

7 July 2022

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TWT Property Group Pty Ltd
c/- Smart Design Studio
14 Stokes Avenue
Alexandria NSW 2015

Attention: Harald Straatveit

Dear Harald

71-89 Chandos Street, St Leonards Cross Ventilation Assessment – Letter of Advice

SLR Consulting Pty Ltd (SLR) has been engaged by TWT Property Group Pty Ltd to prepare a qualitative statement in relation to the natural ventilation potential of the proposed 12 storey 71-89 Chandos Street, mixed use development. This assessment will form part of the application to North Sydney Council.

Specifically, this report addresses those units utilising slots and façade articulations to comply with natural ventilation requirements proposed within the ADG.

Given experience in assessing similar developments within the local wind environment, SLR is of the opinion that the highlighted apartments can meet a suitable minimum air change volume in order to comply with natural ventilation requirements.

SLR utilised drawing set PP001 – PP523, rev. B dated 30.06.22 to review the proposed site for natural ventilation potential.

Yours sincerely

JAMES CLEARY
Senior Project Consultant

Checked/ Authorised by: Neihad Al-Khalidv
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1.1 Site and Planning Proposal Updates

Upon concluding assessments on the initial plans for the proposed site, SLR was advised of design changes to the planning proposal for 71-89 Chandos Street, St Leonards. Under the revised Planning Proposal, upper levels for the site have been extended, with the provision of additional apartments and slots for the purpose of natural ventilation.

1.2 Site and Surrounds

71-89 Chandos Street is located in St Leonards, approximately 400m east of St Leonards Train Station, situated to the north of Atchison Lane and bounded by Chandos Street, Oxley Street and Atchison Lane to the north, east and south respectively, with 55-69 Chandos Street located west of the site. Surrounds of the site are predominantly medium to high rise development to the south and west, and medium to low rise developments to the north and east. Immediate surrounds around the site will create medium shielding for the development.

Figure 1 Site Location



Image: Nearmap, 7 April 2021

1.3 Development Description

The proposed development will comprise a 12-storey building, inclusive of:

- 2 basement levels with residential parking and commercial parking;
- Ground level with residential lobby, commercial lobby and retail space;
- Commercial office space for Levels 1;
- Residential apartments from Levels 2 to 11;
- Communal Open space on level 12; and
- Roof with plant space and lift overrun.

Perspective View from North is shown in **Figure 2**.

Figure 2 Elevation North



2 Apartment Design Guide Requirements

The State Environmental Planning Policy (SEPP) 65 supported by the Apartment 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 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).

There are no specific requirements (eg air changes per hour) in the ADG guideline.

AS1668.2-2002 "The use of ventilation and air-conditioning in buildings Part 2: Ventilation design for indoor air contaminant control (excluding requirements for the health aspects of tobacco smoke exposure)" recommends 3 air changes per hour for habitable rooms to satisfy the air quality requirements.

