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(DHCS)

BRADDON MIXED USE DEVELOPMENT PROJECT

ASSESSMENT OF ENVIRONMENTAL NOISE IMPACT

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1. INTRODUCTION

This report presents our assessment of the potential impact of environmental noise (specifically traffic noise) on the acoustic amenity of the proposed mixed use development Braddon.

As the building will typically be of concrete and masonry construction, the noise path requiring assessment will be through the glazing.

The glazing assemblies required to exclude environmental noise (including traffic and noise from the nearby licensed club) has been assessed and are recommended based on noise levels measured at the site in this report.

2. PROJECT LOCATION

The proposed development is located in Braddon, ACT bound by Cooyong Street, Currong Street, Donaldson Street and Ainslie Avenue.

Noise which will potentially impact the development includes noise generated from traffic movements on surrounding streets which carry medium to low traffic volumes and noise generated from the operation of The Braddon Club on the corner of Donaldson and Cooyong Streets.

3. 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 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 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 intrusion.

4. 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 MEASUREMENT LOCATION

Traffic noise was measured at a number of locations surrounding the site at the future façades of the proposed site.

4.2 TIME OF MEASUREMENTS

The traffic noise was conducted using attended measurements on the 28th May, 2010 during a typical afternoon peak period of 4pm to 5pm..

4.3 MEASUREMENT EQUIPMENT

A Norsonics type SA110 Sound Analyser was used for the noise measurements. 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.

4.4 MEASURED NOISE LEVELS

Table 1 lists the measured L_{eq} levels that occurred at site. Noise level measurements were obtained during the peak afternoon period of 4.00pm to 5pm during periods when traffic noise was at its greatest.

Table 1 - Measured Traffic Noise Levels

MONITORING LOCATION	L_{eq} dB(A)
Cooyong Street	68
Donaldson Street	67
Ainslie Avenue	67
Currong Street	65

5. CLUB NOISE MEASUREMENTS

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

5.1 MEASUREMENT LOCATION

Club noise was measured at the potentially worst affected location of the future site on the corner of Cooyong Streets and Donaldson Streets.

5.2 TIME OF MEASUREMENTS

Club noise was conducted using attended measurements on the 28th May, 2010 during a typical Friday evening period of 8.30pm to 9.30pm..

5.3 MEASUREMENT EQUIPMENT

A Norsonics type SA110 Sound Analyser was used for the noise measurements. 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.

5.4 MEASURED NOISE LEVELS

Table 1 lists the measured L_{eq} levels that occurred at site from The Braddon Club. Noise level measurements were obtained during the peak Friday evening period of 8.30pm to 9.30pm noise was at its greatest.

Table 2 - Measured Club Noise Levels

MONITORING LOCATION	L_{eq} dB(A)
Corner Cooyong and Donaldson Streets	66

6. PROJECT ACOUSTIC OBJECTIVES

The determination of an acceptable level of environmental noise within the apartment spaces requires consideration of the activities carried out within the space and the degree to which noise will interfere with those activities

Within residential developments the activities most affected by traffic noise are the ability to sleep, talk, read and communicate. Internal noise levels have been specified at a level which will not interfere with the internal residential areas in conjunction with the recommended levels within the Australian Standard AS2107:2000.

This section of the report includes the investigation into traffic and club noise which potentially impacts the site.

6.1 ENVIRONMENTAL NOISE OBJECTIVES

Internal environmental noise levels have been assessed in accordance with the criteria specified in Table 3 below, which complies with the Australian standards AS-2107 2000 and AS-3671 2000 and project criteria.

Table 3 - Traffic Noise Level Objectives

LOCATION	NOISE LEVEL dB(A)
Living Areas	35
Bedrooms	40

7. EVALUATION OF NOISE INTRUSION

Environmental noise intrusion into the future development was assessed using the measured external noise levels reported in Sections 4 and 5 above as a basis.

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

8. RECOMMENDED CONSTRUCTIONS

8.1 GLAZING CONSTRUCTIONS

The recommended glazing assemblies are indicated in Table 4. In all cases, the selected glazing type reduces internal noise levels to within the nominated criterion for the various space types. The recommended glazing has been designed to control traffic noise intrusion.

The glazing thicknesses recommended are those needed to satisfy acoustic requirements and do not take into account other requirements such as structural, safety or other considerations. These additional considerations may require the glazing thickness to be increased beyond the acoustic requirement.

Table 4 - Recommended Glazing

LEVEL	LOCATION	GLAZING	ACOUSTIC SEALS
All Levels	All Facades	6mm float/ 12mm air gap / 6mm float	Yes
		OR 6mm Laminated	Yes

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the STC rating of the glazing assembly below the values nominated in Table 5. Note that mohair type seals will not be acceptable for the windows requiring acoustic seals.

The proposed suppliers should provide evidence that the window systems proposed have been tested in a registered laboratory with the recommended glass thicknesses and comply with the minimum STC requirements listed in Table 5.

Table 5 - Minimum STC of Glazing

Glazing Assembly	Acoustic Seals	Minimum STC of Installed Window
6mm float/ 12mm air gap / 6mm float	Yes	30
6mm Laminated	Yes	30

8.2 ROOF/ CEILING CONSTRUCTIONS

External metal deck roof or concrete construction will be sufficient to control traffic noise intrusion.

9. BUILDING SERVICES NOISE

As detailed building services selections have not been conducted at this time, an acoustic assessment of noise impact can not be conducted.

A detailed services noise assessment will be conducted once plant selections and services drawings have been finalised as part of the construction documentation. Based on experience with similar development acoustic treatments are both possible and practical using acoustic treatments such as lining of ductwork, acoustic silences, variable speed controllers, time switches, acoustic screens etc.

Based on previous experience compliance with criteria detailed in this report is both possible and practical and will insure noise impacting on surrounding receivers does not reduce their acoustic amenity using treatments such as lined ductwork, acoustic screens, variable speed controllers and the like.

Details of acoustic treatments will be provided at the construction certificate stage of the development.

Building services noise will be assessed to ensure noise impact to neighbouring receivers complies with the Environment Protection Act 1997 (the Act) and Environment Protection Regulations 2005 (the Regs). As the development is located within the Braddon with residential properties the relevant zone is G which has the following acoustic criteria.

Table 6 - External Noise Level Criteria Environmental Noise Emissions

Noise Zone	Zone Noise Standard dB(A) L ₁₀			
	Mon – Sat 7am – 10pm	Mon – Sat 10pm – 7am	Sun and Public holidays 8am – 10pm	Sun and Public holidays 10pm – 8am
Zone G – Surrounding Residential Properties	45	35	45	35

10. CONCLUSION

This report provides an evaluation of traffic noise intrusion into the proposed mixed use development at Braddon, Canberra.

Provided the glazing construction as recommended in Section 8 are implemented, internal noise levels will comply with the internal noise criteria given in Sections 4 and 5 of this report, and fully comply with the development approval conditions.

External noise level criteria for the operation of the proposed building have also been presented.

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

Report prepared by

A handwritten signature in black ink that reads "B.G. White." The signature is written in a cursive, slightly slanted style.

ACOUSTIC LOGIC CONSULTANCY PTY LTD

Ben White