

Natural Ventilation Statement  
for the proposed development at  
23-37 Lindfield Avenue, Lindfield

October 7, 2010

Report Reference No. WA869-01F03(rev1)- NV Report

## Document Control

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Revision Number	Date	Revision History	Prepared By (initials)	Reviewed & Authorised By (initials)
0	26/05/2010	Initial	TH	TR
1	07/10/2010	Revised for the updated drawings.	AB	

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## 1.0 Introduction

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This report presents an opinion on the natural ventilation characteristics of the various residential units of the proposed development located at 23-37 Lindfield Avenue, Lindfield.

The conclusions of this report are drawn from our extensive experience in this field and are based on an examination of the architectural drawings prepared by PTI Architecture, dated October 2010. The results of the study are compared to the wind-driven natural ventilation criteria detailed in the State Environmental Planning Policy No. 65 (SEPP65).

No wind tunnel tests have been undertaken for the subject development. As such, this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection. Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind-driven natural ventilation effects.

## 2.0 Sydney Wind Climate

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Natural ventilation in Sydney is most important during the summer months of the year, which is when the occupants of the residential units of the proposed development are expected to take advantage of this effect. The local climate for Sydney during these months is dominated by north-easterly and southerly winds, as indicated in Table 1. During winter the westerly winds tend to dominate. Wind roses for the Sydney region (recorded at Kingsford Smith Airport) are also presented in the attached Appendix A. An analysis of the Sydney wind climate data for the 6 warmer months of the year (October to March), indicates the north-easterly winds account for 39% of all occurrences, and the southerly winds for 43% of all occurrences.

**Table 1: Principal Time of Occurrence of Winds – Sydney Region**

Month	Wind Direction		
	North-Easterly	Southerly	Westerly
January	X	X	
February	X	X	
March	X	X	
April		X	X
May			X

**Table 1: Principal Time of Occurrence of Winds – Sydney Region (cont..)**

Month	Wind Direction		
	North-Easterly	Southerly	Westerly
June			X
July			X
August			X
September		X	X
October	X	X	
November	X	X	
December	X	X	

### **3.0 Natural Ventilation Criteria**

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Only the north-easterly and southerly winds have been considered as predominant wind directions that contribute to natural ventilation for this development, since these are the predominant wind directions for the Sydney region for the warmer months of the year. Hence, for this development, good natural ventilation can be achieved when more than one of the following criteria is satisfied;

- (i) The individual unit needs to have openings either on orthogonal aspects or opposite aspects.
- (ii) One of the aspects with openings needs to be either facing or orthogonal to the north-easterly direction, with minimal obstruction.
- (iii) One of the aspects with openings needs to be either facing or orthogonal to the southerly direction, with minimal obstruction.

If a unit satisfies all of the above criteria then it is deemed to have **excellent** natural ventilation characteristics.

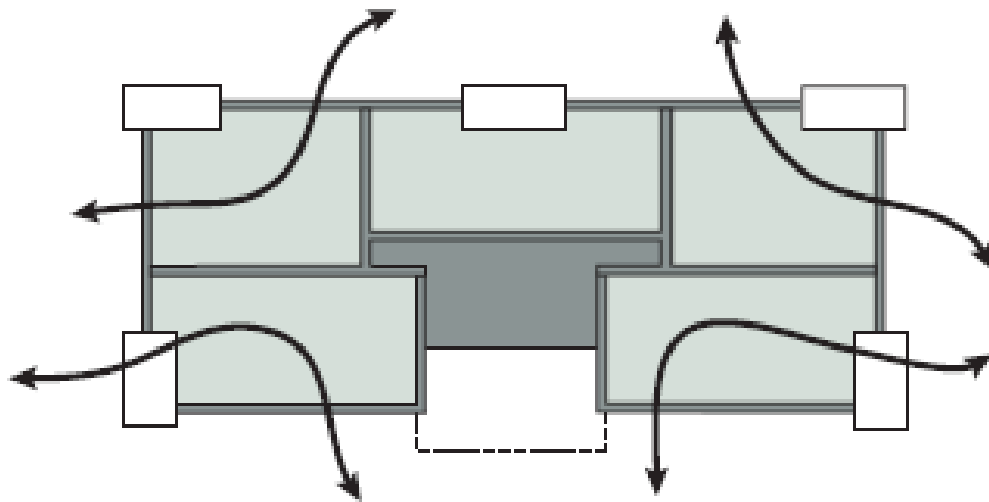
If a unit satisfies 2 out of the above three criteria then it is deemed to have **good** natural ventilation characteristics.

