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QUALITATIVE WIND ASSESSMENT
CPP PROJECT 18742
2 MARCH 2026

79-81 Queens Road and 2-8 Spencer Street

Five Dock, NSW

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Executive Summary

A qualitative assessment of the 79-81 Queens Road and 2-8 Spencer Street development to be built in Five Dock, NSW was conducted to provide an initial assessment of the surrounding pedestrian wind environment. The assessment was based on the local wind climate, CPP's experience in the region and on comparable projects, and the characteristics of the proposed development. This assessment addresses SEARs 8. Environmental Amenity and 24. Public Space.

The wind environment around the development is likely to be generally suitable for pedestrian walking style activities from a comfort perspective with reference to the Lawson criteria. Areas intended for long term stationary activity such as seating and dining are likely to require treatment to ensure they are suitable for their intended use. The inset area on William Street towards the north-east of the site is expected to be subject to relatively mild wind conditions, and may be suitable for outdoor seating without significant mitigation. Most areas in the public domain in the vicinity of the subject site are expected to satisfy the relevant wind safety criterion.

Relatively windy conditions are expected to occur on the Level 5 podium terrace. For frequent use of the communal open space in this area, partial enclosure of the terrace ideally to the western side is recommended to achieve wind conditions suitable for short-term stationary activity.

Wind conditions on residential balconies are expected to be generally calm given the mostly inset nature of the balconies and typical of or better than comparable buildings in the region.

This report is a high-level qualitative assessment based on basic features of the local wind climate and proposed built environment.

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1. Introduction

GENERAL INFORMATION

The assessment of the wind environment around developments can ensure adverse impacts are minimized and inform designers about the suitability of outdoor areas for their intended uses. Where necessary, design modifications can be made, or intervention measures added to mitigate areas with the potential for excessive wind speeds.

The proposed development is located in Five Dock, immediately south of the Five Dock Leisure Centre and approximately 500 m to the south of Parramatta River. The surrounding terrain is comprised primarily of low-rise suburban development in the existing context, Figure 1. However, it is understood that the area immediately around the site is subject to future development with towers of similar size as the subject tower slated for the surrounding sites to the west, south, and north.

The proposed development is comprised of a single prismatic tower set back over a podium, reaching a maximum height of about 88 m above ground level, Figure 2. As it is slightly larger than most of the surrounding structures, the addition of the proposed development is expected to have some impact on the local wind conditions, and the extents are broadly discussed in this report. It is noted that future developments of similar size to the subject development are planned immediately around the site to the east, south, and west. The impact of these developments depends on the detailed massing of these, and is addressed at high level in the discussion.

Figure 1: Aerial view with proposed development site highlighted (Google Earth, 2024)

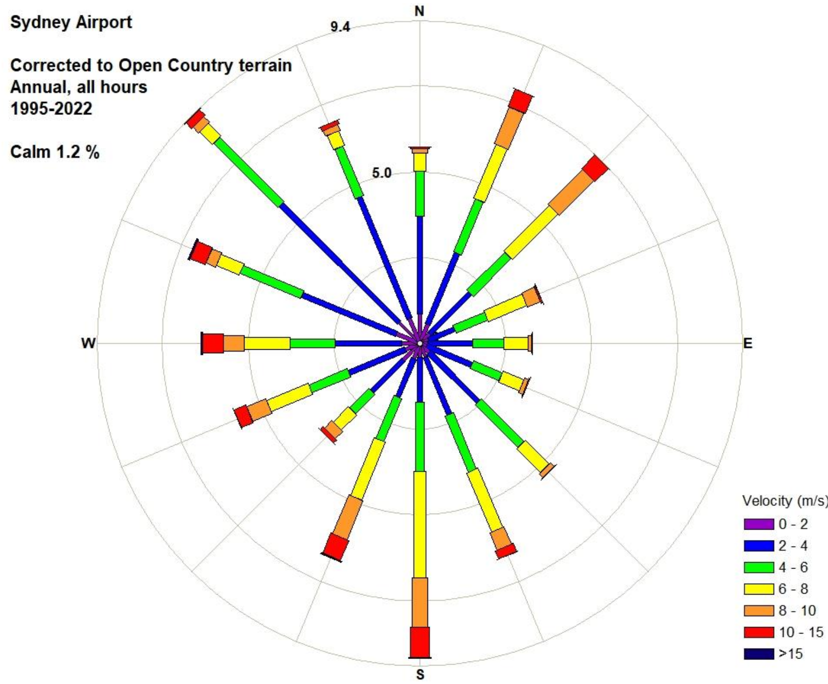
Figure 2: 3D render (T) and north elevation (B) of proposed development (Plus Studios, 2026)

2. Wind Climate

The proposed development lies approximately 12 km to the north-west of the Sydney Airport Bureau of Meteorology (BoM) anemometer and 13 km to the east-north-east of the Bankstown Airport BoM anemometer, which provide the best source of historical wind data for the project. To enable a qualitative assessment of the wind environment, the wind frequency and direction information measured by the Bureau of Meteorology at a standard height of 10 m from 1995 – 2022 have been used in this analysis.

The wind rose for both Sydney Airport and Bankstown Airport are shown in Figure 3. The arms of the wind roses point in the direction from where the wind is blowing, the width and color of the arm represent the wind speed, and the length of the arm indicates the percent of the time that the wind blows for that combination of speed and direction.

The distribution and frequency of winds on an annual basis were analyzed to assess the project with regards to wind comfort and safety. The wind roses show that strong prevailing winds from the west are present at both airports, while for Sydney Airport, strong winds from the south and north-east are also prevalent with strong winds from the south-east quadrant being observed in Bankstown. In coastal Sydney, winds from the north-east tend to be summer sea breezes which dissipate with distance from the coast and are significantly diminished at Bankstown. In terms of distance from the coast, the site is between Sydney Airport and Bankstown. Therefore, sea breezes from the north-east are likely to be substantially less prevalent at the site than at Sydney Airport.



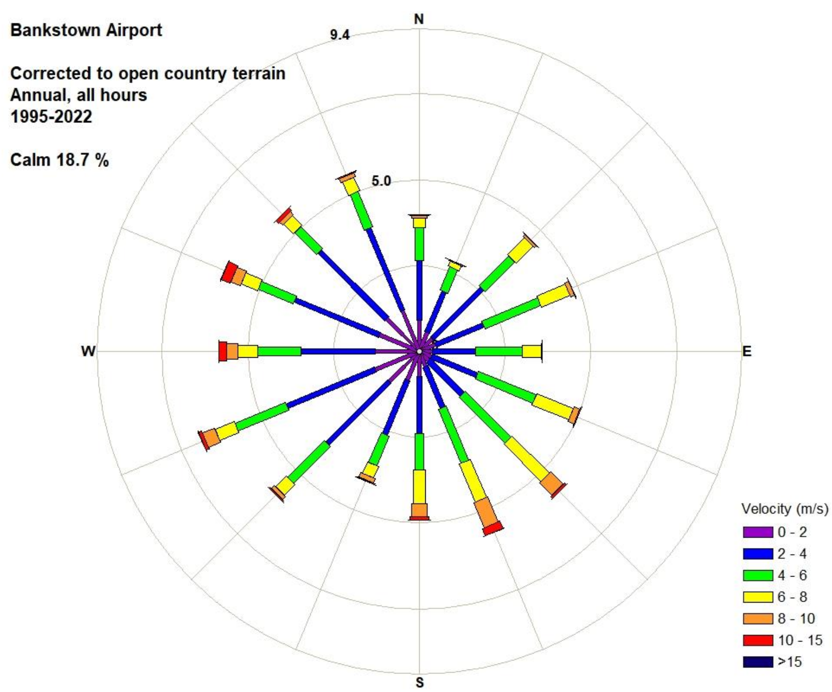


Figure 3: Probability of Wind Speeds by Direction Sydney Airport (T) and Bankstown Airport (B) –(1995 – 2022, All Hours)

3. Wind Assessment Criteria

A number of researchers have suggested quantitative methods for assessing wind comfort and safety based on estimated wind speeds and local climate statistics. These criteria provide a means of evaluating the wind amenity of location based on the frequency of threshold wind speeds, noting that pedestrians will tolerate higher wind speeds for a shorter time period than lower speeds. The comfort criteria also allow planners to assess the usability, with respect to the wind environment, of different locations for various purposes. A discussion on various criteria is presented in Appendix B.

