WINDTECH

PEDESTRIAN WIND ENVIRONMENT STATEMENT

19A EVANS AVENUE, EASTLAKES

WF277-04F02(REV0)- WS REPORT

MAY 4, 2026

Prepared for:

Builtcom Developments Eastlakes Pty Ltd

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EXECUTIVE SUMMARY

This report presents an opinion on the likely impact of the proposed development located at 19A Evans Avenue, Eastlakes, 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 southerly, 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 21 April and 27 April 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:

- Ground Level Trafficable Areas and Pedestrian Throughfares:
    - Retention of the proposed awnings along the Evans Avenue frontage, as indicated in the architectural drawings.
    - Inclusion of wind mitigation features along the Evans Avenue, Barber Avenue and western frontages, such as localised free-standing screening or densely foliating evergreen vegetation. Furthermore, these wind mitigation measures are to be located adjacent to the proposed community centre entrance, lobby entrances, retail entrances, F&B entrances, and within all areas intended for short and/or long durations of stationary usage.

- Elevated Communal Open Spaces:
    - Levels 04, 14, 17, and 18 Communal Open Spaces:
        - Inclusion of planter boxes/zones throughout the communal open space, which are to be populated with densely foliating vegetation (e.g. hedges/shrubs) capable of growing to a height of 1.5m above the finish floor level. Note the densely foliating vegetation is to be of an evergreen variety to ensure their effectiveness in wind mitigation throughout the year and adjacent to areas intended for short and/or long durations of stationary usage.
        - Inclusion of tree plantings throughout the communal open space, which are to be of a densely foliating species, capable of growing of growing to a height of 3-5m above the finish floor level, with a canopy spread of 3-5m. Note the densely foliating tree planting is to be of an evergreen variety to ensure their effectiveness in wind mitigation throughout the year and adjacent to areas intended for short and/or long durations of stationary usage.
        - Inclusion of impermeable balustrades along all exposed perimeters edges of the communal open spaces to a height of 1.5m.
- Elevated Private Balconies and Terraces:
    - Building 1:
        - Inclusion of a full-height impermeable end screen along one of the two open aspects of the south-eastern and south-western corner balconies, from Levels 05 to 18.
        - Inclusion of impermeable balustrades along the exposed perimeter edges of all northern balconies and terraces to a height of 1.5m.
    - Building 2:
        - Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-eastern and north-western corner balconies, from Levels 05 to 17.
    - Building 3:
        - Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-eastern corner balconies, from Levels 05 to 18.
        - Inclusion of a full-height impermeable end screen along one of the two open aspects of the south-eastern corner balconies, from Levels 05 to 17.
    - Building 4:
        - Inclusion of a full-height impermeable end screen along one of the two open aspects of the southern corner balconies, from Levels 05 to 14.

- Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-eastern and south-western corner balconies, from Levels 05 to 16.

- Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-western corner balconies, from Levels 05 to 17.

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. Nonetheless, wind tunnel testing is recommended to be undertaken at a more detailed design stage to quantitatively assess the wind conditions and to optimise the size and extent of the treatments required.

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, and any recommendations in this report are made only in-principle.

Table 1: List of Architectural Drawings Referenced

Drawing Number	Drawing Title	Revision	Date
DA604	Ground Floor	P3	20/04/2026
DA605	Level 1	P2	20/04/2026
DA606	Level 2	P3	20/04/2026
DA607	Level 3	P2	20/04/2026
DA608	Level 4	P5	27/04/2026
DA609	Level 5	P5	27/04/2026
DA610	Level 6-13	P5	27/04/2026
DA611	Level 14	P5	27/04/2026
DA612	Level 15-16	P5	27/04/2026
DA613	Level 17	P5	27/04/2026
DA614	Level 18	P5	27/04/2026
DA615	Roof	P5	27/04/2026
DA700	North Elevations	P3	27/04/2026
DA701	East Elevations	P3	27/04/2026
DA702	South Elevations	P3	27/04/2026
DA703	West Elevations	P3	27/04/2026
DA704	Internal Elevation A	P3	27/04/2026
DA705	Internal Elevation B	P3	27/04/2026
DA706	Internal Elevation C	P3	27/04/2026
DA707	Internal Elevation D	P3	27/04/2026
DA708	Internal Elevation E	P2	27/04/2026
DA709	Internal Elevation F	P2	27/04/2026

