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North Penrith Development Stage 1 Traffic Noise Assessment

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1 INTRODUCTION

This report presents our review of traffic noise exposure of the North Penrith Stage 1A homes. Refer to the Stage 1 Lot Layout site plan 07210L15[13] for the locations. Traffic noise impact on Lot 1221 was previously assessed in a separate report by Acoustic Logic.

This review is based on the following documents:

Table 1 – Referenced Documents

Author	Document	Drawing Number	Dated
Craig and Rhodes	Site Plan	07210L15[13]	20/06/11
Benbow Environmental	Noise and Vibration Assessment (NVA)	N/A	19/10/10
Parsons Brinckerhoff	North Penrith Development Transport Mobility and Accessibility Plan (TMAP)	N/A	29/10/10
Landcom	Thornton Design Guide	N/A	June 2012

2 SITE DESCRIPTION

The subject site relates to four distinct zones:

- Residences adjoining Correen Avenue;
- Residences adjoining Sydney Smith Drive (the main entrance road);
- Residences surrounding the village oval on the ring road; and
- Residences not covered by one of the above.

Each of these will be addressed separately.

3 TRAFFIC NOISE EXPOSURE

For preparation of the NVA, unattended noise monitoring was undertaken at a number of locations on the overall North Penrith development site.

3.1 FUTURE FACADE NOISE LEVELS

The predicted flow on Sydney Smith Drive is 2000-3000 vehicles per day (Reference: Figure 18 of TMAP). Based on the road design diagrams within the TMAP and the project design drawings, using CORTN modelling, the predicted noise level at the residential façade of sites only affected by Sydney Smith Drive is 58dB(A) L_{eq} .

From the NVA, the predicted noise level at the residential façade facing Coreen Avenue is 70dB(A).

Based on the above, the following table presents the façade noise level within the various zones.

Table 2 – Predicted Noise Levels at Residential Receivers

Location	Noise Level dB(A)	Time of Day	
		Day (7am–10pm)	Night (10pm-7am)
Coreen Avenue Facade	Average $L_{eq(worst\ 1hr)}$	70	59
Northern End of Sydney Smith Drive		64	<59
Northern Façade in Bartlett Place		66	<59
Sydney Smith Drive South Façade and around Village Oval		58-61	<59

*Refer to Markup attached for Zone Locations

4 INTERNAL NOISE GOALS

In accordance with the NVA, the project internal goals for road traffic noise are as follows:

Table 3 – Residential Internal Noise Goals

Room Type	Internal Noise Goals dB(A)	
	Day (7am – 10pm)	Night (10pm – 7am)
Bedroom	40 $L_{eq(15hour)}$	35 $L_{eq(9hour)}$
Living Room	40 $L_{eq(15hour)}$	40 $L_{eq(9hour)}$

5 REVIEW

The internal noise levels of the property will be primarily as a result of noise transfer through the roof, windows and entry doors. This is due to the relatively light building elements used, which offer less resistance to the transmission of sound.

Any noise transferred through masonry wall elements will not be significant and does not need be considered further.

The future land owners can choose to build whatever style of dwelling they wish provided the proposal complies with the relevant Council requirements and the Thornton design guideline. This could include an elevated single storey, a double storey, etc., possibly with light weight facades or very large glazed areas and so on. These design variations make it impossible to nominate precise, cost effective treatments for all those future dwellings without considering the dwelling design as a whole. It also means that acoustic screening installed at subdivision stage is of limited benefit, as the later design decisions of the future builder may prove it ineffective.

The following sections present indicative treatments to dwellings in Zones 1 to 4, which could be followed by a future resident in construction of their dwelling for compliance with the internal noise goals. The typical building type chosen for the determination of indicative treatments is based on the construction of nearby dwellings and the Thornton Design Guide.

In the event that a proposed dwelling does not fit within the assumed constructions presented in this section (for the applicable Zone), the future resident will need to undertake a noise intrusion assessment into their proposed dwelling for compliance with the internal noise as presented in table 3.

The following assumptions are common to each case:

- Any roof/ceiling or wall penetrations acoustically treated to maintain the acoustic performance of the element.
- Total glazed area of a bedroom or living area (i.e. any habitable room) is up to 40% of the floor area unless a particular area ratio is presented in the Zone recommendations.
- 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.
- Penetrations in walls must be sealed gap free with a flexible sealant.
- Entry doors should be installed with all gaps minimised, but acoustic seals are not required.
- Glazed doors should be installed in accordance with the glazing requirements presented in the relevant zone.

