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Auyin Property Development Pty Ltd

7-15 Horne Street, Elsternwick

Wind Impact Assessment

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Executive Summary

Auyin Property Development Pty Ltd commissioned Vipac Engineers and Scientists Ltd to prepare a statement of wind effects for the ground level areas adjacent to the proposed development at **7-15 Horne Street, Elsternwick**. This appraisal is based on Vipac's experience as a wind-engineering consultancy.

Drawings of the proposed development were provided by **CBG Architects** in **June 2026**.

The findings of this study can be summarized as follows.

With proposed design:

- Wind conditions in the ground level footpath areas and access ways would be expected to be within the **walking** comfort criterion.
- The main entrances would be expected to be within the **standing** comfort criterion.
- The covered plaza area would be expected to be within the **standing and sitting** comfort criterion.
- The outdoor dining areas are expected to fulfil the recommended **sitting** criterion.
- The terraces and balconies would be expected to be within the recommended **walking/standing** comfort criterion.
- The wind conditions are expected to be within safety criterion.

As a general statement, educating occupants about wind conditions at open terrace/balcony areas during high-wind events and fixing loose, lightweight furniture on the terrace are highly recommended.

The assessments provided in this report have been made based on experience of similar situations in Melbourne and around the world. As with any opinion, it is possible that an assessment of wind effects based on experience and without experimental validation may not account for all complex flow scenarios in the vicinity.

We recommend a wind tunnel study and/or CFD simulations be conducted in a detail design stage to quantify the wind conditions and determine the proper wind control measures wherever necessary.

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1 Introduction

Vipac Engineers and Scientists has been commissioned by **Auyin Property Development Pty Ltd** to carry out an appraisal of the pedestrian wind effects at the ground level of the proposed development at **7-15 Horne Street, Elsternwick**.

Strong winds in pedestrian areas are frequently encountered in central business districts of cities around the world, including Sydney, Melbourne and Brisbane. Wind characteristics such as the mean speed, turbulence and ambient temperature determine the extent of disturbance to users of pedestrian areas. These disturbances can cause both comfort and safety problems and require careful consideration to mitigate successfully.

The proposed development is a Ground floor + 12-storey residential building with a roof parapet height of 45.91 m. The site is bounded by Horne Street to the northeast, a laneway to the northwest and southwest and existing developments to the southeast. A satellite image of the proposed development site and the two elevations of the building are shown in Figure 1 and Figure 2, respectively.

This report details the opinion of Vipac as an experienced wind engineering consultancy regarding the wind effects in ground level footpath areas adjacent to the development as proposed. No wind tunnel testing has been carried out for this development at this stage. Vipac has carried out wind tunnel studies on many developments of similar shape and having similar exposure to that of the proposed development. These serve as a valid reference for the prediction of wind effects. Empirical data for typical buildings in boundary layer flows has also been used to estimate the likely wind conditions on the ground level areas of the proposed development [2] & [3].

Drawings of the proposed development were supplied to Vipac by **CBG Architects** in **March 2026**. A list of drawings supplied is provided in Appendix C of this report.



Figure 1: Aerial view of the proposed development site.

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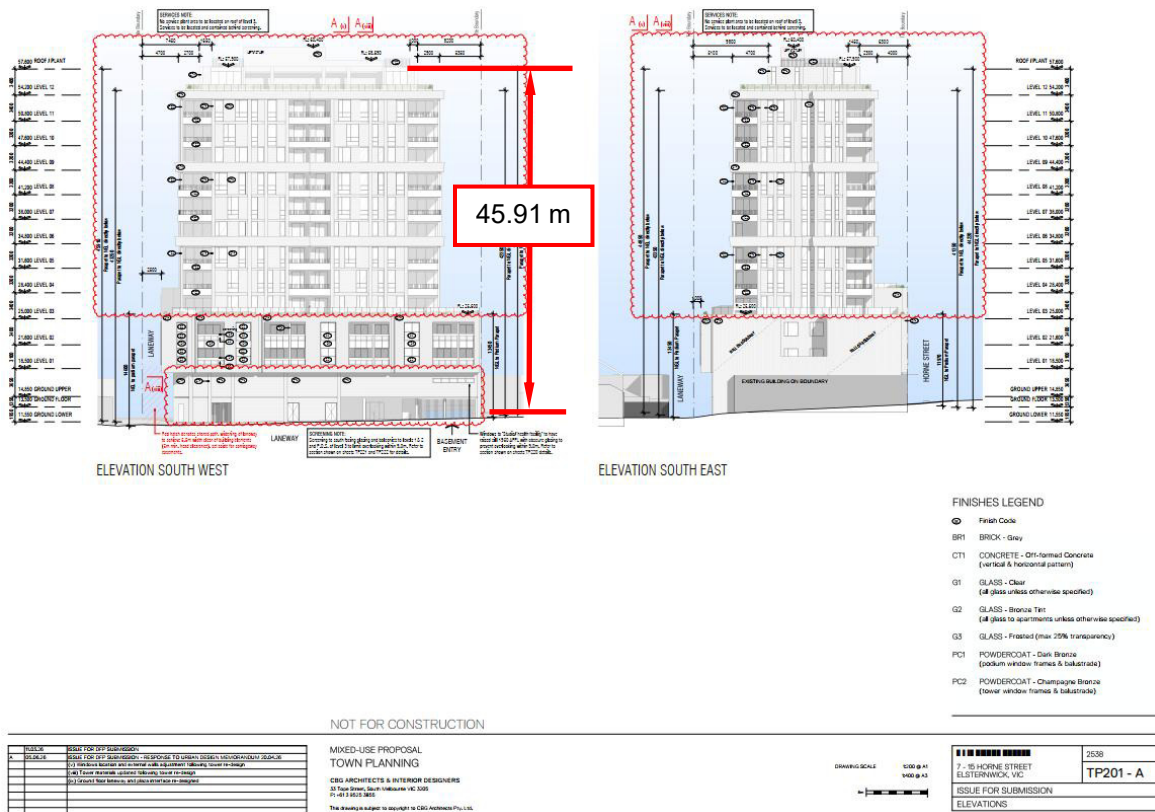


Figure 2: Southwest and southeast elevations of the proposed development.

