

Astra Aerolabs BAE Precinct, Williamstown

Demountable Building and Guardhouse Aircraft Noise Impact Assessment

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Attention To	Built (NSW) Pty Limited

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1 INTRODUCTION

This report presents the results of our investigation and assessment of aircraft noise impacts into the proposed BAESA Precinct Entry Works Development on the Astra Aerolab subdivision, including the Guardhouse and demountable office building.

Aircraft noise intrusion into the proposed development have been assessed in accordance with the requirements of Australian Standard AS:2021–2015 "*Aircraft Noise Intrusion – Building Siting and Construction*".

This assessment is based on the architectural drawings provided by DesignInc, dated 25/11/24.

2 ASSESSMENT OF AIRCRAFT NOISE

2.1 SITE EVALUATION

The acceptability of aircraft noise exposure is assessed using Australian Standard AS 2021-2015 "Aircraft Noise Intrusion - Building Siting and Construction".

The standard sets criteria for allowable levels of aircraft noise exposure depending on the proposed land use for the site being assessed.

The acceptability of a site in terms of aircraft noise exposure is assessed using the Australian Noise Exposure Forecast System (ANEF). Three basic parameters influence perception of aircraft noise: the frequency of aircraft movements overhead, the noise level and duration of individual aircraft movements, and the time of the day in which they occur. ANEF was developed to provide a rating system that reflects actual human response to these factors so that the noise exposure of a particular location can be readily assessed.

The proposed site is located between the ANEF 35 and 40 contour, based on the Royal Australian Air Force (RAAF) Base Williamtown & Salt Ash Air Weapons Range contour 2025 map presented in Figure 1 below.