The City of Canada Bay DCP (2023) does not specify any wind assessment criteria for the site.CPP uses a modified form of the widely-accepted pedestrian-level wind criteria developed by Lawson (1990). Lawson's criteria are divided into separate categories of comfort and distress (safety).

Lawson's criteria are based on wind speeds exceeded 5% of the time, and are described as categories for comfort ranging from 'Pedestrian Sitting' to 'Business Walking', allowing planners to judge the usability of locations for various intended purposes. The criteria also include a distress rating, for safety assessment, which is based on occasional (once or twice per year) wind speeds, to identify locations where wind speeds may be hazardous to pedestrians.

The categories and criteria are specified in Table 1. In general, wind conditions comfortable for Sitting and Standing are considered appropriate for areas such as entrances where pedestrians are likely to gather for longer durations, while wind conditions comfortable for Casual Walking and Business Walking are more appropriate for sidewalks where pedestrians are actively in transit. Locations rated as Uncomfortable are generally less suitable for most pedestrian activities and wind control solutions are often sought. Whether mitigation is needed at a location depends upon the intended pedestrian use of the location.

Satisfaction of the safety rating is generally required for areas accessible to the general public. A rating of 'Able-Bodied' may be acceptable for areas with managed access or where pedestrians are unlikely to be present under adverse conditions.

Pedestrians' perception of wind can often be subjective and vary depending on regional difference in wind climate and thermal conditions, as well as by individual. Calibration to the local wind environment should be taken into account when evaluating predicted wind comfort conditions. Note that the ratings of 'Uncomfortable' and 'Safety' are the words of the published wind criteria and applicability may vary by project and location.

Table 1: Wind Comfort and Safety criteria (after Lawson, 1990)

COMFORT RATING	U_{EQUIV}*	DESCRIPTION
Dining**	< 2 m/s	Calm / light breezes suitable for outdoor restaurant uses, seating areas, and other amenities based on CPP experience.
Sitting	>2-4 m/s	Calm or light breezes suitable for long duration seating areas, and other amenities.
Standing	>4-6 m/s	Gentle breezes suitable for sitting for shorter periods, main entrances and bus stops where pedestrians may linger.
Pedestrian Walking	>6-8 m/s	Moderate winds appropriate for window shopping and strolling along a downtown street, or park.
Business Walking	>8-10 m/s	Relatively high speeds that can be tolerated if one's objective is to walk, run, or cycle.
Uncomfortable	> 10 m/s	Strong winds unacceptable for all pedestrian activities; wind mitigation is typically required.

*U_{Equiv} = Max (U_{Mean}, U_{Gust} / 1.85).
*U_{Equiv} speeds are based on an annual exceedance of 5% (~8 hours / week) assessed over all hours.
** For regular outdoor dining, and in semi-enclosed spaces, it has been the experience of CPP that the comfort rating of Sitting may be windier than desired and a comfort criterion of 4 m/s or less may be more applicable.

SAFETY RATING	U_{EQUIV}*	DESCRIPTION
Pass	< 15 m/s	Meets wind safety criterion.
Able-Bodied	>15-20 m/s	Acceptable where only able-bodied people would be expected; not acceptable for frail persons or cyclists
Fail	>20 m/s	Excessive wind speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is often required.

* U_{Equiv} = Max (U_{Mean}, U_{Gust} / 1.85).
*U_{Equiv} speeds are based on an annual exceedance of 0.022% (~2 / year or 1 / season) assessed over all hours.

4. Assessment

SITE DESCRIPTION

The development site is surrounded in most directions by low-rise buildings, with a region of parkland to the north and the Parramatta River beyond. Future developments of similar size to the subject development are planned immediately around the site to the east, south, and west. Topography surrounding the site is relatively flat from a wind perspective and unlikely to significantly affect the wind climate at the site. Winds in such surrounds tend to experience less channelling than areas with many tall structures, with local effects instead being dictated by exposed buildings and their relation to prevailing strong wind directions. Several wind flow mechanisms such as downwash and channelling flow are described in Appendix A, including the effectiveness of some common wind mitigation measures.

The subject site is located on a block bounded by William Street to the east, Queen Street to the north, and Spencer Street to the south. The proposed development consists of a single prismatic tower of 26 storeys with a rectangular planform over a 5 storey podium connected at ground level to a 5 storey building to the north. Plans for ground floor and Level 2-4 are shown in Figure 4.

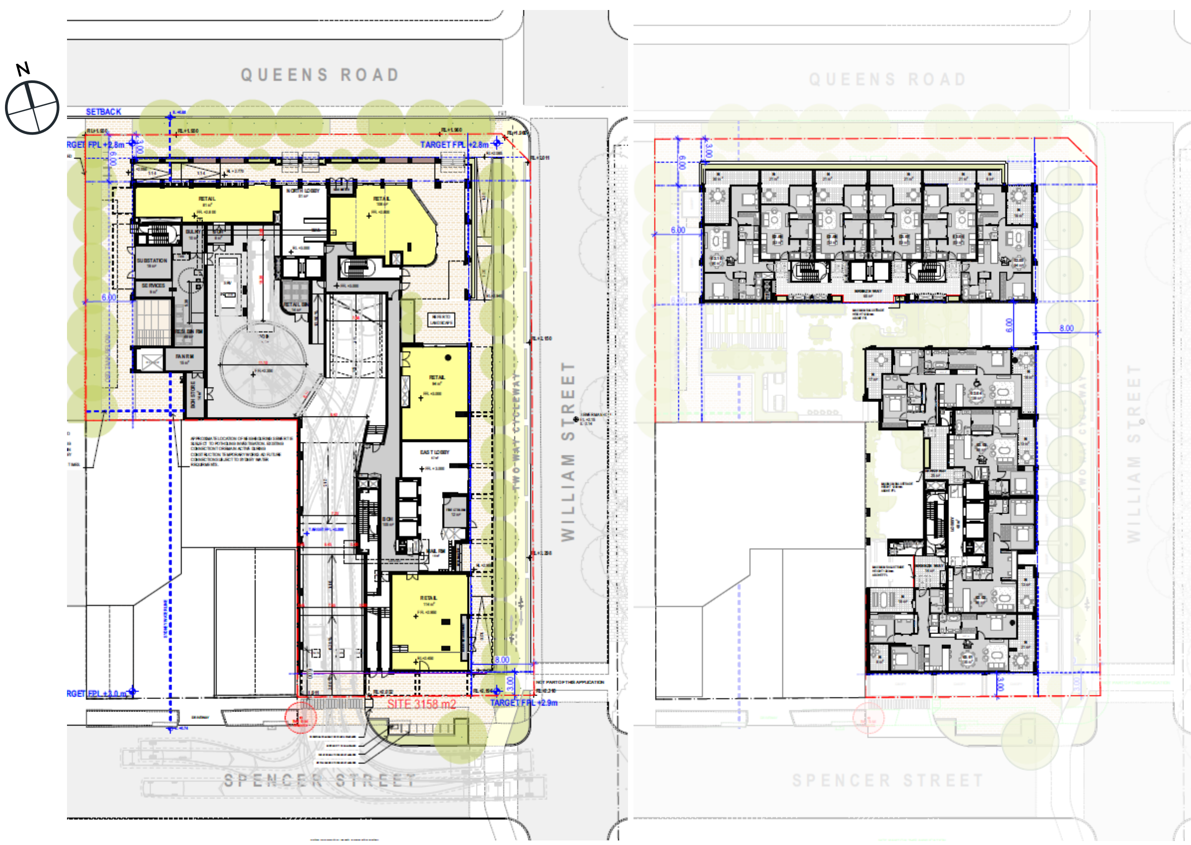


Figure 4: Ground floor (L) and Level 2 (R) plan of proposed development (Plus Studio, 2026)

