REVERB ACOUSTICS

Noise and Vibration Consultants

Aircraft Noise Impact Assessment
Residential Development
34-36 Light Street & 42 Walker Street
Casino NSW

July 2023

Prepared for Brewster Murray Architects Pty Ltd
Report No. 23-2880-R1

Building Acoustics-Council/EPA Submissions-Modelling-Compliance-Certification

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1 INTRODUCTION

Reverb Acoustics has been commissioned to conduct an aircraft noise impact assessment for a proposed residential development at 34-36 Light Street and 42 Walker Street, Casino. The assessment has been conducted following the principles and procedures detailed in AS2021-2015, "Acoustics, Aircraft noise intrusion-building siting and construction".

The Assessment was requested by Brewster Murray Pty Ltd to form part of and to support an Application to NSW Planning & Environment Land & Housing Corporation, and to ensure any noise control measures required for the development are incorporated during the design stages.

2 TECHNICAL REFERENCE / DOCUMENTS

Beranek, L.L and Istvan, L.V. (1992). *Noise and Vibration Control Engineering.* John Wiley and Sons, Inc.

Gréhant B. (1996). *Acoustics in Buildings.* Thomas Telford Publishing.

Harris, C.M. (ed) (1957). *Handbook of Noise Control.* New York, McGraw-Hill.

AS 1276.1-1999 *"Acoustics – Rating of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation"*.

International Civil Aviation Organisation. (1993). *Environmental Protection, Volume I, Aircraft Noise.*

AS 2021-2015 *"Acoustics – Aircraft noise intrusion – building siting and construction"*.

Rw Ratings. *Pilkington, Boral, CSR, Insulation Solutions, Lafarge catalogues, based on NATA laboratory test data.*

Plan supplied by Brewster Murray Pty Ltd, Rev B, 14 April 2023. Note that variations from the dwelling design supplied to us may affect the acoustic recommendations.

A Glossary of commonly used acoustical terms is presented in Appendix A to aid the reader in understanding the Report.

3 CRITERIA

Aircraft noise impact assessments are conducted in accordance with the requirements and procedures detailed in AS 2021-2015 “Acoustics - Aircraft Noise Intrusion - Building Siting and Construction”. No ANEF or ANEC charts can be identified in relation to aircraft activities at the Aerodrome. However, building site acceptability can be determined in accordance with the requirements of AS 2021-2015. Table 1 shows the design internal sound levels, applicable to houses, hotels, flats and caravan parks, taken from Table 3.3 of AS 2021-2015, which must be used for assessment purposes.

Table 1 - Extract from Table 3.3 AS 2021-2015.

Building Type and Activity	Indoor Design Sound Level, dB(A), Lmax
Houses, home units, flats, caravan parks	
Sleeping areas, dedicated lounges	50
Other habitable spaces	55
Bathrooms, toilets, laundries	60

4 METHODOLOGY & ANALYSIS

LAmax noise levels at the site are determined with reference to AS2021-2015, by determining the offset distances from the runway(s) at the Aerodrome, as shown below:

- Perpendicular Distance from runway centreline (DS), i.e. 425m.
- Distance from closest end of runway to the intersection of the extended runway centre-line and the perpendicular line passing through the site (DL), i.e. 720m.
- Distance from other end of runway to the intersection of the extended runway centre-line and the perpendicular line passing through the site (DT), i.e. 2100m,

Lmax aircraft noise levels due to take-offs and landings have been sourced from Tables 3.52-3.57 of AS2021-2015. The predicted maximum noise levels of **74-76dB(A),Lmax** for Cessna 182 are the highest, which have been adopted for the closest exposed building facade at the site.

Section 2.3 of AS2021-2015 defines various actions based on building site classifications, detailed below:

"*Acceptable"* for construction of a particular building type with no need for the building construction to be designed to provide protection against aircraft noise.

"Conditionally Acceptable" Acceptable for construction of a particular building type, providing the aircraft noise attenuation to be expected from the proposed construction is determined in accordance with Clause 3.3 of the Standard

"Unacceptable" construction of the building should not normally be considered.