If a unit satisfies 1 out of the above three criteria then it is deemed to have **below average** natural ventilation characteristics.

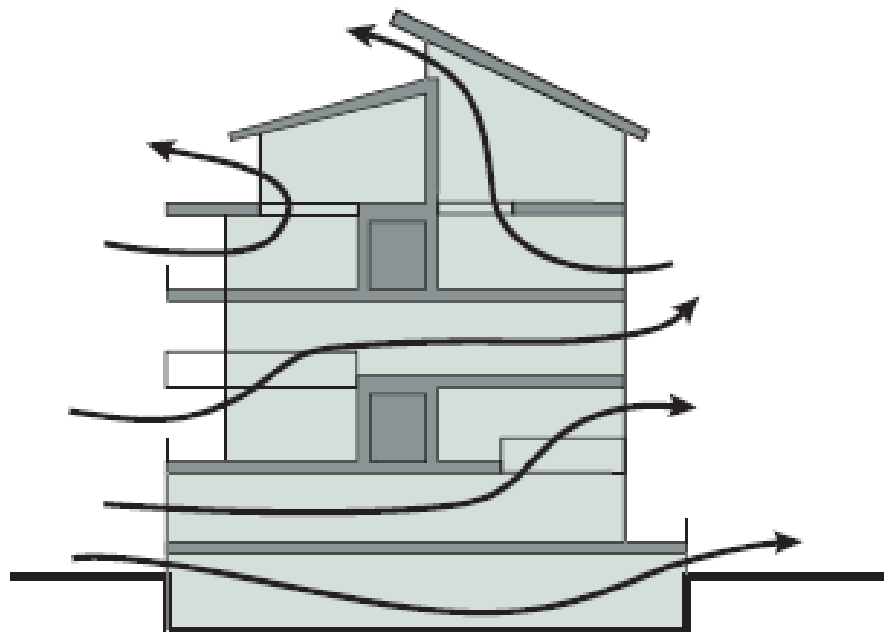
If a unit satisfies none of the above three criteria then it is deemed to have **poor** natural ventilation characteristics.

The State Environmental Planning Policy No. 65 (SEPP65) defines that for an entire development to be considered naturally ventilated it is required that

60% of the individual units of the development be naturally ventilated. For a unit to be considered naturally ventilated, it is required that they perform to the minimum performance of a double-end unit or corner unit with effective openings either on orthogonal aspects or opposite aspects providing good cross ventilation as indicated in Figure 1a and 1b from SEPP65. For the purpose of this analysis, a unit will comply with the SEPP65 requirements for effective natural ventilation if the unit is deemed to have either **excellent** or **good** natural ventilation characteristics.