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2 Analysis Approach

In assessing whether a proposed development is likely to generate adverse wind conditions in ground level footpath areas, Vipac has considered the following five main points:

- The exposure of the proposed development to wind;
- The regional wind climate;
- The geometry and orientation of the proposed development;
- The interaction of flows with adjacent developments; and
- The assessment criteria determined by the intended use of the areas affected by wind flows generated or augmented by the proposed development.

The pedestrian wind comfort at specific locations of ground level footpath areas may be assessed by predicting the gust and mean wind speeds with a probability of 0.1% and 20% expected at that location. The location may be deemed generally acceptable for its intended use while gust and mean wind speeds are within the threshold values noted in Section 2.5. Where Vipac predicts that a location would not meet its appropriate comfort criterion, the use of wind control devices and/or local building geometry modifications to achieve the desired comfort rating may be recommended. For complex flow scenarios or where predicted flow conditions are well in excess of the recommended criteria, Vipac recommends scale model wind tunnel testing to determine the type and scope of the wind control measures required to achieve acceptable wind conditions.

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2.1 Site Exposure

The proposed development is located on relatively flat terrain. The site is surrounded within an approximately 2.8 km radius predominately by low to mid-rise developments; with Elsternwick Park to the south-west. A satellite image showing these site surroundings is shown in Figure 3.

Considering the immediate surroundings and terrain, for the purposes of this study, the site of the proposed development is assumed to be within Terrain Category 2.5 for wind directions W to SW and Terrain Category 3 for all other wind directions (Figure 3).



Figure 3: Assumed terrain categories for wind speed estimation.

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2.2 Regional Wind Climate

The mean and gust wind speeds have been recorded in the Melbourne area for over 30 years. This data has been analysed and the directional probability distribution of wind speeds has been determined. The directional distribution of hourly mean wind speed at the gradient height, with a probability of 0.1% of time and 20% of time exceeded are shown in Figure 4. The wind data at this free stream height is common to all Melbourne city sites and may be used as a reference to assess ground level wind conditions at the site.

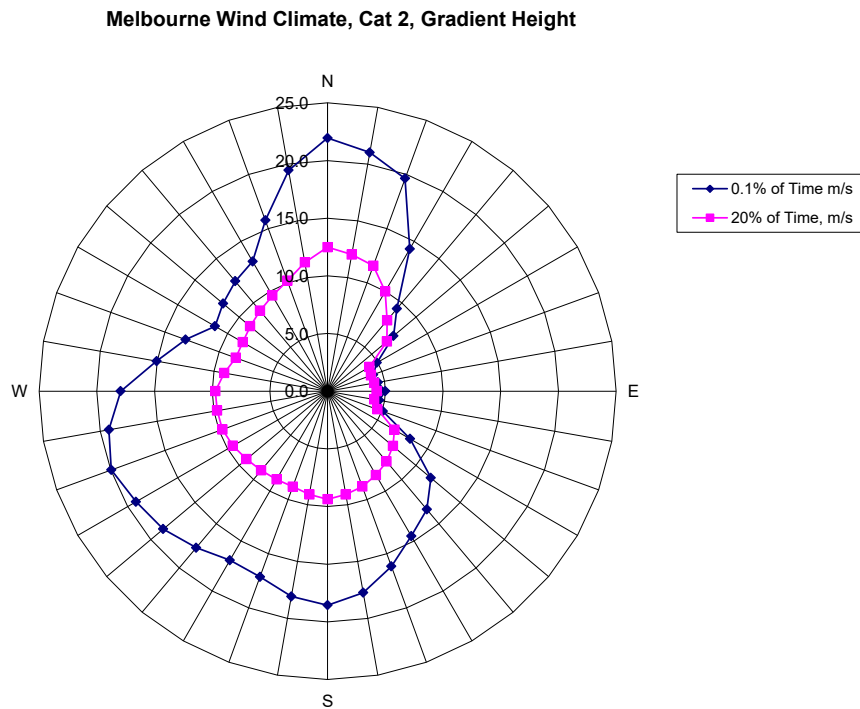


Figure 4: Directional Distribution of Mean Hourly Wind Velocities (m/s) for 0.1% and 20% exceeded at Gradient Height for Melbourne.

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2.3 Building Geometry and Orientation

The proposed development is an 8-storey residential building. The overall plan-form dimensions are approximately 30 m x 45 m as shown in Figure 5. The main entrances are located on Horne Street, with a rear lobby entry off the laneway to the southwest. There is a covered plaza at the site corner of the north. The development incorporates tower setbacks from all site boundaries from level 3.

