

Resonate

47 Jugan St, Mt Hawthorn

Planning Stage Acoustic Report

P180500RP1 Revision 0

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Document Information

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Revision Table

Report revision	Date	Comments
0	2 July 2018	Preliminary report issued to client

Glossary

A-weighting	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.
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.
D_w	Weighted Level Difference—the noise level difference or reduction between two enclosed spaces. It quantifies the acoustic separation between two spaces. It relates to the R_w rating of the separating building elements (such as walls and doors) and also includes all noise flanking paths (such as ceiling voids, joins and seals) and the acoustic absorption in the receiving space. The higher the D_w rating the better the acoustic separation.
$L_{n,w}$	A measure of the noise impact performance of a floor and ceiling.
$L_{nT,w}$	Weighted Standardised Impact Sound Pressure Level— A measure of the impact noise performance of a floor and ceiling between two enclosed spaces. It is an on-site measured level that relates to the laboratory $L_{n,w}$ value. The lower the $L_{nT,w}$ rating the better the impact isolation.
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.
$R_w + C_{tr}$	A measure of the sound insulation performance of a building element with a C_{tr} spectrum adaptation term placing greater emphasis on the low frequency performance.

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1 Introduction

Resonate Consultants have been commissioned by Risbec Corporation Pty. Ltd. to undertake a planning stage acoustic assessment for 47 Jugan Street, Mt Hawthorn.

The development consists of 5 two-storey residential units with shared party walls and is located approximately 40 m from Mitchel Freeway.

This report therefore addresses the following issues:

- Acoustical requirements for the building are to comply with the National Construction Code NCC,
- Noise intrusion from traffic is to be designed to meet the requirements of State Planning Policy (SPP) 5.4

The following drawings have been reviewed in this assessment:

- Lot 502 (#47) Jugan Street (5 sheets) dated 17-06-2018

2 Internal Sound Insulation

The proposed residential apartment development is classified as Class 2 under the National Construction Code. These buildings must achieve the objectives outlined in Part F5 of the NCC *Sound Transmission and Insulation*.

The acoustic requirements applicable to this development are outlined in Table 1. Refer also to Figures 1 and 2 for a markup of the required acoustic treatments to meet the NCC for residential apartments.

Additional design advice may be required for non-acoustical requirements such as fire ratings, structural integrity, buildability, etc.

2.1 NCC/BCA Clarifications

The section below outlines specific National Construction Code BCA requirements, which, in our opinion, are not applicable to this project. These clarifications are referred to the certifier to confirm our interpretation.

Apartment Floors over Storerooms/Carparks

The BCA states in Clause F5.4 (a) (ii)

Floors separating apartments from a plantroom, lift shaft, stairway, public corridors, public lobby or the like, or parts with a different classification [such as store room or carpark] to be impact-rated

Resonate Consultants is of the opinion that this impact rating is only applicable for floors where the apartment is under the plantroom or carpark, not for floors where the apartment is over the other space. There is no noise sensitive activity in the space below which requires impact isolation treatment so it is recommended that no impact isolation treatment is to be installed on such floors.

2.2 BCA/NCC Requirements

The development has no common corridors and no units directly above other sole-occupancy units. Hydraulic services are not to cross into other sole-occupancy units.

Table 1: BCA requirements for Class 2 and 3 buildings

Building element	Description	Impact noise requirements	Airborne noise criterion	Minimum proposed Construction	Legend
Walls	Separating sole occupancy units	—	$R_w + C_{tr} \geq 50$	Rendered cavity brickwork - 250 mm Midland Acoustic Maxibricks or equivalent OR Minimum 150 mm concrete	
	Separating a habitable room (other than a kitchen) of a sole occupancy unit from a bathroom, sanitary compartment, laundry or kitchen in an adjacent sole occupancy unit	Discontinuous construction	$R_w + C_{tr} \geq 50$	Rendered cavity brickwork - 250 mm Midland Acoustic Maxibricks or equivalent with no ties or resilient ties OR Minimum 150 mm concrete with free-standing stud and plasterboard. Gap between stud and concrete is to be no less than 20 mm.	
Pumps	The point of connection between the service pipes in a building and any circulating or other pump.	A flexible coupling at the connection	—		Not shown

Notes to Table above

1. No supply or waste pipes to have direct contact with surrounding elements. All pipes to be acoustically fixed at mounting points/penetrations. Use Bradflex, 6 mm thick neoprene, closed-cell foam or 'unicushion' between all pipes and pipe clamps.
2. Acoustically rated walls to extend full height to underside of soffit/roof. Where this does not occur, ceilings to be acoustically rated and services / penetrations are to be acoustically treated.
3. Unless noted otherwise, all acoustic insulation to be 14 kg/m³ acoustic grade glasswool insulation or equivalent. Nominal thickness 75 mm unless otherwise noted
4. Walls are not to be chased, and pipes are not to be fixed to the wall leaf on the side adjoining any other sole-occupancy unit and must have a clearance not less than 10 mm to the other wall leaf.
5. Plasterboard is not to be glued to concrete or masonry walls. Where required, it may be fixed using 28 mm furring channels with 25 mm insulation.

