FINAL REPORT

TOGA CENTRAL

SYDNEY, AUSTRALIA

PEDESTRIAN WIND STUDY
RWDI # 1902973
November 27, 2020

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed TOGA Central development located on Block C of the Central Station Western Gateway Sub-Precinct in Sydney, NSW. The pedestrian level wind assessment was conducted for two configurations (representing the publicly available massing schemes for surrounding buildings available at the time of testing):

Existing: Existing site with existing surroundings, including the Block A Winning Design Competition Massing and Block B Public Exhibition Reference Design Massing of the Central Station Western Gateway Sub-Precinct (Image 2A), and,

Proposed: Proposed development with existing surroundings, including the Block A Winning Design Competition Massing and Block B Public Exhibition Reference Design Massing of the Central Station Western Gateway Sub-Precinct (Image 2B).

The potential wind conditions at pedestrian level on and around the proposed project were predicted using the results from a boundary-layer wind tunnel test combined with historical meteorological wind records for the area as shown on site plans in Figures 1A through 2B, while the associated wind speeds are listed in Table 1. The results can be summarised as follows:

- The existing conditions were noted to generally satisfy the standing and walking conditions throughout the precinct, with localized areas exceeding the walking criteria at south-western corner of Block B. A number of locations (17) were noted to exceed the safety limit criteria including areas along Lee Street, within the Western Forecourt, on the north-south link and the Devonshire stairway and pedestrian bridge.
- The inclusion of the subject development-built form was noted to improve conditions for a number of additional areas satisfying the walking criteria. Generally, conditions will still satisfy the standing or walking criteria throughout the sub-precinct and its surrounds. In addition, this would offer some shelter to the north-eastern direction of the Proposed Development due to the obstruction of the prevailing winds. Generally, wind conditions will still satisfy the standing to walking criteria throughout the sub-precinct and its surrounds.

  The proposed development was noted to reduce the number of locations exceeding the safety limit criteria down to 14. Overall, there was a net improvement of wind conditions for 9 locations in the precinct with the inclusion of the TOGA Central development. The inclusion of the development was found to mitigate the following locations:
  - All locations within the Western Forecourt area;
  - The western corner of the heritage hotel; and
  - Two locations within the north-south link.

  The remaining locations were noted to not be affected by the subject development as they were governed by the existing conditions. Wind conditions at two additional locations were noted on the north-south link due to the southerly winds funneled between Blocks A and B (probe locations 13 and 14) and the walkway to the south-eastern area of the Proposed Development (probe locations 9 and 10). Mitigation measures have been discussed in this report to address this area and can be investigated in further detailed once the design has developed.
- Upper level terrace area locations were noted to be exposed to the prevailing wind conditions and hence will need to be considered as part of the detailed design.

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1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed rezoning and reference design of the development known as the TOGA Central, located on Block C of the Central Station Western Gateway Sub-Precinct in Sydney, NSW. This report presents the project objectives, background and approach, and discusses of the results from RWDI's wind tunnel assessment and provides conceptual wind control measures, where necessary.

1.1 Project Description

The project (site shown in Image 1) is located at the north-western corner of the Central Station Western Gateway Sub-Precinct at the corner of Lee Street and Ambulance Avenue. Block A (Atlassian) is located to the east of the site and Block B (Dexus/Fraser) is located to the south. The proposed development is to be located adjacent and partially atop the existing Adina Hotel and has a maximum height governed by the Sun Access Plane (SAP) to Prince Alfred Park, which at the highest point equates to an RL of 211.98 m.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations for minimising adverse effects, if needed. This quantitative assessment was based on wind speed measurements of a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to appropriate criteria for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including public footpaths.

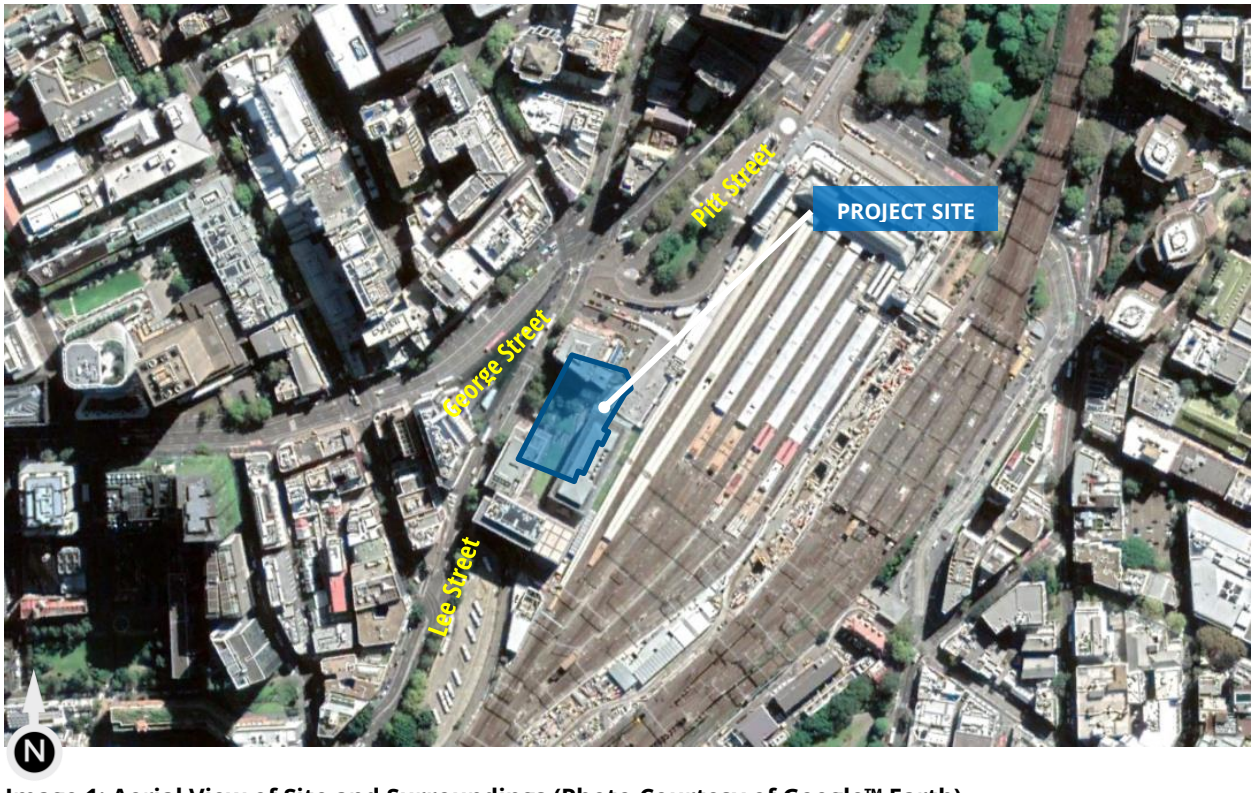


Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

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

A - Existing: Existing site with existing surroundings, including the Block A Winning Design Competition Massing and Block B Public Exhibition Reference Design Massing of the Central Station Western Gateway Sub-Precinct (Image 2A), and,

B - Proposed: Proposed development with existing surroundings, including the Block A Winning Design Competition Massing and Block B Public Exhibition Reference Design Massing of the Central Station Western Gateway Sub-Precinct - (Image 2B).