5.1 ZONE 1 – CORREEN AVENUE

The particular constructions relevant to this zone are as follows:

- Standard construction brick veneer external walls (provided there are no vents on the internal skins of external walls) or an acoustically equivalent alternative determined by an acoustic consultant;
- Pitched concrete tile roof with bulk insulation within a large airgap ceiling cavity that is typically formed, with a 16mm plasterboard ceiling; OR
- Pitched metal deck roof with bulk insulation within a large airgap ceiling cavity that is typically formed, with a double layer 16mm plasterboard ceiling.

Based on the above constructions, the following glazing requirements apply:

- For a bedroom, with a total glazed area up to 40% of the floor area, 10.38mm Laminated glazing with acoustic seals, and not less than STC of 35 for the glass/frame system.
- For a bedroom, with a total glazed area up to 15% of the floor area, 6.38mm Laminated glazing with acoustic seals, and not less than STC of 31 for the glass/frame system.
- For a lounge room with a total glazed area up to 40% of the floor area, 12.38mm Laminated glazing with acoustic seals, and not less than STC of 37 for the glass/frame system; OR
- For a lounge room with a total glazed area up to 25% of the floor area, 10.38mm Laminated glazing with acoustic seals, and not less than STC of 35 for the glass/frame system.

For dwellings which are two storey, with brick veneer construction for the ground floor and the first 1m (nominal) of the first floor and light weight wall construction above 1m to the roof height, the following constructions apply to those rooms on the first floor:

- Light weight external wall construction – 2x9mm fibre cement sheeting externally, min 92mm stud with min 75mm thick 11kg/m³ glasswool insulation in the cavity (thicker if required for thermal concerns), and 2x16mm plasterboard lining internally;
- For a bedroom or living area, with a total glazed area up to 15% of the floor area, 10.38mm Laminated glazing with acoustic seals, and not less than STC of 35 for the glass/frame system.
- For a bedroom or living area, with a total glazed area up to 25% of the floor area, 12.38mm Laminated glazing with acoustic seals, and not less than STC of 37 for the glass/frame system.

Note: Roof/ceiling constructions remain as nominated above.

5.2 ZONE 2 – SYDNEY SMITH DRIVE NORTH AND BARTLETT PLACE

The particular constructions relevant to this zone are as follows:

- Standard construction brick veneer external walls (provided there are no vents on the internal skins of external walls); OR

- Light weight external walls consisting of external cladding equal to 9mm fibre cement, minimum 92mm stud with bulk cavity insulation and 2x16mm plasterboard internal lining;
- Pitched concrete tile roof with bulk insulation within a large airgap ceiling cavity that is typically formed, with a 13mm plasterboard ceiling; OR
- Pitched metal deck roof with bulk insulation within a large airgap ceiling cavity that is typically formed, with a 16mm plasterboard ceiling.

Based on the above constructions, the following glazing requirements apply:

- For a bedroom, with a total glazed area up to 40% of the floor area, 6.38mm Laminated glazing with acoustic seals, and not less than STC of 31 for the glass/frame system.
- For a bedroom, with a total glazed area up to 25% of the floor area, 6mm Float glazing with acoustic seals, and not less than STC of 29 for the glass/frame system.
- For a lounge room with a total glazed area up to 40% of the floor area, 10.38mm Laminated glazing with acoustic seals, and not less than STC of 35 for the glass/frame system; OR
- For a lounge room with a total glazed area up to 25% of the floor area, 6.38mm Laminated glazing with acoustic seals, and not less than STC of 31 for the glass/frame system.

5.3 ZONE 3 – SYDNEY SMITH DRIVE SOUTH

The particular constructions relevant to this zone are as follows:

- Standard pitched concrete tile or metal deck roof with plasterboard ceiling and insulation in the roof/ceiling cavity is acoustically acceptable without upgrade.
- Standard construction external light weight walls with cavity insulation are acoustically acceptable.

Based on the above constructions, the following glazing requirements apply:

- For a bedroom facing Sydney Smith Drive and for lots 1201 and 1212 facing North, with a total glazed area up to 40% of the floor area, 6mm Float glazing with acoustic seals, and not less than STC of 29 for the glass/frame system; OR
- For a bedroom not facing Sydney Smith Drive (except Northern façade of lots 1201 and 1212), 4mm Float glazing without acoustic seals can be used.
- For a lounge room facing Sydney Smith Drive and for lots 1201 and 1212 facing North, with a total glazed area up to 40% of the floor area, 4mm Float glazing with acoustic seals, and not less than STC of 27 for the glass/frame system; OR
- For a lounge room not facing Sydney Smith Drive (except Northern façade of lots 1201 and 1212), 4mm Float glazing without acoustic seals can be used.

5.4 ZONE 4 – REMAINING AREAS

Standard building constructions are acoustically acceptable.

6 CONCLUSION

An acoustic review of the traffic noise intrusion into Stage 1 has been conducted.