**Figure 1a: Units Achieving Effective Natural Ventilation  
(floor plan of a typical residential building)**



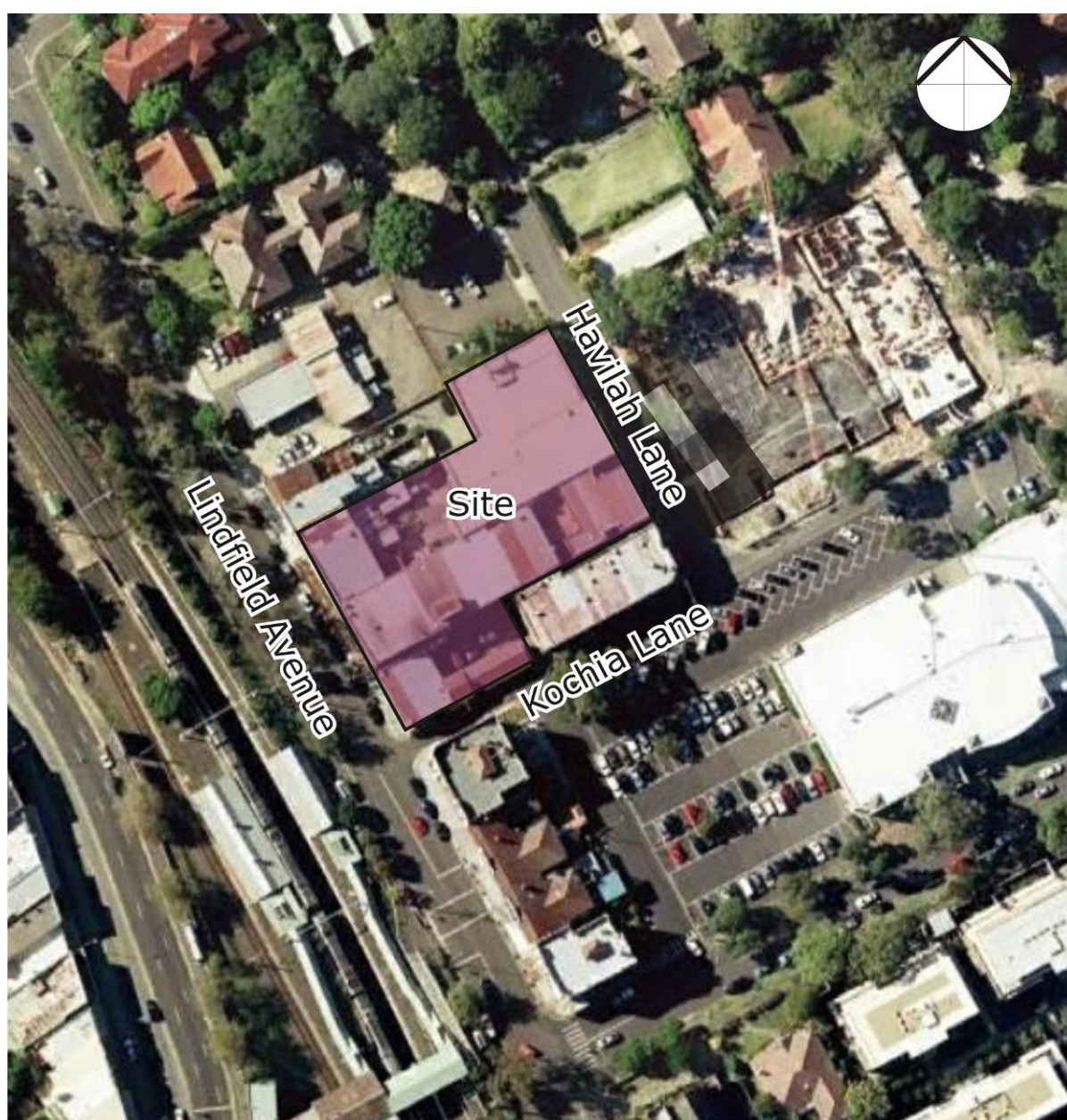
**Figure 1b: Units Achieving Effective Natural Ventilation  
(section elevation of a typical residential building)**

## **4.0 Description of the Proposed Development**

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The site is located at 23-37 Lindfield Avenue, Lindfield. Figure 2 shows an aerial image of the site location. The site is bounded by Havilah Lane to the north-east, Lindfield Avenue to the west, Kochia Lane to the south and a service station to the north. The local land topography generally rises to the north and west of the site.

The proposed development consists of two main buildings on a common podium with mixed used development. There are a total of 102 residential units across seven residential floors. The building heights, based on the latest architectural drawings, range from five to seven stories above ground.



**Figure 2: Aerial Image of the Proposed Development Site**

## 5.0 Results of the Analysis

For each of the predominant wind directions for the Sydney region, the interaction between the wind and the building morphology in the area was considered. Important features taken into account include the distances between the proposed building forms, their overall heights and bulk as well as the landform. Note that westerly winds are not considered for the natural ventilation assessment since these winds predominantly occur during the winter months, when wind-driven natural ventilation is not desired.