Appendix E of AS2021-2015 recommends that where an aerodrome is confined to a small number of civil, non-jet aircraft movements, building site acceptability is to be determined using Table E1, AS2021-2015. Reference to the Table confirms that noise levels are below accepted upper limits, based on <30 flights each day at the aerodrome, i.e. <80dB(A),Lmax. Therefore the site is classified as "acceptable" for residential development and no special acoustic modifications will be necessary.

TABLE E1

BUILDING SITE ACCEPTABILITY BASED ON AIRCRAFT NOISE LEVELS*

Number of flights per day	Aircraft noise level expected at building site, dB(A)		
	Acceptable	Conditionally acceptable	Unacceptable
House, home unit, flat, caravan park, school, university, hospital, nursing home			
>30	<70	70–75	>75
15–30	<80	80–85	>85
<15	<90	90–95	>95
Hotel, motel, hostel, public building			
>30	<75	75–80	>80
15–30	<85	85–90	>90
<15	<95	95–100	>100
Commercial building			
>30	<80	80–85	>85
15–30	<90	90–95	<95
<15	<100	100–105	>105

* The values in Table E1 are based on a small aerodrome with a small number of civil, non-jet aircraft movements. They should not be used in any other circumstances.

5 CONCLUSION

An aircraft noise impact assessment has been completed for a proposed residential development at 34-36 Light Street and 42 Walker Street, Casino, resulting in noise control recommendations contained in Section 4 of this Report.

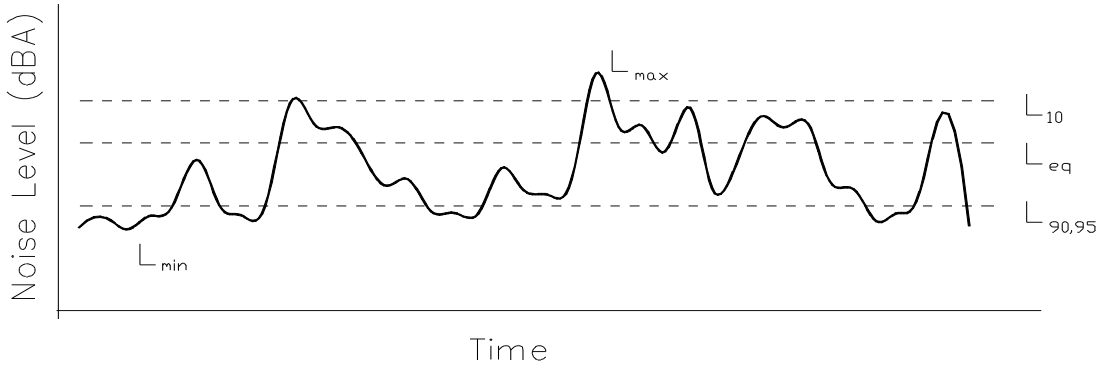
An assessment of aircraft noise impacting upon the development has confirmed that no special acoustic features need to be incorporated into the design to comply with the requirements of the AS2021-2015. We therefore see no acoustic reason why the proposal should be denied.