2 DESCRIPTION OF DEVELOPMENT AND SURROUNDINGS

The site is located at 19A Evans Avenue, Eastlakes, and is bounded by Evans Avenue to the north, Barber Avenue to the east and south, and the Jack Mundey Reserve to the west. The buildings surrounding the subject development are predominately low-rise residential and commercial buildings, with a few mid-rise apartment buildings to the north. The region also contains several areas of parkland, including Australian Park to the north and Botany Dams/Wetlands to the east and south.

A survey of the land topography indicates a gradual incline towards the east, however, there are 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 1-2 storey commercial buildings. The proposed development consists of four buildings, with Buildings 1-3 each having a height of 19 storeys and Building 4 having a height of 18 storeys.

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:

- Ground Level Trafficable Areas including Pedestrian Throughfares, Footpaths and the adjacent Jack Mundey Reserve
- Elevated Communal Open Spaces
- Elevated Private Balconies and Terraces

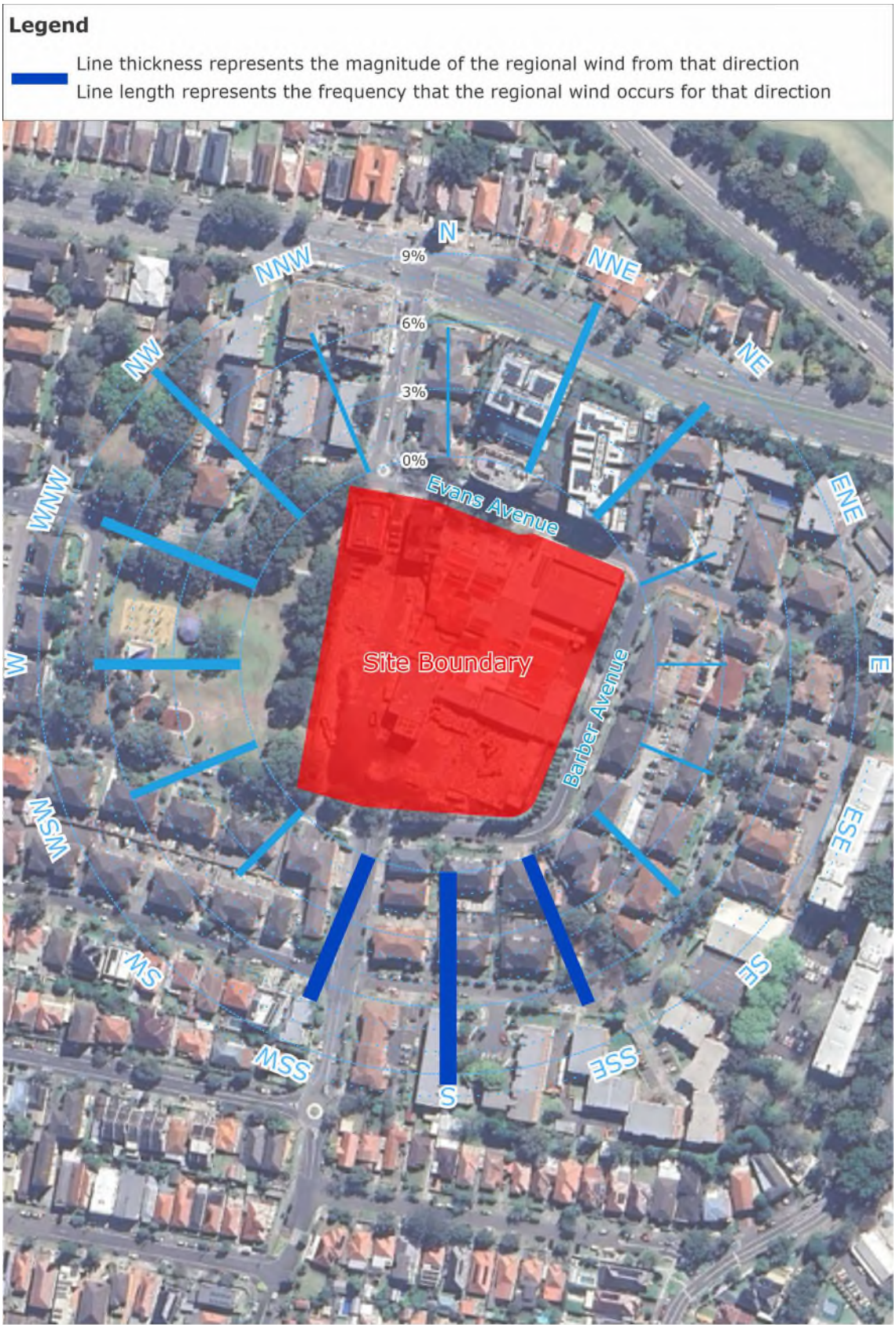

Figure 1: Aerial Image of the Site Location and Prevailing Wind Directions

3 REGIONAL WIND

The Eastlakes region is governed by three principal wind directions that can potentially affect the subject development. These winds prevail from the south, 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 Sydney Airport by the Bureau of Meteorology (recorded from 1995 to 2025). 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.

