed	6.6	Strolling				
	Winter	Existing	4.8	Standing				
		Proposed	6.2	Strolling				
	Annual	Existing	5.0	Standing			15.0	Pass
		Proposed	6.3	Strolling			18.5	Pass
81	Summer	Existing	7.3	Strolling				
		Proposed	6.4	Strolling				
	Winter	Existing	6.1	Strolling				
		Proposed	5.3	Standing				
	Annual	Existing	6.4	Strolling			17.1	Pass
		Proposed	5.6	Strolling			16.4	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
82	Summer	Existing	7.3	Strolling				
		Proposed	6.2	Strolling				
	Winter	Existing	6.4	Strolling				
		Proposed	5.6	Strolling				
	Annual	Existing	6.7	Strolling			17.2	Pass
		Proposed	5.7	Strolling			15.4	Pass
83	Summer	Existing	6.5	Strolling				
		Proposed	5.6	Strolling				
	Winter	Existing	5.6	Strolling				
		Proposed	4.8	Standing				
	Annual	Existing	5.8	Strolling			17.3	Pass
		Proposed	5.0	Standing			15.0	Pass
84	Summer	Existing	5.3	Standing				
		Proposed	5.4	Standing				
	Winter	Existing	4.7	Standing				
		Proposed	4.5	Standing				
	Annual	Existing	4.8	Standing			15.6	Pass
		Proposed	4.7	Standing			14.9	Pass
85	Summer	Existing	3.7	Standing				
		Proposed	3.4	Sitting				
	Winter	Existing	3.7	Standing				
		Proposed	3.4	Sitting				
	Annual	Existing	3.6	Standing			12.1	Pass
		Proposed	3.3	Sitting			11.7	Pass
86	Summer	Existing	5.4	Standing				
		Proposed	4.5	Standing				
	Winter	Existing	5.4	Standing				
		Proposed	4.5	Standing				
	Annual	Existing	5.3	Standing			16.4	Pass
		Proposed	4.3	Standing			14.9	Pass
87	Summer	Existing	7.9	Walking				
		Proposed	7.0	Strolling				
	Winter	Existing	6.6	Strolling				
		Proposed	5.7	Strolling				

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
	Annual	Existing	6.9	Strolling	18.3	Pass		
		Proposed	6.0	Strolling	17.2	Pass		
88	Summer	Existing	6.5	Strolling				
		Proposed	6.4	Strolling				
	Winter	Existing	6.1	Strolling				
		Proposed	6.4	Strolling				
	Annual	Existing	6.0	Strolling			17.0	Pass
		Proposed	6.2	Strolling			19.2	Pass
89	Summer	Existing	5.5	Standing				
		Proposed	5.3	Standing				
	Winter	Existing	5.0	Standing				
		Proposed	5.0	Standing				
	Annual	Existing	5.0	Standing			15.3	Pass
		Proposed	5.1	Standing			15.3	Pass
90	Summer	Existing	5.9	Strolling				
		Proposed	4.7	Standing				
	Winter	Existing	5.3	Standing				
		Proposed	4.7	Standing				
	Annual	Existing	5.3	Standing			15.4	Pass
		Proposed	4.4	Standing			13.8	Pass
91	Summer	Existing	4.2	Standing				
		Proposed	6.3	Strolling				
	Winter	Existing	4.1	Standing				
		Proposed	5.1	Standing				
	Annual	Existing	4.0	Standing			11.9	Pass
		Proposed	5.6	Strolling			16.4	Pass
92	Summer	Existing	4.0	Standing				
		Proposed	5.7	Strolling				
	Winter	Existing	4.1	Standing				
		Proposed	5.5	Standing				
	Annual	Existing	3.9	Standing			11.3	Pass
		Proposed	5.5	Standing			16.6	Pass
93	Summer	Existing	4.5	Standing				
	Proposed	4.5	Standing					
	Winter	Existing	4.3	Standing				



Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Proposed	4.5	Standing	12.7	Pass
		Existing	4.2	Standing		
		Proposed	4.4	Standing		