It is noted that the massing for Blocks A and B represent the publicly available massing schemes available at the time of testing.

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 360 m radius of the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 80 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 1.5 m above local grade in the pedestrian accessible areas throughout the study area. Wind speeds were measured for 36 directions at 10-degree increments. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site and reviewed by the client.

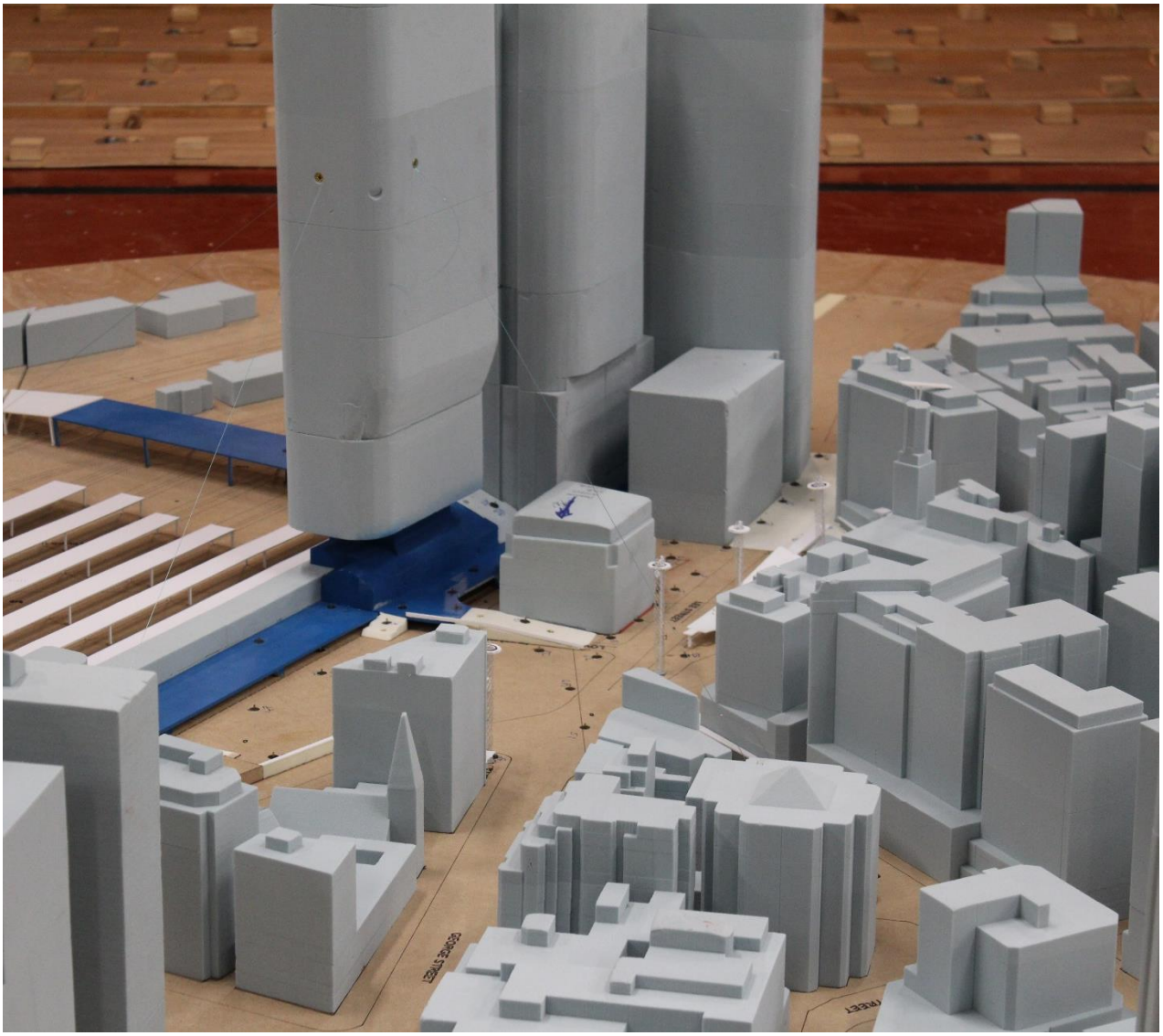
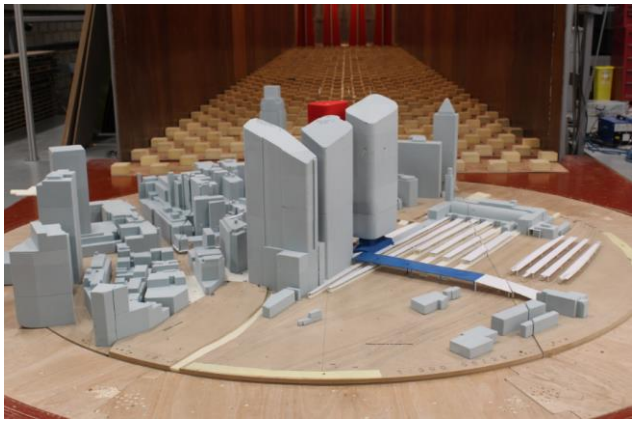
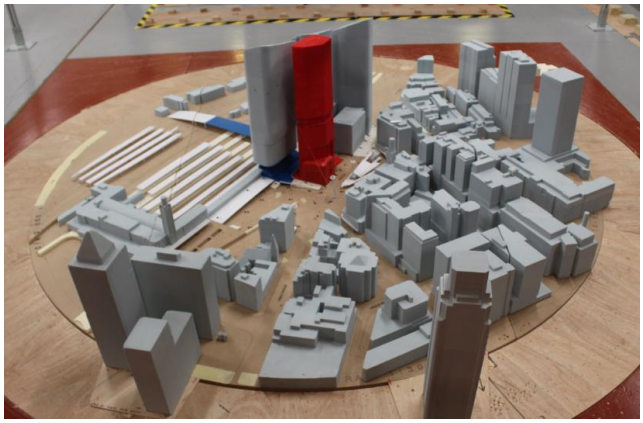


