CPP WIND ENGINEERING CONSULTANTS

PEDESTRIAN WIND ASSESSMENT
CPP PROJECT 21744
11 FEBRUARY 2026

45-53 Macleay St

Potts Point, NSW

PREPARED FOR:

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Executive Summary

A wind tunnel study of the 45-53 Macleay St, to be built in Potts Point, NSW was conducted to assess the surrounding pedestrian wind environment. Measurements of winds likely to be experienced by pedestrians were combined with wind statistics and compared to wind comfort and safety criteria.

The wind tunnel testing was performed in a natural boundary layer wind tunnel of CPP. A model of the project was fabricated to a 1:200 length scale and centred on a turntable in the wind tunnel. Replicas of existing and approved surrounding buildings within a 290 m radius were constructed and placed on the turntable. Approach boundary layers representative of the environment surrounding the proposed development was established in the test section of the wind tunnel.

Measurements of winds likely to be experienced by pedestrians were made with a hot-film anemometer at 29 locations for 16 wind directions each. These points were tested around the development site focusing on pedestrian access routes, entries, and outdoor seating or recreation areas. The measurements were combined with site specific wind statistics to produce results of wind speed versus the percentage of time that wind speed is exceeded for each location. The results of the wind assessment can be summarized as follows:

GROUND LEVEL:

Wind conditions at ground level are generally suitable for pedestrian circulation and routine access, with comfort ratings of Pedestrian Standing and Pedestrian Walking under the Lawson criterion. The highest wind speeds occur along the northern and southern edges of the site where downwash is channelled along walkways. The tower setback above the podium provides effective mitigation of downwash winds and is expected to improve wind conditions relative to the existing site by redirecting corner flows and limiting acceleration at tower bases. The Lawson safety criteria are satisfied across all ground locations.

PODIUM TERRACE:

Wind conditions across the podium terrace are suitable for standing and casual recreational activity, with locations achieving Pedestrian Standing to Pedestrian Walking comfort ratings. Increased wind speeds are observed at the northern corners, where intermittent high mean wind speed flows occur from the north-west and eastern directions. All tested locations satisfy the Lawson safety criteria and this area is generally not expected to be in use during extreme wind events. Users are expected to be able to find calmer areas during stronger prevailing winds at some locations, and mitigation would be considered optional, particularly for private or flexible use.

ROOFTOP TERRACE:

The rooftop terrace exhibits mild wind conditions due to perimeter balustrades and planters, generally maintaining suitable comfort for Pedestrian Sitting and general recreational use. The north-eastern terrace experiences slightly stronger north-westerly mean winds, though not materially affecting intended use. All tested locations satisfy the Lawson safety criteria.

BALCONIES:

Wind conditions on the north-facing balconies represent the most exposed scenario for residential use but remain suitable for standing and general balcony activity, achieving Pedestrian Standing comfort ratings with the aid of high balustrades. All tested locations meet Lawson safety criteria, with no mitigation required.

Document Tracking and Version Control

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Contents

1. Introduction

GENERAL INFORMATION

Pedestrian wind studies are conducted to investigate pedestrian comfort and safety in and around developments. This assessment of the wind environment around developments can inform designers about the suitability of outdoor areas for their intended uses. Where necessary, design modifications can be made, or intervention measures added to mitigate areas with the potential for excessive wind speeds.

This report contains information regarding the local wind climate analysis, wind tunnel testing and analysis procedures, a discussion of the test results, and recommendations to improve wind conditions in areas where any adverse wind conditions may be identified. The test parameters and configurations are summarised in Table 1.

All data collection was performed in accordance with the guidelines of the Australasian Wind Engineering Society (2019), and the American Society of Civil Engineers (1999, 2021). While analytical methods such as Computational Fluid Dynamics (CFD) have some utility in the field of pedestrian wind comfort, they are not yet capable of reliably and accurately predicting gust wind speeds for assessment of wind conditions from a safety perspective.

Table 1: Wind Tunnel Test Parameters

SUMMARY OF TEST PARAMETERS	
GENERAL INFORMATION	
Model Scale	1:200
Surrounding Model Radius (full scale)	290 m
Approach Terrain Category	Intermediate between built-up and open water approach (45° – 112.5°) Intermediate between built-up and open-country approach (292.5°–22.5°, 135°–202.5°) Built-up approach (225°–270°, 337.5°)
ENVIRONMENTAL WINDS STUDY	
Number of test locations	29
Reference height (full scale)	100 m
TEST CONFIGURATION(S)	
Configuration A	Site and surroundings as they currently exist and all approved or under construction developments within the modelled test radius as shown in Figure 1.

2. Methodology

WIND TUNNEL MODEL

The anticipated wind conditions around the project site were evaluated through wind tunnel testing of a 1:200 scale model of the development and surrounding area. This scale allowed for an adequate portion of surrounding developments and terrain to be included within an approximately 290 m radius of the site and all the relevant building details to be modelled accurately. The boundary-layer wind conditions beyond the modelled area were also appropriately simulated in one of CPP's wind tunnels (see Appendix A). The models were mounted on the turntable, located near the downstream end of the wind tunnel test section, allowing rotation of the modelled area for examination of wind speeds from any approach wind direction.

Photographs of the test and surrounds models installed in the wind tunnel are given in Figure 1.

MEASUREMENT POINTS

For this study, wind speed measurements were recorded at 29 locations to evaluate pedestrian wind comfort and safety in and around the project site. The selected test locations are shown in Figure 4 to Figure 7.

Wind speed measurements were made at the model scale equivalent of 1.5 to 2.1 m above the surface for 16 wind directions at 22.5° intervals. Locations were chosen to determine the degree of pedestrian wind comfort and safety at building corners where relatively severe conditions are frequently found, near building entrances and passageways, at outdoor recreation areas and terraces.

The hot-film signal was sampled for a period corresponding to one hour in full scale. All wind speed data were digitally filtered to obtain the two to three second running mean wind speed at each point; this is the basis for the various acceptability criteria. These local wind speeds, U, were normalised by the tunnel reference wind speed, U_{ref}. Mean and turbulence statistics were calculated and used to calculate the normalised effective peak gust using:

$$\frac{U_{pk}}{U_{ref}} = \frac{U + g_f \cdot U_{rms}}{U_{ref}}$$

Where the peak factor (g_f) is: $g_f = 3$ for a 3 s gust and $g_f = 3.6$ for a 0.5 s gust.

The mean and gust equivalent mean wind speeds relative to the free stream wind tunnel reference speed at a full-scale elevation of 100 m are plotted in polar form in Appendix B. The graphs show the directional magnitude of wind speed ratio. The polar plots aid in visualisation of the effects of the nearby structures or topography, the relative significance of various wind azimuths, and whether the mean or gust wind speed is of greater importance.

The measured local wind speeds were combined with wind climate data described in the following section to allow assessment of the pedestrian wind environment.

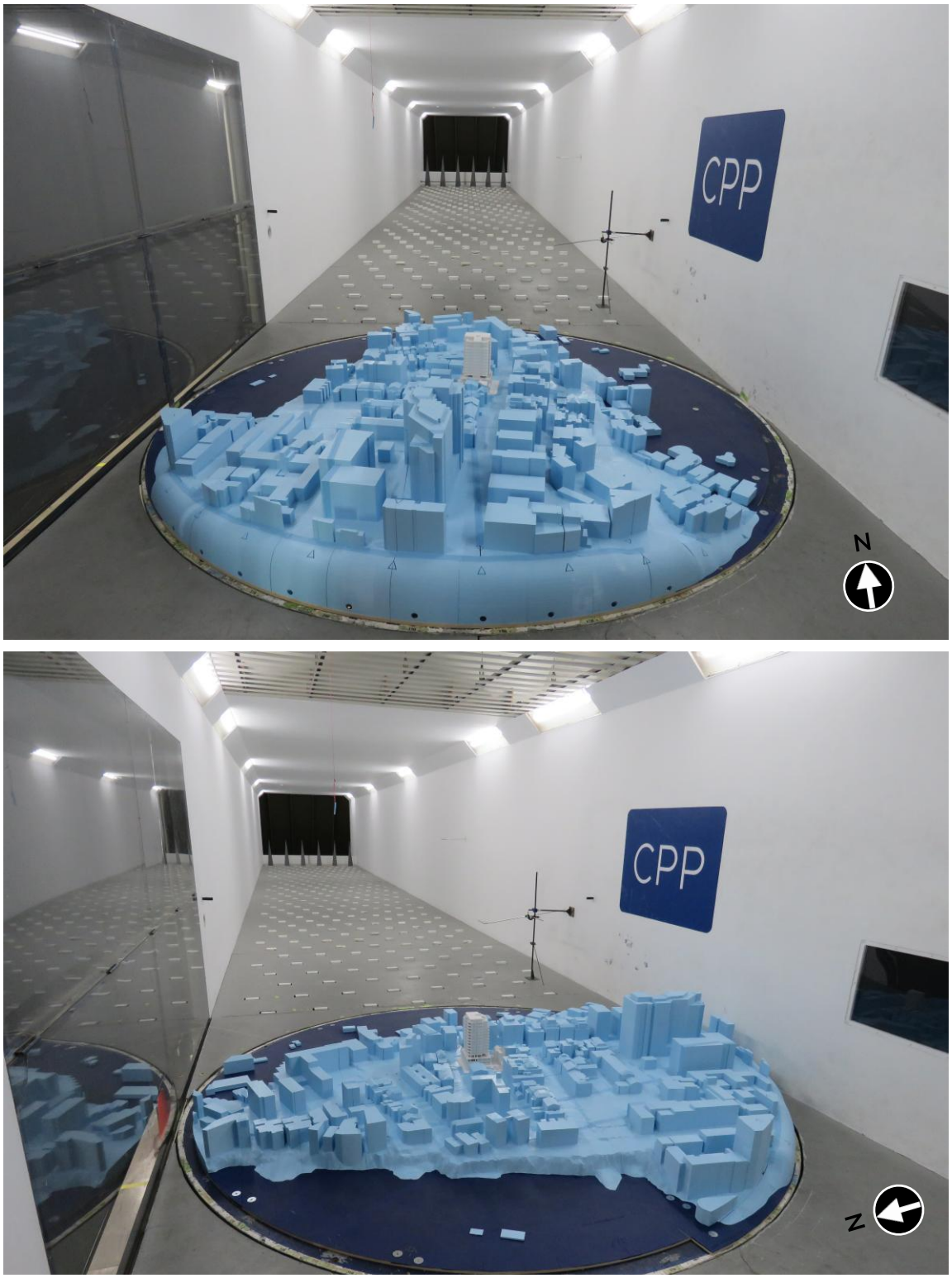


Figure 1a: Photographs of Wind Tunnel Test and Surrounds Model

Figure 1b: Photographs of Wind Tunnel Test Model

WIND CLIMATE

The measured wind speed data were normalized to an approach reference wind speed and then combined with a climatological model (wind frequency and direction) derived from data measured at a standard height of 10 m at the Sydney International Airport. The project site is located approximately 9 kilometres to the north-east of the airport which provides the best source of historical wind data for the project.