The following Table 2 present the results of the analysis of the wind-driven natural ventilation characteristics for each living space of the various residential units of the proposed development. The indicated unit numbers in these tables correspond to the unit numbering scheme as indicated in Appendix B of this report and based on the latest architectural drawings prepared by PTI Architecture, dated October 2010.

The results for the natural ventilation characteristics for the various residential units within the proposed development are presented in Table 2 below. Note that each residential unit is compared to the three basic criteria detailed in Section 3.0 of this report.

**Table 2: Natural Ventilation Results**

Unit Number	Satisfies Criteria			Natural Ventilation Rating
	Criterion (i)	Criterion (ii)	Criterion (iii)	
A.1.01	No	Yes	Yes	Good
A.1.02	No	No	Yes	Below Average
A.1.03	No	No	Yes	Below Average
A.1.04	No	No	Yes	Below Average
A.1.05	No	No	Yes	Below Average
A.1.06	Yes	Yes	Yes	Excellent
A.1.07	Yes	Yes	Yes	Excellent
A.1.08	Yes	Yes	Yes	Excellent
A.1.09	Yes	Yes	Yes	Excellent
A.1.10	Yes	Yes	Yes	Excellent
A.2.01	Yes	Yes	Yes	Excellent
A.2.02	Yes	Yes	Yes	Excellent
A.2.03	Yes	Yes	No	Good
A.2.04	No	Yes	No	Below Average
A.2.05	No	Yes	No	Below Average

**Table 2: Natural Ventilation Results (cont..)**

Unit Number	Satisfies Criteria			Natural Ventilation Rating
	Criterion (i)	Criterion (ii)	Criterion (iii)	
A.2.06	No	Yes	No	Below Average
A.2.07	No	Yes	No	Below Average
A.2.08	No	Yes	No	Below Average
A.2.09	No	Yes	No	Below Average
A.2.10	No	No	Yes	Below Average
A.3.01	No	No	Yes	Below Average
A.3.02	No	No	Yes	Below Average
A.3.03	No	No	No	Poor
A.3.04	No	Yes	No	Below Average
A.3.05	Yes	Yes	Yes	Excellent
A.3.06	Yes	No	Yes	Good
A.3.07	Yes	No	Yes	Good
A.3.08	Yes	No	Yes	Good
A.3.09	Yes	No	Yes	Good
A.3.10	Yes	No	Yes	Good
A.4.01	Yes	No	Yes	Good
A.4.02	Yes	Yes	Yes	Excellent
A.4.03	Yes	Yes	Yes	Excellent
A.4.04	Yes	Yes	Yes	Excellent
A.4.05	Yes	Yes	Yes	Excellent
A.4.06	Yes	Yes	Yes	Excellent
A.4.07	Yes	Yes	Yes	Excellent
A.4.08	Yes	Yes	Yes	Excellent
A.4.09	Yes	Yes	No	Good
A.4.10	No	Yes	No	Below Average
A.5.01	Yes	Yes	Yes	Excellent
A.5.02	No	No	Yes	Below Average
A.5.03	No	No	Yes	Below Average
A.5.04	No	No	Yes	Below Average
B.2.01	No	No	Yes	Below Average
B.2.02	No	Yes	No	Below Average

