WINDTECH

PEDESTRIAN WIND ENVIRONMENT STATEMENT

26-30 CAMPSIE STREET & 1 ASSET STREET, CAMPSIE

WK531-01F02(REV1)- WS REPORT

APRIL 13, 2026

Prepared for:

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DOCUMENT CONTROL

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EXECUTIVE SUMMARY

This report presents an opinion on the likely impact of the development located at 26-30 Campsie Street & 1 Asset Street, located in Campsie, on the local wind environment at the critical outdoor areas within and around the subject site. The effect of wind activity has been examined for the three predominant wind directions for the region, namely the south-easterly, westerly, and north-easterly winds. The analysis of the wind effects relating to the proposed development have been carried out in the context of the local wind climate, building morphology and land topography.

The conclusions of this report are drawn from our extensive experience in this field and are based on an examination of the latest architectural drawings. No wind tunnel testing has been undertaken for the subject development, and hence this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection of the architectural drawings provided (received April 2, 2026). Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind environment effects.

The results of this assessment indicate that the development has incorporated several design features and wind mitigating strategies and is expected to be suitable for the intended use for the majority of the outdoor trafficable areas. However, there are some areas that are likely to be exposed to stronger winds. It is expected that the wind effects identified in the report can be ameliorated with the consideration of the following treatment strategies into the design of the development:

Treatments - Ground Level:

- Retention of the proposed and existing trees/elevated landscaping around the site, ensuring that the proposed trees are of an evergreen and densely foliating species capable of growing to a height of at least 3-5m, with 3-5m wide canopies.
- Retention of the proposed awning structure at Level 1 (around the eastern corner). It is also important for this awning to extend and wrap around pointed corner section along the south-eastern façade.
- Retention of the slab extension at Level 1 along the NE aspect, within the NW half of the floor plan, and the inclusion of densely foliating and evergreen vegetation within this extended section as proposed.
- Play area located to the NW of the site - Retention of the proposed tall wind barrier (bricks + glazing) along the north-eastern edge, porous fencing (maximum porosity = 30%) along the north-western edge, and the tall impermeable acoustic barrier along the south-western edge.
- Retention of the proposed set-back form of the lobby entrances.

Treatments – Level 1 Outdoor Childcare/Play Area:

- Inclusion of 1.5-1.8m high impermeable or porous (max porosity = 30%) screening/balustrades along the entire exposed perimeter of the outdoor childcare play area.

Treatments – Level 16 Communal Open Spaces (Roof Terrace Areas):

- Retention of the proposed impermeable screening around the entire perimeter of the Roof Terrace. The height of the screening is recommended to be 2m.
- Inclusion of 1.2-1.5m high hedges/shrubs within the designated planter patches throughout the Roof Terrace to break up the winds that flow over the perimeter screening.

Treatments – Private Balconies/Terraces (Level 1-15):

- Levels 1 to 15 - Increasing the height of the impermeable balustrades along the shorter aspects of each of the overall corner balconies of the typical floor plan to 1.3m, for Levels 10-15 (inclusive), and retention of the proposed standard height impermeable balustrades along the longer aspects. This will avoid the prevailing winds that accelerate around the corners from impacting these balconies.
- Level 1 - Retention of the porous fencing around the arc-shaped terrace of Unit 104, limiting the porosity to a maximum of 30%.

With the inclusion of the abovementioned recommendations in the final design, it is expected that wind conditions for the various trafficable outdoor areas within and around the development will be suitable for their intended uses, and that the wind speeds will satisfy the applicable criteria for pedestrian comfort and safety. In particular, the wind conditions within and around the various communal areas (including the Ground Level entrances and the childcare open play areas) are expected to satisfy the standing comfort criterion, while the wind conditions within the various pedestrian footpaths as well as the private balconies are expected to satisfy the walking comfort criterion. It is recommended that the extent of the treatments required be optimised at a more detailed design stage via wind tunnel testing.

CONTENTS

1 INTRODUCTION

An opinion on the likely impact of the proposed design on the local wind environment affecting pedestrians within the critical outdoor areas within and around the subject development is presented in this report. The analysis of wind effects relating to the proposed development has been carried out in the context of the predominant wind directions for the region, building morphology of the development and nearby buildings, and local land topography. The conclusions of this report are drawn from our extensive experience in the field of wind engineering and studies of wind environment effects.

