

30-46 AUBURN ROAD (STAGE 3), REGENTS PARK

Environmental Wind Study

Prepared for:

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with 30 Auburn Road Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
R02-v1.1	03 November 2025	Dr Farzin Ghanadi	Dr Neihad Al-Khalidy	Dr Neihad Al-Khalidy
R02-v1.0	16 November 2023	Dr Farzin Ghanadi	Dr Neihad Al-Khalidy	Dr Neihad Al-Khalidy

EXECUTIVE SUMMARY

SLR Consulting Australia Pty Ltd (SLR) has been engaged by 30 Auburn Road Pty Ltd to provide a qualitative (expert opinion) Pedestrian Wind Environment Study assessing the impact of stage 3 30-46 Auburn Road, Regents Park. The proposed Development is located at 30-46 Auburn Road, Regents Park, about 500 m south of Regents Park Station (T3 Bankstown Line). This assessment forms part of the development application to the Canterbury Bankstown Council.

This study has been made on the basis of our best engineering judgment and on the experience gained from (decades of) scale-model Wind Tunnel Testing and CFD Simulation Modelling of a range of similar scale developments.

Surrounding Built Environment

The proposed Development is located at 30-46 Auburn Road, Regents Park and is bounded by rail infrastructure to the south and west, Auburn Road to the east and the upcoming buildings within the site to the north. The “near-field” built environment includes low-rise residential areas, rail infrastructure, and light industrial zones, with future stages introducing 6-12 storey buildings on the eastern and southern sides of Stage 3, significantly affecting ground-level winds. The “far-field” environment comprises low-rise housing, schools, light industrial areas, and parks, with generally flat topography. Surrounding buildings and vegetation offer moderate ground-level shelter, but upper levels will experience minimal wind mitigation. Key aerodynamic effects, such as downwash and accelerated shear flow, will primarily result from the development itself.

Regents Park Wind Climate

Using long-term wind records obtained from nearby Bureau of Meteorology stations at Bankstown Airport and Sydney Kingsford Smith Airport, SLR has determined that Regents Park has local winds characteristics closer to Bankstown Airport than Sydney (KS) Airport, given Regents Park’s distance being similar to Bankstown Airport. Accordingly, key prevailing wind directions of interest are the northeast, southeast and south for summer and mainly west quadrant winds for winter.

Existing Winds

Existing street level wind conditions in the vicinity of the site are likely to be at or just above the 16 m/s “walking comfort” criterion for some prevailing wind directions given the moderate shielding afforded to the site by the surrounding environment for the northeast and southeast directions in particular.

Future Wind Environment

In terms of the *future* wind environment with the proposed Development, the following features are noted as being of most significance:

Ground Level and Level 1

- Keep the proposed or existing evergreen, densely foliated trees and landscaping along the sides of the development to mitigate local wind speeds effectively throughout the year (see Figure 8).
- Retain the proposed ground-level setbacks, colonnades, and awnings at building entrances to minimize wind downwash and channel airflow along pedestrian pathways (see Figure 8).

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- Position outdoor seating areas on the north side of the site, under the building's setback, where proposed trees will mitigate high-level winds from the north and downwash (see Figure 8).
- Maintain setbacks and colonnades around the outdoor childcare playground, ensuring vertical windbreaks are implemented at both ground level and Level 1 (see Figure 9).
- Maintain the proposed 1.9m high glazed balustrade along the perimeter of the Level 1 communal terrace to reduce adverse wind effects (see Figure 9).

Elevated Communal Open Areas

- Keep the proposed 1.9m high glazed balustrade on the perimeter of communal areas at Level 8 (see Figure 10).

Upper-Level Balconies (refer to Figure 11)

- Consider partial balcony screening (e.g., full-height balustrades, louvres, or pull-down screens) on the most exposed façades (eg. Level 6 corner balcony), allowing for flexibility to benefit from milder summer winds while mitigating stronger winter winds.
- For balconies exposed on multiple sides, prioritize wind shielding on the most exposed façade.

The analysis in this report has been made on the basis of our best engineering judgment and on the experience gained from scale model wind tunnel testing or computational fluid dynamics analysis of a range of developments. The conclusions of this SLR report can be quantified using wind tunnel testing or computational fluid dynamics analysis.

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1 INTRODUCTION

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2 PROPOSED DEVELOPMENT OVERVIEW

2.1 Development Site Location

The proposed Development is located at 30-46 Auburn Road, Regents Park and is bounded by rail infrastructure to the south and west, Auburn Road to the east and the upcoming buildings within the site to the north - refer **Figure 1**.

