



NATURAL VENTILATION STATEMENT

BLOCK 20A, EDMONDSON PARK

WK098-01F03(REV1)- NVS REPORT

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Prepared for:

Landcom

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DOCUMENT CONTROL

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EXECUTIVE SUMMARY

This Natural Ventilation Statement Report accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in support of a State Significant Development Application (SSDA) for the construction of the proposed mixed-use building, reference SSD-99909708.

This report addresses the Secretary's Environmental Assessment Requirements (SEARs) issued for the project, notably as indicated in Table 1:

Table 1: SEARs Requirement Section of Report where response is provided

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SEARs Section 6 – Built Form and Urban Design	Section 3

This report presents an opinion on the natural ventilation performance of the various residential apartments of the proposed Block 20a development, located on Buchan Avenue and McDonald Road in Edmondson Park NSW, based on our extensive experience in this field and the architectural drawings prepared by the project architect Fuse Architects, received 3 March 2026. The results of the assessment are based on our extensive experience in modelling of natural ventilation in buildings and our understanding of the guidelines for wind-driven natural cross ventilation provided in the Apartment Design Guide (ADG) as per the State Environmental Planning Policy (Housing) 2021 Chapter 4 Design of residential apartment development.

The results of the assessment indicate that a total of 61% (72 out of 118) of the residential apartments within the first nine storeys of the development will achieve adequate levels of natural cross ventilation as per the ADG, which is greater than the required minimum of 60%. Natural cross ventilation has been achieved through openings on orthogonal or opposite aspects (for example corner or through apartments), with direct exposure to prevailing winds or windows located in significantly different pressure regions as defined within Section 4B of the ADG.

This has been achieved for the following apartments due to the proposed openings in the form of operable windows and doors located in significantly different pressure regions along the various aspects. This will be effective in generating pressure driven air flow through the apartment as the incident wind travels from the positively pressurised windward openings and exhausted to the negative or neutrally pressurised sideward or backward openings.

Ground Floor:

- Apartments AG03 and BG04.
- Similarly, apartments TH01, TH02, TH03 and TH04 will achieve adequate levels of natural ventilation through the inclusion of the proposed operable skylights. Winds are expected to enter through the positively pressurised Ground Floor balcony doors, exhausting to the negatively pressurised operable skylights located on Level 01.

Level 01:

- Apartments A103, B101 and B105.

Level 02 to Level 08:

- Corner apartments on Tower A on Level 02 and above (such as A203, A204, A207, A208 and those located above these apartments)
- All Tower B apartments located on Level 02 and above

Note that each habitable room should have an unobstructed opening size of at least of 5% of the floor area served by the opening, in accordance with Objective 4B-1 of the ADG and have a minimum free area of 0.4m² in order to provide effective natural ventilation.

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REGIONAL WIND CLIMATE

The Edmondson Park region is governed by three principal wind directions, and these can potentially affect the subject development. These winds prevail from the north-east, south to south-east, and west. This summary is based on an analysis of wind rose data obtained by the Bureau of Meteorology from Bankstown Airport between 1993 and 2016. Directional plots of the daily average winds when temperatures are between 20-29.5°C, which is the thermal comfort range for this region is shown in Figure 1 below (when occupants tend to open windows for ventilation).

Natural ventilation for a residential apartment is most beneficial during the warmer times of the year, when the occupants of the apartment are most likely to open the windows and/or doors and also when the cooling effect of airflow through the apartment is most effective. An analysis of the Bankstown wind climate data within the thermal comfort zone range indicates that more than half of the wind events occur from the 'NNE' to 'SSE' directions. Furthermore, the 'NE' to 'ENE' and 'ESE' to 'SE' winds are the most dominant.