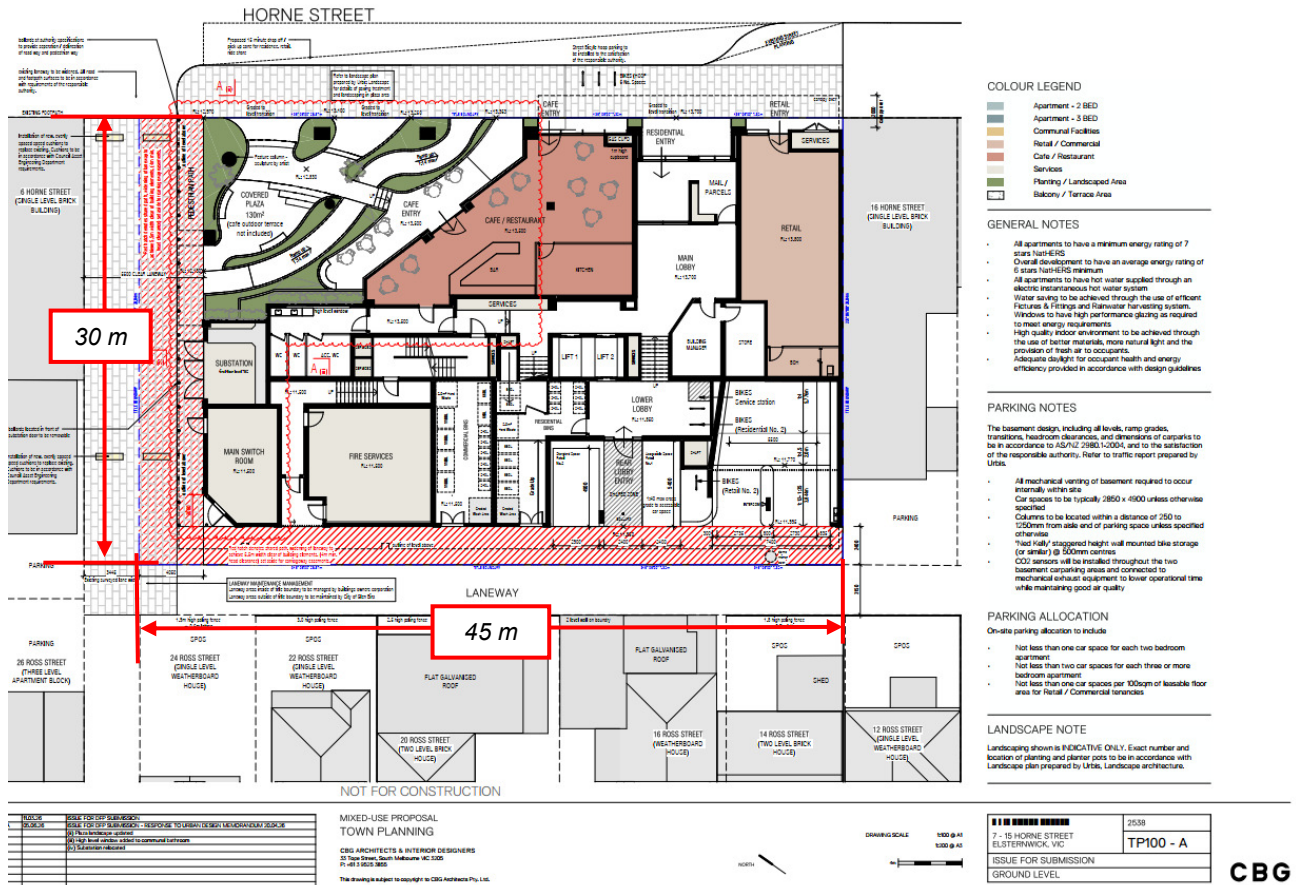


Figure 5: Ground floor plan with the overall dimensions overlaid.

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2.4 Flow interactions with Adjacent Developments

The immediately adjacent developments are shown in Figure 6. At ground level, the site is exposed to direct winds from the north-westerly direction channelling along Horne Street. The building is oriented such the northeast façade would be expected to induce downwash flows into Horne Street. The development is taller than the surrounding buildings and so is exposed to winds from all directions at the upper levels.

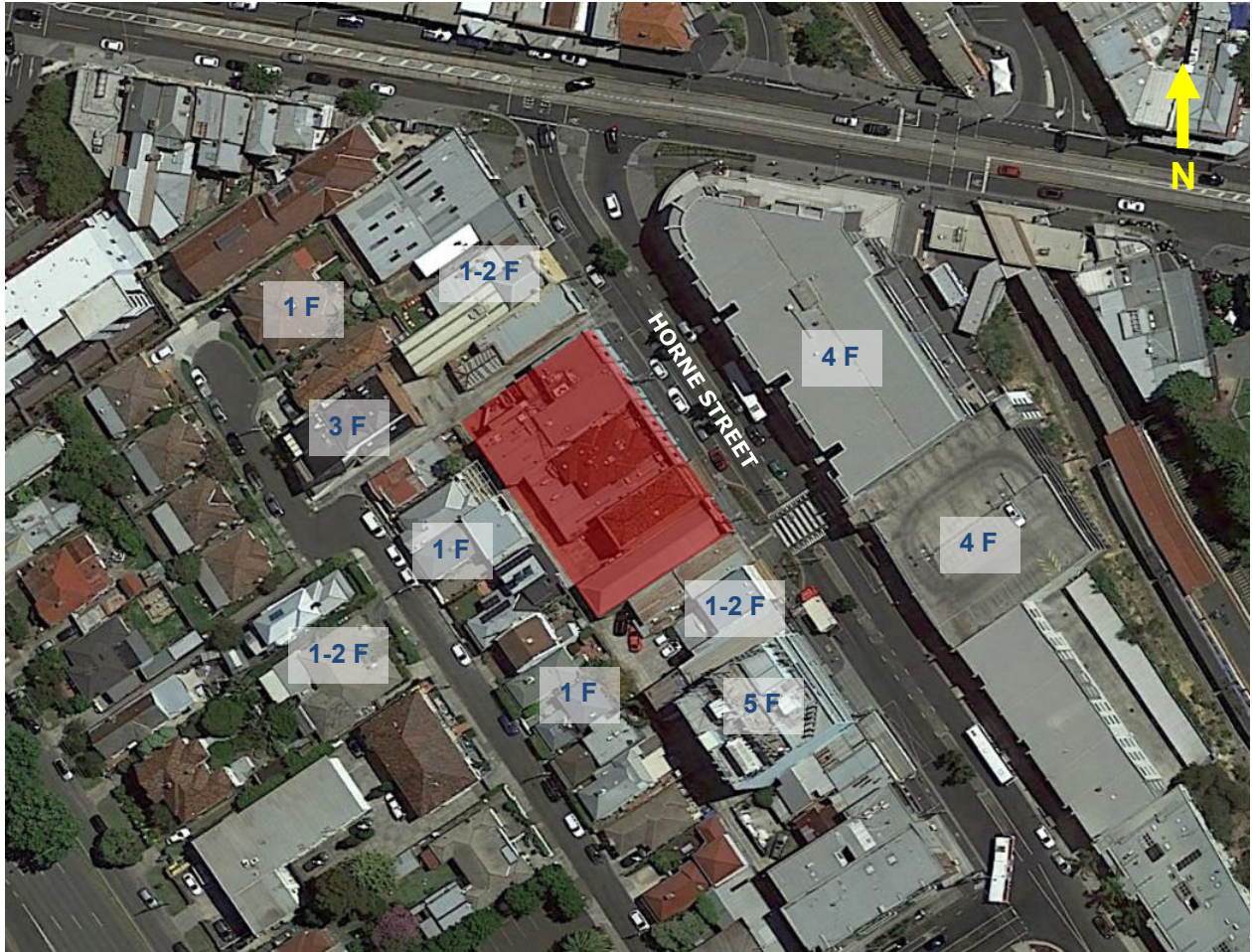


Figure 6: Immediately adjacent surroundings and their approximate number of floors (F)

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2.5 Assessment Criteria

The following wind comfort criteria detailed in Table 1 were applied in this study.

