Blackett Acoustics
Noise & Vibration Consultants

28 April 2025

Project Number: BA250521
Email: john@changed.cc

Mr John Konstantinou
PO Box 7176
Yarralumla, ACT 2600

Dear John

Re: 415 Sydney Road, Balgowlah– DA/CDC Traffic Noise Assessment

1. Introduction

Blackett Acoustics has been engaged to conduct a traffic noise impact assessment for a proposed residential development in Balgowlah.

This report addresses the acoustic issue of traffic noise intrusion; investigates the degree of traffic noise exposure and recommends construction to reduce traffic noise ingress to the proposed development. The recommended noise control measures are to support the DA/CDC process.

2. Project and Site Description

The Project Site location is situated at 415 Sydney Road, Balgowlah. The proposed work consists of alteration and addition of the existing double storey dwelling within the Project Site.

During a site survey conducted on Thursday, 12 June 2025, it was aurally observed that the Project Site is affected by noise emission from traffic on Sydney Road. Operator attended noise measurements were conducted in free field positions in the front yard to establish the existing traffic noise impact on the Project Site.

Figure 2-1 present an aerial outlining the Project Site with the proposed building envelope, the surroundings buildings and noise measurement location. The proposed works are shown in Figure 2-2 to Figure 2-8. Further details can be found in drawing package (Project no. RP2439 dated June 2025) by Raw Process Design Pty Ltd.

