



(ACN 004 230 013)

Ref: 24055A-DE-DR00

05 September 2024

Time & Place
Level 3, 189 Flinders Lane
Melbourne VIC 3000

Attn: Maude Connolly

Dear Maude,

11-27 Dorcas Street Development, South Melbourne
Environmental Wind Considerations for Town Planning Revision Plans

A wind tunnel study has been completed in July 2024 to measure the environmental wind conditions in and around the 11-27 Dorcas Street Development. The results of this wind tunnel study have been presented in MEL Consultants Reports 24055A-WT-ENV02.

This letter discusses the environmental wind considerations for the amended plans as detailed in the architectural drawings prepared by Bates Smart and received on 2nd September 2024 (listed in Appendix A). From an environmental wind effects perspective, the main amendments for the 11-27 Dorcas Street Development are as follows:

- New corner balconies on the northwest corner of Levels 3-14
- Balconies near the northeast corner of Levels 3-14 extended to the northeast corner
- New corner balconies on the southwest corner of Levels 3-9
- Smaller corner balconies on southeast corner of Levels 11-17
- Minor modifications (removal, relocation, addition) to balconies away from the building corners

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From an environmental wind effects perspective, these amendments would have little significant effect the environmental wind conditions in the surrounding streetscapes, entrances and elevated terraces away from building corners of the development, and the wind conditions at these locations would be expected to be similar to those presented MEL Consultants Report 24055A-WT-ENV02. Based on the July 2024 wind tunnel measurements on the elevated terraces, the wind conditions on the new terraces on the northeast, northwest and southwest corners would be expected to satisfy the safety and walking comfort criteria, at a minimum.

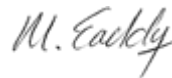
In summary, the results from the assessment of the environmental wind conditions presented in MEL Consultants Report 24055A-WT-ENV02 would still be valid for the development at 11-27 Dorcas Street based on the design detailed in the amended plans by Bates Smart received on 2nd September 2024, and no additional analysis or wind model testing from an environmental wind conditions perspective would be required.

Prepared by:



Y. Padayatchy
MEL Consultants Pty Ltd

Checked and Released by:



M. Eaddy (RPEV)
MEL Consultants Pty Ltd

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Appendix A – Drawing Register

Project No.	Drawing No.	Revision	Date	Title
M12805	TP01.001	1	29/08/2024	Existing Site Plan
M12805	TP01.020	1	29/08/2024	Site Demolition Plan
M12805	TP03.0B1	1	30/08/2024	Basement 01
M12805	TP03.0B2	1	30/08/2024	Basement 02
M12805	TP03.0B3	1	30/08/2024	Basement 03
M12805	TP03.0LG	1	30/08/2024	Lower Ground
M12805	TP03.0UG	1	30/08/2024	Upper Ground
M12805	TP03.001	1	30/08/2024	Level 01
M12805	TP03.002	1	30/08/2024	Level 02
M12805	TP03.003	1	30/08/2024	Level 03
M12805	TP03.004	1	30/08/2024	Level 04 - Level 10
M12805	TP03.011	1	30/08/2024	Level 11 - Level 14
M12805	TP03.015	1	30/08/2024	Level 15 - Level 16
M12805	TP03.017	1	30/08/2024	Level 17
M12805	TP03.018	1	30/08/2024	Level 18
M12805	TP03.019	1	30/08/2024	Level 19 Roof

Note: PDF Drawings Received 2nd September 2024

Filename: 240829_M12805_TP Revision Plans.pdf

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ENVIRONMENTAL WIND SPEED MEASUREMENTS ON A WIND TUNNEL MODEL OF 11-27 DORCAS STREET DEVELOPMENT, SOUTH MELBOURNE

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By

M. Hapsari
and
Y. Padayatchy

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SUMMARY

A wind tunnel study has been conducted on a 1/400 scale model of the proposed 11-27 Dorcas Street Development, South Melbourne. The model of the Development within surrounding buildings, was tested in a simulated upstream boundary layer of the natural wind to determine likely environmental wind conditions. These wind conditions have been related to the freestream mean wind speed at a reference height of 300m and compared with criteria developed for the Melbourne region as a function of wind direction.

For the Proposed Configuration, the wind conditions for all Test Locations in the immediate surrounds and the streetscapes surrounding the development have been shown to satisfy the walking comfort criterion at a minimum, with many locations satisfying the sitting or standing comfort criteria. The wind conditions at the ground level entrances to the development have been shown to satisfy the recommended standing comfort criterion or better.

The wind conditions for the Proposed Configuration at the podium level terraces of the neighbouring buildings have been shown to satisfy the walking comfort criterion at a minimum, and were similar to the wind comfort criteria satisfied for the existing conditions. Thus, indicating that the proposed development would not influence the wind comfort criteria at these terraces.

The wind conditions for the Proposed Configuration at representative private terraces and balconies on the development have been shown to satisfy the recommended walking comfort criterion or better.

The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations.



Report 24055A-WT-ENV02

September 2024

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**11-27 DORCAS STREET DEVELOPMENT, SOUTH MELBOURNE
ENVIRONMENTAL WIND TUNNEL MODELLING**

MEL CONSULTANTS REPORT NO: 24055A-WT-ENV02

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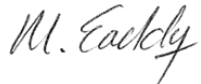
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Date: 10 Sept 2024

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REVISION HISTORY

Revision No:	Date Issued	Reason/Comment
0	26 July 2024	Initial Issue
1	30 July 2024	Text update
2	10 September 2024	Text update, figures correction

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1. INTRODUCTION

The proposed 11-27 Dorcas Street Development, will be situated on a site bounded by Dorcas Street to the north and Wells Street to the west in South Melbourne, as shown in Figure 1. The proposed building will be approximately 60m high and used as residences with retail on the ground level.

A wind tunnel study was commissioned by Time and Place to examine the wind conditions for the proposed 11-27 Dorcas Street development and, if necessary, to develop wind mitigation strategies.

These tests were carried out in the MEL Consultants 400kW Boundary Layer Wind Tunnel during July 2024.

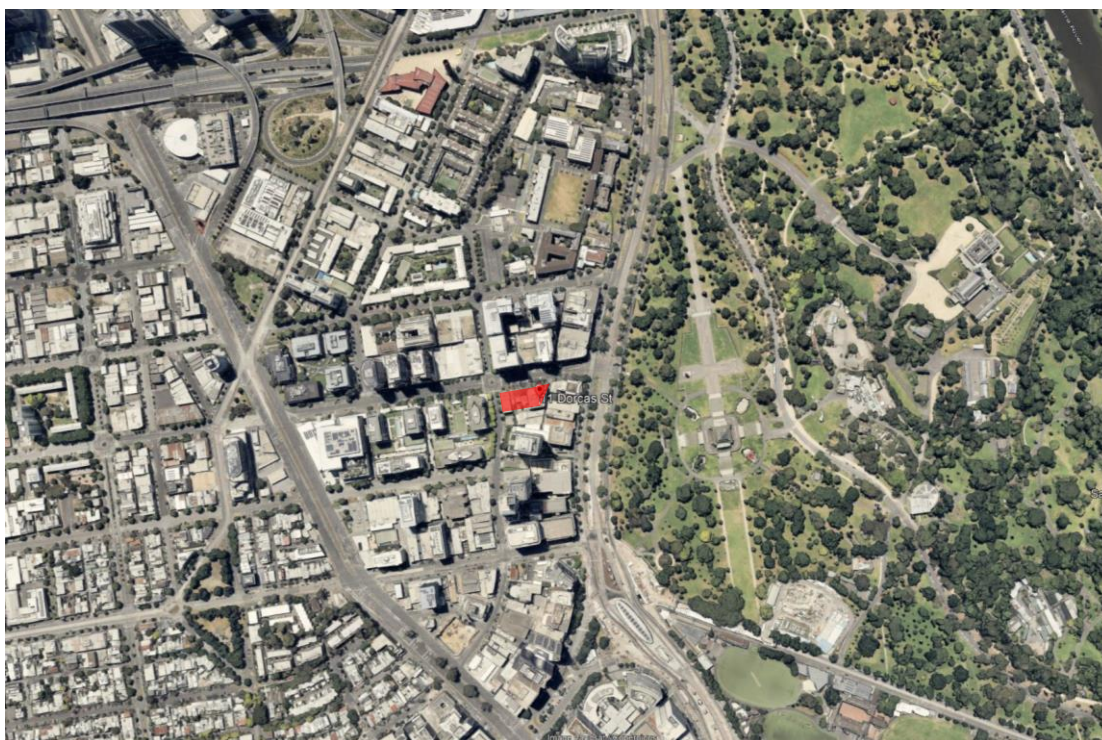


Figure 1 - The proposed 11-27 Dorcas Street Development site in South Melbourne (highlighted red).

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2. ENVIRONMENTAL WIND CRITERIA

The advancement of wind tunnel testing techniques, using large boundary layer flows to simulate the natural wind, has facilitated the prediction of wind speeds likely to be induced around a development. To assess whether the predicted wind conditions are likely to be acceptable or not, the Port Phillip Planning Scheme Clause 58.04-04 Standard D17 wind safety and comfort criteria will be used. The criteria are as follows:

Unsafe wind conditions means the annual maximum 3 second gust wind speed which exceeds 20 metres/second with the probability of exceedance of 0.1% from any wind direction considering at least 16 wind directions with the corresponding probability of exceedance percentage.

Comfortable wind conditions means hourly mean wind speed or gust equivalent mean speed from all wind directions combined with probability of exceedance less than 20% of the time, equal to or less than:

- 3 metres/second for sitting areas
- 4 metres/second for standing areas
- 5 metres/second for walking areas

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Mean wind speed means the maximum of:

- Hourly mean wind speed, or
- Gust equivalent mean wind speed (3 second gust wind speed divided by 1.85)

The above comfort criteria are pass/fail criteria which assess the integrated probability of all wind directions to determine whether a location passes or fails the threshold criterion. The safety criterion is a pass/fail criterion based upon exceedance of the wind speed for any one wind direction. For completeness, this report will provide data for each Test Location as a function of wind direction in Appendix A.

The wind condition must be assessed within a distance of half the greatest length of the building, or half the total height of the building measured outwards on the horizontal plane from the ground floor building facade, whichever is greater.

The Port Philip Planning Scheme guidelines do not provide any methodology or worked example as how to obtain the 'from all wind directions combined'. Therefore, to obtain the probability for all wind directions combined we will apply the methodology described in Melbourne (1978) to determine the probability for all wind directions. The guidelines use the definition of mean wind speed as based on the hourly wind speed so the probabilities will be determined from the hourly wind data for an applicable automatic weather station for the Melbourne City. The probability data used have been corrected for the approach terrain at the location of the automatic weather station and referenced to 10m in Terrain Category 2. This is the standard reference height of AS/NZS1170.2:2021.

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2.1 Suggested Pedestrian Comfort Criteria.

The proposed 11-27 Dorcas Street Development will have entrances along Dorcas and Wells Streets, and communal and private balconies/terraces on the Upper Levels. Therefore, the following wind criteria are suggested:

- | | |
|--|--------------------|
| • Pedestrian transit areas | Walking Criterion |
| • Building entrances | Standing Criterion |
| • Upper-Level private terraces/balconies | Walking Criterion* |

*The wind conditions at outdoor areas have been suggested to satisfy the walking criterion as these premises could be considered elective when external conditions would be perceived as acceptable for the desired activity. Users of these terraces will need to be educated on the wind effects and loose objects should not be left unattended in outdoor areas.

The activation of the public realm external to the site would depend on the existing wind conditions in the streetscapes that are often beyond the control of the proposed Development. For cases where the existing wind conditions in the public realm external to the site are on the walking criterion, then the proposed Development should not have any adverse wind effects in these areas.

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3. MODEL AND EXPERIMENTAL TECHNIQUES

A 1/400 scale model of 11-27 Dorcas Street Development was constructed from digital information provided by Bates Smart Architecture received up to 26th June 2024.

The model of 11-27 Dorcas Street Development was inserted into a proximity model of surrounding buildings out to a minimum radius of 400m. No existing or proposed landscape trees were included within the model. The building model was tested in a model of the natural wind generated by flow over roughness elements augmented by vorticity generators at the beginning of the wind tunnel working section. The basic natural wind model was for flow over suburban terrain, the characteristics of which are given in Figure 2. The surrounding wind tunnel model of all significant buildings, out to a minimum radius of 400m, modified the approach wind model for the presence of the surrounding buildings.

Hot-wire anemometers were used to measure the local wind speeds at various locations within a radius of the development. The minimum radius examined was half the building height or width, whichever is greater, measured from the site boundaries.

The wind tunnel velocity measurements were made for an equivalent 1-hour period in full scale and filtered to provide an equivalent full scale 3 second gust wind speed for 16 wind directions.

The following velocity ratios were measured in the wind tunnel with a hot-wire anemometer.

$$\text{mean } \bar{V}_R = \frac{\bar{V}_{local}}{\bar{V}_{300m}}$$

$$\text{gust } \hat{V}_R = \frac{\hat{V}_{local}}{\hat{V}_{300m}}$$

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where:

V_{local} is the velocity measured from the hot-wire anemometer at the test location

V_{300m} is the velocity measured at the free-stream reference height of 300m

These measured velocity ratios were combined with a statistical model of the local wind climate that relates wind speed to a probability of exceedance. The model of the wind climate also includes the directional variation of wind speed (frequency).

The measured wind speeds are assessed against the pedestrian safety and the pedestrian comfort criteria. The pedestrian safety criterion is applied to the annual hourly maximum wind gusts for each wind direction. The pedestrian comfort criteria are based on all wind directions combined (i.e. summation of exceedances across 360° of wind direction) and the pedestrian comfort criterion utilises the maximum of either the hourly mean wind speed, or the gust equivalent mean wind speed (GEM) as follows

$$\text{Mean wind speed for comfort criterion} = \max \left(\bar{V}, \frac{\hat{V}}{1.85} \right)$$

where:

\bar{V} is the mean wind speed

\hat{V} is the 3-second gust wind speed

Photographs of the model as tested in the wind tunnel are shown in Figures 3 and 4. The Test Locations in the surrounding streetscapes of the proposed Development are shown in Figures 5a to 5e.

The wind tunnel study has been undertaken to exceed the requirements of the Australasian Wind Engineering Society Quality Assurance Manual for Wind Tunnel Studies.

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4. DISCUSSION OF RESULTS

Velocity measurements were made at various locations around the proposed 11-27 Dorcas Street Development for different wind directions at 22.5° intervals.

The following model configurations were tested:

- Existing Configuration
- Proposed Configuration

The Existing Configuration is defined as the existing single to five storey buildings currently occupying the Development site.

The Proposed Configuration for the 11-27 Dorcas Street Development was as defined by Bates Smart Architecture drawings received on 26th June 2024.

None of the above configurations included or relied on existing or proposed landscaping trees for wind mitigation.

The Ground Level, neighbouring buildings podium terraces, and Upper-Level terraces/balconies Test Locations are shown in Figures 5a to 5e.

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4.1 Summaries of Discussion

A summary of wind comfort criteria satisfied at each Test Location in and surrounding the proposed development have been summarised using a colour code system in the following figures:

Ground Level Streetscapes	- Existing Configuration	Figure 6a
	- Proposed Configuration	Figure 6b
Building Frontages	- Existing Configuration	Figure 7a
	- Proposed Configuration	Figure 7b
Level 2 and 3 balconies/terraces	- Proposed Configuration	Figure 8
Level 7 and 13 balconies	- Proposed Configuration	Figure 9
Level 16 and 19 balconies/terraces	- Proposed Configuration	Figure 10

Different colours have been used to represent the wind criteria satisfied at the respective Test Locations.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions are also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

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4.2 Dorcas Street

The wind conditions for the Proposed Configuration along Dorcas Street (Test Locations 1 to 19 and 28 to 31) have been shown to satisfy the walking comfort criterion at a minimum, with many locations satisfying the sitting or standing comfort criteria. The main entrance (Test Location 29) and the retail entrances (Test Locations 28 and 30) have been shown to satisfy the recommended standing comfort criterion. These criteria satisfied have been presented in Table 1 as well as the conditions for the Existing Configuration for comparison. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

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Table 1: Pedestrian Wind Comfort and Safety – Dorcas Street

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
1	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
2	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
3	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
4	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
5	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
6	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
7	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
8	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
9	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
10	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
11	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
12	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
13	Existing	Pass	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
14	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
15	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
16	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
17	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
18	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
19	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass

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Table 1: Pedestrian Wind Comfort and Safety – Dorcas Street [continued]

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
28	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
29	Existing	FAIL	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
30	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
31	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass

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4.3 Wells Street and Terraces of Neighbouring Buildings

The wind conditions for the Proposed Configuration along Wells Street (Test Locations 20 to 27, 37, and 38) have been shown to satisfy the walking comfort criterion at a minimum, with many locations satisfying the sitting or standing comfort criteria. The wind conditions at the retail entrance (Test Location 38) have been shown to satisfy the recommended standing comfort criterion.

The wind conditions for the Proposed Configuration at the podium terraces of the neighbouring buildings (Test Locations N1 to N4) have been shown to satisfy the walking comfort criterion at a minimum. These wind conditions at the neighbouring buildings terraces have been shown to satisfy similar wind comfort criteria compared to the Existing Configuration, indicating that the proposed development would not influence the wind comfort criteria of the neighbouring buildings terraces.

