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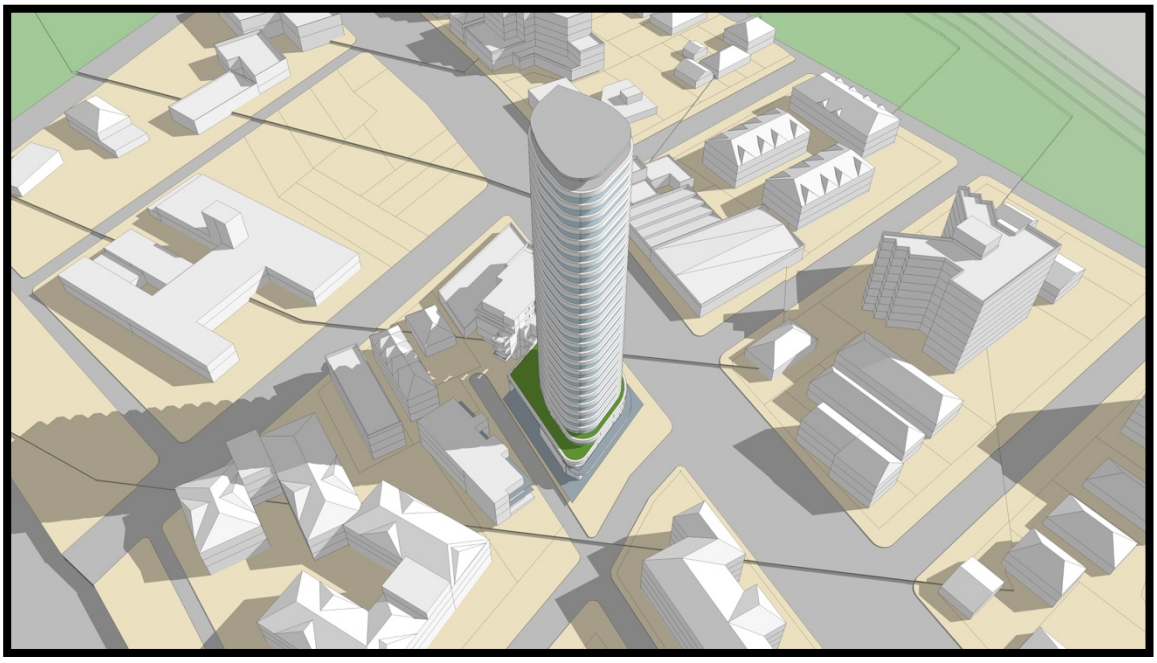
629 - 639 Pacific Highway Chatswood

Planning Proposal Acoustic Review



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Document Information

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Revision Table

Report revision	Date	Comments
0	3 July 2017	Draft for comment
A	17 July 2017	Draft for comment
B	22 Sep 2017	For issue
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Glossary

'A' Weighted	A spectrum adaption that is applied to measured noise levels to represent human hearing. A-weighted levels are used as human hearing does not respond equally at all frequencies.
Daytime (INP)	Between 7.00 a.m. and 6 p.m. as defined in the INP. (See INP)
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of that sound level.
dB(A)	'A' Weighted sound level in dB.
Evening	Between 6.00 p.m. and 10 p.m. as defined in the INP. (See INP)
Frequency (Hz)	The number of times a vibrating object oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second. The human ear responds to sound in the frequency range of 20 Hertz to 20,000 Hz.
INP	New South Wales DEC Industrial Noise Policy, 2000.
Intrusive Noise	Noise emission that when assessed at a noise-sensitive receiver (principally a residential premises boundary) is greater than 5 dB above the background (L_{90}) noise level.
L_{10}	Noise level exceeded for 10 % of the measurement time. The L_{10} level is commonly referred to as the average maximum noise level.
L_{90}	Noise level exceeded for 90 % of the measurement time. The L_{90} level is commonly referred to as the background noise level.
L_{eq}	Equivalent Noise Level—Energy averaged noise level over the measurement time.
Night-time (INP)	Between 10.00 p.m. on one day and 7.00 a.m. on the following day as defined in the INP. (See INP).
Rating Background Level (RBL)	Overall single-figure A-weighted background level representing an assessment period (day/evening/night). For the short-term method, the RBL is simply the measured $L_{90,15min}$ noise level. For the long-term method it is the median value of all measured background levels during the relevant assessment period.

