ACOUSTIC LOGIC CONSULTANCY
noise and vibration consultants
abn 11 068 954 343

4 March, 2009

Report: 2009167/0902A/R0/TA

Prepared for: Meriton

BUILDING E

3 – 5 PYMBLE AVE, PYMBLE

PROPOSED RESIDENTIAL DEVELOPMENT

TRAFFIC NOISE ASSESSMENT

Directors Matthew Palavidis | Victor Fattoretto | Matthew Carter | Matthew Shields

Sydney | Ph 02 8338 9888 | fax 02 8338 8399 | 9 Sarah Street Mascot NSW 2020
Melbourne | Ph 03 9614 3199 | fax 03 9614 3755 | Level 7, 31 Queen Street Melbourne VIC 3000
Canberra | Ph 02 6162 9797 | fax 02 6162 9711 | Unit 14/71 Leichhardt Street Kingston ACT 2604

TABLE OF CONTENTS

1. INTRODUCTION

This report presents our assessment of the potential impact of traffic noise on the acoustic amenity of the proposed residential development to be situated at 3 - 5 Pymble Avenue, Pymble for the future occupants of Building E.

Traffic noise intrusion will be assessed within the development in accordance with Ku-ring-gai Municipal Council Development Control Plan.

As the building will be of concrete/masonry construction, the predominant noise path requiring assessment will be through the glazing. The glazing constructions required to exclude traffic noise are recommended based on noise levels measured around the site to comply with the relevant assessment criteria.

2. DESCRIPTION OF THE PROPOSAL

2.1 PROPOSED DEVELOPMENT

The proposed development is located at 3 - 5 Pymble Avenue, Pymble. The north eastern façade faces Pacific Hwy, which is a 6 lane road carrying high volumes of vehicular traffic, while the south eastern façade is facing Pymble Avenue, which is 2 lane roadway and carries low volumes of vehicular traffic. The remaining façades of proposed residential development are bound by other residential premises. A detailed site illustration is presented in Figure 1.