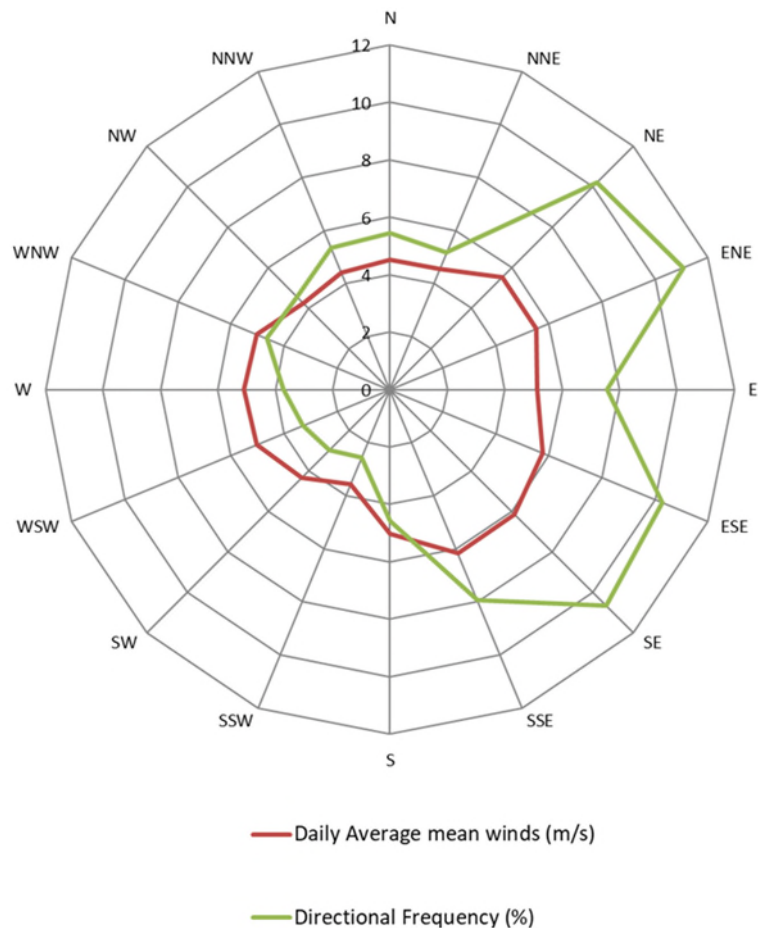


Figure 1: Daily Average Hourly Mean Wind Speeds, and Frequencies Occurrences, for the Edmondson Park Region for Outdoor Temperatures between 20-29.5°C (based on observations from Bankstown Airport from 1993 to 2016, corrected to open terrain at 10m)

NATURAL CROSS VENTILATION OF DEEMED TO SATISFY APARTMENTS

Natural ventilation of indoor areas can be used to improve both the level of occupant comfort and the air quality of an internal space. Natural ventilation is beneficial in improving occupant comfort during the warmer months of the year when the occupants will generally have windows and doors open, while during the winter months it is considered primarily beneficial for air quality purposes only.

The predominant wind directions for the region have been analysed in Section 1 of this report, and from this analysis only the north-easterly and southerly winds should be considered as contributors to natural ventilation for occupant comfort purposes, since these are the predominant wind directions during the warmer months of the year. The westerly winds are predominant during the cooler winter months and would be beneficial for air quality purposes only.

The Apartment Design Guide (ADG) as per the State Environmental Planning Policy (Housing) 2021 Chapter 4 Design of residential apartment development, states that, for a development to be considered naturally ventilated, at least 60% of the individual apartments in the first nine storeys of the building must be considered to be naturally cross ventilated. Apartments at ten storeys or greater are deemed to be cross ventilated only if any enclosure of the balconies at these levels allows adequate natural ventilation and cannot be fully enclosed. To be considered to be naturally cross ventilated, the overall depth of a cross-over or cross-through apartment must not exceed 18m, measured glass line to glass line. Examples of apartments which are classified as being naturally ventilated by the Apartment Design Guide are shown in Figures 2 below, which also show the flow paths for natural cross ventilation through the apartments.

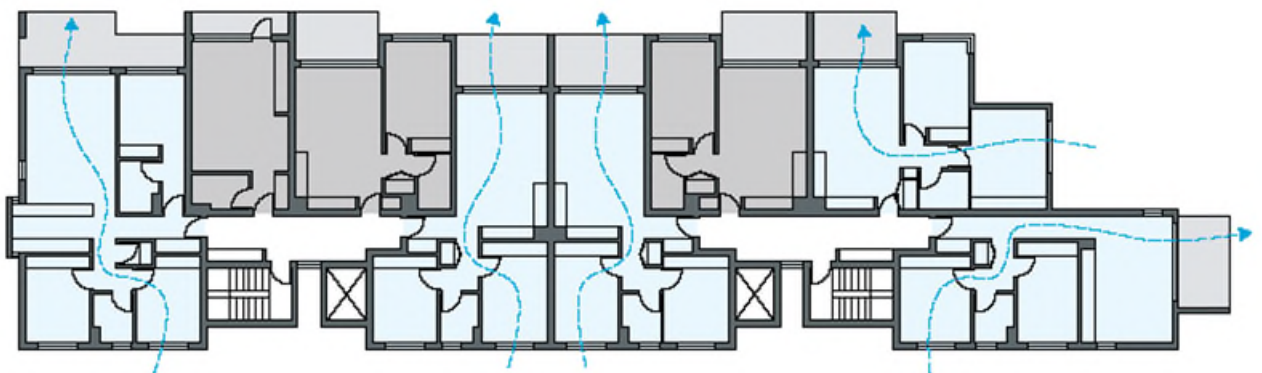


Figure 2a: Examples of Apartments Achieving Effective Natural Cross Ventilation
(from Apartment Design Guide, floor plan of a typical residential building)

