

142-160 OXFORD STREET
PADDINGTON, NSW



PEDESTRIAN WIND ASSESSMENT

PROJECT # 2604637

29 MAY 2026

SUBMITTED TO

Toohey Miller

Level 5, 19 Harris Street,
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SUBMITTED BY

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Version	Status	Date	Prepared By	Reviewed By
A	Initial	21 May 2026	AMC	RL
B	Final	28 May 2026	RL	HK
C	Updated Final for Client Comments	28 May 2026	RL	HK
D	Updated for Client Comments	29 May 2026	RL	HK

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STATEMENT OF DECLARATION

The undersigned declares that the Pedestrian Wind Assessment Report (PWA Report) has been prepared in accordance with relevant policy, guidelines, or legislative requirements. The PWA Report contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the PWA Report relates; does not contain information that is false or misleading; identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project; identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the PWA Report relates; and contains a consolidated summary of the proposed or necessary mitigation measures.



Raymond Lau
Senior Engineer

EXECUTIVE SUMMARY



This desktop Pedestrian Wind Assessment has been prepared by RWDI Australia Pty Ltd (RWDI) to accompany a detailed State Significant Development Application (SSDA) for the proposed mixed use residential flat building and shop development proposal at 142-160 Oxford Street, 13 Gipps Street and 6 Shadforth Street, Paddington. The site is legally described as Lot 1 DP26385, Lot 2 DP26385, Lot 3 DP26385, Lot 4 DP26385, Lot 1 DP70235, Lot 5 DP26385 and SP13018.

This report has been prepared to accompany the EIS submitted for SSD DA, SSD-97528708.

This report concludes that the proposed development is expected to be suitable, and warrants approval subject to retention of the wind mitigating design features in the proposed design mentioned in this report, and any impacts will be acceptable and appropriate.

1. PROJECT BACKGROUND AND INTRODUCTION



1.1 Introduction

This desktop Pedestrian Wind Assessment Report has been prepared by RWDI Australia Pty Ltd to accompany a detailed SSDA for the proposed mixed use residential flat building and shop development proposal at for the proposed mixed use residential flat building and shop development proposal at 142-160 Oxford Street, 13 Gipps Street and 6 Shadforth Street, Paddington.

The SSDA seeks development consent for:

- Demolition of all structures and buildings on the site, except for the dwelling on 13 Gipps Street, and removal of vegetation on the site excluding vegetation on 13 Gipps Street.
- Site works comprising excavation and ground works including bulk excavation and in ground services works.
- A four (4) storey basement, with vehicular access from Shadforth Street, comprising:
 - Car parking spaces;
 - Motorcycle spaces;
 - Bicycle spaces;
 - Garbage storage;
 - Loading space;
 - Plant rooms; and
 - Apartment storage.
- Ground floor shops;
- A total of approximately 44 dwellings, comprised of:
 - Affordable housing dwellings to be managed by a community housing provider for a period of at least 15 years.
 - Market build-to-sell dwellings
- Landscaping works and extension and augmentation of services and infrastructure as required, including landscaping works on 13 Gipps Street.

1. PROJECT BACKGROUND AND INTRODUCTION



1.1 Introduction

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) for In-fill Affordable Housing dated 28 November 2025 for the SSD DA (SSD-97528708). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

SEARs Item	Description of Issue and Assessment Requirements	Section reference (this report)
7. Environmental Amenity	Assess amenity impacts on the surrounding locality, including solar access, visual privacy, view loss and view sharing, as well as wind, lighting and reflectivity impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated	Section 5.3
23. Public Space	- If public space is proposed as part of the development, demonstrate how the development: - maximises the amount, access to and quality of public spaces (including open space, public facilities and streets/plazas within and surrounding the site), reflecting relevant design guidelines and advice from the local council and the Department. - provides accessible public space. - maximises permeability and connectivity. - maximises the amenity of public spaces in line with their intended use, such as through adequate facilities, solar access, shade and wind protection. - maximises street activation. - minimises potential vehicle, bicycle and pedestrian conflicts.	Section 5.3

1. PROJECT BACKGROUND AND INTRODUCTION



1.2 Site Description

The site is irregular in shape and situated at 13 Gipps Street, 6 Shadforth Street and 142-148, 160 Oxford Street, Paddington within the Woollahra Local Government Area (LGA). It has a site area of 2,172.4m². The site is legally described as Lot 1 DP26385, Lot 2 DP26385, Lot 3 DP26385, Lot 4 DP26385, Lot 1 DP70235, Lot 5 DP26385 and SP13018.