Figure 1 Proposed Development Site Location



Image: Courtesy Nearmap, January 2025

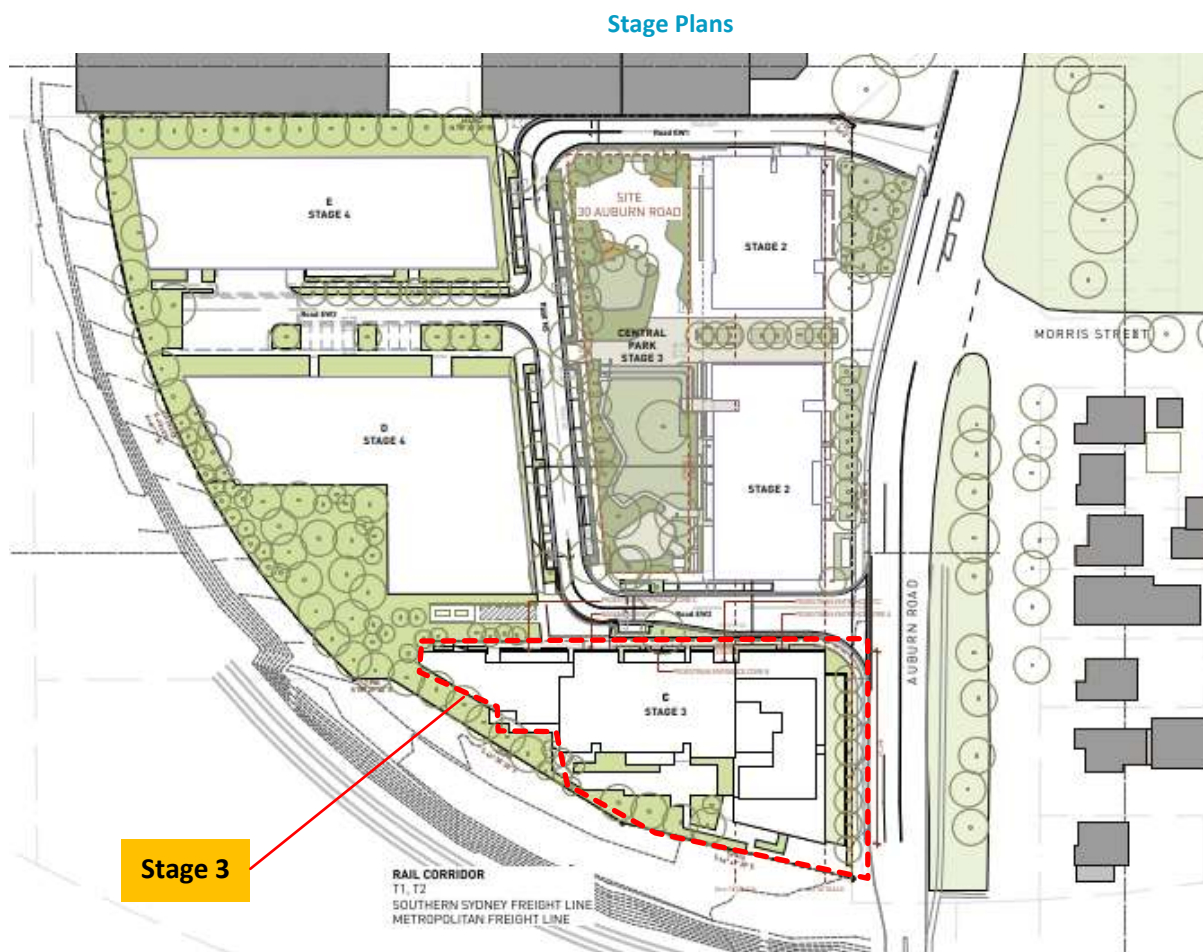
2.2 Proposed Development Description

From the plans provided, the proposed development comprises the following features:

- 3 Levels of basement carpark and amenities,
- Ground Level (Level 0) with carparks, residential apartments, childcare, communal outdoor spaces and main entrances,
- Level 1 with residential apartments and childcare and communal outdoor spaces,
- Levels 2 to 7 with residential apartments,
- Level 8 with residential apartments and communal open space,
- Levels 9 to 11 with residential apartments,
- Roof.

Representative Floor Plans and Development Images are shown in **Figure 2**.

Figure 2 Representative Plans of the Proposed Development



2.3 Surrounding Built Environment

“Near Field”

The “near-field” built environment comprises 1-2 storey residential areas to the east, rail infrastructure to the south and west and light industrial; to the north – refer **Figure 1**. However, future development stages (stages 1, 2 and 4), will involve the construction of buildings ranging between 6 to 12 stories on the eastern and southern sides of stage 3. These upcoming structures are expected to significantly impact ground-level winds at the site, with the exception of influences from the north and west.

“Far Field”

The “far-field” built environment comprises a similar mix of mainly low-rise residential housing, schools, light industrial and commercial buildings and public parks (Jim Ring Reserve lies to the west-southwest).

The surrounding topography is generally flat with no significant features (hills, ridges, escarpments, etc) influencing local wind speeds.

Impact of Surrounding Built Environment

The above suggests that moderate sheltering only will be available to the site at ground level from surrounding buildings and vegetation and that upper levels of the development will be impacted by oncoming winds with minimal wind mitigation upstream.

The above also suggests that key elements of the wind field within the proposed Development and in the immediate surrounds will be aerodynamic effects from the Development itself, e.g. downwash off building facades for oncoming winds, accelerated shear flow as wind moves past building corners, etc – refer also **Section 4**.