This data is portrayed in the wind roses in Figure 2. The arms of the wind roses point in the direction from where the wind is blowing, the width and colour of the arm represent the wind speed, and the length of the arm indicates the percent of the time that the wind blows for that combination of speed and direction. These data were then adjusted to the site location using an analytical method to account for the exposure of the project site for each direction.

The distribution and frequency of winds on an annual basis were analysed to assess the project with regards to wind comfort and safety. As can be seen from the wind rose in Figure 2, winds from the north-east, south, and north-west quadrants are predominant. The locations tested around the development site may be susceptible to winds from these directions, depending on the relative position of the location tested to the geometry of the proposed development and surrounds.

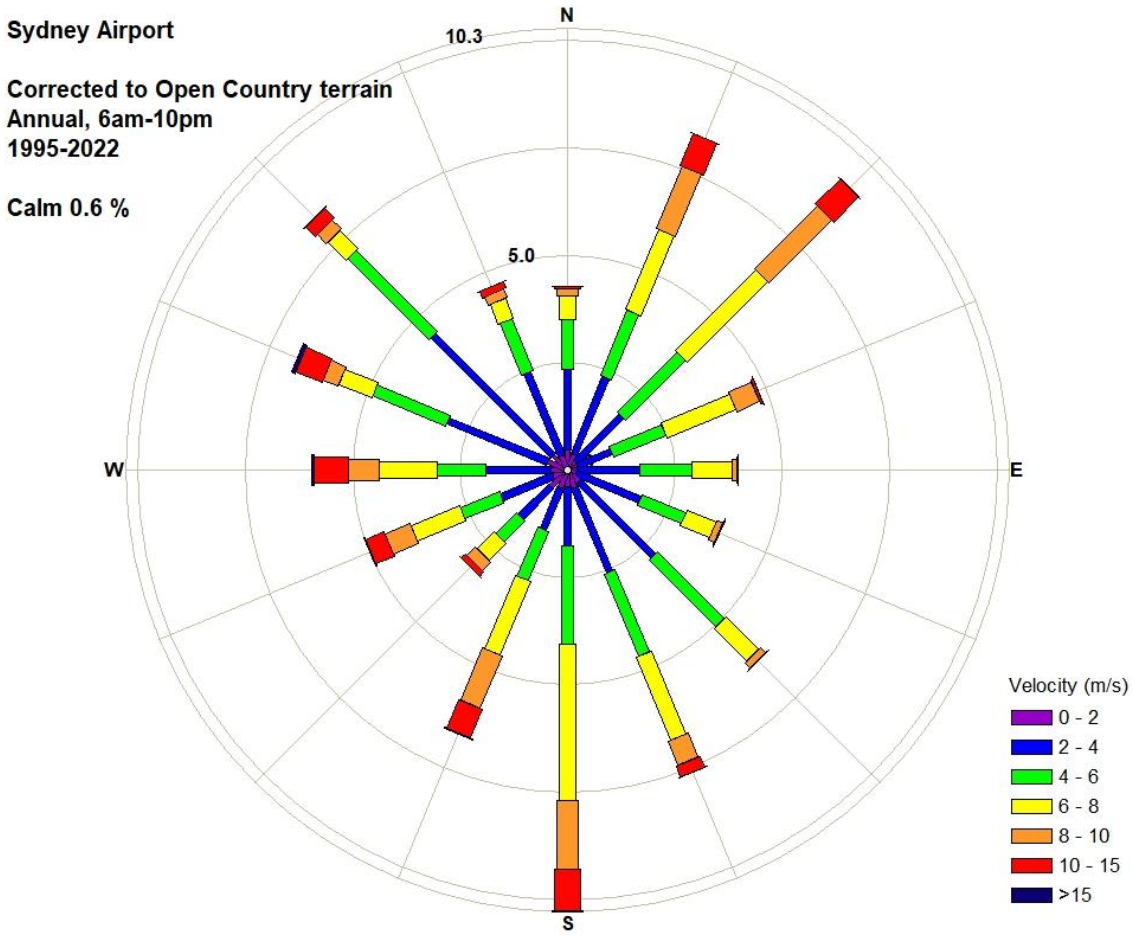


Figure 2: Probability of Wind Speeds by Direction – Sydney International Airport (1995 – 2022, All Hours)

WIND ASSESSMENT CRITERIA

To enable a quantitative assessment of the wind environment, the wind tunnel data and climatological model are combined to calculate wind speeds for comparison with pedestrian wind comfort and safety criteria at each test point.

A number of researchers have suggested quantitative methods for assessing wind comfort and safety based on wind tunnel data and local climate statistics. CPP uses a modified form of the widely-accepted pedestrian-level wind criteria developed by Lawson (1990). Lawson's criteria are divided into separate categories of comfort and distress (safety). The comfort criteria allow planners to assess the usability, with respect to the wind environment, of different locations for various purposes, such as for long-duration activities (e.g., sitting at an outdoor café) or strolling on walkways.

Lawson's criteria are based on wind speeds exceeded 5% of the time, and are described as categories for comfort ranging from 'Pedestrian Sitting' to 'Business Walking', allowing planners to judge the usability of locations for various intended purposes. The criteria also include a distress rating, for safety assessment, which is based on occasional (once or twice per year) wind speeds, to identify locations where wind speeds may be hazardous to pedestrians.

Pedestrians' perception of wind can often be subjective and vary depending on regional difference in wind climate and thermal conditions, as well as by individual. Calibration to the local wind environment should be taken into account when evaluating predicted wind comfort conditions. Note that the ratings of 'Uncomfortable' and 'Safety' are the words of the published wind criteria and applicability may vary by project and location.

Table 2: Wind Comfort & Safety criteria (after Lawson, 1990)

COMFORT RATING	U_{EQUIV}*	DESCRIPTION
Dining**	≤2 m/s	Calm / light breezes suitable for outdoor restaurant uses, seating areas.
Sitting	>2-4 m/s	Calm or light breezes suitable for long duration seating areas, and other amenities.
Standing	>4-6 m/s	Gentle breezes suitable for sitting for shorter periods, main entrances and bus stops where pedestrians may linger.
Pedestrian Walking	>6-8 m/s	Moderate winds appropriate for window shopping and strolling along a downtown street, or park.
Business Walking	>8-10 m/s	Relatively high speeds that can be tolerated if one's objective is to walk, run, or cycle.
Uncomfortable	>10 m/s	Strong winds unacceptable for all pedestrian activities; wind mitigation is typically required.

*U_{Equiv} = Max (U_{Mean}, U_{Gust} / 1.85). U_{Gust} is the peak 3 s gust wind speed in an hour.
** For regular outdoor dining, and in semi-enclosed spaces, it has been the experience of CPP that the comfort rating of Sitting may be windier than desired and a comfort criterion of 2 m/s or less may be more applicable.

SAFETY RATING		U_{EQUIV}*	DESCRIPTION
○	Pass	≤15 m/s	Meets wind safety criterion.
○	Able-Bodied	>15-20 m/s	Acceptable where only able-bodied people would be expected; not acceptable for frail persons or cyclists
○	Fail	>20 m/s	Excessive wind speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is often required.

* U_{Equiv} = Max (U_{Mean}, U_{Gust} / 1.85), based on an annual exceedance of 0.022% (~2 / year or 1 / season) assessed over all hours.

3. Results

A summary of the assessed comfort and safety ratings for each test location is given in Table 3 and Figure 3. The results of the study are graphically presented in Figure 4 to Figure 7 in which measurement locations are displayed on a site plan and colour coded to denote the predicted wind comfort and safety rating. The central colour indicates the comfort rating for the location, and the colour of the outer ring indicates whether the location passes or exceeds the distress criterion.

From the cumulative wind speed distributions for each location, the percentage of time each of the Lawson comfort rating wind speeds are exceeded are presented in tabular form under the polar plots in Appendix B. These plots include directional criterion lines for the Lawson comfort levels to provide additional information regarding directional sensitivity at each location.

In general, wind conditions comfortable for Sitting and Standing are considered appropriate for areas such as entrances where pedestrians are likely to gather for longer durations, while wind conditions comfortable for Casual Walking and Business Walking are more appropriate for sidewalks where pedestrians are actively in transit. Locations rated as Uncomfortable are generally less suitable for most pedestrian activities and wind control solutions are often sought. Whether mitigation is needed at a location depends upon the intended use of the location. Although conditions may be classified as acceptable, there may be certain wind directions that cause regular strong events.

Satisfaction of the safety rating is required for areas accessible to the general public. Mitigation measures are generally required to address any locations deemed to fail the safety assessment.