These criteria satisfied have been presented in Table 2 as well as the conditions for the Existing Configuration for comparison. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

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Table 2: Pedestrian Wind Comfort and Safety – Wells Street and Terraces of Neighbouring Building

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
20	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
21	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
22	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
23	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
24	Existing	FAIL	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
25	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
26	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
27	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
N1	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
N2	Existing	FAIL	FAIL	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
N3	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
N4	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
37	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	FAIL	Pass	Pass
38	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass

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4.4 Middleton Lane

The wind conditions for the Proposed Configuration along Middleton Lane (Test Locations 32 to 36), have been shown to satisfy the standing criterion or better, including at the Porte Cochere (Test Location 35) which have been shown to satisfy the sitting criterion. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations. These criteria satisfied have been presented in Table 3 as well as conditions for the Existing Configuration for comparison.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

Table 3: Pedestrian Wind Comfort and Safety – Middleton Lane

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
32	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
33	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass
34	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
35	Existing	Pass	Pass	Pass	Pass
	Proposed	Pass	Pass	Pass	Pass
36	Existing	FAIL	Pass	Pass	Pass
	Proposed	FAIL	Pass	Pass	Pass

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4.5 Level 2 and 3 Balconies and Terraces

The wind conditions at the Level 2 and 3 balconies and terraces (Test Locations P1 to P6) have been shown to satisfy the walking comfort criterion at a minimum, with most locations satisfying the sitting or standing comfort criterion. The wind conditions for the Proposed Configuration have been shown to satisfy the safety criterion at all Test Locations. These criteria satisfied have been presented in Table 4.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

Table 4: Pedestrian Wind Comfort and Safety – Level 2 and 3 Balconies and Terraces

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
P1					
	Proposed	Pass	Pass	Pass	Pass
P2					
	Proposed	Pass	Pass	Pass	Pass
P3					
	Proposed	FAIL	Pass	Pass	Pass
P4					
	Proposed	Pass	Pass	Pass	Pass
P5					
	Proposed	Pass	Pass	Pass	Pass
P6					
	Proposed	FAIL	FAIL	Pass	Pass

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4.6 Level 7 Balconies

The wind conditions for the Proposed Configuration at the Level 7 balconies (Test Locations B1 to B5) have been shown to satisfy the sitting comfort criterion. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations. These criteria satisfied have been presented in Table 5.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

Table 5: Pedestrian Wind Comfort and Safety – Level 7 Balconies

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
B1					
	Proposed	Pass	Pass	Pass	Pass
B2					
	Proposed	Pass	Pass	Pass	Pass
B3					
	Proposed	Pass	Pass	Pass	Pass
B4					
	Proposed	Pass	Pass	Pass	Pass
B5					
	Proposed	Pass	Pass	Pass	Pass

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4.7 Level 13 Balconies

The wind conditions for the Proposed Configuration at the Level 13 balconies (Test Locations B6 to B10) have been shown to satisfy the sitting comfort criterion. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations. These criteria satisfied have been presented in Table 6.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

Table 6: Pedestrian Wind Comfort and Safety – Level 13 Balconies

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
B6					
	Proposed	Pass	Pass	Pass	Pass
B7					
	Proposed	Pass	Pass	Pass	Pass
B8					
	Proposed	Pass	Pass	Pass	Pass
B9					
	Proposed	Pass	Pass	Pass	Pass
B10					
	Proposed	Pass	Pass	Pass	Pass

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4.8 Level 16 Balconies

The wind conditions for the Proposed Configuration at the Level 16 (Test Locations B11 to B14) have been shown to satisfy the sitting comfort criterion. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations. These criteria satisfied have been presented in Table 7.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

Table 7: Pedestrian Wind Comfort and Safety – Level 16 Balconies

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
B11					
	Proposed	Pass	Pass	Pass	Pass
B12					
	Proposed	Pass	Pass	Pass	Pass
B13					
	Proposed	Pass	Pass	Pass	Pass
B14					
	Proposed	Pass	Pass	Pass	Pass

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4.9 Level 19 Rooftop Terraces

The wind conditions for the Proposed Configuration on the Level 19 Rooftop terrace (Test Locations R1 and R2) have been shown to satisfy the walking comfort criterion at a minimum. For completeness, additional locations in the roof plant areas (Test Locations R3 to R5) were tested and have been shown to satisfy the standing comfort criterion. The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations. These criteria satisfied have been presented in Table 8.

The percentage for which a given mean wind speed is exceeded for each wind comfort criteria (sitting, standing, and walking), the mean or gust equivalent mean wind speed from all wind directions combined, and the highest annual maximum 3 second gust wind speed for each Test Location are presented in tabular form in Appendix A. The annual maximum 3 second gust wind speed from each of the 16 wind directions for each Test Location is also presented in a polar plot and compared against the 20m/s safety criterion in Appendix A.

Table 8: Pedestrian Wind Comfort and Safety – Level 19 Rooftop Terraces

Test Location	Configuration	Wind Criteria			
		Comfort			Safety
		Sitting	Standing	Walking	
R1					
	Proposed	FAIL	Pass	Pass	Pass
R2					
	Proposed	FAIL	FAIL	Pass	Pass
R3					
	Proposed	FAIL	Pass	Pass	Pass
R4					
	Proposed	FAIL	Pass	Pass	Pass
R5					
	Proposed	FAIL	Pass	Pass	Pass

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5. CONCLUSIONS

A wind tunnel study has been conducted on a 1/400 scale model of the proposed 11-27 Dorcas Street Development, South Melbourne. The model of the Development within surrounding buildings, was tested in a simulated upstream boundary layer of the natural wind to determine likely environmental wind conditions. These wind conditions have been related to the freestream mean wind speed at a reference height of 300m and compared with criteria developed for the Melbourne region as a function of wind direction.

For the Proposed Configuration, the wind conditions for all Test Locations in the immediate surrounds and the streetscapes surrounding the development have been shown to satisfy the walking comfort criterion at a minimum, with many locations satisfying the sitting or standing comfort criteria. The wind conditions at the ground level entrances to the development have been shown to satisfy the recommended standing comfort criterion or better.

The wind conditions for the Proposed Configuration at the podium level terraces of the neighbouring buildings have been shown to satisfy the walking comfort criterion at a minimum, and were similar to the wind comfort criteria satisfied for the existing conditions. Thus, indicating that the proposed development would not influence the wind comfort criteria at these terraces.

The wind conditions for the Proposed Configuration at representative private terraces and balconies on the development have been shown to satisfy the recommended walking comfort criterion or better.

The wind conditions for the Proposed Configuration satisfy the safety criterion at all Test Locations.

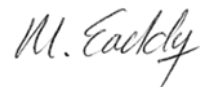
Prepared by:



M. Hapsari

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Authorised by:



M. Eaddy (RPEV)

September 2024



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REFERENCES

1. W. H. Melbourne, Wind environment studies in Australia, Journal of Industrial Aerodynamics, Volume 3, 1978, pp. 201-214

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FIGURES

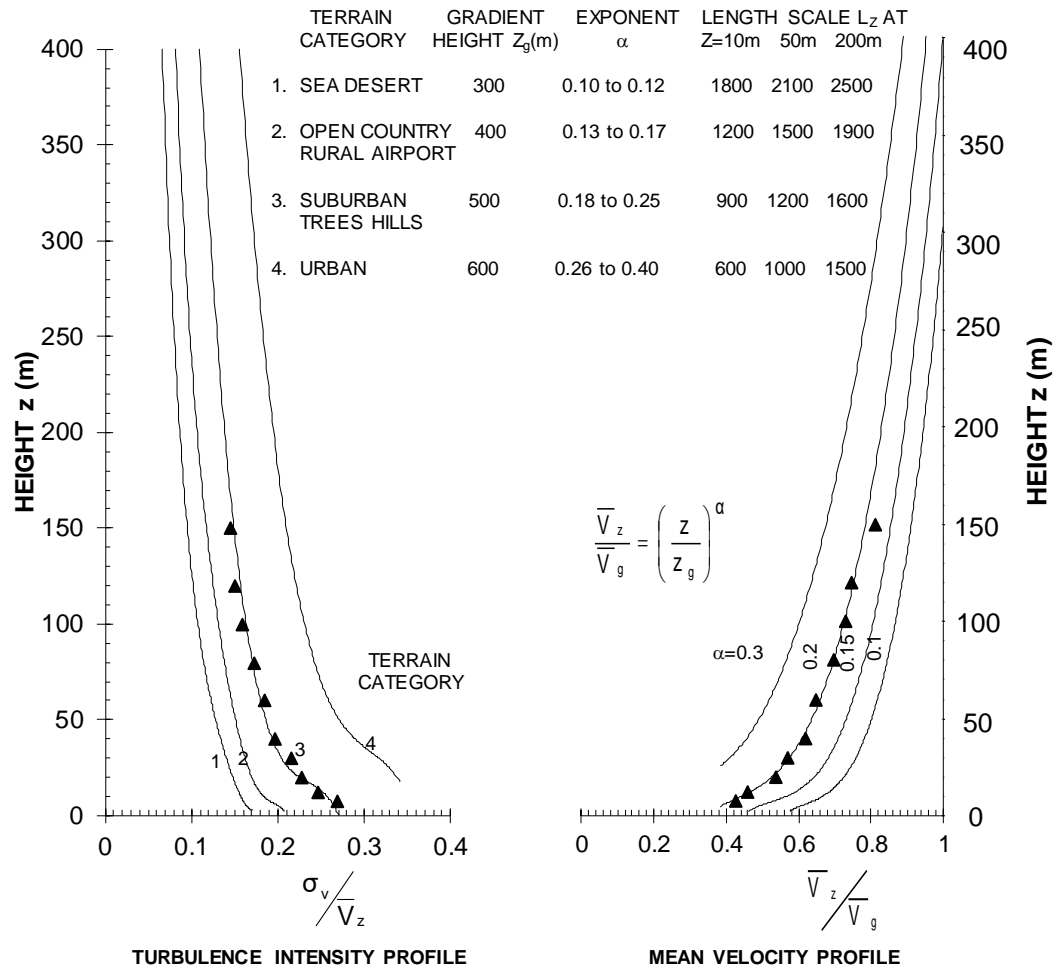


Figure 2 - 1/400 scale TC3 boundary layer turbulence intensity and mean velocity profiles in the MEL Consultants Boundary Layer Wind Tunnel 4.8m x 2.2m working section, scaled to full scale dimensions.

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Figure 3 - View from the northeast of the 1/400 scale model of the proposed 11-27 Dorcas Street Development in the wind tunnel.

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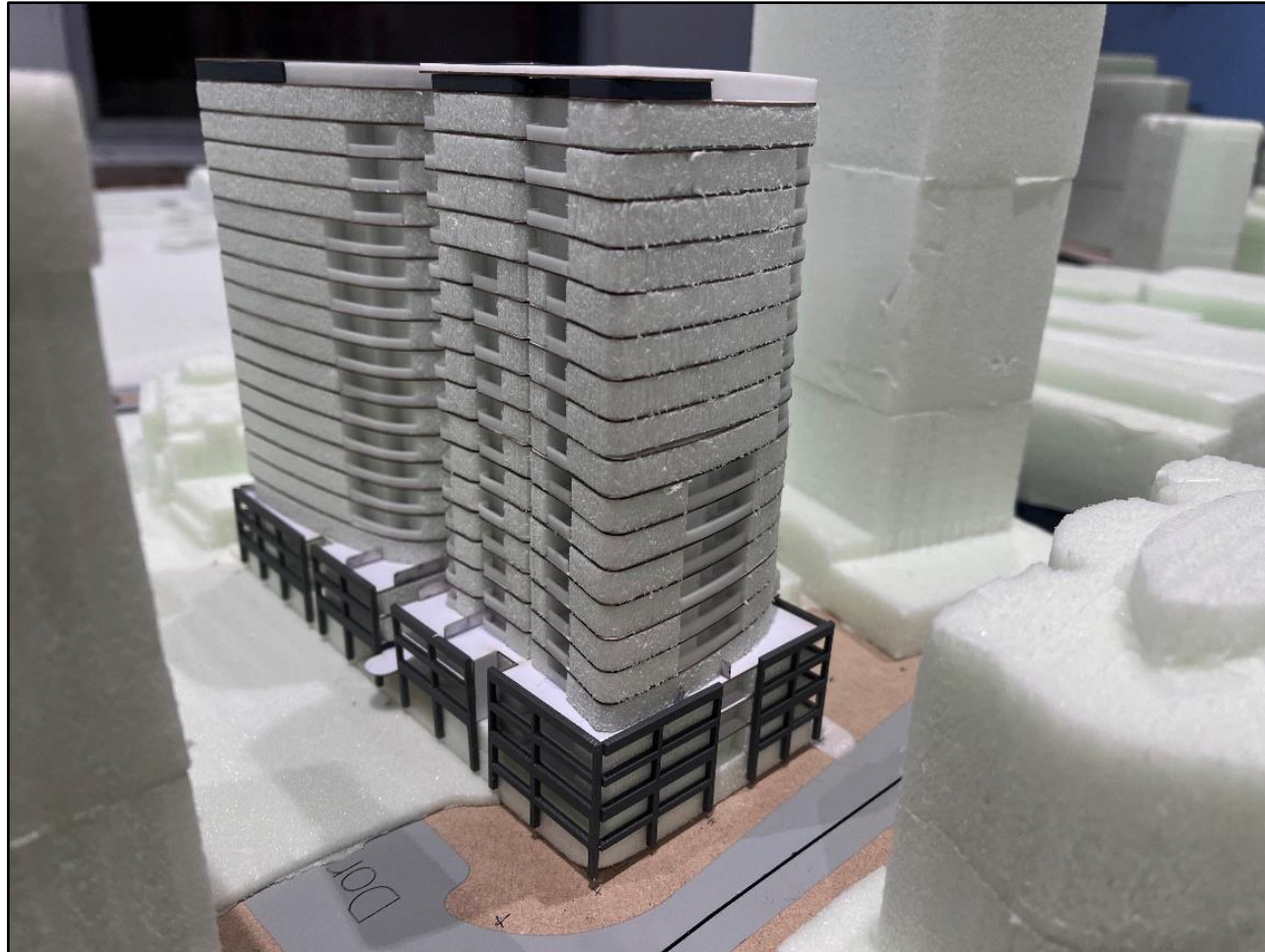
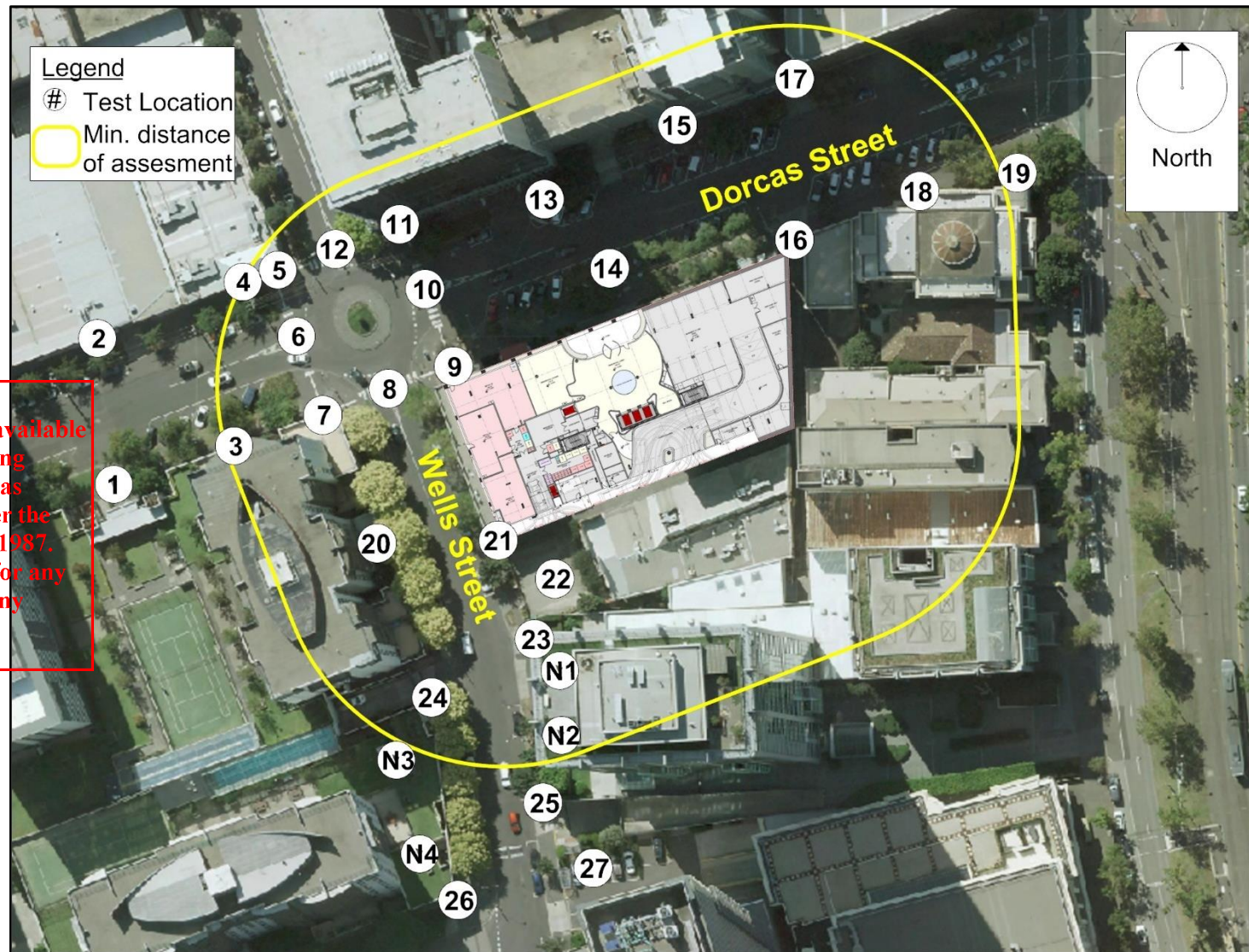


Figure 4 - Close-up view from the west of the 1/400 scale model of the proposed 11-27 Dorcas Street Development in the wind tunnel.



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Figure 5a - Test Locations on the surrounding streetscapes for the proposed 11-27 Dorcas Street Development.