WINDS FROM THE WEST

In the existing surrounds configuration, the project site is relatively exposed to the west with no significant surrounding buildings providing shielding for the site. In the future site context, there may be additional upwind buildings with similar massing which can provide significant protection for the site for winds from the west quadrant depending on the massing of the future surrounding buildings.

Without tall upwind buildings, winds from the west quadrant will approach the site over a region of suburban development and impinge on the broad west façade of the tower. This would generate downwash which would partially be diverted at level 05 through the open terrace areas, though because of the absence of a significant tower setback to the west, most of the flow would continue to lower elevations. On the south side, the majority of the downwash would be deflected over the roof of the neighbouring building and not impact ground level wind conditions significantly. However, on the north-west corner of the tower the flow would reach level 01 and accelerate through the gap between the tower and the north building. While the higher cross-sectional area of the space to the north-west of the tower is beneficial to avoid high wind speeds, the narrow passage directly north of the tower would be subject to high wind speeds. While this is not a major thoroughfare, this would be expected to impact the footpath and cycleway along William Street. The stepped down landscaped area would assist in reducing the impact, though the vertical momentum of the flow would push the wind towards ground level here.

The eastern aspect of the site is largely expected to experience mild wind conditions for approaching winds from the west quadrant, including the area around the east lobby entrance.

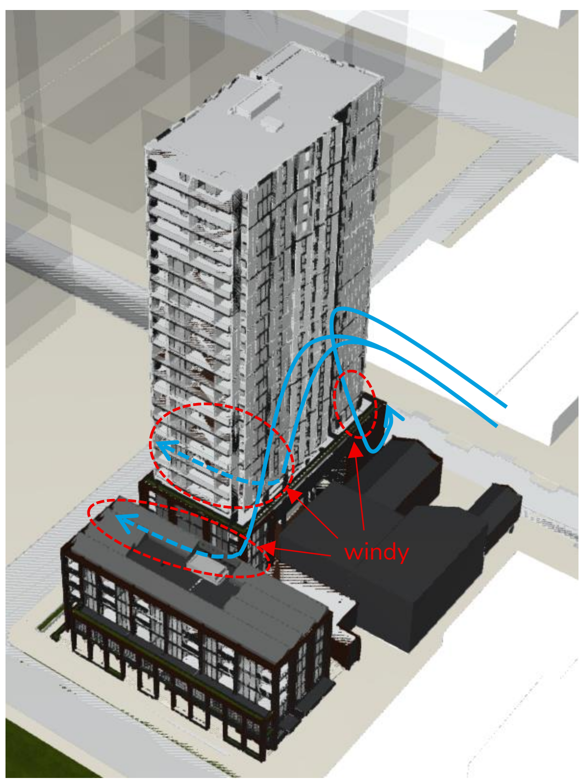


Figure 5: Schematic view of winds from the west around the building.

WINDS FROM THE SOUTH TO SOUTH-EAST

Winds from the south quadrant will approach over low-rise suburban development. Future developments are planned for the adjacent sites to the south which would provide some shielding to the subject buildings.

In the existing surrounds configurations, winds from the south would impinge on the narrower south façade of the tower. The slight setback at podium level combined with the inset for the activity space on the southern end of the podium terrace would deflect some downwash at podium height. Additionally, some downwash would be directed over the roof of the adjacent low-rise building to the west. Accelerated flow is expected on the south-east corner of the site and along William Street. The recessed area at the north-east corner of the site would be protected from this flow along William Street and may be appropriate for retail seating.

Winds with a more easterly component, from the south-east, would impact the building at an oblique angle which would encourage horizontal flow around the tower rather than downwash, so the abovementioned effects would be lessened for winds from the south-east.

The addition of future towers to the south and east of the site would alleviate the strong winds at the south-east corner of the site and move this to the south-most tower. However, the presence of further towers along both sides of William Street would increase the channelling effect with higher wind speeds on the footpath and cycle path along William Street due to accelerated flow through the street corridor.

WINDS FROM THE NORTH-EAST

Winds from the north-east quadrant are less frequent further inlands and are expected to be of reduced strength in Five Dock compared to more coastal areas of Sydney. The oblique angle of the wind to the building façade would encourage flow horizontally around the building with relatively little vertical flow.

SUMMARY – PUBLIC DOMAIN

From a pedestrian comfort perspective, the wind environment around the proposed development site is likely to be classified as acceptable for pedestrian standing or walking under Lawson. These pedestrian comfort levels would be suitable for public accessways, and for stationary short-term exposure activities. Most locations would be expected to satisfy the safety/distress criterion. The recessed area near the north-east corner of the site would be the most protected area around the site and expected to be suitable for seating. Any other areas intended for outdoor seating, e.g. along William Street would benefit from permanent or temporary wind breaks or landscaping to provide some wind protection. The through-site link to the west of the site is expected to be subject to relatively mild wind conditions as the flow path towards Spencer Street on the south is blocked by existing buildings.

WIND CONDITIONS WITHIN THE DEVELOPMENT

LEVEL 1 COMMUNAL OPEN SPACE

An area of communal open space is indicated on Level 1, Figure 6. The parts of this space away from the north-west corner of the tower are generally expected to experience relatively mild wind conditions due to the wind protection provided by surrounding buildings. As discussed in the previous sections, the area near the north-west tower corner and between the tower and the north building is expected to be subjected to strong cross wind and would not be suitable for stationary activities.