Image 2A: Wind Tunnel Study Model – Existing Configuration





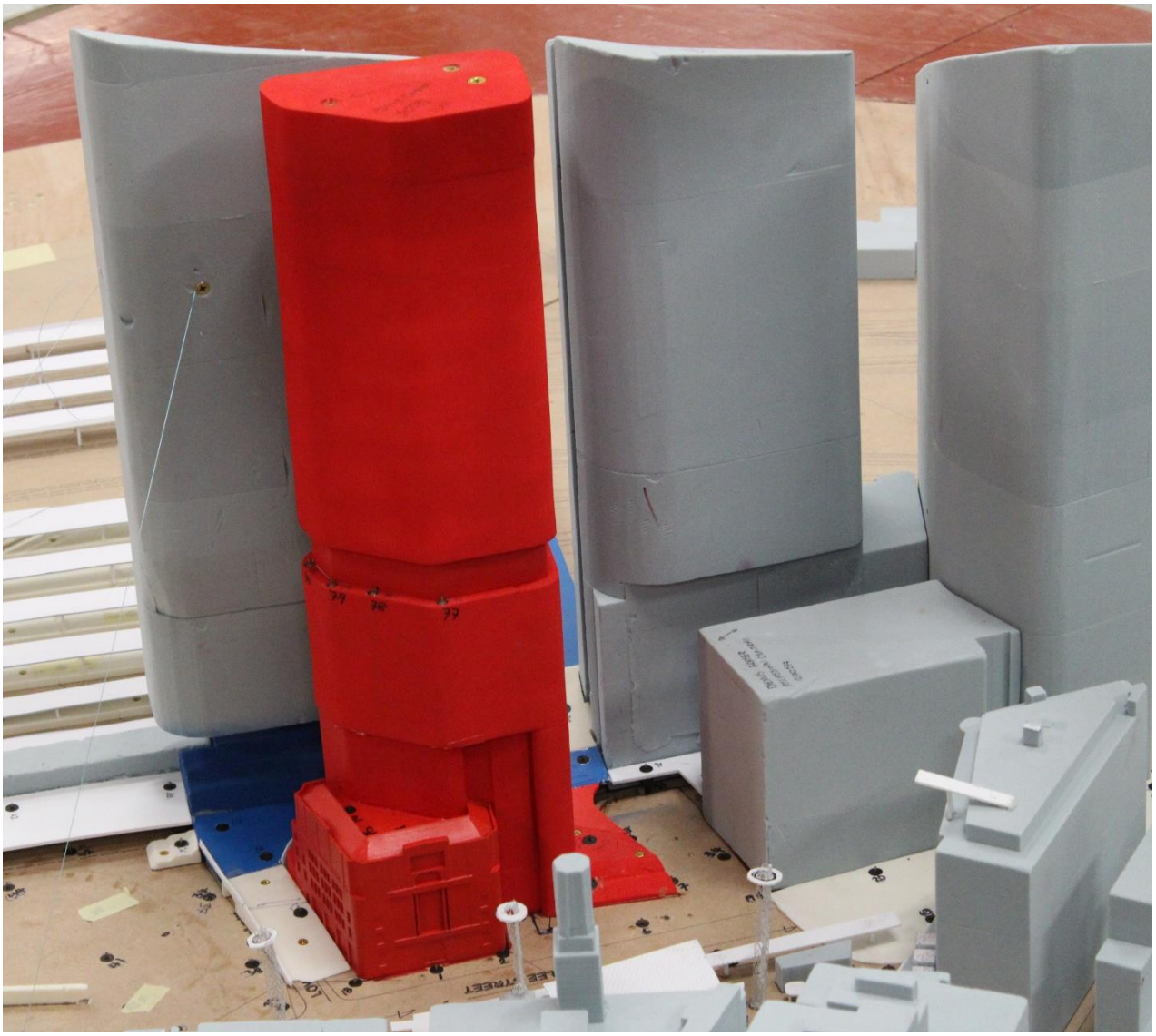
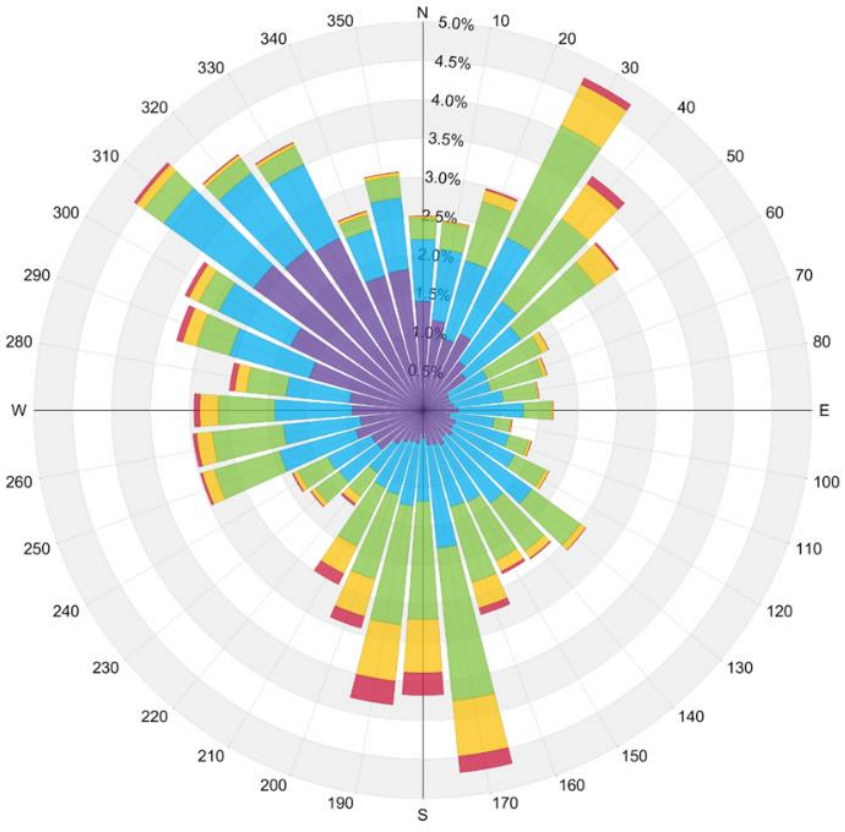


Image 2B: Wind Tunnel Study Model – Proposed Configuration

2.2 Meteorological Data

Wind statistics recorded at Sydney International Airport between 1999 and 2018, inclusive, were analyzed annually. Image 3 graphically depicts the annual directional distributions of wind frequencies and speeds. Winds from the northwest, west and northeast, and south directions are predominant throughout the year as indicated by the wind rose (Image 3). Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10 m) occur for 9.4% of the time throughout the year.

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



Annual Winds

Wind Speed (km/h)	Probability (%)
Calm	0.3
1-10	33.2
11-20	31.8
21-30	25.3
31-40	7.3
>40	2.1

Image 3: Directional Distribution of Winds Approaching Sydney International Airport From 1999 to 2018

2.3 The Draft Sydney Planning Strategy 2016-2036 wind criteria

The assessment of wind comfort and safety is based on the criteria described in the Draft Sydney Planning Strategy 2016 – 2036. The criteria states the following:

*Define the mandatory **Wind Safety Standard** as an annual maximum peak 0.5 second gust wind speed in one hour measured between 6am and 10pm Eastern Standard Time (EST) of **24 metres per second.***

*Define the mandatory **Wind Comfort Standard for Walking** as an hourly mean wind speed, or gust equivalent mean wind speed, whichever is greater for each wind direction, for no more than 292 hours per annum measured between 6am and 10pm EST (i.e., 5 percent of those hours) of **8 metres per second**.*

*Define the mandatory **Wind Comfort Standard for Sitting** in Parks as an hourly mean wind speed, or gust equivalent mean wind speed, whichever is greater for each wind direction, for no more than 292 hours per annum measured between 6am and 10pm EST of **4 metres per second** and applies to parks protected by Sun Access Planes and/or No Additional Overshadowing Controls.*

*Define the desirable **Wind Comfort Standard for Sitting and Standing** as an hourly mean wind speed, or gust equivalent mean wind speed, whichever is greater for each wind direction, for no more than 292 hours per annum measured between 6am and 10pm EST of:*

4 metres per second for Sitting
6 metres per second for Standing

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on site plans in Figures 1A, 1B, 2A and 2B located in the "Figures" section of this report. Existing Site conditions are shown in Figures 1A, and 2A, while conditions with the proposed TOGA Central development are shown in Figures 1B, and 2B. Figures 1A and 1B show the annual comfort conditions while 2A and 2B show the safety wind conditions.