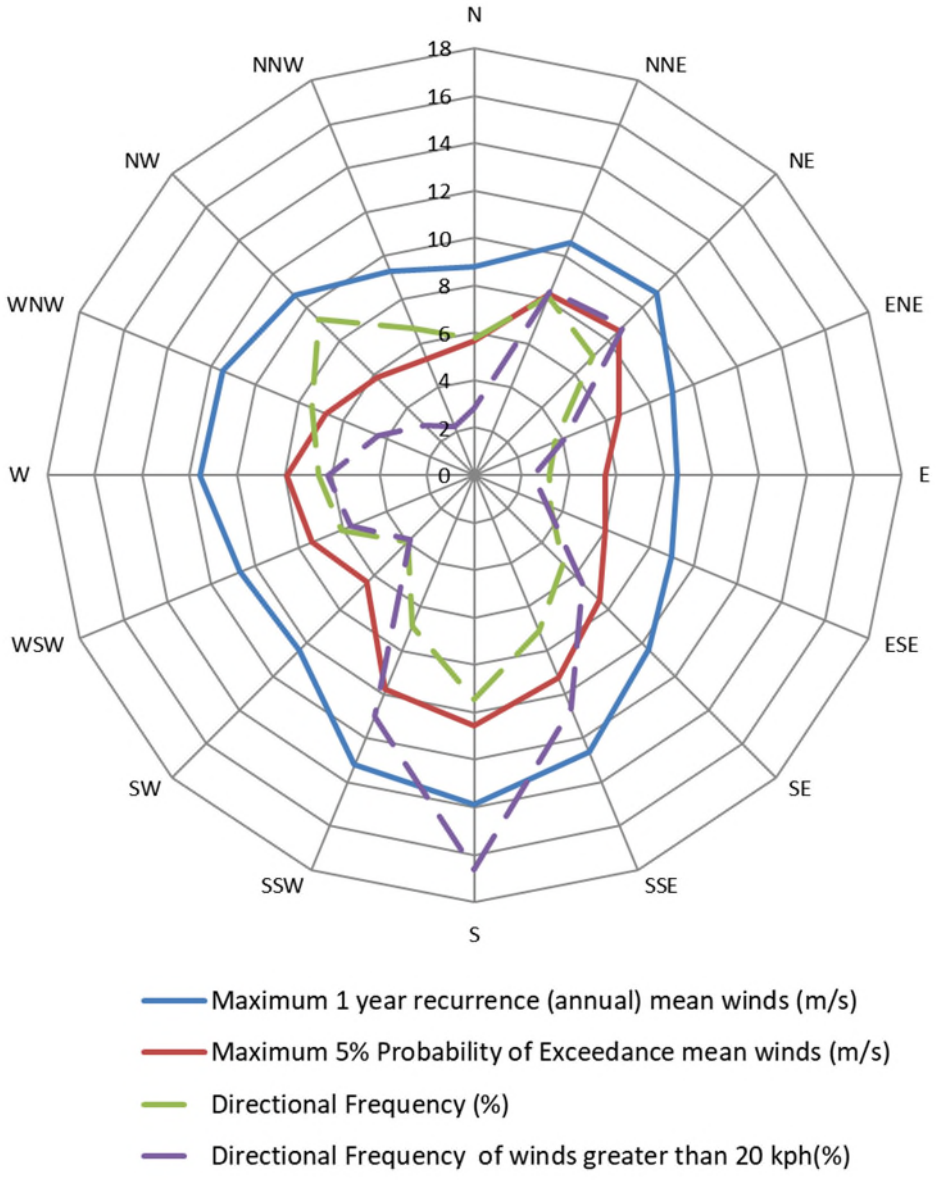

Figure 2: Directional Annual and 5% Exceedance Hourly Mean Wind Speeds (referenced to 10m height in standard open terrain), and Frequencies of Occurrence, for the Eastlakes Region

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 2 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 2: 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 Trafficable Areas

The outdoor trafficable areas within and around the development site benefits from shielding provided by the subject and neighbouring buildings. There are however outdoor areas that may be susceptible to stronger wind conditions due to the interaction of the prevailing winds with the building morphology, summarised as follows:

- The pedestrian thoroughfares along Evans Avenue and Barber Avenue are exposed to the prevailing westerly and south-easterly winds respectively, which are expected to side-stream along the northern and eastern aspects of the podium levels.

- The western entrance, seated areas and footpaths within the Jack Mundey Reserve are susceptible to winds down washing from the west aspects of Buildings 1 and 3 from the prevailing westerly direction. The existing tree plantings located within the Jack Mundey Reserve are expected to assist in mitigating the adverse effects caused by these winds.

It is expected the following treatment strategies to be effective in mitigating the abovementioned potential wind effects and enhance the local wind conditions within the various outdoor trafficable areas within and around the site, hence they are recommended to be considered in the design of the development and are indicated in Figures 3:

- Retention of the proposed awnings along the Evans Avenue frontage, as indicated in the architectural drawings.

- Inclusion of wind mitigation features along the Evans Avenue, Barber Avenue and western frontages, such as localised free-standing screening or densely foliating evergreen vegetation. Furthermore, these wind mitigation measures are to be located adjacent to the proposed community centre entrance, lobby entrances, retail entrances, F&B entrances, and within all areas intended for short and/or long durations of stationary usage.