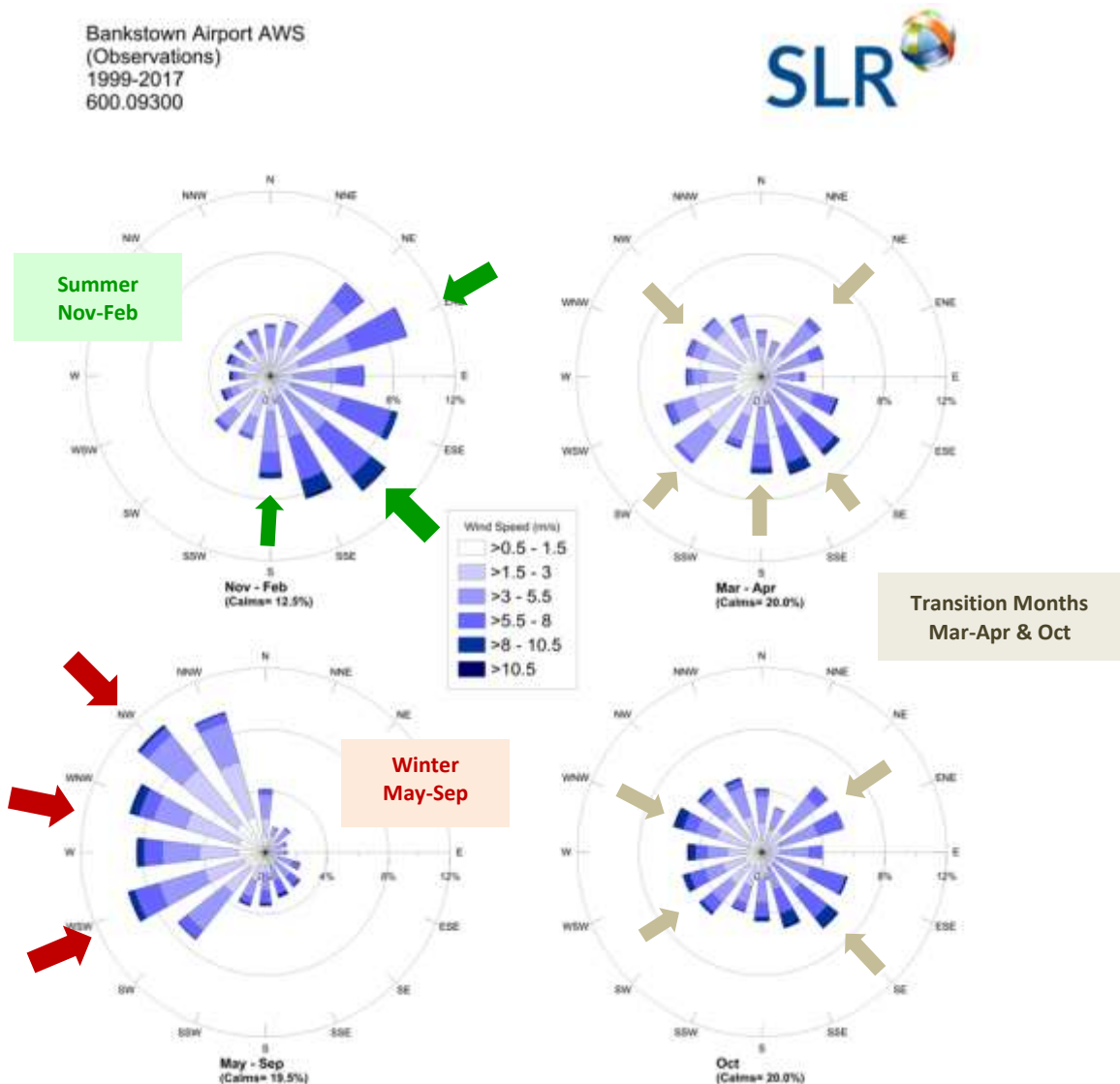
3 PROJECT SITE WIND CLIMATE

3.1 Seasonal Variations of Sydney's Regional Wind Climate

Key characteristics of Sydney's "regional" wind climate relevant to the development site are shown in the **Figure 3** seasonal wind roses, recorded at the nearby Bureau of Meteorology weather station at Bankstown Airport. These indicate that Sydney is affected by two primary wind seasons, with brief transition periods in between:

- Summer/Early Autumn winds occur mainly from the northeast, southeast, and south. While northeast winds are the more common prevailing wind direction (occurring typically as offshore land-sea breezes), southeast and southerly winds generally provide the strongest gusts during summer.
- Winter/Early Spring winds occur mainly from the west (southwest to northwest): these provide the strongest winds during winter and in fact for the whole year.

Figure 3 Bankstown Airport (Bureau of Meteorology Station) Seasonal Wind Roses (1999-2017)

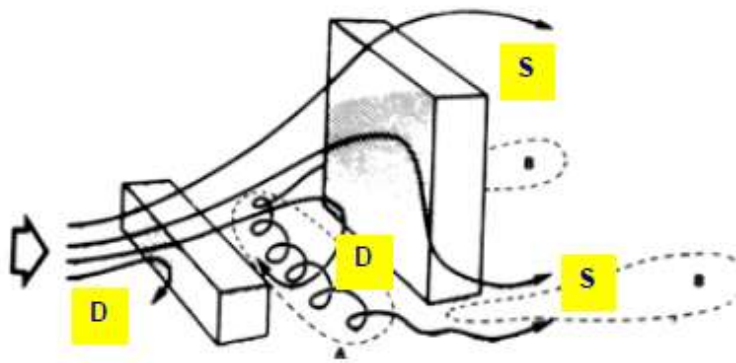


4 BUILDING-WIND INTERACTION – GENERAL OBSERVATIONS

The impact of wind flowing past buildings has well known general impacts at ground level – refer **Figure 4**. In general, the taller the building, the more pronounced the impact on ground level winds.

- **Downwash winds “D”** are the winds which impact on the windward face of a building and are then deflected downwards to Ground Level in a vertical direction; and
- Accelerating **Shearflow winds “S”** are the winds which experience acceleration as they pass by the building edges and roof as the wind flow moves around and past the building.

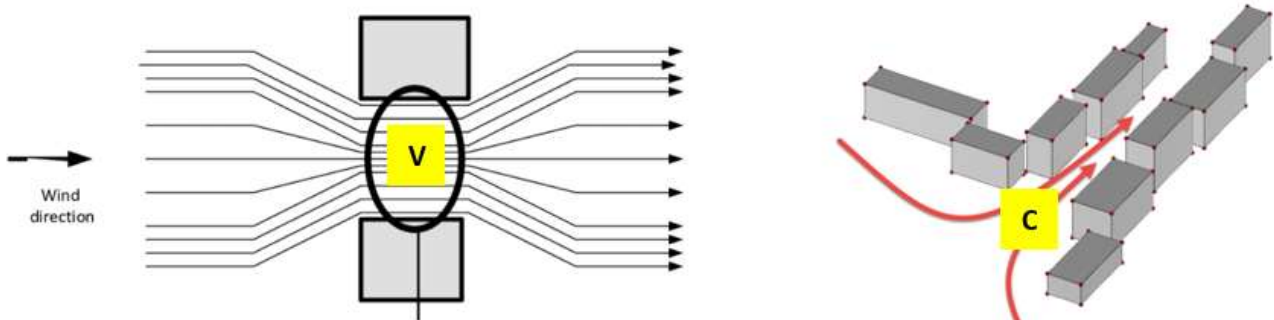
Figure 4 Windflow Patterns Past Regular-Shaped Buildings



The grouping of buildings can also have an impact on resulting pedestrian winds – refer to **Figure 5**.

- **Channelling Effect winds “C”** result when there are rows of parallel buildings (especially taller ones) where the gaps in between line up with prevailing wind directions.
- **Venturi Effect winds “V”** result when wind flow is forced to pass between two converging buildings or groups of buildings with a resulting increase in flow.