These conditions and the associated wind speeds are also represented in Table 1, located in the "Tables" section of this report. The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

3.1 Configuration A – Existing Site Conditions

3.1.1 Grade Level (Locations 1 through 73)

Wind conditions on and around the project site are largely suitable for standing to walking use throughout the year at most of the locations. Two locations (23 and 64) at the south-western corner of Block B (adjacent to the intersection of Lee Street and Little Regent Street) are noted to experience uncomfortable wind conditions. Two locations (17 and 33) located on the northern aspect of the heritage hotel and within the Block B massing respectively are noted to achieve sitting conditions. Wind conditions around the site are generally driven by the north-north-easterly and southerly winds, as such conditions are slightly stronger during the summer months of the year when these wind directions are more prevalent.

There were occurrences of strong winds which will exceed the safety threshold of 24 m/s along Lee Street (Locations 2, 3, 23, 58, 62, 63 and 64), the north-south link and northern park areas (Locations 12, 16, 42, 43, 44) and the stairway connection to Devonshire Street Bridge Over Station Development (OSD) (Locations 29, 30, 71, 72 and 73). These areas are noted to be exposed due to the interaction with the massing envelopes of the Block A Winning Design Competition Massing and Block B Public Exhibition Reference Design massing built forms. The Devonshire Street Bridge over Central Station was modelled without the inclusion of any balustrades etc and hence is exposed due to the elevated and exposed location of the pedestrian bridge.

3.2 Configuration B – Proposed TOGA Central Development

3.2.1 Grade Level (Locations 1 through 73)

3.2.1.1 Pedestrian Footpaths

Wind conditions along George Street (Locations 50 to 56, 59, 60 and 67 to 70) were found to satisfy the standing conditions for pedestrian comfort. These conditions were found to be generally similar to the existing conditions, noting a minimal impact with the inclusion of the proposed development for these footpath areas.

The conditions along the eastern side of Lee Street with the inclusion of the development were noted to generally satisfy the standing comfort conditions, apart from Location 23 at the south-western corner of Block B which continue to have uncomfortable conditions and also exceeds the safety limit as in the existing case. The proposed development is noted to improve the conditions for this area with a number of locations adjacent to the heritage hotel (Locations 2, 3 and 6) noted to satisfy the walking criteria in the existing configuration now

being comfortable for standing. The areas along the western side of Lee Street (Locations 57, 58 and 61 to 65) are noted to generally satisfy the walking criteria, with uncomfortable conditions noted at the corner of Little Regent Street and Lee Street. These conditions are noted to be similar to the existing configuration tested and hence noted to be a result of the existing context and not affected by the inclusion of the proposed development.
It is noted that Locations 2, 3, 23, 58, 62, 63 and 64 exceed the safety limit for the existing scenario (as noted in Section 3.1.1) however with the inclusion of the proposed development, Locations 2 and 3, at the western corner of the heritage hotel will no longer exceed the safety limit. The other locations display a minimal effect with the inclusion of the subject development as they are governed by the built environment modelled in the existing conditions.

3.2.1.2 Henry Deane Plaza

Wind speeds within Henry Deane Plaza were noted to generally satisfy standing conditions throughout the year, with similar conditions to the existing site conditions noted. Locations 9 and 10 at the north-eastern corner of the Plaza is noted to experience an increase in the wind conditions. This was found to be largely due to the southerly winds funnelling through the gap between the Block A and Block B massing to the east and down-washing off the south-eastern corner of the tower form as well as the westerly winds downwashing and funnelling between the tower forms. The inclusion of horizontal articulation in the Block C built form at the lower levels along the eastern aspect of the development should be considered and is expected to assist in mitigating this noted downwash effect. It is further noted that Block B in the publicly exhibited Environmental Wind Assessment report dated 10 October 2019 (Arup) included a temporary roof structure over the Devonshire stairs (leading to the OSD) which, if implemented, could resolve the wind conditions in this area (subject to further assessment).

3.2.1.3 North-South Link

Wind conditions throughout the north-south link (Locations 12 to 16 and 31 to 33) experience different effects with the inclusion of the subject development. To the south within the Block B site (Locations 31 to 33) conditions are noted to be generally similar to the existing conditions with conditions satisfying the standing and sitting criteria. The inclusion of the development is also noted to remove the safety limit exceedances noted in the existing configuration for Locations 12 and 16. The section between the Block A (Atlassian) building and the TOGA Central built forms (Locations 13 and 14) is noted to increase the wind speed conditions with the inclusion of the development. This was found to primarily be a result of the southerly winds funnelling through the gap between Blocks A and B massing to the east and down-washing off the south-eastern corner of the proposed tower form, which previously was being directed over the heritage hotel. As noted in Section 3.2.1.2, it is recommended that façade elements be included along the eastern and southern aspects of the TOGA Central massing along the north-south link to capture these downwashed winds. It will be important that these elements be developed with an understanding of the mitigation measure required for the Devonshire Street Stairway noted in Section 3.2.1.5 to ensure a holistic solution.

3.2.1.4 Western Forecourt

Wind conditions within the proposed Western Forecourt precinct (Locations 35 to 49) to the north of the Western Gateway Sub-Precinct are noted to benefit with the inclusion of the TOGA Central development. The existing conditions noted that while all locations would satisfy the standing criteria, three locations would exceed the safety limit criteria. With the inclusion of the TOGA Central built form, 5 of these locations will now

satisfy the sitting criteria, while all locations will also satisfy the safety limit criteria. This includes the extension of the north-south link within the Western Forecourt area.

3.2.1.5 Devonshire Street Bridge and Stairway

The Devonshire Street Bridge over Central Station (Locations 71 to 73) and the stairway between Blocks A and B (Locations 29 and 30) are noted to be exposed to adverse wind conditions which will exceed the safety limit criteria. This was noted in Section 3.1.1 for the existing configuration that a mitigation approach will need to be developed as part of Block A and/or Block B design solutions. The mitigation measure developed should consider conditions in the North-South Link to ensure that this does not simply transfer these adverse conditions to this area.

3.2.2 Above-Grade Levels (Locations 74 to 80)

3.2.2.1 Level 6

The rooftop area on the north-western corner of the existing heritage hotel was found to be generally suitable for the intended use as an outdoor space, with conditions satisfying the sitting and standing conditions. This is expected to be due to this area being set down from the perimeter roofline of the heritage hotel façade. The area would benefit from inclusion of landscaping treatments which can be developed in due course as the design progresses.

3.2.2.2 Level 20

There is a setback around the perimeter of Level 20. This area has been modelled as recessed terrace as part of the reference massing, with no consideration for required balustrade/screening included as part of this study to provide an indication of wind conditions in the area. All areas are subsequently expected to experience conditions which exceed the safety limit criteria and generally encounter uncomfortable conditions for people using this space. Any elevated terrace space will need to consider these wind conditions as the design develops to ensure that suitable conditions can be provided for use by patrons. Elements to consider may include porous or solid screening as well as localized landscaping to help reduce these conditions. Alternatively, the consideration for compartmentalization of outdoor terrace spaces to minimise the potential for funneling through voids. It is also noted that this feature is expected to have provided some benefit to reducing the downwash to lower level areas so should not be completely closed off.

