



70 - 72 Gordon Ave, South Granville NSW

Part 5 Housing SEPP 2021 Acoustic Assessment

SYDNEY9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 98 145 324 714 www.acousticlogic.com.au

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1 INTRODUCTION

Acoustic Logic (AL) has been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed development located at 70-72 Gordon Avenue, South Granville.

This document addresses noise impacts associated with the following:

- Noise intrusion to project site from adjacent roadways, and
- Noise emissions from mechanical plant to service the project site (in principle).

AL have utilised the following documents and regulations in the noise assessment of the development:

- Cumberland Development Control Plan 2021;
- Australian Standard AS/NZS 3671:1989 'Acoustics—Road traffic noise intrusion—Building siting and Construction';
- Australian and New Zealand AS/NZS 2107:2016 'Recommended design sound levels and reverberation times for building interiors'

This assessment has been conducted using the Studio Johnston architectural drawings, job number #pln, dated 27/10/22.

2 SITE DESCRIPTION

The proposed residential development comprises of multiple two storey townhouses.

Investigation has been carried out by this office in regards to the existing properties and noise impacts surrounding the proposed development, which is detailed below:

• Existing residential blocks surrounding the site along Gordon Avenue and Pegler Avenue

The nearest noise receivers around the site include:

- R1: Residential Receiver 1 Residential receivers at 66-68 Gordon Avenue.
- **R2:** Residential Receiver 2 Residential receivers at 67, 69, 71& 73 Pegler Avenue.
- **R3:** Residential Receiver 3 Residential receiver at 74 Gordon Avenue.
- **R4:** Residential Receiver 4 Residential receivers at 63 & 67 Gordon Avenue.
- **R5:** Residential Receiver 5 Residential receiver at 61 Gordon Avenue.

A site map, measurement description and surrounding receivers are presented in Figure 1 below.



Attended Measurements

Figure 1 - Project Site Source: NSW Six Maps

Unattended Noise Monitor

3 NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principle measurement parameters are used, namely L_{10} , L_{90} and L_{eq} . The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15-minute period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

4 AMBIENT NOISE SURVEY

NSW EPA's Rating Background Noise Level (RBL) assessment procedure requires determination of background noise level for each day (the ABL) then the median of the individual days as set out for the entire monitoring period.

Appendices in this report present results of unattended noise monitoring conducted at the project site. Weather affected data was excluded from the assessment. The processed RBL (lowest 10th percentile noise levels during operation time period) are presented in Summarised rating background noise levels for the project site and immediate surroundings are presented below. Weather affected data has been removed in line with the recommendations of Fact Sheets A & B of the NSW EPA Noise Policy for Industry.

Table 4-1.

4.1 MEASUREMENT POSITION

One unattended noise monitor was located in the rear yard of the project site at 70 Gordon Avenue.

4.2 MEASUREMENT PERIOD

Unattended noise monitoring was conducted from Friday 6th November 2020 to Tuesday, 17th of November 2020. Attended noise measurements were undertaken between the hours of 9:00am to 10:00am on Tuesday, 17th of November 2020.

4.3 MEASUREMENT EQUIPMENT

Equipment used consisted of an Acoustic Research Laboratories Pty Ltd noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Noise logger data is provided in Appendix A of this report.

4.4 SUMMARISED RATING BACKGROUND NOISE LEVELS

Summarised rating background noise levels for the project site and immediate surroundings are presented below. Weather affected data has been removed in line with the recommendations of Fact Sheets A & B of the NSW EPA Noise Policy for Industry.

Table 4-1 – Measured Noise Levels

Noise Monitor Location	Time of day	Rating Background Noise Level dB(A) _{L90(Period)}
	Day (7am – 6pm)	38
70-72 Gordon Avenue, South Granville	Evening (6pm – 10pm)	36
Granvine	Night (10pm – 7am)	32

5 EXTERNAL NOISE INTRUSION ASSESSMENT

Site investigation indicates that the major external noise source around the project site is from traffic movements along Gordon Avenue at the eastern boundary of the site.

5.1 NOISE INTRUSION CRITERIA

A noise intrusion assessment has been conducted based on the requirements of the following acoustic noise criteria and standards:

- Cumberland Development Control Plan 2021;
- Australian Standard AS/NZS 3671:1989 'Acoustics—Road traffic noise intrusion—Building siting and Construction'; and
- Australian Standard AS2107:2016 'Recommended Design Sound Levels and Reverberation Times for Building Interiors.'