No wind tunnel testing has been undertaken for this assessment. Hence this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection of the drawings provided (Appendix B), and any recommendations in this report are made only in-principle.

2 DESCRIPTION OF DEVELOPMENT AND SURROUNDINGS

The site is located at 26-30 Campsie Street & 1 Asset Street, Campsie, and is bounded by Campsie Street to the north, Assets Street to the east, Wilfred Avenue to the south, and a low to medium rise residential developments to the west. The buildings surrounding the subject development are predominately low-rise residential and commercial buildings, with a few scattered mid-rise residential and commercial buildings.

A survey of the site topography indicates no major elevation changes in the area immediately surrounding the site. An aerial image of the subject site and the local surroundings is shown in Figure 1, with the frequency and magnitude of the prevailing winds is superimposed for each wind direction. The existing site consists of single storey residential buildings. The proposed development is 17 storeys high.

The critical outdoor trafficable areas associated with the proposed development, which are the focus of this assessment with regards to wind effects, are listed as follows:

- Public footpaths and Ground Level trafficable areas.
- Level 01 outdoor childcare/play area.
- Level 16 communal open spaces (roof terrace areas).
- Private balconies/terraces.

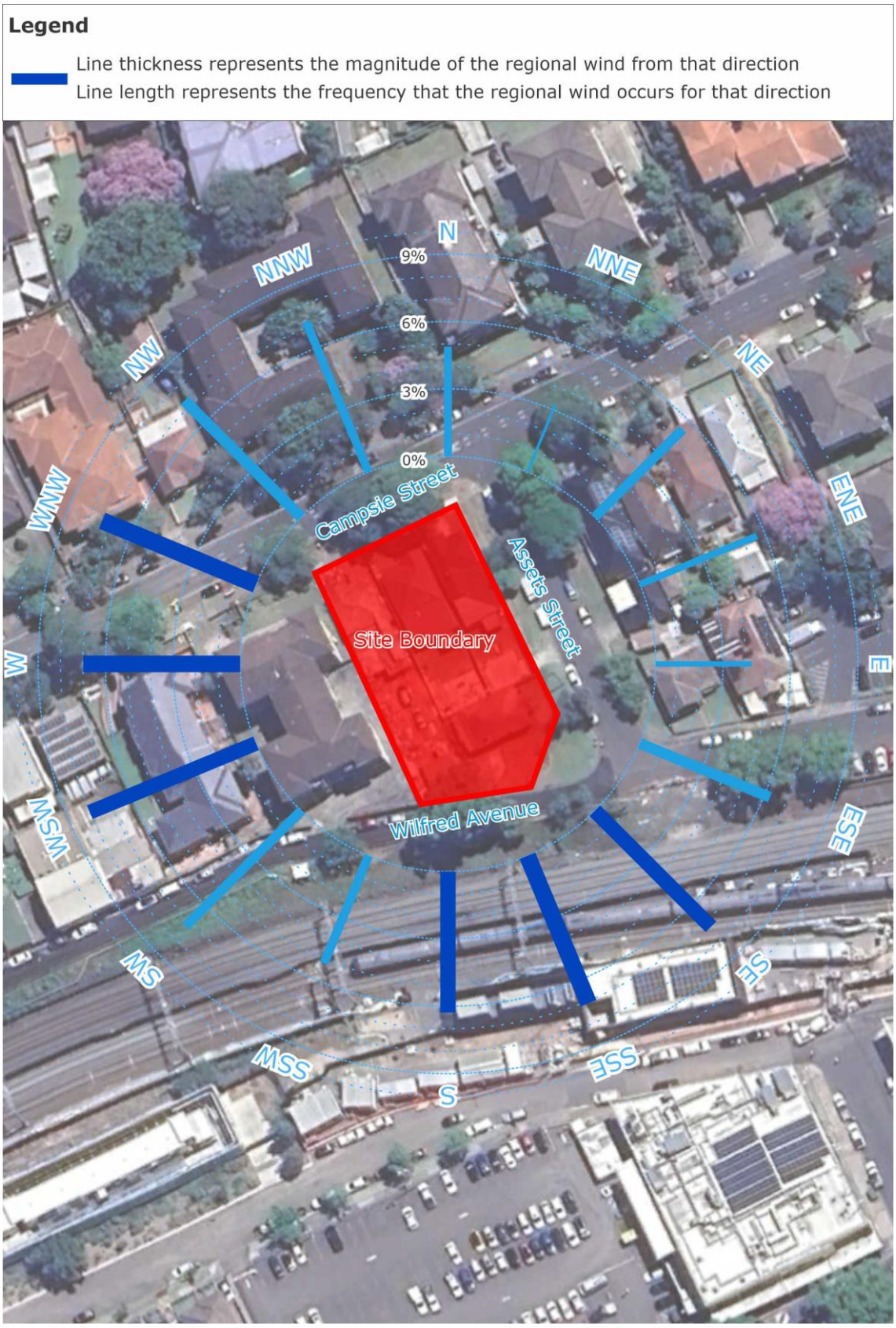

Figure 1: Aerial Image of the Site Location and Prevailing Wind Directions

3 REGIONAL WIND