Figure 5 Windflow Patterns Past Groups of Buildings

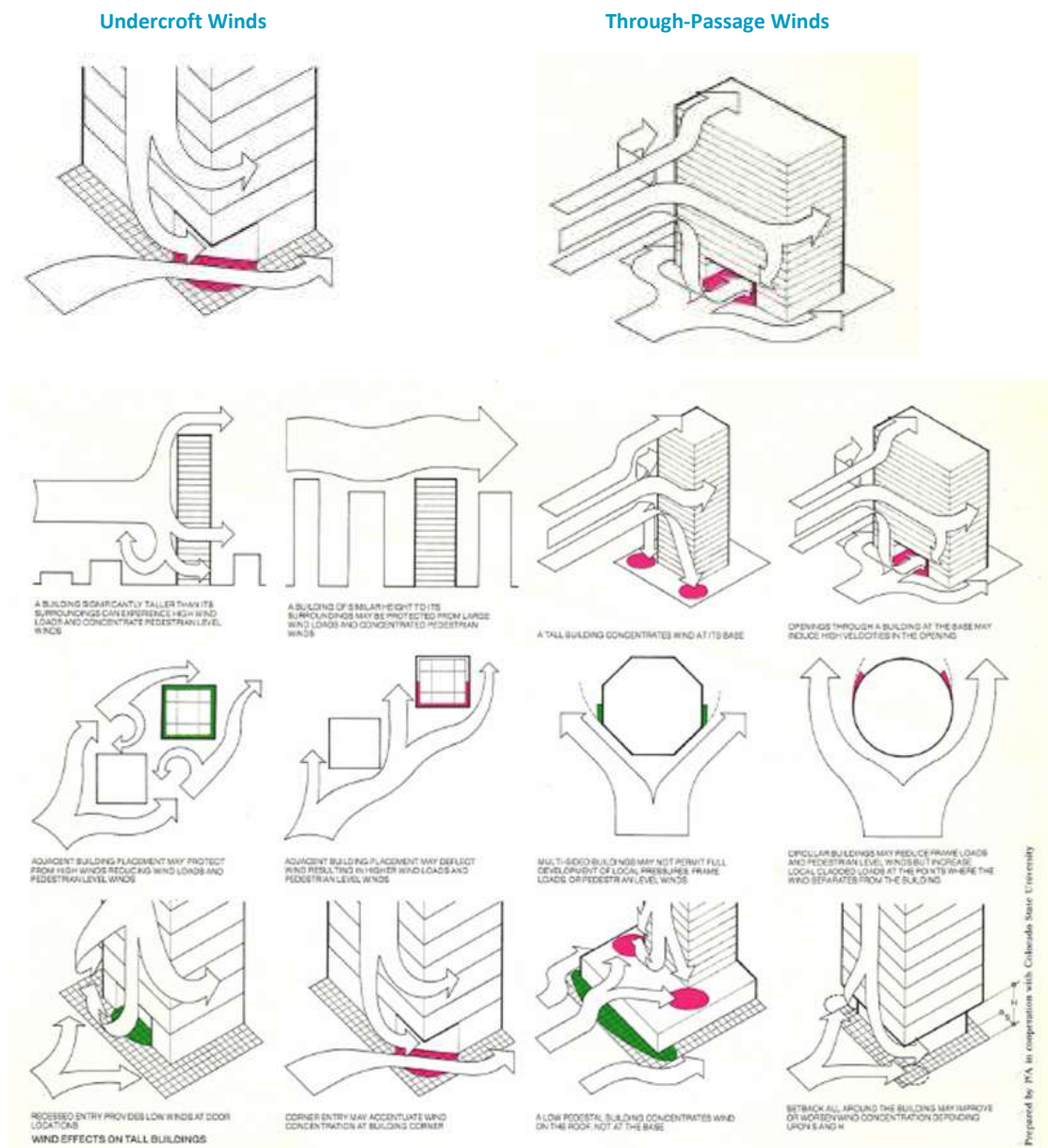


Local building details can also influence winds in the immediate vicinity – refer **Figure 6**.

The “**Undercroft**” effect is a well-known adverse building-wind characteristic as depicted in the generic building wind effect diagrams shown below. The winds are induced towards the negative pressure area within the undercroft, creating concentrated adverse wind flow through undercroft. This same pressure difference between the windward and leeward facades of a building can induce a strong wind tunnel effect through any open passage located at the base of a building – the “**Through Passage**” effect.

These and other common building-related wind impacts are depicted in **Figure 6**.

Figure 6 Undercroft Winds and Through-Passage Winds



5 WIND ACCEPTABILITY CRITERIA

5.1 Standard Local Government Criteria

The choice of suitable criteria for evaluating the acceptability of particular ground level conditions has been the subject of international research over the past few decades. One of the commonly accepted set of acceptability criteria developed from this research, currently referenced by many Australian Local Government Development Control Plans, is summarised in **Table 1**. The limiting wind speed criteria in **Table 1** are based on the maximum wind gust occurring (on average) once per year.

Table 1 Standard Local Government Wind Acceptability Criteria

Type of Criteria	Limiting Gust Wind Speed Occurring Once Per Year	Activity Concerned
Safety	24 m/s	Knockdown in Isolated Areas
	23 m/s	Knockdown in Public Access Areas
Comfort	16 m/s	Comfortable Walking
	13 m/s	Standing, Waiting, Window Shopping
	10 m/s	Dining in Outdoor Restaurant

The primary objectives relating to the above wind impact criteria are as follows:

- The general objective is for annual 3-second gust wind speeds to remain at or below the so-called 16 m/s “Walking Comfort” criterion. Whilst this magnitude may appear somewhat arbitrary, its value represents a level of wind intensity above which the majority of the population would find unacceptable for comfortable walking on a regular basis at any particular location.
- In many urban locations, either because of exposure to open water conditions or because of street “canyon” effects, etc, the 16 m/s “Walking Comfort” level may already be currently exceeded. In such instances a new development should ideally not exacerbate existing adverse wind conditions and, wherever feasible and reasonable, ameliorate such conditions.
- It can be seen in **Table 1** that the recommended limiting wind speeds for spaces designed for activities such as seating, outdoor dining, etc., are lower (ie more stringent) than for “walking comfort”.

5.2 Application of Wind Criteria

The criteria provided in **Table 1** (especially in relation to Comfort) should not be viewed as “hard” numbers as the limiting values were generally derived from subjective assessments of wind acceptability. Such assessments have been found to vary considerably with the height, strength, age, etc., of the pedestrian concerned. A further factor for consideration is the extent of windy conditions, and some relaxation of the above criteria may be acceptable for small areas under investigation provided the general site satisfies the relevant criteria.

6 WIND IMPACTS OF THE PROPOSED REDEVELOPMENT

6.1 Areas of Interest in Relation to Wind Impact

Areas of interest in relation to the expected wind impact of the proposed Development on surrounding footpaths, primary building entry points, communal open spaces, balconies, etc, are identified in **Figure 7**.

They include:

- The Auburn Road footpath
- Public spaces around proposed building
- The New Streets within the Development site
- Building Entry points
- Elevated Communal Terrace Areas
- Private Corner Balconies

6.2 Future Wind Impact at All Areas of Interest

The wind impact of the proposed Development is described by examining the impact of key prevailing wind conditions on areas of interest within and external to the development.

The key directions analysed are:

- NE and S/SE winds for summer months and
- SW-NW (Westerly) winds for winter months.