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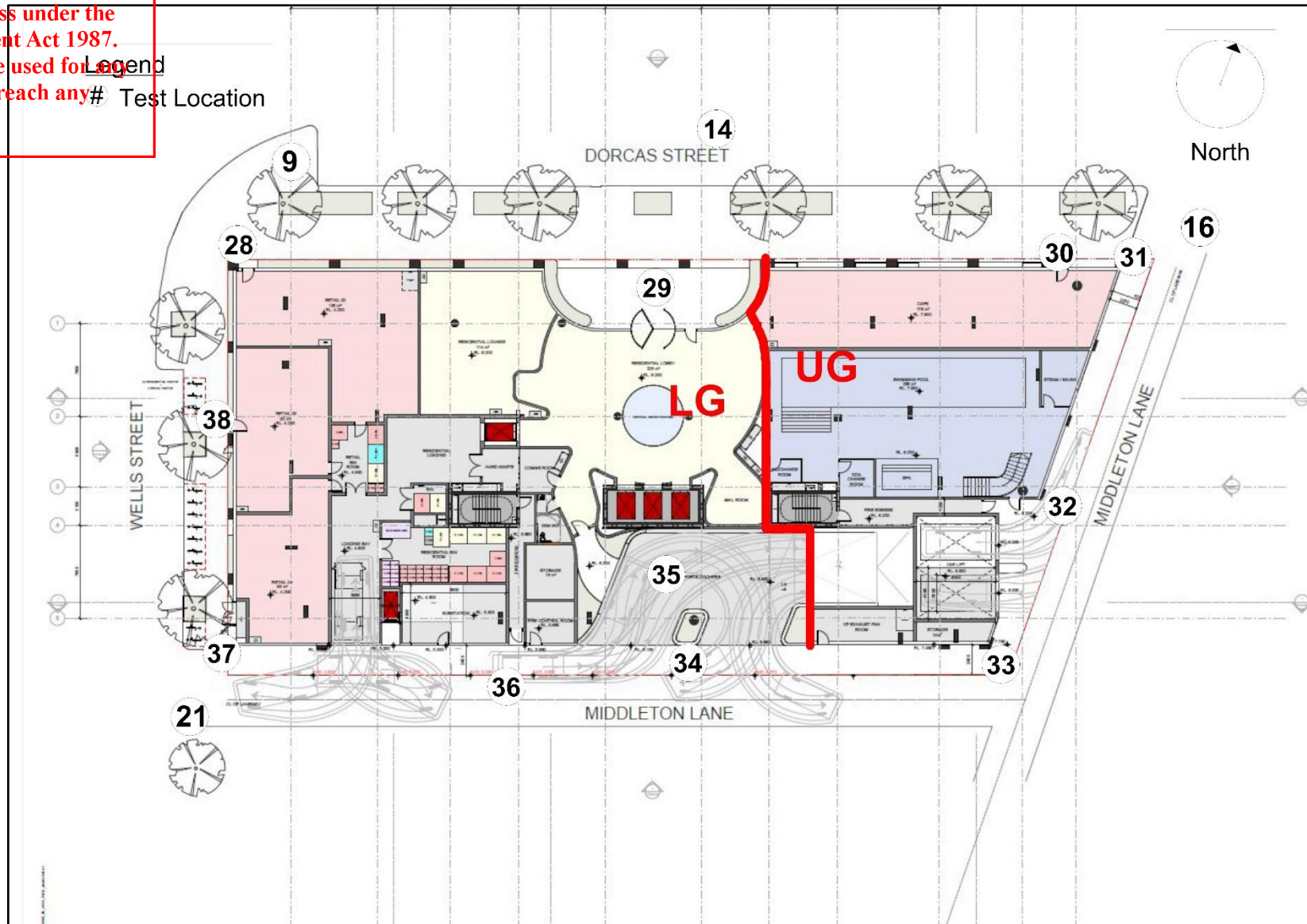


Figure 5b - Test Locations on the building frontages for the proposed 11-27 Dorcas Street Development.



Figure 5c - Test Locations on the Level 2 and 3 Balconies and Terraces for the proposed 11-27 Dorcas Street Development.



Figure 5d - Test Locations on the Level 7 and 13 Balconies for the proposed 11-27 Dorcas Street Development.



Figure 5e - Test Locations on the Level 16 and 19 Balconies and Terraces for the proposed 11-27 Dorcas Street Development.



Figure 6a - Summary of the surrounding streetscapes wind conditions for the Existing Configuration for the 11-27 Dorcas Street Development.

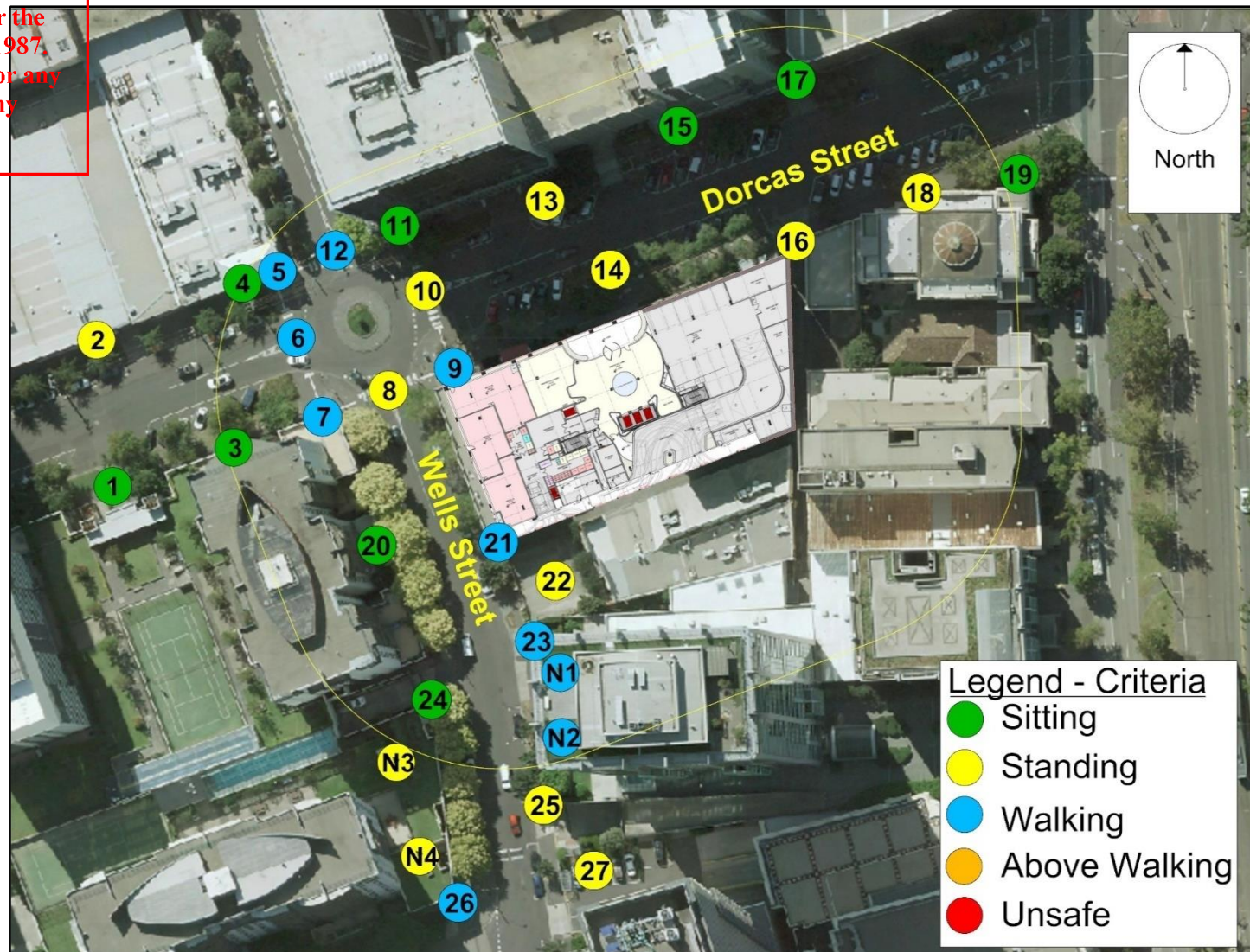


Figure 6b - Summary of the surrounding streetscapes wind conditions for the Proposed Configuration for the 11-27 Dorcas Street Development.



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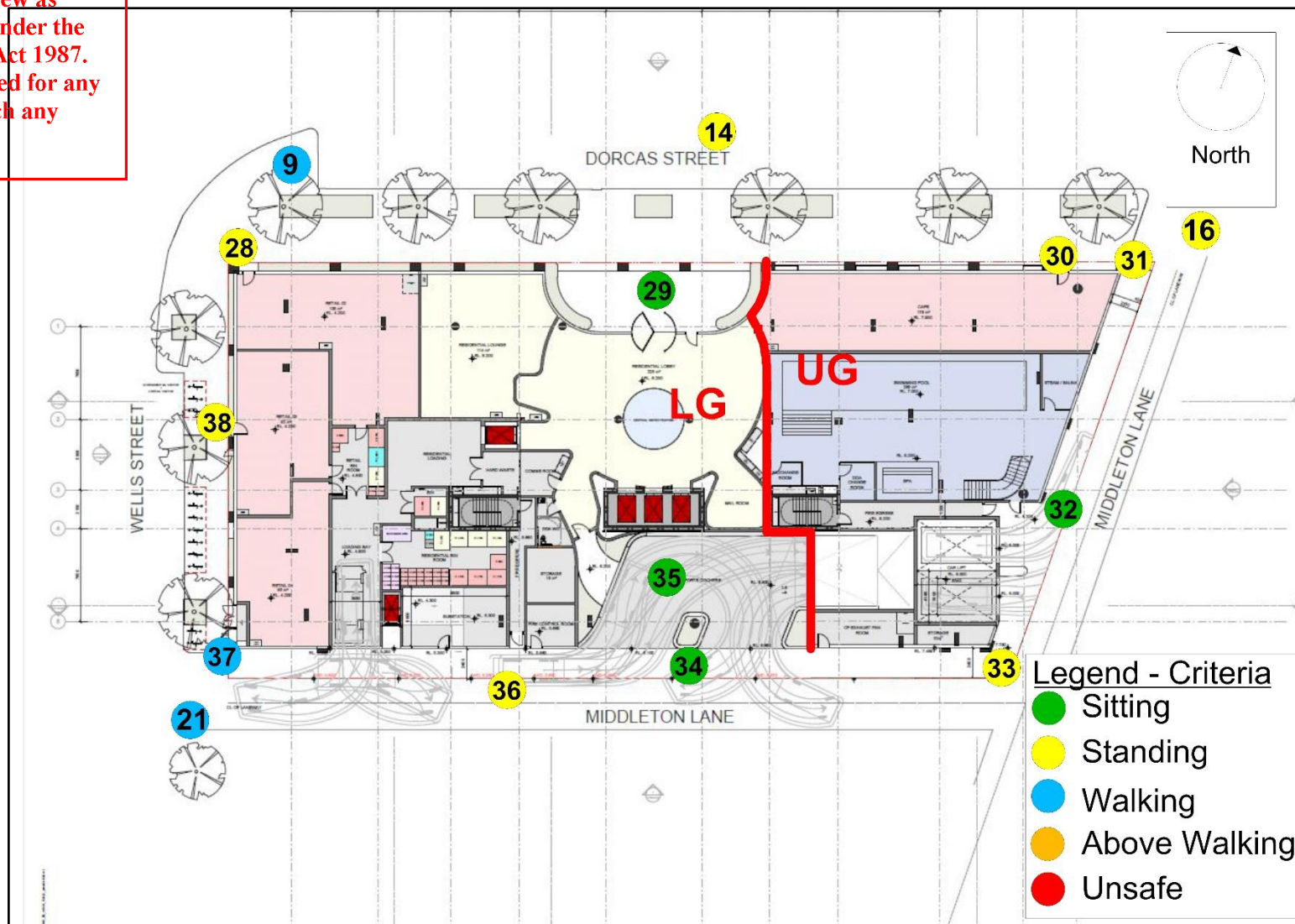


Figure 7b - Summary of the building frontages wind conditions for the Proposed Configuration for the 11-27 Dorcas Street Development.

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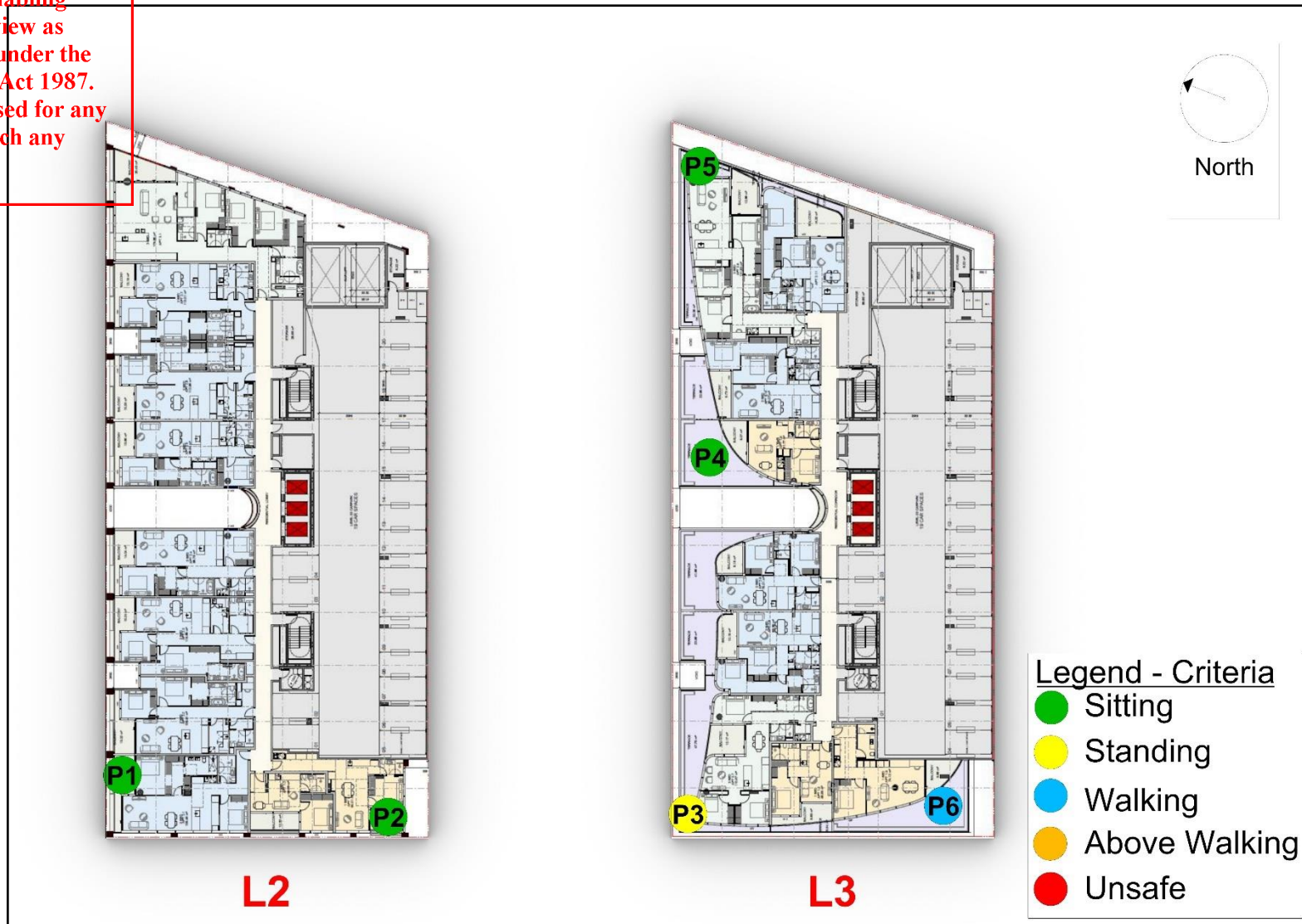


Figure 8 - Summary of the Level 2 and 3 Balconies and Terraces wind conditions for the Proposed Configuration for the 11-27 Dorcas Street Development.

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Figure 9 - Summary of the Level 7 and 13 Balconies wind conditions for the Proposed Configuration for the 11-27 Dorcas Street Development.

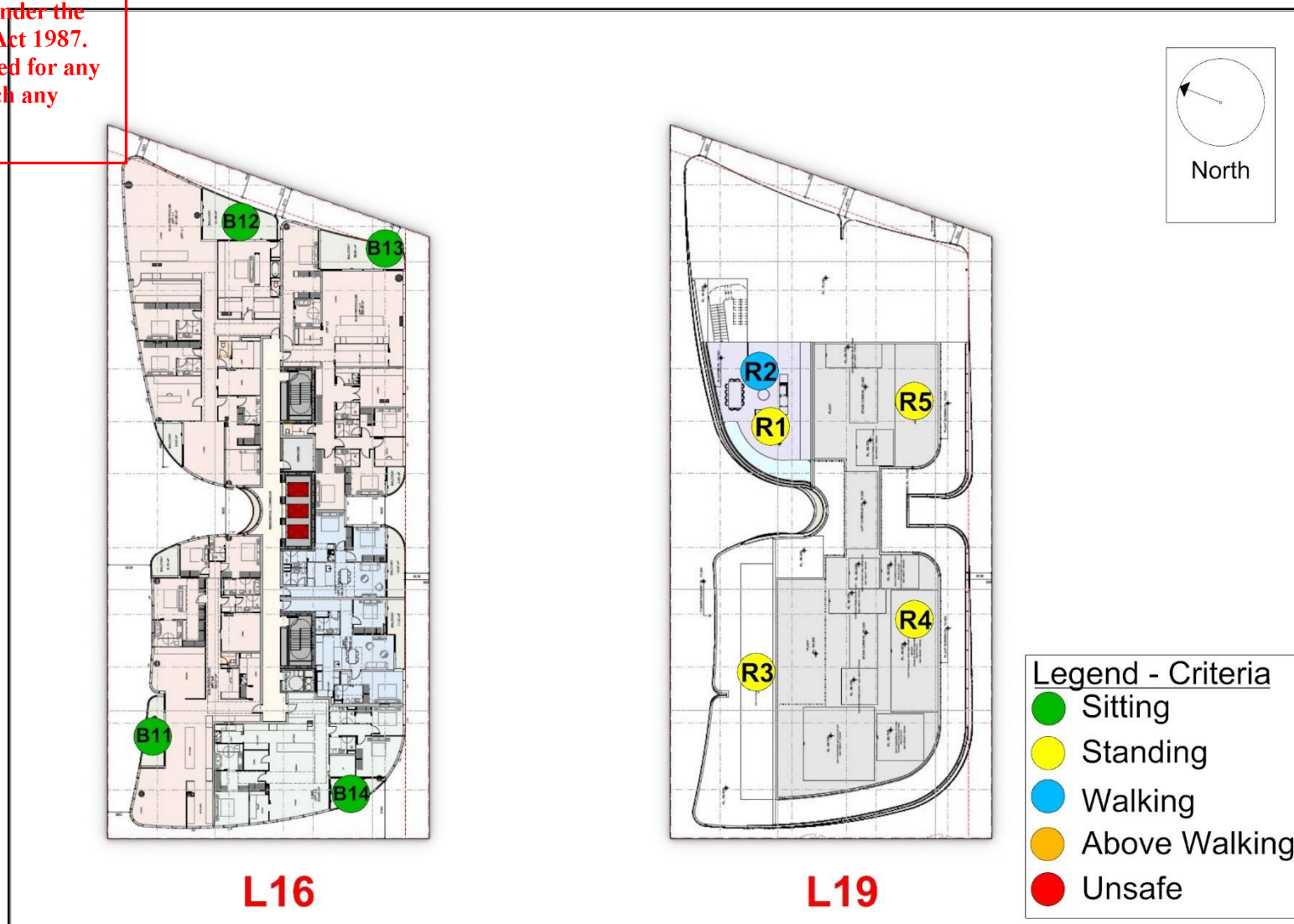


Figure 10 - Summary of the Level 16 and 19 Balconies and Terraces wind conditions for the Proposed Configuration for the 11-27 Dorcas Street Development.