3 Natural Ventilation

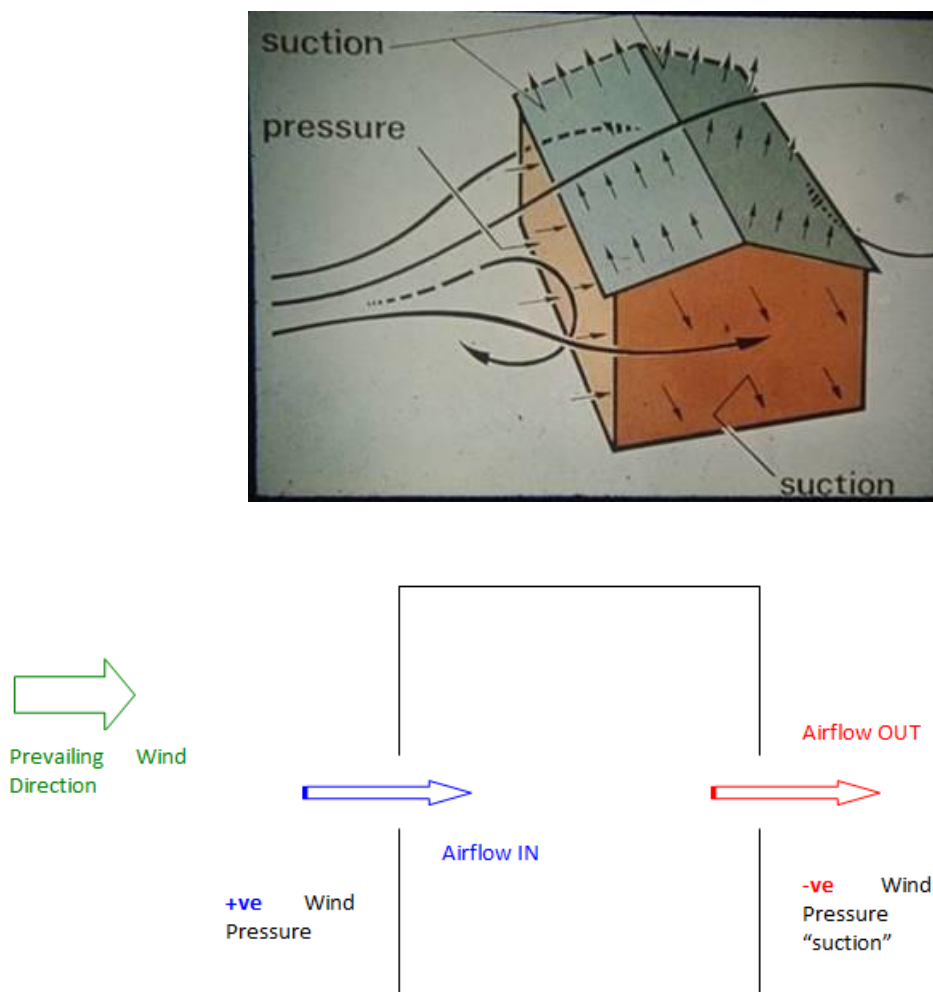
3.1 General Principles

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



4 Assessment of Natural Ventilation Potential

From the provided plans there are a significant number of apartments that will comply with the ADG guidelines.

Additionally, recesses and articulations proposed for the development can provide appropriate conditions for natural ventilation. SLR has found that numerical solutions including Computational Fluid Dynamics (CFD) and wind tunnel studies can prove these apartments to provide appropriate through apartment ventilation and circulation, for natural ventilation requirements. These slots and façade articulations create pressure differences across the various facades and encourage cross ventilation through an increased number of apartments.

SLR has assessed the proposed developments potential to achieve natural ventilation to apartments through operable windows connected to building slots.

4.1 Natural Ventilation Potential using Building Slots

Apartments designed to be naturally ventilated through the aid of building slots are identified in **Figure 4** and **Figure 5**.