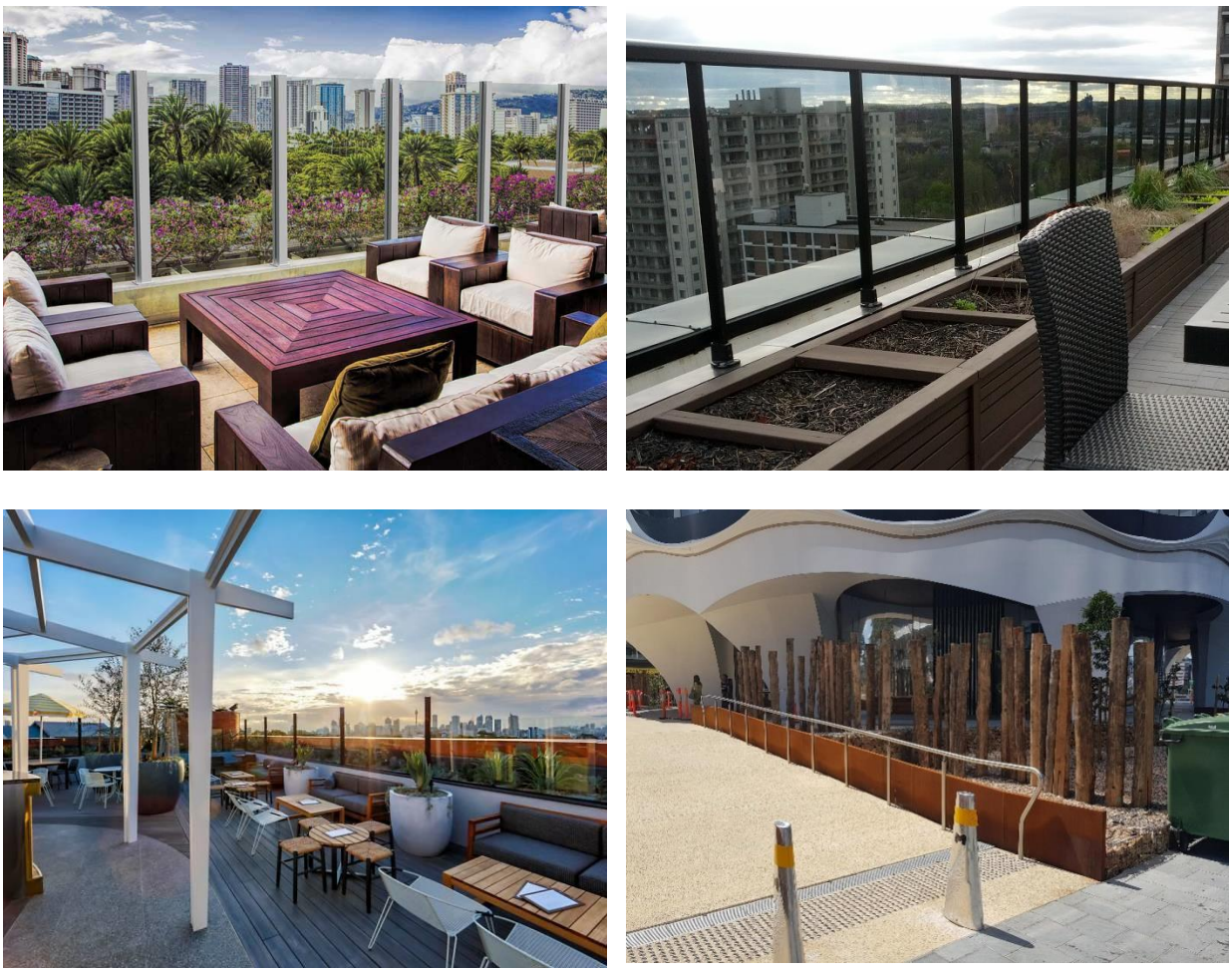


Image 5: Examples of Landscaping and Screening Elements for Terrace Spaces

4 APPLICABILITY OF RESULTS

The drawings and information listed below were received from FJMT and were used to construct the scale model of the proposed TOGA Central development in Sydney. The wind conditions presented in this report pertain to the proposed development as detailed in the architectural design drawings listed in the table below. The constructed scale model was reviewed and approved by FJMT prior to commencement of testing.

Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
1902973 Adina Central	Rhino	10/08/2020
TAC Adina Central Model	DWG	11/11/2020

5 REFERENCES

1. ASCE Task Committee on Outdoor Human Comfort (2004). *Outdoor Human Comfort and Its Assessment*, 68 pages, American Society of Civil Engineers, Reston, Virginia, USA.

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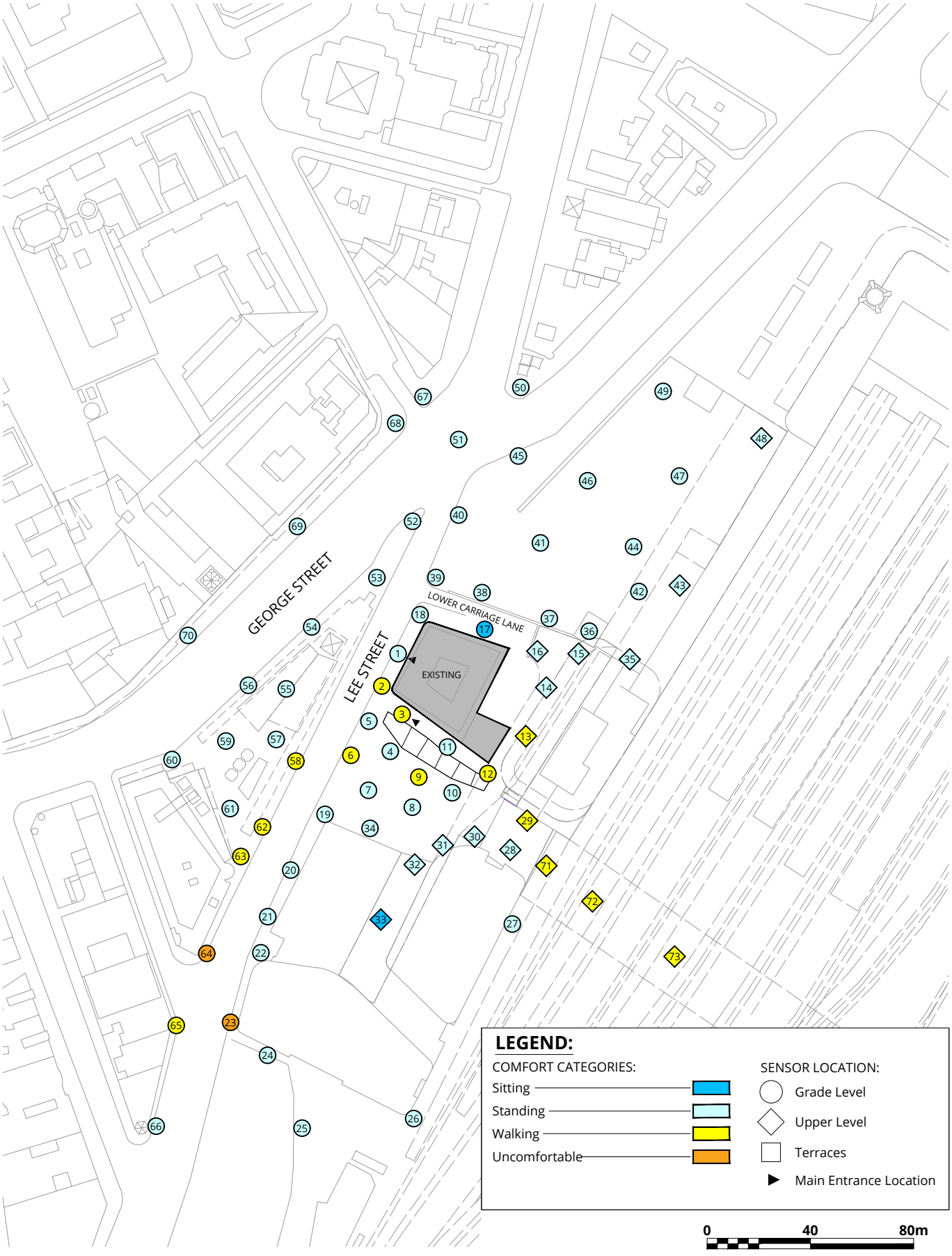
FIGURES