**Table 2: Natural Ventilation Results (cont..)**

Unit Number	Satisfies Criteria			Natural Ventilation Rating
	Criterion (i)	Criterion (ii)	Criterion (iii)	
B.2.03	No	Yes	No	Below Average
B.2.04	No	Yes	No	Below Average
B.2.05	No	Yes	No	Below Average
B.2.06	No	No	Yes	Below Average
B.2.07	No	No	Yes	Below Average
B.2.08	No	No	Yes	Below Average
B.2.09	No	No	No	Poor
B.2.10	No	Yes	No	Below Average
B.3.01	Yes	Yes	Yes	Excellent
B.3.02	Yes	No	Yes	Good
B.3.03	Yes	No	Yes	Good
B.3.04	Yes	No	Yes	Good
B.3.05	Yes	No	Yes	Good
B.3.06	Yes	No	Yes	Good
B.3.07	Yes	No	Yes	Good
B.3.08	Yes	Yes	Yes	Excellent
B.3.09	Yes	Yes	Yes	Excellent
B.3.10	Yes	Yes	Yes	Excellent
B.4.01	Yes	Yes	Yes	Excellent
B.4.02	Yes	Yes	Yes	Excellent
B.4.03	Yes	Yes	Yes	Excellent
B.4.04	Yes	Yes	Yes	Excellent
B.4.05	Yes	Yes	No	Good
B.4.06	No	Yes	No	Below Average
B.4.07	Yes	Yes	Yes	Excellent
B.4.08	No	No	Yes	Below Average
B.4.09	No	No	Yes	Below Average
B.4.10	No	No	Yes	Below Average
B.5.01	No	No	Yes	Below Average
B.5.02	Yes	Yes	Yes	Excellent
B.5.03	Yes	No	Yes	Good

**Table 2: Natural Ventilation Results (cont..)**

Unit Number	Satisfies Criteria			Natural Ventilation Rating
	Criterion (i)	Criterion (ii)	Criterion (iii)	
B.5.04	Yes	No	Yes	Good
B.5.05	Yes	No	Yes	Good
B.5.06	Yes	No	Yes	Good
B.5.07	Yes	No	Yes	Good
B.5.08	Yes	No	Yes	Good
B.5.09	Yes	No	Yes	Good
B.5.10	Yes	No	Yes	Good
B.6.01	Yes	No	Yes	Good
B.6.02	Yes	No	Yes	Good
B.6.03	Yes	No	Yes	Good
B.6.04	Yes	No	Yes	Good
B.6.05	Yes	No	Yes	Good
B.6.06	Yes	No	Yes	Good
B.6.07	Yes	No	Yes	Good
B.6.08	Yes	No	Yes	Good
B.6.09	Yes	No	Yes	Good
B.6.10	Yes	No	Yes	Good
B.7.01	Yes	No	Yes	Good
B.7.02	Yes	No	Yes	Good
B.7.03	Yes	No	Yes	Good
B.7.04	Yes	No	Yes	Good
B.7.05	Yes	No	Yes	Good
B.7.06	Yes	No	Yes	Good
B.7.07	Yes	No	Yes	Good
B.7.08	Yes	No	Yes	Good

The results for the natural ventilation characteristics of the various residential units within the proposed development are be summarised as follows:

- Total number of residential units is **102**.
- A total of **68** residential units were found to comply with SEPP65 as having effective wind-driven natural ventilation
- Percentage of units that comply with SEPP65 as having effective wind-driven natural ventilation is **66.7%**.

## **6.0 Conclusion**

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An assessment of the natural ventilation characteristics of the various residential units of the proposed development located at 23-37 Lindfield Avenue, Lindfield, has been undertaken. The conclusions of this report are drawn from our extensive experience in this field and are based on an examination of the architectural drawings prepared by PTI Architecture, dated October 2010. No wind tunnel tests have been undertaken for the subject development. As such, this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection. Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind-driven natural ventilation effects.

The results of the study are compared to the wind-driven natural ventilation criteria detailed in the State Environmental Planning Policy No. 65 (SEPP65), which requires that at least 60% of the residential units within a development should achieve effective natural ventilation.

The results of the analysis are summarised as follows:

- A total of **66.7%** of the residential units within the proposed development are considered to have effective natural ventilation.