2.3 BCA/NCC Markups

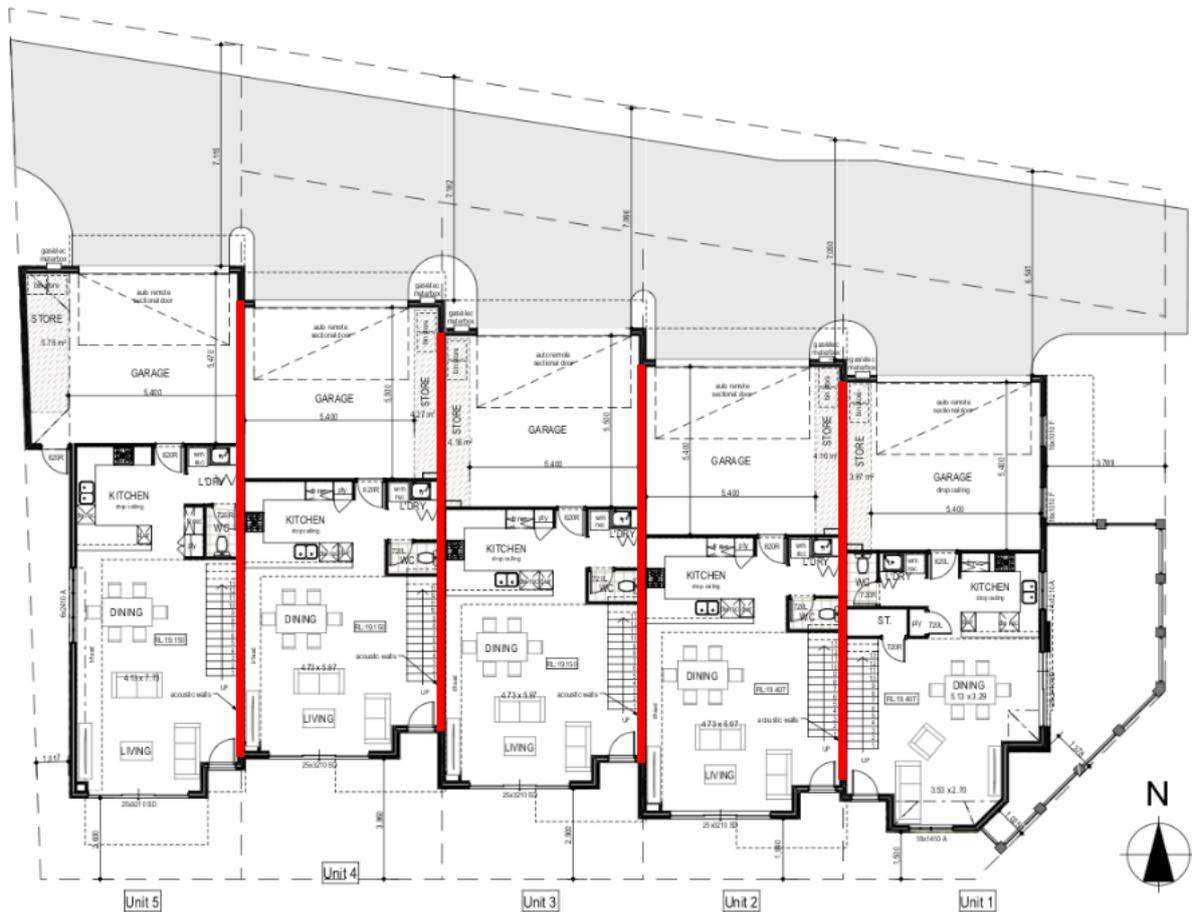


Figure 1: Ground floor BCA/NCC markup

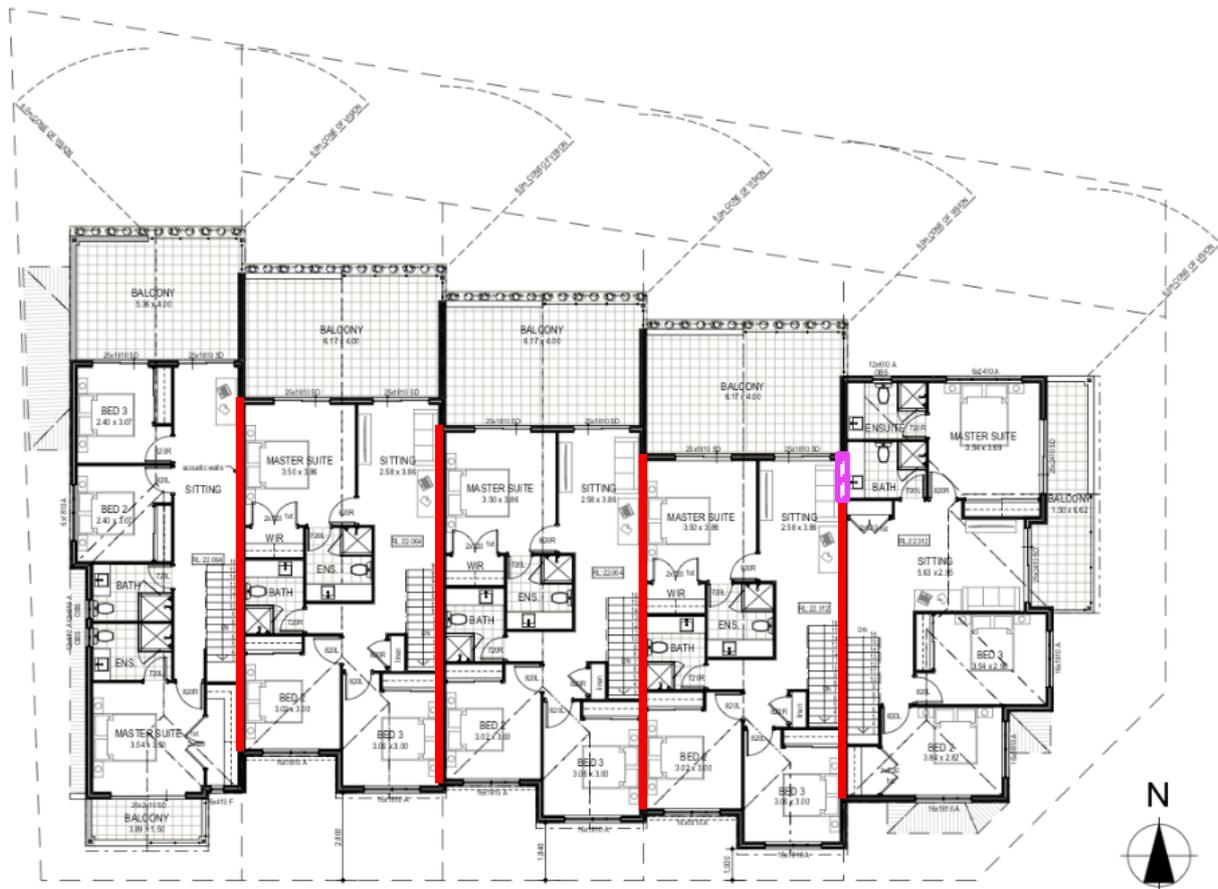


Figure 2: First floor BCA/NCC Requirements

3 Noise Intrusion Requirements

3.1 Forecast Traffic Noise Level

The closest part of the development is approximately 45 m from the Mitchel Freeway which has historically recorded 147,000 vehicles per day (DMR 2013/15, 2015/16). There is an existing noise wall on the edge of the freeway, approximately 1500 mm high, and the neighbouring property at 45 Jugan Street is single storey.

A noise logger is to be deployed at the current site to obtain 3 days of unattended measurements. In this preliminary report, the noise level has been forecast based on the SPP 5.4 guideline. This forecast level is $L_{Aeq,day}$ 70 dB (free-field). The treatments will be updated once the noise data has successfully been collected under suitable weather conditions.

3.2 Required Treatments

Glazing systems selected are to possess a laboratory test certificated to demonstrate that they meet the minimum requirements specified in Figure 3 and Figure 4, noting that performance is strongly dependent on the frames and seals of a selected system rather than the glass thickness alone. The NRC 0.9 acoustic lining required on nominated balconies may be Reapor 50 mm, Stratocell Whisper 50 mm, or equivalent.