Pedestrian Wind Comfort Conditions - Existing

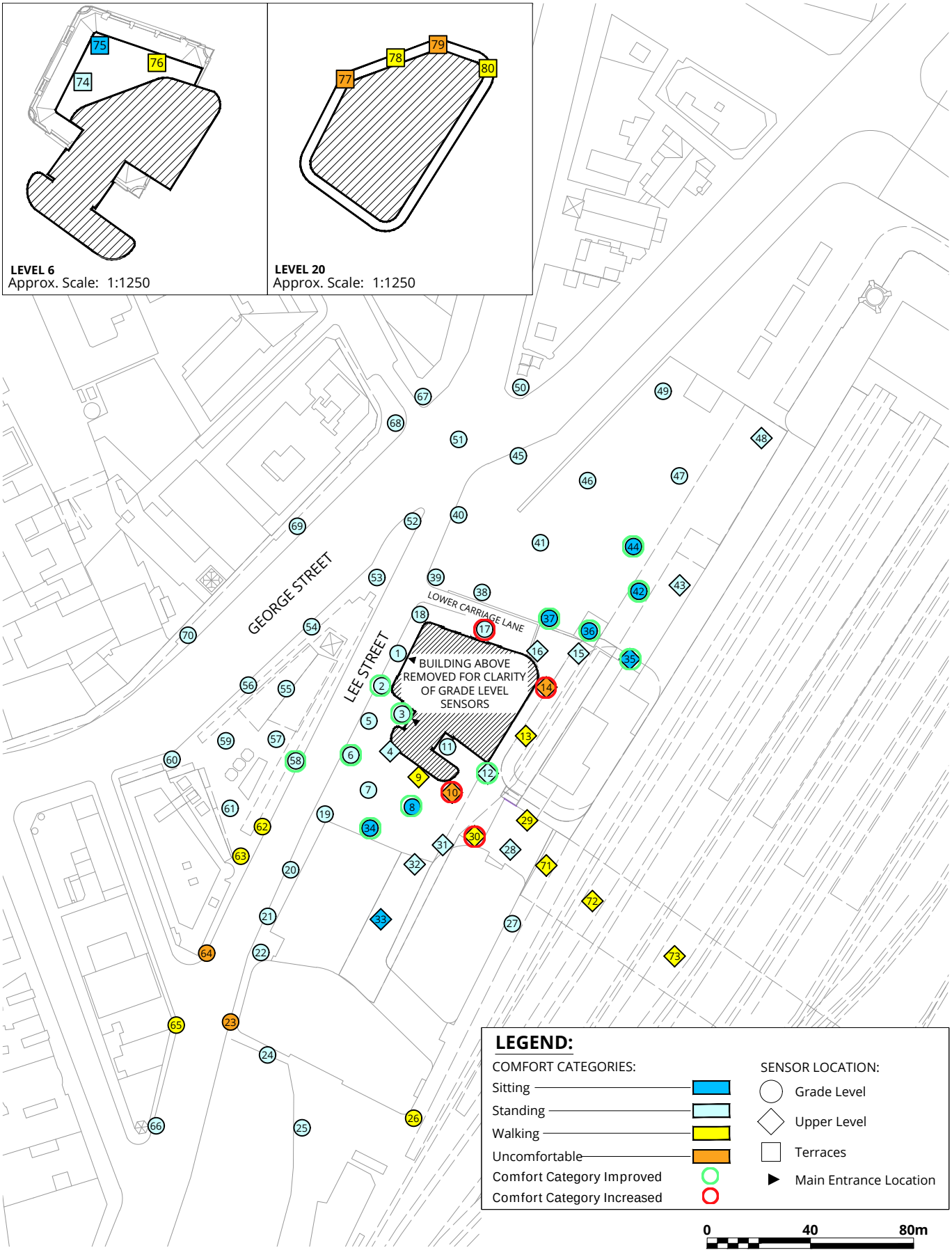
Annual (January to December, 6:00 to 22:00)

True North

Drawn by:	SAA	Figure:	1
Approx. Scale:	1:2000		
Date Revised:	Nov. 20, 2020		

Adina Central Redevelopment - Sydney, NSW

Project #1902973



Pedestrian Wind Comfort Conditions - Proposed

Annual (January to December, 6:00 to 22:00)

True North

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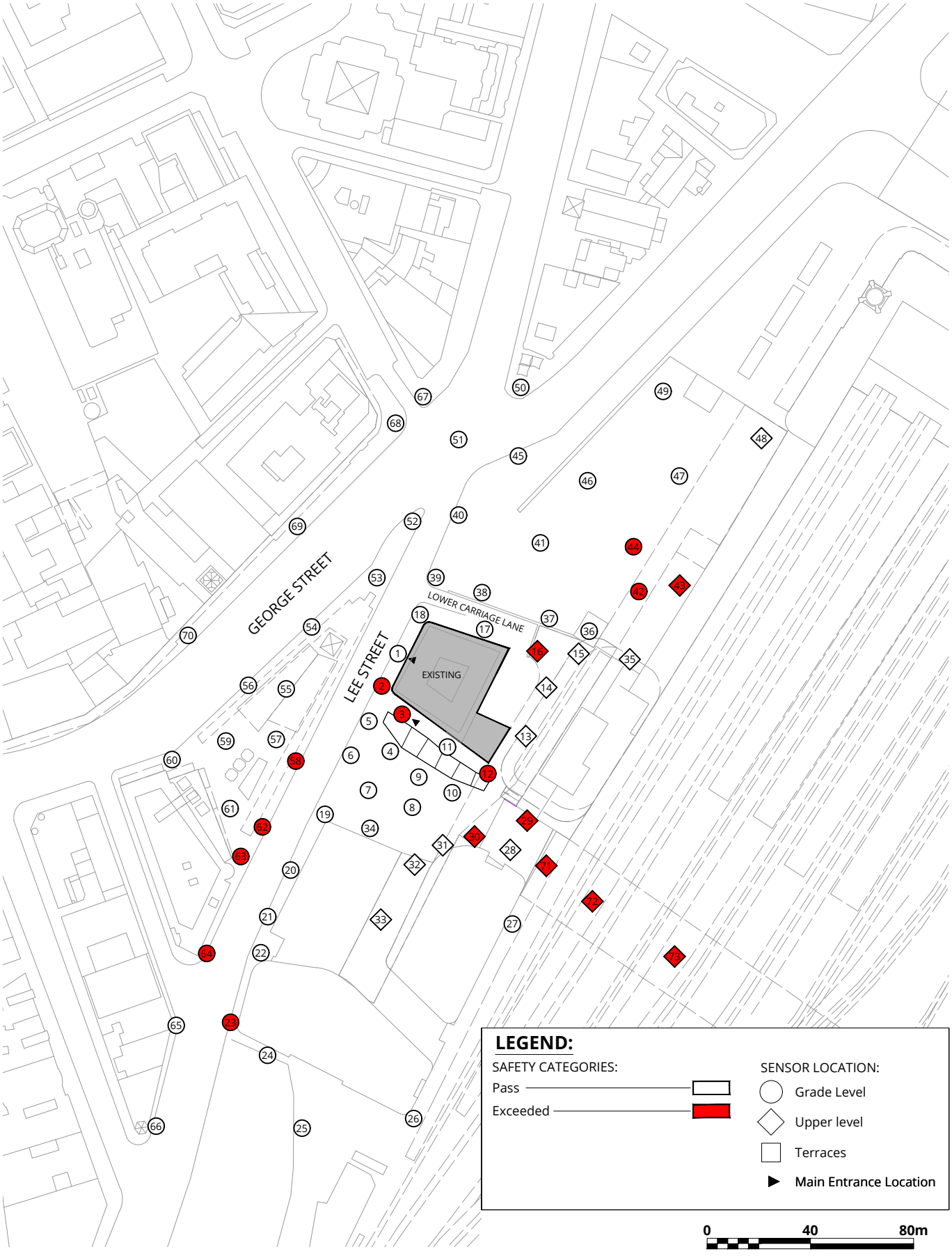
Adina Central Redevelopment - Sydney, NSW