The Campsie region is governed by three principal wind directions that can potentially affect the subject development. These winds prevail from the south-east, west, and north-east. These wind directions were determined from an analysis undertaken by Windtech Consultants of recorded directional wind speeds obtained from the meteorological station located at Bankstown Airport by the Bureau of Meteorology (recorded from 1993 to 2016). The data has been corrected to represent winds over standard open terrain at a height of 10m above ground level. The results of this analysis are presented in Figure 2 in the form of a directional plot of the annual and 5% exceedance mean winds for the region. The frequency of occurrence of these winds is also shown in Figure 2.

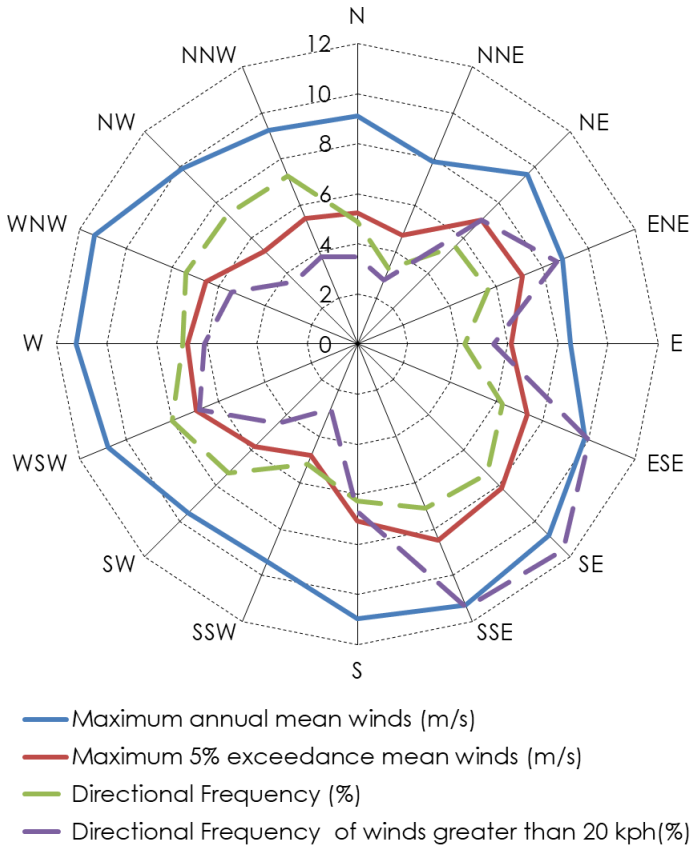

Figure 2: Directional Annual and 5% Exceedance Hourly Mean Wind Speeds (referenced to 10m height in standard open terrain), and Frequencies of Occurrence, for the Campsie Region

4 WIND EFFECTS ON PEOPLE

The acceptability of wind in any area is dependent upon its use. For example, people walking, or window-shopping will tolerate higher wind speeds than those seated at an outdoor restaurant. Various other researchers, such as A.G. Davenport, T.V. Lawson, W.H. Melbourne, and A.D. Penwarden, have published criteria for pedestrian comfort for pedestrians in outdoor spaces for various types of activities. Some Councils and Local Government Authorities have adopted elements of some of these into their planning control requirements.

For example, A.D. Penwarden (1973) developed a modified version of the Beaufort scale which describes the effects of various wind intensities on people. Table 1 presents the modified Beaufort scale. Note that the effects listed in this table refers to wind conditions occurring frequently over the averaging time (a probability of occurrence exceeding 5%). Higher ranges of wind speeds can be tolerated for rarer events.

