

15 February 2022

Ref: 212184R/29663

A. & K. Mackay Building P/L
c/- The Plan Centre
153 Lambton Road
Broadmeadow NSW 2292

RE: ACOUSTIC ASSESSMENT – 61 BANKS STREET, EAST MAITLAND

This letter report presents the results of an investigation of potential noise impacts at a proposed multi residential development at Lot 201, D.P. 1241484, 61 Banks Street, East Maitland, NSW. The proposed site layout is shown in **Figure 1**.

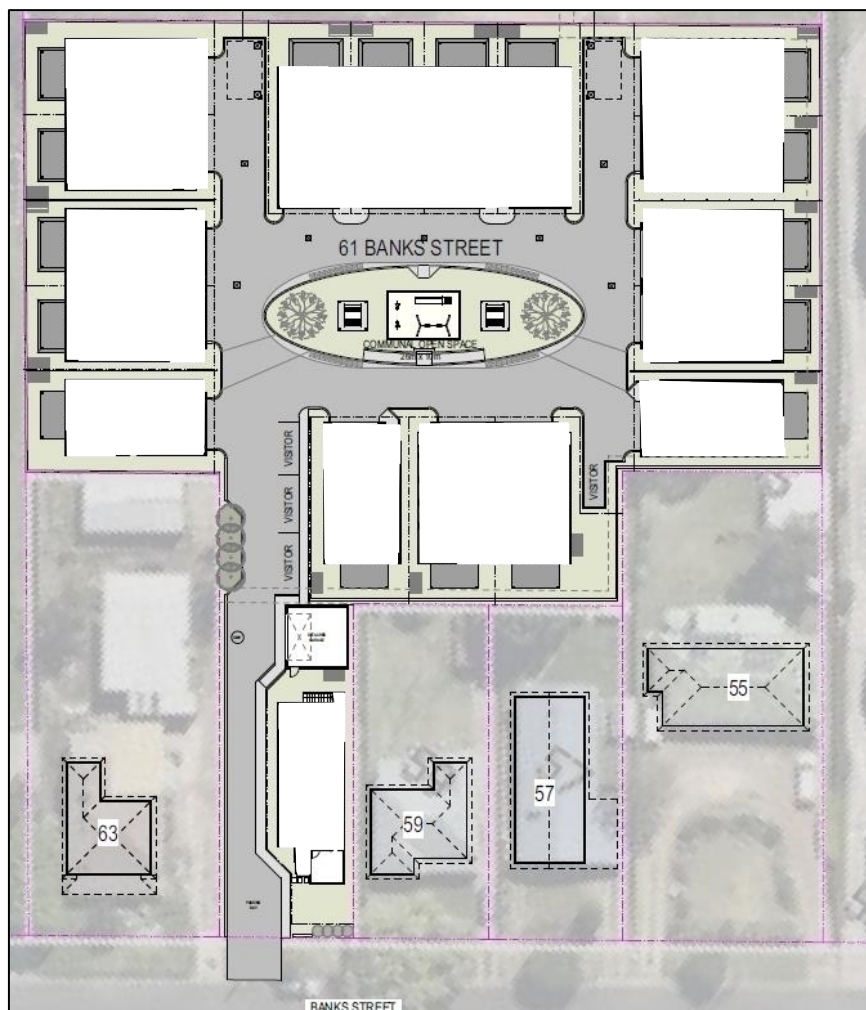


Figure 1. Project site – 61 Banks Street, East Maitland.

The assessment has been prepared to address a requirement of Maitland City Council, as reproduced below;

- *Acoustic privacy: The application must address acoustic amenity, particularly for dwellings facing vehicle areas (i.e. Unit 1).*

TRAFFIC NOISE IMPACTS

There are no specific noise criteria applicable to the noise emissions from cars using a driveway in a residential development. Environmental noise criteria in the Noise Policy for Industry (NPI), for example, are applicable externally and, therefore the application of these, would have little effect on the acoustic amenity of future residents.

In the absence of any specific environmental noise criteria then, guidance has been taken from the Office of Environment and Heritage (OEH) NSW Road Noise Policy (RNP, 2012), as adopted by the Roads and Maritime Services (RMS) of NSW. This document recommends various criteria for different road developments and uses. For new residential developments near roads, the RNP advises that land use developers must meet internal noise goals in the Infrastructure SEPP (Department of Planning NSW, 2007).