5.1.1 Cumberland Development Control Plan 2021

The Cumberland Development Control Plan 2021 contains no specific controls for the treatment of noise intrusion from minor roadways.

5.1.2 Australian Standard AS/NZS 3671:1989 'Acoustics—Road traffic noise intrusion—Building siting and Construction'

Australian Standard AS 3671-1989 notes the following in relation to traffic noise:

- Internal noise levels should be determined in accordance with AS/NZS 2107:2016 'Acoustics –
 Recommended design sound levels and reverberation times for building interiors'.
- A suitable descriptor should be adopted relevant to the use of the development. As AS2107:2016 adopts the L_{eq} descriptor, AL shall also use this descriptor.
- AS3671 does not specifically recommend a time interval. On this basis, AL have adopted the interval used by the EPA Road Noise Policy for main/arterial roads, that being:
 - o Day 7am to 10pm (15 hour); and
 - o Night 10pm to 7am (9 hour).
- AL have applied the daytime interval to the living areas of the apartment and the night time interval to the bedrooms of the apartment.

Internal noise levels have been selected in accordance with AS 2107:2016.

5.1.3 Australian and New Zealand AS/NZS 2107:2016 'Recommended design sound levels and reverberation times for building interiors'

AS2107:2016: Recommended design sound levels and reverberation times for building interiors specifies allowable internal noise levels for internal spaces within residential and commercial buildings. Table 1, in Section 5 of AS2107:2016, gives the following maximum internal noise levels for commercial buildings and residential buildings near major roads.

Table 5-1 – Recommended Design Sound Levels

Space /Activity Type	Recommended Design Sound Levels	
Sleeping Areas	35-40 dB(A)L _{eq(10pm-7am)}	
Living Areas	35-45 dB(A)L _{eq(anytime)}	

5.1.4 Summarised External Noise Intrusion Criteria

The internal noise criteria adopted for each internal space is therefore summarised below based on the relevant State, Council and Australian Standard requirements.

Table 5-2 – Adopted Internal Noise Levels

Space / Activity Type	Required Internal Noise Level
Sleeping Areas	35 dB(A)L _{eq(10pm-7am)}
Living Areas	40 dB(A)L _{eq(worst 1hr)}

5.2 EXTERNAL NOISE MEASUREMENTS

This section of the report details noise measurements conducted at the site to establish surrounding environmental noise levels impacting the development.

5.2.1 Measurement Equipment

Attended short term noise measurements of traffic noise were undertaken by this office. Measurements were conducted using a Norsonic 140 Sound Analyser. The analyser was set to fast response and calibrated before and after the measurements using a Norsonic Sound Calibrator type 1251. No significant drift was noted.

5.2.2 Measurement Location

Attended noise measurements were undertaken at Gordon Avenue adjacent to the project site. The sound level meter had an unobstructed view of traffic and was approximately 3m from the kerb. Refer to Figure 1 for a detailed location.

5.2.3 Measurement Period

Attended noise measurements were undertaken between the hours of 9:00am to 10:00am on Tuesday 17th of October 2020.

5.2.4 Attended Noise Measurements

Attended noise measurements have been summarised below for each location.

Table 5-3 – Attended Noise Measurements

Noise Measurement Location	Measured Noise Level dB(A) L _{eq (15 minute)}	
70-72 Gordon Avenue, South Granville (3m from kerb)	51 dB(A)L _{eq(15min)}	

5.2.5 Summarised External Noise Levels

The following noise levels for the site have been established based on short term attended measurements and long-term noise monitoring.

Table 5-4 – Predicted Traffic Noise Levels at Façade

Noise Measurement Location	Time of Day	Noise Level – L _{eq}
70-72 Gordon Avenue, South	Daytime 7am – 10pm	51 dB(A) L _{eq (15hr)}
Granville	Night-time 10pm – 7am	45 dB(A) L _{eq (9hr)}

5.3 RECOMMENDED CONSTRUCTIONS

Assessment of façade requirements to achieve required indoor noise levels has been undertaken. Dimensions of rooms, setbacks from roadways, window openings and floor areas have been used.

5.3.1 Glazed Windows and Doors

The following constructions are recommended to comply with the project noise objectives. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria. All external windows and doors listed are required to be fitted with Q-lon type acoustic seals. (**Mohair Seals are unacceptable**).