Table 3: Summary of wind comfort and safety assessment results

Description / Location		Wind Tunnel Results	
		Lawson Comfort rating, 5% exceedance wind speed (m/s)	Lawson Safety rating, 0.022% exceedance wind speed (m/s)
Ground Level	1	7.0	13.3
	2	4.8	11.5
	3	5.6	11.2
	4	7.3	13.4
	5	5.4	10.0
	6	6.1	11.1
	7	5.6	11.1
	8	5.9	10.2
	9	7.6	13.9
	10	5.9	11.2
	11	5.8	10.5
	12	6.1	11.8
	13	5.6	14.8
	14	4.9	8.5
	15	4.8	8.7
	16	6.2	11.4
Podium Level	17	5.3	10.5
	18	6.9	13.6
	19	5.5	12.6
	20	5.7	11.6
	21	6.9	12.5
	22	5.8	12.6
	23	6.4	14.8
Rooftop	24	2.8	5.4
	25	2.7	5.5
	26	3.7	8.3
	27	4.6	11.5
N. Balconies	28	4.6	8.5
	29	4.0	9.9

LEGEND

Comfort Criteria

- Outdoor Dining
- Pedestrian Sitting
- Pedestrian Standing
- Pedestrian Walking
- Business Walking
- Uncomfortable

Lawson Safety Criteria

- Passes safety criteria
- Able bodied
- Fails safety criteria

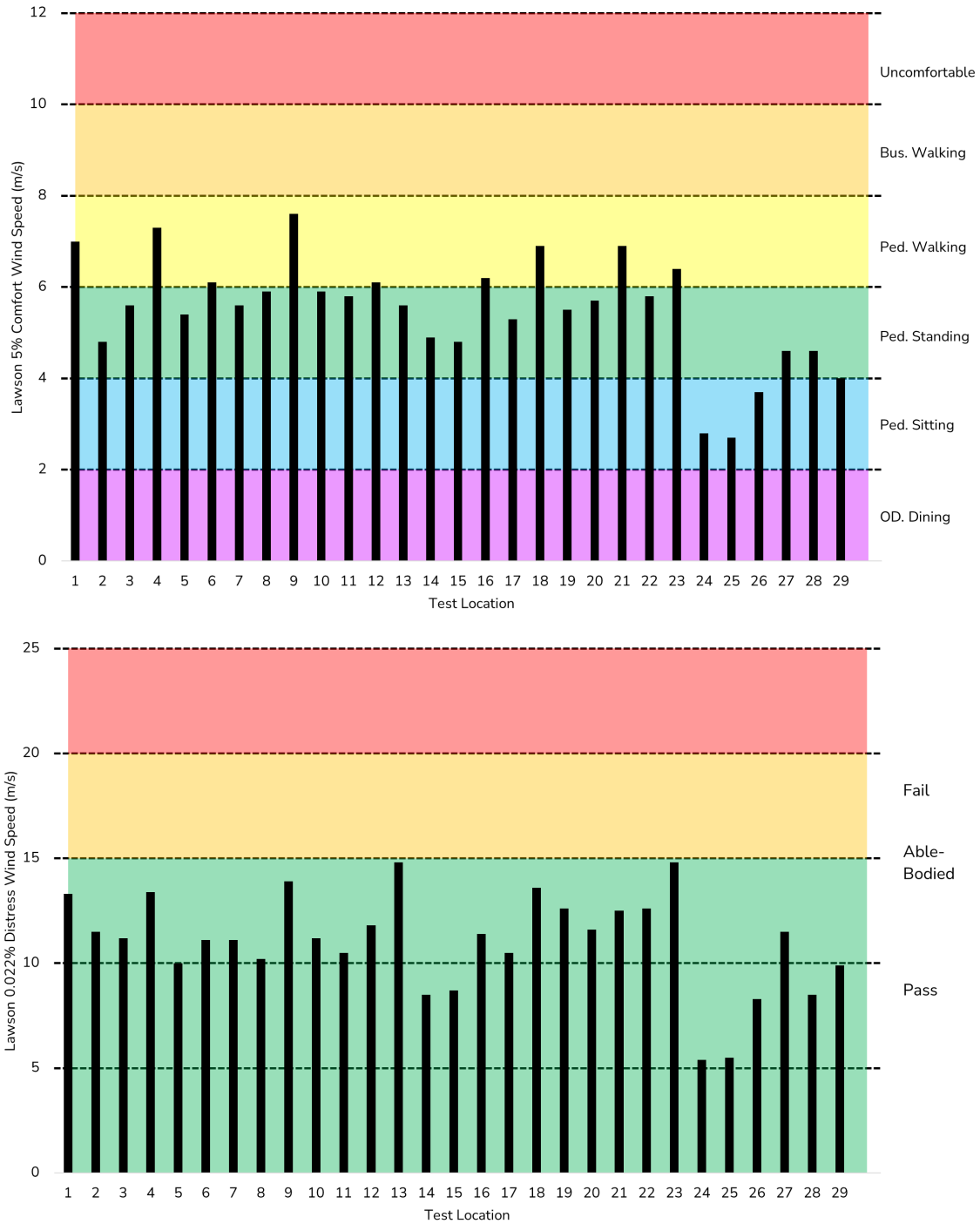


Figure 3: Summary of Lawson wind comfort and safety assessment results

Figure 4: Pedestrian wind speed measurement locations with Lawson comfort/safety ratings – Ground Level

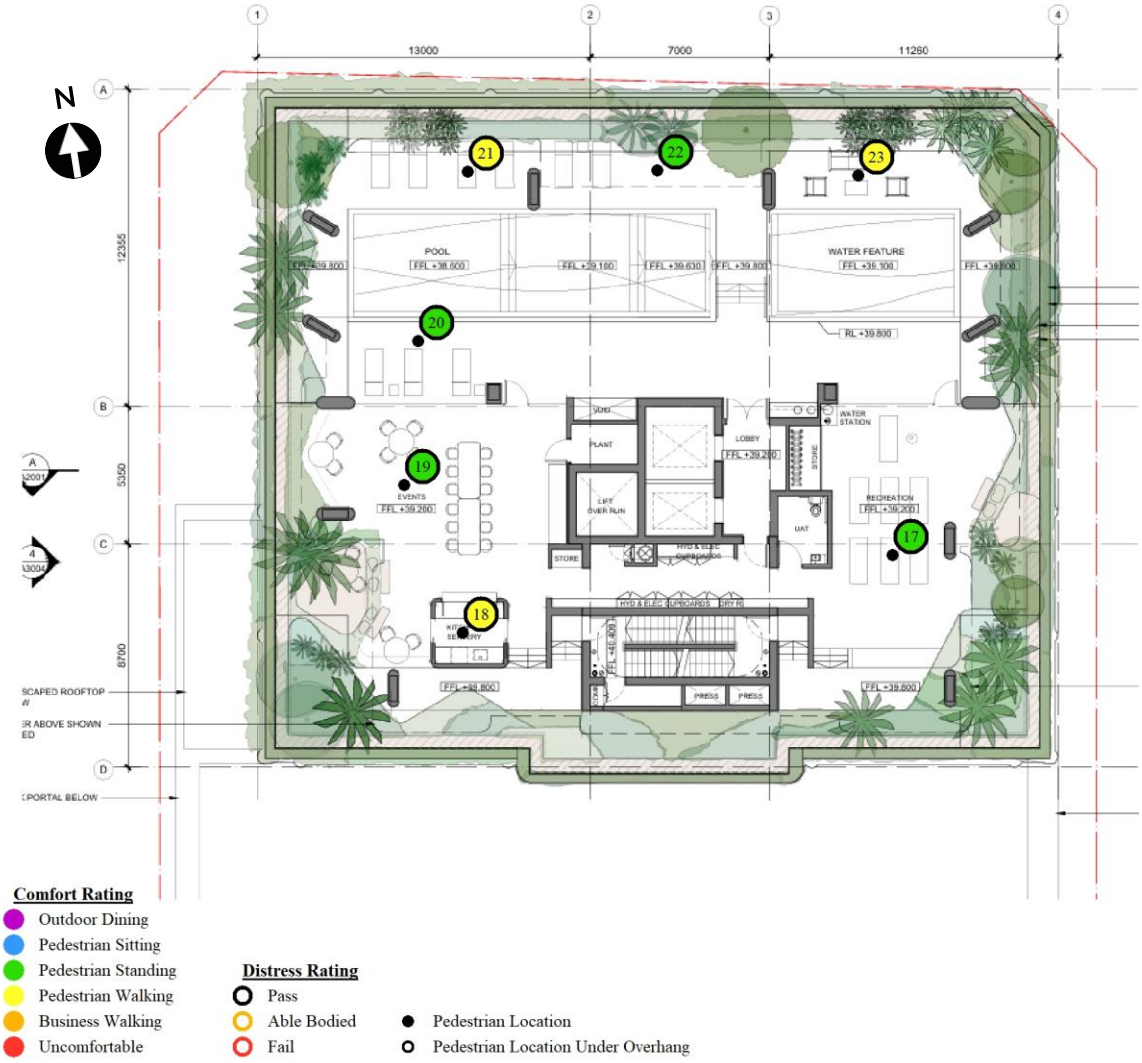


Figure 5: Pedestrian wind speed measurement locations with Lawson comfort/safety ratings – Podium Terrace

