



**ACOUSTIC
LOGIC**



1157-1165 Burwood Highway, Upper Ferntree Gully

Acoustic Assessment

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Project ID	20240474.1
Document Title	Acoustic Assessment
Attention To	TAG - Ferntree Gully Pty Ltd atf The TAG-Ferntree

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	30/05/2024	20240474.1/3005A/R0/JT	██████		██████

TABLE OF CONTENTS

1	INTRODUCTION	4
2	SITE DESCRIPTION	4
2.1	LOCAL NOISE SOURCES.....	5
3	PLANNING PERMIT.....	5
4	ENVIRONMENTAL NOISE DESCRIPTORS.....	5
5	ASSESSMENT CRITERIA	6
6	NOISE LEVEL MEASUREMENTS.....	6
6.1	MEASUREMENT EQUIPMENT	6
6.2	DATE AND TIME.....	6
6.3	MEASUREMENT LOCATIONS	6
6.4	MEASUREMENT RESULTS	6
7	EVALUATION OF EXTERNAL NOISE INTRUSION	7
7.1	RECOMMENDED GLAZING	7
7.2	ROOF CONSTRUCTION.....	8
7.3	EXTERNAL WALL CONSTRUCTION	8
8	CONCLUSION.....	9
	APPENDIX 1 – ACOUSTIC TREATMENT MARKUP	10

1 INTRODUCTION

Acoustic Logic (AL) have been engaged by TAG – Ferntree Gully Pty Ltd to undertake an acoustic assessment of the proposed childcare centre located at 1157-1165 Burwood Highway, Upper Ferntree Gully. This report addresses Condition 56 of the Planning Permit.

The following documentation have been referenced in the acoustic assessment.

Table 1 – Referenced Documents

Company	Document Reference	Date
Fd Architects Pty Ltd	Project No.: UP2404FD	17/06/2024
Knox City Council	Application No.: P/2020/6347	06/01/2023

2 SITE DESCRIPTION

The proposed development is located at 1157-1165 Burwood Highway, Upper Ferntree Gully. The proposed development is located in an area adjacent to the Belgrave passenger rail corridor and Burwood Highway. The development consists of basement carpark with 1 level of childcare rooms and play areas.

The site is bounded by Burwood Highway to the south and undeveloped land to the east and west. The Belgrave passenger rail corridor is located approximately 20m to the north of site.

Figure 1 below shows the subject site location, noise level measurement locations and surrounding area.