The site is well located with a bus station directly in front of the site on Oxford Street which provides services to Bondi Junction, Rozelle and Marrickville Metro Station and less than 600m away further east of Oxford street, bus services are provided to the Sydney CBD. The broader context includes a mix of uses of various heights, form and age. The site comprises of three (3) street frontages, including a northern frontage to Gipps Street, eastern frontage to Shadforth Street and southern frontage to Oxford Street.

Existing development on the site currently comprises of a detached two (2) storey rendered residential dwelling at 13 Gipps Street, a three (3) storey brick and rendered residential flat building at 160 Oxford Street with 27 studio dwellings, a row of two (2) storey terrace houses between 142-148 Oxford Street and a two (2) storey brick cottage at 6 Shadforth Street. Notably, there are two vehicular accessways to Gipps Street.



Image 1: Site Aerial Map
Source: Nearmap and Ethos Urban

2. METHODOLOGY



Predicting wind speeds and occurrence frequencies around a building is a complex process, encompassing an assessment of factors such as building geometry, orientation, surrounding building heights and positions, terrain upstream, and the local wind climate. RWDI has amassed extensive expertise through conducting numerous wind tunnel studies and Computational Fluid Dynamics (CFD) assessments specifically focused on pedestrian wind conditions around buildings. This wealth of experience, complemented by comprehensive literature, facilitates a reliable and efficient desktop estimation of pedestrian wind conditions for concept designs without the need for wind-tunnel testing or detailed CFD studies.

Note that this approach delivers a preliminary assessment of potential wind conditions around the site. It offers a conceptual framework for wind control measures aimed at enhancing wind comfort, if and where necessary. To further validate and refine the predicted conditions discussed in this report or to fine-tune the suggested wind control measures, physical scale model tests in a boundary layer wind tunnel or CFD simulations will be required. These detailed studies offer a quantitative validation and enable a more detailed assessment, ensuring the accuracy and effectiveness of proposed wind control strategies.

Therefore, RWDI's assessment is based on the following:

- A review of the regional long-term meteorological data;
- Drawings and information received by RWDI in May 2026.
- Wind-tunnel studies, CFD simulations, and desktop assessments undertaken by the microclimate team for projects in the region;
- RWDI's engineering judgement, experience, and expert knowledge of wind flows around buildings^{1, 2}; and,
- Assessment against a suitable criteria for pedestrian wind comfort and safety.

Note that other microclimate issues such as those relating to cladding and structural wind loads, door operability, building air quality, noise, vibration, etc. are not part of the scope of this assessment.

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1. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", *Journal of Wind Engineering and Industrial Aerodynamics*, vol.104-106, pp.397-407.
 2. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", 10th International Conference on Wind Engineering, Copenhagen, Denmark.

3. METEOROLOGICAL DATA



Meteorological data recorded at Sydney International Airport for the period from 1995 to 2025 were used as a reference to assess wind conditions in the study area. Image 2 depicts the directional distributions of wind frequencies and speeds recorded at the station. The records indicate that winds from the northeast, south and west to northwest directions are predominant in region throughout the year.

Strong winds with a mean speed exceeding 30 km/h, as measured at the airport at a height of 10 meters, predominantly originate from the south throughout the year while winds from the northeast are common in summer and winds from west to northwest are common in winter. These winds can potentially be the source of uncomfortable or unsafe wind conditions, depending on the site exposure or development design.