94	Summer	Existing	7.3	Strolling	19.3	Pass
		Proposed	7.2	Strolling		
	Winter	Existing	7.0	Strolling		
		Proposed	6.8	Strolling		
	Annual	Existing	6.9	Strolling		
		Proposed	6.8	Strolling		
95	Summer	Existing	4.9	Standing	14.2	Pass
		Proposed	5.1	Standing		
	Winter	Existing	4.8	Standing		
		Proposed	5.1	Standing		
	Annual	Existing	4.6	Standing		
		Proposed	4.9	Standing		
97	Summer	Existing	4.8	Standing	13.4	Pass
		Proposed	5.9	Strolling		
	Winter	Existing	4.6	Standing		
		Proposed	5.5	Standing		
	Annual	Existing	4.6	Standing		
		Proposed	5.5	Standing		
98	Summer	Existing	5.5	Standing	15.0	Pass
		Proposed	6.0	Strolling		
	Winter	Existing	5.3	Standing		
		Proposed	5.4	Standing		
	Annual	Existing	5.2	Standing		
		Proposed	5.5	Standing		
99	Summer	Existing	4.9	Standing	15.4	Pass
		Proposed	5.0	Standing		
	Winter	Existing	5.2	Standing		
		Proposed	5.6	Strolling		
	Annual	Existing	4.9	Standing		
		Proposed	5.1	Standing		
100	Summer	Existing	5.0	Standing	16.0	Pass
		Proposed	4.5	Standing		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety			
			Speed	Rating	Speed	Rating		
101	Winter	Existing	5.1	Standing	15.6	Pass		
		Proposed	4.1	Standing				
	Annual	Existing	4.9	Standing				
		Proposed	4.2	Standing				
	Summer	Existing	-	-			15.3	Pass
		Proposed	4.1	Standing				
Winter		Existing	-	-				
Proposed	4.6	Standing	-	-				
Annual	Existing	-	-	-	-			
Proposed	4.3	Standing	15.3	Pass				
102	Summer	Existing	-	-	16.2	Pass		
		Proposed	4.7	Standing				
	Winter	Existing	-	-				
		Proposed	5.2	Standing				
	Annual	Existing	-	-			-	-
		Proposed	4.7	Standing			16.2	Pass
103	Summer	Existing	-	-	18.1	Pass		
		Proposed	5.6	Strolling				
	Winter	Existing	-	-				
		Proposed	6.4	Strolling				
	Annual	Existing	-	-			-	-
		Proposed	5.8	Strolling			18.1	Pass
104	Summer	Existing	-	-	15.4	Pass		
		Proposed	4.0	Standing				
	Winter	Existing	-	-				
		Proposed	5.0	Standing				
	Annual	Existing	-	-			-	-
		Proposed	4.4	Standing			15.4	Pass
105	Summer	Existing	-	-	15.1	Pass		
		Proposed	4.3	Standing				
	Winter	Existing	-	-				
		Proposed	4.7	Standing				
	Annual	Existing	-	-			-	-
		Proposed	4.4	Standing			15.1	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
106	Summer	Existing Proposed	– 1.8	– Sitting	– 5.3	– Pass
	Winter	Existing Proposed	– 1.8	– Sitting		
	Annual	Existing Proposed	– 1.8	– Sitting		
107	Summer	Existing Proposed	– 1.8	– Sitting	– 4.8	– Pass
	Winter	Existing Proposed	– 1.7	– Sitting		
	Annual	Existing Proposed	– 1.7	– Sitting		
108	Summer	Existing Proposed	– 3.3	– Sitting	– 13.3	– Pass
	Winter	Existing Proposed	– 4.2	– Standing		
	Annual	Existing Proposed	– 3.7	– Standing		
109	Summer	Existing Proposed	– 4.8	– Standing	– 19.7	– Pass
	Winter	Existing Proposed	– 5.2	– Standing		
	Annual	Existing Proposed	– 5.0	– Standing		
110	Summer	Existing Proposed	– 2.5	– Sitting	– 6.8	– Pass
	Winter	Existing Proposed	– 2.1	– Sitting		
	Annual	Existing Proposed	– 2.2	– Sitting		
111	Summer	Existing Proposed	– 2.9	– Sitting	– –	– –
	Winter	Existing Proposed	– 2.8	– Sitting		