5.2 Elevated Communal Open Spaces

The various communal open spaces, located on Levels 04, 14, 17, and 18, benefit from some shielding provided by the building-form from at least one of the prevailing winds. These elevated spaces are expected to be exposed to adverse wind conditions caused by effects such as direct impact, funnelling, and corner acceleration from the prevailing north-easterly, south-easterly, and westerly wind. It is expected the following treatment strategies will be effective in mitigating the abovementioned wind effects and enhance the local wind conditions within the Communal Open Roof Spaces. These recommendations are indicated in Figures 3:

- Inclusion of planter boxes/zones throughout the communal open space, which are to be populated with densely foliating vegetation (e.g. hedges/shrubs) capable of growing to a height of 1.5m above the finish floor level. Note the densely foliating vegetation is to be of an evergreen variety to ensure their effectiveness in wind mitigation throughout the year and adjacent to areas intended for short and/or long durations of stationary usage.

- Inclusion of tree plantings throughout the communal open space, which are to be of a densely foliating species, capable of growing of growing to a height of 3-5m above the finish floor level, with a canopy spread of 3-5m. Note the densely foliating tree planting is to be of an evergreen variety to ensure their effectiveness in wind mitigation throughout the year and adjacent to areas intended for short and/or long durations of stationary usage.

- Inclusion of impermeable balustrades along all exposed perimeters edges of the communal open spaces to a height of 1.5m.

5.3 Elevated Private Balconies and Terraces

The majority of the elevated balconies and terraces within the proposed development are expected to be suitable for their intended use due to the inclusion of various wind mitigation features such as their overall recessed design, balustrades, full-height blade walls, and intertenancy screens. These features should be retained in the final design.