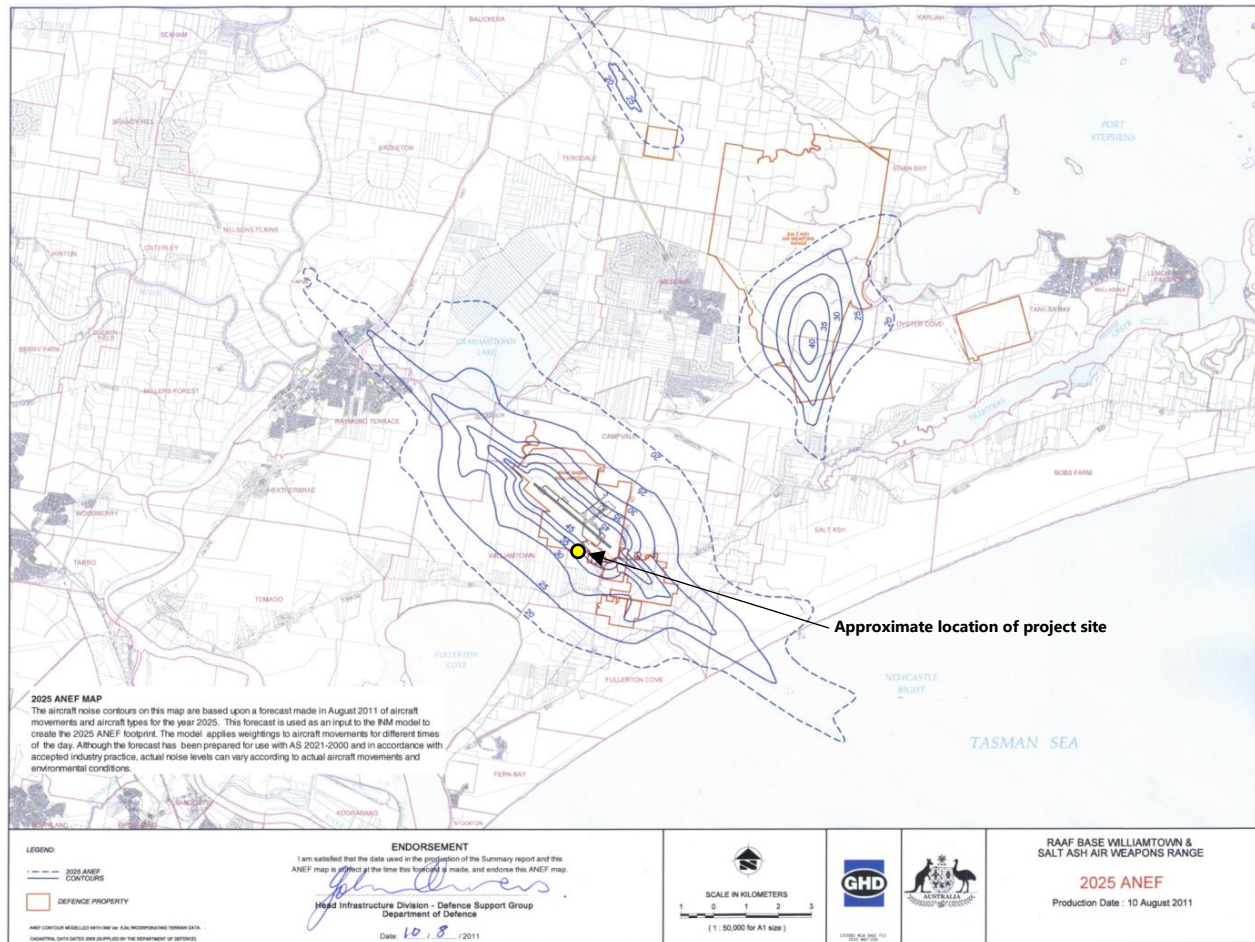


Figure 1: RAAF Base Williamtown & Salt Ash Air Weapons Range 2025 ANEF Map

2.2 INTERNAL NOISE CRITERIA FOR COMMERCIAL BUILDINGS AND OFFICES

AS2021 states that a full evaluation of internal noise levels should be carried out for locations with an aircraft noise exposure close to or exceeding ANEF 20. This full evaluation requires an examination of likely levels of internal noise from aircraft flyovers.

AS2021 stipulates the internal noise levels listed in the Table 1 below for commercial buildings/offices. These levels will be used to assess aircraft noise intrusion into the office areas of the development.

Table 1 – Indoor Design Sound Levels for Aircraft Noise Reduction Assessment

ACTIVITY	INDOOR DESIGN SOUND LEVEL FROM AIRCRAFT FLYOVER, dB(A) $L_{max}(Slow)$
Drafting, open offices	65dB(A)

2.3 EXTERNAL AIRCRAFT NOISE LEVELS

An unattended noise monitor was used to measure the loudest typical aircraft movement from the Williamstown RAAF Base between Tuesday, 26th November 2024 to Tuesday, 3rd December 2024. The unattended noise monitor was located within the vacant block of land where the guardhouse and demountable building will be constructed. Refer to Figure 2 below for an aerial markup of the monitoring location.

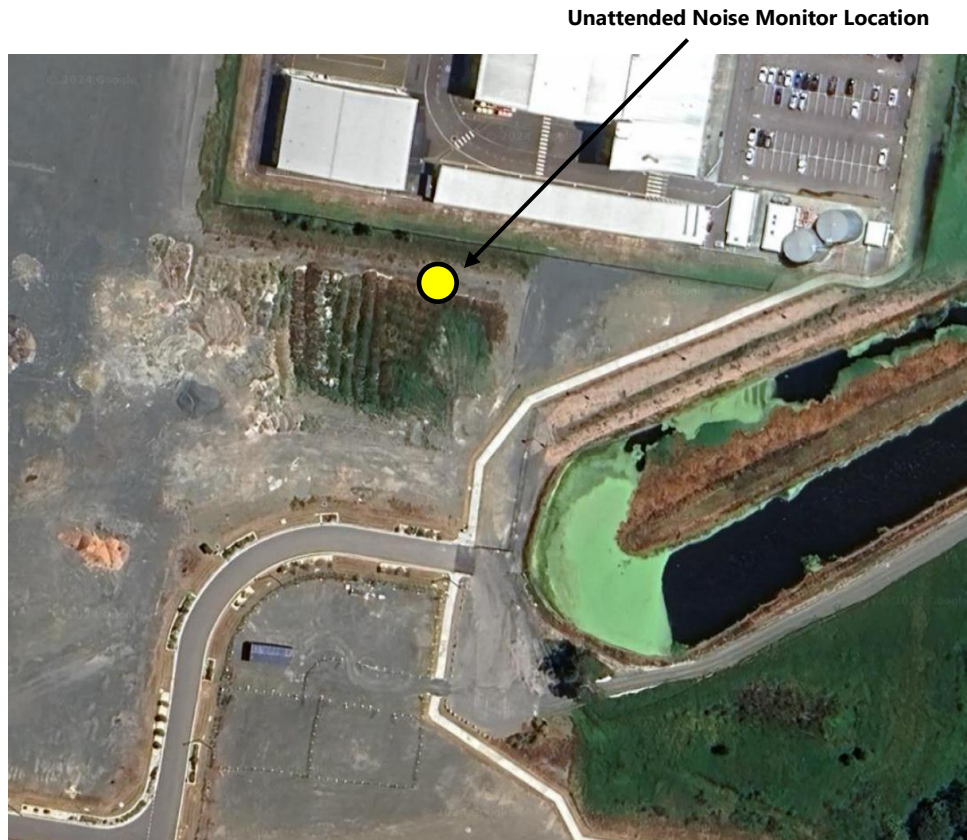


Figure 2: Unattended Noise Monitoring Location

Unattended aircraft noise measurements were obtained using an Acoustic Research Laboratories Pty Ltd noise monitor. The monitor has been programmed to store 15-minute statistical noise levels throughout the monitoring period. The noise monitor was calibrated at the beginning and the end of the measurement period using a Rion NC-73 calibrator. No significant drift was detected. All measurements were taken on A-weighted slow response mode.