The predicted wind environment at the site is examined in terms of both the:

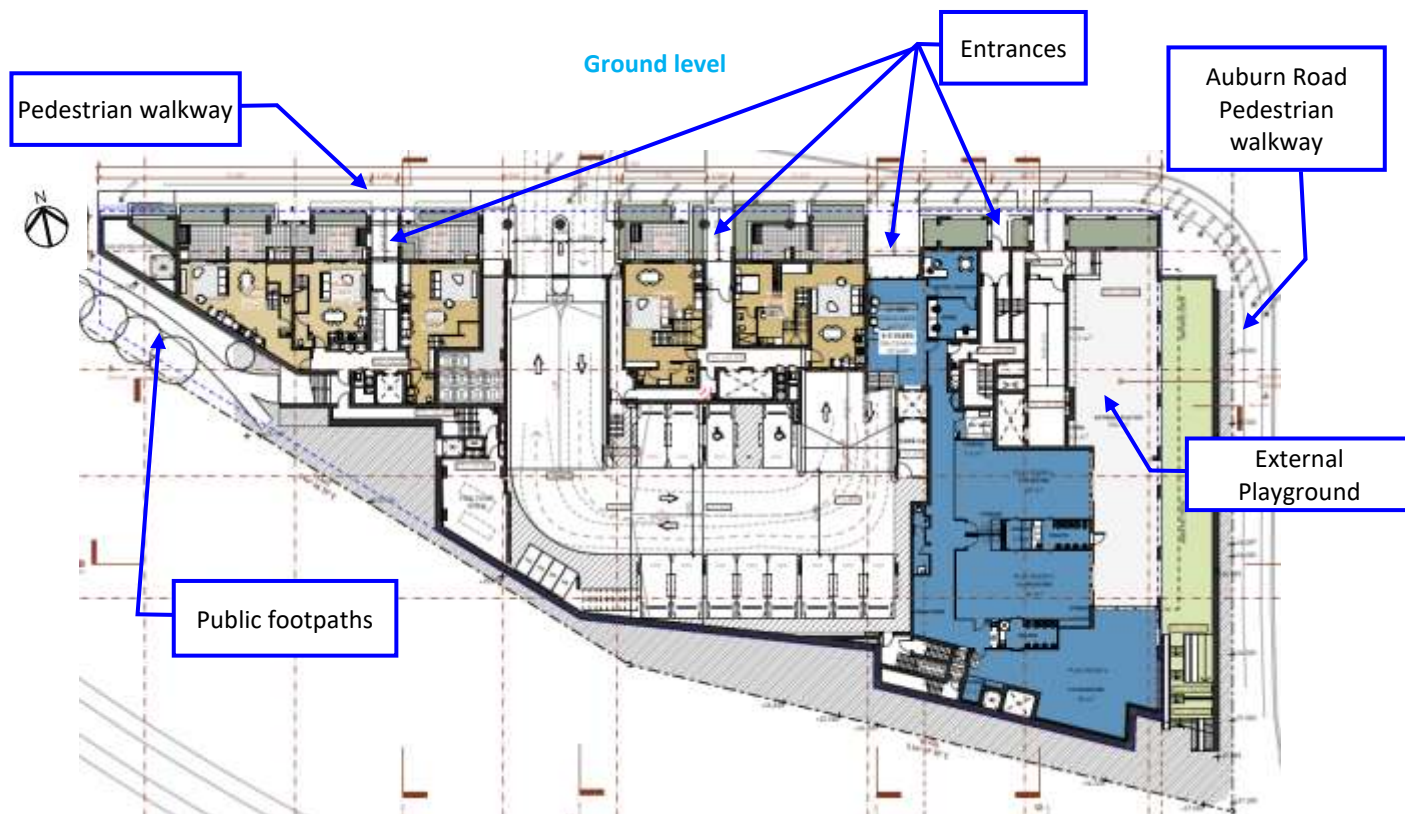
- Existing Winds, and
- Future Winds with the addition of the proposed development.

The proposed buildings in stage 3 are anticipated to potentially influence the ground-level wind conditions around the planned buildings in other stages at the site. This impact is expected to provide additional shielding, except for influences from the west.

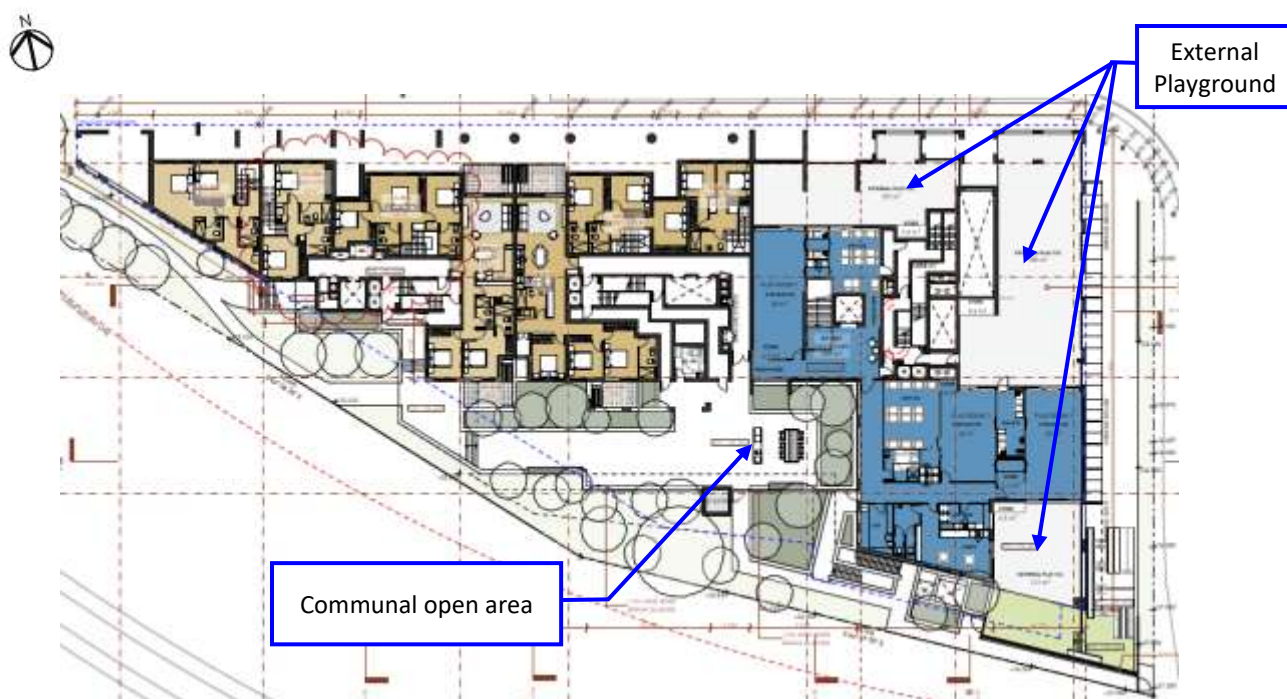
The above predictions are made on the basis of our best engineering judgement and (decades of) experience in carrying out Environmental Wind Tunnel Testing and CFD Simulation Studies.

The above predictions are initially made without necessarily assuming any benefit from the already planned landscaping for the proposed development. Areas of interest (i.e. surrounding footpaths, primary entry points, internal public access areas, seating and dining areas, etc) are identified in **Figures 7-11**.