Project #1902973



Pedestrian Wind Safety Conditions - Existing

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

True North

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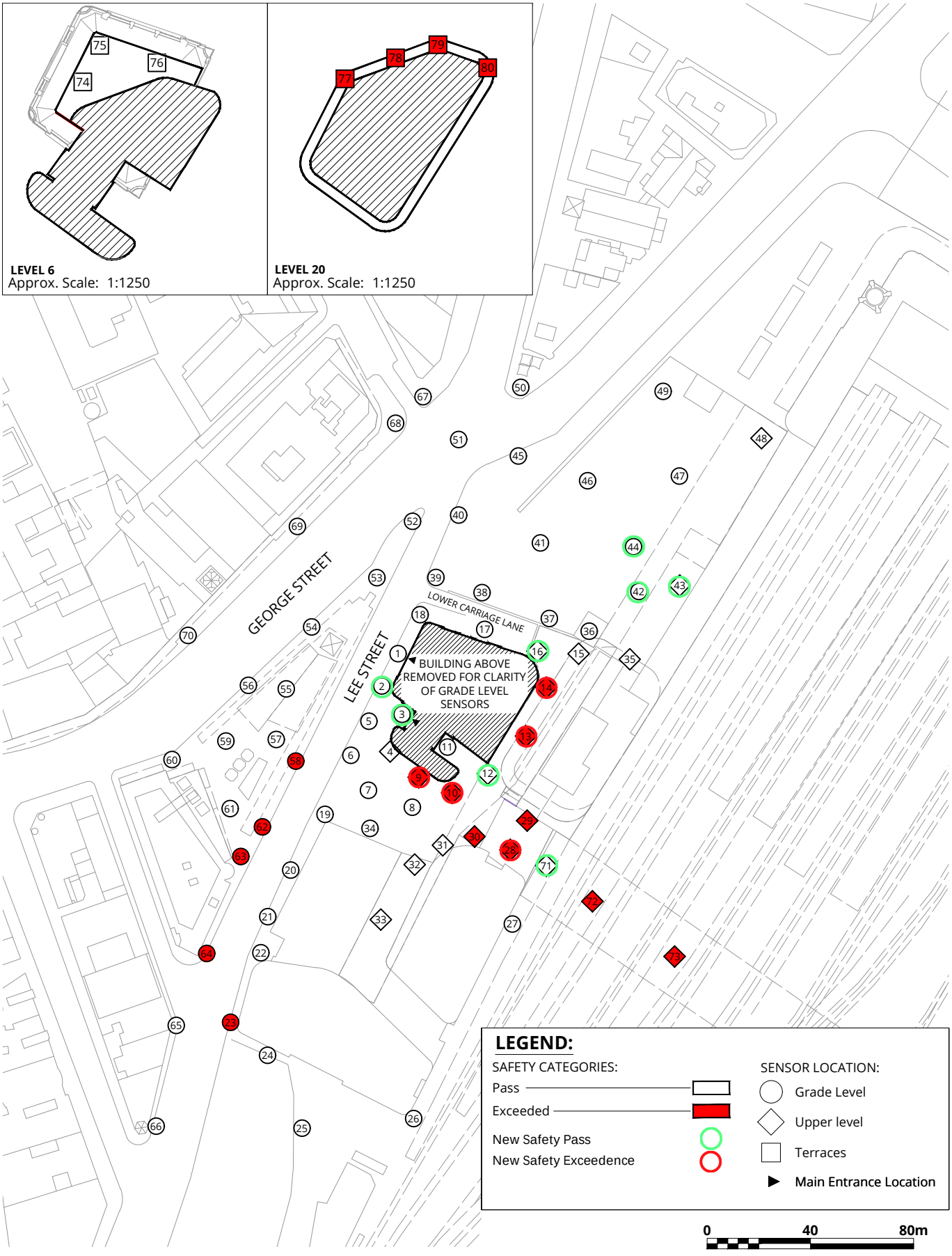
Date Revised:	Nov. 20, 2020		

Adina Central Redevelopment - Sydney, NSW

Project #1902973



Pedestrian Wind Safety Conditions - Proposed

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

True North

Drawn by: SAA	Figure: 4		
Approx. Scale: 1:2000			
Date Revised: Nov. 20, 2020			

Adina Central Redevelopment - Sydney, NSW

Project #1902973

TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Probe Location	Configuration	Wind Comfort		Wind Safety	
		Speed (m/s)	Rating	Speed (m/s)	Rating
1	C1	4.8	Standing	19.4	Pass
	C2	4.5	Standing	16.8	Pass
2	C1	6.1	Walking	26.2	Exceeded
	C2	5.7	Standing	22.4	Pass
3	C1	6.3	Walking	24.7	Exceeded
	C2	4.2	Standing	15.6	Pass
4	C1	5.9	Standing	22.2	Pass
	C2	4.2	Standing	19.2	Pass
5	C1	5.8	Standing	22.8	Pass
	C2	5.3	Standing	19.5	Pass
6	C1	6.3	Walking	24	Pass
	C2	5.4	Standing	22.2	Pass
7	C1	5.8	Standing	21.6	Pass
	C2	4.8	Standing	20.9	Pass
8	C1	5.8	Standing	23.7	Pass
	C2	3.9	Sitting	15.9	Pass
9	C1	6.2	Walking	22.9	Pass
	C2	7.4	Walking	25.5	Exceeded
10	C1	5	Standing	19.7	Pass
	C2	8.8	Uncomfortable	30.5	Exceeded
11	C1	5	Standing	20.7	Pass
	C2	4.2	Standing	15.9	Pass
12	C1	6.6	Walking	25.5	Exceeded
	C2	6	Standing	22.7	Pass
13	C1	6.2	Walking	22.2	Pass
	C2	7.1	Walking	24.7	Exceeded
14	C1	6	Standing	22.8	Pass
	C2	8.3	Uncomfortable	28.3	Exceeded
15	C1	5.2	Standing	23.7	Pass
	C2	4.9	Standing	19.4	Pass
16	C1	5.6	Standing	25.8	Exceeded
	C2	4.6	Standing	18.7	Pass
17	C1	4	Sitting	14.7	Pass
	C2	4.2	Standing	15.5	Pass
18	C1	5.7	Standing	19.6	Pass
	C2	5.6	Standing	18.5	Pass
19	C1	5.8	Standing	20.8	Pass
	C2	5.2	Standing	17.9	Pass
20	C1	5.4	Standing	22.9	Pass
	C2	5.1	Standing	22.4	Pass

