

# QUALITATIVE NATURAL VENTILATION ASSESSMENT

3 Holdsworth Avenue, St Leonards

**Prepared for:**

New Golden St Leonards Pty Ltd  
Suite 11/ 30 Atchison St,  
ST LEONARDS NSW 2065

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## BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with New Golden St Leonards Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

## DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.30393-R04-v1.0	21 June 2022	James Cleary	Dr. Neihad Al-Khalidy	Dr. Neihad Al-Khalidy

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## EXECUTIVE SUMMARY

SLR Consulting Pty Ltd (SLR) has been engaged by New Golden St Leonards Pty Ltd to assess the natural ventilation potential for the proposed 3 Holdsworth Avenue, St Leonards development. This report will focus specifically on the sites potential for natural ventilation under the Apartment Design Guide (ADG). This report will form part of the development application to Lane Cove Council.

*At least 60% of apartments are required to be naturally cross ventilated in the first nine storeys of the building. 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.*

Developments, which seek to vary from the minimum standards, must demonstrate how natural ventilation can be satisfactorily achieved, particularly in relation to habitable rooms.

### Natural Ventilation Potential

The proposed development has been provided with openings on multiple sides of apartments for the majority of proposed floor plans, allowing it to make use of wind-induced natural ventilation throughout the year and thereby minimising energy costs.

Based off our best engineering judgement the qualitative study concluded that for the development:

- 61.19% (41 of 67) of the apartments within the proposed development meet the cross-ventilation requirements of the Australian Design Guide.
- A significant proportion of those deemed to be ADG compliant will also have naturally cross ventilated kitchens.

This analysis has been made on the basis of our best engineering judgment and on experience gained from model scale wind tunnel testing or Computational Fluid Dynamics (CFD) analysis of a range of developments of similar magnitude to the currently proposed development. Quantitative modelling can be carried out to confirm natural ventilation potential for the proposed site.

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# 1 Introduction

SLR Consulting Pty Ltd (SLR) has been engaged by New Golden St Leonards Pty Ltd to assess the natural ventilation potential for the proposed 3 Holdsworth Avenue, St Leonards development. This report will focus specifically on the sites potential for natural ventilation under the Apartment Design Guide (ADG).

SLR has previously assessed the development for cross ventilation under previous schemes. Quantitative assessment was carried out, for which results are detailed within:

- SLR Letter 610.30393-L01-v1.0-20210603, dated 2 June 2021
- SLR report 610.30393.00000-R01-v2.0, dated 23 September 2021
- SLR report 610.30393.00000-R03-v1.0, dated 26 November 2021

As the design has been revised from these initial schemes, SLR has been commissioned to carry out a qualitative natural ventilation assessment in accordance with the ADG.

This report will form part of the development application to Lane Cove Council.

## 1.1 Development Site Location

The proposed development is located in St Leonards just to the south of the Pacific Highway and approximately 150 metres west of the train line.

Figure 1 Development Site Location



Image: Nearmap (May 2021)