The SEPP (2007) is supported by the Department of Planning guideline “Development near Rail Corridors and Busy Roads – Interim Guideline” (2008) (Guideline) which gives the following criteria in Section 3.5:

- In any bedroom in the building: **35 dB(A), L_{eq}** at any time 10pm – 7am, and
- Anywhere else in the building (other than a garage, kitchen, bathroom or hallway): **40dB(A), L_{eq}** at any time.

These criteria originated from the Rail Infrastructure Corporation (RIC) publication “Consideration of Rail Noise and Vibration in the Planning Process” (2003) where it is explicit that the criteria apply with windows and doors closed. The criteria correspond with those in AS/NZS 2107 “Acoustics - Recommended design sound levels and reverberation times for building interiors”.

Figure 2 is a reproduction of Figure B2 from the Guideline showing a hypothetical situation of a dwelling adjacent to a busy road. Acoustic consultants often use the Guideline (and Figure B2 specifically) in recommending architectural modifications to achieve appropriate internal noise levels.

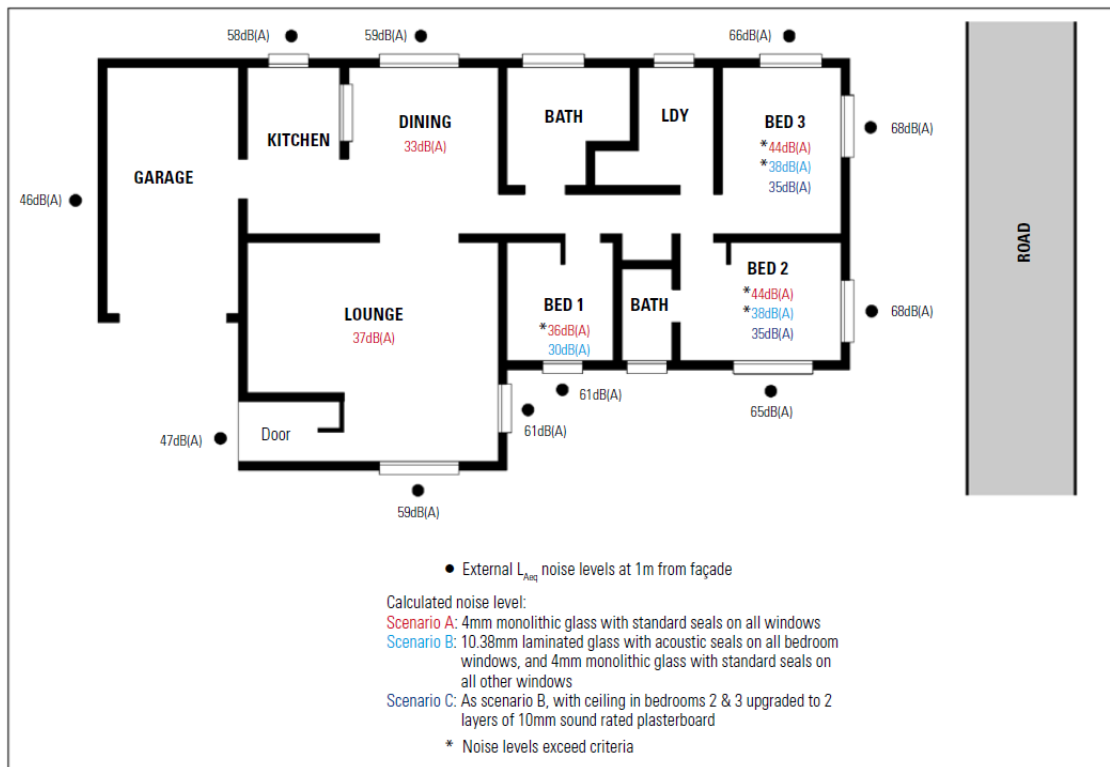


Figure 2. Traffic noise reduction for various construction types.

Figure 2 shows that typical building construction with standard window glazing provides a 24dB reduction of traffic noise.