Figure 2-1 Aerial of Project Site

Figure 2-2 Proposed Site Layout

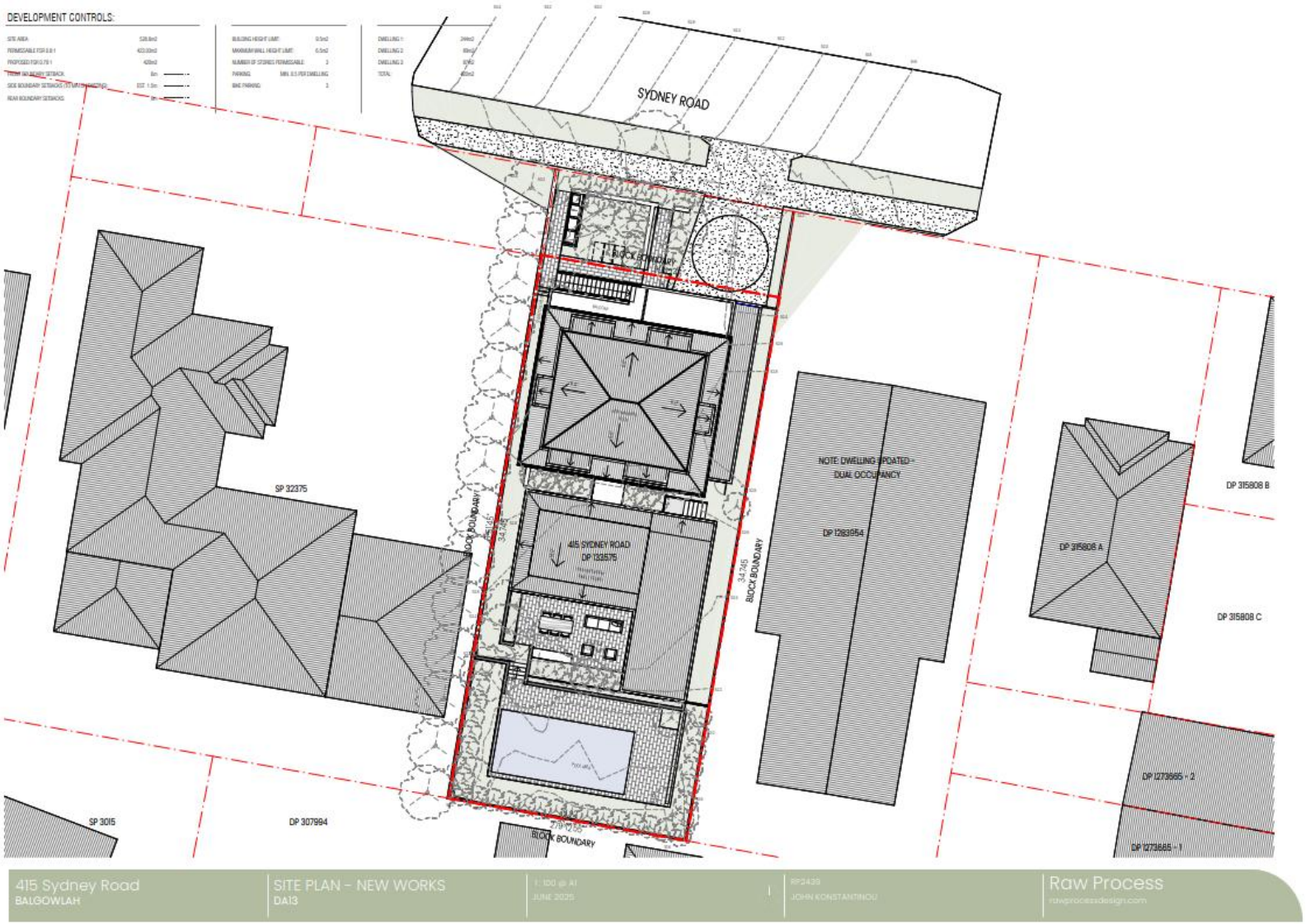


Figure 2-3 Proposed Site Layout – Ground Level Plan

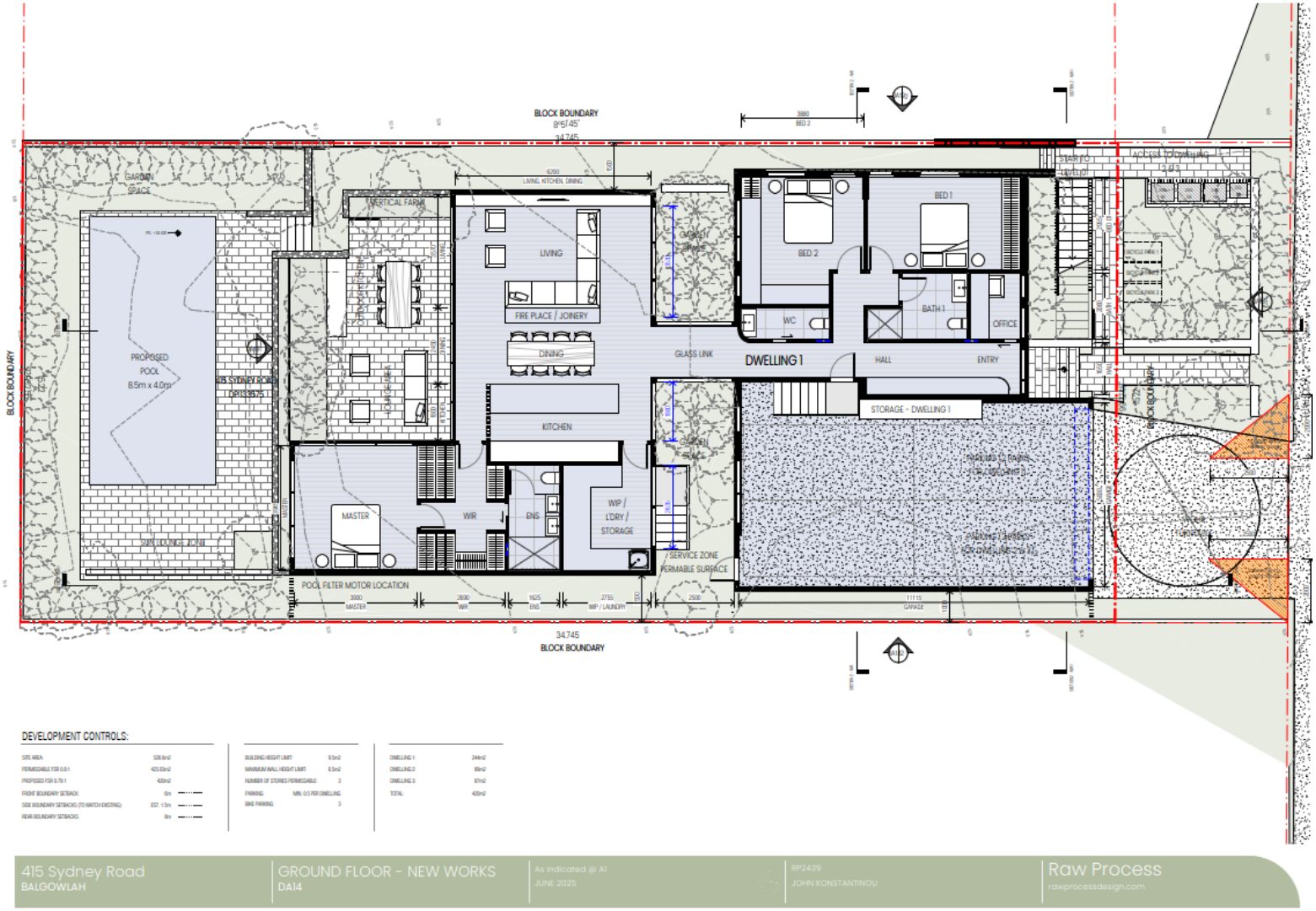


Figure 2-4 Proposed Site Layout – First Level Plan

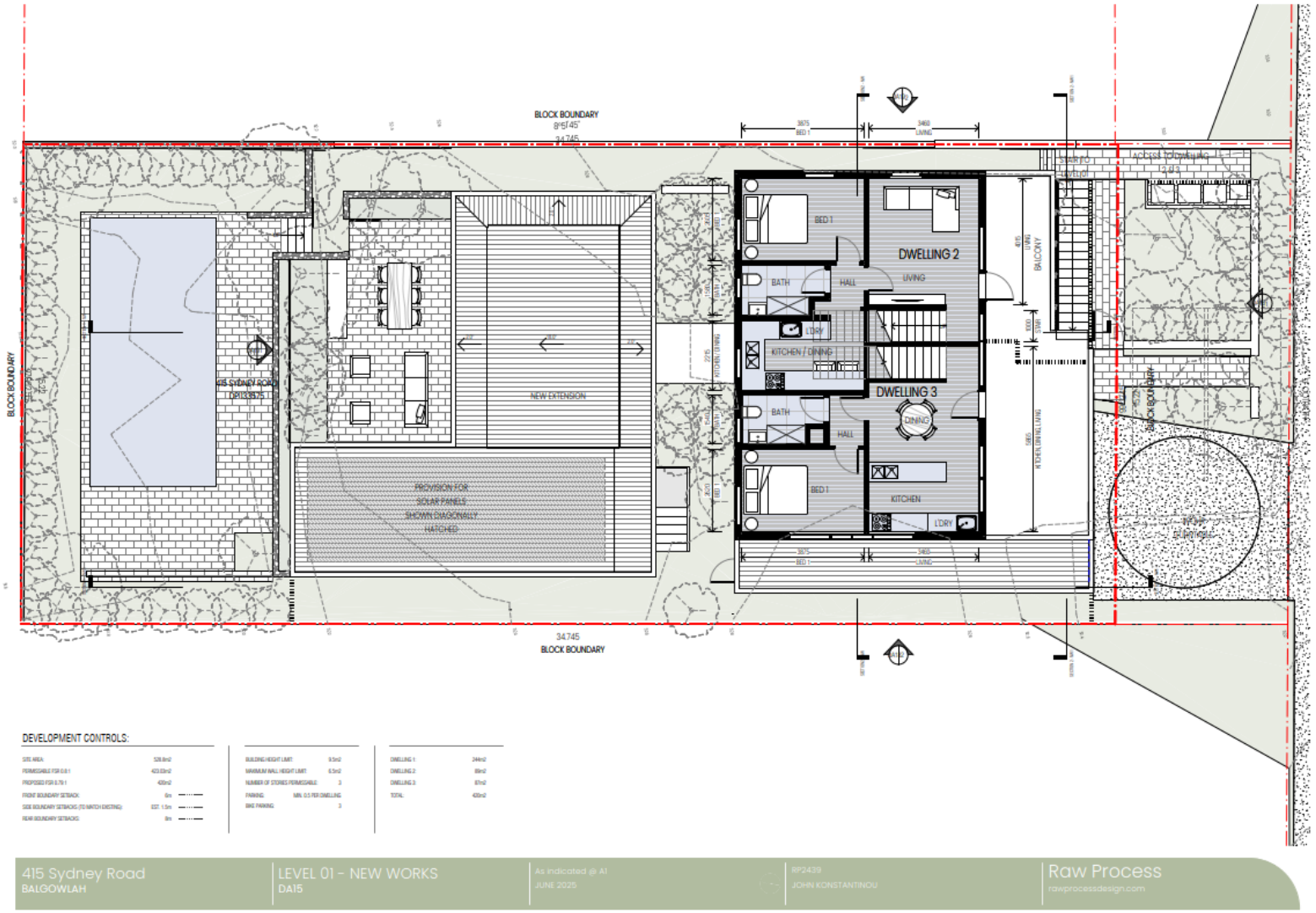


Figure 2-5 Proposed Site Layout – Loft Level Plan

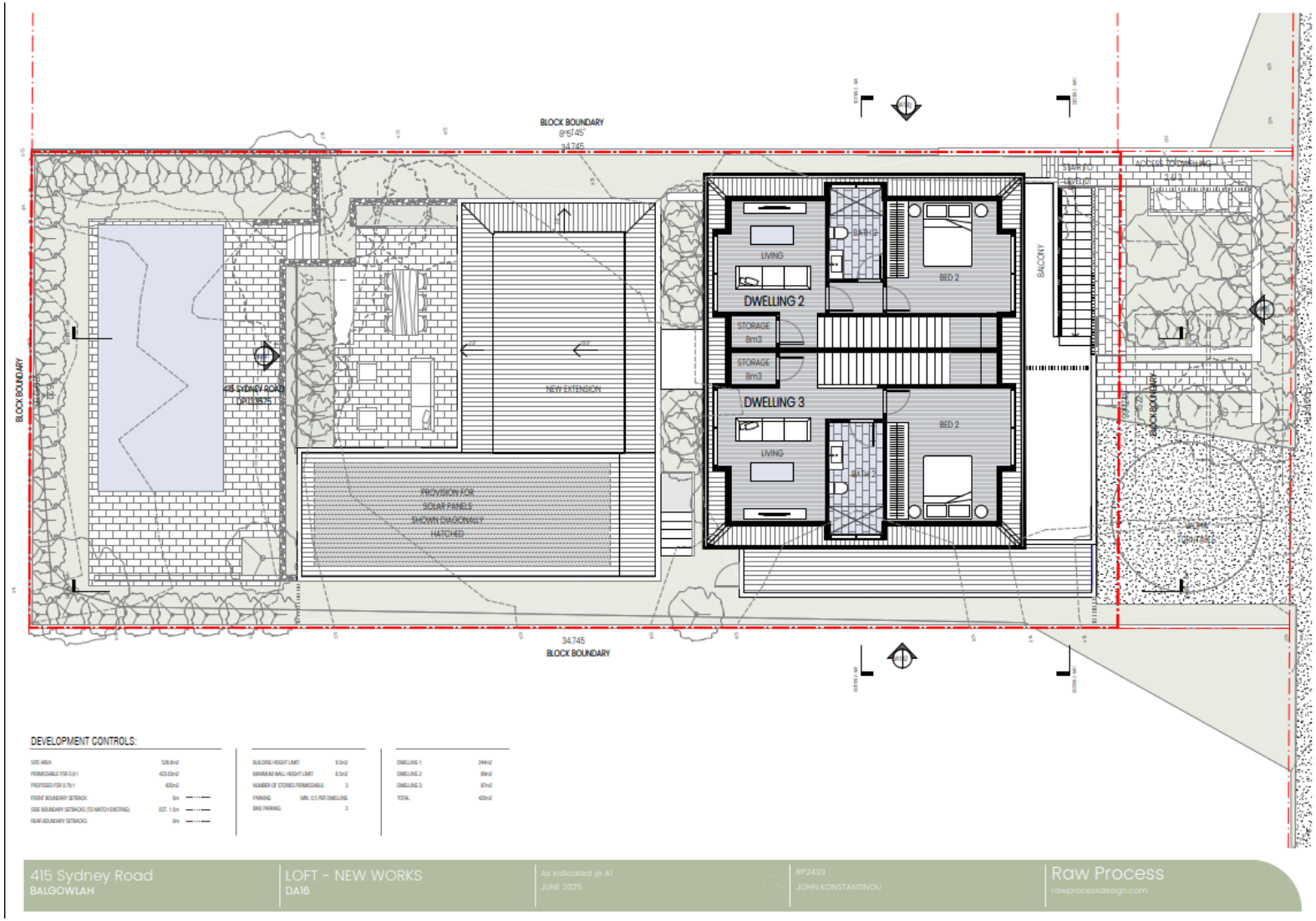


Figure 2-6 Proposed Site Layout – Roof Level Plan

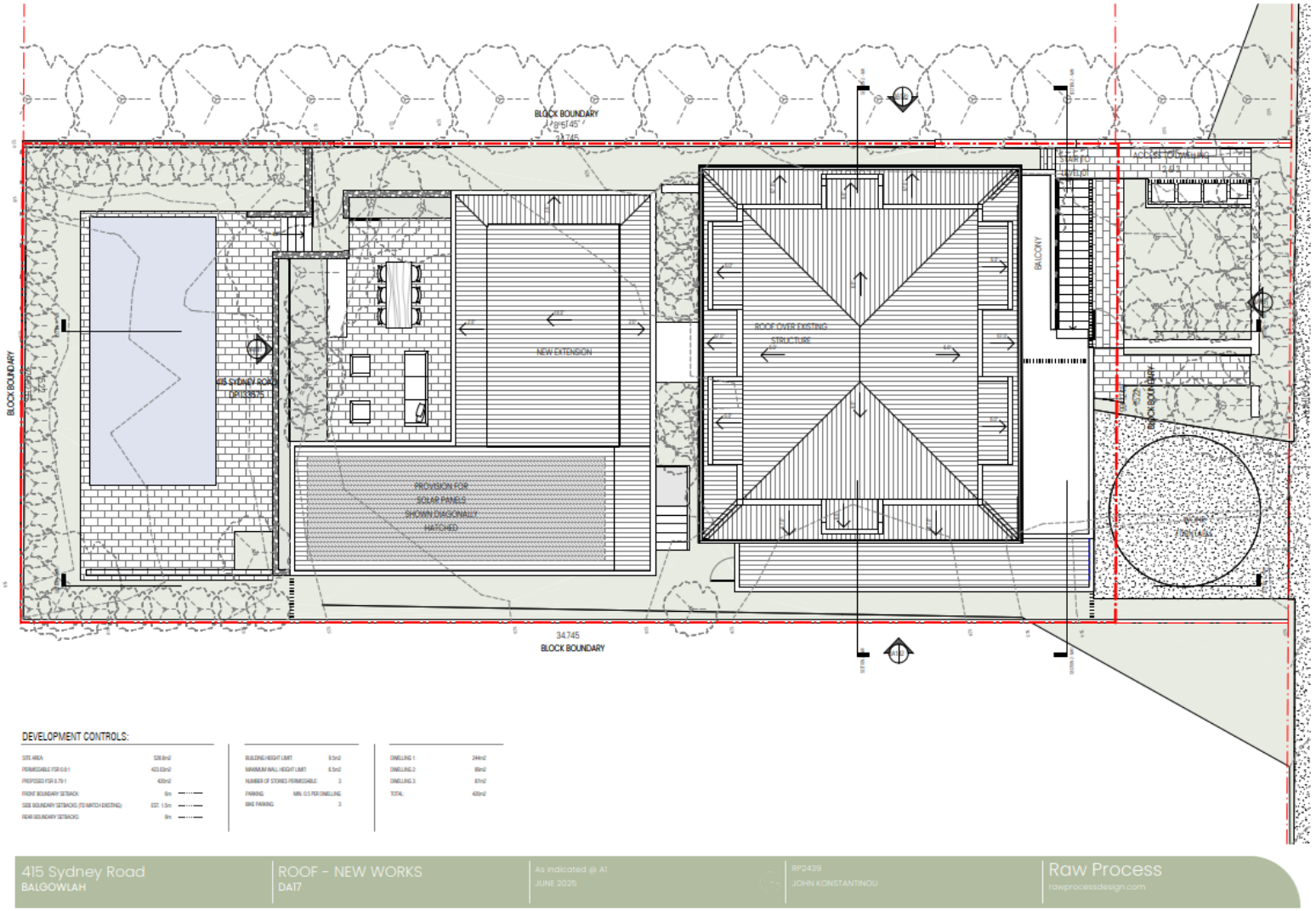


Figure 2-7 Proposed Elevations – North & East

Figure 2-8 Proposed Elevations – South & West