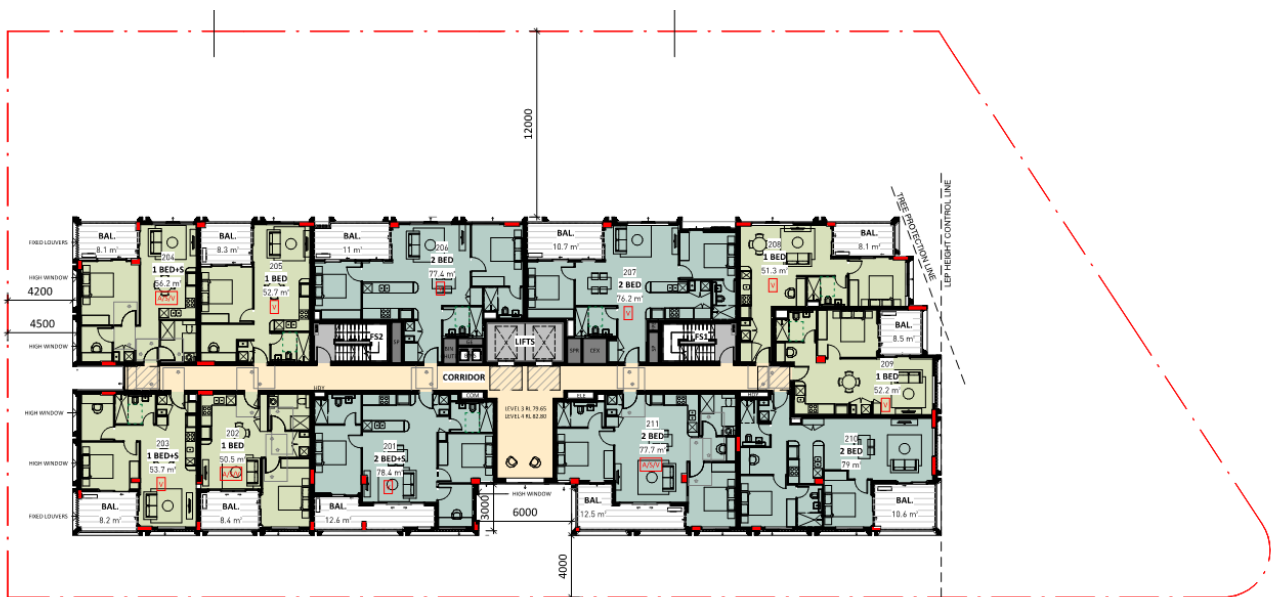
## 1.2 Proposed Development Description

From the plans provided the proposed Development comprises the following:

- Four levels of basement car parking;
- Lower Ground Level with Holdsworth Avenue lobby entry, residential apartments and the car park entrance;
- Upper Ground Level with residential apartments, plant spaces and public open space;
- Level 1 with residential apartments and communal open space;
- Level 2-10 with residential apartments;
- Level 11 with residential apartment and outdoor communal space; and
- Level 12 with residential apartments.

Figure 2 shows a typical floor plan for the proposed site.

Figure 2 Level 3 Floor Plan





## 2 Natural Ventilation

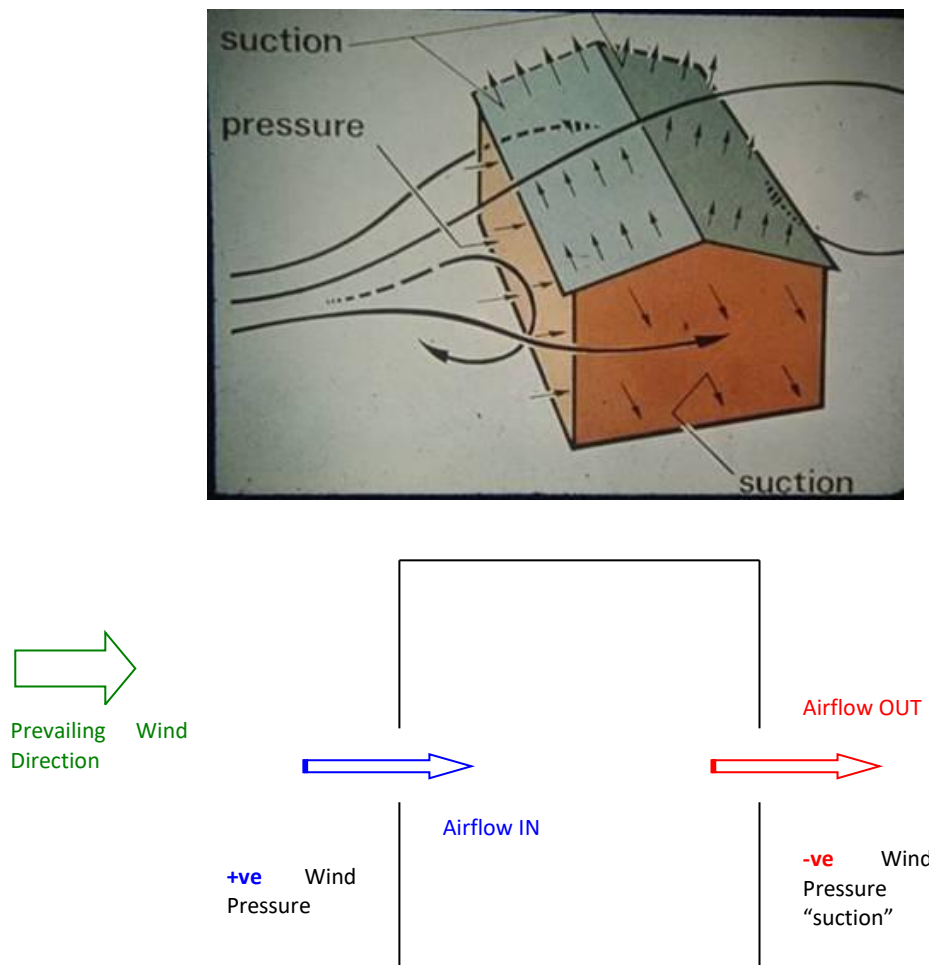
### 2.1 General Principles

A key feature of the proposed development is the incorporation of façade openings designed to enable various spaces within the development buildings to make use of wind-induced natural ventilation throughout the year thereby minimising energy costs.