Table 1: Wind Comfort Criteria as per Clause 58.04-4

Unsafe	Comfortable
Annual maximum 3 second gust wind speed exceeding 20m/sec with a probability of exceedance of 0.1% considering at least 16 wind directions.	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: 3m/sec for sitting areas (outdoor cafés) 4m/sec for standing areas (window shopping, queuing) 5m/sec for walking areas (steady steps for most pedestrians)

This criterion specifically calls for the safety criterion to be used to assess infrequent winds (e.g. peak event of $\leq 0.1\%$ of the time); and the perceived pedestrian comfort to be assessed based on frequently occurring winds (e.g. winds that occurs 80% of the time).

In Table 1, the mean wind velocity is defined as the maximum of hourly mean or gust equivalent mean ($\text{Gust}/1.85$)

This criterion specifies that safe and comfortable wind conditions must be achieved in publicly accessible areas within a distance equal to half the longest width of the building measured from all facades or half the overall height of the building, whichever is greater, as shown in Figure 7.

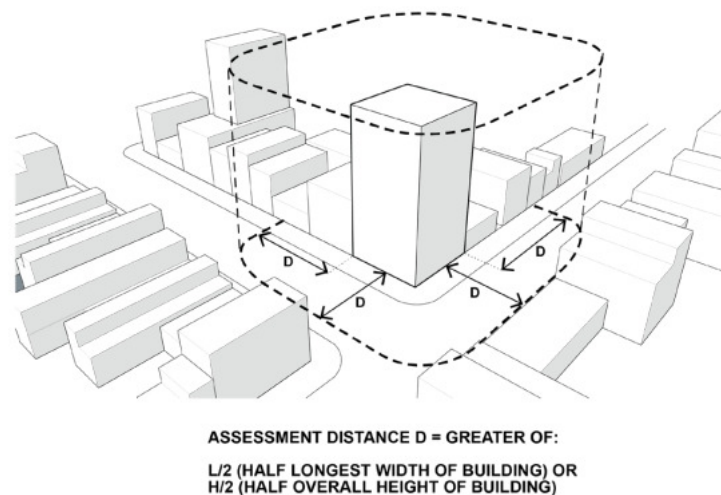


Figure 7: Assessment distance

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2.5.1 Use of Adjacent Pedestrian Occupied Areas & Recommended Comfort Criteria

The following table lists the specific areas adjacent to the proposed development and the corresponding recommended criteria.

Table 2: Recommended application of criteria

Area	Specific location	Recommended Criteria
Public Footpaths, Access ways	Along Horne Street and the adjacent laneways (Figure 8)	Walking
Building Entrances	Main Building Entrances Along Horne Street and the rear entry off the laneway (Figure 8)	Standing
Covered Plaza	Northern Corner ground level	Standing and Sitting
Seated areas	In north front of the café	Sitting
Communal Outdoor Space	Level 3 (Figure 9)	Standing
Balcony/Terraces	Up the height of the building	Walking (See discussion below)

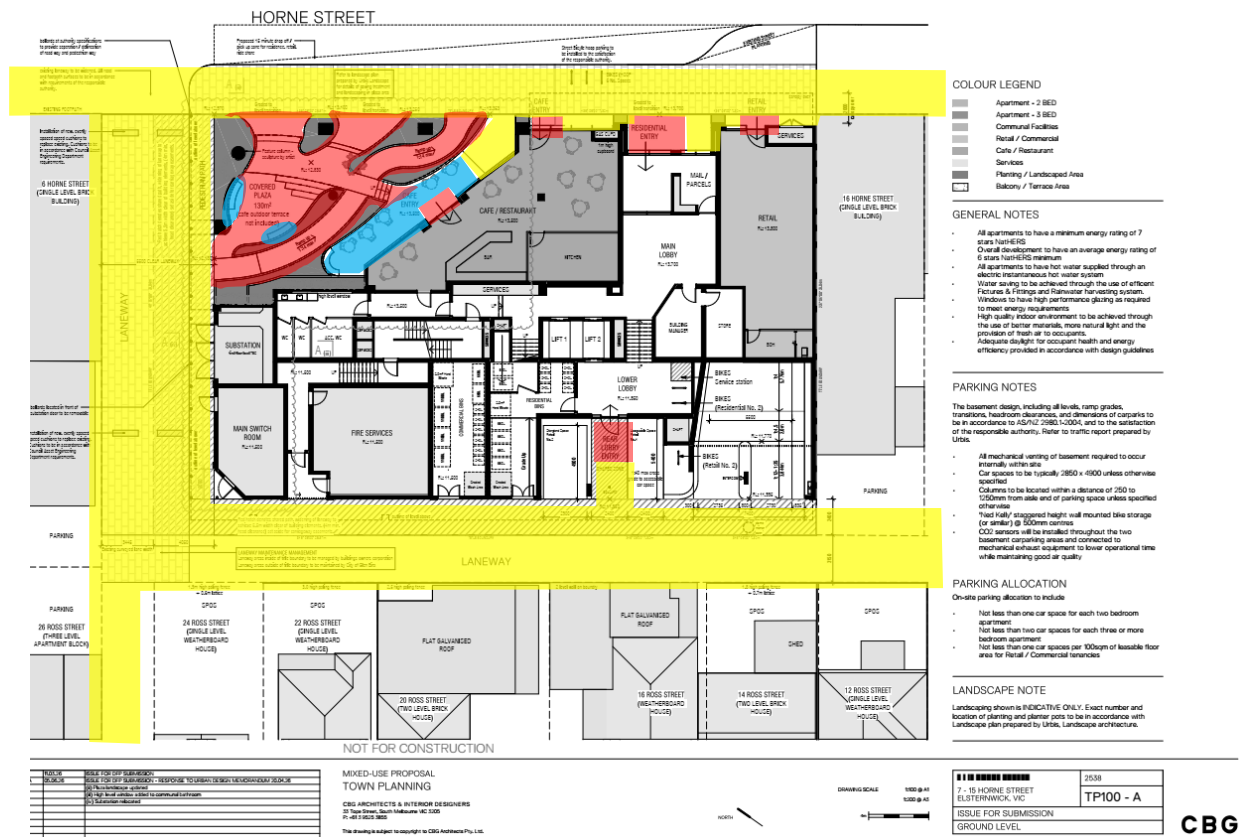
2.5.2 Terrace / Balcony Recommended Criterion Discussion