3. NSW Infrastructure SEPP Noise Requirements

The Department of Planning's (DoP) document entitled *"Development near Rail Corridors and Busy Roads – Interim Guideline" (*DRCBR) provides guidance in relation to mitigation of noise sensitive developments in order to provide a minimum deemed acceptable level of acoustic amenity near road and rail.

Derived from clause 2.120 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) which relates to the impact of road noise or vibration on non-road development, Table 3-1 provides a summary of the recommended internal noise levels under Clause 102 of the NSW Infrastructure SEPP, where noise sensitive spaces are likely to be impacted by traffic noise ingress.

Table 3-1 NSW Infrastructure SEPP Recommended Internal Noise Levels

Residential Buildings		
Type of occupancy	**Internal L_{Aeq} Noise Level (dBA)**	**Applicable time period**
Sleeping areas (bedroom)	35	Night time 10.00pm to 7.00am
Other habitable rooms (excluding garages, kitchens, bathrooms & hallways)	40	At any time

Note: Airborne noise is calculated as $L_{Aeq,15hr(day)}$ and $L_{Aeq,9hr(night)}$.

4. Noise Measurements & Results

All noise measurements were conducted using a NTi XL2 Sound Level Meter (SLM). The sound level meter conforms to Australian Standard 1259 *Acoustics - Sound Level Meters* as a Type 1 Precision Sound Level Meter which has accuracy suitable for field and laboratory use. The A-Weighting filter of the meter was selected, and the time weighting was set to "Fast". The calibration of the meter was checked before and after the measurements with a sound level calibrator and no significant drift was noted. The weather was clear with no recorded rainfall and negligible wind.