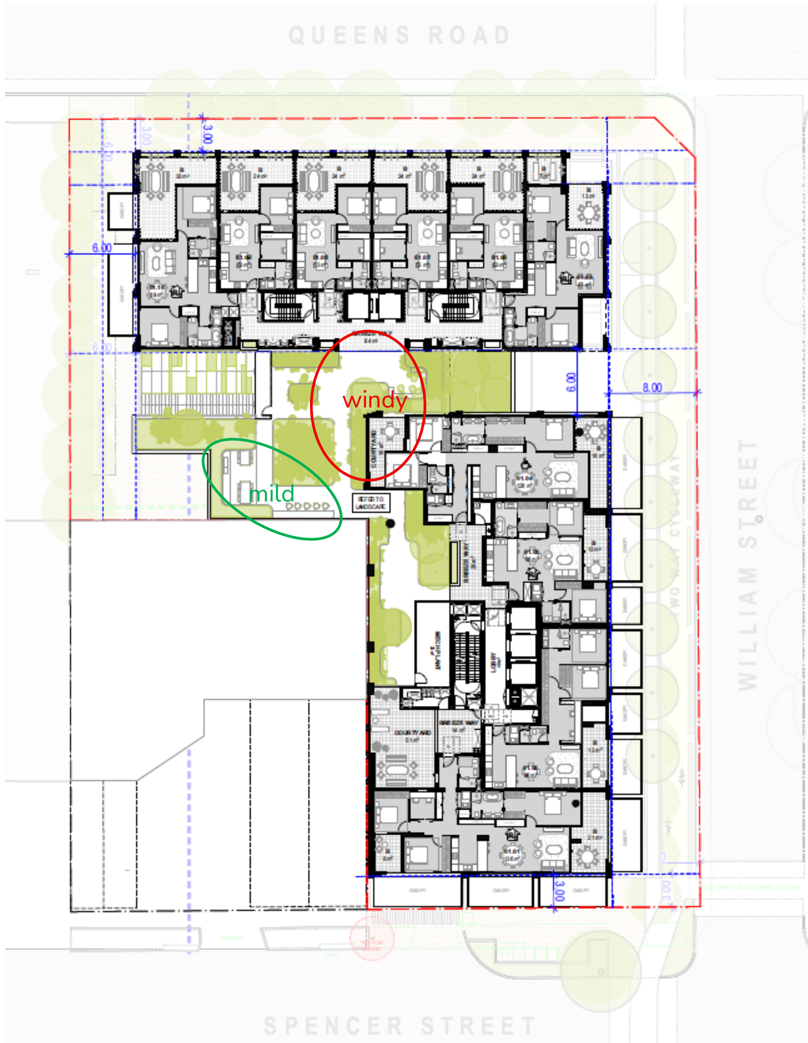


Figure 6: Level 1 floor plan (Plus Studio, 2026)

PODIUM TERRACE

The Level 05 floor plan shows a large outdoor area including a pool deck and entertainment space to the north and an activity space to the south, Figure 7. The internal volume at this level would ensure that there would be a protected parts of the outdoor space on this level regardless of wind direction. However, particularly the northern part including the pool area are expected to be subject to strong cross wind for winds from the west, north, and east quadrants. To increase the time that this recreational terrace area can be comfortably used by the residents, the addition of a partial enclosure is recommended, ideally to the western frontage, to minimise cross flow.

BALCONIES

Most balconies in the development are open to one side only which is beneficial from a wind perspective, as it prevents strong cross flow through the balcony spaces. The corner balconies on the tower at the north-east and north-west corners are partially open to the sides though the majority of the balcony spaces is well protected from cross flows. The northern corner balconies on the 5 story building are open to two sides and may attract some cross flow. To provide for milder wind conditions on the balconies partial or full enclosure on the short side would be an effect wind mitigation strategy.

The requirements for wind amelioration for terraces will depend on the intended use of these spaces. Conditions on terraces and balconies are likely to be similar to or better than those on comparable developments in the region, and no specific requirement for mitigation measures is foreseen for normal discretionary use.

INTERNAL FLOW

Levels 1-4 on both the tower and the northern building feature a breezeway. The open exposure of apartment doors to the outside wind environment can cause internal flow issues during medium and strong winds. These issues can be further investigated during later design phases including the development of mitigation measures if required.

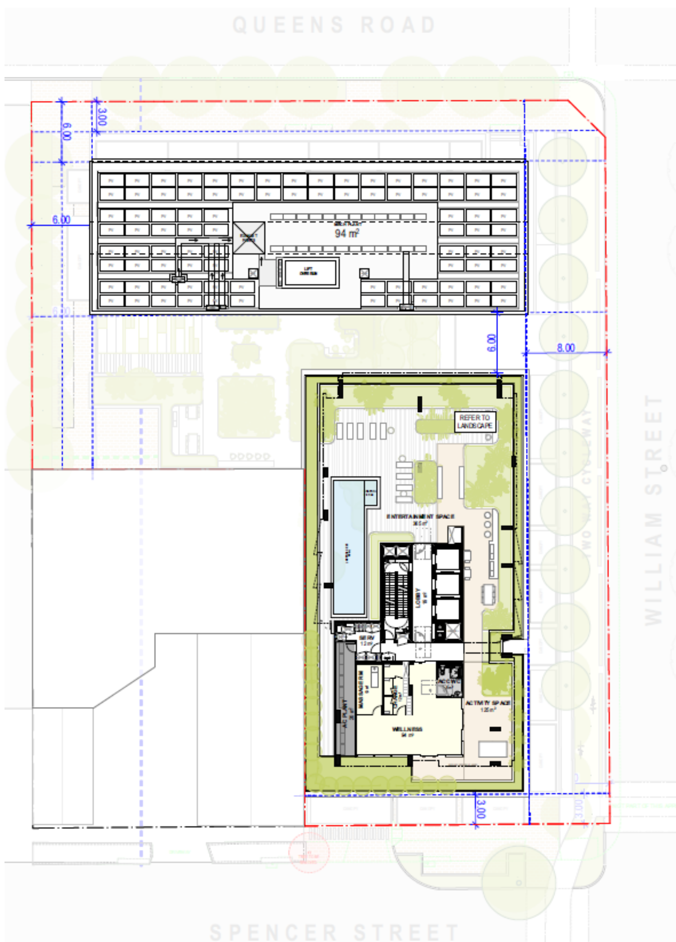


Figure 7: Level 05 floor plan of proposed development (Plus Studio, 2026)

5. Conclusion

Cermak Peterka Petersen Pty. Ltd. has provided a qualitative assessment of the impact of the proposed 79-81 Queens Road and 2-8 Spencer Street project on the local wind environment in and around the development site. Being slightly larger than most surrounding structures, the proposed development will have some effect on the local wind environment, though any changes are not expected to be significant from the perspective of pedestrian comfort or safety. Wind conditions around the development are expected to be classified as acceptable for pedestrian standing or walking from a Lawson comfort perspective and pass the distress/safety criterion. No adverse conditions requiring specific mitigation are foreseen, however local amelioration may be advised for areas intended for long-term stationary or outdoor dining activities. To ensure adequate wind conditions for the intended use of the Level 5 podium terrace, the addition of partial enclosure, ideally to the west, is recommended to reduce cross flow through the communal open space.

Wind tunnel testing would be required to quantify the wind conditions around the development.

References

City of Canada Bay (2023) Development Control Plan.

Lawson, T.V. (1990), “The Determination of the Wind Environment of a Building Complex before Construction” Department of Aerospace Engineering, University of Bristol, Report Number TVL 9025.

Standards Australia (2021), *Australian/New Zealand Standard, Structural Design Actions, Part 2: Wind Actions* (AS/NZS1170.2:2021).

Appendix A – Wind Flow Mechanisms

An urban environment generates a complex wind flow pattern around closely spaced structures, hence it is exceptionally difficult to generalise the flow mechanisms and impact of specific buildings as the flow is generated by the entire surrounds. However, it is best to start with an understanding of the basic flow mechanisms around an isolated structure.

ISOLATED BUILDING

When the wind hits an isolated building, the wind is decelerated on the windward face generating an area of high pressure, Figure 8, with the highest pressure at the stagnation point at about two thirds of the height of the building. The higher pressure bubble extends a distance from the building face of about half the building height or width, whichever is lower. The flow is then accelerated down and around the windward corners to areas of lower pressure, Figure 8. This flow mechanism is called **downwash** and causes the windiest conditions at ground level on the windward corners and along the sides of the building.

Rounding the building corners or chamfering the edges reduces downwash by encouraging the flow to go around the building at higher levels. However, concave curving of the windward face can increase the amount of downwash. Depending on the orientation and isolation of the building, uncomfortable downwash can be experienced on buildings of greater than about 6 storeys.