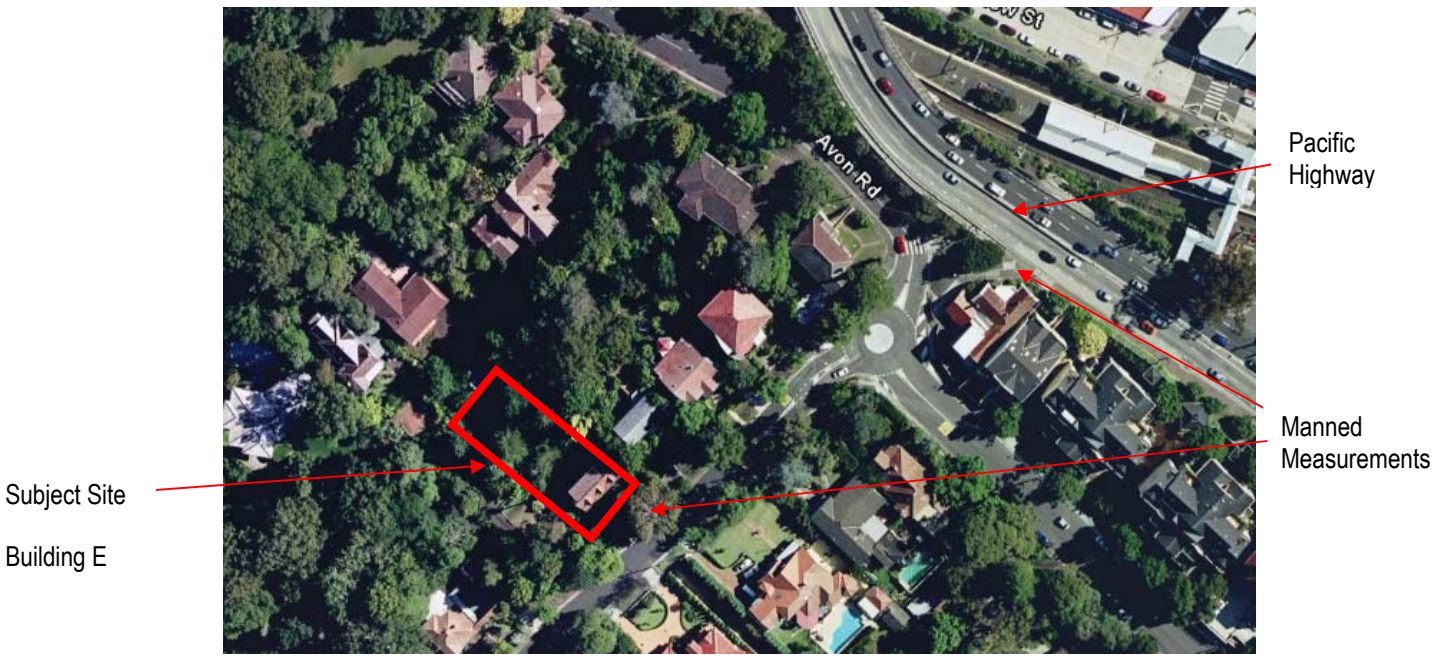

Figure 1 - Site Map

3. NOISE OBJECTIVE

This assessment has been conducted in accordance with the Ku-ring-gai Municipal Council Development Control Plan and EPA Environmental Criteria for Road Traffic Noise requirements. The Ku-ring-gai Municipal Council DCP states new developments should be:

"Set back 14 metres to main and arterial roads unless the design incorporates noise attenuation measures addressed by an acoustic report to demonstrate internal compliance with 40dba. Compliance with Environmental Protection Authority/Roads and Traffic Authority/State Rail Authority noise standards where a site fronts a busy road or railway."

The DECC/EPA Environmental Criteria for Road Traffic Noise sets out further criteria:

"Sleeping areas are usually the most sensitive to noise impact, so in the absence of any local codes internal levels of 35–40 dB(A) at night are recommended."

The following summary of criteria obtained from the Ku-ring-gai Municipal Council Development Control Plan and EPA Environmental Criteria for Road Traffic Noise is established:

Table 1 – Internal Noise Level Criteria

Internal Space	Time Period	Noise Level dB(A)L_{eq}
Living Areas	Day (7am to 10pm)	L_{Aeq} ≤40 (24hr)
Sleeping Areas	Day (7am to 10pm)	L_{Aeq} ≤40 (15hr)
Sleeping Areas	Night (10pm to 7am)	L_{Aeq} ≤35 (9hr)

4. TRAFFIC NOISE ASSESSMENT

4.1 TRAFFIC NOISE MEASUREMENTS

Measurements were performed generally in accordance with the Australian Standard AS 1055 - Description and measurement of environmental noise - General Procedures.

4.1.1 Measurement Positions

An unmanned noise monitor was installed along Pacific Hwy at 2 Clydesdale Place, Pymble. The location of the noise monitor was approximately 8 metres set back from Pacific Hwy carriage way.

Manned noise measurements were taken 3 meters from Pacific Hwy with full view of the carriage way and adjacent to the building envelope of the subject development on Pymble Avenue.

4.1.2 Time of Measurements

Unmanned noise measurements were conducted between the period of 13 February and 19 February 2008. Manned measurements were conducted on the morning of February 8, 2009 during the peak morning period.

4.1.3 Measurement Equipment

Unmanned traffic measurements were conducted using an Acoustic Research Laboratories Pty Ltd noise monitor. The monitor was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of the measurements using a Rion NC-73 calibrator; no significant drift was detected. Measurements were taken on A-weighted fast response mode.

Manned noise measurements were obtained using a CEL-593 precision sound level analyser. The analyser was set to fast response and calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was noted.

4.2 TRAFFIC NOISE DESCRIPTORS

Traffic noise constantly varies in level, due to fluctuations in traffic speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level.

To accurately determine the effects of traffic noise a 15-20 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. These parameters are used to measure how much annoyance would be caused by a particular noise source.