	Annual	Existing	– –	– –		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
		Proposed	2.7	Sitting	7.9	Pass
112	Summer	Existing Proposed	- 3.5	- Sitting		
	Winter	Existing Proposed	- 3.1	- Sitting		
	Annual	Existing Proposed	- 3.2	- Sitting	- 9.4	- Pass
113	Summer	Existing Proposed	- 3.8	- Standing		
	Winter	Existing Proposed	- 3.8	- Standing		
	Annual	Existing Proposed	- 3.6	- Standing	- 11.6	- Pass
114	Summer	Existing Proposed	- 3.8	- Standing		
	Winter	Existing Proposed	- 3.9	- Standing		
	Annual	Existing Proposed	- 3.8	- Standing	- 12.1	- Pass
115	Summer	Existing Proposed	- 3.3	- Sitting		
	Winter	Existing Proposed	- 3.2	- Sitting		
	Annual	Existing Proposed	- 3.1	- Sitting	- 13.3	- Pass
116	Summer	Existing Proposed	- 2.5	- Sitting		
	Winter	Existing Proposed	- 3.0	- Sitting		
	Annual	Existing Proposed	- 2.6	- Sitting	- 9.6	- Pass
117	Summer	Existing Proposed	- 3.3	- Sitting		
	Winter	Existing Proposed	- 3.1	- Sitting		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Existing Proposed	– 3.1	– Sitting	– 10.9	– Pass
118	Summer	Existing Proposed	– 3.5	– Sitting		
	Winter	Existing Proposed	– 2.5	– Sitting		
	Annual	Existing Proposed	– 3.0	– Sitting	– 11.2	– Pass
119	Summer	Existing Proposed	– 5.5	– Standing		
	Winter	Existing Proposed	– 5.2	– Standing		
	Annual	Existing Proposed	– 5.2	– Standing	– 16.1	– Pass
120	Summer	Existing Proposed	– 5.4	– Standing		
	Winter	Existing Proposed	– 5.4	– Standing		
	Annual	Existing Proposed	– 5.3	– Standing	– 17.0	– Pass
121	Summer	Existing Proposed	– 6.5	– Strolling		
	Winter	Existing Proposed	– 6.1	– Strolling		
	Annual	Existing Proposed	– 6.2	– Strolling	– 19.8	– Pass
122	Summer	Existing Proposed	– 3.0	– Sitting		
	Winter	Existing Proposed	– 2.7	– Sitting		
	Annual	Existing Proposed	– 2.8	– Sitting	– 9.3	– Pass
123	Summer	Existing Proposed	– 1.9	– Sitting		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Winter	Existing Proposed	- 1.8	- Sitting		
	Annual	Existing Proposed	- 1.8	- Sitting	- 5.2	- Pass
124	Summer	Existing Proposed	- 1.7	- Sitting		
	Winter	Existing Proposed	- 1.8	- Sitting		
	Annual	Existing Proposed	- 1.7	- Sitting	- 5.1	- Pass
125	Summer	Existing Proposed	- 4.9	- Standing		
	Winter	Existing Proposed	- 4.4	- Standing		
	Annual	Existing Proposed	- 4.6	- Standing	- 13.9	- Pass
126	Summer	Existing Proposed	- 4.1	- Standing		
	Winter	Existing Proposed	- 3.9	- Standing		
	Annual	Existing Proposed	- 3.9	- Standing	- 11.9	- Pass
127	Summer	Existing Proposed	- 4.1	- Standing		
	Winter	Existing Proposed	- 4.8	- Standing		
	Annual	Existing Proposed	- 4.4	- Standing	- 16.3	- Pass
128	Summer	Existing Proposed	- 4.5	- Standing		
	Winter	Existing Proposed	- 4.3	- Standing		
	Annual	Existing Proposed	- 4.3	- Standing	- 13.8	- Pass
129	Summer	Existing	-	-		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Winter	Proposed	5.1	Standing	18.6	Pass
		Existing Proposed	- 5.8	- Strolling		
	Annual	Existing Proposed	- 5.4	- Standing		
130	Summer	Existing Proposed	- 3.9	- Standing	12.0	Pass