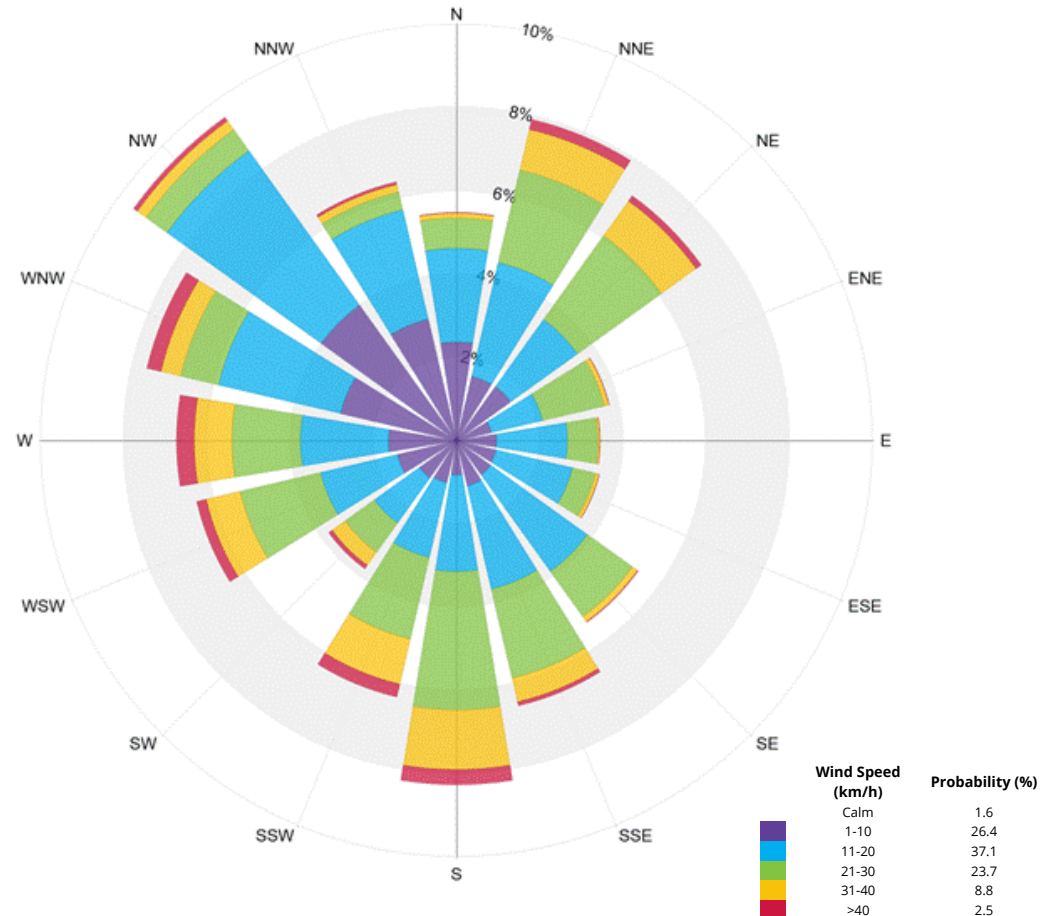


Image 2: Directional Distribution of Winds Approaching Sydney International Airport (1995 - 2025)

4. PEDESTRIAN WIND CRITERIA



4.1 Pedestrian Wind Safety Criterion

Pedestrian wind safety is associated with excessive gusts that can adversely affect a person’s balance and footing. The *Australasian Wind Engineering Society Guidelines for Pedestrian Wind Effects Criteria* (2024) recommends assessing wind safety using a threshold of 3-second gusts exceeding 83 km/h for more than 0.1% (or 9 hours) per year. Wind conditions surpassing this limit are considered severe and likely to impact pedestrian stability. This has been assessed qualitatively in the current report.

4.2 Pedestrian Wind Comfort Criteria

Pedestrian wind comfort is assessed using the criteria developed by Soligo et al.^{1,2} which are illustrated in Image 3. These criteria, established at RWDI through extensive research and consulting since 1974, are based on gust-equivalent mean wind speeds. Wind comfort levels are categorised according to the typical/intended pedestrian activity such that higher the activity level, higher the wind speed tolerable while engaged in the activity. Wind conditions are assessed at a typical pedestrian chest height and are considered suitable for the intended use of the space if the associated winds for the category are expected for at least 80% of the time. Wind control measures are

recommended for areas where the occurrence frequencies of wind speeds are expected to exceed the threshold values for specific pedestrian activities.

It should be noted that these criteria for wind forces represent average wind tolerance and can be subjective with regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. also impacting and individual’s perception of the wind climate. For a full assessment of comfort, a thermal comfort study is required.

Sitting ≤ 10 km/h		Calm or light breezes desired for outdoor seating areas where one can read a paper without having it blown away
Standing ≤ 14 km/h		Gentle breezes suitable for main building entrances, bus stops and locations where pedestrians may linger such as communal terraces
Strolling ≤ 17 km/h		Moderate winds that would be appropriate for strolling along a downtown street, plaza or park and where the objective is not to linger
Walking ≤ 20 km/h		High Winds that can be tolerated if one’s objective is to walk, run or cycle without lingering - Also suitable for certain sporting activities
Uncomfortable > 20 km/h		None of comfort categories above are met - Represents conditions that might be dangerous to the elderly and children and are of a considerable discomfort to others

1. M.J. Soligo, P.A. Irwin, and C.J. Williams (1993). "Pedestrian Comfort Including Wind and Thermal Effects," Third Asia-Pacific Symposium on Wind Engineering, Hong Kong.