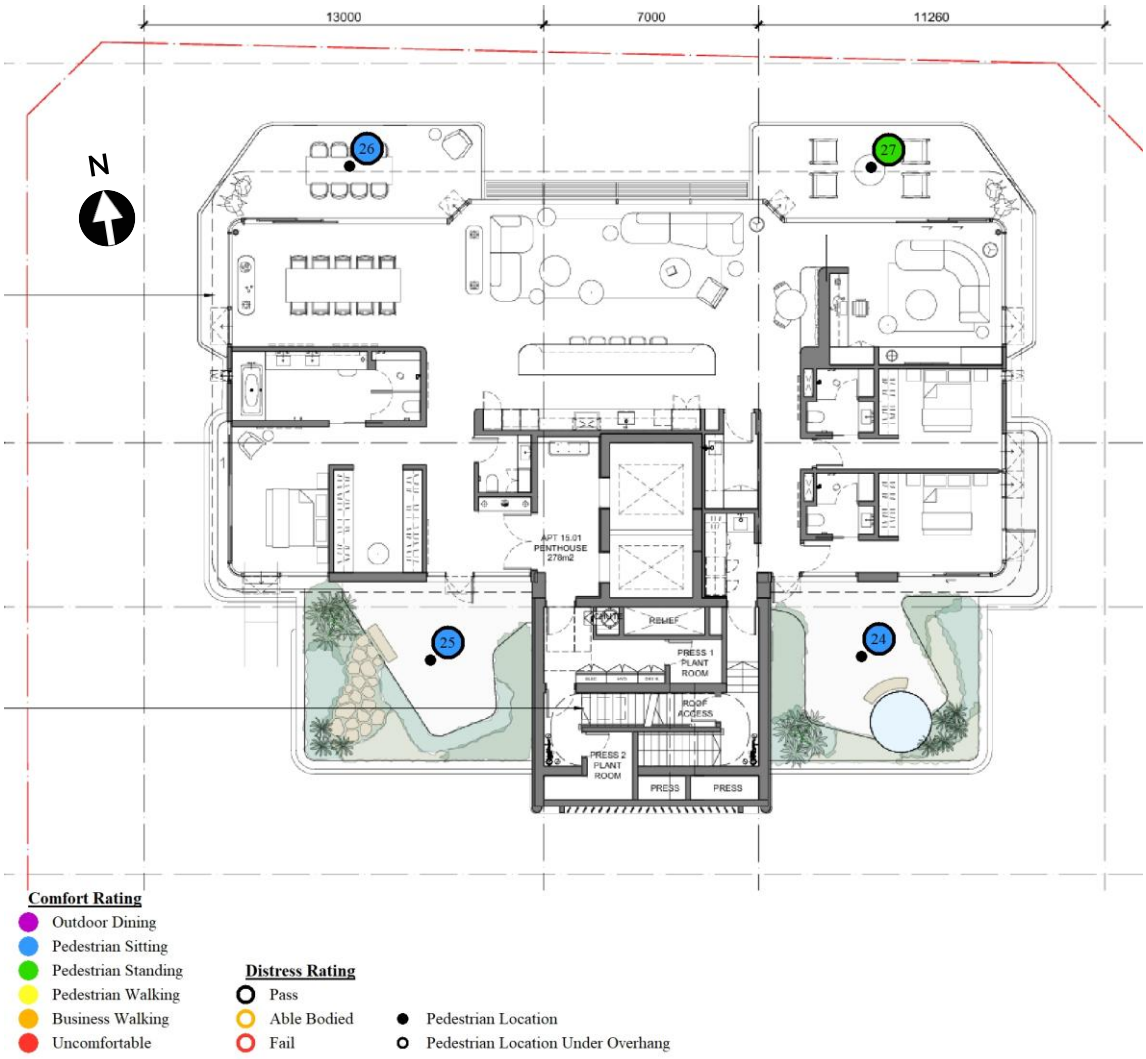
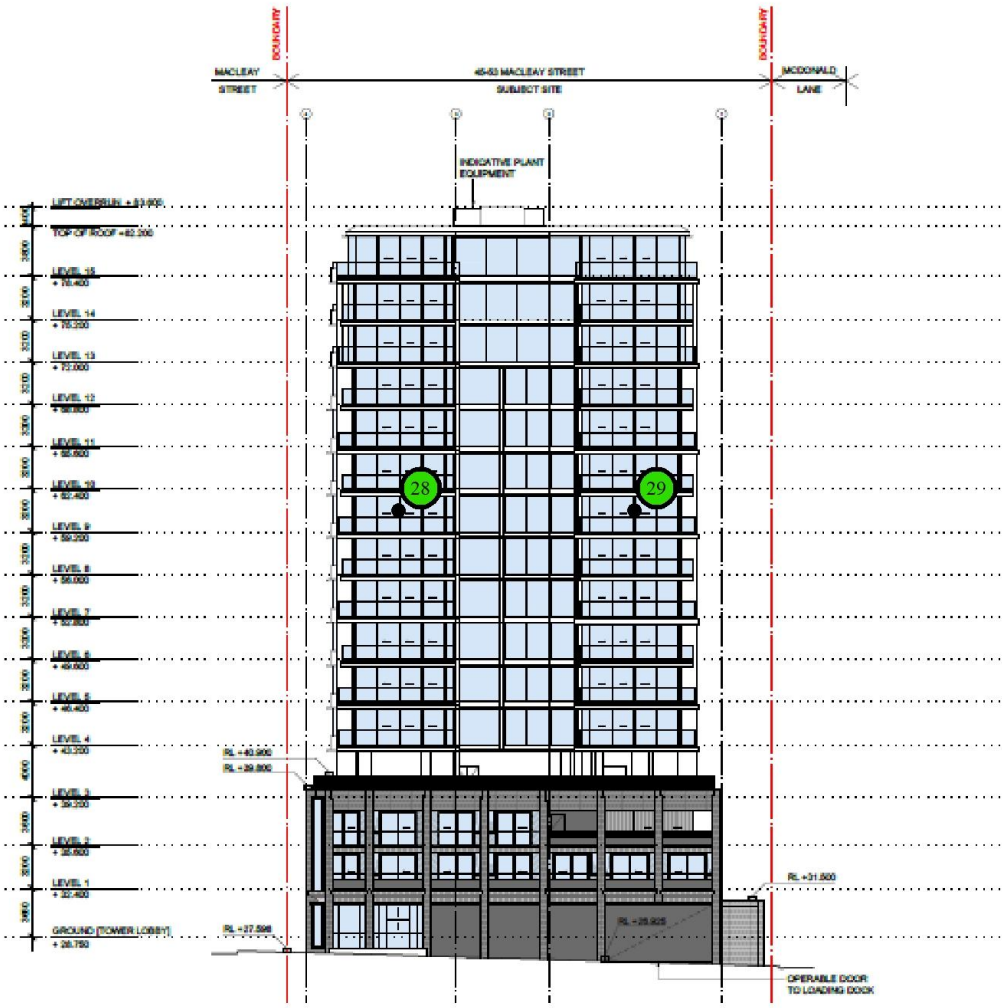


Figure 6: Pedestrian wind speed measurement locations with Lawson comfort/safety ratings – Rooftop



Comfort Rating

- Outdoor Dining
- Pedestrian Sitting
- Pedestrian Standing
- Pedestrian Walking
- Business Walking
- Uncomfortable

Distress Rating

- Pass
- Able Bodied
- Fail

- Pedestrian Location
- Pedestrian Location Under Overhang

Figure 7: Pedestrian wind speed measurement locations with Lawson comfort/safety ratings – North Balconies

4. Discussion

GROUND LEVEL

Wind conditions at ground level, covering Locations 1–16, are rated between Pedestrian Standing and Pedestrian Walking under the Lawson comfort criterion. Overall, wind conditions are appropriate for routine pedestrian activity, including circulation and access, with all areas suitable for the intended use.

Pedestrian Walking wind conditions are primarily observed at locations to the north and south of the site, where downwash is re-directed along linear channels.

Compared with existing site conditions, wind conditions at ground level and particularly the north-east corner are likely improved due to the setback of the tower at podium level, which assists in redirecting downwash around the tower corners at podium level, reducing wind acceleration around the base of the development at ground level. This design limits the extent of adverse downwash wind effects typically associated with exposed tower corners on the ground plane.

As the existing tower does not include a tower setback, the wind conditions around exposed corners on the ground plane are expected to be slightly improved by the proposed development compared to the existing configuration. It should be noted that the existing building does not have a tower setback, therefore downwash winds generated on the facades are expected to reach ground level without redirection, causing accelerated flow at the tower corners at ground level. For the proposed building, the setback of the tower above the podium to the north, east, and west, combined with the open podium floor deflects part of the downwash at height, reducing the amount which reaches ground level. As a result, the wind conditions for pedestrians at the tower corners are expected to be improved compared to the existing site configuration. No Lawson safety exceedances are identified across the ground level.

PODIUM TERRACE

Wind conditions on the podium terrace, covering Locations 17–23, are consistently in Pedestrian Standing to Pedestrian Walking ratings under the Lawson comfort criterion. The majority of the podium terrace provides wind conditions suitable for general pedestrian circulation and casual recreational use.

Locations 18, 21, and 23 record Pedestrian Walking wind conditions. These locations are positioned closer to the northern corners of the podium, where increased mean wind speeds from the north-west and eastern directions can occur at intermittent times. Stronger winds from the north-west and south-east to east can create significantly windy conditions in the spaces at Locations 18 and 23 for a small percentage of time, but wind speeds remain below the Able-bodied criterion under Lawson.

While users of the recreational podium spaces are expected to be able to occupy calmer zones during stronger wind events, given the variability of wind exposure across the terrace, the podium terrace is not expected to be in use during extreme wind events. Given the intermittent and seasonal nature of the higher wind exposure, mitigation is considered optional for these locations, particularly where the podium terrace is intended for private or flexible use. If required, temporary screening elements could be deployed on a need basis to improve comfort. All tested locations satisfy the Lawson safety criterion.

ROOFTOP TERRACE

Wind conditions on the rooftop terrace, covering Locations 24–27, are generally mild due to the presence of high balustrades and planter installations around the perimeter, which act to screen and diffuse winds. As a result, wind conditions across most of the rooftop are appropriate for the intended pedestrian use of the space.

Locations 24–26 experience Pedestrian Standing wind comfort ratings under the Lawson criterion, remaining suitable for casual movement and stationary use. Location 27 is subject to slightly more prominent north-westerly winds, reflecting its orientation and exposure; however, the influence of these winds does not materially affect the intended use of the rooftop terrace.

Overall, the wind conditions across the rooftop terrace support safe and comfortable pedestrian activity. All tested locations satisfy the Lawson safety criteria, with no additional mitigation required.

NORTH BALCONIES

Wind conditions on the north-facing balconies, covering Locations 28 and 29, represent the general exposure scenario for balcony users across the site. Both locations record Pedestrian Standing comfort ratings under the Lawson criteria, indicating wind conditions that remain appropriate for typical balcony use, including standing and general residential access. No pronounced channelling or corner acceleration effects are evident that would materially degrade pedestrian comfort or usability.

Overall, wind conditions on the north balconies are suitable for their intended use. All tested locations satisfy the Lawson safety criteria, and no mitigation is required.

APPLICABILITY

Testing was performed without existing and proposed trees and other plantings to provide a worst-case assessment. Heavy landscape planting typically reduces wind speeds by less than 10% and in general should not be relied upon to mitigate strong winds due to variation in size and foliage and difficulty in accurate modelling. Further, trees or other plantings may pose a safety risk if damaged during high winds.

The results presented within this report are based on the 3D model labelled “251029_Macleay_VisualAssessmentModel.dxf” received by CPP on 12 November 2025. If significant changes to the design of the development have occurred beyond this date or new information regarding the status of surrounding buildings becomes available, it is recommended that CPP be contacted to evaluate the impact of any changes.

5. Conclusion

CPP has conducted a wind tunnel study to quantify the pedestrian-level wind environment for the proposed 45-53 Macleay St development. Ground-level wind conditions are appropriate for general movement, with the tower setback above the podium contributing to an overall improvement in conditions by reducing the impact of downwash on the ground plane. Podium-level areas provide wind environments suitable for circulation and informal recreational use, with some higher wind speeds near the northern corners. Lawson comfort and safety outcomes remain acceptable for private use and occupants are expected to occupy calmer areas during stronger wind events, meaning mitigation is not essential. Rooftop areas benefit from wind screening provided by balustrades and planters, resulting in wind conditions suitable for pedestrian and recreational activities, while balcony areas are appropriate for residential use. Overall, no significant adverse wind impacts are anticipated as a result of the development, and the proposed design provides an acceptable pedestrian wind environment.

References

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American Society of Civil Engineers (2021), *Wind Tunnel Testing for Buildings and Other Structures* (ASCE 49-21).

American Society of Civil Engineers (2021), *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE 7–22).