There are Private Balconies and Terraces located up the height of the development. Vipac recommends as a minimum that balcony/terrace areas meet the criterion for walking since:

- these areas are not public spaces;
- the use of these areas is optional, and only intended to be used on fair weather days with calm winds;
- many similar developments in Melbourne and other Australian capital cities experience wind conditions on balconies and elevated deck areas in the vicinity of the criterion for walking.

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Recommended to fulfil Walking

Recommended to fulfil Standing

Recommended to fulfil Sitting

Figure 8: Ground floor with recommended wind criteria overlaid

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HORNE STREET

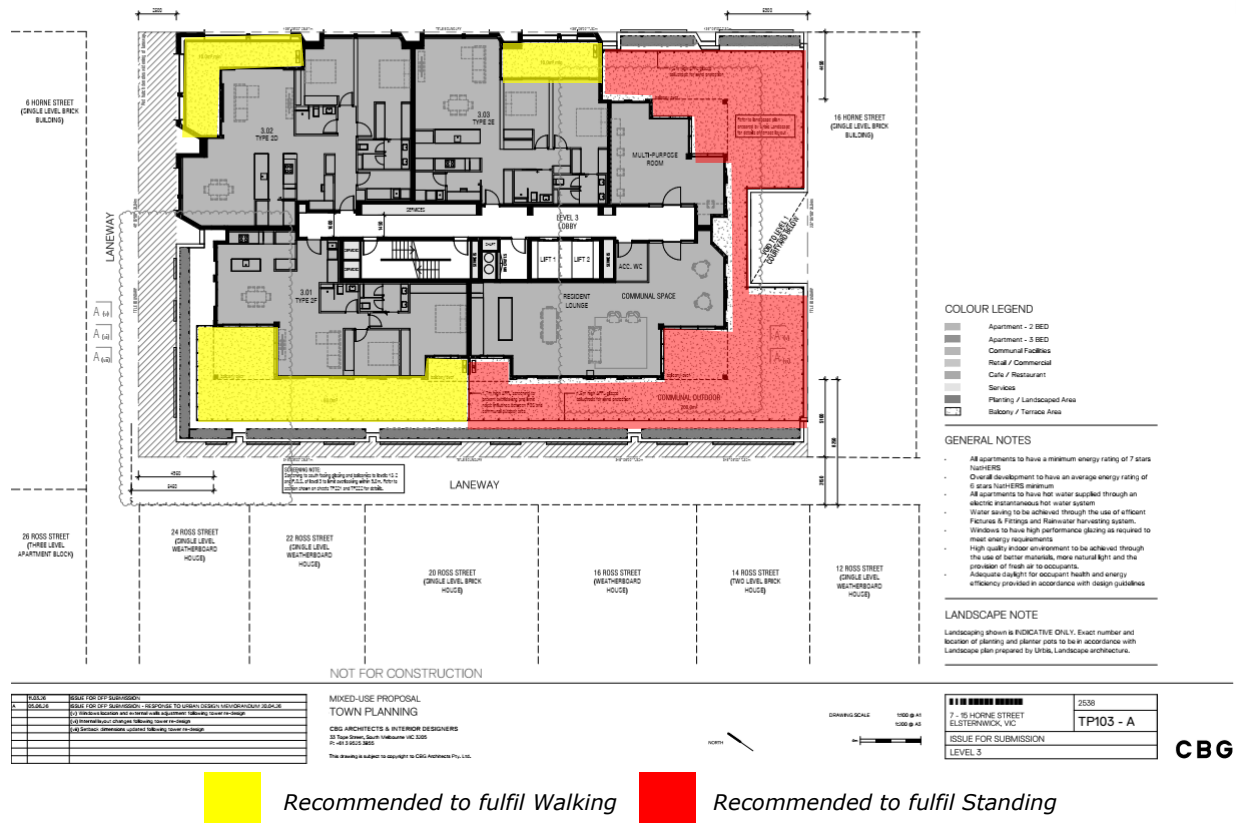
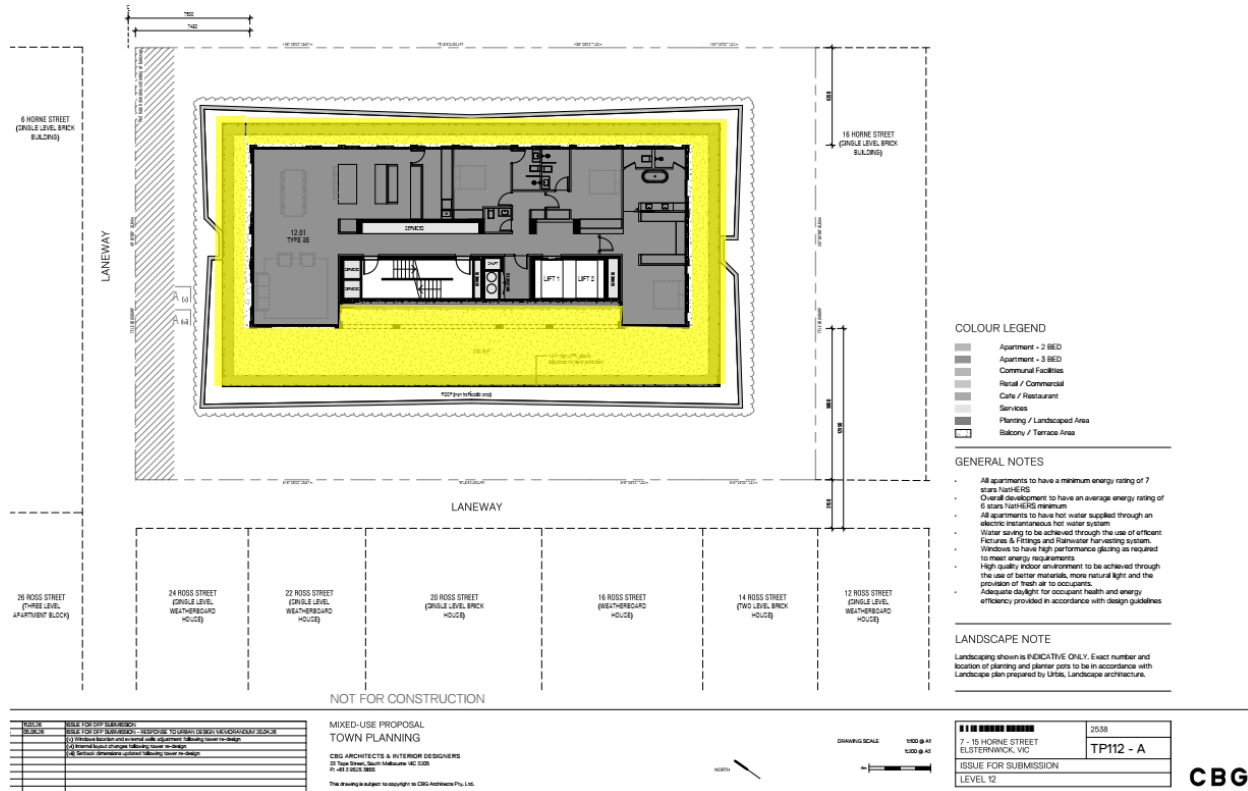


