NATIONAL NOISE & VIBRATION

212 CHURCHILL RD, PROSPECT SA 5082

DA ACOUSTIC ASSESSMENT

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Project Information

Details	
Report Title:	DA ACOUSTIC ASSESSMENT
Address:	212 Churchill Rd, Prospect SA 5082
Client:	Heather Pinder
Attention:	Daniel Brunoli

Document Control

Reference	Issue Date	Details	Revision	Prepared	Reviewed	Authorised
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1 INTRODUCTION

Engineering Sciences has been engaged by Heather Pinder to conduct a DA Acoustic Assessment for the proposed Multi-Storey Residential Apartment Building located at 212 Churchill Rd, Prospect SA 5082.

The site experiences noise intrusion from nearby road traffic, as well as noise emissions from the onsite laundromat services potentially affecting noise-sensitive receivers on level 1. This report outlines feasible and reasonable recommendations to mitigate these impacts and preserve the amenity of future occupants and nearby noise-sensitive areas.

The assessment of the project site adheres to the following regulatory requirements:

- Ministerial Building Standard MBS 010 (May 2023)
- AS2107:2016 Recommended Design Sound Levels and Reverberation Times for Building Interiors

This report has been prepared with reference to the architectural drawings provided by 3D Design & Drafting Australia, outlined in Table 1.

Table 1 - Architectural Drawings (3D Design & Drafting Australia)

Drawing Number	Drawing Name	Revision	Date
A0.1	Cover Sheet	E	18/10/2024
A0.2	Index & Notes		
A1.2	Ground Floor Plan		
A1.3	First Floor Plan		
A1.4	Second Floor Plan		
A1.5	Third Floor Plan		
A1.6	Fourth Floor Plan		
A1.7	Rooftop Plan		
A2.1	Elevations		
A2.2			
A2.2	External Finishes		

2 SITE LOCALITY

The proposed development is situated at 212 Churchill Rd, Prospect SA 5082, within the City of Prospect Council area and encompasses a ground-level laundromat, twenty-one upper-level apartments, and a rooftop common area, housed within a five-storey building. The site is adjacent to a designated Type A road as per MBS 010, therefore requiring a noise assessment.

The site is also located approximately 80 meters from a rail corridor. However, it falls outside the immediate influence of train-related noise and does not fall within any designated sound exposure category as per MBS 010.

The design of the proposed construction will incorporate elements aimed at mitigating noise from the adjacent road, ensuring compliance with the indoor sound level objectives detailed within this report. The site plan and aerial imagery are presented in Figures 1 & 2.

Figure 1 – Site Plan

Figure 2 – Aerial Image (National Map)

3 PROJECT CRITERIA

3.1 Ministerial Building Standard MBS 010

Ministerial Building Standard MBS 010 – *"Construction requirements for the control of external sound"* forms part of the Building Rules under Section 80 of the *Planning, Development and Infrastructure Act 2016*. It contains provisions for reducing the intrusion of unacceptable levels of sound into habitable rooms of residential buildings. It states:

> *2.1 To prevent loss of amenity for the occupants of a Class 1, 2, 3 building, a Class 4 part of a building or a Class 9c residential care building located within a noise attenuation area, the building envelope and any mechanical ventilation system must provide attenuation to reduce the intrusion of external airborne sound from a designated sound source into habitable rooms to an acceptable indoor sound level.*

The performance requirement for residential buildings set by MBS 010 is presented in Table 5 below.

Table 2 – Internal sound criteria for sound intrusion from road, rail and mixed land uses

Activity	Maximum allowable for individual rooms in the building, dB(A) $L_{eq, night}$
Bedrooms	35
Other habitable spaces	40

4 NOISE INTRUSION ASSESSMENT

As the project site is located within 15 meters of a Type A road, it is classified under the following **Sound Exposure Categories**, in accordance with Ministerial Building Standard MBS 010.

Table 3 – Sound Exposure Categories as Per MBS 010

Facade	Distance (m)	Sound Exposure Categories
North (Front 2-Bedroom Units)	15 - 35	3
South (Front 1-Bedroom Units)		
North (Rear Studios & 1 Bedroom Units)	35 - 60	2
South (Rear Studios & 1 Bedroom Units)		
East	<15	4
West	35 - 60	1

As per Appendix A of MBS 010, performance solutions can be calculated to demonstrate compliance with the maximum allowable noise level for individual rooms in the building. This method will provide site specific information and modelling of the proposed building in relation to sound exposure on the site. This results in a more accurate sound exposure category, as it is based on the site conditions such as shielding from nearby buildings and existing sound barriers which may be present in the local context. Road noise levels from Appendix A Table A1.2 and the noise spectrum from Table A1.4 have been utilised for the basis of this assessment.

4.1.1 Noise Modelling

Noise intrusion levels at the project site facades have been calculated using computer-based 3D acoustic noise modelling software iNoise version 2023.1.1. iNoise utilizes ISO 9613 calculation algorithms to determine noise emission levels at the nearest affected noise sensitive receivers. The following assumptions have been included within the noise model:

- Distance attenuation.
- Atmospheric attenuation.
- Directivity.
- Ground absorption (G = 0.5)
- Barrier effects/screening.
- Ground Elevation Contours.

4.2 Predicted External Noise Levels

External noise predictions at the facades of the project site that will be used as part of this assessment are presented in Table 4 below.