Vehicle moving around within the development, and passing any of the units, will have similar noise emissions to that of traffic on a typical, quiet suburban road. There are 18 units in the development, each with two car parking spaces. As a worst case, a scenario has been considered where 36 cars left the site in a single one hour period.

For vehicles travelling at 10kph and with a sound power level of 90 dB(A), this equates to a received noise of 55 dB(A) Leq (1 hr) at a an average distance of 5m from the vehicles. This implies an internal traffic noise level of 31 dB(A) Leq (1 hr) in rooms facing the driveway, as detailed below:

<u>Driveway noise</u>	<u>Reduction</u>	<u>Internal level</u>
55 dB(A),Leq (1hr)	24 dB	31 B(A),Leq (1 hr)

It is, therefore, shown, that under the worst case assessed conditions, the predicted Leq noise emissions from vehicles levels using the driveway are below the acceptable internal noise criteria by 4dB(A) Leq (1hr) for bedrooms and 9 dB(A) Leq (1 hr) for other living spaces.

Rooms with windows not directly facing the driveway would experience lower internal noise levels. Similarly, lower traffic flows, either in total, or past any particular window would be significantly reduced from the predicted levels shown. Based on this analysis, standard building construction and glazing, in all proposed residences, will achieve the traffic noise levels recommended in the Guideline.

In discussing the potential for adverse noise impacts, however, it is also useful to consider the references in practise notes accompanying the NPfl in relation to sleep disturbance impacts during the night time period (i.e. between 10pm and 7am). The sleep disturbance criteria specifically relate to Lmax noise levels.

The practise notes lead to the following conclusions;

- *Maximum internal noise levels below 50-55 dB(A) are unlikely to cause awakening reactions.*
- *One or two noise events per night, with maximum internal noise levels of 65-70 dB(A), are not likely to affect health and wellbeing significantly.*

It can be assumed from the above conclusions that disturbance to sleep may be minimised by ensuring that internal maximum noise levels do not exceed 50 to 55 dB(A). It is also accepted by EPA, and generally, that the noise loss through an open window to the centre of a room is at least 10 dB.

Under these circumstances the maximum acceptable external noise level, to prevent disturbing people from their sleep, would therefore be in the range 60 to 65 dB(A) at the facade of a bedroom.

The potential for sleep disturbance may come from noise from cars entering or leaving an individual unit or on the driveway, with the maximum noise relating to accelerating or revving of engines. The sleep disturbance assessment relates to the noise from a single car and is not dependent upon the number of vehicles.

The results of the assessment of sleep disturbance impacts are shown in **Table 1**. The calculation was made to the outside of a bedroom window in one of the proposed units, at an assumed distance of 5m from the vehicle.

TABLE 1 RECEIVED NOISE (Lmax) – CAR IN DRIVEWAY dB(A) Lmax	
Item	Proposed Units
Sound Power Level (Lmax)	90
Distance Loss to Receiver	-22 (@5m)
Received Noise (Lmax)	68
Screening Level (Lmax)	60 to 65

The results in Table 1 show that, under the assessed conditions, the maximum noise levels from cars in the driveway may exceed the sleep disturbance screening criterion. That is, the predicted noise level at the most exposed bedroom windows in the proposed units may be in the range where internal noise levels could result in sleep disturbance.

The acoustically weak point in any building facade is, typically, through glazing that faces towards a noise source. It is recommended that, to ensure an adequate internal acoustic amenity in the bedrooms, the windows be fitted with minimum 6.38mm laminated glass, or acoustically similar. This assumes the windows to be closed.

In the current development the minimum glazing requirement would be applicable to the glass sliding doors to Bedroom 1 in Units 2 to 18 and to the windows to both bedrooms in Unit 1.

The design of the Units must ensure that they can achieve the ventilation requirements in the BCA with the bedroom windows closed.

The remainder of the facades will incorporate brick veneer and external cladding with an inner plasterboard lining which is acoustically adequate in the current circumstances.

The front doors to each unit open to entry foyers, so there are no specific acoustic requirements for these.

The floor construction is to be a concrete slab on the ground which will be acoustically adequate.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

SPECTRUM ACOUSTICS PTY LIMITED



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