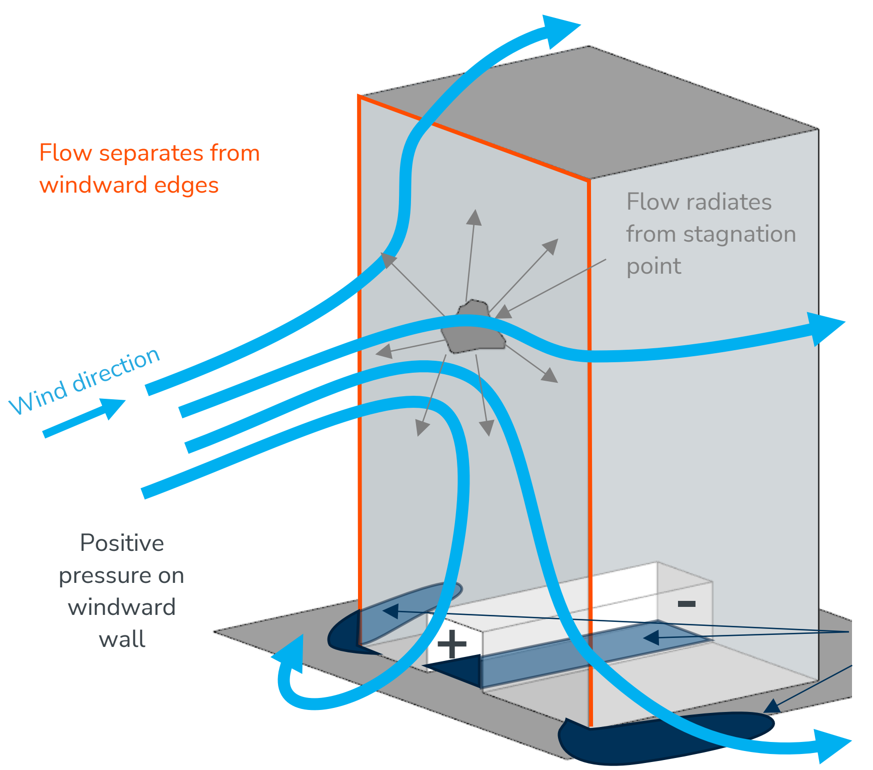


Figure 8: Schematic wind flow around tall isolated building

Techniques to mitigate the effects of downwash winds at ground level include the provision of horizontal elements, the most effective being a podium to divert the downward flow away from pavements and building entrances, but this will generate windy conditions on the podium roof, Figure 9. Generally, the lower the podium roof and deeper the setback from the podium edge to the tower improves the ground level wind conditions. The provision of an 8 m setback on an isolated building is generally sufficient to improve ground level conditions, but is highly dependent on the building isolation, orientation to prevailing wind directions, shape and width of the building, and any plan form changes at higher level.

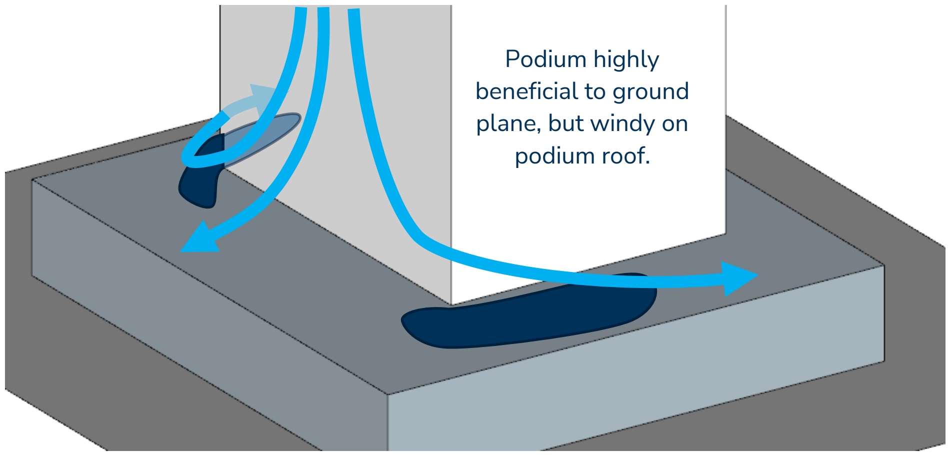


Figure 9: Schematic flow pattern around building with podium

Awnings along street frontages perform a similar function as a podium, and generally the larger the horizontal projection from the façade, the more effective it will be in diverting downwash flow, Figure 10. Awnings become less effective if they are not continuous along the entire façade, or on wide buildings as the positive pressure bubble extends beyond the awning resulting in horizontal flow under the awning.

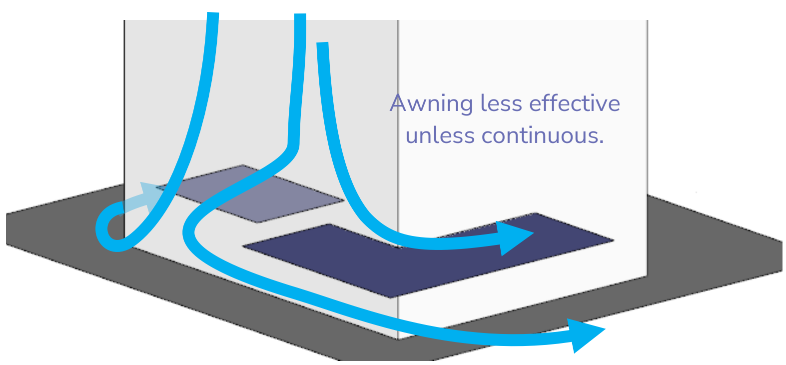


Figure 10: Schematic flow pattern around building with awnings

It should be noted that colonnades at the base of a building with no podium generally create augmented windy conditions at the corners due to an increase in the pressure differential, Figure 11. Similarly, open through-site links through a building cause wind issues as the pressure tries to equilibrate between the entrances to the link causing strong flow, Figure 8. If the link is blocked, wind conditions will be relatively calm, Figure 12. This area is in a region of high pressure and therefore there is the potential for internal flow issues. A ground level recessed corner has a similar effect as an undercroft, resulting in windier conditions, Figure 12.

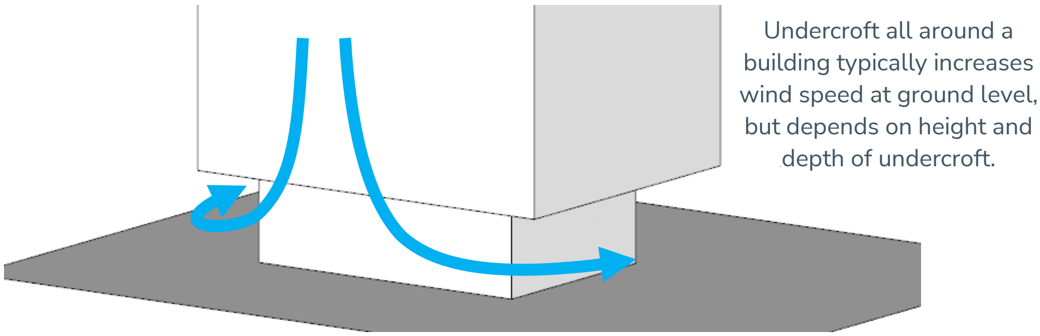


Figure 11: Schematic of flow patterns around isolated building with undercroft

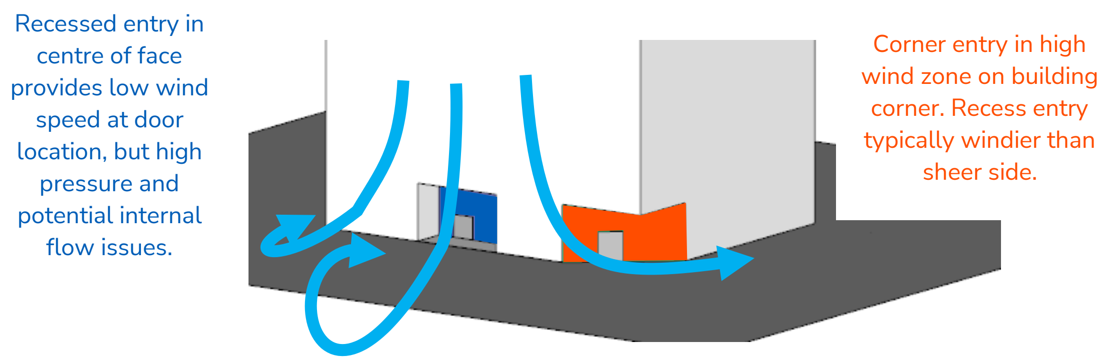


Figure 12: Schematic of flow patterns around isolated building with ground articulation