R_W	Weighted Sound Reduction Index—A laboratory measured value of the acoustic separation provided by a single building element (such as a partition). The higher the R_W the better the noise isolation provided by a building element.
Reverberation Time (RT)	Of a room, for a sound of a given frequency or frequency band, the time that would be required for the reverberantly decaying sound pressure level in the room to decrease by 60 decibels.

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1 Introduction

Resonate has been engaged by Develotek to undertake a planning proposal acoustic review for the proposed mixed-used development to be located at 629-639 Pacific Highway, Chatswood NSW.

This report outlines potential acoustic requirements for consideration during the Development Application phase. It is noted that this report is at a desktop level and incorporates advice based on our experience on similar projects.

2 Project Description

The proposed mixed-use development would be located at 629-639 Pacific Highway, Chatswood, as shown in Figure 1. The proposal consists of a 23-storey design with basement car parking incorporating ground-floor commercial/retail spaces and 21 floors of residential apartments with 81 apartments in total.

The proposal site is located adjacent to the Pacific Highway, which experiences high road traffic volumes, and the North Shore railway line.

The current land uses surrounding the development are summarised as follows:

- North: Gordon Avenue and residential receivers beyond
- South: Nearest residential receivers within mixed-use townhouses
- East: Hammond Lane and residential receivers
- West: Pacific Highway and residential receivers beyond