APPENDIX A

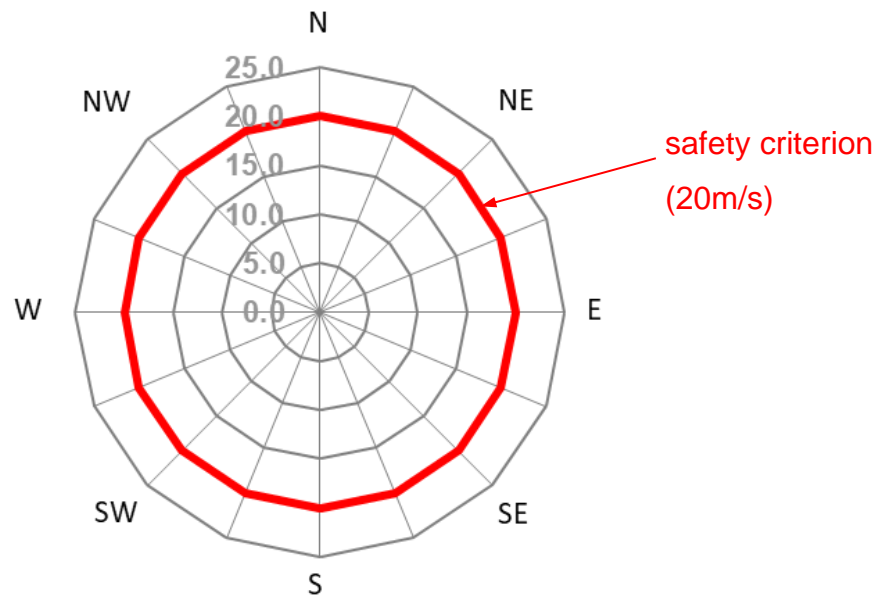
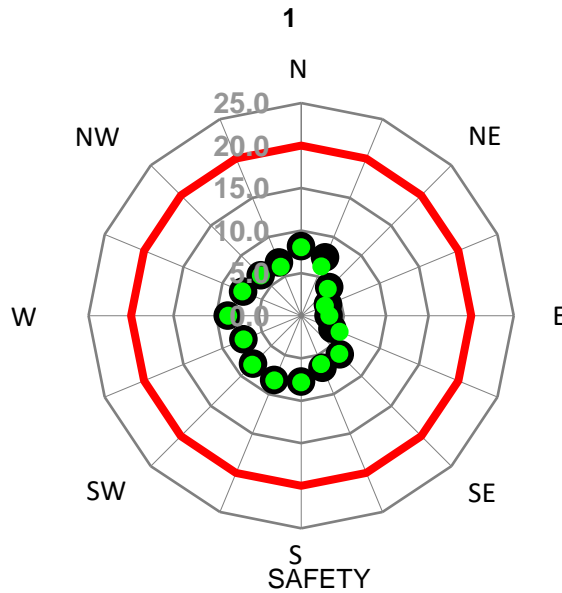


Figure A – Environmental wind safety criterion for Melbourne Region based on local 3 second peak gust wind speed

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Test Location



Local peak 3 second gust wind speed (m/s)

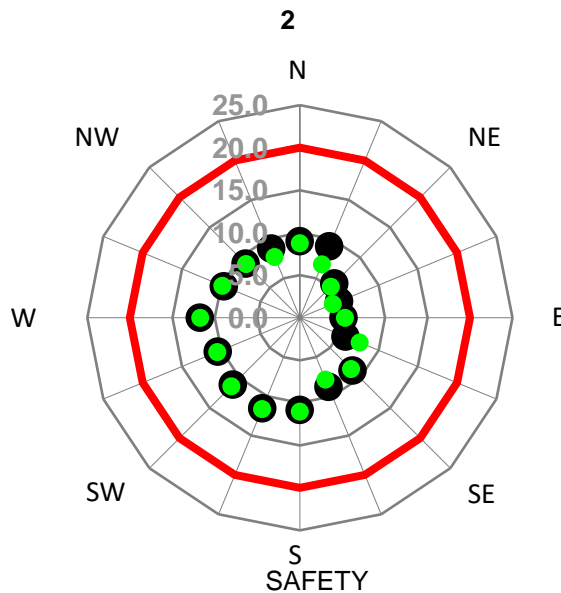
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	10.2%	2.3%	0.4%	2.5	Pass	8.6	Pass
● Existing Configuration	9.7%	2.2%	0.4%	2.4	Pass	8.6	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

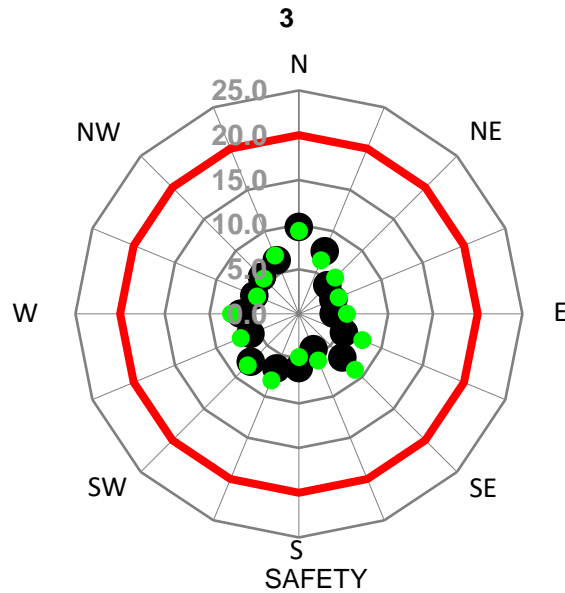
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	23.5%	9.1%	3.0%	3.2	Pass	11.7	Pass
● Existing Configuration	21.9%	8.6%	2.8%	3.1	Pass	11.7	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

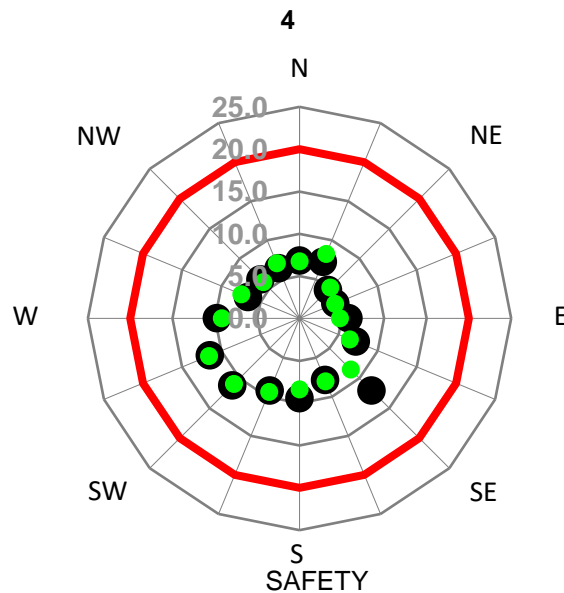
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s)	Standing (4m/s)	Walking (5m/s)				
● Proposed Configuration	8.7%	2.7%	0.6%	2.2	Pass	9.7	Pass
● Existing Configuration	9.9%	2.9%	0.6%	2.3	Pass	9.3	Pass
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Local peak 3 second gust wind speed (m/s)

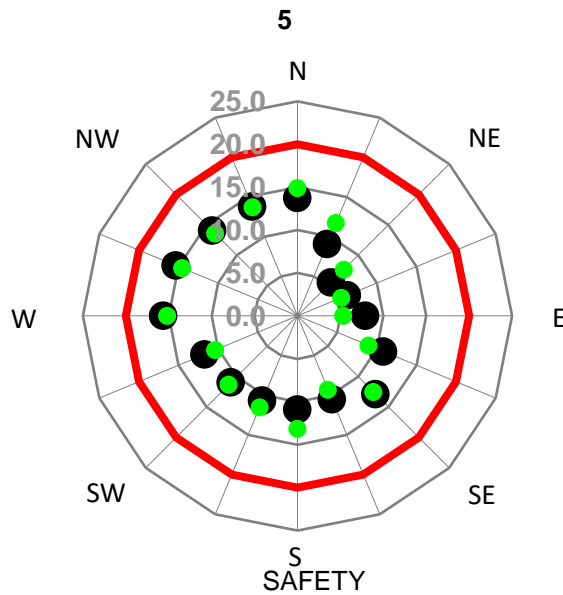
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	15.5%	5.2%	1.8%	2.7	Pass	12.0	Pass
● Existing Configuration	14.0%	4.4%	1.4%	2.7	Pass	11.6	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

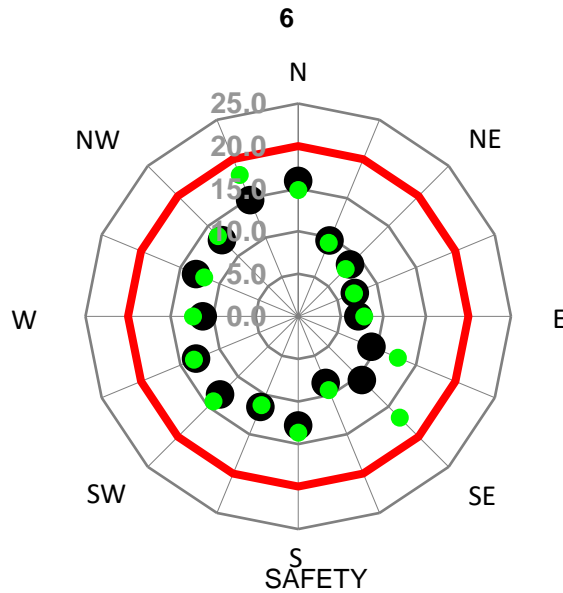
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	37.2%	21.2%	10.9%	4.1	Pass	15.6	Pass
● Existing Configuration	39.4%	23.8%	12.6%	4.3	Pass	15.2	Pass
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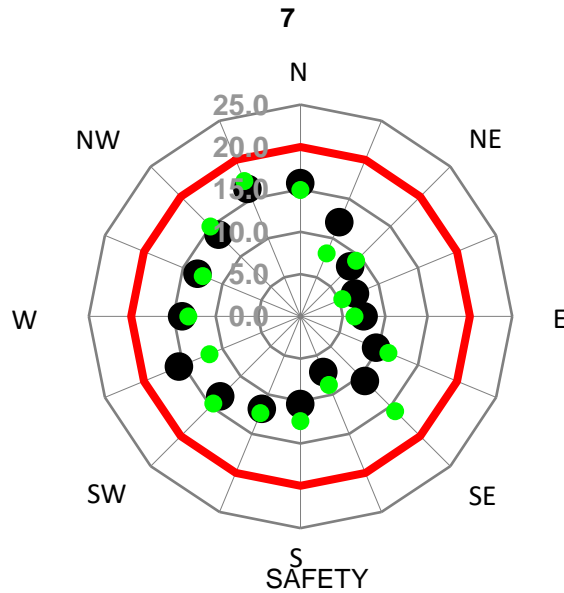


Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	37.4%	21.8%	11.6%	4.2	Pass	15.9	Pass
● Existing Configuration	40.4%	24.7%	13.6%	4.4	Pass	18.0	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

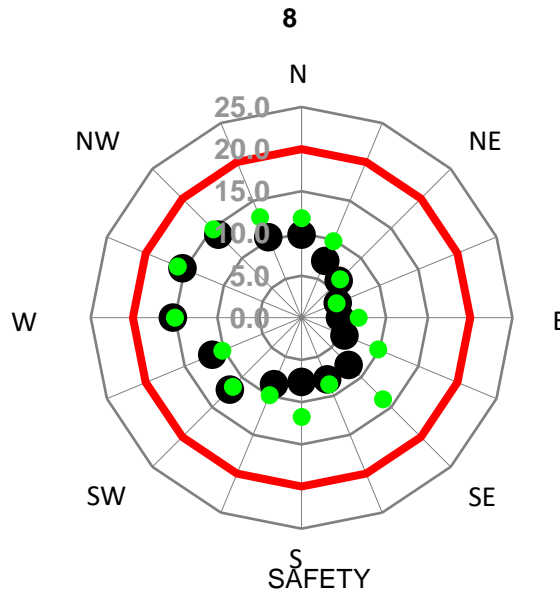
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Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	38.0%	22.4%	12.7%	4.2	Pass	16.3	Pass
● Existing Configuration	39.4%	23.6%	13.0%	4.3	Pass	17.3	Pass
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Local peak 3 second gust wind speed (m/s)

Safety Wind Speed = 20m/s

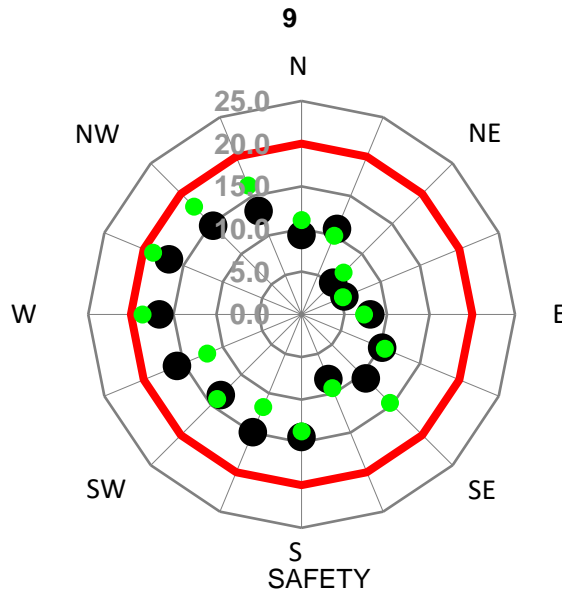
Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	24.2%	11.2%	4.8%	3.3	Pass	15.3	Pass
● Existing Configuration	33.4%	17.9%	8.2%	3.8	Pass	15.9	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

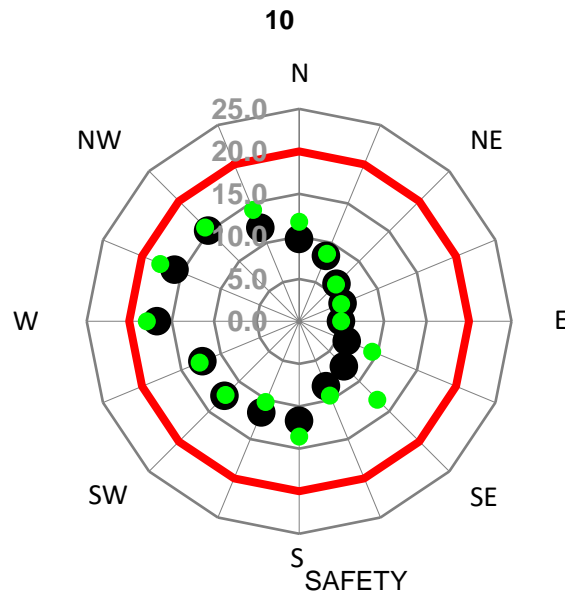
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	37.6%	22.5%	12.0%	4.2	Pass	16.8	Pass
● Existing Configuration	40.9%	25.5%	14.4%	4.4	Pass	18.8	Pass
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Local peak 3 second gust wind speed (m/s)

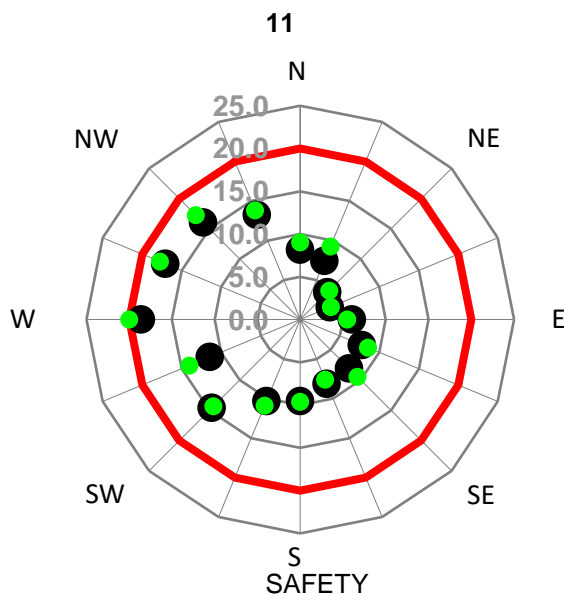
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Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	32.4%	17.3%	8.2%	3.8	Pass	16.7	Pass
● Existing Configuration	38.9%	23.3%	12.7%	4.3	Pass	17.9	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