Operator attended noise measurements were conducted in free field positions as outlined in Figure 2-1 on Thursday, 12 June 2025 between 8.30am to 9.30am, it was visually and aurally observed that the Project Site is currently impacted by noise emission from traffic on Sydney Road. Traffic movements were constant during the time of measurement.

The above time periods were selected in order to measure the existing peak hour traffic noise levels. This is considered as the typical worst-case scenario and measured noise levels will be used to establish as the $L_{Aeq,15hr}$ daytime noise level. The $L_{Aeq,9hr}$ night time noise levels are typically 3-5dBA lower than the $L_{Aeq,15hr}$ daytime noise level. For the

purpose of this assessment, the $L_{Aeq,9hr}$ night time noise level is conservatively estimated as 3dBA lower.

Table 4-1 presents the measured L_{Aeq} noise levels associated with traffic movements.

Table 4-1 Measured L_{Aeq} Noise Levels from Surrounding Road Network– dBA

Meas. Location	Date & Time	Time Period	Overall Measured $L_{Aeq,1hr}$
Measurements within the Project Site of 415 Sydney Road at 1.5m above ground.	12/06/2025 8.30am-9.30am	Daytime	66

Based on the measured noise levels in Table 4-1, the established daytime and night time noise levels for the purpose of this assessment are as below:

- **Daytime $L_{Aeq,15hr\ (traffic)}$** : 66dBA
- **Night time $L_{Aeq,9hr\ (traffic)}$** : 63dBA

For design purposes, the measured traffic noise levels impacting the project site will be used. Accordingly, the reductions required for each space are shown in Table 4-2 below.

Table 4-2 Required Noise Reductions for Each Space – dBA

Type of occupancy	Internal L_{Aeq} Noise Level	Transportation Noise Reduction (TNR) Required
Sleeping areas (bedroom)	35	28
Other habitable rooms (excluding garages, bathrooms & hallways)	40	26

5. Recommended Constructions

Acoustic calculation, taking into account the low frequency characteristic of noise, has been carried out to determine the building construction requirements of the external building envelope for different space types when fully furnished. The following sections detail the construction necessary to achieve the desired TNR values. Note that external windows and doors must be kept closed and all gaps must be sealed airtight, otherwise the TNR of the building envelope will be significantly reduced.

Roof-ceiling system

Roof-ceiling system will consist of the following:

- Selected metal roof cladding.
- Minimum cavity depth of 250mm if it is a flat roof or a raked ceiling.
- Cavity insulation equivalent to or greater than R2.0 cavity insulation (nominal thickness of 75mm and density of 20kg/m^3).
- Internal ceiling lining consisting of 1 layer of 13mm Fyrchek with a minimum mass of 10.5kg/m^2 or equivalent.

Wall system

The proposed wall construction for all levels is assumed to be of masonry wall and lightweight timber stud wall constructions.

The masonry wall construction will have an internal lining of plasterboard and insulation batts in the wall cavity. Such constructions have a sound insulation rating of at least R_w+C_{tr} of 50 and does not require any further upgrade for sound insulation purposes.

The following provide 3 options for the proposed wall construction.

Option 1 – Brick Veneer Construction:

- 110mm brick, 90mm timber stud frame or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.

Option 2 – Double Brick Cavity Construction:

- 2 leaves of 110mm brickwork separated by 50mm gap.

Option 3 – Light-weight Timber Stud Construction:

For Northern, Eastern and Western Façades

- Selected wall cladding such as Colorbond Enseam metal cladding.
- 1 layer of 17mm plywood.
- 90mm timber stud frame.
- Cavity insulation equivalent to or greater than R2.0 cavity insulation (nominal thickness of 75mm and density of 20kg/m^3).
- Internal wall lining consisting of 1 layer of 13mm Fyrchek with a minimum mass of 10.5kg/m^2 or equivalent.

For Southern Façade Only

- Selected wall cladding such as Colorbond Enseam metal cladding.
- 90mm timber stud frame.
- Cavity insulation equivalent to or greater than R2.0 cavity insulation (nominal thickness of 75mm and density of 20kg/m^3).
- Internal wall lining consisting of 1 layer of 13mm Fyrchek with a minimum mass of 10.5kg/m^2 or equivalent.

Entry door

All entry doors must be solid-core doors with a minimum thickness of 35mm and must be fitted with acoustic perimeter/astragal seals as well as threshold/drop seals. Door seals equivalent to Raven RP47 (door frame) and RP38 (door bottom) are recommended.