The private corner balconies and terraces on Levels 05 to 18 are susceptible to stronger wind conditions due to their exposure to winds corner accelerating through the balconies from the prevailing wind directions. It is expected the following treatment strategies will be effective in mitigating the abovementioned wind effects within the private corner balconies and terraces, hence they are recommended to be incorporated in the final design. These treatments are indicated in Figures 3:

- Building 1:
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the south-eastern and south-western corner balconies, from Levels 05 to 18.
    - Inclusion of impermeable balustrades along the exposed perimeter edges of all northern balconies and terraces to a height of 1.5m.
- Building 2:
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-eastern and north-western corner balconies, from Levels 05 to 17.
- Building 3:
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-eastern corner balconies, from Levels 05 to 18.
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the south-eastern corner balconies, from Levels 05 to 17.
- Building 4:
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the southern corner balconies, from Levels 05 to 14.
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-eastern and south-western corner balconies, from Levels 05 to 16.
    - Inclusion of a full-height impermeable end screen along one of the two open aspects of the north-western corner balconies, from Levels 05 to 17.

Treatments Legend

Inclusion of wind mitigation features, such as localised free-standing screening or densely foliating evergreen vegetation. Furthermore, these wind mitigation features are to be located adjacent to the proposed community centre entrance, lobby entrances, retail entrances, F&B entrances, and within all areas intended for short/long durations of stationary usage.