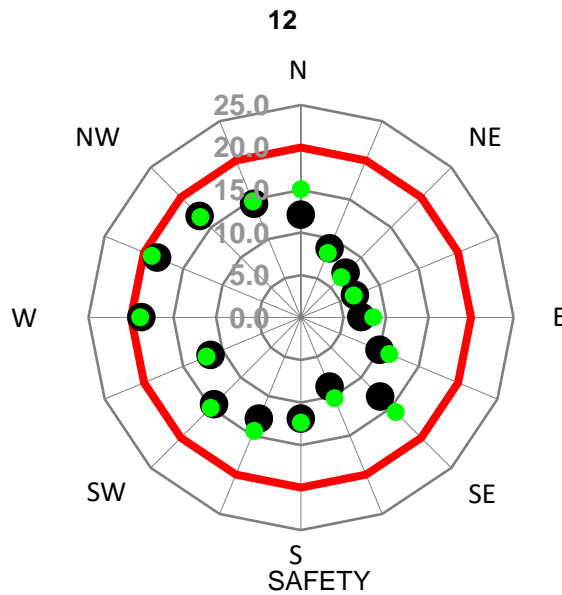
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	29.8%	15.9%	8.9%	3.6	Pass	18.6	Pass
● Existing Configuration	32.6%	17.9%	9.9%	3.8	Pass	20.0	Pass
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Local peak 3 second gust wind speed (m/s)

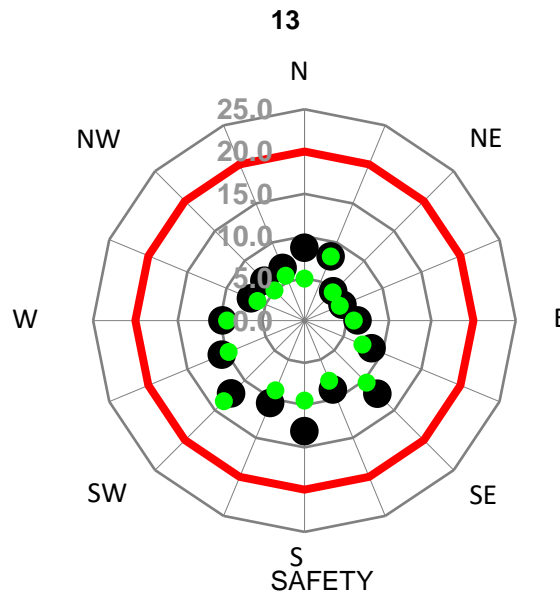
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	39.3%	23.4%	12.7%	4.3	Pass	18.8	Pass
● Existing Configuration	44.3%	28.4%	17.1%	4.7	Pass	19.0	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

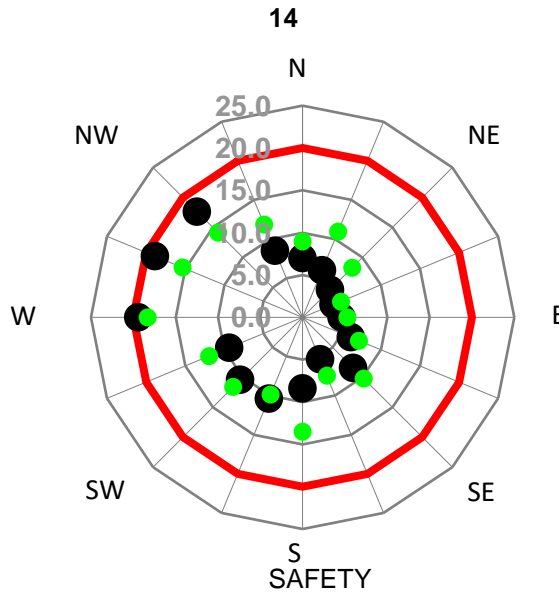
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	22.2%	10.1%	3.7%	3.1	Pass	13.1	Pass
● Existing Configuration	13.4%	4.9%	1.8%	2.5	Pass	13.5	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

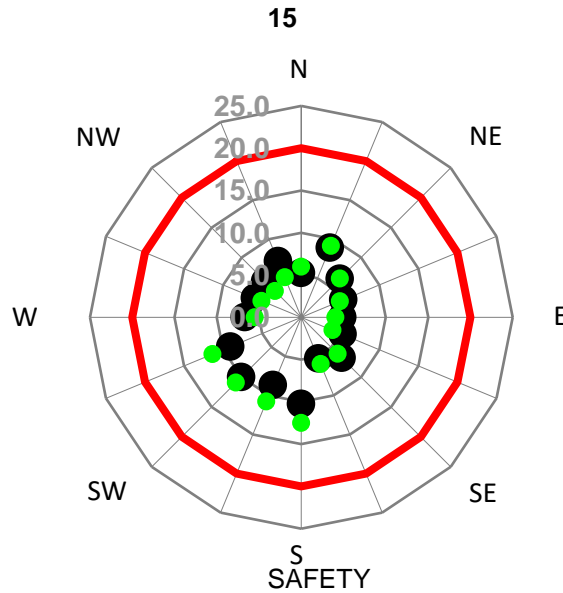
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	20.7%	10.3%	5.6%	3.0	Pass	19.4	Pass
● Existing Configuration	31.4%	16.8%	7.8%	3.7	Pass	18.3	Pass
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Test Location

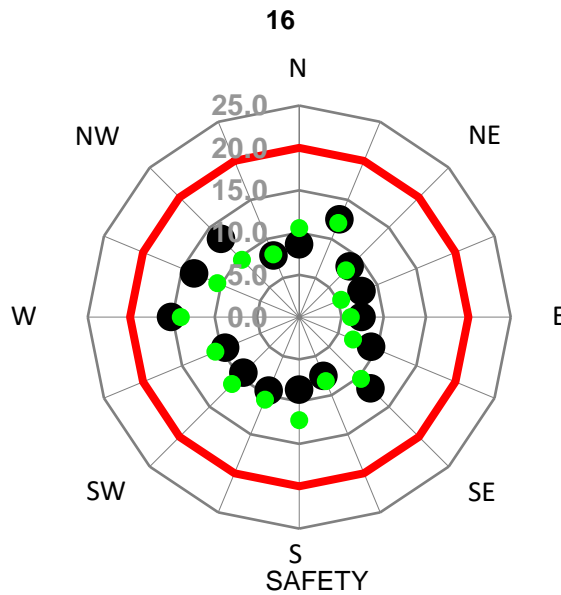


Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	11.0%	3.3%	1.1%	2.4	Pass	10.3	Pass
● Existing Configuration	14.1%	6.6%	2.5%	2.6	Pass	12.5	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

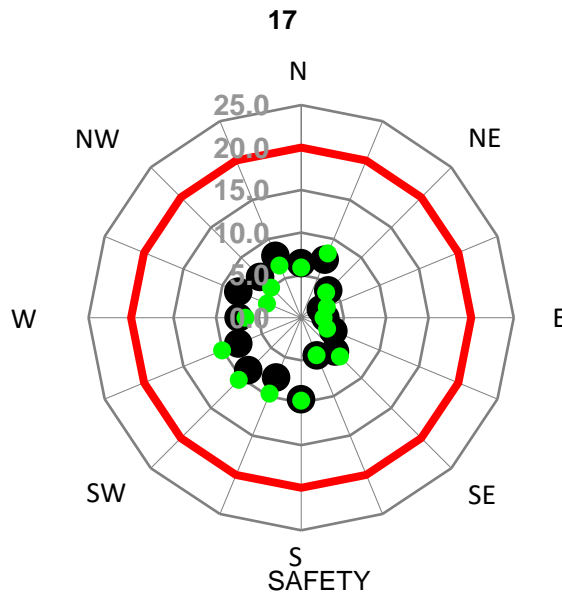
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s)	Standing (4m/s)	Walking (5m/s)				
● Proposed Configuration	22.6%	9.8%	4.0%	3.1	Pass	15.1	Pass
● Existing Configuration	27.6%	13.2%	4.9%	3.5	Pass	14.0	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

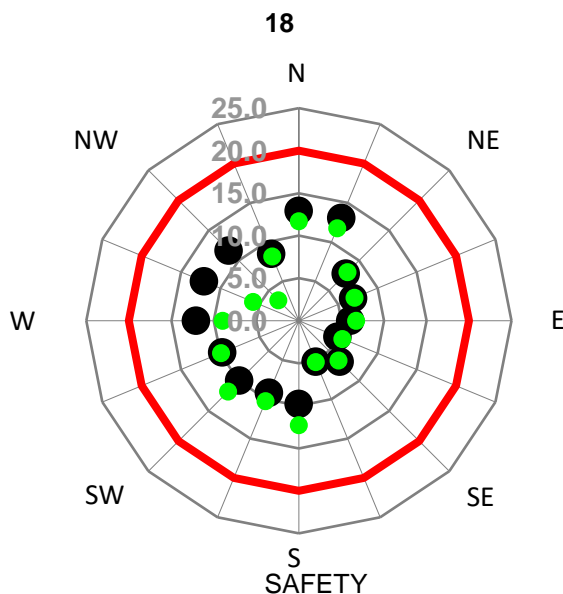
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	10.1%	2.4%	0.6%	2.4	Pass	9.6	Pass
● Existing Configuration	10.6%	3.2%	1.1%	2.4	Pass	10.3	Pass
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Local peak 3 second gust wind speed (m/s)

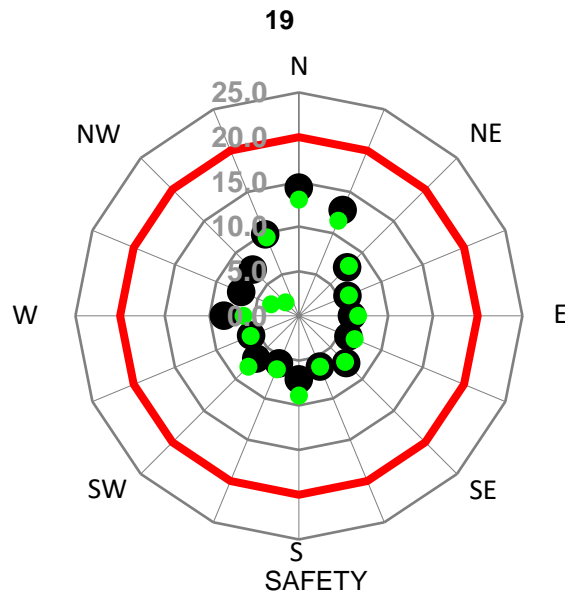
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	25.6%	12.1%	5.4%	3.3	Pass	13.1	Pass
● Existing Configuration	22.9%	11.3%	4.4%	3.2	Pass	12.3	Pass
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Local peak 3 second gust wind speed (m/s)

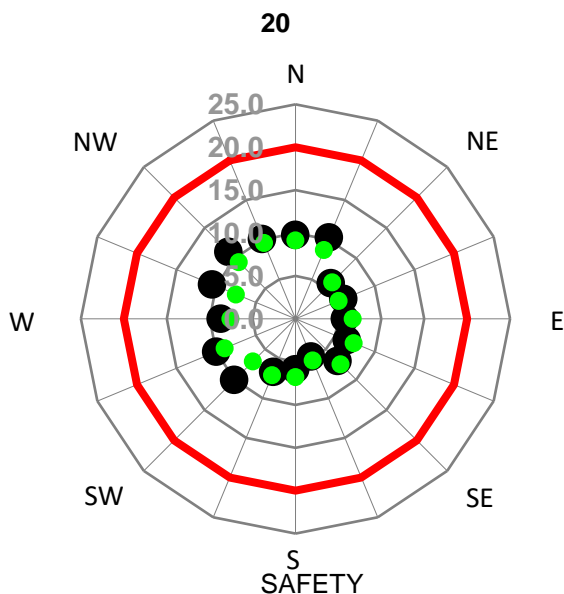
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s)	Standing (4m/s)	Walking (5m/s)				
● Proposed Configuration	17.9%	9.2%	4.8%	2.8	Pass	14.3	Pass
● Existing Configuration	17.4%	8.2%	3.6%	2.8	Pass	13.0	Pass
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Local peak 3 second gust wind speed (m/s)

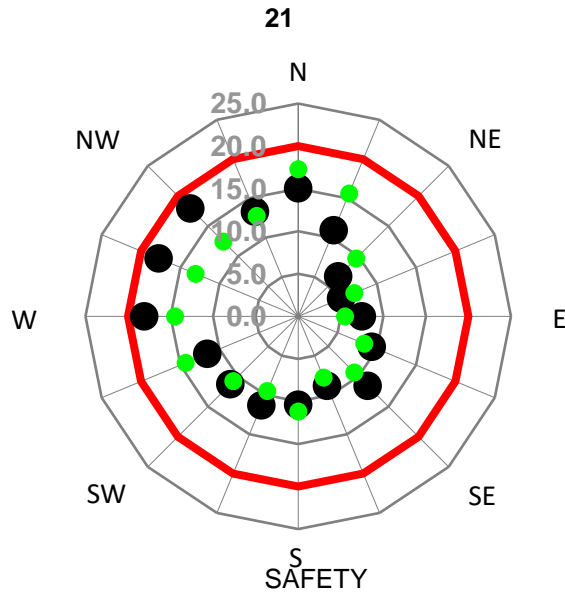
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 4m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	16.4%	6.5%	2.0%	2.8	Pass	11.0	Pass
● Existing Configuration	12.9%	4.0%	0.9%	2.5	Pass	9.6	Pass
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Local peak 3 second gust wind speed (m/s)

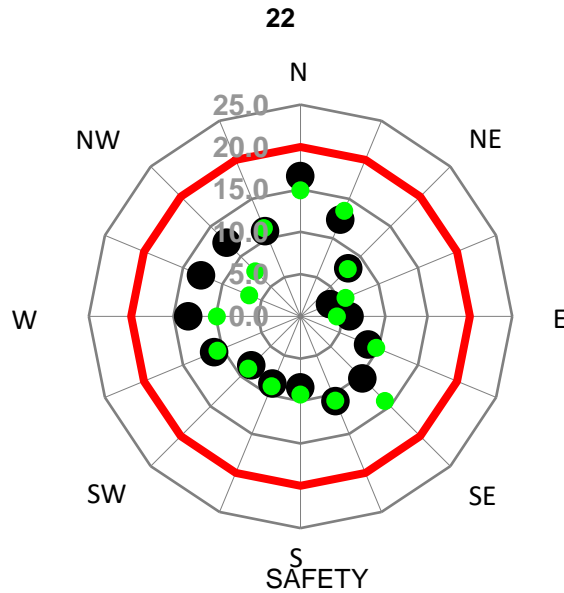
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	38.3%	22.5%	12.5%	4.2	Pass	18.1	Pass
● Existing Configuration	37.3%	21.7%	12.5%	4.1	Pass	17.3	Pass
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Local peak 3 second gust wind speed (m/s)

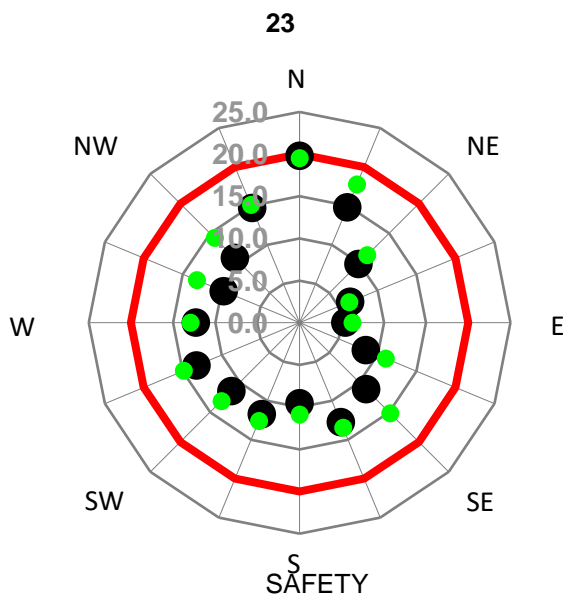
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	30.8%	17.1%	9.3%	3.7	Pass	16.6	Pass
● Existing Configuration	28.3%	14.7%	7.5%	3.5	Pass	14.9	Pass
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Local peak 3 second gust wind speed (m/s)

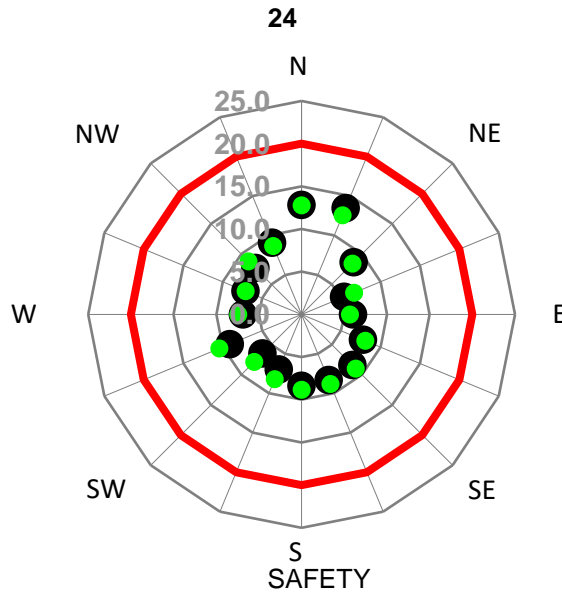
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	38.8%	23.7%	14.2%	4.4	Pass	19.8	Pass
● Existing Configuration	45.0%	28.9%	18.0%	4.8	Pass	19.5	Pass
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Local peak 3 second gust wind speed (m/s)