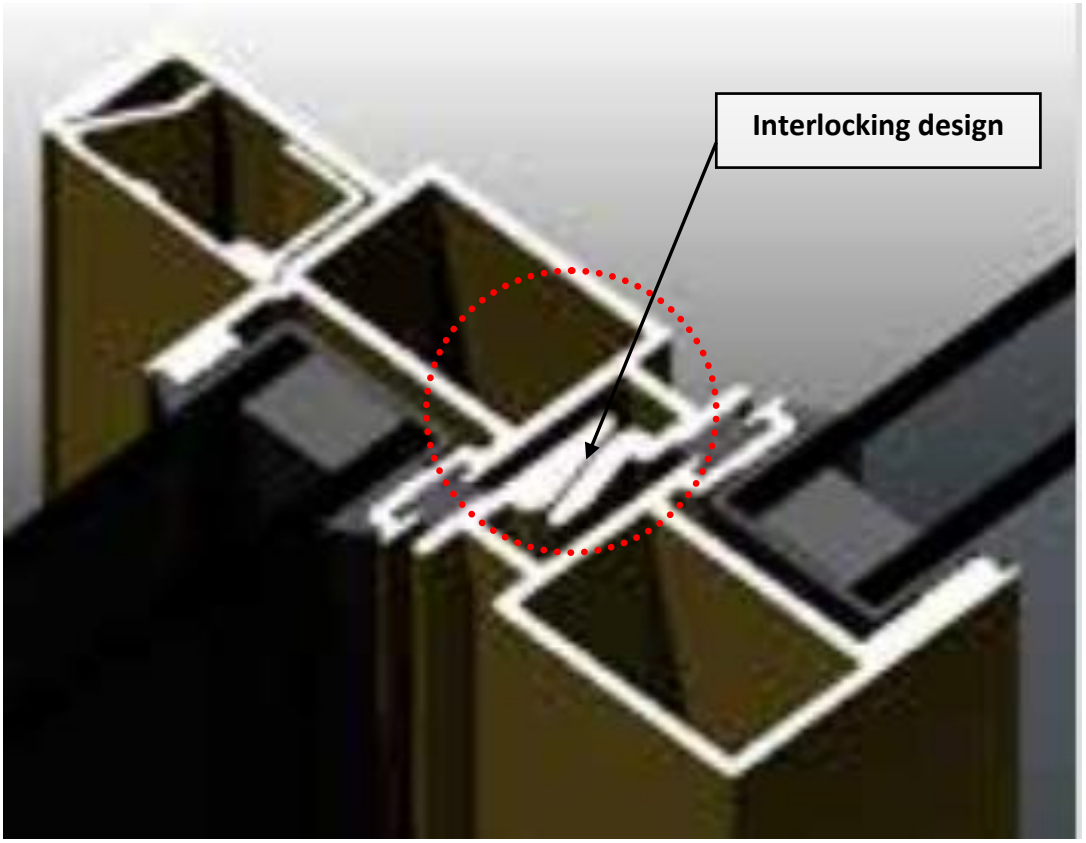
It should be noted that the acoustic performance of a closed door is a result of the combination of door, seals and frame. The performance of the frame depends on the air tightness provided by the seals and the construction of the frame itself. The gap between the door jamb casing and timber frame needs to be filled with oversized backing rod and silicone sealant (1:1 depth to width ratio for joint widths less than 12mm and 2:1 ratio for joint widths greater than 12mm). Where void is larger than the 30mm, install timber packer to take up void around door jamb and timber frame instead of using backing rod and seal remaining gap with silicone sealant.

Window / Sliding Door

Where possible, compression style windows (e.g. awning, casement) should be used instead of sliding style windows (e.g. horizontal sliding, double hung). This is because compression style windows provide a tighter seal against the frame whereas sliding windows generally allow greater air infiltration and therefore greater noise infiltration.

It is recommended that the selected window frames to have the panels with an interlocking design feature between each sash. This feature is typically designed to improve the water penetration resistance; However, it will also provide benefits to the acoustic properties of the overall window frame system. The design feature is graphically illustrated in Figure 5-1.

Figure 5-1 Interlocking Design Between Each Sash



Acoustic seals only provide suitable performance if they are fitted properly. Seals should be selected based on their acoustic performance, simplicity of use, life cycle and maintenance requirements. Generally, Q-lon seals are more effective than brush seals. Standard mohair seals should be avoided where possible.

Table 5-1 and Table 5-2 provide the minimum recommended glazing constructions that should be adopted for all the configurations considered to meet the noise objectives detailed in the Standard.