Figure 3a: Recommended Treatment for the Ground Level

Figure 3b: Recommended Treatment for the Level 04

Figure 3c: Recommended Treatment for the Levels 05-13

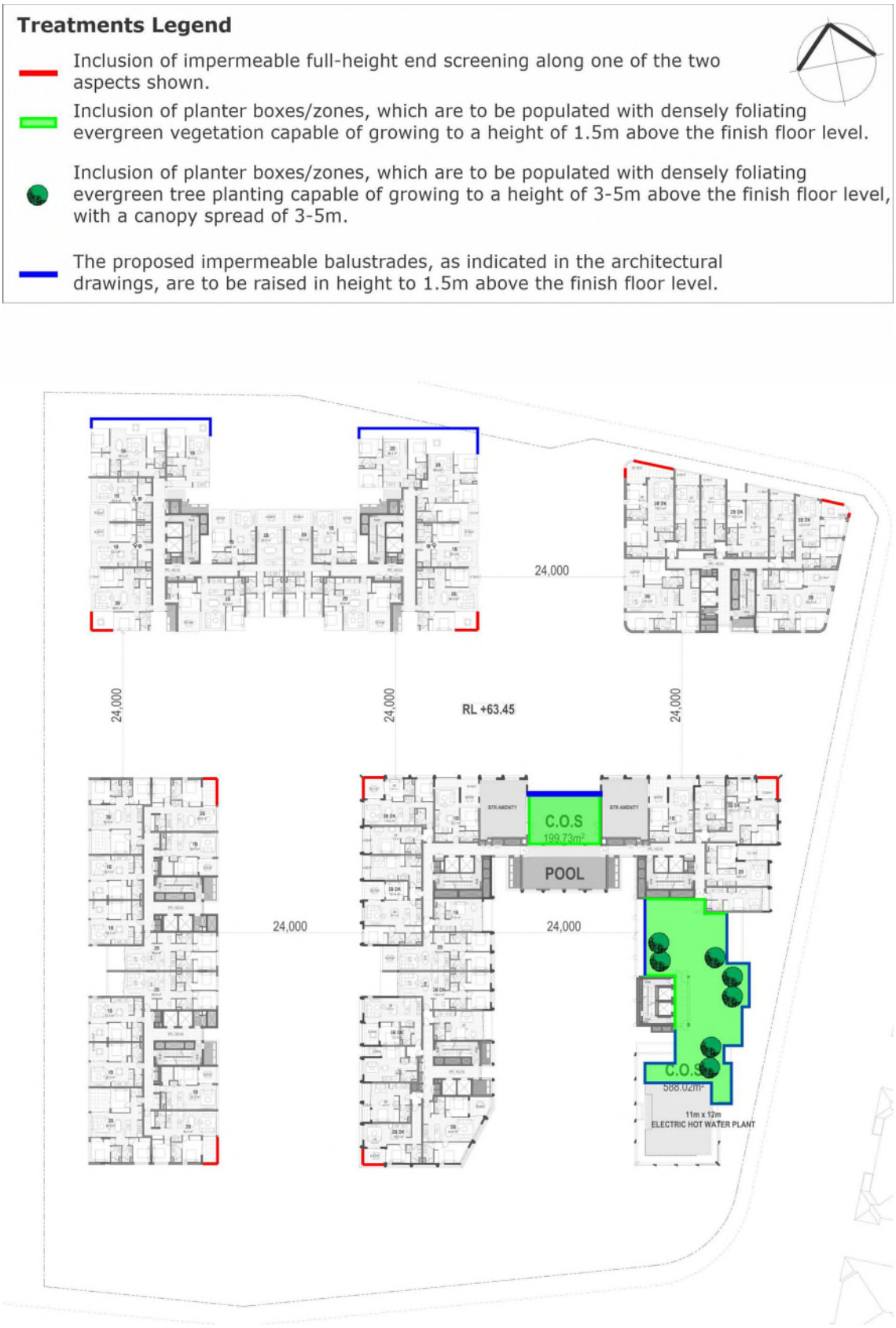

Figure 3d: Recommended Treatment for the Level 14

Figure 3e: Recommended Treatment for the Levels 15-16

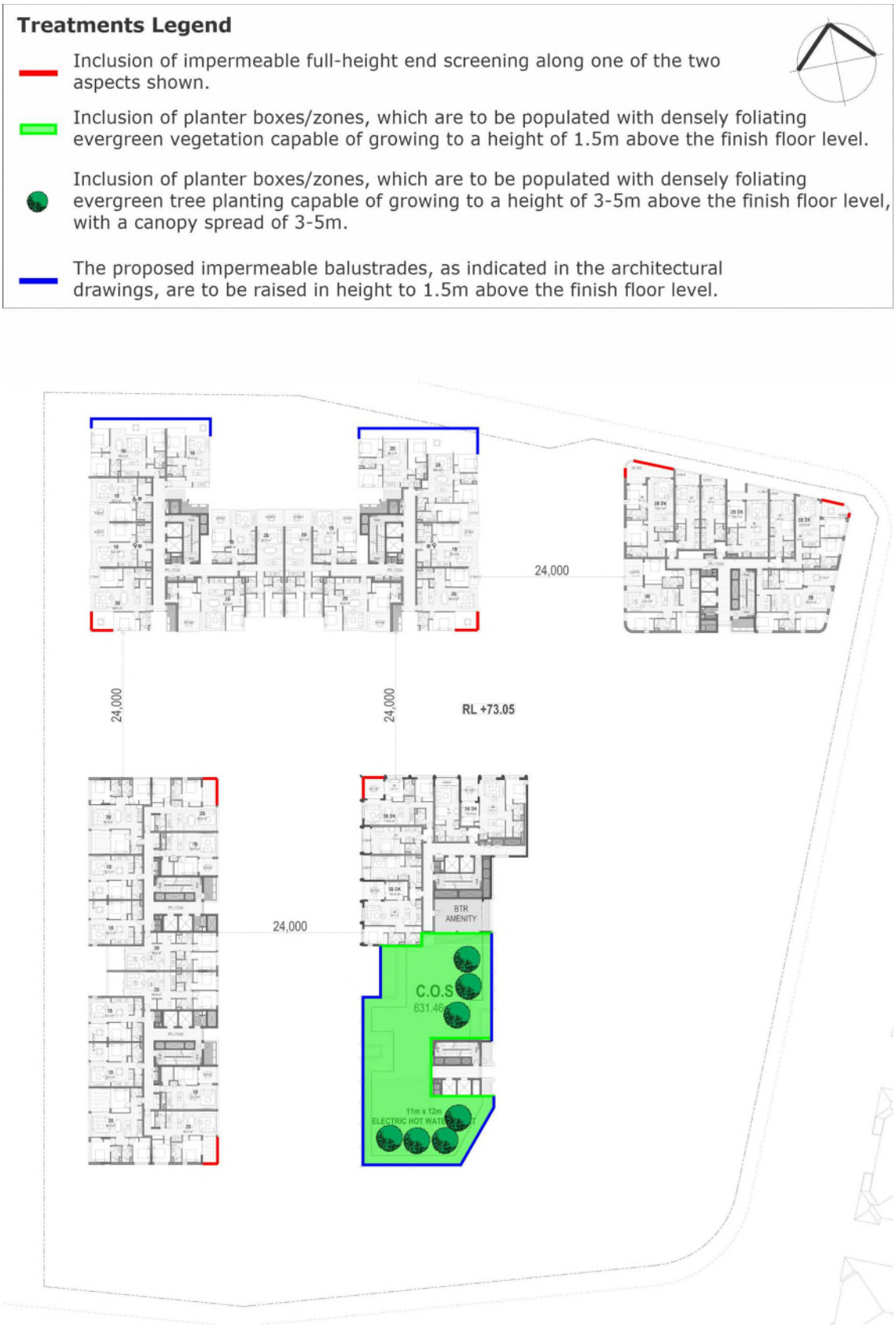

Figure 3f: Recommended Treatment for the Level 17

Figure 3g: Recommended Treatment for the Level 18

6 REFERENCES

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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.