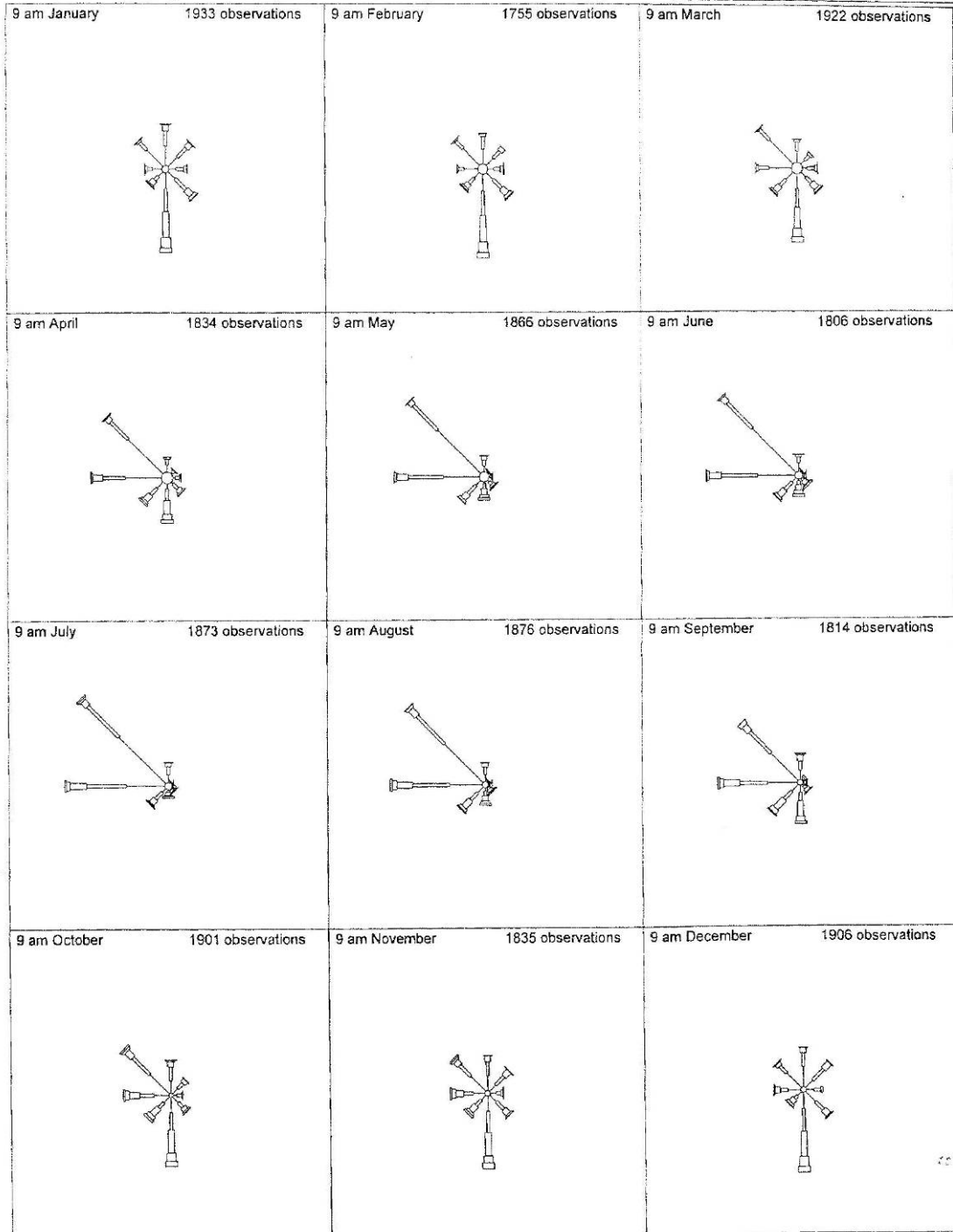
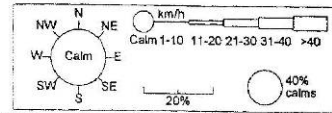
Hence the proposed development will satisfy the SEPP65 requirement of at least 60% of the residential units will achieve effective natural ventilation.