2. M.J. Soligo, P.A. Irwin, C.J. Williams, and G.D. Schuyler (1998). "A Comprehensive Assessment of Pedestrian Comfort Including Thermal Effects," Journal of Wind Engineering and Industrial Aerodynamics, vol. 77&78, pp. 753-766.

Image 3: RWDI Pedestrian Wind Comfort Criteria

5. RESULTS AND DISCUSSION



5.1 General Wind Flow around Buildings

In the following discussion of wind conditions on and around the Proposed Development, reference may be made to the following generalised wind flows (see Image 4). If these building / wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and uncomfortable or potentially unsafe conditions. Design details such as setting back a tower from the edges of a podium for a prevailing wind direction, deep canopies close to ground level, wind screens / tall trees with dense landscaping, etc. can help reduce high wind activity. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

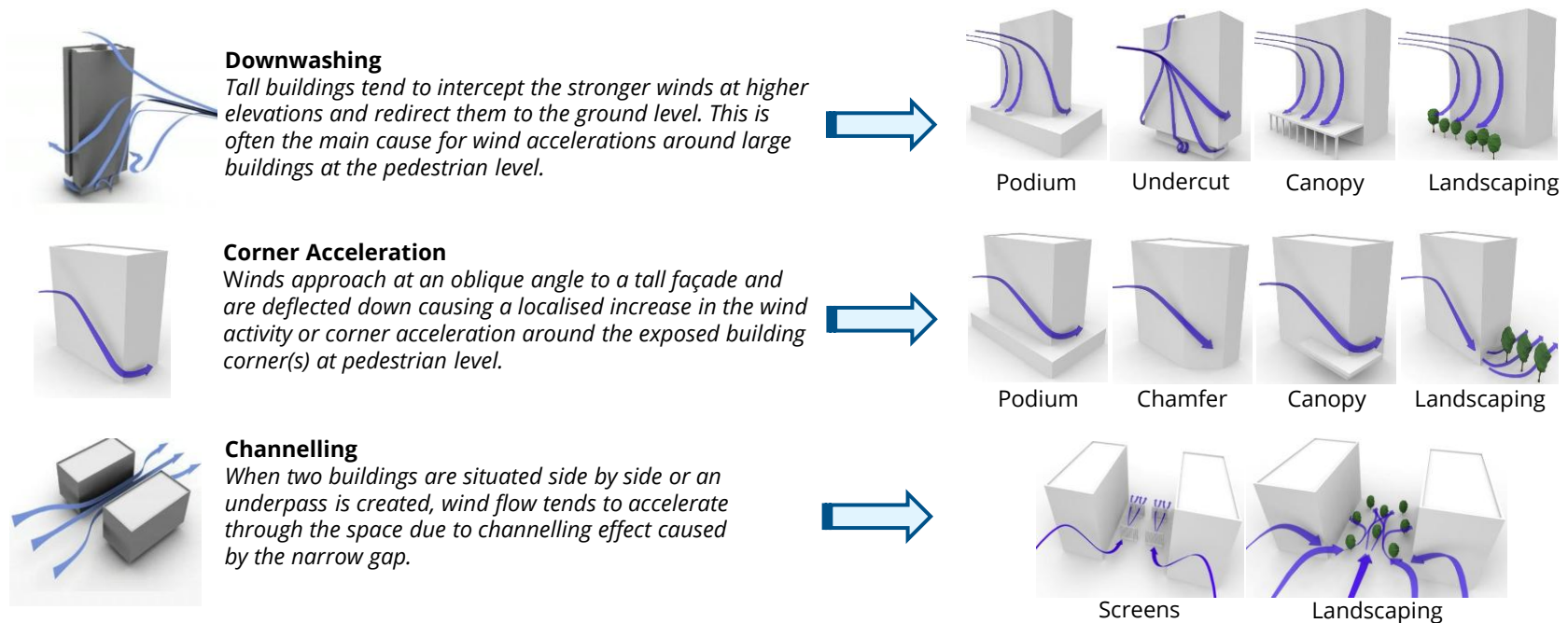


Image 4: General Wind Flow around Buildings with Examples of Common Wind Measures

5. RESULTS AND DISCUSSION



5.2 Site Exposure and Existing Site Conditions

The exposure of the site to regional prevailing winds is illustrated in Image 5 and discussed below.