Table 1: Summary of Wind Effects on People (A.D. Penwarden, 1973)

Type of Winds	Beaufort Number	Mean Wind Speed (m/s)	Effects
Calm	0	Less than 0.3	Negligible.
Calm, light air	1	0.3 – 1.6	No noticeable wind.
Light breeze	2	1.6 – 3.4	Wind felt on face.
Gentle breeze	3	3.4 – 5.5	Hair is disturbed, clothing flaps, newspapers difficult to read.
Moderate breeze	4	5.5 – 8.0	Raises dust, dry soil and loose paper, hair disarranged.
Fresh breeze	5	8.0 – 10.8	Force of wind felt on body, danger of stumbling
Strong breeze	6	10.8 – 13.9	Umbrellas used with difficulty, hair blown straight, difficult to walk steadily, wind noise on ears unpleasant.
Near gale	7	13.9 – 17.2	Inconvenience felt when walking.
Gale	8	17.2 – 20.8	Generally impedes progress, difficulty balancing in gusts.
Strong gale	9	Greater than 20.8	People blown over.

It should be noted that wind speeds affecting this particular development can only be accurately quantified with a wind tunnel study. This assessment addresses only the general wind effects and any localised effects that are identifiable by visual inspection and the acceptability of the conditions for outdoor areas are determined based on their intended use. Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind environment effects.

5 RESULTS AND DISCUSSION

The expected wind conditions affecting the development are discussed in the following sub-sections of this report for the various outdoor areas within and around the subject development. The interaction between the wind and the building morphology in the area is considered and important features taken into account including the distances between the surrounding buildings and the proposed building form, as well as the surrounding landform. Note that only the potentially critical wind effects are discussed in this report. A glossary of the different wind effects described in this report included in Appendix A.

For this assessment, the wind speed criteria for pedestrian comfort that are considered are listed as follows:

- Walking Criterion (8m/s with a 5% probability of exceedance)
  for general circulation and pedestrian thoroughfares, e.g. footpaths, private balconies/terraces, through-site links etc.
- Standing (Short Exposure) Criterion (6m/s with a 5% probability of exceedance)
  for stationary activities generally less than an hour, e.g. waiting areas, communal terraces, main entries, café seating etc.
- Sitting (Long Exposure) (4m/s with a 5% probability of exceedance)
  for stationary activities longer than an hour, e.g. outdoor cinemas, outdoor fine dining etc.

Note that the above wind comfort levels are derived from the Lawson (1975) criteria. Although this assessment is qualitative in nature, the abovementioned criteria for pedestrian comfort are considered when assessing the wind environment impacts. However, all areas are also assessed with consideration to a pedestrian safety criterion of 23m/s for the annual maximum gust.

5.1 Ground Level

The pedestrian footpath along the Assets Street is exposed to the north-easterly prevailing winds, which can result in direct wind effects, as well down-wash effects off the northern façade, on to the Ground Level footpath along Assets Street. The south-easterly winds are expected to side stream along the Assets Street footpath. While this is an existing wind effect given the alignment of these winds with the Assists Street footpath, the side streams off the lower levels of the northern façade may generate undesirable wind effects on to the footpath. These effects can be ameliorated with the retention of the existing trees to the north-east of the site, as a well as with the retention of the proposed awning structure and the slab extension to cover the entire NE aspect. It is also important for this awning to wrap around pointed corner section along the south-eastern façade. The pedestrian footpath along Wilfred Avenue is exposed to the south-easterly direct winds, although the severity of this effect is expected to be reduced due to the narrowness of the aspect of the building facing Wilfred Street. No downwash effects are expected either. The Wilfred Avenue footpath is also exposed to the prevailing westerly and north-easterly (direct) winds, however this is largely an existing wind effect given the alignment of these winds with the subject footpath. Retention of the trees located to the south-east of the site is expected to improve the wind conditions in the vicinity. The pedestrian footpath along Campsie Street is not expected to be impacted by the inclusion of the proposed development due to the significant set-back of the building envelope (6m) from the site boundary (and hence the footpath) in this direction.

The north-east facing entrances to the building lobbies (CCC and Residential Entries) are set-back into the building envelope, as well as covered from down-wash winds by the building extension at Level 2 (and above)

beyond the entrance doors. As such, the wind conditions outside these entrances are expected to satisfy the standing comfort criterion.

A large portion of the childcare play areas on the Ground Level is covered by the Level 1 slab, and the direct effects of the prevailing north easterly, and westerly winds on the subject play area can be ameliorated with the retention of the tall wind barrier (bricks + glazing) along the north-eastern edge, porous fencing (maximum porosity = 30%) along the north-western edge, and the tall impermeable acoustic barrier along the south-western edge.