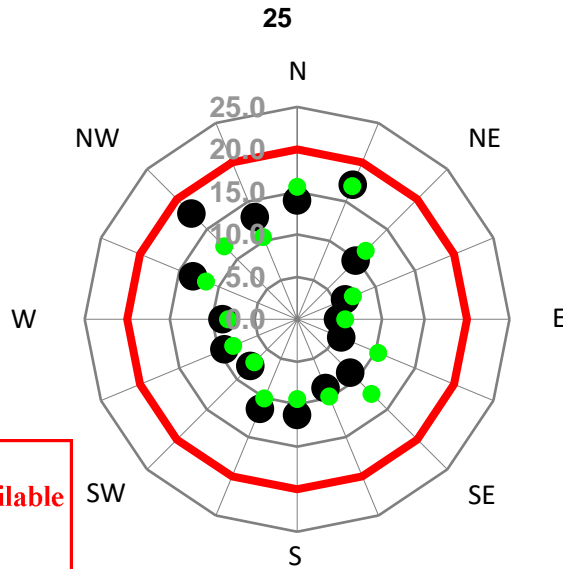
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	19.8%	8.9%	3.8%	3.0	Pass	13.5	Pass
● Existing Configuration	21.9%	9.8%	4.0%	3.1	Pass	12.8	Pass
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SAFETY

Local peak 3 second gust wind speed (m/s)

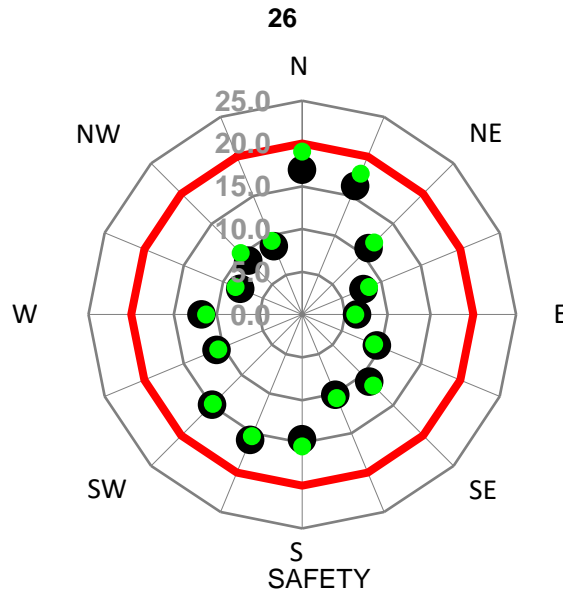
Safety Wind Speed = 20m/s

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Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	32.5%	18.3%	9.6%	3.8	Pass	17.6	Pass
● Existing Configuration	29.5%	15.9%	8.8%	3.6	Pass	17.0	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

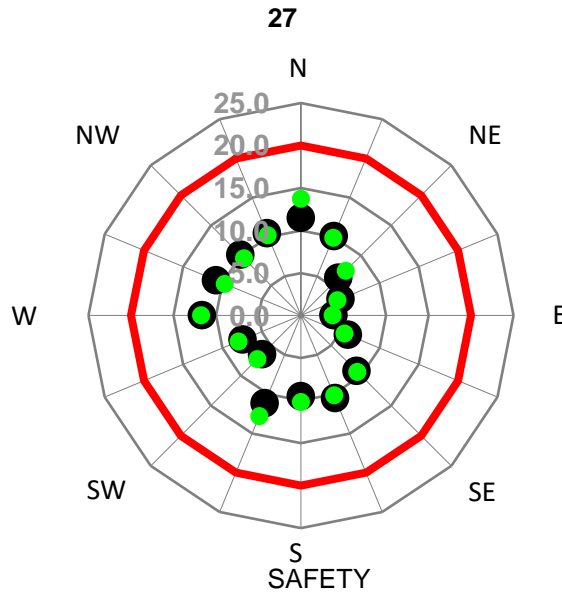
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	38.2%	23.6%	13.7%	4.3	Pass	16.9	Pass
● Existing Configuration	40.6%	26.1%	15.8%	4.5	Pass	19.1	Pass
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Local peak 3 second gust wind speed (m/s)

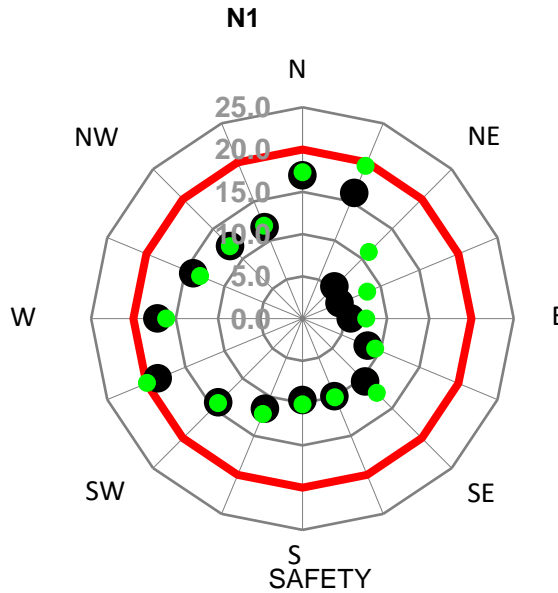
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	24.1%	10.8%	4.0%	3.3	Pass	11.6	Pass
● Existing Configuration	27.5%	13.5%	6.2%	3.5	Pass	13.7	Pass
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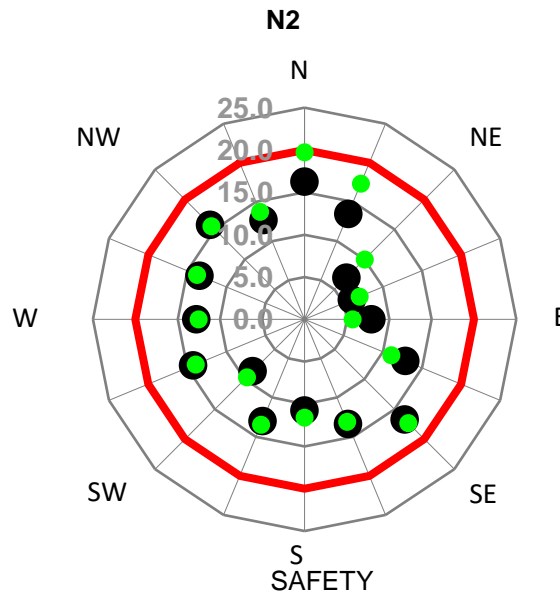


Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	39.5%	24.1%	14.1%	4.4	Pass	18.5	Pass
● Existing Configuration	42.2%	26.5%	16.0%	4.6	Pass	19.9	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

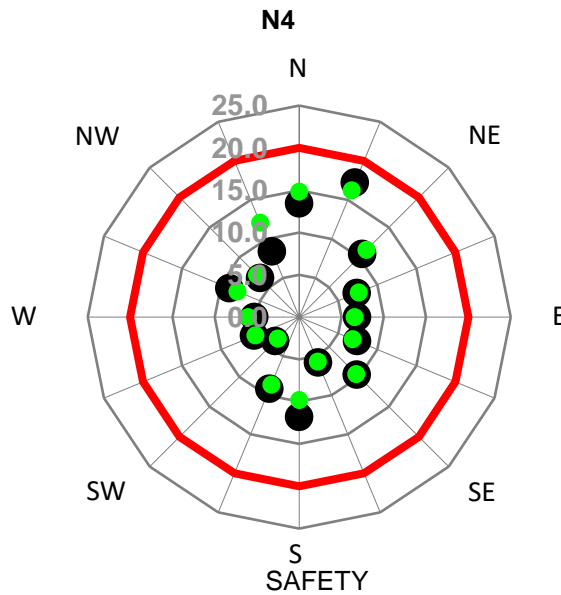
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	39.8%	23.5%	13.7%	4.3	Pass	16.7	Pass
● Existing Configuration	43.9%	28.1%	17.2%	4.7	Pass	19.7	Pass
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Test Location

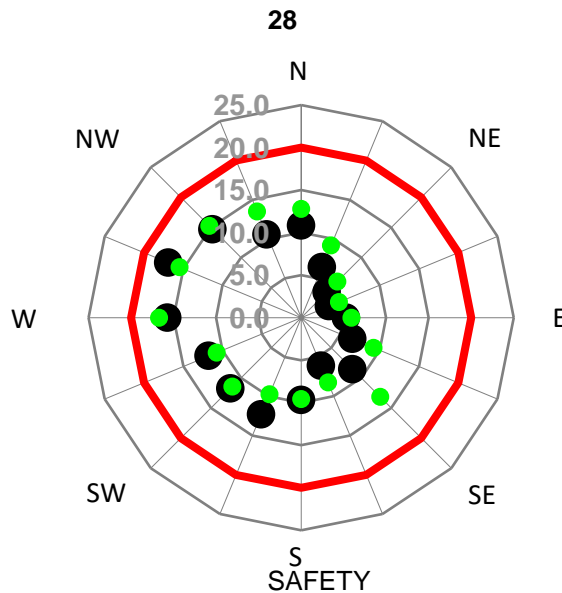


Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	22.4%	12.1%	5.8%	3.2	Pass	17.2	Pass
● Existing Configuration	23.3%	12.5%	6.8%	3.2	Pass	16.2	Pass
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Local peak 3 second gust wind speed (m/s)

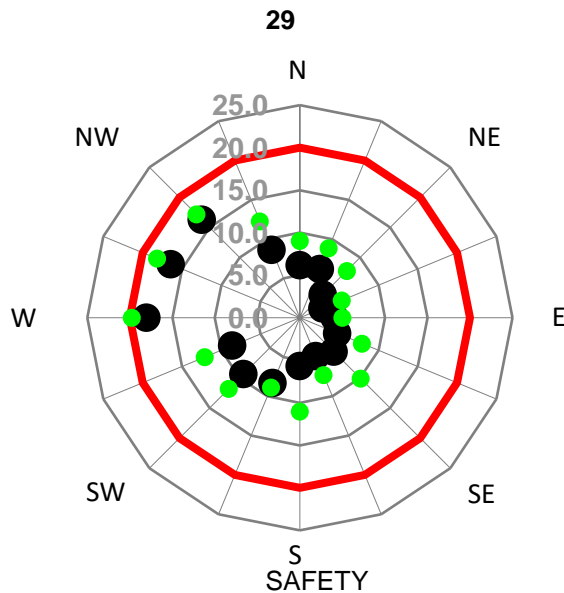
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	29.2%	14.7%	7.0%	3.6	Pass	16.9	Pass
● Existing Configuration	33.1%	17.7%	8.9%	3.8	Pass	16.7	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

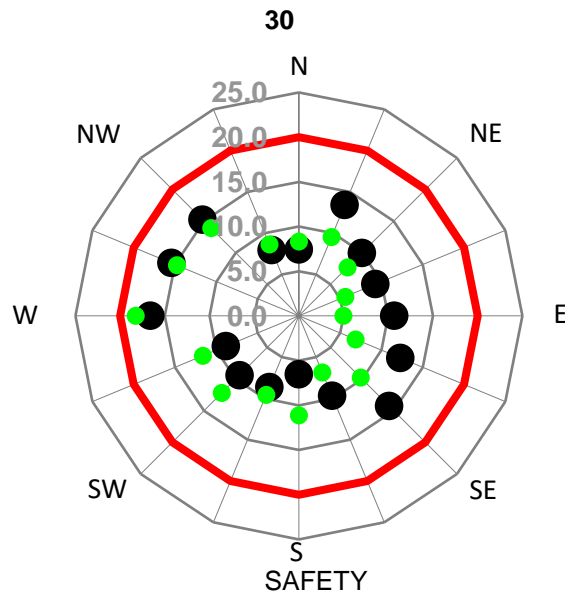
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 4m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	15.4%	7.9%	4.5%	2.7	Pass	18.0	Pass
● Existing Configuration	31.0%	16.0%	8.1%	3.7	Pass	19.7	Pass
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Local peak 3 second gust wind speed (m/s)

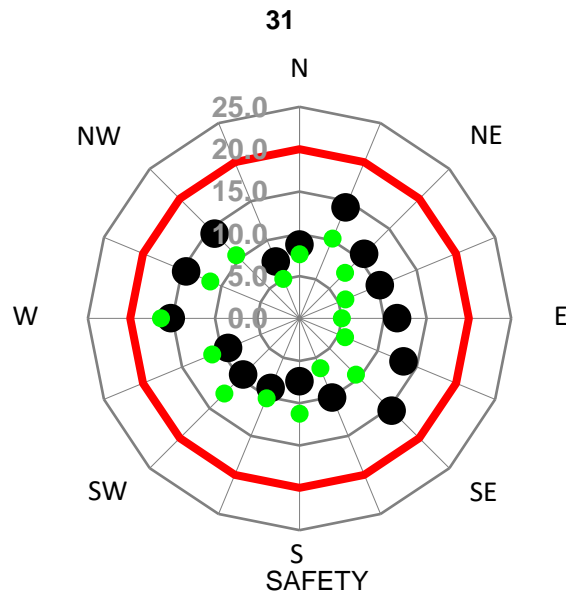
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 4m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	22.7%	10.9%	5.7%	3.2	Pass	16.6	Pass
● Existing Configuration	26.9%	12.8%	5.9%	3.4	Pass	18.3	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

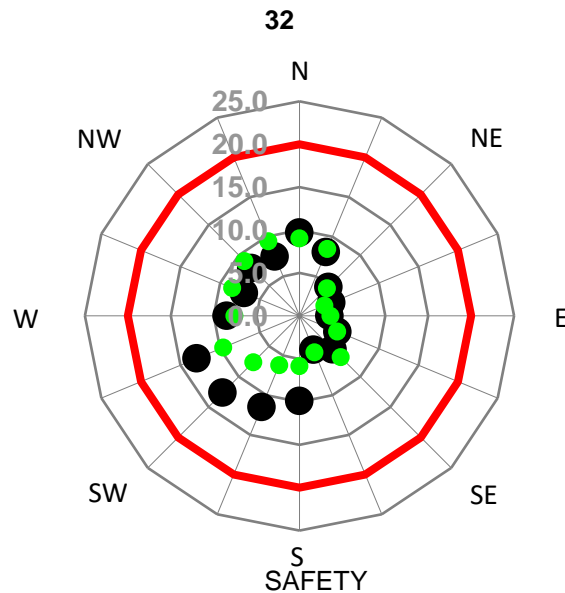
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	24.4%	11.5%	5.5%	3.3	Pass	15.4	Pass
● Existing Configuration	22.5%	10.5%	4.3%	3.2	Pass	16.4	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

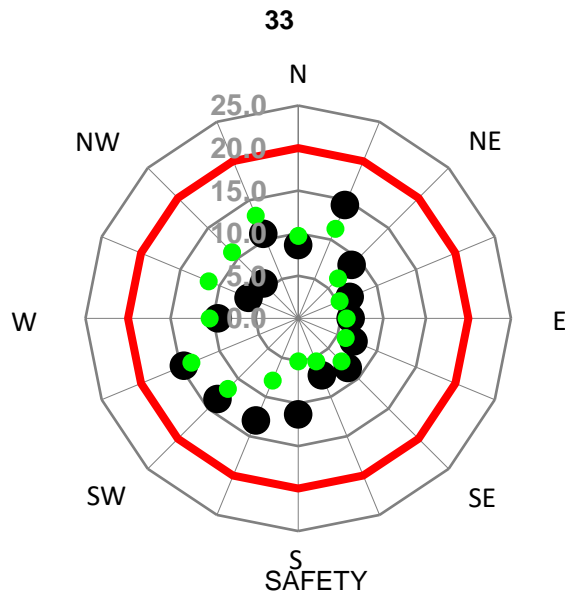
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	19.7%	7.9%	2.8%	3.0	Pass	12.9	Pass
● Existing Configuration	12.0%	3.8%	0.9%	2.5	Pass	9.6	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

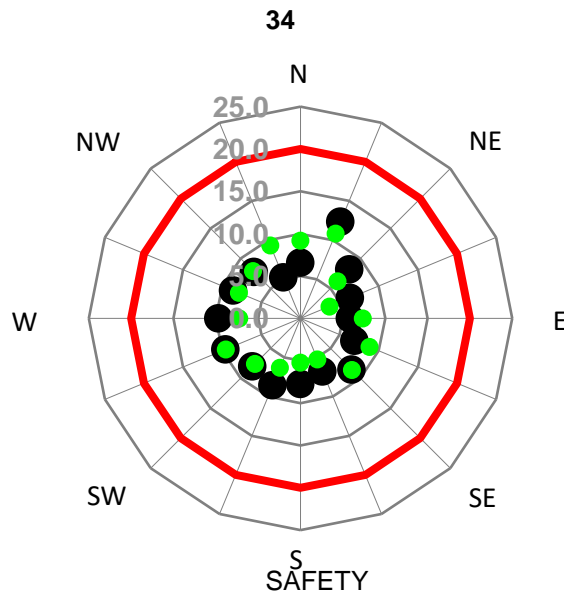
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	26.4%	13.4%	6.4%	3.4	Pass	14.5	Pass
● Existing Configuration	21.6%	10.6%	4.4%	3.1	Pass	13.6	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

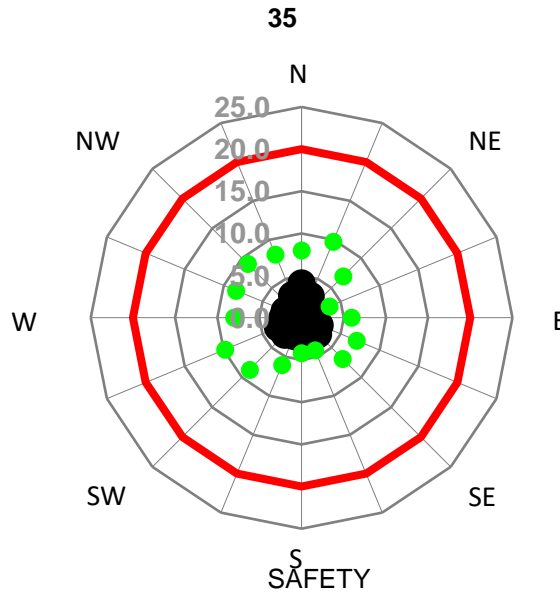
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	13.0%	4.3%	1.5%	2.6	Pass	12.3	Pass
● Existing Configuration	12.9%	4.3%	1.1%	2.5	Pass	10.8	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