Figure 7 Areas of Interest – Site Area



Level 1



This is a detailed architectural floor plan of a building, likely a residential or institutional structure. The plan shows a complex arrangement of rooms, corridors, and service areas. A blue rectangular box highlights a specific area in the lower right quadrant, labeled "Communal open area". A blue arrow points from this box to a green-shaded outdoor space at the bottom right of the building. The plan includes various room layouts, furniture placement, and structural elements like walls and doors. A north arrow is visible in the top left corner.

6.3 Future Wind Environment – Areas of Interest

Location	Wind Direction	Existing Wind Environment	Anticipate Future Wind Environment	Key wind issues and whether mitigation may be needed
Auburn Road Pedestrian Pathway	Northeast	Borderline compliance	Likely comply	The proposed development may generate localized downwash effects and wind channelling along the Auburn Road pedestrian pathways. However, the incorporation of the proposed trees is expected to play a vital role in mitigating these high wind effects and improving overall pedestrian comfort.
	South/Southeast	Borderline compliance	Likely comply	The pedestrian walkways underwent limited protection from the surrounding buildings. It's then important to factor in the surrounding landscaping to effectively mitigate the impact of high-speed winds.
	West	Borderline compliance	Likely comply	This area will gain advantages from sufficient shielding offered by nearby buildings upstream, and the alignment of the construction will additionally minimize the influence of prevailing winds.
Pedestrian walkway On the north side of the building	Northeast	Borderline compliance	Likely comply	The proposed development may induce localized downwash effects under prevailing north-easterly winds. However, the future Stage 2 buildings are expected to provide additional shielding to this area. Furthermore, the inclusion of the proposed trees, together with the building setbacks and colonnade design, will help to reduce high-level wind impacts and enhance pedestrian comfort.
	South/Southeast	Borderline compliance	Likely comply Potential improvement	This area is not exposed to direct S and SE winds. Additionally, due to the presence of proposed buildings, the pedestrian walkways along the north side of the building is shielded, resulting in limited east and southeast winds being experienced.
	West	Borderline compliance	Likely comply	The upcoming development could cause wind channelling along the pathways on the north side of the building. This impact will be minimized by the strategic placement of landscaping and sizable trees in the vicinity of this area.
Pedestrian Pathway Along the south side of the building	Northeast	Borderline compliance	Likely comply	This area will gain advantages from sufficient shielding offered by nearby buildings upstream, and the alignment of the construction will additionally minimize the influence of prevailing winds.
	South/Southeast	Borderline compliance	Likely comply	The alignment of the street intensifies wind speed, potentially leading to increased airflow along the pedestrian pathway on the south walkways due to the planned development. This impact will be minimized by the strategic placement of landscaping and sizable trees in the vicinity of this area.

Location	Wind Direction	Existing Wind Environment	Anticipate Future Wind Environment	Key wind issues and whether mitigation may be needed
	West	Borderline compliance	Likely comply	Limited upstream sheltering is observed for westerly winds, and the street orientation amplifies wind speed-up. However, with the presence of established trees and street footpath landscaping, the high-speed easterly winds will be alleviated.
Entrances	Northeast	na	Likely comply	The building entrances could encounter increased winds originating from north and northeast, however, the building setback will ameliorate these winds. As such, winds at entry points will be modest.
	South/Southeast	na	Likely comply	This area is not directly exposed to Southerly and westerly winds. Furthermore, the proposed building and the proposed gate door offer protection, creating a shielded environment and consequently minimizing the impact of westerly winds in this area.
	West	na		
External Playground on ground level and level 1	Northeast	na	Likely comply	The outdoor playground areas may be exposed to elevated wind conditions from the north-east and south. However, these spaces are partially sheltered by the building above, which significantly reduces the influence of high-level winds and improves the overall comfort and usability of the playground.
	South/Southeast	na	Likely comply	
	West	na	Likely comply	This area is not directly exposed to westerly winds. Furthermore, the proposed building offer protection, creating a shielded environment and consequently minimizing the impact of westerly winds in this area.
Communal open space on Level 1	Northeast	na	Likely comply	This area is not exposed to direct northerly winds as it will receive upstream sheltering at this area due the proposed development.
	South/Southeast	na	Likely comply	The open space may experience elevated wind conditions from the south and west. However, the inclusion of the proposed vertical windbreaks along the outer perimeter, together with the incorporation of the proposed trees, is expected to effectively mitigate wind speeds and enhance the comfort of the area.
	West	na	Likely comply	
Communal open space on Level 8	Northeast	na	Likely comply	This area is currently exposed to strong winds from multiple directions due to limited shielding. However, the implementation of an effective wind mitigation strategy will substantially reduce the influence of prevailing winds and improve overall comfort and protection within the space.
	South/Southeast	na	Likely comply	
	West	na	Likely comply	
Private corner balconies	Northeast	na		

Location	Wind Direction	Existing Wind Environment	Anticipate Future Wind Environment	Key wind issues and whether mitigation may be needed
			Potential increase without mitigation	
	South/Southeast	na		The corner elevated balconies could encounter heightened winds from different directions. As such some vertical windbreaks on the outer perimeter of the area are required to mitigate the wind speed.
	West	na		

7 MITIGATION AND TREATMENT RECOMMENDATIONS

On the basis of the expected wind impacts outlined in Section 7, the following recommendations for wind amelioration features are made in areas where winds are expected to approach or exceed the relevant 10 m/s, 13 m/s or 16 m/s criterion depending on the designed use for that area.

Ground level and level 1

- Retain the proposed or existing trees and landscaping along the sides of the development to mitigate the impact of local wind speeds. Ensure all trees and landscaping are evergreen and densely foliated to remain effective year-round – refer **Figure 8**.
- Maintain the proposed setbacks, colonnades, and awnings at ground-level building entrances to minimize wind downwash effects and redirect airflow along pedestrian pathways– refer **Figure 8**..
- Position any designated outdoor seating areas on the north side of the site beneath the building's setback, with the proposed trees helping to mitigate high-level winds from the north and downward.
- Preserve the setbacks and colonnades around the outdoor childcare playground, ensuring the surrounding vertical windbreaks are upheld at both ground level and Level 1 – refer **Figure 9**.
- Retain 1.9m high glazed balustrade along the outer perimeter of the communal open terrace on Level 1 to reduce adverse wind effects – refer **Figure 10**..

Elevated communal open area

- Keep 1.9m high glazed balustrade around the outer edge of the communal open space on level 8. This windbreak can consist of balustrades or a combination of walls and planters/trees of similar height, strategically placed along the edges.