In summary, the following in-principle wind mitigation measures are recommended to be included/retained in the design to ameliorate the effects of prevailing winds on the pedestrian trafficable located on the Ground Level:

Treatments - Ground Level:

- Retention of the proposed and existing trees/elevated landscaping around the site, ensuring that the proposed trees are of an evergreen and densely foliating species capable of growing to a height of at least 3-5m, with 3-5m wide canopies.
- Retention of the proposed awning structure at Level 1 (around the eastern corner). It is also important for this awning to extend and wrap around pointed corner section along the south-eastern façade.
- Retention of the slab extension at Level 1 along the NE aspect, within the NW half of the floor plan, and the inclusion of densely foliating and evergreen vegetation within this extended section as proposed.
- Play area located to the NW of the site - Retention of the proposed tall wind barrier (bricks + glazing) along the north-eastern edge, porous fencing (maximum porosity = 30%) along the north-western edge, and the tall impermeable acoustic barrier along the south-western edge.
- Retention of the proposed set-back form of the lobby entrances.

5.2 Level 1 Outdoor Childcare/Play Area

Level 1 of the proposed development consists of an active outdoor childcare play area located to the north-western half of the floor plan. This area is exposed to all the prevailing winds for the subject region. These prevailing winds can cause direct effects as well as corner separation and acceleration effects as they side-stream along build up façade sections. Furthermore, the outdoor terrace of Unit 104 is also exposed to the south-easterly and westerly prevailing winds - the treatment for this terrace is listed under Section 5.4.

The following in-principle wind mitigation measures, are recommended to be included/retained in the design to ameliorate the effects of prevailing winds within the various communal areas:

Treatments – Level 1 Outdoor Childcare/Play Area:

- Inclusion of 1.5-1.8m high impermeable or porous (max porosity = 30%) screening/balustrades along the entire exposed perimeter of the outdoor childcare play area.

5.3 Level 16 Communal Open Spaces (Roof Terrace Areas).

The development proposes to include communal open spaces on Level 16 (Roof Level). As the surrounding developments in the immediate vicinity are shorter than the subject development, and at much lower levels than the subject open space areas, these communal areas are exposed to the north-easterly, south-easterly and westerly prevailing winds. These prevailing winds can cause direct effects as well as corner separation and acceleration effects as they side-stream along the services enclosure in the middle.

The following in-principle wind mitigation measures, are recommended to be included/retained in the design to ameliorate the effects of prevailing winds within the Level 16 communal areas:

Treatments – Level 16 Communal Open Spaces (Roof Terrace Areas):

- Retention of the proposed impermeable screening around the entire perimeter of the Roof Terrace. The height of the screening is recommended to be 2m.
- Inclusion of 1.2-1.5m high hedges/shrubs within the designated planter patches throughout the Roof Terrace to break up the winds that flow over the perimeter screening.

5.4 Private Balcnonies/Terraces (Levels 1-15)

The majority of the private balconies within the development are expected to be suitable for their intended uses due to the inclusion of various wind mitigation features such as their overall recessed design, impermeable balustrades, and intertenancy walls/screens. These features should be retained in the final design. Some corner balconies throughout the development are exposed to strong wind effects (typically corner acceleration and side-streaming), and are recommended to be treated as follows:

Treatments – Private Balconies/Terraces (Level 1-15):

- Levels 1 to 15 - Increasing the height of the impermeable balustrades along the shorter aspects of each of the overall corner balconies of the typical floor plan to 1.3m, for Levels 10-15 (inclusive), and retention of the proposed standard height impermeable balustrades along the longer aspects. This will avoid the prevailing winds that accelerate around the corners from impacting these balconies.
- Level 1 - Retention of the porous fencing around the arc-shaped terrace of Unit 104, limiting the porosity to a maximum of 30%.

5.5 Concluding Remarks

With the inclusion of the abovementioned recommendations in the final design, it is expected that wind conditions for the various trafficable outdoor areas within and around the development will be suitable for their intended uses, and that the wind speeds will satisfy the applicable criteria for pedestrian comfort and safety. In particular, the wind conditions within and around the various communal areas (including the Ground Level entrances and the childcare open play areas) are expected to satisfy the standing comfort criterion, while the wind conditions within the various pedestrian footpaths as well as the private balconies are expected to satisfy the walking comfort criterion. It is recommended that the extent of the treatments required be optimised at a more detailed design stage via wind tunnel testing.