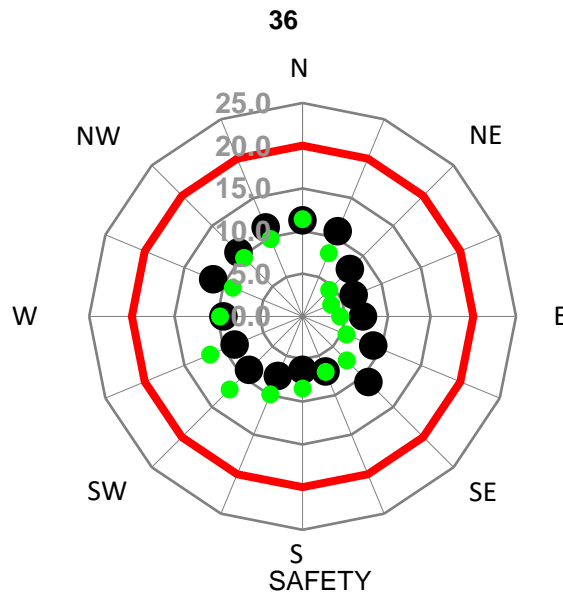
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria				Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 4m/s)	Peak wind speed (of all wind directions)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %			
● Proposed Configuration	0.0%			0.9	Pass	4.0
● Existing Configuration	10.8%	3.1%	0.7%	2.4	Pass	9.8
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Test Location



Local peak 3 second gust wind speed (m/s)

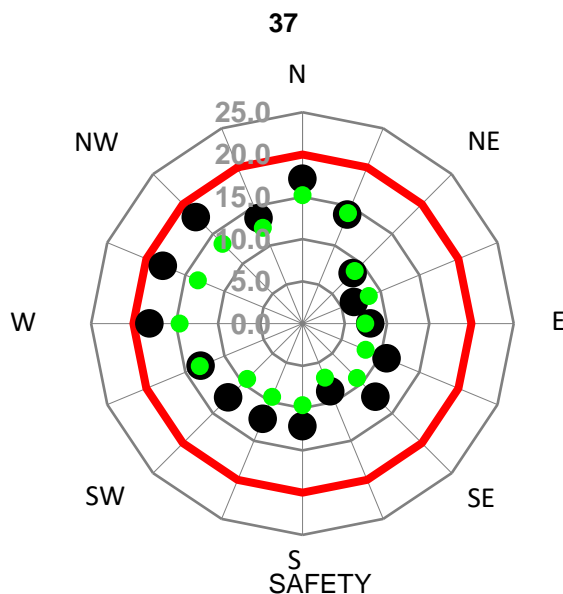
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	20.3%	9.2%	3.4%	3.0	Pass	11.3	Pass
● Existing Configuration	21.9%	9.6%	3.6%	3.1	Pass	12.1	Pass
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Local peak 3 second gust wind speed (m/s)

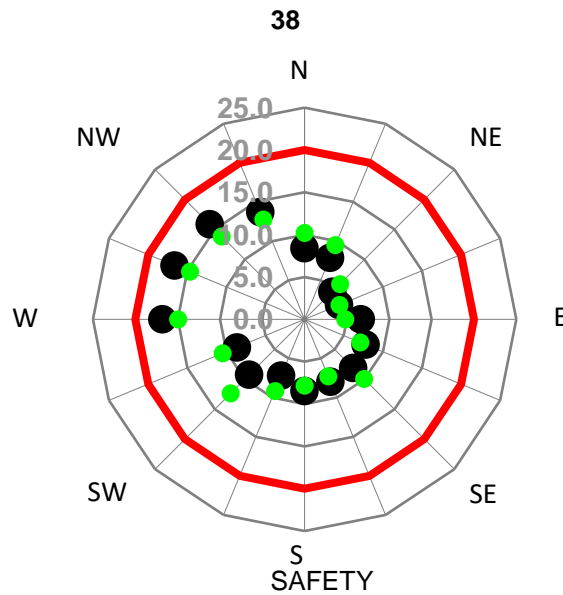
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	43.2%	27.3%	16.0%	4.6	Pass	18.1	Pass
● Existing Configuration	32.9%	17.8%	9.7%	3.8	Pass	15.2	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

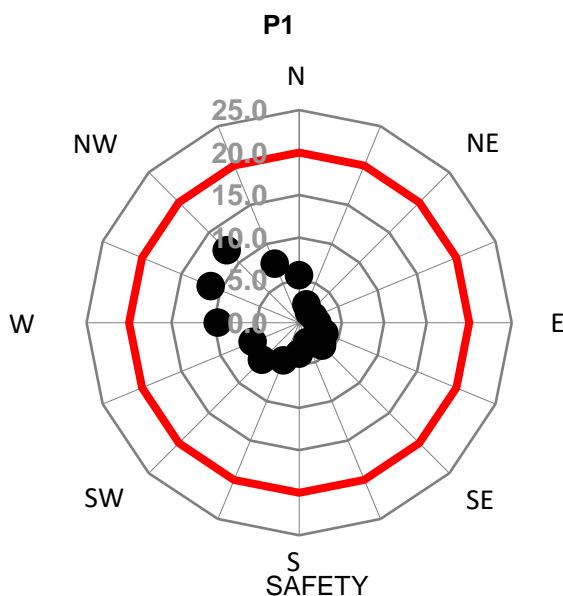
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	23.4%	11.3%	5.4%	3.2	Pass	16.8	Pass
● Existing Configuration	26.1%	12.6%	5.5%	3.4	Pass	15.0	Pass
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Local peak 3 second gust wind speed (m/s)

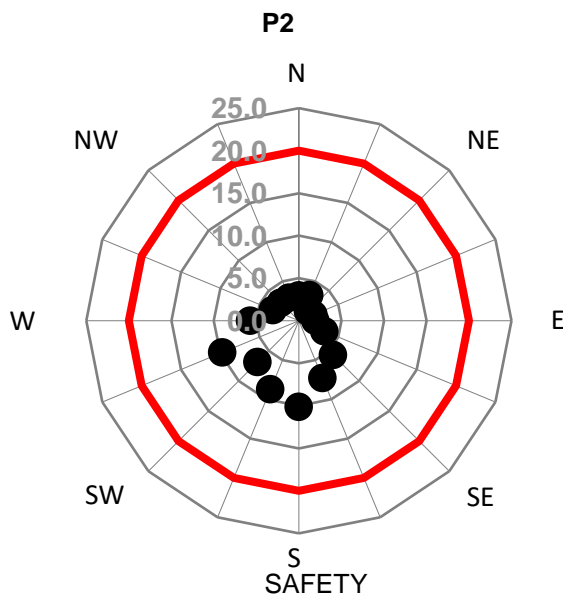
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	5.7%	2.1%	0.7%	1.9	Pass	12.0	Pass
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Local peak 3 second gust wind speed (m/s)

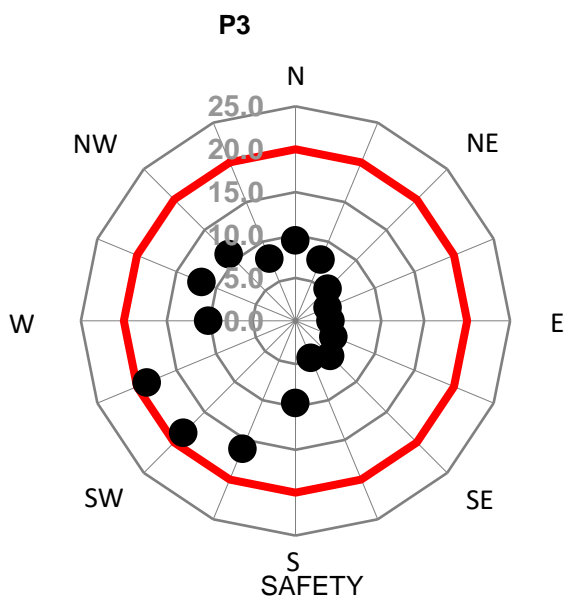
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	7.9%	2.5%	0.8%	1.9	Pass	10.1	Pass
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Local peak 3 second gust wind speed (m/s)

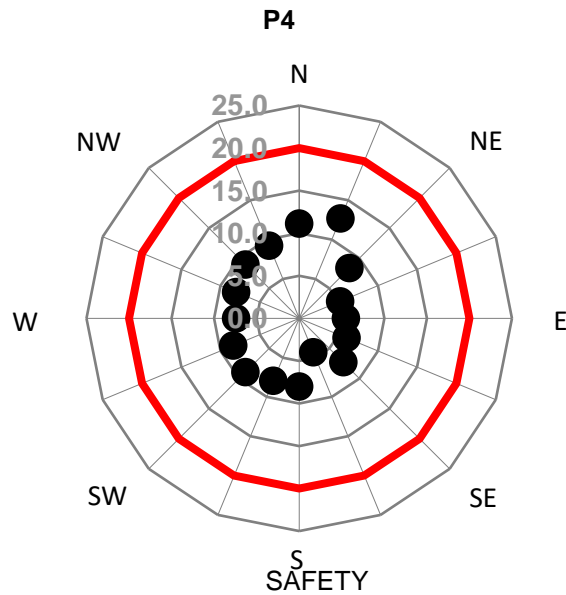
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	25.4%	13.3%	7.1%	3.4	Pass	18.7	Pass
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Local peak 3 second gust wind speed (m/s)

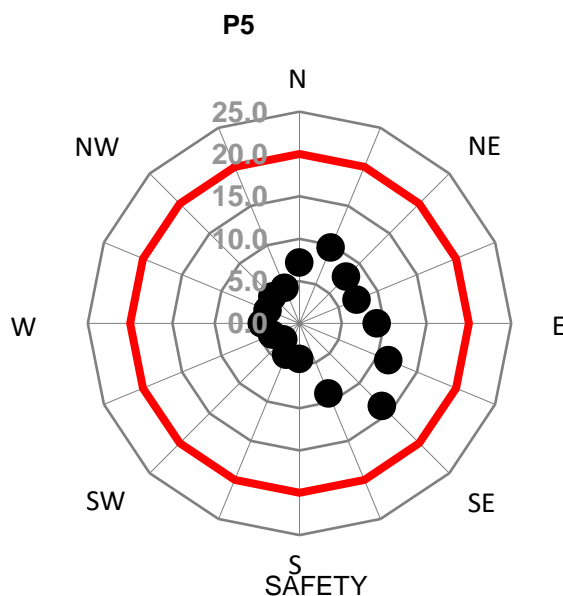
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	17.7%	7.2%	2.6%	2.9	Pass	12.7	Pass
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Local peak 3 second gust wind speed (m/s)

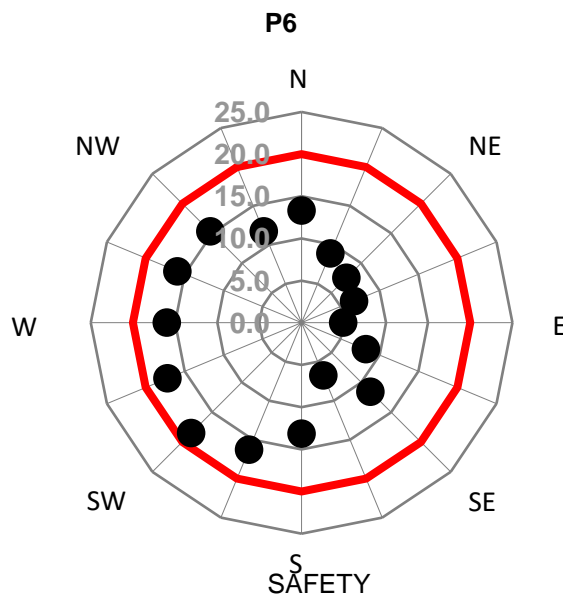
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	7.2%	2.7%	1.1%	1.9	Pass	13.8	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

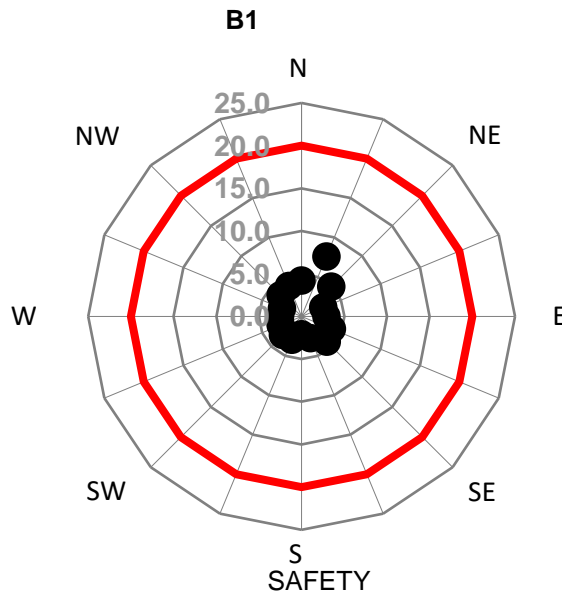
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	41.1%	26.7%	15.0%	4.5	Pass	18.5	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

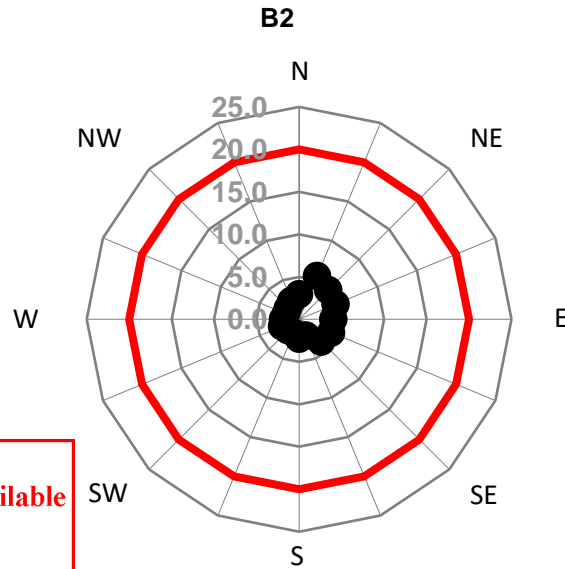
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	0.6%	0.1%	0.0%	1.1	Pass	7.6	Pass
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Test Location



SAFETY

Local peak 3 second gust wind speed (m/s)

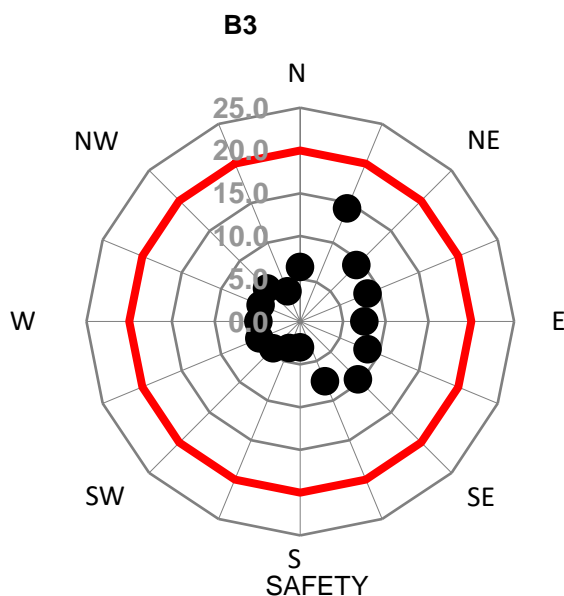
Safety Wind Speed = 20m/s

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Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	0.2%	0.0%	0.0%	1.0	Pass	5.5	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

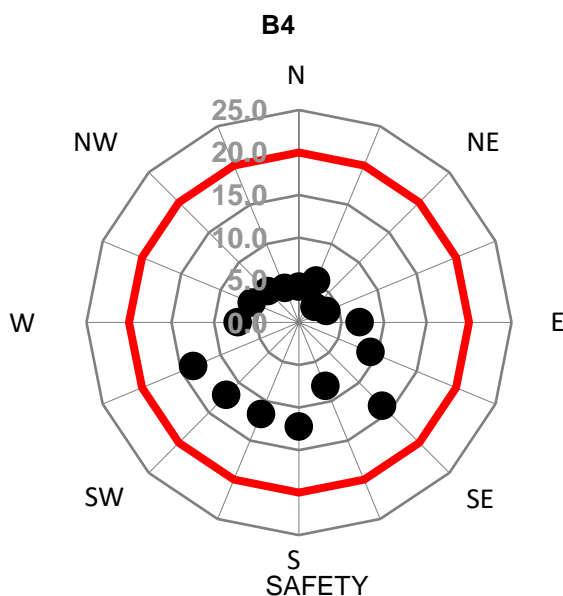
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	6.2%	2.4%	1.2%	1.9	Pass	14.3	Pass
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Local peak 3 second gust wind speed (m/s)

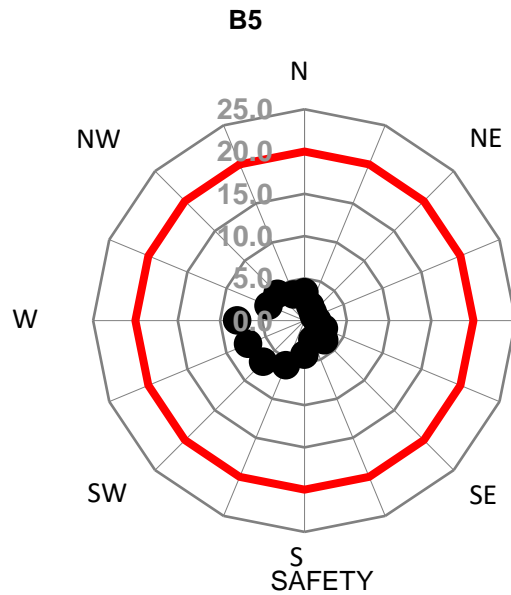
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	16.6%	8.5%	3.7%	2.7	Pass	13.8	Pass
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Local peak 3 second gust wind speed (m/s)