Lawson, T.V. (1990), "The Determination of the Wind Environment of a Building Complex before Construction" Department of Aerospace Engineering, University of Bristol, Report Number TVL 9025.

Standards Australia (2021), *Australian/New Zealand Standard, Structural Design Actions, Part 2: Wind Actions* (AS/NZS1170.2:2021).

Australasian Wind Engineering Society (2019), Wind Engineering Studies of Buildings (AWES-QAM-1-2019).

Appendix A – Wind Tunnel Test Facilities

The wind tunnel testing was performed at the CPP wind engineering laboratory in Sydney, Australia. Specifications for the wind tunnel used for this project are given in Figure A1.

The mean wind speed profile approaching the modelled area for each direction has the form:

$$\frac{U}{U_{ref}} = \left(\frac{z}{z_{ref}} \right)^n$$

in which U is the mean wind speed at height z, U_{ref} is a reference wind speed at reference height z_{ref}, and n is a constant which depends on the characteristics of the upstream roughness for each direction.

The profiles of longitudinal turbulence intensity in the flow approaching the modelled area are also modelled. The turbulence intensities are appropriate for the approach mean wind speed profiles selected.

CPP SYDNEY WIND TUNNEL	
DIMENSIONS	
Test section length	21 m
Test section width	3 m
Ceiling height	2.4 m
DRIVE SPECIFICATIONS	
Total power	110 kW
Type of drive	Single Axle motor/12 blade axial fan
Speed Control	Variable frequency drive
FLOW CHARACTERISTICS	
Mean Wind Speed	0 to 20 m/s
Boundary-layer thickness*	1.2 m (nominal)
Turbulence	About 2% at entrance to test section
Longitudinal pressure gradient	Zero by blockage tolerant roof

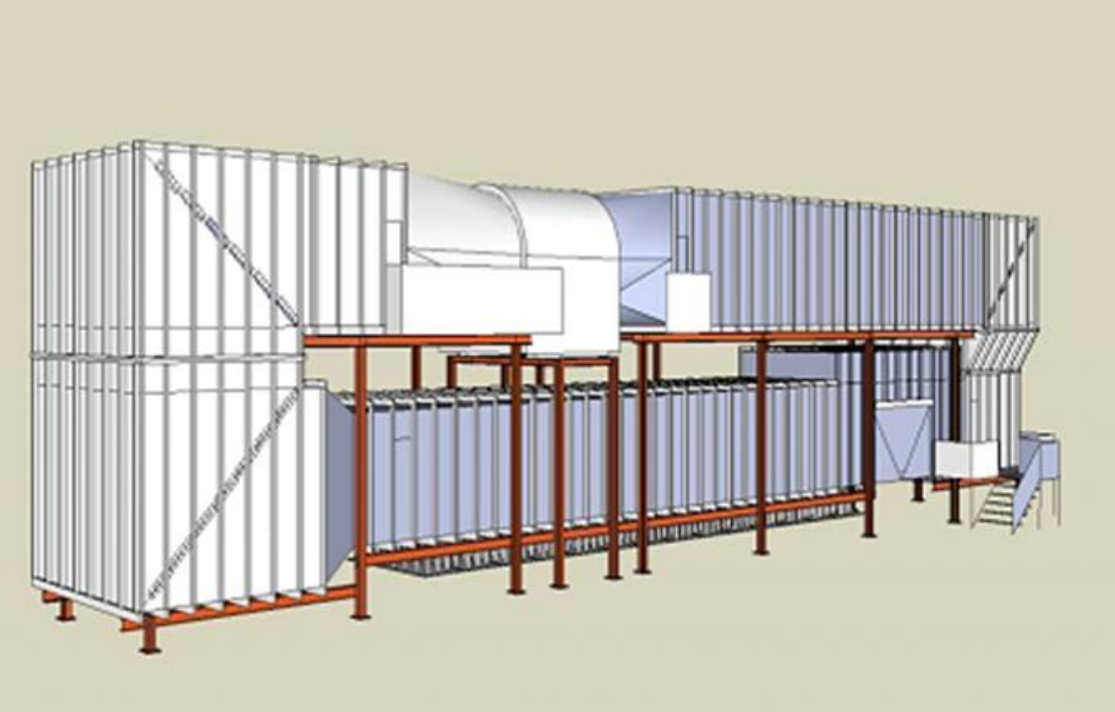
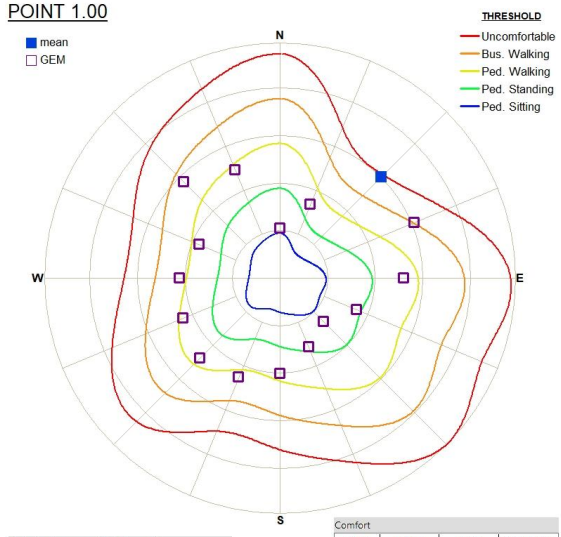


Figure A1: CPP Wind Tunnel - Sydney, Australia

Appendix B - Directional wind results

POINT 1.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	47.85	66.24	66.49
4	16.42	25.81	26.61
6	7.09	7.79	9.44
8	2.24	1.43	2.72
10	0.43	0.21	0.51

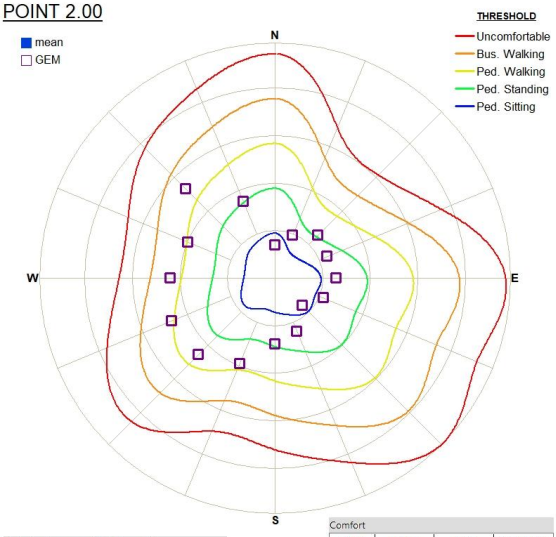
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.7	6.6	7.0
Rating	Ped Walking	Ped Walking	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	12.9	12.4	13.3
Rating	Pass	Pass	Pass

POINT 2.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	32.30	48.69	48.69
4	5.34	10.18	10.18
6	0.92	2.11	2.11
8	0.16	0.38	0.38
10	0.04	0.07	0.07

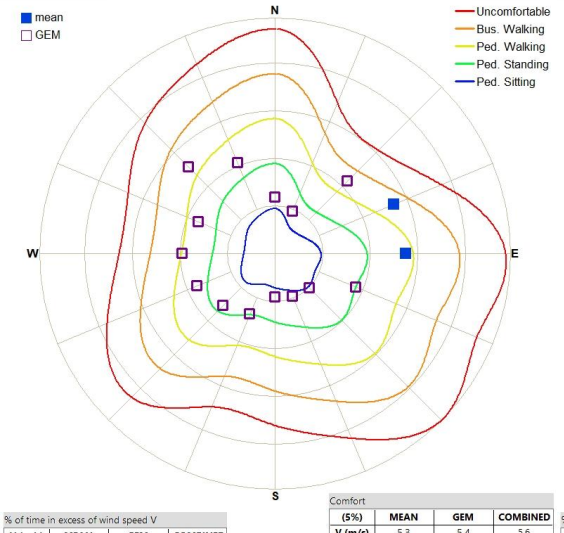
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.0	4.8	4.8
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	10.5	11.5	11.5
Rating	Pass	Pass	Pass

POINT 3.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	36.40	47.83	48.20
4	13.01	14.15	15.44
6	2.86	2.89	3.70
8	0.27	0.42	0.46
10	0.03	0.06	0.07

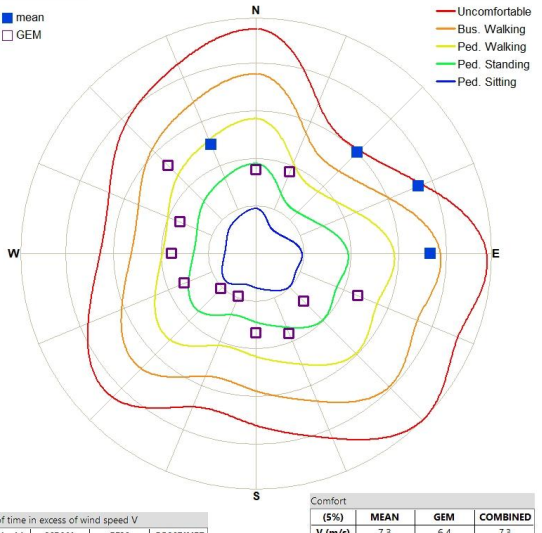
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.3	5.4	5.6
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	10.2	11.1	11.2
Rating	Pass	Pass	Pass

POINT 4.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	51.61	62.55	63.30
4	18.24	21.42	23.01
6	9.45	6.69	9.90
8	3.40	1.37	3.43
10	0.63	0.26	0.64

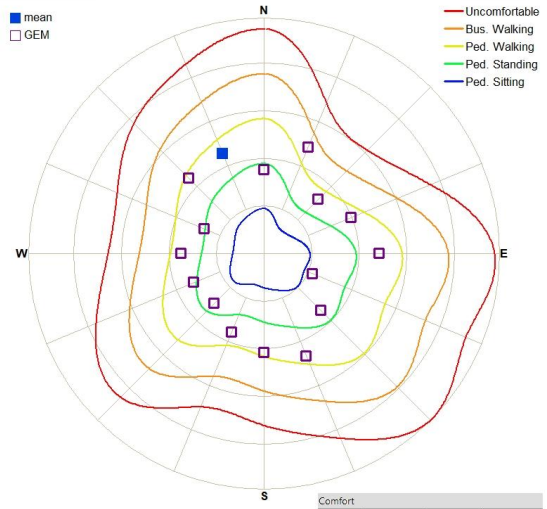
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.3	6.4	7.3
Rating	Ped Walking	Ped Walking	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	13.4	12.0	13.4
Rating	Pass	Pass	Pass