Thicker glazing may be required for structural, safety or other purposes. Where it is required to use thicker glazing than scheduled, this will also be acoustically acceptable. The recommended constructions are detailed in Table 5-5.

Table 5-5 – Recommended Glazing Construction

Space	Glazing Thickness	Acoustic Seals
Living Rooms/Bedrooms	6mm float/toughened	Yes

It is recommended that only window systems having test results indicating compliance with the required ratings obtained in a certified laboratory be used where windows with acoustic seals have been recommended.

In addition to complying with the minimum scheduled glazing thickness, the R_w rating of the glazing fitted into open-able frames and fixed into the building opening should not be lower than the values listed in Table 5-6 for all areas. Where nominated, this will require the use of acoustic seals around the full perimeter of open-able frames and the frame will need to be sealed into the building opening using a flexible sealant.

Table 5-6 – Minimum R_w of Glazing Assembly (with Acoustic Seals)

Glazing Assembly	Minimum R _w of Installed Window	
6mm float/toughened	29	

5.3.2 External Roof/Ceiling Construction

External roof construction from concrete or masonry elements will not require acoustic upgrading. External roof construction from light weight elements will require acoustic upgrading. The following roof construction is recommended for lightweight roof/ceiling constructions.

The recommended roof/ceiling construction is shown in Figure 1 and Table 6 below:

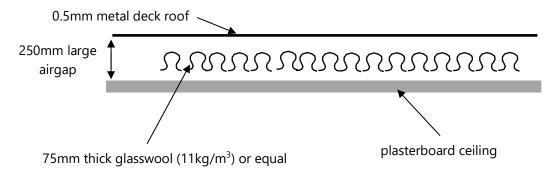


Figure 1 - Roof/ Ceiling Construction

Table 6 – External Light Weight Roof Construction

Space	Internal Lining	Truss System	External Lining
Bedrooms	1 x 10mm plasterboard	Minimum of 250mm truss with 75mm thick 11kg/m³ glasswool insulation in cavity	0.5mm metal deck roof

In the event that any penetrations are required through the external skin, an acoustic sealant should be used to minimise all gaps.

5.3.3 External Wall construction

External walls which are constructed from brick and masonry elements will not require any additional acoustic treatments.

External walls to be constructed from light weight cladding systems are recommended to adopt the construction shown below.

Table 7 – Recommended Light Weight External Wall Construction

Space	Internal Lining	Stud System	External Lining
Bedrooms	1 x10mm Plasterboard	90mm Stud with 75mm thick 11kg/m³ glasswool insulation in cavity	1 x 9mm Fibre Cement Sheeting

5.3.4 Entry Doors

All external entry doors shall have glazing thicknesses equal to those recommended in Section 5.3.1 and are to have Raven RP10 to the top and sides and Raven RP38 to the underside of a swing door.

Note that mohair seals in windows and doors are not acceptable where acoustic seals are required.

5.3.5 Mechanical Ventilation

With respect to natural ventilation of a dwelling, the NSW Department of Planning document 'Development near Busy Roads and Rail Corridors - Interim Guideline' dictates that:

"If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."

With windows open, the allowable internal noise goal is permitted to be 10dB(A) higher than when the windows are closed (i.e. – allowable level in bedrooms becomes 45dB(A) and living rooms becomes 50dB(A) L_{eq(worst 1hr)}.

All façades will be able to achieve required internal noise levels with windows or doors open.

Any supplementary ventilation system proposed to be installed should be acoustically designed to ensure that the acoustic performance of the acoustic treatments outlined above is not reduced and does not exceed Council criteria for noise emission to nearby properties. A mechanical engineer is to confirm if supplementary ventilation (to meet Australian Standard AS1668.2 requirements) will be required to these rooms.

6 NOISE EMISSION CRITERIA

The noise emission from the project site shall comply with the requirements of the following documents:

- Cumberland Development Control Plan 2021; and
- NSW Department of Environment and Heritage, Environmental Protection Authority document 'Noise Policy for Industry' (NPI) 2017.

6.1 CUMBERLAND DEVELOPMENT CONTROL PLAN 2021

The Cumberland Development Control Plan 2021 contains the following controls regarding noise emissions from air conditioners and swimming pool pumps.

C12. Air conditioners, swimming pool pumps and the like are not to exceed 5dba above background noise levels and should not be audible from habitable rooms of neighbouring dwellings.