Table 4 – Sound Exposure Categories as Per MBS 010

Facade	Noise Level dB(A)	Sound Exposure Categories
North (Front 2-Bedroom Units)	65	**2**
South (Front 1-Bedroom Units)	64	**2**
North (Rear Studios & 1 Bedroom Units)	60	**1**
South (Rear Studios & 1 Bedroom Units)	54	**0**
East	70	**3**
West	40	**0**

5 Construction Recommendations

Based on the predicted external noise levels at each façade of the development, the road traffic noise level transmitted through all building elements has been predicted based on the spectral characteristics of traffic movements, the area of each assessed building element (such as walls, windows, ceiling/roof, etc), the absorption characteristics of each room and the noise reduction performance of each of the building elements.

The following construction recommendations are provided to achieve compliance with the internal noise levels as stated in Table 2.

5.1 External Walls & Roof

The external walls & roof are proposed to be constructed from masonry elements. This is deemed acoustically suitable with no further construction upgrade required.

5.2 Glazing

Recommended minimum constructions for glazed elements such as windows and glazed doors are provided in Table 5 and Table 6 below.

Table 5 – Glazing Requirements

Facade	Sound Insulation Requirement	Minimum Glazing Requirement
North (Front 2-Bedroom Units)	65	6.38mm Laminate
South (Front 1-Bedroom Units)	64	6mm Float
North (Rear Studios & 1 Bedroom Units)	60	4mm Float
South (Rear Studios & 1 Bedroom Units)	54	
East	70	10.38mm Laminate
West	40	4mm Float

In addition to the above minimum glazing thickness requirements for compliance with AS2021:2015, the minimum Rw rating of the windows should be as detailed in Table 6. Acoustic seals are also required around the full perimeter of operable frames, and the frame will need to be sealed into the building opening using a flexible sealant.

Table 6 – STC Requirement of Glazing Element with Acoustic Seals

Glazed Element	Required *Rw rating
4mm Float	30 (or STC29)
6mm Float	32 (or STC30)
10.38mm Laminate	36

*Rw can be substituted for STC unless stated otherwise

5.3 Manufacturers Recommendations

Where manufacturers have installation recommendations required to achieve a specified acoustic rating system, these should be followed in order to achieve the appropriate acoustic rating.

6 NOISE EMISSION ASSESSMENT

This section provides an analysis of the noise emissions generated by the proposed laundromat and their impact on the nearest noise-sensitive receiver, a 2-bedroom residential unit located directly above the laundromat on Level 1 within the proposed building. Given that the receivers most likely noise impact will be through the building slab from the ground level laundromat, our analysis will concentrate exclusively on predicting the internal noise levels within this unit, stemming from the operations of the laundromat below. To evaluate compliance, the assessment will reference the guidelines set forth in AS2107, which delineate acceptable internal noise levels for residential environments.

6.1 AS2107:2016 Recommended Design Sound Levels and Reverberation Times for Building Interiors

The standard AS2107 can be used to establish internal noise limits for internal receivers near noise emitting operations. The noise limits applicable to this assessment are outlined in the table below. The levels are given as equivalent continuous A-weighted sound pressure levels measured in decibels.

Table 7 - Design Sound Levels for Different Commercial Occupancies (Internal)

Receiver	Type of occupancy/activity	Design Sound Level ($L_{Aeq,t}$) Range
LEVEL 1, 2-BEDROOM UNIT 212 CHURCHILL RD, PROSPECT SA 5082	Living/sleeping areas	35 - 40

6.2 Operational Scenarios

In order to assess the worst-case operation of the laundromat, the following assumptions have been considered in the noise emission assessment:

- Noise emitted from the premises includes 30 washing machines operating on a wash cycle at once.
- The washing machines will be acoustically isolated from the building raised on acoustic pads and not directly fixed to any walls. If fixing to walls is required, suitable vibration mounts are to be used.
- The building is constructed with a 220mm concrete slab.
- The laundromat will operate 24-hours a day.

6.3 Noise Sources

The sound power level of a washing machine on a wash cycle has been taken from our technical database containing measurements conducted in the past. Octave band sound power levels used within the assessment are provided in Table 8. Octave band sound power levels are reported in A-weighting (Noise level perception of human ear).

Table 8 – Sources Sound Power Levels and Reverberant Sound Pressure Level

Noise Source	Total Sound Power Level, L_{Aw} dB(A)	Octave Band Frequency (Hz) Sound Power Levels dB(A)						
		63	125	250	500	1k	2k	4k
30 Washing Machines (wash cycle)	77	74	80	74	74	73	69	65

6.4 Predicted Noise Levels

Predicted internal noise levels at the nearest residential receivers are presented in table 9 below.

Table 9 - Predicted Noise Levels at the Nearest Receivers

Receiver	Predicted Internal Noise Level, $L_{eq,15min}$ dB(A)	Noise Criteria, $L_{eq,15min}$ dB(A)	Complies?

LEVEL 1, 2-BEDROOM UNIT 212 CHURCHILL RD, PROSPECT SA 5082	19	**35**	✓

7 CONCLUSION

National Noise & Vibration has conducted a DA Acoustic Assessment for noise associated with the Multi-Storey Residential Apartment Building to be located at 212 Churchill Rd, Prospect SA 5082.

Noise emissions from the proposed project have been assessed and are expected to be compliant with the criteria outlined in within this report.

Please contact us if you have any further queries.

Sincerely,

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