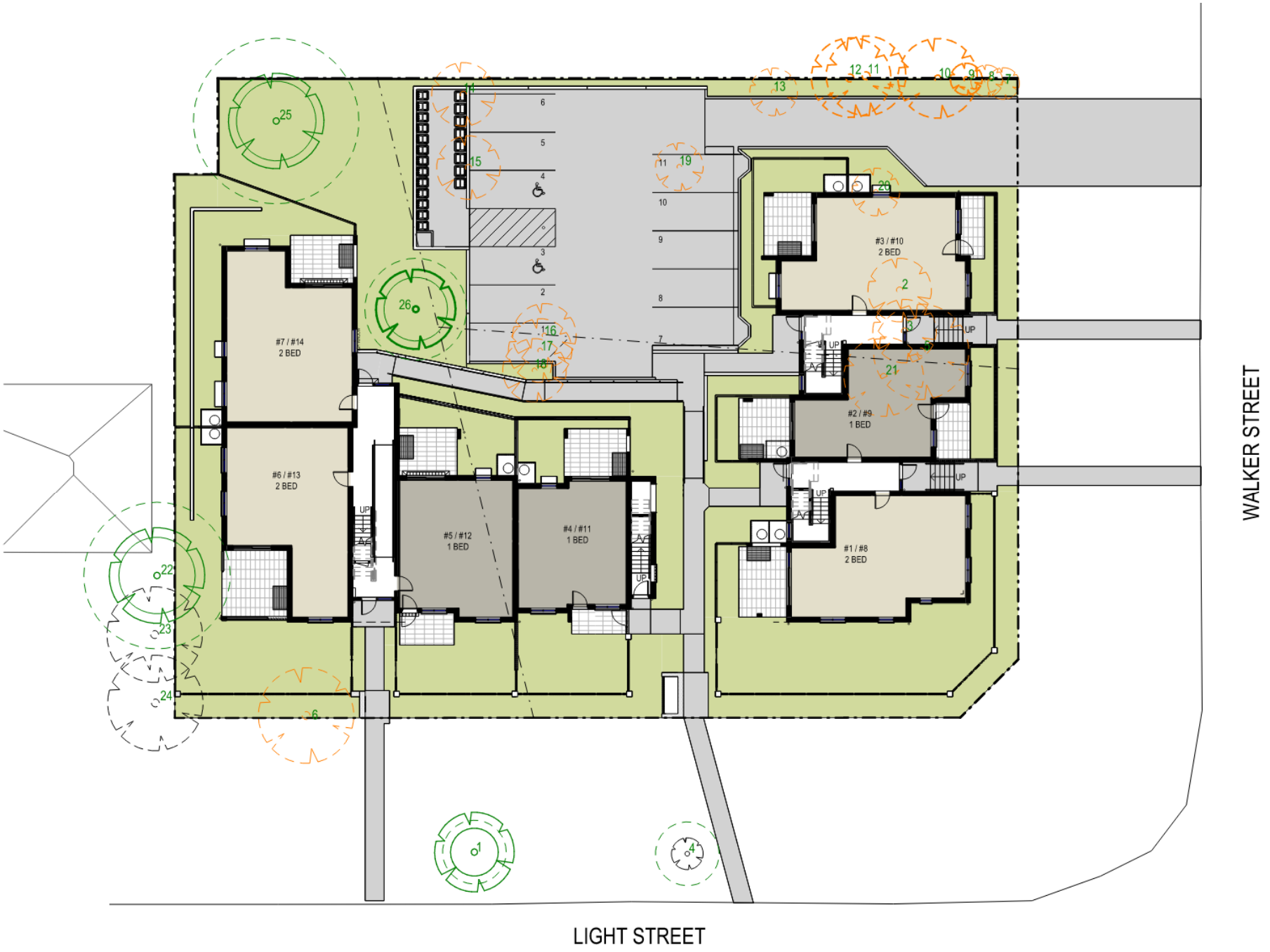
Steve Brady M.A.S.A. A.A.A.S.
Principal Consultant

Appendix A
Definition of Acoustic Terms

Definition of Acoustical Terms

Term	Definition
dB(A)	A unit of measurement in decibels (A), of sound pressure level which has its frequency characteristics modified by a filter ("A-weighted") so as to more closely approximate the frequency response of the human ear.
Rw	Weighted Sound Reduction Index. The ability of a partition to attenuate sound, in dB. Given as a single number representation.
Leq	Equivalent Continuous Noise Level - which, lasting for as long as a given noise event has the same amount of acoustic energy as the given event.
L90	The noise level which is equalled or exceeded for 90% of the measurement period. An indicator of the mean minimum noise level, and is used in Australia as the descriptor for background or ambient noise (usually in dBA).
Lmax	The maximum level for the measurement period (usually in dBA)

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UP
WALKER STREET
LIGHT STREET