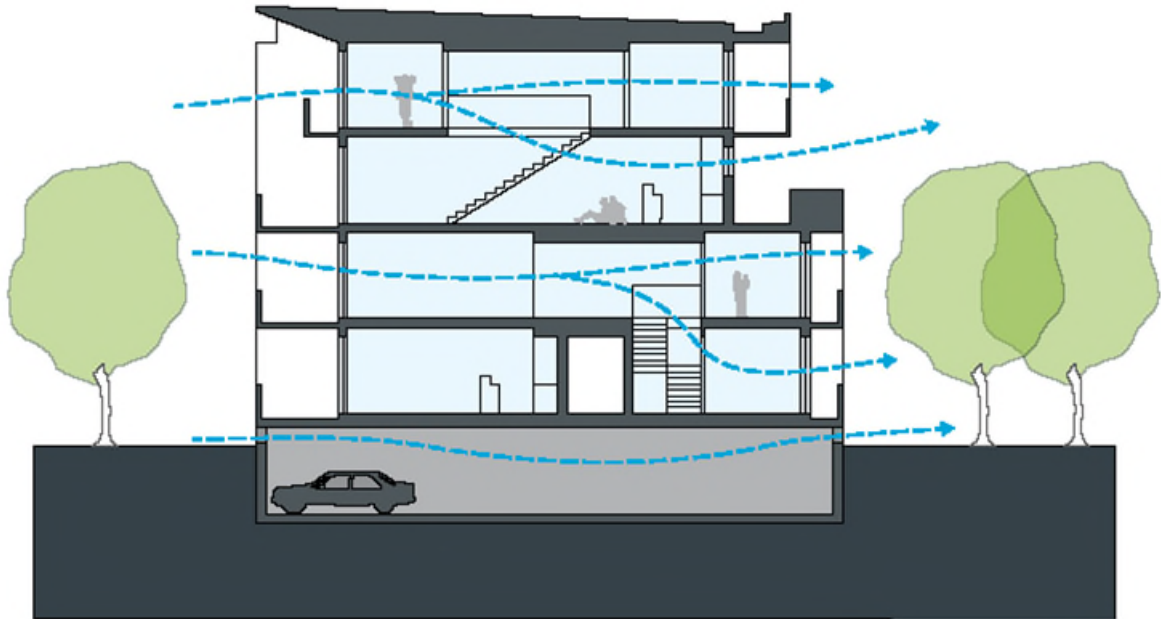


Figure 2b: Examples of Apartments Achieving Effective Natural Cross Ventilation
(from Apartment Design Guide, section elevation of a typical residential building)

Apartments have been considered to have dual aspects if the two openings are able to be located on aspects which are less than 135° in plan orientation from each other. Openings which are located on aspect orientations greater than this are more likely to have similar pressures at the opening, and their performance cannot be considered to satisfy based on the ADG guidelines. These apartments may still be considered to be naturally ventilated, but will require further analysis, as outlined in Section 3.

The Apartment Design Guide does provide design guidance for the layout and design of single aspect apartments to maximise natural ventilation. While these are not considered naturally cross ventilated, they allow for site restraints for design excellence in single aspect apartments. The design allows for the inclusion of plenums, vertical ventilation shafts and building indentations with a width to depth ratio of 2:1 or 3:1 to ensure effective air circulation and avoid trapped smells.

It is important that the naturally cross ventilated flow path does not flow through a bathroom in order to avoid issues with odours.

It should be noted that deviations in the apartment layout shown in the Apartment Design Guide can have the potential to provide effective natural ventilation through the apartment. However, due to the complicated nature of flow paths driven by pressure differentials at different openings of an apartment, the effectiveness of natural ventilation for apartments which are outside of those presented in Figures 2 should be demonstrated by means of a detailed wind tunnel study. A comparison between the predicted natural ventilation characteristics of an apartment obtained from wind tunnel testing with the observed full-scale characteristics of the same apartment have been published in the paper titled 'Designing for Natural Ventilation for Tall Residential Buildings' by Peddie and Rofail (2011), which demonstrates close agreement.