POINT 5.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	48.91	63.40	63.65
4	9.84	19.20	19.31
6	1.35	2.84	2.88
8	0.08	0.25	0.26
10	0.00	0.02	0.02

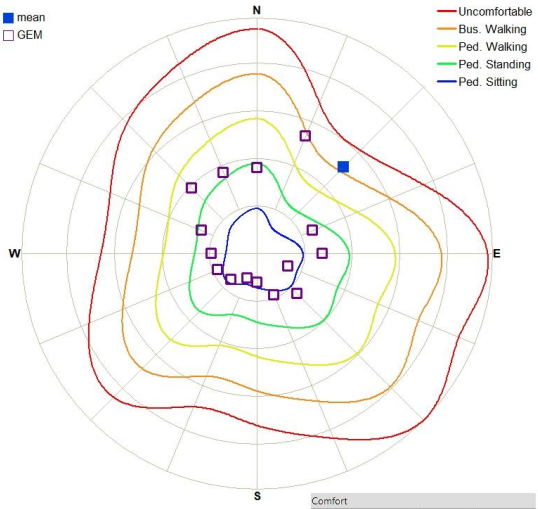
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.7	5.4	5.4
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	8.9	10.0	10.0
Rating	Pass	Pass	Pass

POINT 6.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	21.81	34.01	34.15
4	10.85	12.17	12.57
6	4.31	4.68	5.49
8	0.73	0.72	1.04
10	0.09	0.06	0.12

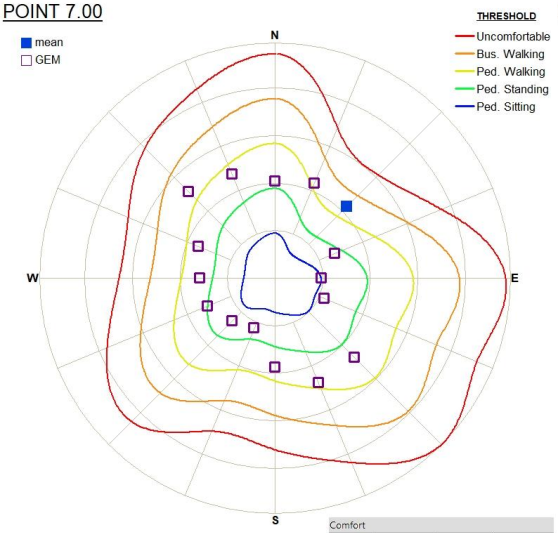
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.7	5.8	6.1
Rating	Ped Standing	Ped Standing	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	10.9	10.6	11.1
Rating	Pass	Pass	Pass

POINT 7.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	44.66	61.65	61.76
4	11.26	17.96	18.27
6	2.09	3.10	3.41
8	0.27	0.36	0.43
10	0.02	0.06	0.06

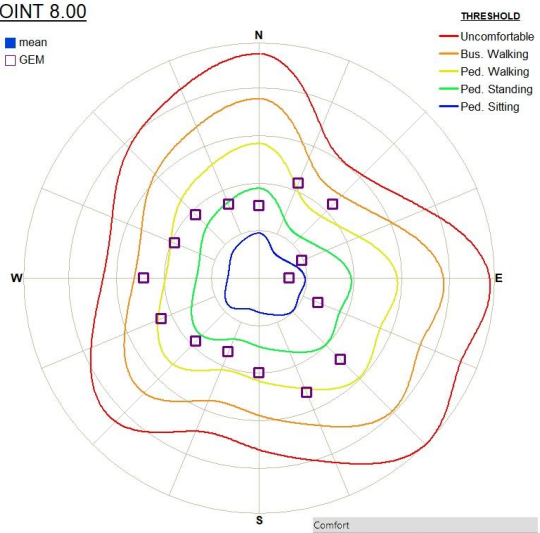
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.0	5.5	5.6
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	10.0	11.1	11.1
Rating	Pass	Pass	Pass

POINT 8.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	46.06	62.06	62.06
4	11.85	22.52	22.52
6	1.58	4.67	4.67
8	0.18	0.54	0.54
10	0.02	0.03	0.03

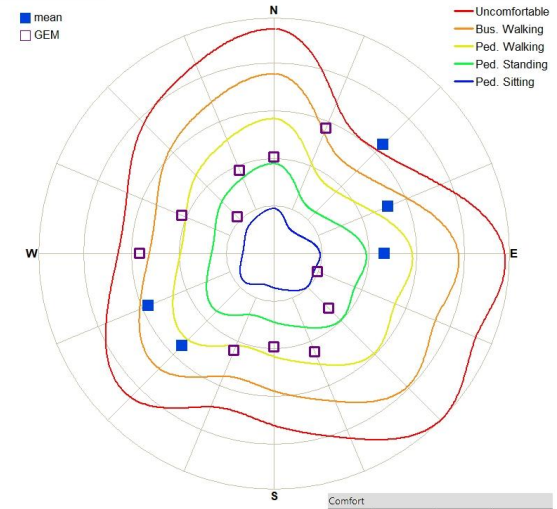
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.8	5.9	5.9
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	9.8	10.2	10.2
Rating	Pass	Pass	Pass

POINT 9.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	53.03	65.55	66.33
4	24.58	28.99	31.25
6	10.52	9.34	12.42
8	3.58	1.97	4.13
10	0.83	0.21	0.88

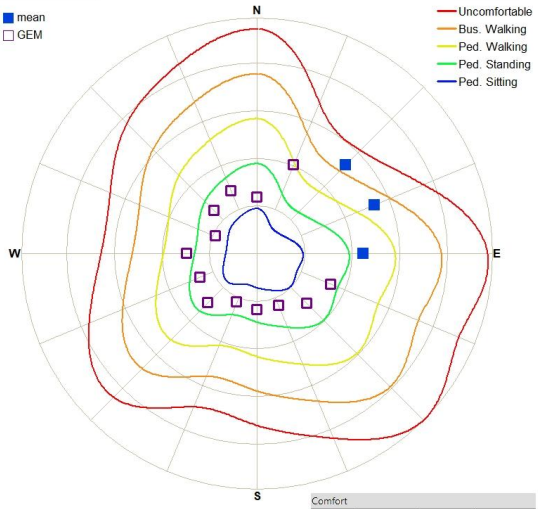
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	7.4	6.8	7.6
Rating	Ped Walking	Ped Walking	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	13.8	11.9	13.9
Rating	Pass	Pass	Pass

POINT 10.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	28.21	44.84	46.12
4	11.80	11.82	14.50
6	4.58	2.10	4.93
8	0.86	0.23	0.88
10	0.15	0.00	0.15

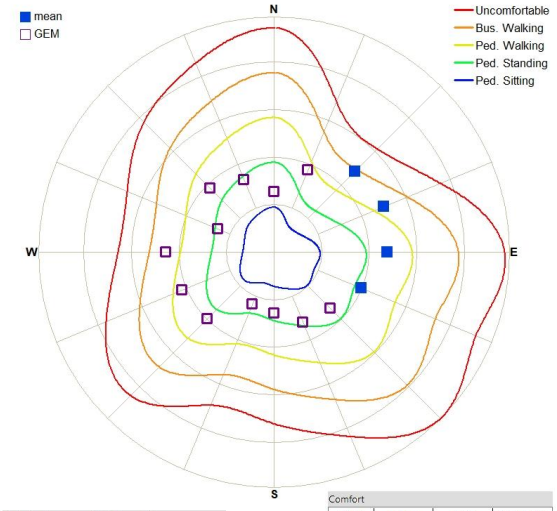
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.8	5.1	5.9
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	11.2	9.3	11.2
Rating	Pass	Pass	Pass

POINT 11.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	40.03	56.00	57.56
4	12.40	15.53	17.97
6	3.46	2.90	4.45
8	0.42	0.34	0.54
10	0.04	0.02	0.05

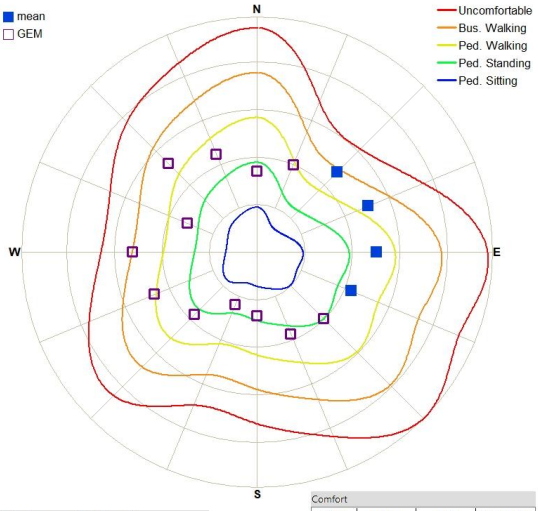
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.5	5.4	5.8
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	10.3	9.8	10.5
Rating	Pass	Pass	Pass

POINT 12.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	47.28	64.39	65.76
4	14.71	19.88	22.34
6	4.20	4.24	5.74
8	0.61	0.76	0.96
10	0.08	0.12	0.15

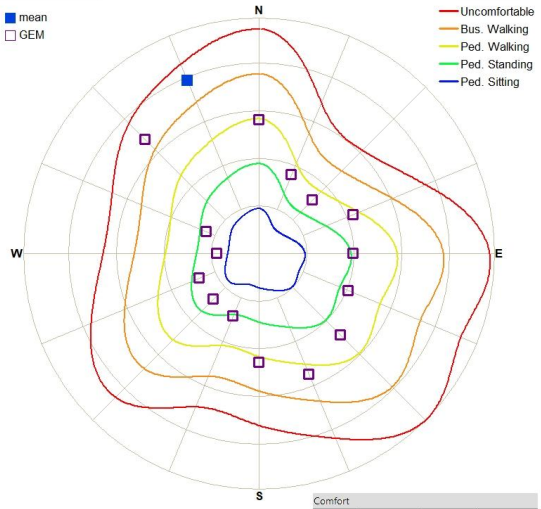
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.7	5.8	6.1
Rating	Ped Standing	Ped Standing	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	11.0	11.8	11.8
Rating	Pass	Pass	Pass

POINT 13.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	51.35	67.45	67.75
4	12.44	21.81	22.27
6	2.62	3.70	3.91
8	0.87	0.98	1.09
10	0.31	0.34	0.41