MULTIPLE BUILDINGS

When a building is located in a city environment, depending on upwind buildings, the interference effects may be positive or negative, Figure 13. If the building is taller, more of the wind impacting on the exposed section of the building is likely to be drawn to ground level by the increase in height of the stagnation point, and the additional negative pressure induced at the base by the surrounding buildings. If the upwind buildings are of similar height then the pressure around the building will be more uniform hence downwash is typically reduced with the flow passing over the buildings.

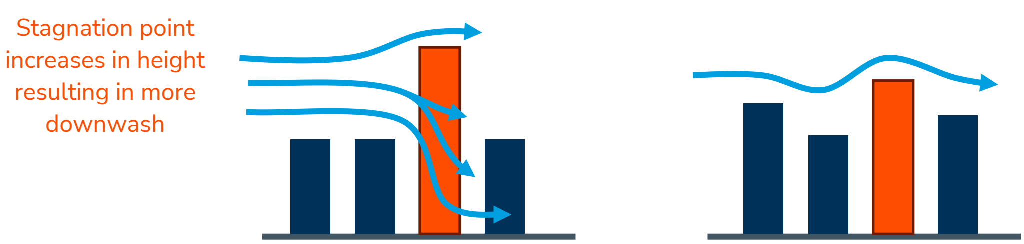


Figure 13: Schematic of flow pattern interference from surrounding buildings

The above discussion becomes more complex when three-dimensional effects are considered, both with orientation and staggering of buildings, and incident wind direction, Figure 14.

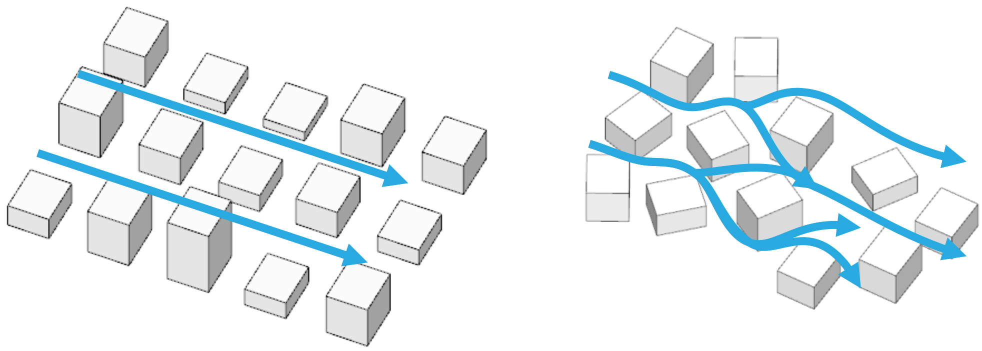


Figure 14 Schematic of flow patterns through a grid and random street layout

On the fringe of a city, the compound shape of neighbouring buildings instigates the flow pattern through the city. The overall massing causes an obstruction to the flow causing a slowing of the incident flow and increasing the windward pressure. Pressure driven flow is produced between the buildings, Figure 15. The vertical component in pressure driven flow is lower than downwash flow.

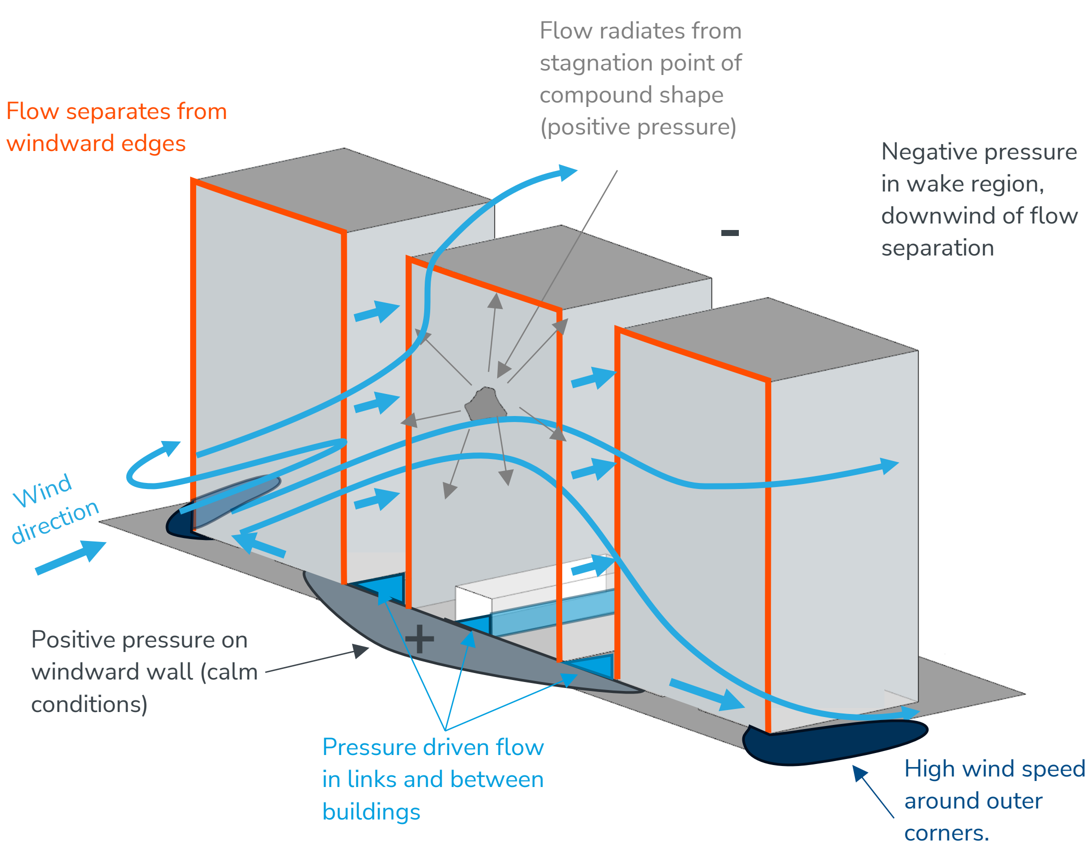


Figure 15: General flow pattern around multiple buildings

Channelling is instigated when pressure driven flow accelerates between two buildings, and continues along straight streets with buildings on either side, Figure 14(L). This occurs on the edge of large built-up areas where the approaching flow is diverted around the overall massing and channelled along the fringe by a relatively continuous wall of building facades. This is generally the primary mechanism producing strong wind conditions on the perimeter of a built-up area, particularly on corners, which can be exposed to multiple prevailing wind directions. The perimeter edge zone in a built-up area is typically about two blocks deep. Downwash is the more important flow mechanism for the edge zone of a built-up area with buildings of similar height.