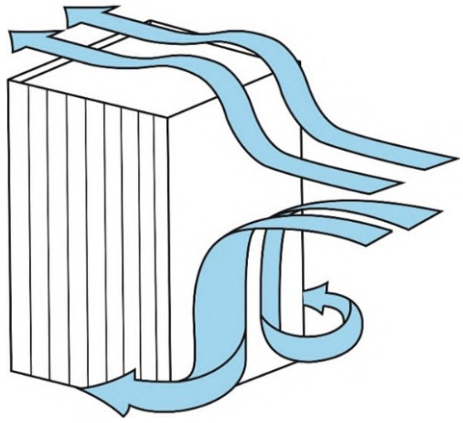

Figure A.1: Downwash Leading to Corner Wind Effect, and Upwash Effects

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.

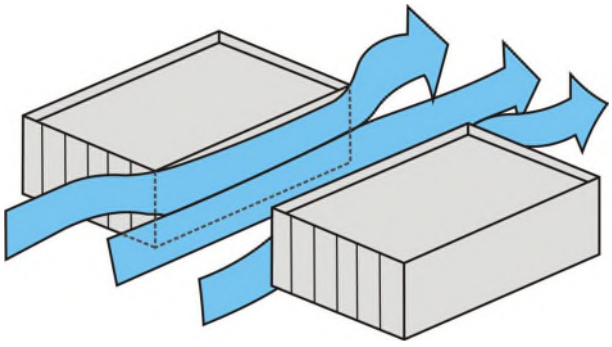

Figure A.2: Funnelling/Venturi Wind Effect

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.

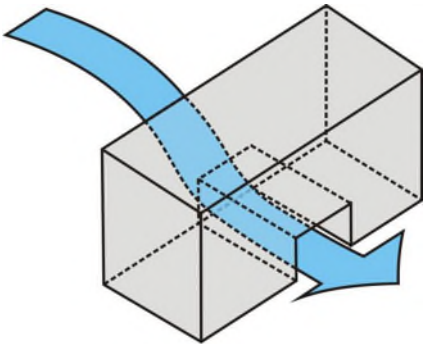

Figure A.3: Gap Wind Effect

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.

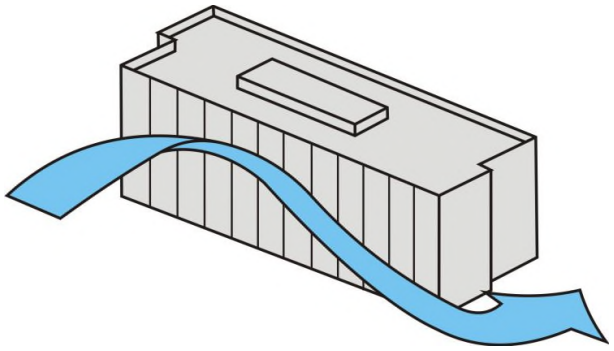

Figure A.4: Sidestream and Corner Wind Effect

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.