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 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 traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of traffic noise.

Current practice favours the L_{eq} parameter as a means of measuring traffic noise, whereas the L_{10} parameter has been used in the past and is still incorporated in some codes. For the reasons outlined above, the L_{90} parameter is not used to assess traffic noise.

4.3 MEASURED NOISE LEVELS

The measured traffic noise levels have been presented in the attached Appendix A while the processed 9 hour and 15 hour noise levels of each period have been presented in Table below.

Table 1 - Measured and Predicted Noise Levels

Location	dB(A)L_{eq} (15Hr)	dB(A)L_{eq} (9hr)
3m from Pacific Hwy	74	70*

*Predicted noise level based on logger data and manned noise measurement.

5. EVALUATION OF NOISE INTRUSION

External noise intrusion into the proposed development was assessed using the measured traffic noise levels. The assessment is based on the architectural drawings 08128 SK101-106 and 08128 SK201 - 202.

Calculations were performed taking into account the orientation of windows, roof area barrier effects *(where applicable)*, the total area of glazing, facade transmission loss and room sound absorption characteristics. In this way the likely interior noise levels can be predicted.

5.1 RECOMMENDED CONSTRUCTIONS

5.1.1 Glazing Constructions

The recommended glazing assemblies are indicated in the Table 2. They are all assumed as aluminium awning windows and doors. In all cases, the selected glazing type reduces internal noise levels to within the nominated criterion for the various space types.

The proposed glazing thickness will satisfy all acoustic requirements of Section 3. 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. Glazing to all units not listed in the Table may be 4mm thick float or 5mm toughened glass for windows and doors, respectively, no acoustic seals required.

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.

Table 2 Recommended Glazing for Windows and Doors

Level	Apartment	Room Type	Glazing Thickness	Acoustic Seals
All Levels	All	Bedrooms	4mm float	Yes
2 & 3	All	Living	6mm float	Yes
4 & 5	X02, X03, X04	Living	6.38mm laminated	Yes
	X01, X05	Living	6.38mm laminated	Yes
6	602, 603	Living	10.38mm laminated	Yes
	601, 604	Living	6.38mm laminated	Yes
7	701, 702	Living	6.38mm laminated	Yes

In addition to complying with the minimum scheduled glazing thickness, the STC rating of the glazing fitted into openable frames and fixed into the building opening should not be lower than the values listed in Table 3 for all rooms. Where nominated, this will require the use of acoustic seals around the full perimeter of openable frames and the frame will need to be sealed into the building opening using a flexible sealant. Note that all these windows are assumed as aluminium awning windows and mohair seals in windows and doors are not acceptable where acoustic seals are required. Where acoustic seals are required, then seals shall be equal to Schlegel Q-lon.

Table 3 – Minimum STC of Glazing

Glazing Assembly	Acoustic Seals	Minimum STC of Installed Window
4mm	Yes	27
6mm	Yes	29
6.38mm Laminated	Yes	31
10.38mm Laminated	Yes	34

5.1.2 Roof/ ceiling constructions

The roof consists of a concrete slab with insulation underneath and will not require any upgrading to meet internal acoustic objectives.

5.1.3 Walls

External walls consist of precast concrete construction and will not require upgrading in order to achieve the internal noise level objectives.

6. CONCLUSION

This report presents the results of an assessment of traffic noise intrusion into Building E of the proposed residential development to be situated at 3 - 5 Pymble Avenue, Pymble.

Noise levels were measured at the site and the results have been used to determine the minimum glazing requirements in order to comply with Ku-ring-gai Municipal Council Development Control Plan requirements for internal noise levels within residential accommodation. Provided the construction requirements set down in Section 6 of this report are implemented for the residential apartments, noise levels will comply with the criteria recommended in Section 3 of this report.

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

Report prepared by

ACOUSTIC LOGIC CONSULTANCY PTY LTD

Tom Aubusson

APPENDIX 1

UNMANNED TRAFFIC NOISE MEASUREMENTS