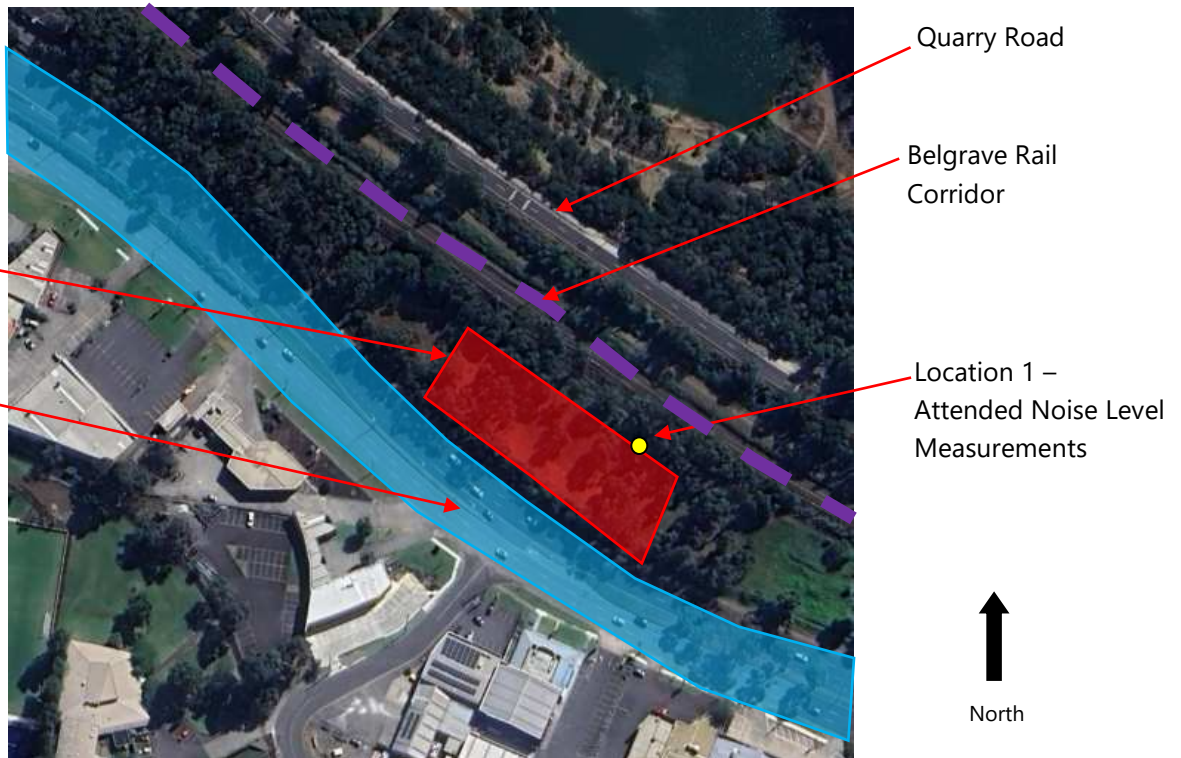


Figure 1: Site Map and surrounding area (Source: Google Maps™)

2.1 LOCAL NOISE SOURCES

Site inspection and noise level measurements indicate that the dominant noise levels at the subject site are the traffic noise levels from surrounding road networks and train passbys on the Belgrave rail corridor.

3 PLANNING PERMIT

Condition 56 of the Planning Permit (Application No.: P/2020/6347, dated 6/01/2023) prepared by Knox city Council contains the following:

- 56 Prior to the commencement of the development and any buildings and works, an Acoustic Report prepared by a suitably qualified and experienced acoustic engineer must be submitted with a recommendation for a maximum internal noise level within the child care building of 40LAeq within indoor activity areas and 35dB(A (within sleeping areas)and with recommendations for any attenuation works required to achieve the maximum internal noise level/s from rail noise impacts to the satisfaction of the Responsible Authority. The measures to achieve the maximum internal noise level within the childcare centre building must not include any external fencing or structures outside the approved building envelope.

4 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including road traffic. Accordingly, a 15-minute measurement interval is normally 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 the case of 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 depends 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 measurement period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

5 ASSESSMENT CRITERIA

Internal noise criteria applicable to the subject development has been developed based on the requirements presented in the planning permit Condition referenced in Section 3 above. Table 2 below provides a summary of the noise intrusion criteria from rail noise as described in the planning requirements.

Table 2 – Internal Noise Level Criteria for Rail Noise

Location	Required Internal Noise Level ¹
Sleeping Areas (Cot Room)	35 dB(A) $L_{eq,1hr}$
Indoor Activity Areas (Room 1-5)	40 dB(A) $L_{eq,1hr}$

Note 1: Assessment is based on furnished internal areas with façade (external windows and doors) fully closed.

6 NOISE LEVEL MEASUREMENTS

6.1 MEASUREMENT EQUIPMENT

A Norsonic Nor140 Sound Level Analyser was used for the attended noise level measurements. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-75 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

6.2 DATE AND TIME

The inspection and attended noise level measurements were conducted on the following dates:

- 3/06/2024 between 11:00am and 2:30pm.
- 4/06/2024 between 4:00pm and 5:30pm.

6.3 MEASUREMENT LOCATIONS

The music noise level measurements were conducted on the following locations:

- Location 1 – Attended noise level measurements under undertaken on the Belgrave Rail Trail to the north of the subject site approximately 15 metres from the rail line. The microphone of the sound level meter at approximately 1.5 metres above grade. The sound level meter had full view of the rail corridor.

6.4 MEASUREMENT RESULTS

The table below details the measured noise levels from the adjacent rail corridor.

Table 3 – Measured Train Noise Levels (Attended Measurements)

Measurement Location	Period ²	Measured Noise Levels ¹
Location 1	7:00am – 7:00pm	62 $L_{eq,1hr}$ dB(A)

Note 1 – Train noise L_{eq} is derived by measuring the level of multiple train pass bys and deriving a Sound Exposure Level (SEL) with 15 train pass bys measured.