As the city expands, the central section of the city typically becomes calmer, particularly if the grid pattern of the streets is discontinued, Figure 14(R). When buildings are located on the corner of a central city block, the geometry becomes slightly more important with respect to the local wind environment.

BARRIERS AND SCREENS

The wind flow pattern over a vertical barrier is illustrated in Figure 16, showing there will be recirculation zones near the windward wall and in the immediate lee of the barrier. The typical extent of these recirculation zones relative to the height of the barrier, *h*, is illustrated in Figure 16. These regions are not fixed but fluctuate in time. The mean wind speed in the wake areas drops significantly compared with the incident flow. With increasing distance from the barrier, the flow pattern will resort to the undisturbed state. Typically, the mean velocity and turbulence intensity at barrier height would be expected to be within 10% of the free stream conditions at 10 times the height of the structure downwind from the barrier.

Multiple barriers offer improved wind conditions between the barriers by preventing the flow from reattaching to the surface.

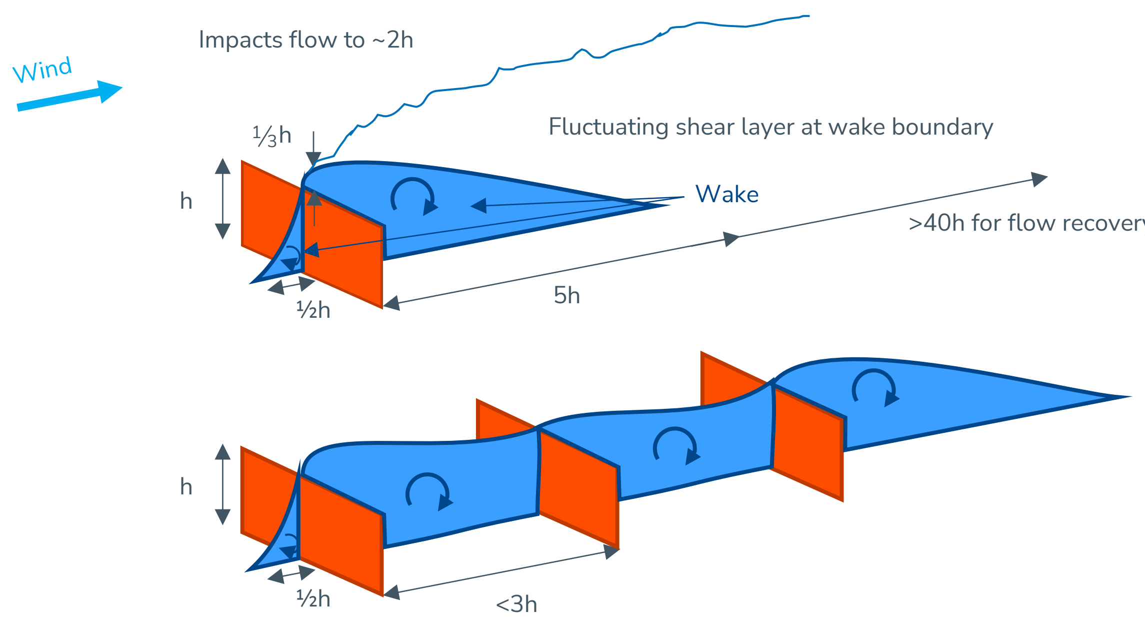


Figure 16: Sketch of the flow pattern over vertical elements

Appendix B - Wind Speed Criteria

GENERAL DISCUSSION

Primary controls that are used in the assessment of how wind affects pedestrians are the wind speed, and rate of change of wind speed. A description of the effect of a specific wind speed on pedestrians is provided in Table 2. It should be noted that the turbulence, or rate of change of wind speed, will affect human response to wind and the descriptions are more associated with response to mean wind speed.

Table 2: Summary of wind effects on pedestrians

Description	Speed (m/s)	Effects
Calm, light air	0–2	Human perception to wind speed at about 0.2 m/s. Napkins blown away and newspapers flutter at about 1 m/s.
Light breeze	2–3	Wind felt on face. Light clothing disturbed. Cappuccino froth blown off at about 2.5 m/s.
Gentle breeze	3–5	Wind extends light flag. Hair is disturbed. Clothing flaps.
Moderate breeze	5–8	Raises dust, dry soil. Hair disarranged. Sand on beach saltates at about 5 m/s. Full paper coffee cup blown over at about 5.5 m/s.
Fresh breeze	8–11	Force felt on body. Limit of agreeable wind on land. Umbrellas used with difficulty. Wind sock fully extended at about 8 m/s.
Strong breeze	11–14	Hair blown straight. Difficult to walk steadily. Wind noise on ears unpleasant. Windborne snow above head height (blizzard).
Near gale	14–17	Inconvenience felt when walking.
Gale	17–21	Generally impedes progress. Difficulty with balance in gusts.
Strong gale	21–24	People blown over by gusts.

Local wind effects can be assessed with respect to a number of environmental wind speed criteria established by various researchers. These have all generally been developed around a peak 3 s gust in an hour, or 1 hour mean wind speed. During strong events, a pedestrian would react to a significantly shorter duration gust than a 3 s, and historic weather data is normally presented as a 10 minute mean.

Despite the apparent differences in numerical values and assumptions made in their development, it has been found that when these are compared on a probabilistic basis, there is some agreement between the various criteria. However, a number of studies have shown less agreement over a wider range of flow conditions. The downside of these criteria is that they have seldom been benchmarked, or confirmed through long-term measurements in the field, particularly for comfort conditions. The wind criteria were all developed in temperate climates and are unfortunately not the only environmental factor that affects pedestrian comfort.

For assessing the effects of wind on pedestrians, neither the random peak gust wind speed (3 s or otherwise), nor the mean wind speed in isolation are adequate. The gust wind speed gives a measure of the extreme nature of the wind, but the mean wind speed indicates the longer duration impact on pedestrians. The extreme gust wind speed is considered to be suitable for safety considerations, but not necessarily for serviceability comfort issues such as outdoor dining. This is because the instantaneous gust wind speed does not always correlate well with mean wind speed, and is not necessarily representative of the parent distribution. Hence, the perceived 'windiness' of a location can either be dictated by strong steady flows, or gusty turbulent flow with a smaller mean wind speed.

To measure the effect of turbulent wind conditions on pedestrians, a statistical procedure is required to combine the effects of both mean and gust. This has been conducted by various researchers to develop an equivalent mean wind speed to represent the perceived effect of a gust event. This is called the 'gust equivalent mean' or 'effective wind speed' and the relationship between the mean and 3 s gust wind speed is defined within the criteria, but two typical conversions are:

$$U_{GEM} = \frac{(U_{1\,hour\,mean} + 3 \cdot \sigma_u)}{1.85} \text{ and } U_{GEM} = \frac{1.3 \cdot (U_{1\,hour\,mean} + 2 \cdot \sigma_u)}{1.85}$$

It is evident that a standard description of the relationship between the mean and impact of the gust would vary considerably depending on the approach turbulence, and use of the space.

A comparison between the mean and 3 s gust wind speed criteria from a probabilistic basis are presented in Figure 17 and Figure 18. The grey lines are typical results from modelling and show how the various criteria would classify a single location. City of Auckland has control mechanisms for accessing usability of spaces from a wind perspective as illustrated in Figure 17 with definitions of the intended use of the space categories included in this Figure.