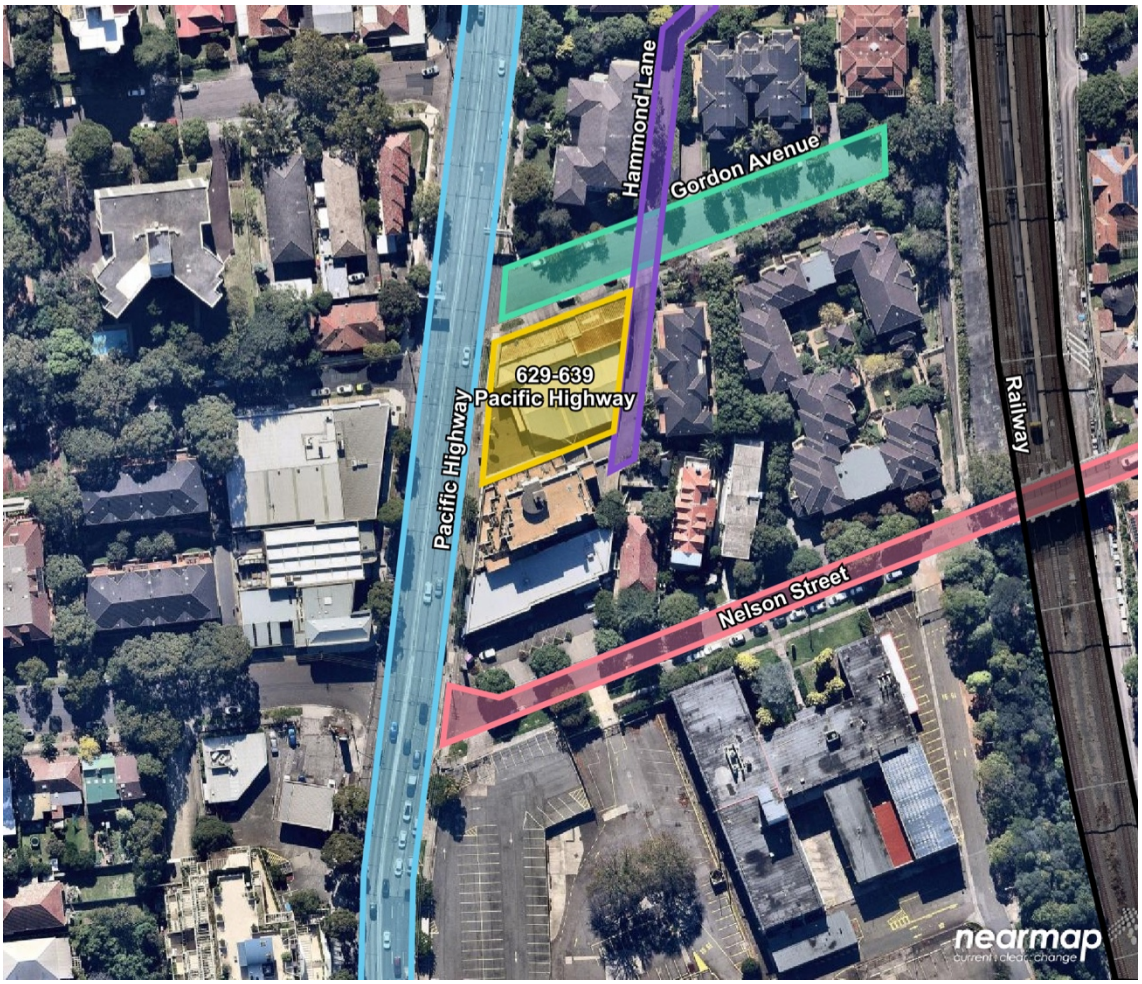

Figure 1 – Proposal site map

3 Potential Acoustic Constraints

Any proposed development will encounter acoustic constraints in relation to noise both on the development itself and from it to the surrounding environment. This section outlines potential constraints and provides examples of ways to minimise noise impacts through effective design.

3.1 Internal amenity – noise intrusion

Due to the proximity of the proposed development to the Pacific Highway and the North Shore railway line, road traffic and rail noise may impact on internal amenity. Noise surveys conducted for other similar developments on Pacific Highway indicate that this may be the case. Therefore, glazing recommendations would be necessary to achieve targeted internal design sound levels in bedrooms and living areas. This is based on an internal design sound level of 35 dB(A) for a bedroom (*Infrastructure SEPP and DoP's Development Near Rail Corridors and Busy Roads*) and previously measured L_{Aeq} noise levels on Pacific Highway in the order of 60 dB(A).

Based on a review of current planning documentation and our previous experience on a similar Develotek project in close proximity to the Pacific Highway, we have predicted road traffic external noise levels up the façade of the building. Possible design implementation to comply with the likely internal design sound level targets could include one or a combination of the following, depending on the design of the tower:

- Proprietary single laminated glazing systems
- A 'winter garden' type strategy for the low-rise portion (or entire of the tower) depending on architectural strategy.
- Deep void double glazed systems

3.2 Ventilation

It is likely that windows will need to remain closed to ensure internal noise criteria can be satisfied. It is therefore likely that an alternative means of ventilation would be required for residential spaces on noise-affected facades. An alternative means of ventilation may take the form of:

- Air conditioning with an outside/fresh air component (not a conventional 'split' system).
- Mechanical ventilation drawn from a 'quiet' side of the building and/or with an acoustically attenuated intake path.
- An open window on a 'quiet' side of the building (should single-sided ventilation be possible).

It is recommended that acoustical modelling be undertaken at the detailed design stage once development approval is granted to optimise glazing selections and the ventilation strategy.

3.3 Mechanical services noise emission

Mechanical services noise from equipment servicing the proposed development would be designed to comply with relevant environmental noise criteria (likely to be related to the NSW EPA INP and council requirements. Numerous options for mechanical services noise control are available for consideration including:

- Selecting the quietest plant for a given task.
- Judicious location and orientation.
- Use larger fans at a slower speed rather than smaller fans at a higher speed.
- Using variable speed drives to lower fan speed in response to lower duty/load requirements.
- Use of barriers, both incidental and purpose designed.
- Internally lined ducts and bends, external duct and equipment wrapping, silencers.

4 Proposed Development Application Methodology

In the context of the potential acoustic constraints outlined in Section 3, the following is a proposed methodology in preparing a planning stage acoustic report for the Development Application:

- Establish development specific acoustic criteria based on relevant planning approval pathways, including:
  - Willoughby City Council – Willoughby Development Control Plan (WDCP)
  - Willoughby Local Environment Plan 2012 (WLEP 2012)
  - NSW Industrial Noise Policy (INP)
  - Building Code of Australia (BCA)
- Calculate glazing and other acoustically related façade requirements based on noise survey information and determine minimum requirements to achieve internal design sound levels as set out in AS2107.
- Predict environmental noise emissions from external mechanical services and other operational noise emissions relating to the commercial tenancies at adjacent noise sensitive receivers and conduct and assessment in accordance with the INP and/or DCP.
- Demonstrate how environmental noise criteria can be complied with.

5 Conclusion

A high-level desktop assessment of potential acoustic considerations has been undertaken for a proposed development to be located at 629-639 Pacific Highway, Chatswood.

Key acoustic constraints in relation to environmental noise on the proposed development and its potential impacts to the surrounding area have been outlined.

Acoustic design considerations have been summarised that show these constraints may be addressed through effective design in the development phase.