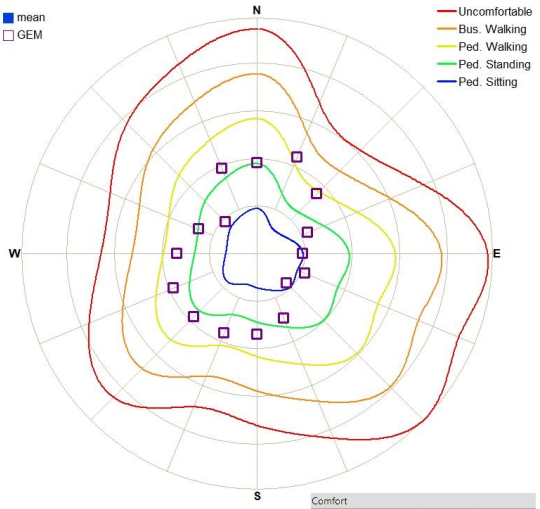
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.0	5.6	5.6
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	13.9	14.7	14.8
Rating	Pass	Pass	Pass

POINT 14.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	30.30	48.90	48.90
4	3.28	12.98	12.98
6	0.06	1.40	1.40
8	0.00	0.05	0.05
10	0.00	0.00	0.00

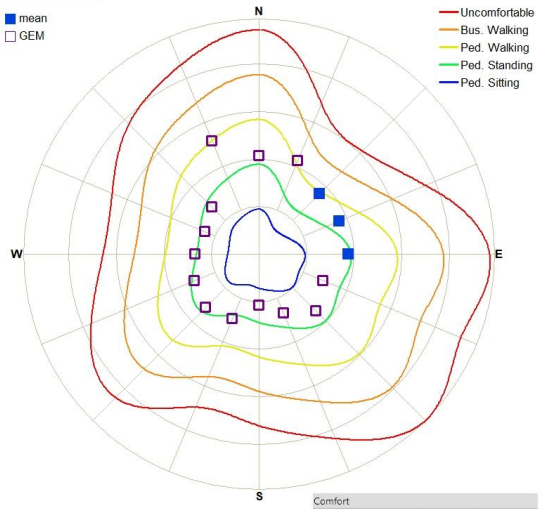
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.7	4.9	4.9
Rating	Ped Sitting	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	6.5	8.5	8.5
Rating	Pass	Pass	Pass

POINT 15.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	33.73	50.32	50.85
4	7.63	10.44	11.36
6	0.53	1.20	1.26
8	0.01	0.06	0.07
10	0.00	0.00	0.00

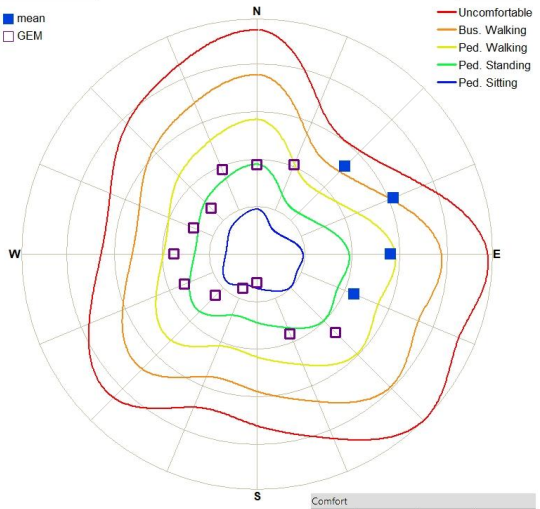
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.4	4.7	4.8
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	7.7	8.6	8.7
Rating	Pass	Pass	Pass

POINT 16.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	37.94	50.22	51.41
4	15.40	16.40	19.63
6	5.66	2.43	6.15
8	1.12	0.18	1.15
10	0.16	0.00	0.16

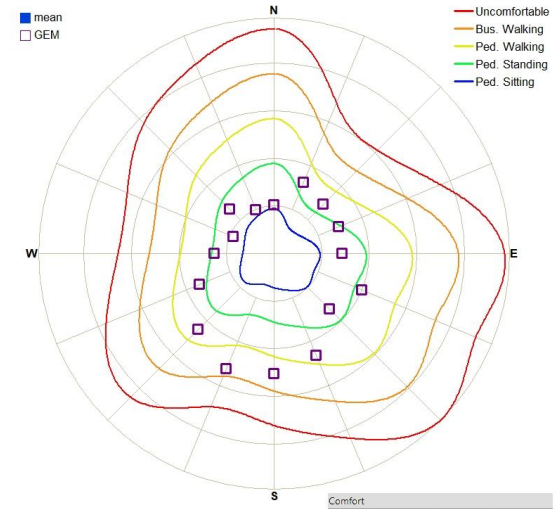
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.1	5.4	6.2
Rating	Ped Walking	Ped Standing	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	11.4	9.2	11.4
Rating	Pass	Pass	Pass

POINT 17.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	42.92	53.97	53.97
4	7.83	15.81	15.81
6	0.77	2.87	2.87
8	0.05	0.41	0.41
10	0.00	0.05	0.05

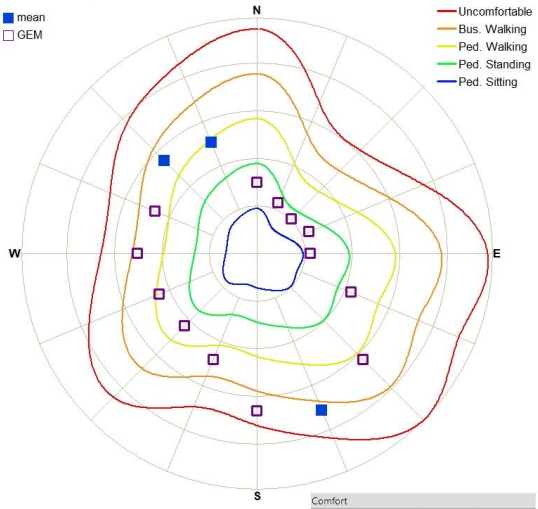
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.3	5.3	5.3
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	8.5	10.5	10.5
Rating	Pass	Pass	Pass

POINT 18.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	53.55	66.52	67.32
4	21.27	26.32	27.00
6	6.85	8.95	9.60
8	1.63	2.25	2.48
10	0.30	0.45	0.53

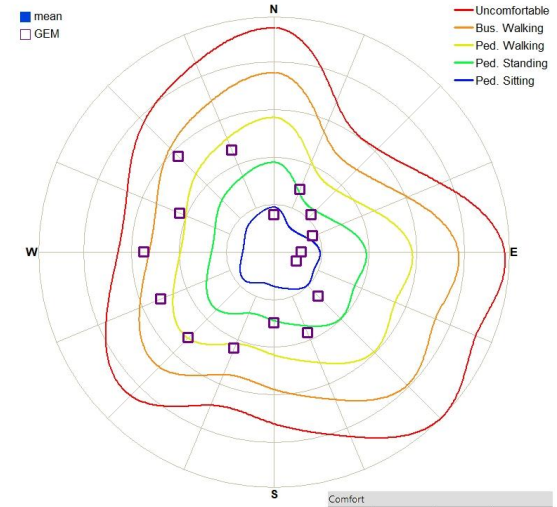
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.4	6.8	6.9
Rating	Ped Walking	Ped Walking	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	13.0	13.3	13.6
Rating	Pass	Pass	Pass

POINT 19.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	37.08	53.63	53.63
4	8.55	14.27	14.27
6	1.98	3.74	3.74
8	0.34	0.93	0.93
10	0.06	0.17	0.17

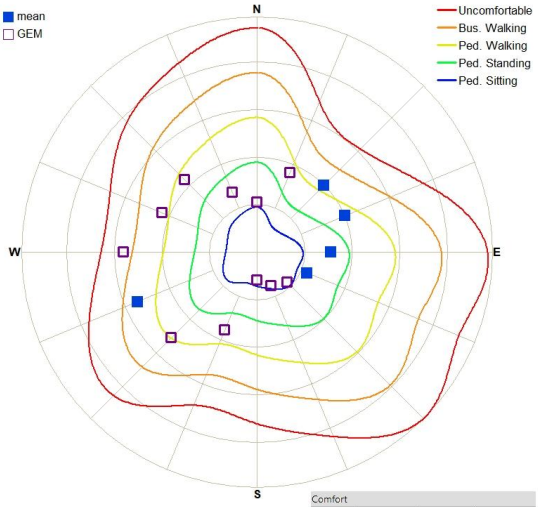
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.6	5.5	5.5
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	11.1	12.6	12.6
Rating	Pass	Pass	Pass

POINT 20.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	40.37	45.74	47.17
4	14.81	15.78	18.36
6	3.01	3.44	4.02
8	0.50	0.75	0.81
10	0.07	0.10	0.11

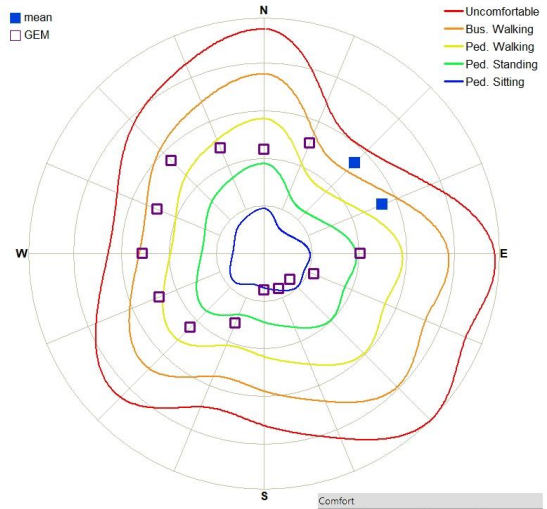
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	5.3	5.4	5.7
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	10.9	11.6	11.6
Rating	Pass	Pass	Pass

POINT 21.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	51.22	55.10	55.42
4	22.30	23.37	24.50
6	8.31	7.53	9.42
8	1.61	1.34	2.00
10	0.29	0.18	0.34