Figure 9: Level 3 plan with recommended wind criteria overlaid.

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 Recommended to fulfil Walking

Figure 10: Level 12 plan with recommended wind criteria overlaid

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3 Pedestrian Level Wind Effects

3.1 Discussion & Recommendations

Due to the orientation of the site, the proposed development is particularly exposed to adverse north-westerly winds channelling along Horne Street at the ground level. Additionally, considering the height of the development above the surroundings, downwash and corner acceleration effects at the northern building corner would be expected. The development incorporates a setback from all directions from Level 3 and Level 4 upwards that will help to mitigate these impacts. As such, the footpaths and access ways are expected to be within the walking criterion.

The main entrances are located along Horne Street and at rear off the laneway are setback within the building envelope. We expect that these areas will meet the recommended standing comfort criterion.

The northern portion of the covered plaza is expected to experience wind conditions approaching the standing comfort criterion. The structural columns are anticipated to provide sufficient shielding for this area to satisfy the recommended standing criterion.

The proposed 1.5 m high solid screen, measured from the plaza floor level, is expected to provide sufficient wind protection to achieve the more stringent sitting comfort criterion within the plaza seating areas. The proposed trees and shrubs will provide additional supplementary shielding, further enhancing wind comfort within these spaces (Figure 11).

The outdoor dining areas in front of the café are expected to fulfil sitting criterion.

The communal outdoor space on Level 3 is expected to be within the recommended standing criterion with the proposed 1.5m high solid balustrade (Figure 12).

The private balconies and terraces up to Level 11 of the development are expected to have windspeeds within the walking comfort criterion.

Level 12 is expected to be within the recommended walking criterion with the proposed 1.5m high solid balustrades (Figure 13).

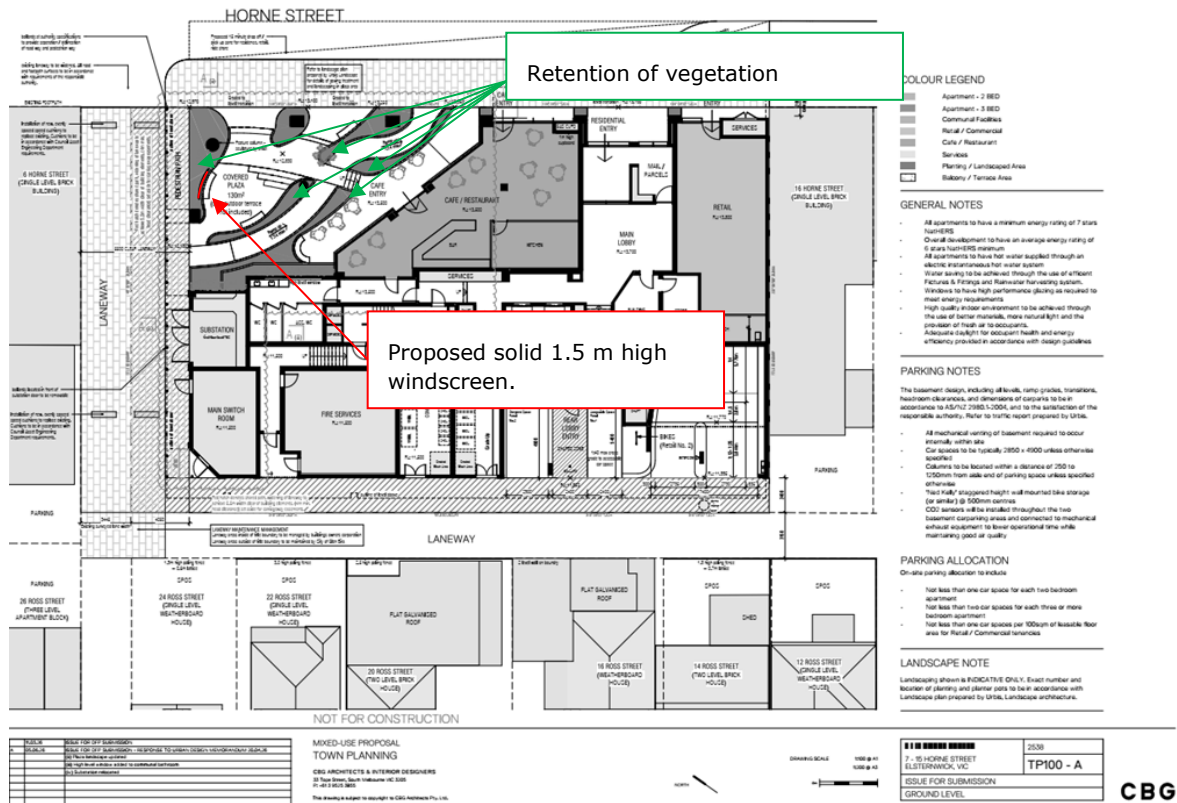
Wind conditions are expected to be within safety criterion.