Upper-Level Balconies – refer Figure 11

The proposed development features open balconies. It is almost certain that some of these balconies, especially those at upper levels and near building corners, will experience adverse wind conditions. Nonetheless, the implementation of a 1.1-meter-high solid balustrade effectively mitigates wind speeds, ensuring compliance with the recommended wind comfort criteria. Treatments might include increased balustrade height or partial screening via moveable louvres, to take advantage of the beneficial impact of cooler, milder winds during summer, while providing the capacity to limit the impact of colder and potentially much stronger winds during winter. Where balconies have exposure to more than one aspect, partial balcony treatment on the most exposed façade would be a practical means of wind shielding, eg full height balustrade, louvres, pull-down screens, etc, on the most exposed aspect of the balcony.

During the Detailed Design phase of the project, once the design of the various building facades is finalised, 3D CFD Simulation modelling could be carried out to confirm zones of the building, by height and by plan view location (eg which building corners), where wind mitigation (ie beyond the standard balustrade height) may be beneficial IF it is intended for balconies and terraces to be used all-year-round, also noting that the strongest north-westerly and easterly winds.

It is again noted that the above recommendation is made only IF it is intended for balconies and terraces to be used all-year-round, also taking into account that the strongest westerly winds occur during winter.

Figure 8 Wind Mitigation Recommendations – Ground Level

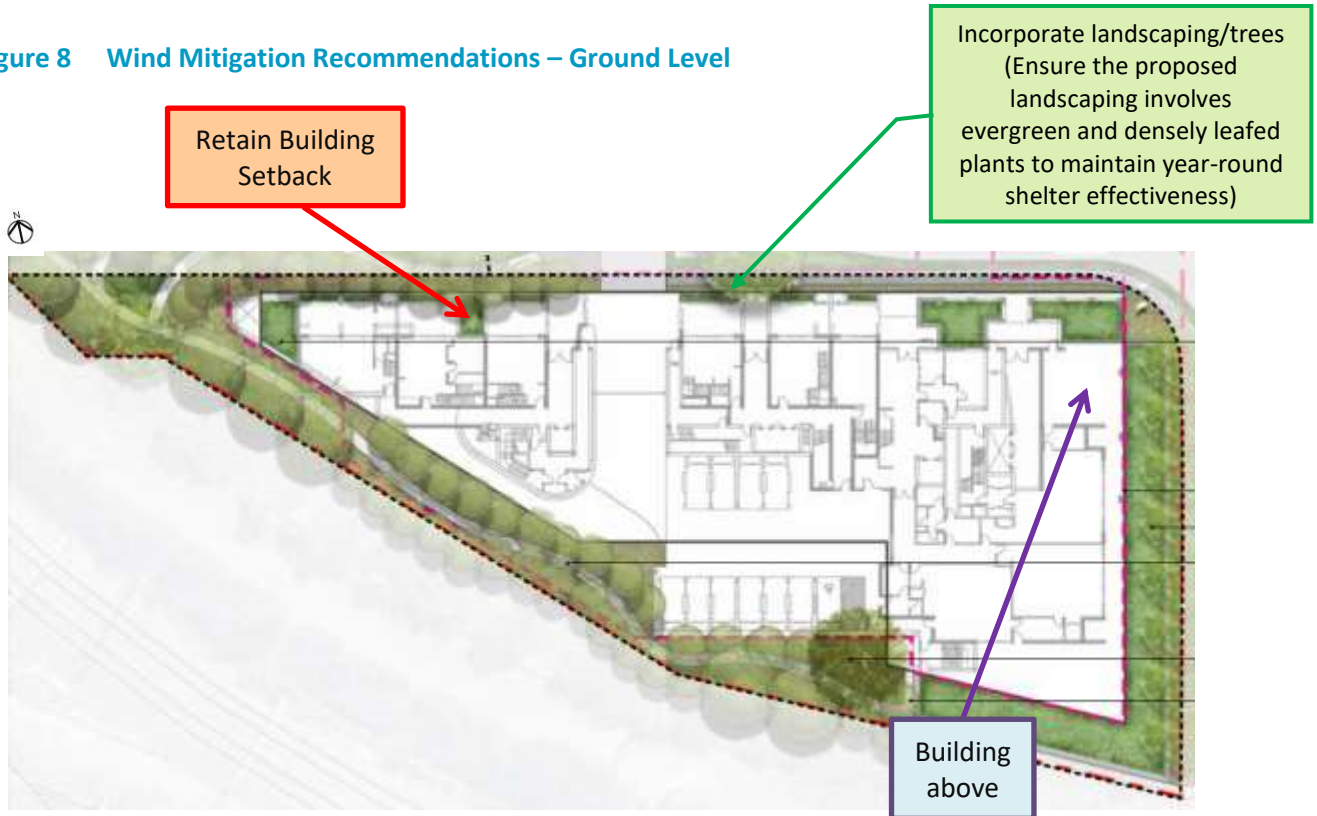


Figure 9 Wind Mitigation Recommendations – Level 1



Figure 10 Wind Mitigation Recommendations – Level 8

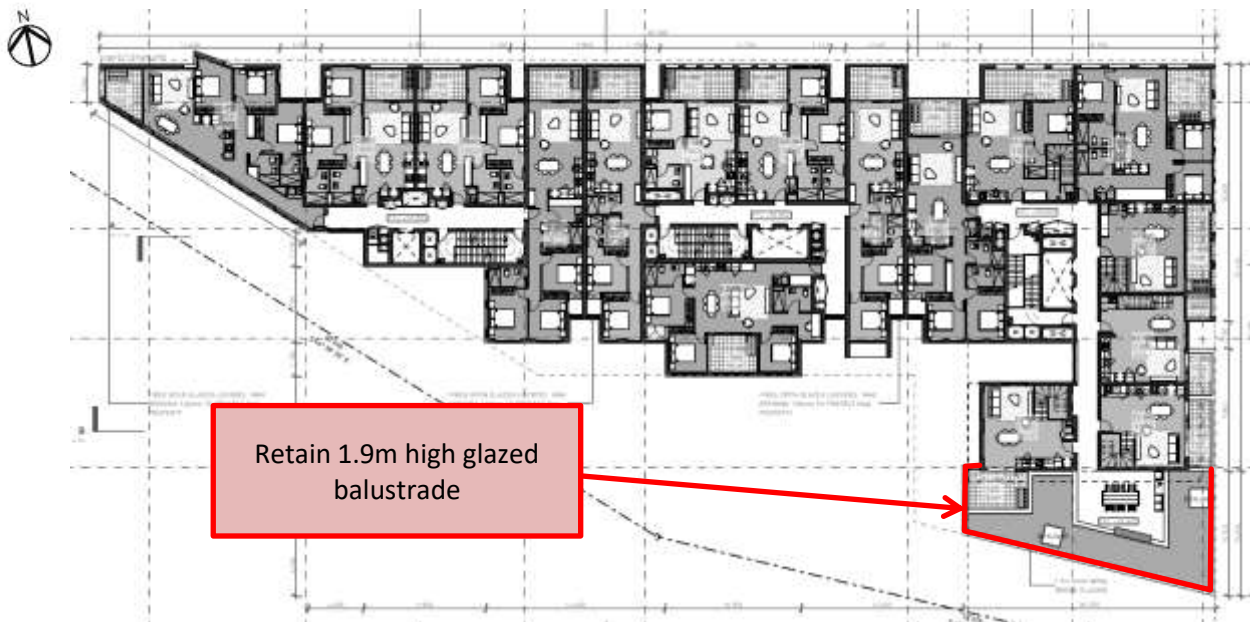
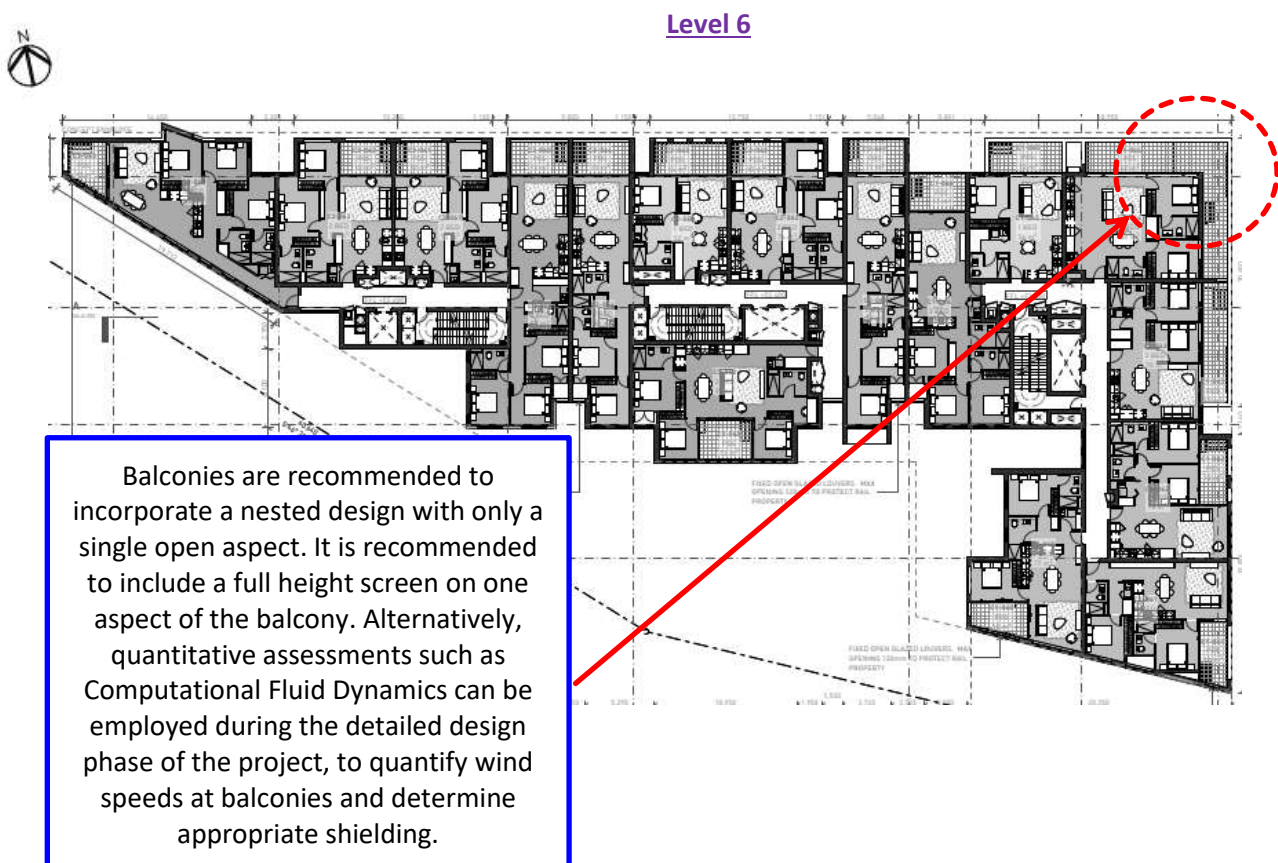


Figure 11 Wind Mitigation Recommendations – elevated corner balconies (Level 4 and above)



8 CONCLUSIONS

