acouras CONSULTANCY

Monument Design Partnership

Lot B 17 Haig Avenue, Georges Hall

Aircraft Noise Assessment

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1 Introduction

The following report has been prepared by Acouras Consultancy on behalf of Monument Design Partnership to assess the potential for impact from aircraft noise with the proposed dwelling located at Lot B 17 Haig Avenue, Georges Hall. The existing residence is in a suburban area surrounded by existing residential buildings.

2 Aircraft Noise Intrusion

For in insulation of sound intrusion from external noise sources, the Australian Standard AS 2021-2015 requires the residential development be designed to meet the following internal noise levels.

Table 1 – AS2021 Noise Intrusion Criteria

Space	AS2021 Maximum L_{Amax} dB
Sleeping areas, dedicated lounges	50
Other Habitable Areas	55
Bathrooms, toilets, laundries	60

Based on our visit to the development site, the dominate noise level are from aircraft flyovers near the site. Applying the procedure given in the Australian Standard to assess aircraft noise flyovers the following Table 2 provides the distance co-ordinates relative to Bankstown Airport runways.

Table 2 – Distance Co-ordinates from Bankstown Airport

	Runway (11L/29R)
DS (m)	220
DT (m)	1,990
DL (m)	880

Using the above co-ordinates, aircraft noise levels given in standard indicates that the highest L_{Amax} level at this site are from the single engine aircraft (GASEPF) take-off, such as a Beech Baron 58P or Cessna 182H.

Table 3 – Maximum Noise Level of Aircraft Flyovers, L_{max} dBA

	Northern Runway (11L/29R)	L_{max} dBA
Take off	General Aircraft-Cessna 182H	84

3 Assessment and Recommendations

3.1 Façade Glazing Requirements

Acoustic glazing for the dwelling is given in Table 4 are required to reduce noise impact on the internal occupants and should result in noise levels within such units in accordance with the Australian Standard AS 2021-2015

Table 4 – Schedule of Window and Glazing (R_w)

Space	Glazing Thickness	Minimum R_w (Glazing+Frame)
Lounge, kitchen & dining	Single: 10.38mm laminated DGU: 10.38mm lam/12mm airgap/6mm	32
All Bedrooms	Single: 12.5mm laminated (Viridian) DGU: 10.76mm VLam/12mm airgap/8.5mm VLam	37
Ensuite	Single: 6.38mm laminated DGU: 6mm/12mm airgap/6mm	30

All Windows/doors should be well sealed (air tight) when closed with good acoustic seals around the top and bottom sliders. Mohair seals are not considered to be acoustic seals.

3.2 Building Façade Construction

To provide sufficient acoustic attention of noise, the general external construction of the proposed building would need to be constructed as detailed in Table 5.

Table 5 – External Façade Construction (R_w)

Building Element	Proposed Construction	Minimum R_w
External Wall	• External brick veneer with internal plasterboard cavity wall. • Insulation as per thermal requirements.	45
Roof and ceiling	• Flat metal roof with thermal insulation. • 1x13mm fire-rated (Fyrchek) or Soundchek plasterboard suspended ceiling. • Roof cavity filled with 75-100mm thick acoustic insulation (11kg/m^3).	45
External Door (if required)	• 30-35mm solid core door. • Acoustic perimeter seals (such Raven RP10) and drop seals (such as Raven RP38) for the bottom of the door with a compatible threshold plate.	25

4 Conclusion

An aircraft noise acoustic assessment of the proposed dwelling has been carried out in accordance with the requirements of Canterbury Bankstown Council and the Australian Standard AS 2021-2015.

Construction for glazing, external walls and the roof/ceiling systems have been provided to achieve the internal noise criteria and are detailed in Section 3.1 and Section 3.2 based on the impact of aircraft noise.

Providing the recommendations in this report are implemented, the impact of aircraft noise for the proposed dwelling is predicted to comply with acoustic requirements of Council the Australian Standard.

Appendix A – Acoustic Terminology

Decibel, dB: A dimensionless unit which denotes the ratio between two quantities that are proportional to power, energy or intensity. One of these quantities is a designated reference by which all other quantities of identical units are divided. The sound pressure level in decibels is equal to 10 times the logarithm (to the base 10) of the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 micro Pascals.

A-WEIGHTING: A measure of sound pressure level designed to reflect the response of the human ear, which does not respond equally to all frequencies. To describe sound in a manner representative of the human ear's response it is necessary to reduce the effects of the low and high frequencies with respect to medium frequencies. The resultant sound level is said to be A-weighted, and the units are in decibels (dBA). The A-weighted sound level is also called the noise level.

Sound Pressure Level, L p (dB), of a sound: 20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 micro Pascals. Sound pressure level is measured using a microphone and a sound level meter, and varies with distance from the source and the environment.

Ambient Noise/Sound: All noise level present in a given environment, usually being a composite of sounds from many sources far and near. Traffic, HVAC, masking sound or even low-level background music can contribute to ambient level of noise or sound.

Percentile Level - L 90 , L 10 , etc: A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, e.g. L 90 is the level which is exceeded for 90% of a measurement period. L 90 is commonly referred to as the "background" sound level.

Background Noise (L 90): The sum total of all unwanted residual noise generated from all direct and reflected sound sources in a space that can represent an interface to, or interfere with good listening and speech intelligibility.

Rating Background Level – RBL: Method for determining the existing background noise level which involves calculating the tenth percentile from the L A90 measurements. This value gives the Assessment Background Noise Level (ABL). Rating Background Level is the median of the overall ABL.

L AEQ,T : Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

Appendix B – Architectural Drawings

This assessment was based on the following architectural drawings provided by Monument Design Partnership.

Drawing	Issue	Date	Description
DA.00	A	20/10/2023	Coversheet
DA.06	A	20/10/2023	Ground Floor
DA.07	A	20/10/2023	First Floor
DA.08	A	20/10/2023	Roof Plan
DA.03	A	20/10/2023	Elevations North & South
DA.10	A	20/10/2023	Elevations East & west
DA.11	A	20/10/2023	Sections 1 & 2
DA.12	A	20/10/2023	Sections 3 & 4