Wind-induced natural ventilation works on the straightforward principle of differential pressure. If a building envelope has multiple openings and there exists a pressure difference between those openings, e.g. the wind pressure at one opening is greater than the pressure at the other opening; airflow will be pushed through the building in the direction positive to negative.

The resulting amount of airflow through the building envelope will be a function of the magnitude of the pressure differential, size of the various building openings and degree of “blockage” in between. These features are illustrated in **Figure 3**.

**Figure 3** Wind Induced Natural Ventilation via Differential Pressure



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## 2.2 SEPP 65 – Requirements

The State Environmental Planning Policy (SEPP) 65 supported by the Australian Design Guide is relevant to the assessment of the natural ventilation through residential components of proposed development. Section 4B-3 of the Australian Design Guide states that:

*At least 60% of apartments are required to be naturally cross ventilated in the first nine storeys of the building. 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.*

The following points from the design guide are also noted:

- Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line.
- Natural ventilation to single aspect apartments is achieved with a light well or stack effect ventilation (or similar) or courtyards or building indentations have a width to depth ratio of 2:1 or 3:1 to ensure effective air circulation and avoid trapped smells.
- In cross-through apartments external window and door opening sizes/areas on one side of an apartment (inlet side) are approximately equal to the external window and door opening sizes/areas on the other side of the apartment (outlet side).



## 3 Assessment

### 3.1 Qualitative Assessment

The natural ventilation for the proposed residential development has been qualitatively assessed. Ventilation is achieved by the differential pressure between the different building facades. Examples of the natural ventilation principles that apply for the proposed development are shown in **Figure 4**. Full diagrams for natural ventilation can be found in **Appendix A**.

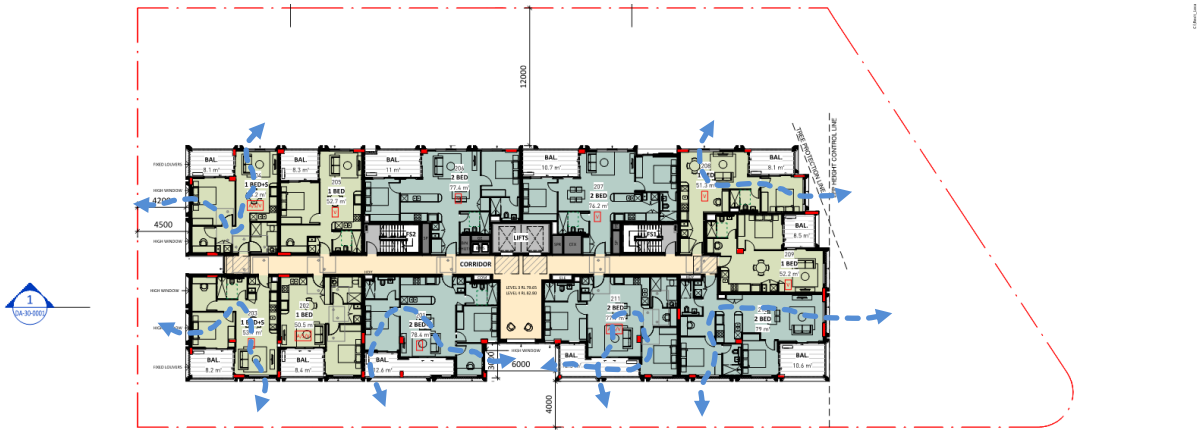
The following comments are made regarding proposed natural ventilation system for the development:

- Operable windows are provided to all façade orientations;
- Minimal shielding is expected to upper levels; therefore, the proposed development benefits from all prevailing Sydney winds, creating the potential for cross ventilation.
- Based on a qualitative study 61.19% (41 of 67) of the apartments within the proposed development comply with the cross-ventilation requirements of the Australian Design Guide for the first nine stories (Refer **Table 1**)

**Table 1 Apartments with Openings to Support Natural Ventilation**

Level	Number of Apartments	Number of Apartments with Openings to Support Cross Ventilation (as per ADG)	Percentage
LG	3	1	33.33%
UG	3	1	33.33%
L1	9	6	66.67%
L2	11	6	54.55%
L3	11	6	54.55%
L4	7	5	71.43%
L5	8	6	75.00%
L6	8	6	75.00%
L7	7	4	57.14%
<b>Total</b>	<b>67</b>	<b>41</b>	<b>61.19%</b>