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Existing street level wind conditions in the vicinity of the site are likely to be at or just above the 16 m/s “walking comfort” criterion for some prevailing wind directions given the moderate shielding afforded to the site by the surrounding environment for the northeast and southeast directions in particular.

Future Wind Environment

In terms of the *future* wind environment with the proposed Development, the following features are noted as being of most significance:

Ground Level and Level 1

- Keep the proposed or existing evergreen, densely foliated trees and landscaping along the sides of the development to mitigate local wind speeds effectively throughout the year (see Figure 8).
- Retain the proposed ground-level setbacks, colonnades, and awnings at building entrances to minimize wind downwash and channel airflow along pedestrian pathways (see Figure 8).

- Position outdoor seating areas on the north side of the site, under the building's setback, where proposed trees will mitigate high-level winds from the north and downwash (see Figure 8).
- Maintain setbacks and colonnades around the outdoor childcare playground, ensuring vertical windbreaks are implemented at both ground level and Level 1 (see Figure 9).
- Maintain the proposed 1.9m high glazed balustrade along the perimeter of the Level 1 communal terrace to reduce adverse wind effects (see Figure 9).

Elevated Communal Open Areas

- Keep the proposed 1.9m high glazed balustrade on the perimeter of communal areas at Level 8 (see Figure 10).

Upper-Level Balconies (refer to Figure 11)

- Consider partial balcony screening (e.g., full-height balustrades, louvres, or pull-down screens) on the most exposed façades (eg. Level 6 corner balcony), allowing for flexibility to benefit from milder summer winds while mitigating stronger winter winds.
- For balconies exposed on multiple sides, prioritize wind shielding on the most exposed façade.

The analysis in this report has been made on the basis of our best engineering judgment and on the experience gained from scale model wind tunnel testing or computational fluid dynamics analysis of a range of developments. The conclusions of this SLR report can be quantified using wind tunnel testing or computational fluid dynamics analysis.

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