3 RESULTS AND DISCUSSION

The results of the assessment indicate that a total of 61% (72 out of 118) of the residential apartments within the first nine storeys of the development will achieve adequate levels of natural cross ventilation as per the ADG, which is greater than the required minimum of 60%. Natural cross ventilation has been achieved through openings on orthogonal or opposite aspects (for example corner or through apartments), with direct exposure to prevailing winds or windows located in significantly different pressure regions as defined within Section 4B of the ADG.

This has been achieved for the following apartments due to the proposed openings in the form of operable windows and doors located in significantly different pressure regions along the various aspects. This will be effective in generating pressure driven air flow through the apartment as the incident wind travels from the positively pressurised windward openings and exhausted to the negative or neutrally pressurised sideward or backward openings.

Ground Floor:

- Apartments AG03 and BG04.
- Similarly, apartments TH01, TH02, TH03 and TH04 will achieve adequate levels of natural ventilation through the inclusion of the proposed operable skylights. Winds are expected to enter through the positively pressurised Ground Floor balcony doors, exhausting to the negatively pressurised operable skylights located on Level 01.

Level 01:

- Apartments A103, B101 and B105.

Level 02 to Level 08:

- Corner apartments on Tower A on Level 02 and above (such as A203, A204, A207, A208 and those located above these apartments)
- All Tower B apartments located on Level 02 and above

The natural ventilation performance of the various residential apartments of the subject development is summarised in Table 2.

Note that it is important that the naturally cross ventilated flow path does not flow through a bathroom in order to avoid issues with odours. Additionally, each habitable room should have an unobstructed opening size of at least of 5% of the floor area served by the opening, in accordance with Objective 4B-1 of the ADG and have a minimum free area of 0.4m² in order to provide effective natural ventilation.

Table 2: Natural Ventilation Performance

Unit Number	Meets ADG Guidelines for Natural Cross Ventilation
AG01	NO
AG02	NO
AG03	YES
TH01	YES
TH02	YES
TH03	YES
TH04	YES
BG01	NO
BG02	NO
BG03	NO
BG04	YES
A101	NO
A102	NO
A103	YES
A104	NO
B101	YES
B102	NO
B103	NO
B104	NO
B105	YES
B106	NO
A201	NO
A202	NO
A203	YES
A204	YES
A205	NO
A206	NO
A207	YES
A208	YES
B201	YES
B202	YES
B203	YES
B204	YES
B205	YES

Unit Number	Meets ADG Guidelines for Natural Cross Ventilation
A301	NO
A302	NO
A303	YES
A304	YES
A305	NO
A306	NO
A307	NO
A308	YES
A309	YES
B301	YES
B302	YES
B303	YES
B304	YES
B305	YES
A401	NO
A402	NO
A403	YES
A404	YES
A405	NO
A406	NO
A407	NO
A408	YES
A409	YES
B401	YES
B402	YES
B403	YES
B404	YES
B405	YES
A501	NO
A502	NO
A503	YES
A504	YES
A505	NO
A506	NO
A507	NO

Unit Number	Meets ADG Guidelines for Natural Cross Ventilation
A508	YES
A509	YES
B501	YES
B502	YES
B503	YES
B504	YES
B505	YES
A601	NO
A602	NO
A603	YES
A604	YES
A605	NO
A606	NO
A607	NO
A608	YES
A609	YES
B601	YES
B602	YES
B603	YES
B604	YES
B605	YES
A701	NO
A702	NO
A703	YES
A704	YES
A705	NO
A706	NO
A707	NO
A708	YES
A709	YES
B701	YES
B702	YES
B703	YES
B704	YES
B705	YES

Unit Number	Meets ADG Guidelines for Natural Cross Ventilation
A801	NO
A802	NO
A803	YES
A804	YES
A805	NO
A806	NO
A807	NO
A808	YES
A809	YES
B801	YES
B802	YES
B803	YES
B804	YES
B805	YES

3.1 Conclusion

The results of the assessment indicate that a total of 61% (72 out of 118) of the residential apartments within the first nine storeys of the development will achieve adequate levels of natural cross ventilation as per the ADG, which is greater than the required minimum of 60%. Natural cross ventilation has been achieved through openings on orthogonal or opposite aspects (for example corner or through apartments), with direct exposure to prevailing winds or windows located in significantly different pressure regions as defined within Section 4B of the ADG.

This has been achieved for the following apartments due to the proposed openings in the form of operable windows and doors located in significantly different pressure regions along the various aspects. This will be effective in generating pressure driven air flow through the apartment as the incident wind travels from the positively pressurised windward openings and exhausted to the negative or neutrally pressurised sideward or backward openings.

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