Probe Location	Configuration	Wind Comfort		Wind Safety	
		Speed (m/s)	Rating	Speed (m/s)	Rating
21	C1	5.5	Standing	22.6	Pass
	C2	5.8	Standing	23.8	Pass
22	C1	5.1	Standing	21.8	Pass
	C2	4.9	Standing	19.1	Pass
23	C1	9.8	Uncomfortable	32.3	Exceeded
	C2	9.8	Uncomfortable	32.6	Exceeded
24	C1	4.6	Standing	20	Pass
	C2	4.8	Standing	19	Pass
25	C1	4.6	Standing	18.6	Pass
	C2	4.4	Standing	18.1	Pass
26	C1	5.9	Standing	21	Pass
	C2	6.3	Walking	23.7	Pass
27	C1	4.6	Standing	17.5	Pass
	C2	4.1	Standing	15.7	Pass
28	C1	6	Standing	20.9	Pass
	C2	5.9	Standing	24.5	Exceeded
29	C1	7.7	Walking	26.2	Exceeded
	C2	7.6	Walking	26.5	Exceeded
30	C1	5.3	Standing	24.6	Exceeded
	C2	6.5	Walking	27.6	Exceeded
31	C1	5.4	Standing	21.2	Pass
	C2	5.1	Standing	19.7	Pass
32	C1	4.8	Standing	19.3	Pass
	C2	4.5	Standing	20.5	Pass
33	C1	3.2	Sitting	15.3	Pass
	C2	3.4	Sitting	14.3	Pass
34	C1	4.6	Standing	17.2	Pass
	C2	3.8	Sitting	13.7	Pass
35	C1	4.1	Standing	20	Pass
	C2	3.7	Sitting	17.9	Pass
36	C1	4.4	Standing	16.3	Pass
	C2	3.2	Sitting	13.3	Pass
37	C1	4.2	Standing	18.3	Pass
	C2	3.7	Sitting	13.9	Pass
38	C1	4.5	Standing	16.5	Pass
	C2	4.2	Standing	14.9	Pass
39	C1	5.6	Standing	22.2	Pass
	C2	5.3	Standing	19.9	Pass
40	C1	4.9	Standing	18.1	Pass
	C2	4.8	Standing	18.5	Pass
41	C1	5	Standing	22.2	Pass
	C2	4.6	Standing	17.3	Pass

Probe Location	Configuration	Wind Comfort		Wind Safety	
		Speed (m/s)	Rating	Speed (m/s)	Rating
42	C1	4.8	Standing	26.3	Exceeded
	C2	3.3	Sitting	15.7	Pass
43	C1	5.7	Standing	24.5	Exceeded
	C2	5.1	Standing	20.6	Pass
44	C1	5.2	Standing	26.9	Exceeded
	C2	4	Sitting	17.7	Pass
45	C1	5	Standing	20.6	Pass
	C2	4.7	Standing	18.7	Pass
46	C1	5.2	Standing	21.6	Pass
	C2	4.1	Standing	16.9	Pass
47	C1	5.4	Standing	23.3	Pass
	C2	4.5	Standing	17.5	Pass
48	C1	4.9	Standing	19.9	Pass
	C2	4.9	Standing	19.6	Pass
49	C1	4.4	Standing	17.7	Pass
	C2	4.1	Standing	16.1	Pass
50	C1	5.4	Standing	22.6	Pass
	C2	4.8	Standing	19	Pass
51	C1	5	Standing	19.2	Pass
	C2	4.8	Standing	17.8	Pass
52	C1	5.1	Standing	20.4	Pass
	C2	4.7	Standing	17.1	Pass
53	C1	5.3	Standing	20.5	Pass
	C2	5.2	Standing	19	Pass
54	C1	5.1	Standing	19.4	Pass
	C2	5.5	Standing	18.6	Pass
55	C1	4.8	Standing	18	Pass
	C2	5.2	Standing	19.9	Pass
56	C1	4.8	Standing	17.7	Pass
	C2	4.6	Standing	17.4	Pass
57	C1	5.1	Standing	20.8	Pass
	C2	5.1	Standing	20	Pass
58	C1	6.2	Walking	25.1	Exceeded
	C2	5.9	Standing	24.7	Exceeded
59	C1	4.7	Standing	17.7	Pass
	C2	4.3	Standing	17.1	Pass
60	C1	4.5	Standing	17	Pass
	C2	4.3	Standing	16.5	Pass
61	C1	4.8	Standing	18.5	Pass
	C2	4.8	Standing	19.6	Pass
62	C1	7.6	Walking	28.2	Exceeded
	C2	7.7	Walking	28.3	Exceeded

Probe Location	Configuration	Wind Comfort		Wind Safety	
		Speed (m/s)	Rating	Speed (m/s)	Rating
63	C1	7.1	Walking	27.1	Exceeded
	C2	7.3	Walking	25.9	Exceeded
64	C1	8.7	Uncomfortable	28.1	Exceeded
	C2	8.1	Uncomfortable	26.8	Exceeded
65	C1	8	Walking	23.7	Pass
	C2	7.6	Walking	23.5	Pass
66	C1	5.6	Standing	21.5	Pass
	C2	5.1	Standing	20.5	Pass
67	C1	4.7	Standing	17	Pass
	C2	4.7	Standing	16.7	Pass
68	C1	4.7	Standing	17.2	Pass
	C2	4.4	Standing	15.8	Pass
69	C1	5.2	Standing	21.3	Pass
	C2	4.8	Standing	18.6	Pass
70	C1	5.1	Standing	20	Pass
	C2	5	Standing	19.8	Pass
71	C1	7.9	Walking	25	Exceeded
	C2	6.9	Walking	22.5	Pass
72	C1	7	Walking	25	Exceeded
	C2	6.9	Walking	24.5	Exceeded
73	C1	7.3	Walking	25.9	Exceeded
	C2	6.8	Walking	24.8	Exceeded
74	C1	--	--	--	--
	C2	4.7	Standing	15.7	Pass
75	C1	--	--	--	--
	C2	3.8	Sitting	13.8	Pass
76	C1	--	--	--	--
	C2	6.6	Walking	22.6	Pass
77	C1	--	--	--	--
	C2	8.5	Uncomfortable	28.6	Exceeded
78	C1	--	--	--	--
	C2	7.2	Walking	25.3	Exceeded
79	C1	--	--	--	--
	C2	8.2	Uncomfortable	29.2	Exceeded
80	C1	--	--	--	--
	C2	6.4	Walking	26.2	Exceeded