6 REFERENCES

Davenport, A.G., 1972, "An approach to human comfort criteria for environmental conditions". Colloquium on Building Climatology, Stockholm.

Lawson, T.V., 1973, "The wind environment of buildings: a logical approach to the establishment of criteria". Bristol University, Department of Aeronautical Engineering.

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Lawson, T.V., 1980, "Wind Effects on Buildings - Volume 1, Design Applications". Applied Science Publishers Ltd, Ripple Road, Barking, Essex, England.

Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions". *Journal of Wind Engineering and Industrial Aerodynamics*, vol. 3, pp241-249.

Penwarden, A.D. (1973). "Acceptable Wind Speeds in Towns", Building Science, vol. 8: pp259–267.

Penwarden, A.D., Wise A.F.E., 1975, "Wind Environment Around Buildings". Building Research Establishment Report, London.

APPENDIX A WIND EFFECTS GLOSSARY

A.1 Downwash and Upwash Effects

The downwash wind effect occurs when wind is deflected down the windward face of a building, causing accelerated winds at pedestrian level. This can lead to other adverse effects as corner acceleration as the wind attempts to flow around the building, as seen in Figure A.1.

This can also lead to recirculating flow in the presence of a shorter upstream building, causing local ground level winds to move back into the prevailing wind.

The upwash effect occurs near upper level edge of a building form as the wind flows over the top of the building. This has the potential to cause acceleration of winds near the leading edge, as well as potentially reattaching onto the roof area. This effect causes wind issues particularly near the leading edges of tall building and on the rooftop areas if there is sufficient depth along the wind direction. Upwash is more apparent in taller towers and podia.

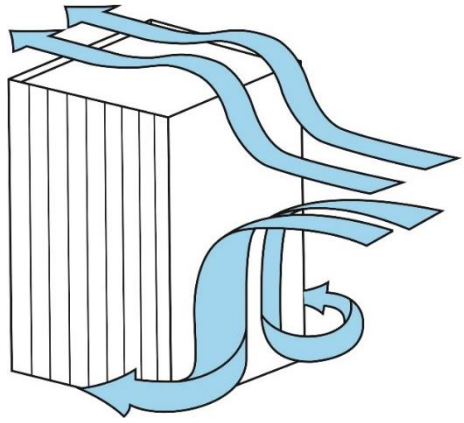

Figure A.1: Downwash Leading to Corner Wind Effect, and Upwash Effects

A.2 Funnelling/Venturi Effect

Funnelling occurs when the wind interacts with two or more buildings which are located adjacent to each other, which results in a bottleneck, as shown in Figure A.2. This causes the wind to be accelerated through the gap between the buildings, resulting in adverse wind conditions and pedestrian discomfort within the constricted space. Funnelling effects are common along pedestrian links and thoroughfares generally located between neighbouring buildings that have moderate gaps between them.

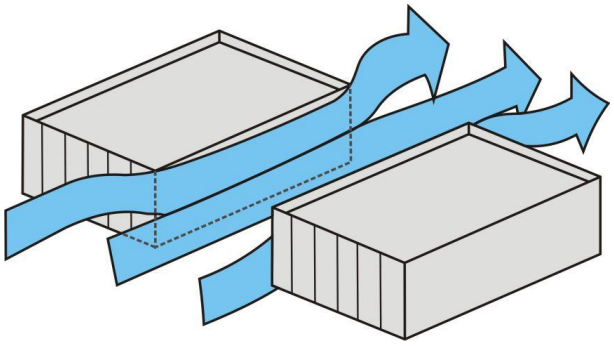

Figure A.2: Funnelling/Venturi Wind Effect

A.3 Gap Effect

The gap effect occurs in small openings in the façade that are open to wind on opposite faces, as seen in Figure A.3. This can involve a combination of funnelling and downwash effects. Presenting a small gap in the façade on the windward aspect as the easiest means through which the wind can flow through can result in wind acceleration through this gap. The pressure difference between the windward façade and the leeward façade also tends to exacerbate the wind flow through this gap.