It should be noted that this study is based on experience only and has not utilised any experimental data for the analysis.

We recommend a wind tunnel study and/or CFD simulations be conducted in a detail design stage to quantify the wind conditions and determine the proper wind control measures wherever necessary.

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Figure 11: Ground floor plan with the recommended wind control measures overlaid.

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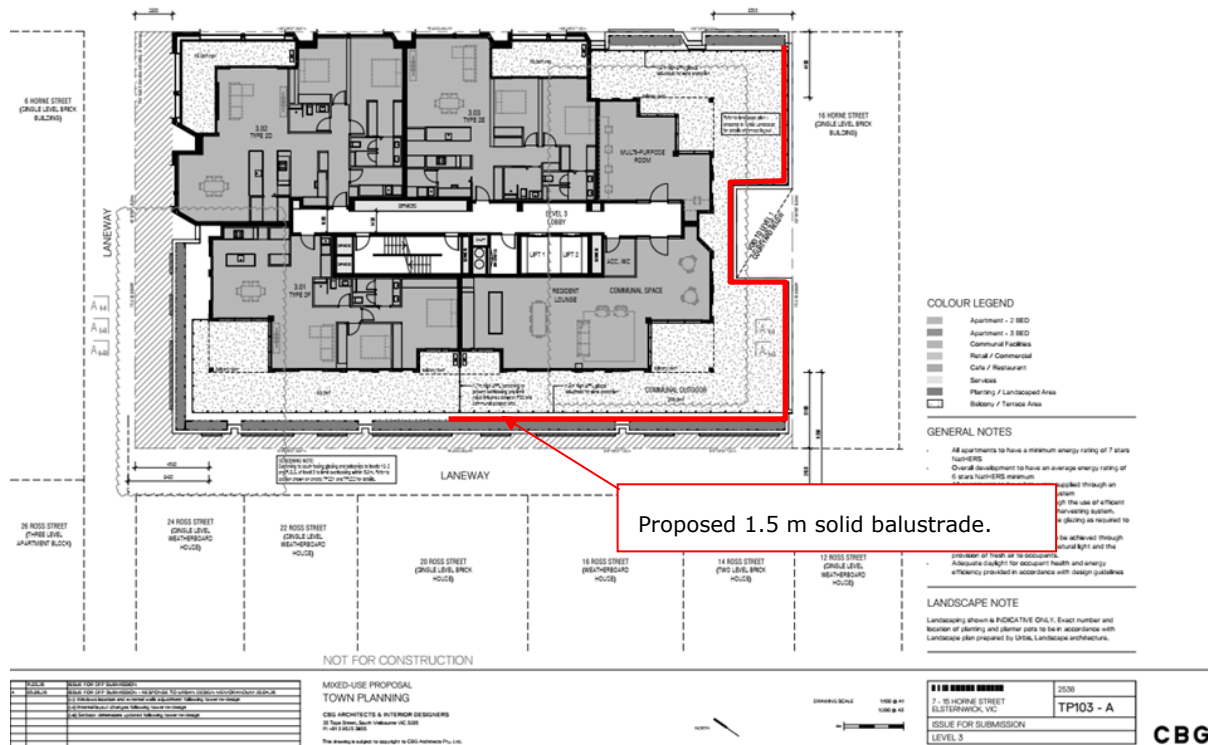


Figure 12: Level 3 plan with the proposed wind control measures overlaid.