Figure 4 Natural Ventilation Example for the Site – Level 2-3



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## 4 Conclusion

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# APPENDIX A

## Natural Ventilation Flow Paths

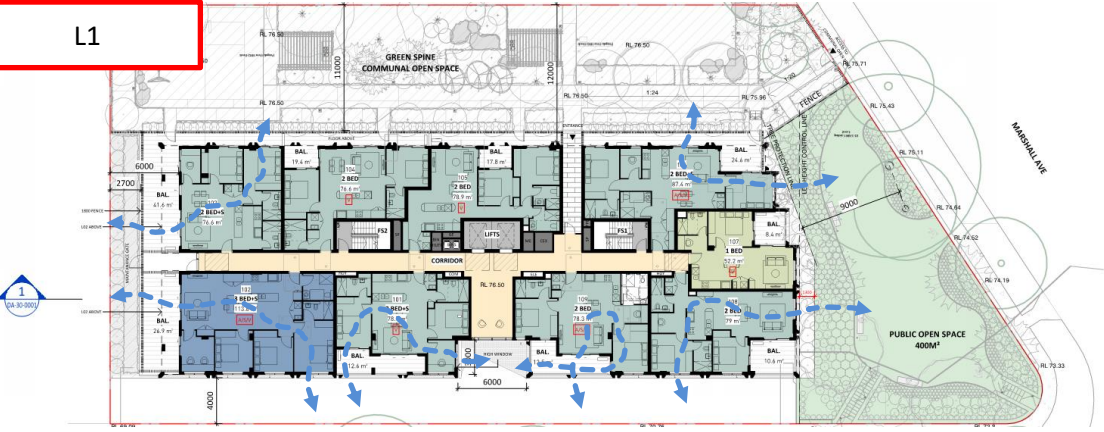
**Lower Ground**

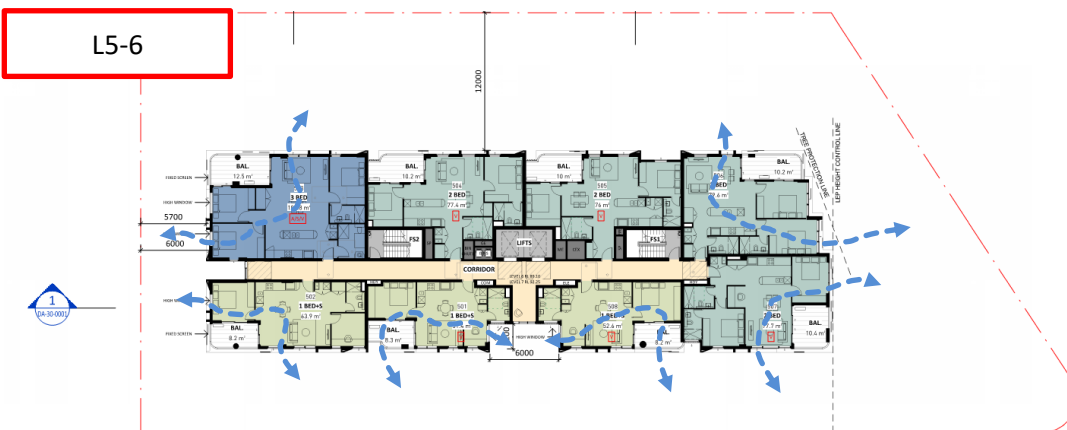
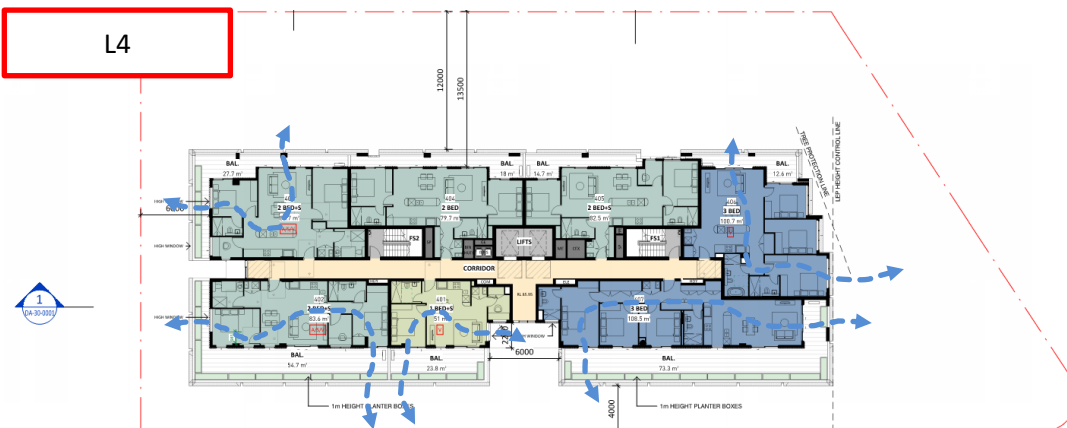


**Upper Ground**



**L1**









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