Table 5-1 Recommended Minimum Glazing for Door and Window Systems – Dwelling 1

Level	Room	Recommended system with glazing
Ground	WIP/Laundry/Storage	4mm standard glazing with a minimum rating of $R_w + C_{tr}$ 28 (R_w: 31, C_{tr}: -3).
	Master, Glass Link, Living, Dining & Kitchen	6.38mm laminated glass with a minimum rating of $R_w + C_{tr}$ 30 (R_w: 33, C_{tr}: -3).
	Bed 1, Bed 2, Office & Entry	10.38mm laminated glass with a minimum rating of $R_w + C_{tr}$ 33 (R_w: 36, C_{tr}: -3).

Table 5-2 Recommended Minimum Glazing for Door and Window Systems – Dwelling 2 & Dwelling 3

Level	Room	Recommended system with glazing
01	Bath	4mm standard glazing with a minimum rating of $R_w + C_{tr}$ 28 (R_w: 31, C_{tr}: -3).
	Kitchen/Dining	6.38mm laminated glass with a minimum rating of $R_w + C_{tr}$ 30 (R_w: 33, C_{tr}: -3).
	Bed 1 & Living	10.38mm laminated glass with a minimum rating of $R_w + C_{tr}$ 33 (R_w: 36, C_{tr}: -3).
Loft	Bath 2	4mm standard glazing with a minimum rating of $R_w + C_{tr}$ 28 (R_w: 31, C_{tr}: -3).
	Living	6.38mm laminated glass with a minimum rating of $R_w + C_{tr}$ 30 (R_w: 33, C_{tr}: -3).
	Bed 2	10.5mm VLam Hush glass with a minimum rating of $R_w + C_{tr}$ 35 (R_w: 38, C_{tr}: -3)

Please note that 10.5mm VLam Hush glass is a proprietary system by Viridian Glass and have better acoustic performance than 10.38mm laminated glass. **Any thermal double-glazing systems proposed are to meet the minimum $R_w + C_{tr}$ ratings outlined in Table 5-1 and Table 5-2**. Note that windows and doors must only be procured from suppliers that have conducted laboratory testing on their products. The gap between window reveal and timber frame need to be filled with oversized backing rod and silicone sealant (1:1 depth to width ratio for joint widths less than 12mm and 2:1 ratio for joint widths greater than 12mm). Where void is larger than the 30mm, install timber packer to take up void around window frame instead of using backing rod and seal remaining gap with silicone sealant.

In order to fully comply with Clause 102 of Infrastructure SEPP, it is necessary to provide alternative ventilation so that external windows and doors can be kept closed. In this way the indoor noise goals can be met while providing room ventilation that meets the Building Code of Australia. Any mechanical ventilation system that is installed should be acoustically designed such that acoustic performance for the acoustic performance of the recommended construction are not reduced by any duct or pipe penetrating the building fabric elements. Noise emission to the adjacent property boundaries by any ventilation system shall comply with Council requirements.

The provision of alternative ventilation can be achieved in a number of ways. Some of these are described in principle below. The options outlined have not been approved for this project by a mechanical engineer as complying with the ventilation requirements but are identical to approved systems used on other similar projects.

Option 1

Fully ducted air-conditioning with provision included of Outside Air. Many domestic air conditioning systems do not include outside air by default – it must be specified at the time of tendering and ordering. Commercial ducted air-conditioning systems usually do have provision for outside air as a standard feature.

Option 2

A proprietary wall-mounted ventilation system, such as Aeropac. Aeropac units are approximately $800 each (per habitable room). Available from Acoustica, phone: 1300 722 825.

Option 3

Provision of an attenuated air inlet such as “Silenceair”. Silenceair® units are approximately $180 each from www.silenceair.com

Option 4

Similar to Option 3 but with an alternative attenuated air inlet provided by the Builder. This could consist of a simple external air grille in the brick wall, connected to a 1.2m long internally insulated plasterboard bulkhead.

6. Conclusion

Blackett Acoustics has been engaged to conduct an acoustic assessment of the proposed residential development at 415 Sydney Road, Balgowlah.

Assessment of traffic noise intrusion in accordance with the requirements of *Development near Rail Corridors and Busy Roads – Interim Guideline"* has been conducted. Recommendations contained in this report have been made for the building elements to control traffic noise ingress from Sydney Road to within design levels recommended in the guideline and to comply with State Environmental Planning Policy (Infrastructure) 2007.

We trust this information is sufficient to satisfy your requirements. Please contact us if you have any further queries.

Yours faithfully

Jimi Ang
Principal | B.Eng (Aeronautical)| M.A.A.S