Figure 4 Apartments Utilising Building Slots – Type L2.02

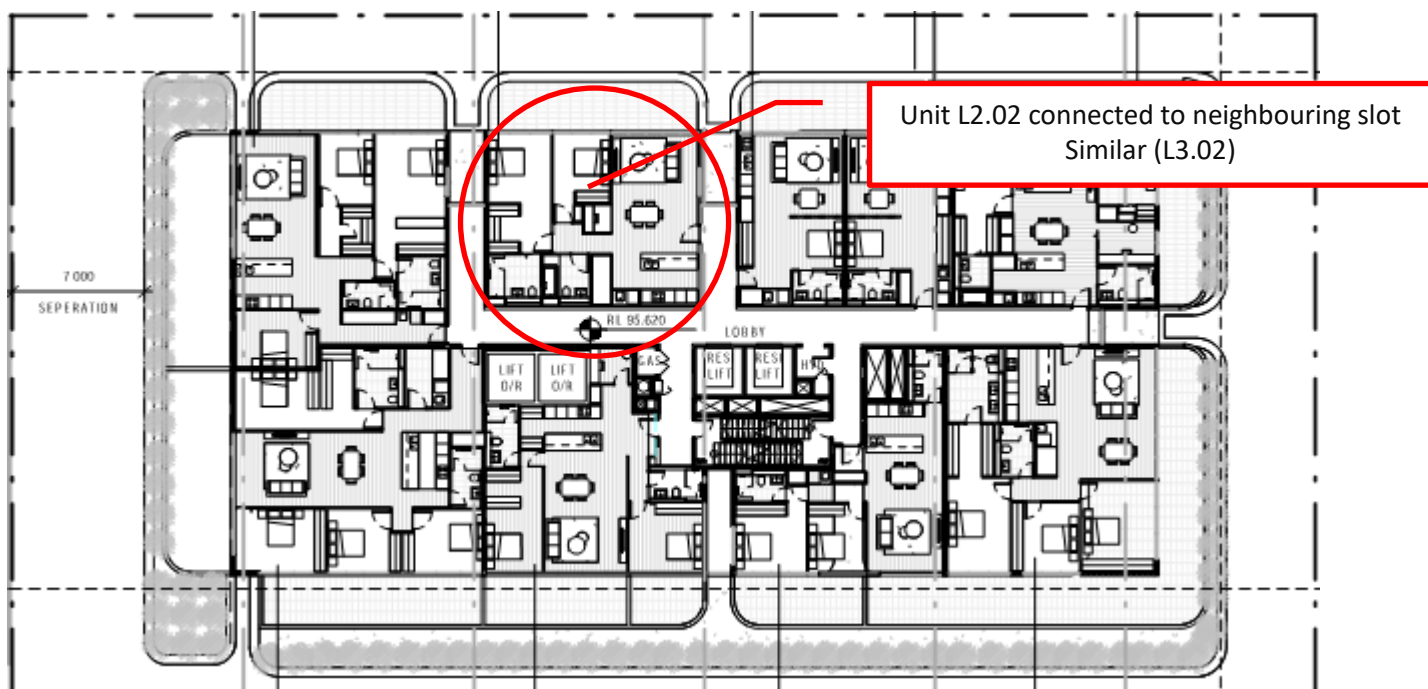
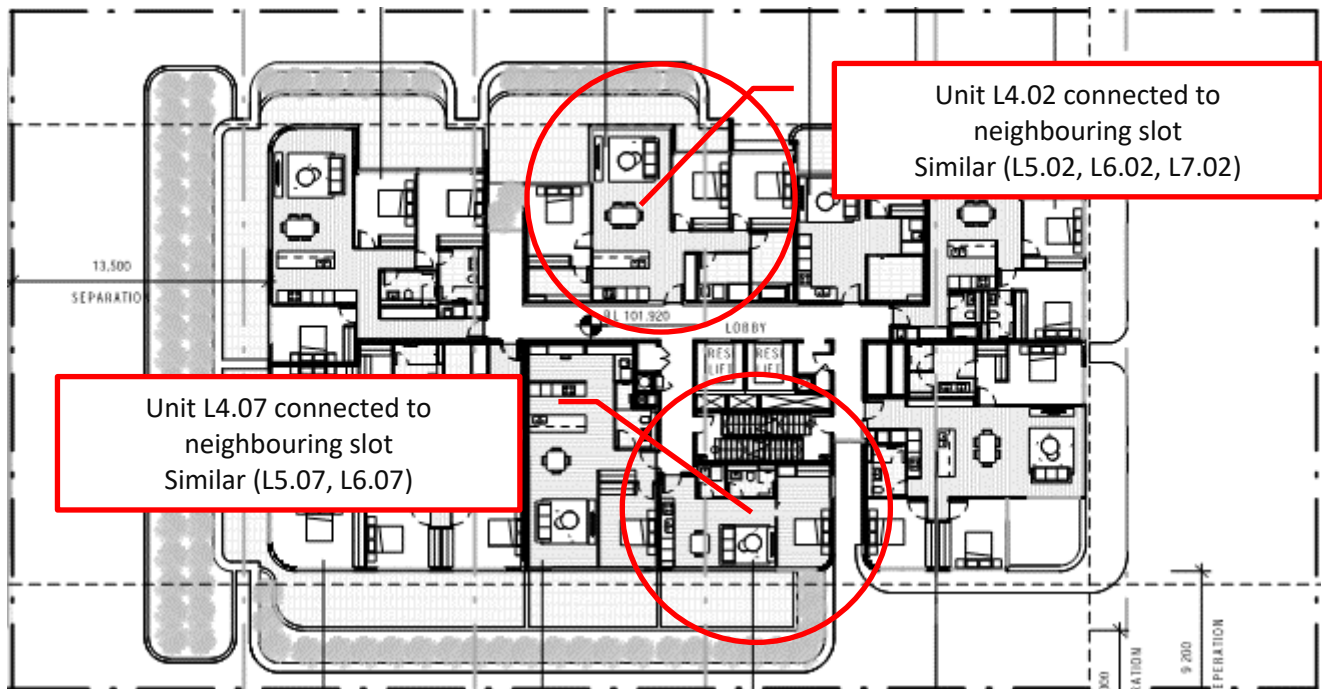


Figure 5 Apartments Utilising Building Slots – Type L4.02 and L4.07



Through **Figure 4** and **Figure 5**., SLR is of the opinion that the provided slots are appropriately sized to allow for airflow through apartments without the risk of air becoming trapped or not circulating out of the provided slots.

This assessment is based on previous CFD experience modelling natural ventilation for similar developments and building sizes. SLR previously carried out a quantitative assessment on the proposed neighbouring developments within the local area and found the similarly sized slots to be adequate for natural ventilation requirements.

When considering the allocated operable glazing to building slots, SLR is of the opinion they are sufficiently sized dependant on the effective open area. To meet a suitable minimum air change volume for the proposed apartments, SLR recommends that all operable windows used for natural ventilation purposes have an effective open area no less than 1 m^2 .