# **Appendix A**

Wind Roses for Sydney  
Kingsford Smith Airport, 1939-2000

# Wind Roses using available data between 1939 and 2000 for SYDNEY AIRPORT AMO

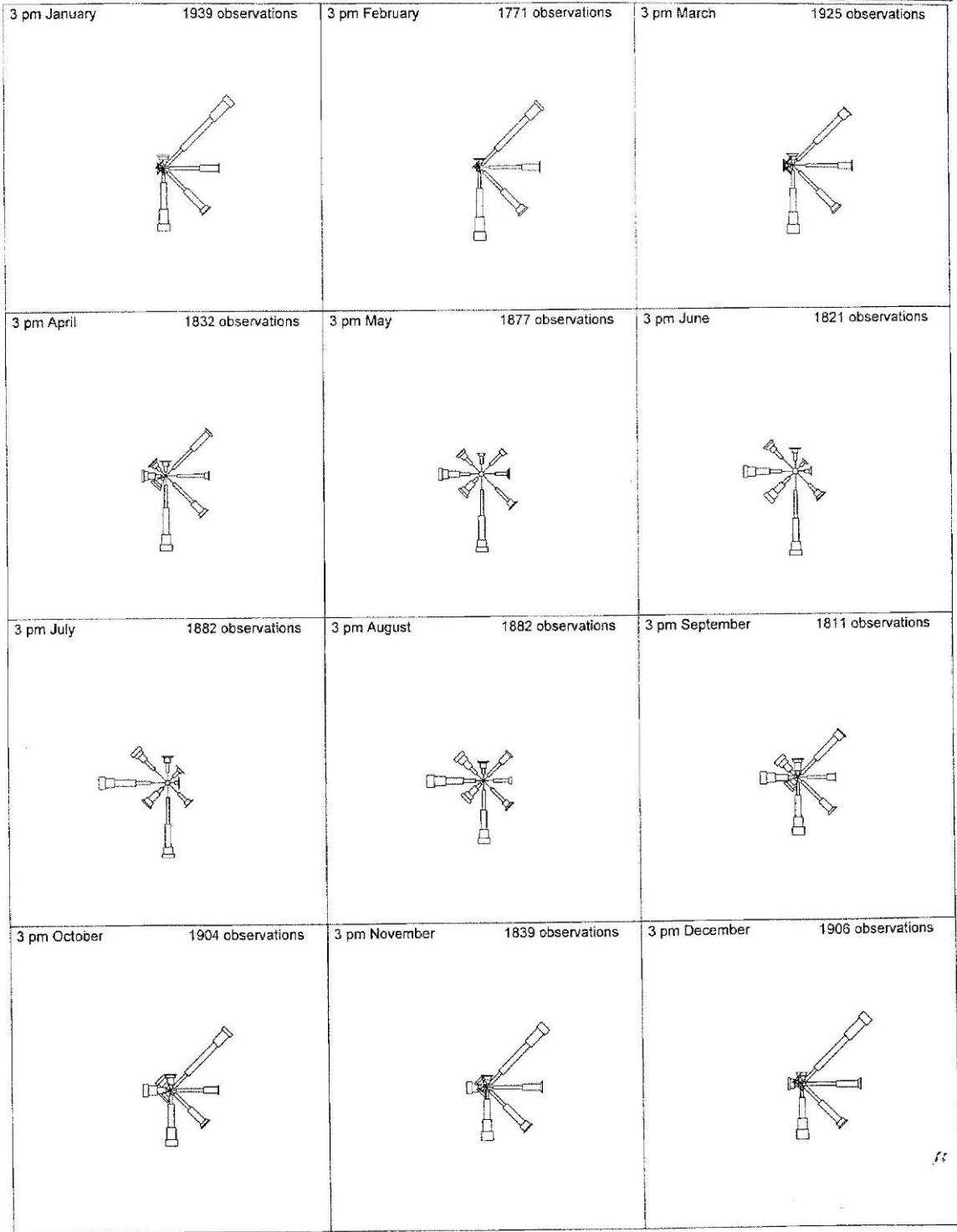
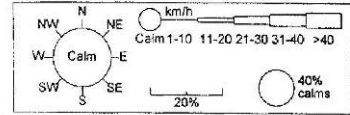
Site Number 066037 • Locality: SYDNEY AIRPORT • Opened Jan 1929 • Still Open  
 Latitude 33°56'28"S • Longitude 151°10'21"E • Elevation 6m



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# Wind Roses using available data between 1939 and 2000 for SYDNEY AIRPORT AMO

Site Number 066037 • Locality: SYDNEY AIRPORT • Opened Jan 1929 • Still Open  
 Latitude 33°56'28"S • Longitude 151°10'21"E • Elevation 6m



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# **Appendix B**

## Unit Numbering System