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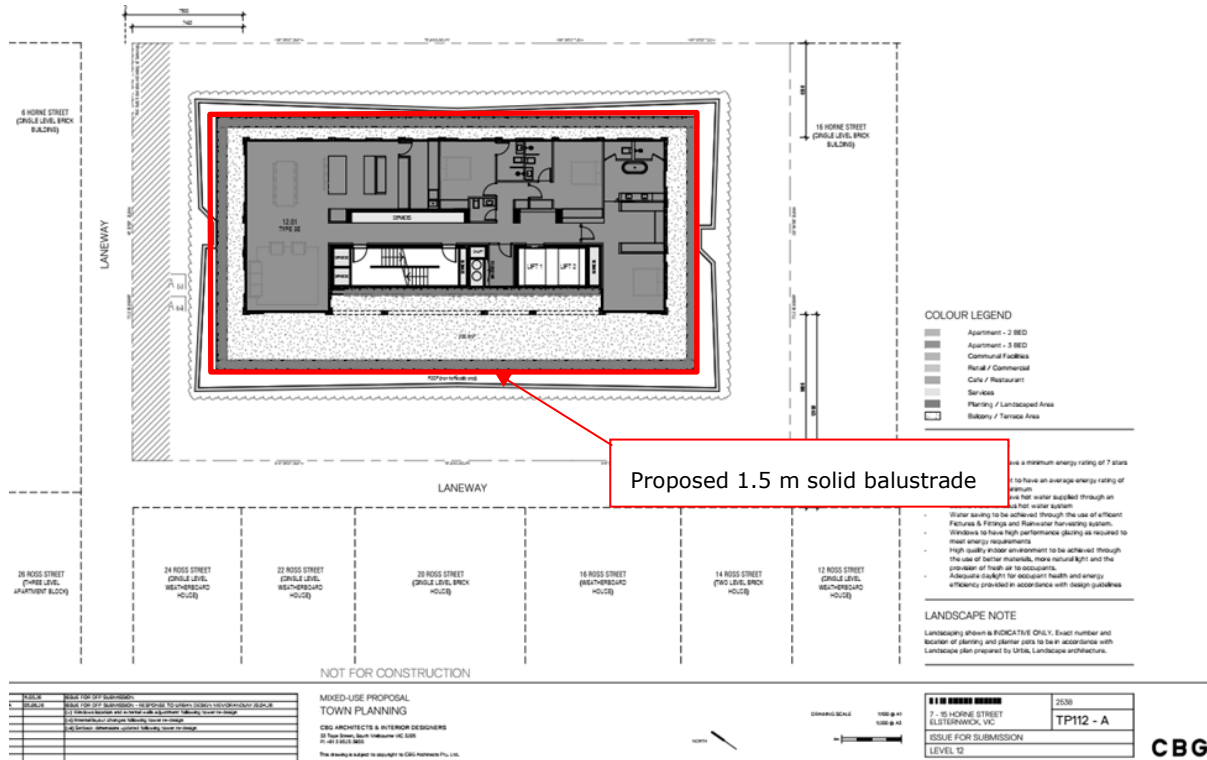


Figure 13: Level 12 plan with the proposed wind control measures overlaid.

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4 Conclusions

An appraisal of the likely wind conditions at the pedestrian ground level and balcony areas of the proposed development at **7-15 Horne Street, Elsternwick** has been made.

Vipac has carefully considered the form and exposure of the proposed development, nominated criteria for various public areas according to their function and referred to past experience to produce our opinion of likely wind conditions.

The findings of this study can be summarised as follows.

With proposed design:

- Wind conditions in the ground level footpath areas and access ways would be expected to be within the **walking** comfort criterion.
- The main entrances would be expected to be within the **standing** comfort criterion.
- The covered plaza area would be expected to be within the **standing and sitting** comfort criterion.
- The outdoor dining areas are expected to fulfil the recommended **sitting** criterion.
- The terraces and balconies would be expected to be within the recommended **walking/standing** comfort criterion.
- The wind conditions are expected to be within safety criterion.

As a general statement, educating occupants about wind conditions at open terrace/balcony areas during high-wind events and fixing loose, lightweight furniture on the terrace are highly recommended.

The assessments provided in this report have been made based on experience of similar situations in Melbourne and around the world. As with any opinion, it is possible that an assessment of wind effects based on experience and without experimental validation may not account for all complex flow scenarios in the vicinity.

We recommend a wind tunnel study and/or CFD simulations be conducted in a detail design stage to quantify the wind conditions and determine the proper wind control measures wherever necessary.

This Report has been Prepared

For

Auyin Property Development Pty Ltd

By

VIPAC ENGINEERS & SCIENTISTS PTY LTD.

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Appendix A Environmental Wind Effects

Atmospheric Boundary Layer

As wind flows over the earth it encounters various roughness elements and terrain such as water, forests, houses and buildings. To varying degrees, these elements reduce the mean wind speed at low elevations and increase air turbulence. The wind above these obstructions travels with unattenuated velocity, driven by atmospheric pressure gradients. The resultant increase in wind speed with height above ground is known as a wind velocity profile. When this wind profile encounters a tall building, some of the fast-moving wind at upper elevations is diverted down to ground level resulting in local adverse wind effects.

The terminology used to describe the wind flow patterns around the proposed development is based on the aerodynamic mechanism, direction and nature of the wind flow.

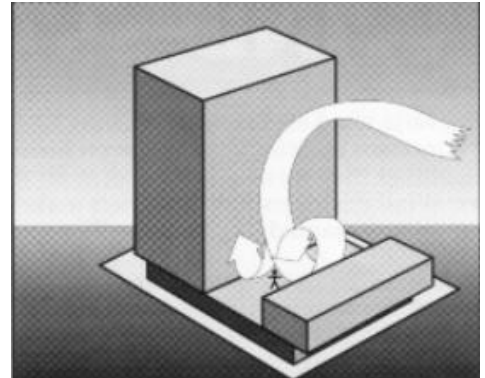
Downwash – refers to a flow of air down the exposed face of a tower. A tall tower can deflect a fast-moving wind at higher elevations downwards.

Corner Accelerations – when wind flows around the corner of a building it tends to accelerate in a similar manner to airflow over the top of an aeroplane wing.

Flow separation – when wind flowing along a surface suddenly detaches from that surface and the resultant energy dissipation produces increased turbulence in the flow. Flow separation at a building corner or at a solid screen can result in gusty conditions.

Flow channelling – the well-known “street canyon” effect occurs when a large volume of air is funnelled through a constricted pathway. To maintain flow continuity the wind must speed up as it passes through the constriction. Examples of this might occur between two towers, in a narrowing street or under a bridge.

Direct Exposure – a location with little upstream shielding for a wind direction of interest. The location will be exposed to the unabated mean wind and gust velocity. Piers and open water frontage may have such exposure.



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Appendix B References

- [1] *Structural Design Actions, Part 2: Wind Actions*, Australian/New Zealand Standard 1170.2:2011
- [2] *Wind Effects on Structures* E. Simiu, R Scanlan, Publisher: Wiley-Interscience
- [3] *Architectural Aerodynamics* R. Aynsley, W. Melbourne, B. Vickery, Publisher: Applied Science Publishers

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Appendix C Drawings List

Drawings received **June 2026**

2538_260603 TP (A).pdf

2538_260603 CA-DR (A).pdf

2538_260605 GROUND.pdf

2538_260605 LEVEL 12.pdf

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