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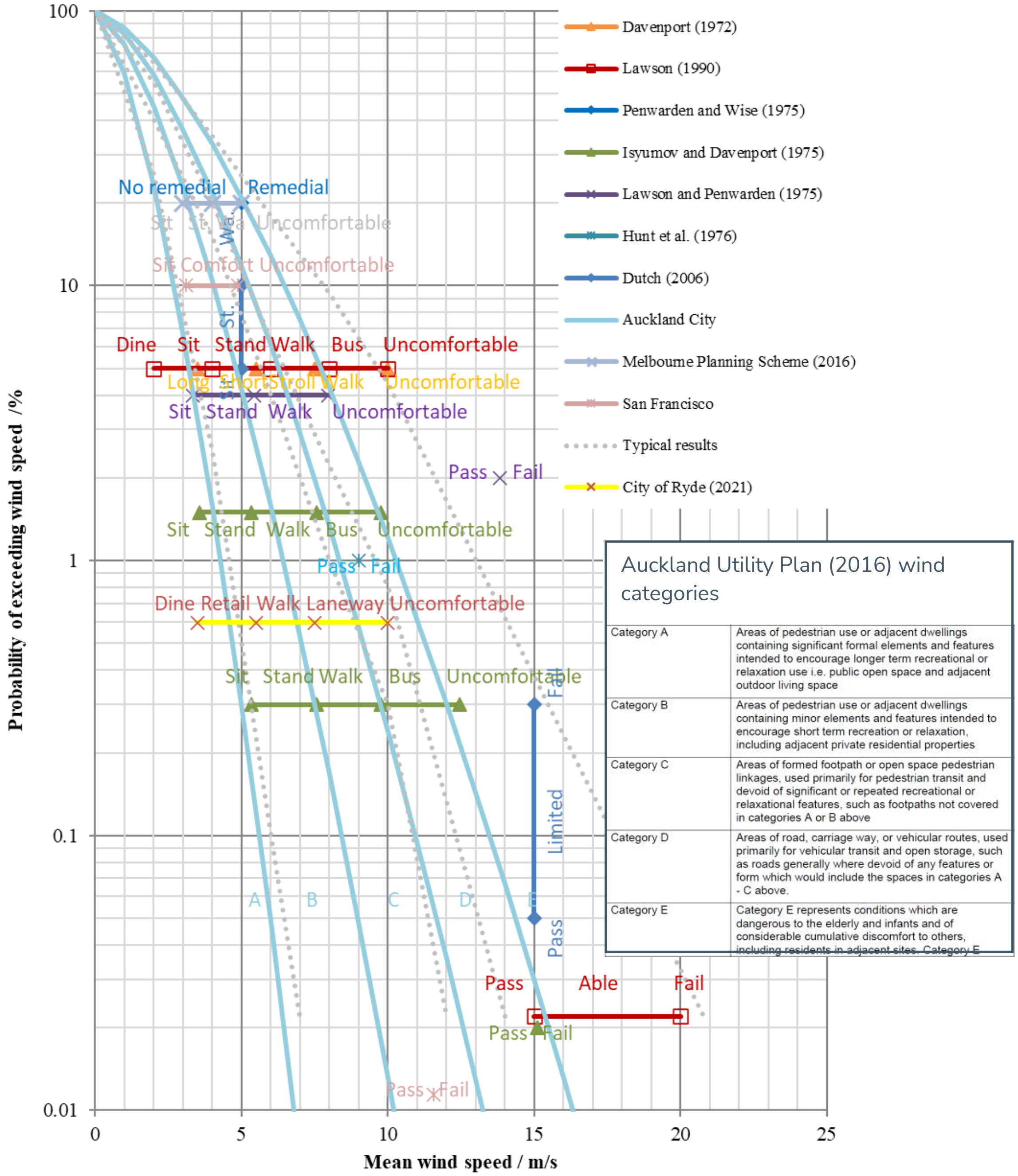

Figure 17: Probabilistic comparison between wind criteria based on mean wind speed

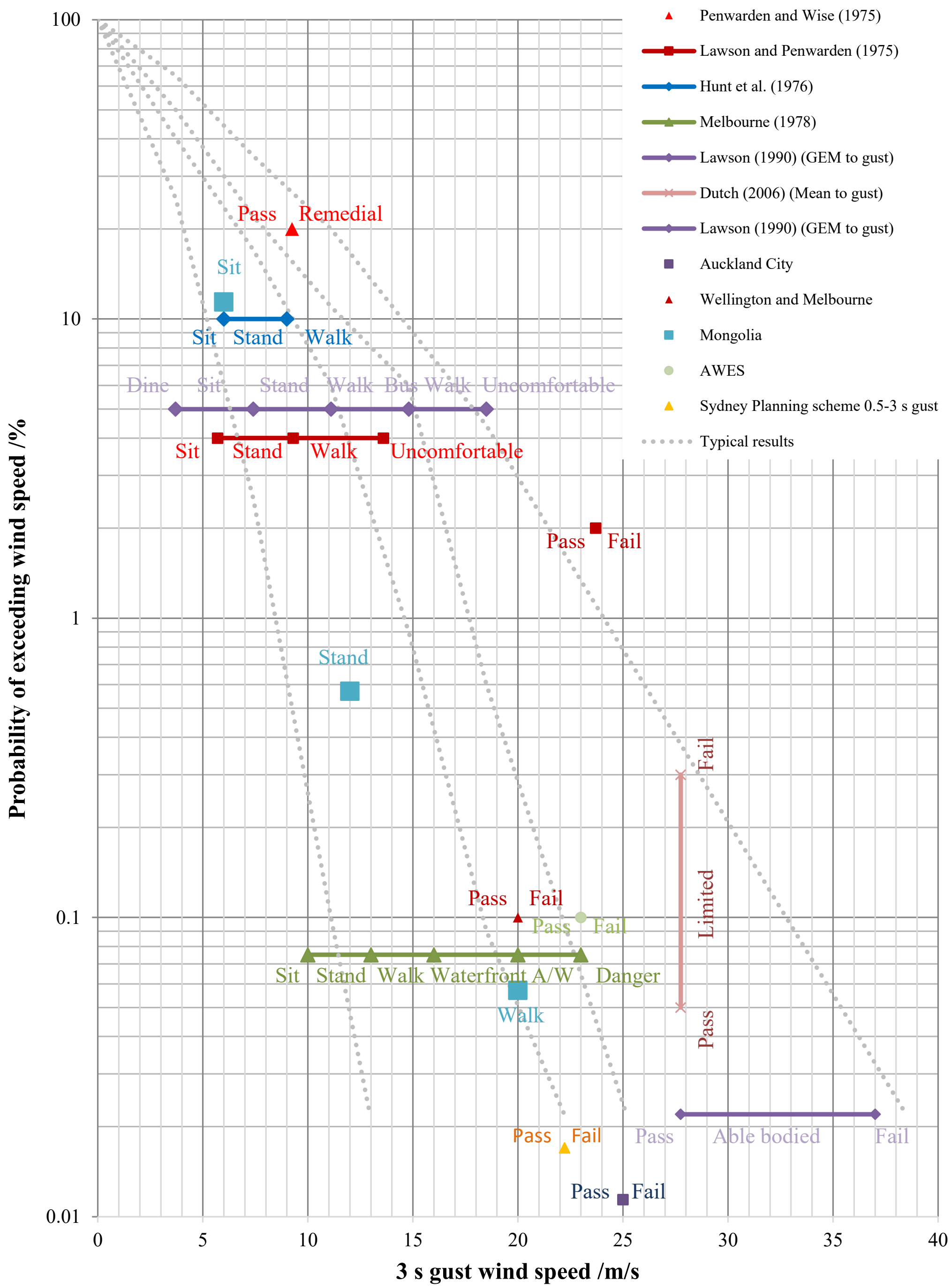

Figure 18: Probabilistic comparison between wind criteria based on 3 s gust wind speed