6.2 NSW EPA NOISE POLICY FOR INDUSTRY (NPI) 2017

The EPA NPI has two criteria which both are required to be satisfied, namely Intrusiveness and amenity. The NPI sets out acceptable noise levels for various localities. The policy indicates four categories to assess the appropriate noise level at a site. They are rural, suburban, urban and urban/industrial interface. Under the policy the nearest residential receivers would be assessed against the suburban criteria.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

6.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Background noise levels adopted are presented in Table 4-1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

6.2.2 Project Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The EPA's NPI sets out acceptable noise levels for various localities. The recommended noise amenity area is based upon the measured background noise levels at the sensitive receiver. Based on the measured background noise levels detailed in Table 4-1, the Noise Policy for Industry suggests the adoption of the 'suburban' categorisation.

The NPI requires project amenity noise levels to be calculated in the following manner;

 $L_{Aeq,15min}$ = Recommended Amenity Noise Level – 5 dB(A) + 3 dB(A)

The amenity levels appropriate for the receivers surrounding the site are presented in Table 6-1.

Recommended Noise Project Amenity Noise Type of Receiver Time of day Level Level $dB(A)L_{eq(period)}$ dB(A)L_{eq(15 minute)} Day 55 53 (7am - 6pm) Evening Residential – Suburban 45 43 (6pm - 10pm) Night 40 38 (10pm - 7am)

Table 6-1 – EPA Amenity Noise Levels

The NSW EPA Noise Policy for Industry (2017) defines:

- Day as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.
- Evening as the period from 6pm to 10pm.
- Night as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

6.2.3 Sleep Arousal Criteria

The Noise Policy for Industry recommends the following noise limits to mitigate sleeping disturbance:

Where the subject development / premises night -time noise levels at a residential location exceed:

- $L_{eq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{Fmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

a detailed maximum noise level even assessment should be undertaken.

Table 6-2 – Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A)L ₉₀	Emergence Level
Residences Surrounding Site Night (10pm – 7am)	32 dB(A) L ₉₀	40 dB(A)L _{eq, 15min} ; 52 dB(A)L _{Fmax}

6.3 SUMMARISED NOISE EMISSION CRITERIA

Table 6-3 - EPA NPFI Noise Emission Criteria

Receiver	Time Period	Assessment Background Noise Level dB(A)L ₉₀	Project Amenity Criteria dB(A) L _{eq}	Intrusiveness Criteria L _{eq(15min)}	NPI Criteria for Sleep Disturbance
Residential	Day (7am – 6pm)	38	53	43	N/A
	Evening (6pm – 10pm)	36	43	41	N/A
	Night (10pm – 7am)	32	38	37	40 dB(A)L _{eq, 15min} ; 52 dB(A)L _{Fmax}

The project noise trigger levels are indicated by the bolded values in the table above.

We note that noise from air conditioners, swimming pool pumps and the like are to comply also with control C12 of the Cumberland DCP which corresponds to the 'Intrusiveness Criteria' in the table above, as well as a requirement to be inaudible within habitable rooms of neighbouring dwellings.

7 NOISE EMISSION ASSESSMENT

7.1 NOISE FROM MECHANICAL PLANT WITHIN PROPOSED SITE GENERALLY

Detailed plant selection and location has not been undertaken at this stage. Satisfactory levels will be achievable through appropriate plant selection, location and if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures.

Noise emissions from all mechanical services to the closest residential receiver should comply with the requirements of Section 6.

Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels.

8 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the proposed townhouse development located at 70 - 72 Gordon Ave, South Granville NSW.

Provided that the recommendations presented in this report are adopted, internal noise levels for the development will comply with the acoustic requirements of the following documents:

- Cumberland Development Control Plan 2021;
- Australian Standard AS/NZS 3671:1989 'Acoustics—Road traffic noise intrusion—Building siting and Construction'; and
- Australian Standard AS2107:2016 'Recommended Design Sound Levels and Reverberation Times for Building Interiors.'

External noise emissions criteria have been established in this report to satisfy the requirements from the following documents:

- Cumberland Development Control Plan 2021; and
- NSW Department of Environment and Heritage, Environmental Protection Authority document 'Noise Policy for Industry' (NPI) 2017.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Pty Ltd Ross Ferraro

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APPENDIX A – UNATTENDED	NOISE MONITORII	NG DATA	