The measured loudest typical aircraft movement at the site is 97 dB(A) $L_{\text{max(slow)}}$. This noise level will be used to predict the resultant internal noise levels.

3 INTERNAL NOISE LEVELS

3.1 METHODOLOGY

Internal noise levels will primarily be as a result of noise transfer through the roof, walls, windows and doors as these are relatively light building elements that offer less resistance to the transmission of sound.

The predicted noise levels through the roof, walls, windows and doors are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to aircraft noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

3.2 RECOMMENDED CONSTRUCTIONS

The following constructions are recommended to comply with the noise objectives stated in Table 1.

3.2.1 Glazed Windows and Doors

The window glazing proposed for this project is listed below in Table 2. The windows will be satisfactory provided they meet the criteria listed below.

The proposed glazing thickness will satisfy all acoustic requirements of AS2021. 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.

Table 2 - Recommended Glazing Constructions (Windows, Glass Doors and Skylights)

Building	Space	Glazing types	Glazing Thickness	Acoustic seals
Demountable Building	Open Office	All	12.38mm Laminated	Yes
Guardhouse			10.38mm / 100mm Airgap / 6mm	

In addition to complying with the minimum scheduled glazing thickness, the R_w rating of the glazing fitted into operable frames and fixed into the building opening should not be lower than the values listed in Table 3 in all areas. Where nominated, this will require the use of acoustic seals around the full perimeter of operable frames and the frame will need to be sealed into the building opening using a flexible sealant. Note that mohair seals in windows and doors are **not** acceptable where acoustic seals are required. 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 R_w requirements listed in Table 3, and that they will be constructed and installed in a manner equal to the test samples.

Table 3 - Minimum R_w of Glazing

Glazing Assembly	Acoustic Seals	Minimum R_w of Installed Glazing
12.38mm Laminated	Yes	37
10.38mm / 100mm Airgap / 6mm		43

3.2.2 External Entry Doors

Any glazed door or glazed panels set into solid doors should be constructed using glazing thickness as specified in table 2. Full perimeter acoustic seals around the doors are required.

Any timber external doors shall be a minimum 45mm solid core timber with Raven RP10 to the top and sides and Raven RP38 to the underside of the door.

3.2.3 External Walls

External walls are proposed to be constructed from brick/masonry elements for the guardhouse and lightweight elements for the demountable building, therefore; acoustic upgrading is required. In the event of any required penetration thru the external skin of the external wall, it should be acoustically sealed to ensure acoustic performance is maintained.

Table 4 – External Light Weight Wall Construction

Building	Space	Internal Lining	Studwork System	External Lining
Demountable Building	Open Office	2x16mm Plasterboard	Minimum 90mm thick stud cavity with 75mm thick 14kg/m ³ glass wool insulation in cavity	2 x 9mm thick Fibre Cement Sheeting + 0.5mm thick sheet metal cladding
Guardhouse	Open Office	1x13mm Plasterboard		1 x 110mm brickwork

3.2.4 Roof / Ceiling Construction

Proposed roof/ceiling construction is from lightweight elements. Acoustic upgrading is required to meet internal noise requirements.

Table 5 – External Light Weight Roof Construction

Building	Space	Internal Lining	Truss System	External Lining
Demountable Building	Open Office	1x16mm Plasterboard	Minimum of 250mm truss with 75mm thick 14kg/m ³ glass wool insulation in cavity	0.5mm Metal Deck Sheeting
Guardhouse	Open Office	1x16mm Plasterboard		0.5mm Metal Deck Sheeting

3.2.5 Ventilation

AS2021-2015 requires the installation of ventilation or air conditioning system where aircraft noise exposure exceeds ANEF 20. As internal noise levels cannot be achieved with windows open it is required that an alternative outside air supply system or air conditioning be installed in accordance with AS 1668.2 requirements. Any mechanical ventilation system that is installed should be acoustically designed such that the acoustic performance of the recommended constructions are not reduced by any duct or pipe penetrating the wall/ceiling/roof. Noise emitted to the property boundaries by any ventilation system shall comply with Council requirements.

4 CONCLUSION

Aircraft noise intrusion from aircraft flyovers of the RAAF Base Williamtown over the proposed Astra Aerolabs Demountable Building and Guardhouse, have been assessed to determine the required acoustic treatment that will result in internal noise levels complying with the internal noise level recommendations given in AS 2021-2015.

Provided that the acoustic recommended treatments set out in Section 3 of this report are adopted, noise impacts on future occupants from the RAAF Base Williamtown will be satisfactory.

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

Yours faithfully,

A handwritten signature in black ink, appearing to read 'S. Nichols'.

Acoustic Logic Pty Ltd
Shane Nichols