- The upwind terrain to the northeast and west to northwest sectors comprises of low- to mid-rise buildings that are expected to provide a level of shelter from prevailing winds from these directions.
- The south of the site is relatively open that is likely to allow the southerly winds to directly impact the site. Existing rows of trees along Oxford Street are likely to provide some shelter from these winds.

The existing buildings on site are low-rise and similar in height to surrounding context. Hence, these are not expected to significantly impact wind conditions. Given the above exposure, wind conditions are likely to be governed by the alignment of the streets with regional winds and the topographic change along the streets that can increase wind speeds. Hence, alignment of Oxford Street with westerly winds and Shadforth Street with southerly and north-easterly winds can increase the speeds along these street corridors. Wind conditions are likely to be comfortable for standing to strolling use along the streets. High winds exceeding the comfort or safety limits are not expected around the existing site.

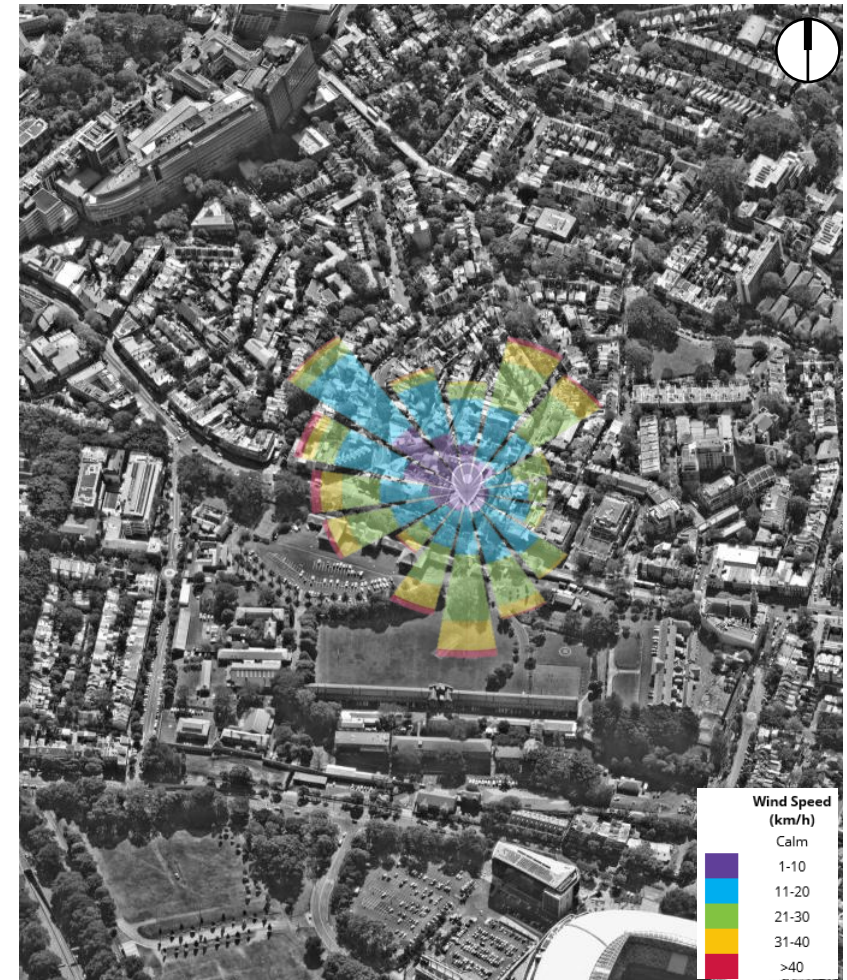


Image 5: Exposure of Site to Regional Prevailing Winds

Source: Nearmap

5. RESULTS AND DISCUSSION



5.3 Proposed Site Conditions and Recommendations

5.3.1 Ground Level

- **Surrounding Streets:** The Proposed Development is taller than the surrounding buildings and is expected to impact the local wind environment. Several positive design features have been incorporated to mitigate potential wind impacts. These include building setbacks and a 1.5 m awning along the southern aspect as well as blade walls along Shadforth Street that are expected to intercept and reduce impact of prevailing winds from the south and northeast, in combination with the tree planting. Hence, wind conditions along Oxford Street and Shadforth Streets are expected to be comfortable for strolling to walking use.
Recommendations: None.
- **Entrances:** The primary lobby entrance and retail entrance to Shop 1 are recessed and sheltered from prevailing winds. Conditions around these are expected to be comfortable for sitting to standing use. The retail entrance to Shop 2 along Oxford Street may be impacted by westerly winds channelling through the street corridor with conditions likely to be comfortable for strolling use. Recessing the entrance into the building form is expected to improve conditions. The existing street trees are likely to assist with the condition, and hence additional measures may not be required.
Recommendations: None.
- **Pool Deck:** The proposed pool deck is recessed into the building form and covered overhead by the above floors which shelters it from prevailing winds. Conditions are expected to be comfortable for sitting use within the space.
Recommendations: None.
- **Communal Open Space:** The communal open space is located at the northwest corner of the site and is sheltered from regional winds due to the surrounding buildings and the subject development. In addition, the proposed vegetation is also likely to further assist with wind impacts. Conditions are expected to be comfortable for sitting to standing use within the space.
Recommendations: None.