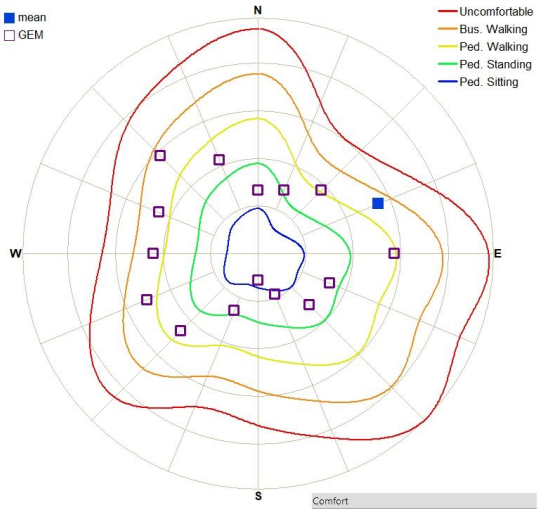
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.7	6.5	6.9
Rating	Ped Walking	Ped Walking	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	12.3	12.2	12.5
Rating	Pass	Pass	Pass

POINT 22.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	40.04	53.34	53.39
4	11.09	18.30	18.52
6	2.16	4.08	4.43
8	0.38	0.71	0.74
10	0.09	0.13	0.14

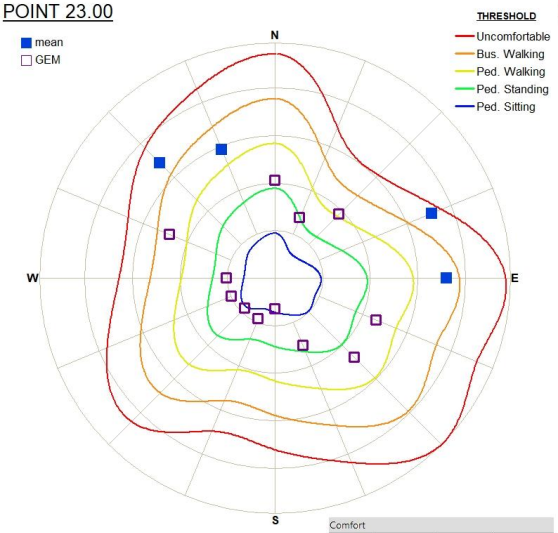
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	4.9	5.7	5.8
Rating	Ped Standing	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	11.9	12.6	12.6
Rating	Pass	Pass	Pass

POINT 23.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	42.47	54.09	54.89
4	15.80	17.80	19.23
6	5.50	4.73	6.52
8	1.75	1.02	1.96
10	0.44	0.24	0.46

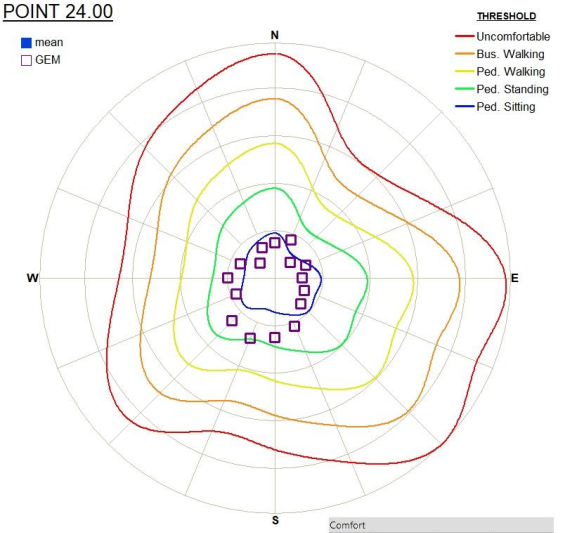
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	6.1	5.8	6.4
Rating	Ped Walking	Ped Standing	Ped Walking

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	14.8	13.9	14.8
Rating	Pass	Pass	Pass

POINT 24.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	4.78	16.33	16.33
4	0.02	0.49	0.49
6	0.00	0.00	0.00
8	0.00	0.00	0.00
10	0.00	0.00	0.00

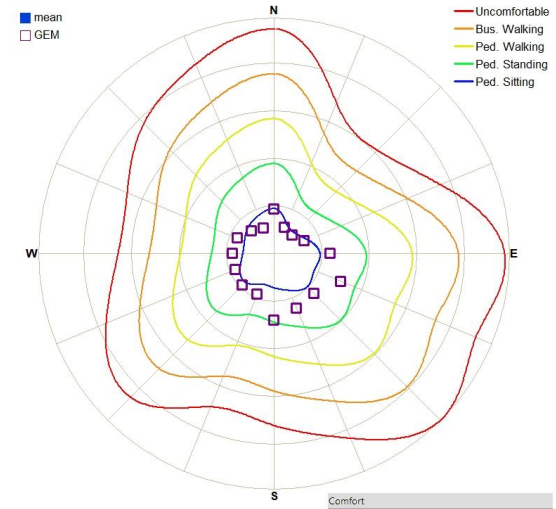
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.0	2.8	2.8
Rating	Outdoor Dining	Ped Sitting	Ped Sitting

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	3.9	5.4	5.4
Rating	Pass	Pass	Pass

POINT 25.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	4.87	17.72	17.72
4	0.02	0.54	0.54
6	0.00	0.01	0.01
8	0.00	0.00	0.00
10	0.00	0.00	0.00

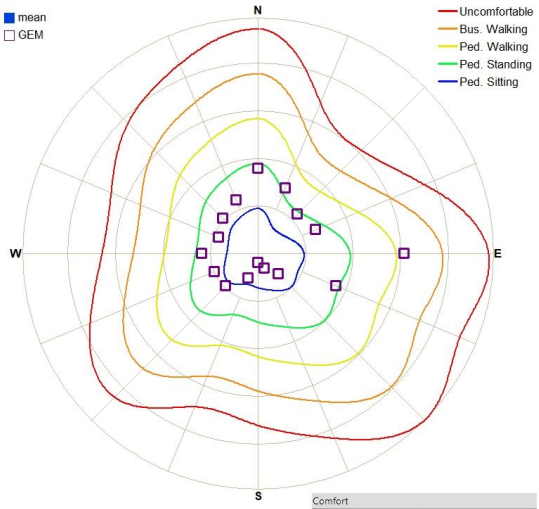
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.0	2.7	2.7
Rating	Outdoor Dining	Ped Sitting	Ped Sitting

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	3.9	5.5	5.5
Rating	Pass	Pass	Pass

POINT 26.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	17.08	27.33	27.33
4	0.90	3.66	3.66
6	0.03	0.28	0.28
8	0.00	0.03	0.03
10	0.00	0.01	0.01

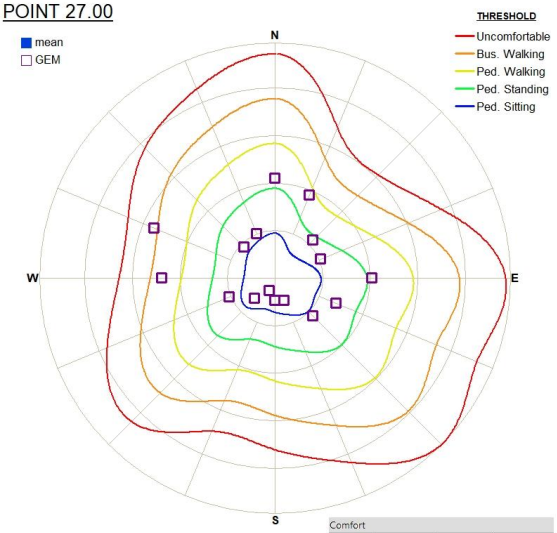
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	2.8	3.7	3.7
Rating	Ped Sitting	Ped Sitting	Ped Sitting

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	6.2	8.3	8.3
Rating	Pass	Pass	Pass

POINT 27.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	20.63	32.38	32.38
4	2.35	7.95	7.95
6	0.07	2.03	2.03
8	0.00	0.54	0.54
10	0.00	0.13	0.13

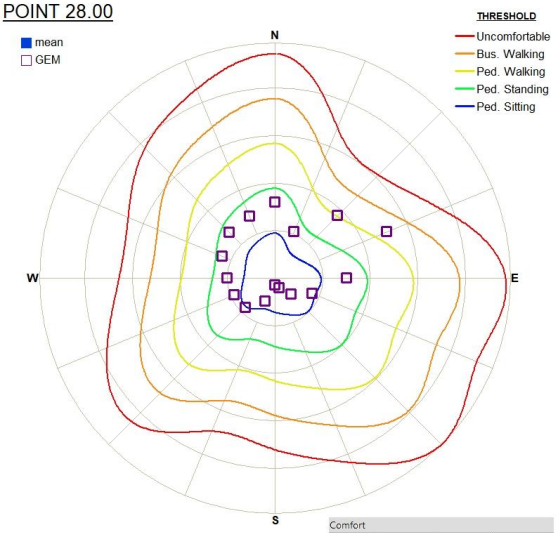
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.3	4.6	4.6
Rating	Ped Sitting	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	6.4	11.5	11.5
Rating	Pass	Pass	Pass

POINT 28.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	15.57	25.68	25.68
4	4.90	7.73	7.73
6	0.32	1.23	1.23
8	0.00	0.06	0.06
10	0.00	0.00	0.00

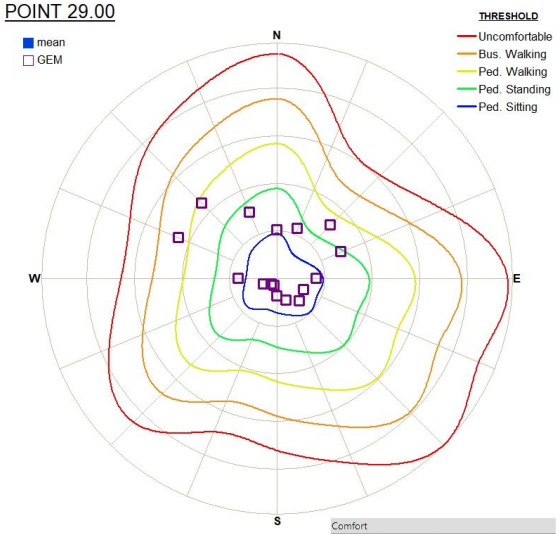
Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.9	4.6	4.6
Rating	Ped Sitting	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	7.4	8.5	8.5
Rating	Pass	Pass	Pass

POINT 29.00



% of time in excess of wind speed V

V (m/s)	MEAN	GEM	COMBINED
2	16.01	26.32	26.32
4	1.46	5.25	5.25
6	0.19	1.09	1.09
8	0.03	0.21	0.21
10	0.00	0.02	0.02

Comfort

(5%)	MEAN	GEM	COMBINED
V (m/s)	3.0	4.0	4.0
Rating	Ped Sitting	Ped Standing	Ped Standing

Safety

(0.022%)	MEAN	GEM	COMBINED
V (m/s)	8.2	9.9	9.9
Rating	Pass	Pass	Pass