Note 2 –Train pass-bys taken between 7am-7pm based on the operating hours of the facility as presented in Condition 33 of the Planning Permit

7 EVALUATION OF EXTERNAL NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows, doors and roof as these are relatively light building elements that offer less resistance to the transmission of sound. Walls that are proposed to be precast / heavy masonry elements will not require upgrading acoustically.

The measured train noise levels conducted at Location 6 have been used to predict the noise levels at the façade of the proposed building, which considered the distance between measurement location and building location.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to rail noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

The constructions set out below are necessary for the satisfactory control of external noise.

7.1 RECOMMENDED GLAZING

The minimum glazing requirements schedule for this development is detailed in **Appendix 1 – Façade Schedule**. The glass thicknesses shown in the schedule do not take into account thermal, structural, safety or any other requirements other than acoustic requirements and thus may require upgrading in some instances. In these instances, increasing the glass thickness beyond the acoustic requirement will be acceptable. Where the glazing thickness has not been specified, standard glazing will be acceptable.

Table 4 below details the minimum Rw performance requirements for the glazing assembly installed. Where open-able windows or sliding doors are installed, the total Rw performance of the system shall not be lower than the values listed in Table 4. It is noted that the system supplied shall meet the overall minimum Rw ratings nominated based on a laboratory test report for the system. If an alternative system is proposed the system shall be reviewed and will require approval by a suitably qualified acoustic consultant to ensure that the proposed system is acceptable and will ensure compliance with the nominated internal noise design criteria.

Table 4 – Minimum External Glazing Requirements / Performance

Glazing Location	Required Glazing Construction ¹	Minimum Rw of Installed Window System	Acoustic Seals ²
Refer Appendix 1 – Façade Schedule	6mm float or 6/12/6 IGU	29	Yes
	6.38mm lam or 6/12/6.38 lam IGU	31	Yes
	10.38mm lam or 6/12/10.38 lam IGU	35	Yes

Note 1 – or alternative approved by a suitably qualified acoustic consultant.

Note 2 - Mohair Seals in windows and doors are not acceptable where acoustic seals are required. Seals in these instances shall be equal to Schlegel Q-Ion.

7.2 ROOF CONSTRUCTION

Concrete roof construction will not require further treatment acoustically. Lightweight roof shall be constructed per Figure 2 below to ensure compliance with internal noise level criteria.

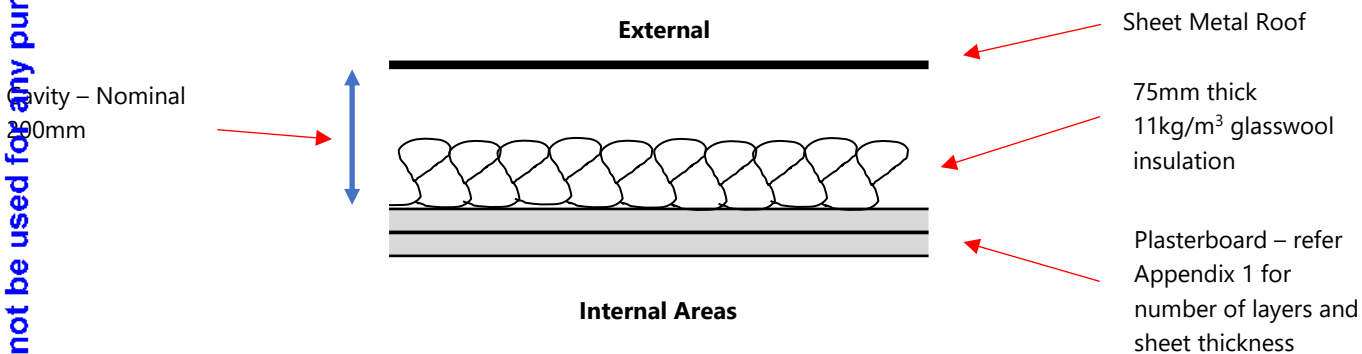


Figure 2: Lightweight External Roof Construction (Section View)

Penetrations in ceilings (such as for light fittings etc.) must be sealed gap free with a flexible sealant. Any ventilation openings in the ceilings would need to be acoustically treated to maintain the acoustic performance of the ceiling construction.