5. RESULTS AND DISCUSSION



5.3 Proposed Site Conditions and Recommendations

5.3.2 Upper-Level Balconies and Terraces

Most private balconies within the development are inset within the building planform to create a low wind exposure single-aspect design. Similarly, the northern and southern corner balconies throughout the height of the building benefit from the inclusion of blade walls along the east and west aspects, effectively creating a similar single aspect design. As a result, wind conditions in these areas are anticipated to be suitable for sitting to standing use. Similarly, the central roof terraces to Apartments L07.02 and L07.03 are sheltered by from prevailing winds due to perimeter landscape to the north and roof plant to the south. Wind conditions within these spaces are expected to be comfortable for sitting to standing use during the year.

The following balconies and terraces may be subject to higher winds:

- **Level L01 South-Western Corner Balcony** above Shop 1 may be exposed to southerly winds channelling between the subject and neighbouring building. The taller balustrading along the southern aspect is expected to mitigate these winds.

Recommendations: None.

- **Level L05 Southern Terraces** are elevated above the tree line and are exposed to direct southerly and westerly winds. Areas near the corners may be subject to stronger winds, however the perimeter planters that are 1.4m tall including planting are expected to reduce these winds. It is noted that impermeable intertenancy screening will be at least 1.8 m tall for privacy and should be retained in the design.

Recommendations: None

- **Corner Roof Terraces (L07.01 and L07.04)** are likely to be more susceptible to regional winds compared to the central terraces due to potential for wind reattachment within the proposed seating areas. The raised pool decks within these terraces are, however, more sheltered due to the inclusion of perimeter screening. Densely foliating vegetation within planters along the northern aspect with a total height of 1.2-1.3 m tall and along the eastern and western aspects with a total height of 1.5 m are expected to mitigate these winds. Wind conditions are likely to be suitable for sitting to standing use within these terrace areas.

Recommendations: None.

6. SUMMARY



Wind conditions on and around the Proposed Development located at 142-160 Oxford Street, 13 Gipps Street and 6 Shadforth Street, Paddington are discussed in this report. The qualitative assessment is based on the review of local wind climate and the current design of the Proposed Development. The impact of the surrounding buildings and the local land topography has also been considered. The assessment is based on RWDI's experience with wind tunnel testing of similar buildings within the region.

Conceptual wind flows around the Proposed Development are discussed in the report for the prevailing wind directions to identify key wind sensitive areas. The review indicates that wind conditions within and around the proposed development the public domain are expected to be suitable for the intended use of the various spaces. However, high winds can occur near the corner of Oxford Street and Shadforth Street and within some upper-level terraces and balconies. Conceptual mitigation strategies have been provided in the report which include extension of impermeable awning along Oxford and screening/landscape advice for upper levels. With the inclusion of these measures, wind conditions are expected to better align with the intended use and comfort levels across the various outdoor areas of the site.

This qualitative approach provides a screening-level estimation of potential wind conditions around the site and offers conceptual wind control measures and design advice suitable for early design of buildings. To quantify and confirm the predicted conditions discussed in the report, wind tunnel testing and/or computational fluid dynamics (CFD) is recommended to be undertaken. The conceptual wind control measures can be further refined through these additional studies.

7. APPLICABILITY OF ASSESSMENT



The assessment discussed in this report pertains to the Proposed Development in accordance with the drawings and information received in May 2026. In the event of any significant changes to the design, construction or operation of the building or addition of surroundings in the future, RWDI could provide an assessment of their impact on the wind conditions discussed in this report. It is the responsibility of others to contact RWDI to initiate this process.

Statement of Limitations

This report entitled '*142-160 Oxford Street: Pedestrian Wind Assessment*', dated 29 May 2026, was prepared by RWDI Australia Pty Ltd ("RWDI"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilise the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

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