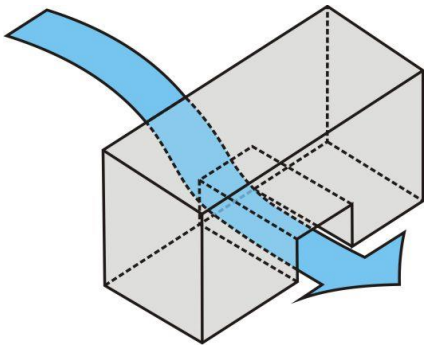

Figure A.3: Gap Wind Effect

A.4 Sidestream and Corner Effects

The sidestream effect is due to a gradual accumulation of wind shearing along the building façade that eventuates in an acceleration corner effect. The flow is parallel to the façade and can be exacerbated by downwash effects as well, or due to corner effect winds reattaching on the façade.

This is shown in Figure A.4. The corner refers to the acceleration of wind at the exterior vertical edge of a building, caused by the interaction of a large building massing with the incident wind, with the flow at the corner being accelerated due to high pressure differentials sets up between the windward façade and the orthogonal aspects. It can be further exacerbated by downwash effects that build up as the flow shears down the façade.

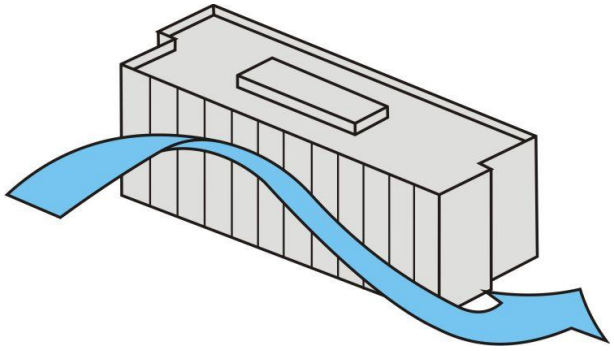

Figure A.4: Sidestream and Corner Wind Effect

A.5 Stagnation

Stagnation in a region refers to an area where the wind velocity is significantly reduced due to the effect of the flow being impeded by the bluff body. For a particular prevailing wind direction, this is typically located near the middle of the windward face of the building form or over a short distance in front of the windward face of a screen or fence. Concave building shapes tend to create an area of stagnation within the cavity, and wind speeds are generally low in these areas.

APPENDIX B DRAWINGS REFERENCED (RECEIVED APRIL 2, 2026)

NO.	DESCRIPTION	SCALE	REVISION
SSDA 0 GENERAL			
SSDA 001	COVER SHEET	NTS	A
SSDA 002	DEVELOPMENT SUMMARY	NTS	A
SSDA 003	CONTEXT ANALYSIS	NTS	A
SSDA 004	SITE ANALYSIS	1:200	A
SSDA 005	SITE PLAN EXISTING CONTEXT	1:250	A
SSDA 006	SITE PLAN FUTURE CONTEXT	1:250	P2
SSDA 007	DEMOLITION PLAN	1:100	A
SSDA 1 PLANS			
SSDA 101	BASEMENT 04 PLAN	1:100	A
SSDA 102	BASEMENT 03 PLAN	1:100	A
SSDA 103	BASEMENT 02 PLAN	1:100	A
SSDA 104	BASEMENT 01 PLAN	1:100	A
SSDA 105	GROUND LEVEL PLAN	1:100	A
SSDA 106	LEVEL 01 PODIUM PLAN	1:100	A
SSDA 107	LEVEL 02 - 15 TYPICAL PLAN	1:100	A
SSDA 108	ROOF TERRACE PLAN	1:100	A
SSDA 109	ROOF PLAN	1:100	A
SSDA 2 ELEVATIONS AND SECTIONS			
SSDA 201	STREET ELEVATION - NORTH	1:400	A
SSDA 202	STREET ELEVATION - EAST	1:400	P2
SSDA 203	STREET ELEVATION - SOUTH	1:400	A
SSDA 204	STREET ELEVATION - WEST	1:400	P2
SSDA 205	NORTH ELEVATION (CAMPSIE ST)	1:150	A
SSDA 206	EAST ELEVATION (ASSETS ST)	1:150	A
SSDA 207	SOUTH ELEVATION (WILFRED AVE)	1:150	A
SSDA 208	WEST ELEVATION	1:150	A
SSDA 209	SECTION AA	1:150	A
SSDA 210	SECTION BB	1:150	P2
SSDA 211	SECTION CC	1:150	P2
SSDA 212	SECTION DD	1:150	A
SSDA 213	SECTION EE DRIVEWAY	1:100	A