7.3 EXTERNAL WALL CONSTRUCTION

Apartment external walls that incorporates concrete or masonry elements will not require upgrading acoustically. Where the lightweight construction occurs, the construction shall be as the following figure.

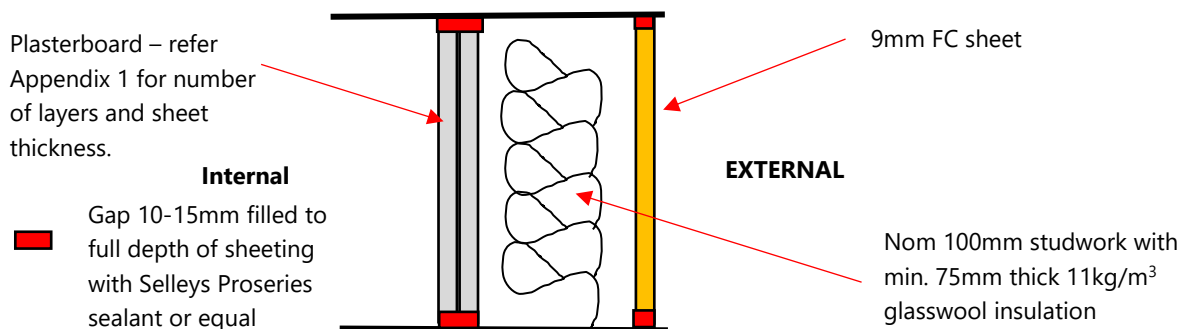


Figure 3: Lightweight External Wall Construction (Section View)

Penetrations in walls must be sealed gap free with a flexible sealant. Any ventilation openings in the walls would need to be acoustically treated to ensure compliance with the nominated design criteria.

8 CONCLUSION

This report details our acoustic assessment to address Condition 56 of the Planning Application No. P/2020/6347 requirements and external noise intrusion from rail noise into the proposed childcare centre located at 1157-1165 Burwood Highway, Upper Ferntree Gully. Provided the acoustic treatment recommendations detailed in this report are implemented, compliance with the established criteria detailed in Section 5 will be achieved which also satisfies Condition 56 of Planning Permit No. P/2020/6347 prepared by Knox City Council.

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

Yours faithfully,



Acoustic Logic Pty Ltd



APPENDIX 1 – ACOUSTIC TREATMENT MARKUP

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Acoustic Schedule

Rev. 0

Date: 18/03/2024

Minimum Glazing Thickness

- 8mm lam or 6/12/6mm IGU
- 10.38mm lam or 6/12/6.38mm lam IGU
- 10.38mm lam or 6/12/10.38mm lam IGU

Lightweight Internal Wall Construction

- 90mm FC sheet / 90mm stud with 11kg/m³ glasswool insulation / 2x13mm plasterboard
- 90mm FC sheet / 90mm stud with 11kg/m³ glasswool insulation / 1x13mm plasterboard

FOR DISCUSSION

PROJECT NO: 1157-1185 BURWOOD HIGHWAY UPPER FERNTREE GULLY
 DRAWING NO: 7
 DATE: 17/03/2024
 SCALE: 1:100



Roof Construction

- Nom. 0.48mm sheet metal roof / minimum 200mm cavity with 75mm thick 11kg/m³ glasswool insulation / 2x13mm plasterboard

Note 1 - The proposed acoustic treatment has been designed to achieve compliance with internal noise criteria presented in Section Gabove.
 Note 2 - or as approved by a suitably qualified acoustic consultant.
 Note 3 - All glazing to contain Q-Ion bulb seals or approved similar.

PROPOSED CHILDCARE CENTRE
 1157 - 1185 BURWOOD HIGHWAY, UPPER FERNTREE GULLY

SHEET TAG
 7

PROPOSED CHILDCARE CENTRE FLOOR PLAN
 DRAWING NO: 7
 DATE: 17/03/2024