ALC have presented in this report indicative treatments to a typical building type (based on the construction of nearby dwellings), which could be followed by a future resident in construction of their dwelling in each Zone.

In the event that a proposed dwelling deviates from the typical constructions presented in section 5 (for the applicable Zone), the future resident will need to undertake a noise intrusion assessment for compliance with the project internal noise goals presented in Section 4.

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

Yours faithfully,

A handwritten signature in cursive script that reads "Pearce".

Acoustic Logic Consultancy Pty Ltd
Hilary Pearce

Acoustic Logic Consultancy
 North Penrith - Stage 1A
 Traffic Noise Assessment
 Zone Markup
 Pearce 20/6/13.

Zone 4 Remaining
 Zone 3
 Zone 2
 Zone 1

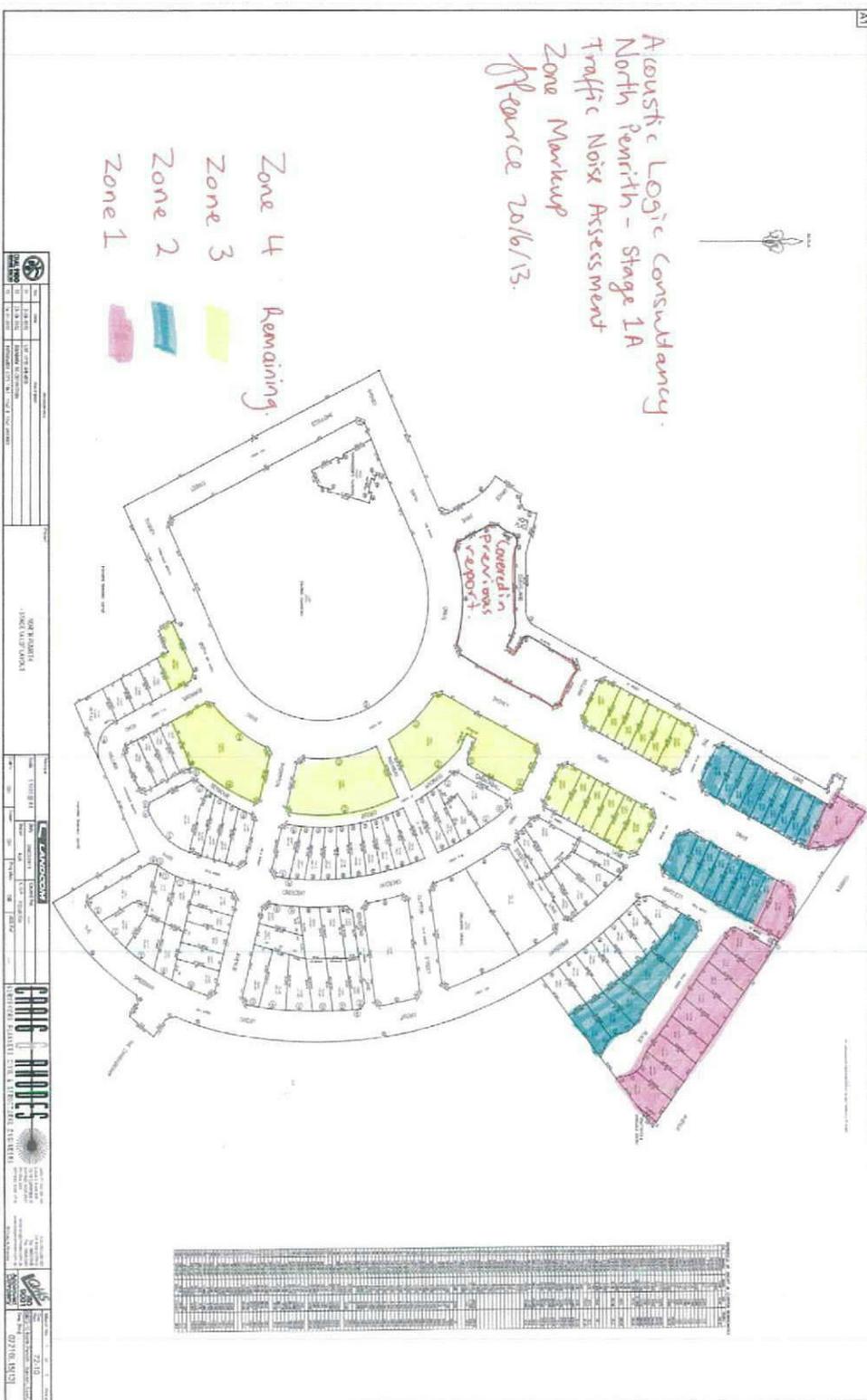


Figure 1 - Zone Markup