	Winter	Existing Proposed	- 4.0	- Standing		
	Annual	Existing Proposed	- 3.8	- Standing		
131	Summer	Existing Proposed	- 2.5	- Sitting	10.4	Pass
	Winter	Existing Proposed	- 3.3	- Sitting		
	Annual	Existing Proposed	- 2.8	- Sitting		
132	Summer	Existing Proposed	- 2.1	- Sitting	6.7	Pass
	Winter	Existing Proposed	- 2.2	- Sitting		
	Annual	Existing Proposed	- 2.1	- Sitting		
133	Summer	Existing Proposed	- 2.4	- Sitting	7.2	Pass
	Winter	Existing Proposed	- 2.4	- Sitting		
	Annual	Existing Proposed	- 2.3	- Sitting		
134	Summer	Existing Proposed	- 3.6	- Standing	10.4	Pass
	Winter	Existing Proposed	- 3.5	- Sitting		
	Annual	Existing Proposed	- 3.4	- Sitting		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
135	Summer	Existing Proposed	– 3.6	– Standing		
	Winter	Existing Proposed	– 3.6	– Standing		
	Annual	Existing Proposed	– 3.5	– Sitting	– 10.8	– Pass
136	Summer	Existing Proposed	– 5.3	– Standing		
	Winter	Existing Proposed	– 5.2	– Standing		
	Annual	Existing Proposed	– 5.0	– Standing	– 15.2	– Pass
137	Summer	Existing Proposed	– 5.2	– Standing		
	Winter	Existing Proposed	– 4.4	– Standing		
	Annual	Existing Proposed	– 4.6	– Standing	– 14.5	– Pass
138	Summer	Existing Proposed	– 3.6	– Standing		
	Winter	Existing Proposed	– 3.2	– Sitting		
	Annual	Existing Proposed	– 3.2	– Sitting	– 10.3	– Pass
139	Summer	Existing Proposed	– 6.2	– Strolling		
	Winter	Existing Proposed	– 7.0	– Strolling		
	Annual	Existing Proposed	– 6.5	– Strolling	– 22.5	– Pass
140	Summer	Existing Proposed	– 4.4	– Standing		
	Winter	Existing Proposed	– 5.1	– Standing		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Existing Proposed	– 4.4	– Standing	– 17.7	– Pass
141	Summer	Existing Proposed	– 4.1	– Standing		
	Winter	Existing Proposed	– 4.8	– Standing		
	Annual	Existing Proposed	– 4.2	– Standing	– 16.3	– Pass
142	Summer	Existing Proposed	– 4.2	– Standing		
	Winter	Existing Proposed	– 3.3	– Sitting		
	Annual	Existing Proposed	– 3.5	– Sitting	– 11.9	– Pass
143	Summer	Existing Proposed	– 2.4	– Sitting		
	Winter	Existing Proposed	– 2.1	– Sitting		
	Annual	Existing Proposed	– 2.2	– Sitting	– 5.8	– Pass
144	Summer	Existing Proposed	– 3.2	– Sitting		
	Winter	Existing Proposed	– 2.8	– Sitting		
	Annual	Existing Proposed	– 2.8	– Sitting	– 8.6	– Pass
145	Summer	Existing Proposed	– 4.4	– Standing		
	Winter	Existing Proposed	– 3.5	– Sitting		
	Annual	Existing Proposed	– 3.8	– Standing	– 11.9	– Pass
146	Summer	Existing Proposed	– 2.5	– Sitting		
	Winter	Existing	–	–		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Annual	Proposed	2.2	Sitting		
		Existing Proposed	- 2.2	- Sitting	- 6.0	- Pass
147	Summer	Existing Proposed	- 5.6	- Strolling		
	Winter	Existing Proposed	- 4.1	- Standing		
	Annual	Existing Proposed	- 4.6	- Standing	- 14.6	- Pass
148	Summer	Existing Proposed	- 3.5	- Sitting		
	Winter	Existing Proposed	- 4.0	- Standing		
	Annual	Existing Proposed	- 3.7	- Standing	- 13.3	- Pass
149	Summer	Existing Proposed	- 3.9	- Standing		