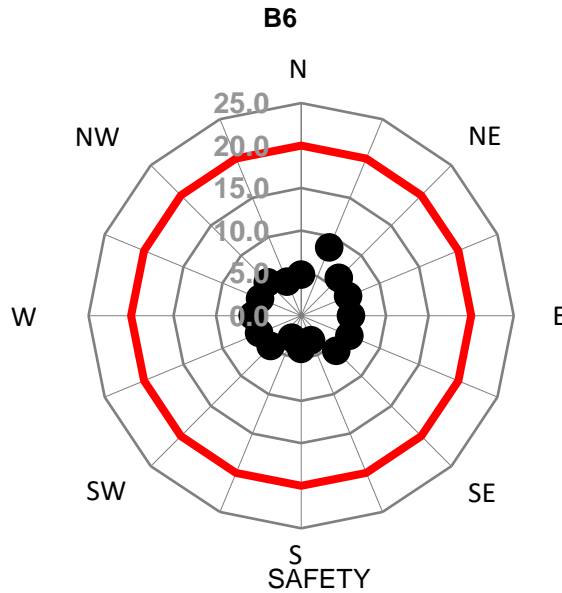
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	1.9%	0.4%	0.1%	1.4	Pass	7.9	Pass
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Local peak 3 second gust wind speed (m/s)

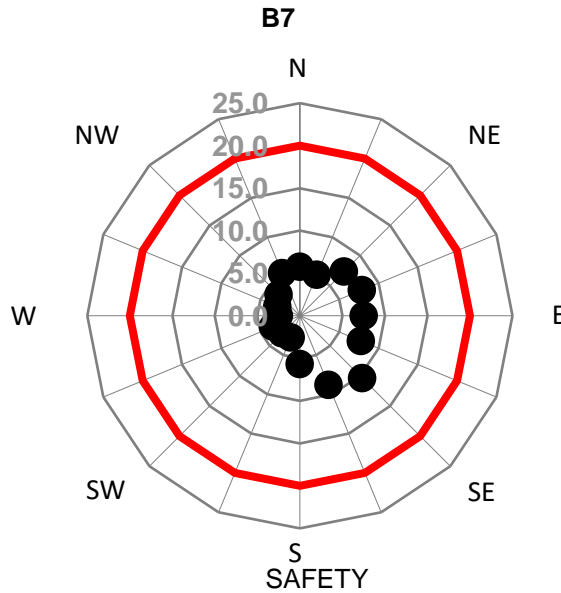
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	2.0%	0.5%	0.1%	1.6	Pass	8.7	Pass
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Local peak 3 second gust wind speed (m/s)

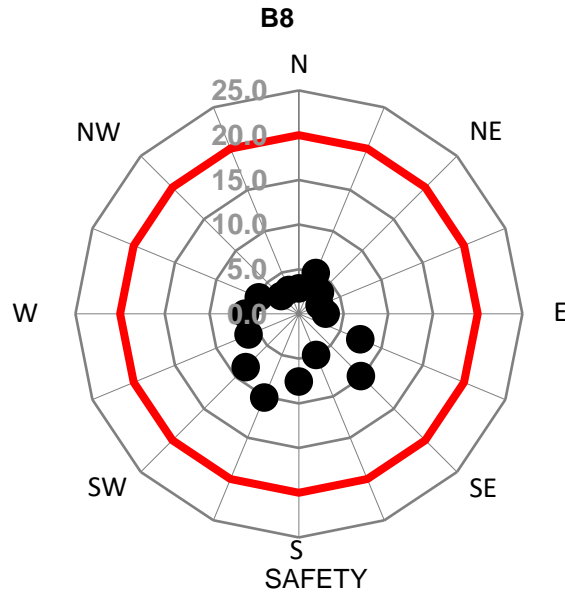
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	4.0%	1.2%	0.4%	1.8	Pass	10.4	Pass
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Local peak 3 second gust wind speed (m/s)

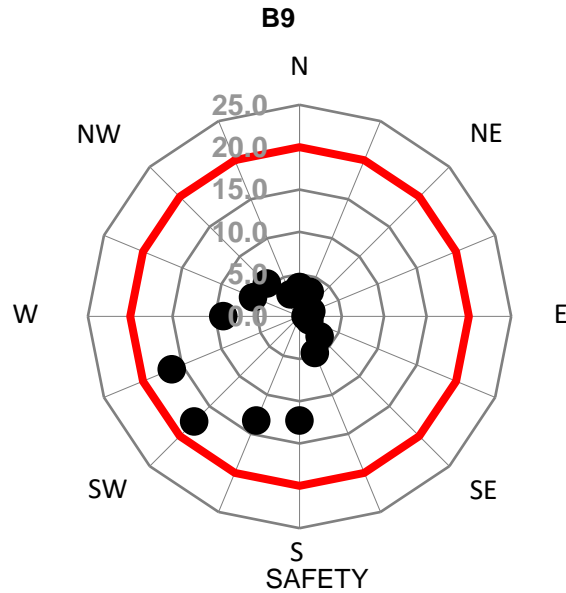
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	5.3%	1.7%	0.5%	1.8	Pass	10.1	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

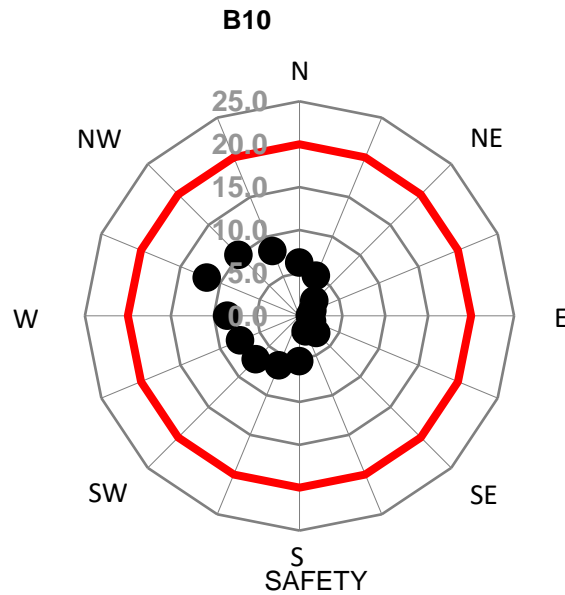
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	16.8%	10.0%	5.4%	2.6	Pass	17.6	Pass
●							
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Test Location



Local peak 3 second gust wind speed (m/s)

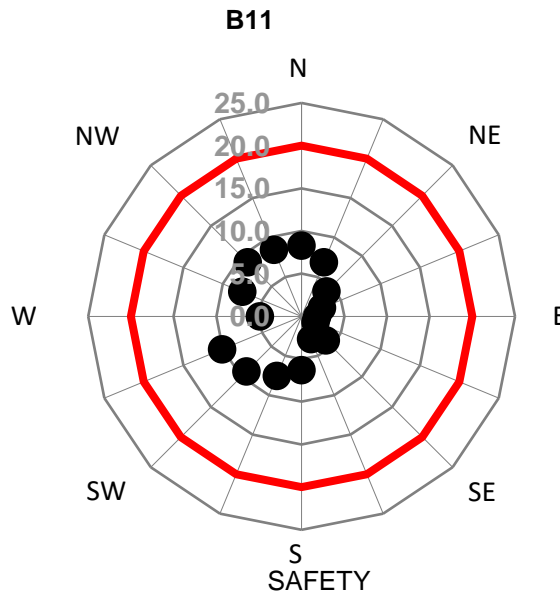
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	6.8%	2.0%	0.6%	2.1	Pass	11.7	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

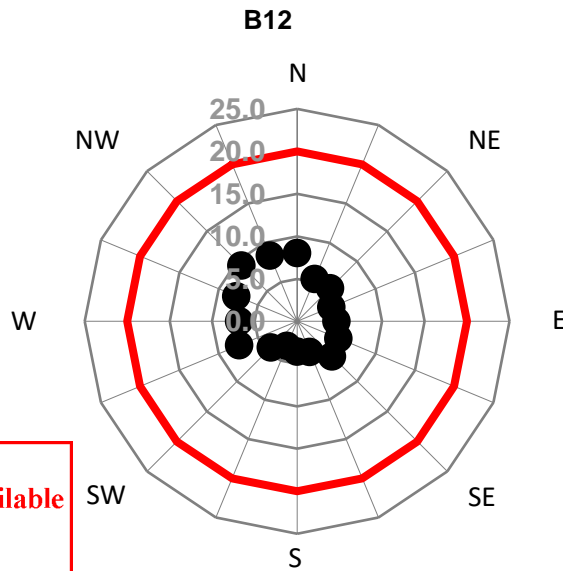
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	10.3%	3.1%	0.7%	2.3	Pass	10.1	Pass
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Test Location



SAFETY

Local peak 3 second gust wind speed (m/s)

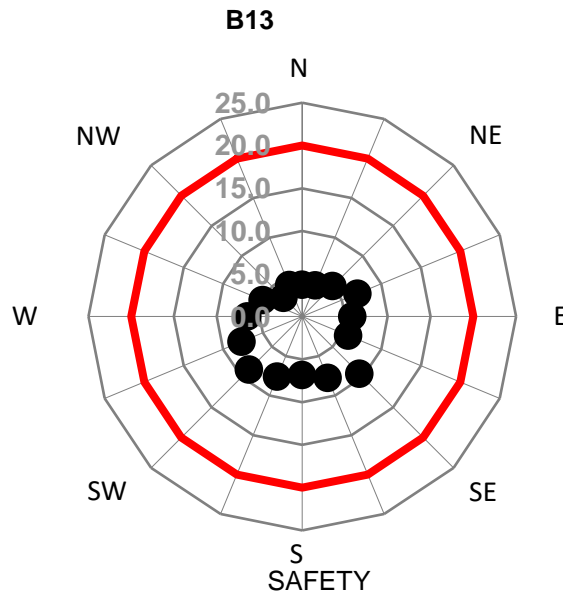
Safety Wind Speed = 20m/s

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Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	6.9%	1.7%	0.3%	2.0	Pass	9.3	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

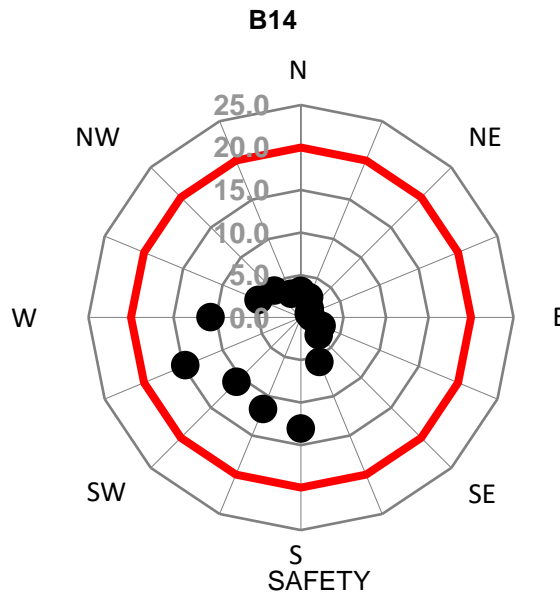
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s)	Standing (4m/s)	Walking (5m/s)				
● Proposed Configuration	5.7%	1.6%	0.4%	1.9	Pass	9.5	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

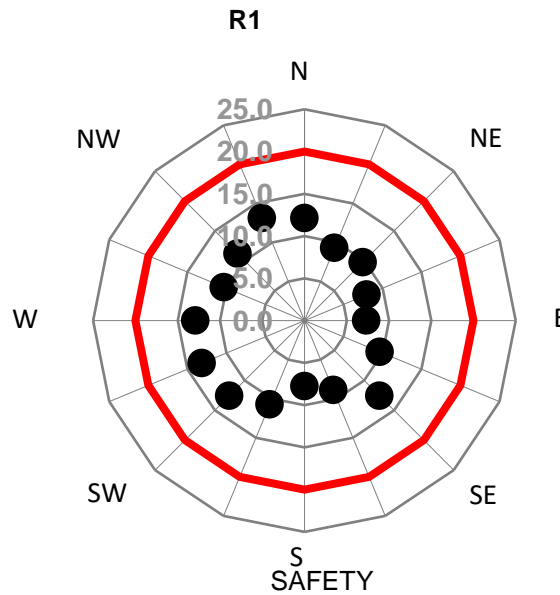
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year) m/s	Result (compared against Target wind speed of 5m/s) Pass/Fail	Peak wind speed (of all wind directions) m/s	Result (compared against Safety wind speed of 20m/s) Pass/Fail
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	15.2%	8.1%	3.6%	2.5	Pass	14.7	Pass
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Local peak 3 second gust wind speed (m/s)

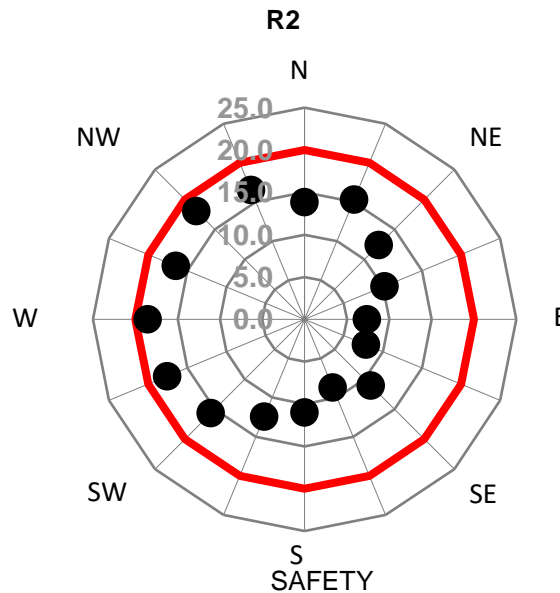
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	29.5%	15.2%	6.8%	3.6	Pass	13.2	Pass
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Local peak 3 second gust wind speed (m/s)

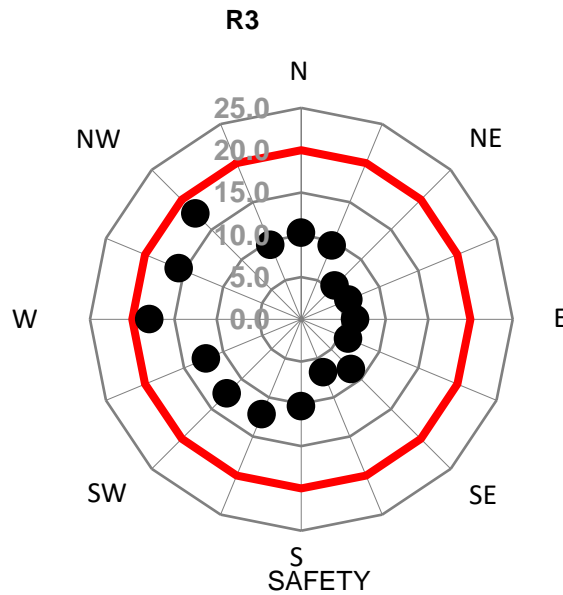
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	43.0%	26.9%	15.6%	4.5	Pass	18.5	Pass
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Test Location



Local peak 3 second gust wind speed (m/s)

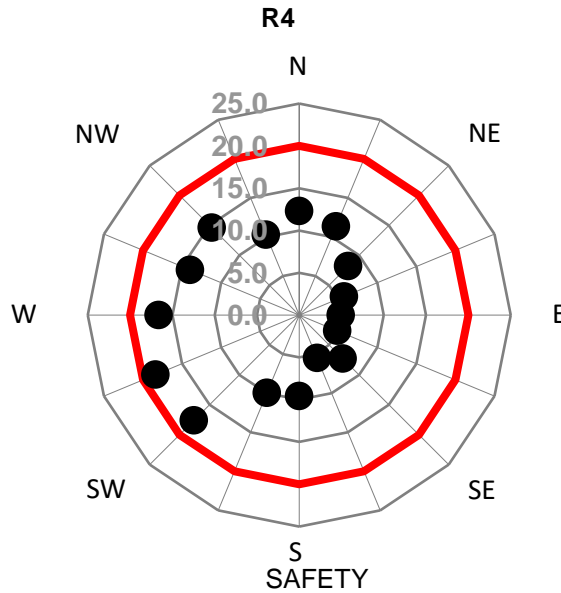
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	30.3%	15.1%	7.1%	3.6	Pass	18.0	Pass
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Local peak 3 second gust wind speed (m/s)

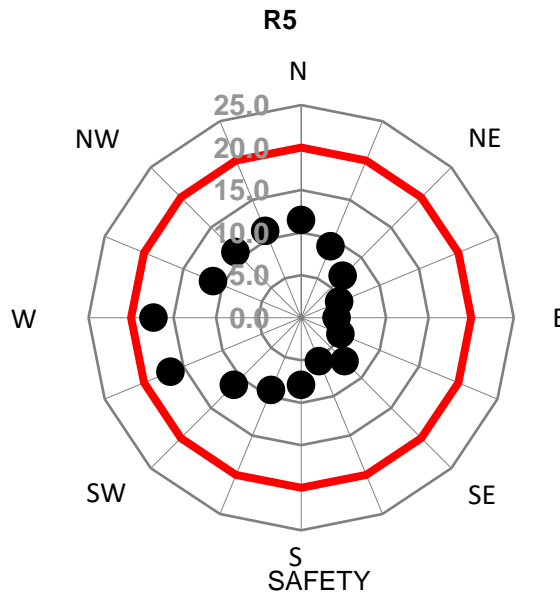
Safety Wind Speed = 20m/s

Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	32.9%	18.9%	10.3%	3.9	Pass	18.4	Pass
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Test Location



Configuration	Wind Comfort Criteria					Safety Criterion	
	Exceedence of given wind speed per year			Mean wind speed (exceeded 20% of year)	Result (compared against Target wind speed of 5m/s)	Peak wind speed (of all wind directions)	Result (compared against Safety wind speed of 20m/s)
	Sitting (3m/s) %	Standing (4m/s) %	Walking (5m/s) %				
● Proposed Configuration	26.1%	13.7%	6.4%	3.4	Pass	17.4	Pass
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