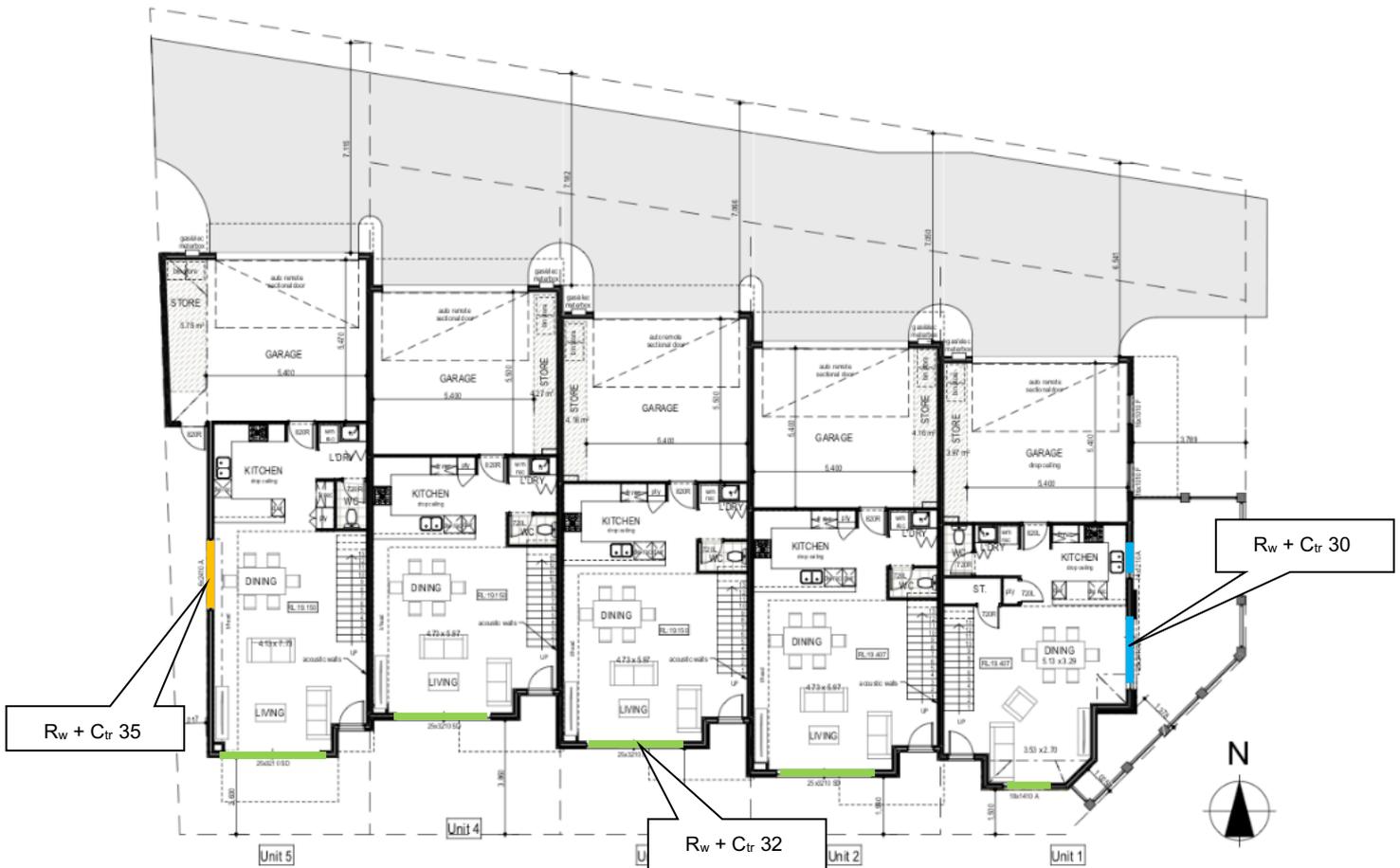


Figure 3: Ground floor glazing markup

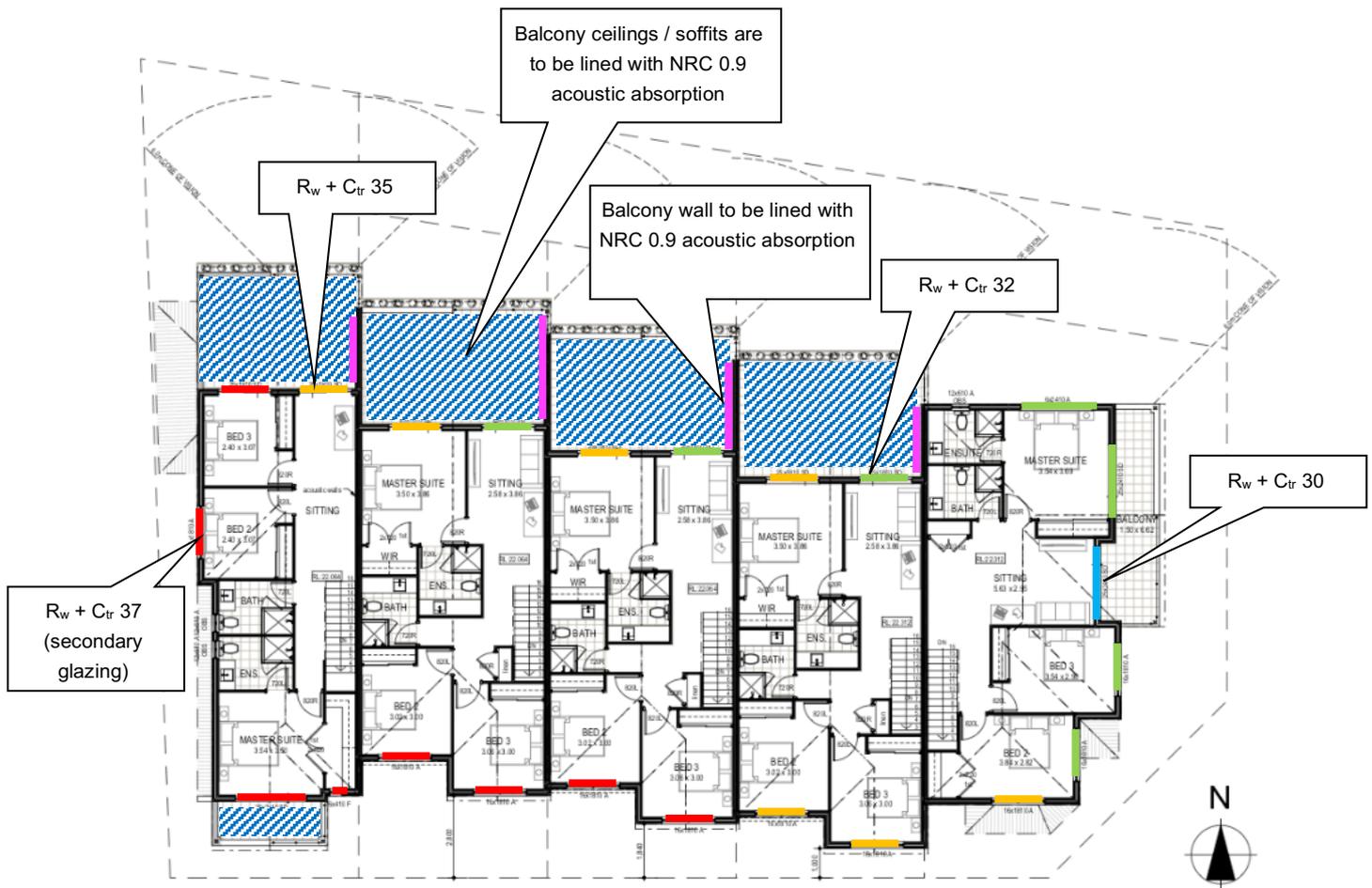


Figure 4: First floor glazing markup

Table 2: Example tested systems to meet required ratings

R _w + C _{tr}	Awning	Sliding door
37 (secondary glazing)	10.38 / 92 / 6.38 laminated Alspec Altitude	10.38 / 100 / 6.38 laminated AWS 584
35	12.5 Vlam Stegbar Aluminum	10.5 Vlam sliding door with 12.5 Vlam fixed part Capral 900
32	6.38 laminated Capral Genesis	10.38 laminated AWS 541
30	6.38 laminated Alspec ProTilt	6.38 laminated Alspec ProGlide

Additionally:

- All external doors are to be R_w 30
- External walls are to be R_w + C_{tr} 50
- Top level ceilings are to be constructed with 2 x 10 mm plaster board with insulation laid over
- Mechanical ventilation to be considered to allow glazing to be kept closed
- No untreated façade penetrations are permitted

4 Conclusions

This report has provided advice to meet BCA/NCC and SPP 5.4 requirements.

Once the constructions nominated in this report have been implemented, the development is forecast to meet BCA/NCC and SPP 5.4 requirements.