	Winter	Existing Proposed	- 4.2	- Standing		
	Annual	Existing Proposed	- 3.8	- Standing	- 13.7	- Pass
150	Summer	Existing Proposed	- 5.0	- Standing		
	Winter	Existing Proposed	- 3.7	- Standing		
	Annual	Existing Proposed	- 4.1	- Standing	- 13.7	- Pass
151	Summer	Existing Proposed	- 3.3	- Sitting		
	Winter	Existing Proposed	- 4.0	- Standing		
	Annual	Existing Proposed	- 3.7	- Standing	- 13.7	- Pass
152	Summer	Existing Proposed	- 3.8	- Standing		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
	Winter	Existing Proposed	– 3.2	– Sitting		
	Annual	Existing Proposed	– 3.4	– Sitting		
153	Summer	Existing Proposed	– 5.4	– Standing		
	Winter	Existing Proposed	– 4.3	– Standing		
	Annual	Existing Proposed	– 4.5	– Standing		
154	Summer	Existing Proposed	– 4.0	– Standing		
	Winter	Existing Proposed	– 4.7	– Standing		
	Annual	Existing Proposed	– 4.3	– Standing		
155	Summer	Existing Proposed	– 3.2	– Sitting		
	Winter	Existing Proposed	– 3.0	– Sitting		
	Annual	Existing Proposed	– 3.1	– Sitting		
156	Summer	Existing Proposed	– 4.7	– Standing		
	Winter	Existing Proposed	– 3.7	– Standing		
	Annual	Existing Proposed	– 4.1	– Standing		
157	Summer	Existing Proposed	– 2.3	– Sitting		
	Winter	Existing Proposed	– 2.4	– Sitting		
	Annual	Existing Proposed	– 2.3	– Sitting		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
158	Summer	Existing Proposed	– 4.0	– Standing	– 12.2	– Pass
	Winter	Existing Proposed	– 3.6	– Standing		
	Annual	Existing Proposed	– 3.8	– Standing		
159	Summer	Existing Proposed	– 3.2	– Sitting	– 9.9	– Pass
	Winter	Existing Proposed	– 3.0	– Sitting		
	Annual	Existing Proposed	– 3.1	– Sitting		
160	Summer	Existing Proposed	– 5.3	– Standing	– 17.1	– Pass
	Winter	Existing Proposed	– 5.3	– Standing		
	Annual	Existing Proposed	– 5.2	– Standing		
161	Summer	Existing Proposed	– 5.9	– Strolling	– 15.4	– Pass
	Winter	Existing Proposed	– 4.3	– Standing		
	Annual	Existing Proposed	– 5.0	– Standing		
162	Summer	Existing Proposed	– 4.3	– Standing	– 13.5	– Pass
	Winter	Existing Proposed	– 4.0	– Standing		
	Annual	Existing Proposed	– 4.0	– Standing		
163	Summer	Existing Proposed	– 5.0	– Standing	–	–
	Winter	Existing Proposed	– 4.2	– Standing		
	Annual	Existing	–	–		

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Season	Configuration	Wind Comfort		Wind Safety	
			Speed	Rating	Speed	Rating
		Proposed	4.4	Standing	13.6	Pass
164	Summer	Existing	-	-		
		Proposed	1.8	Sitting		
	Winter	Existing	-	-		
		Proposed	1.7	Sitting		
	Annual	Existing	-	-	-	-
		Proposed	1.7	Sitting	5.0	Pass
165	Summer	Existing	-	-		
		Proposed	1.9	Sitting		
	Winter	Existing	-	-		
		Proposed	1.8	Sitting		
	Annual	Existing	-	-	-	-
		Proposed	1.8	Sitting	5.3	Pass

Seasons	Months	Hours		Wind Safety (m/s)
Summer	November - April	6:00 - 22:00	Sitting	Pass
Winter	May - October	6:00 - 22:00	Standing	Exceeded
Annual	January - December	0:00 - 23:00	Strolling	
			Walking	
			Uncomfortable	

Configurations

- Existing** Existing site and surrounds
- Proposed** Study building with existing surrounds