

21 October 2016

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McCloy Raymond Terrace Pty Ltd
P.O. Box 2214
Dangar NSW 2309

RE: AIRCRAFT NOISE ASSESSMENT – 42 AND 44 REES JAMES ROAD, RAYMOND TERRACE

This letter report presents the results of an aircraft noise impact assessment conducted in accordance with requirements and procedures detailed in AS/NZS 2021-2000 “Acoustics-Aircraft Noise Intrusion-Building Siting and Construction” (the Standard).

The proposal is to develop a residential subdivision at Lot 3 DP 1107061 and Lot 2 DP 223418, 42 to 44 Rees James Road, Raymond Terrace. This location is defined in the RAAF endorsed plans as being in the 20 to 25 range in the 2025 ANEF contours for the Newcastle Airport and RAAF Base, Williamtown (“RAAF Base Williamtown and Salt Ash Weapons Range (SAWR) ANEF”, GHD, Appendix E Figure 2, 10 August 2011) as shown in **Figure 1**. A provisional lot layout for the subdivision and the approximate location of the 20 ANEF contour is shown in **Appendix I**.

Under these circumstances, Port Stephens Council (PSC) would require an acoustic assessment prior to approval of a Development Application for a residence in the subdivision.

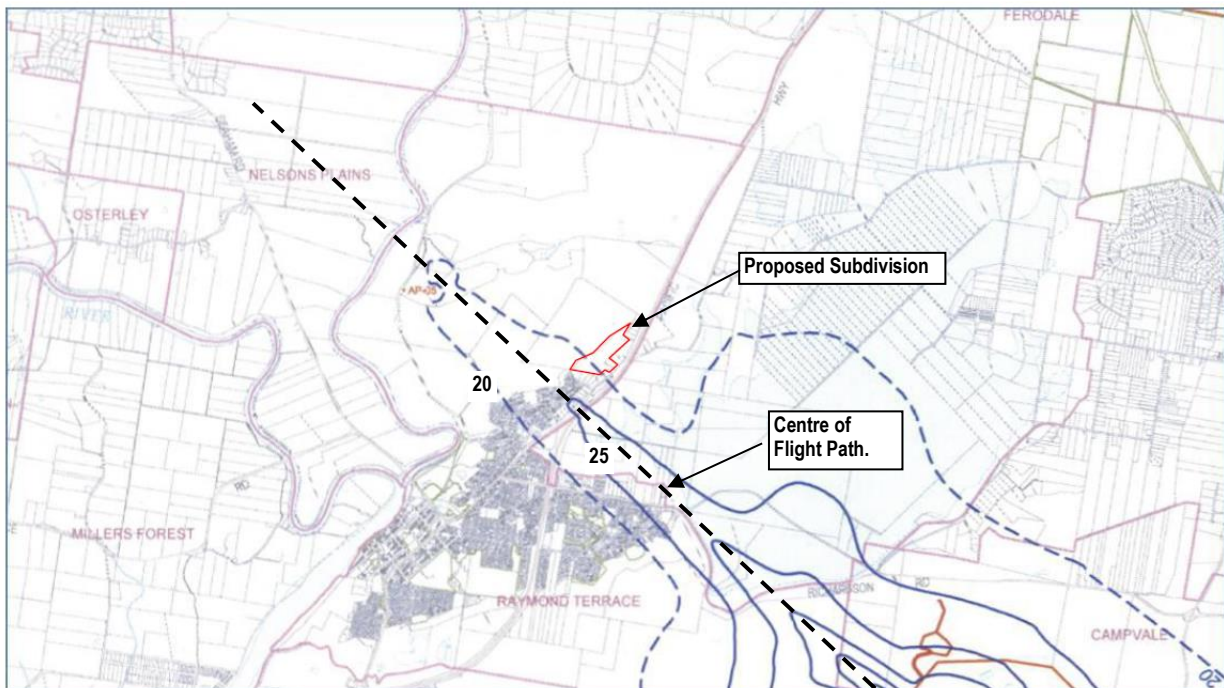


Figure 1. Approximate location of the proposed subdivision (2025 ANEF)

NOISE ASSESSMENT

Figure 1 shows that part of the subdivision site is located between the ANEF 20 and 25 contours for 2025 and, therefore, fits the description of “conditionally acceptable” for residential development in accordance with Table 2.1 of the Standard. The “conditional” stature of the location requires that attenuation of Lmax (maximum) aircraft noise levels should be considered in the design of the building.

Note that the following discussion relates to those lots which lie within the 20 to 25 ANEF. That is, the south-eastern part of the proposed subdivision as shown in Appendix I. It must also be noted that the contour as marked on the plan in Appendix I is approximate only and must not be relied upon to determine noise impacts. The definite location of the ANEF in relation to housing lots should be confirmed by survey.

The ANEF contours define a calculated noise exposure zones. The area between the 20 to 25 contours is regarded as conditionally acceptable for residential purposes. Lots outside of the 20 contour are regarded as unconditionally acceptable for residential development and do not require specific acoustic assessment of proposed construction. This does not imply that aircraft noise levels in this zone are inaudible, or even significantly lower. The Lmax noise from aircraft flyovers will decrease incrementally with increasing distance from the flight path.

Table 1 shows design indoor aircraft noise levels as specified in Table 3.3 of the Standard.

TABLE 1 Extract from Table 3.3 of AS 2021-2000	
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

The alignment of the flightpath is NW to SE and the proposed subdivision site is located to the south of it as shown in Figure 1.

Maximum aircraft noise levels have been previously published (2009) for the Joint Strike Fighter (JSF) aircraft at Williamtown. Whilst these noise levels have not been redefined based on the modified flight paths announced in August 2011, and used to determine the 2025 ANEF, information provided by the RAAF has detailed a series of management procedures designed at reducing potential impacts.

The revised ANEF (for 2025) indicates that that the 25 contour has effectively been “shifted” by about 5 dB (see the variation in ANEF 25 between the 2012 and 2025 contours on Figure 2).

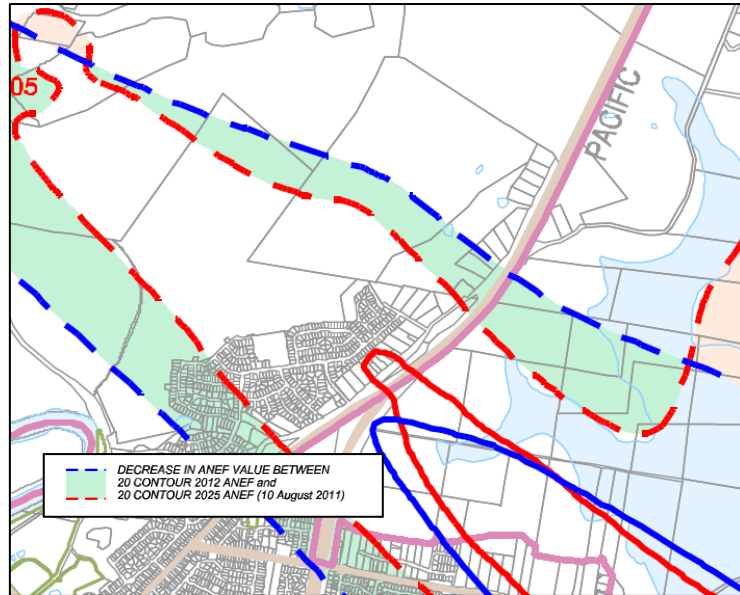


Figure 2. Variation between ANEF for 2012 and 2025

Interpreting the changes in the ANEF on the basis of the previously published Lmax contours (figures 6-12 to 6-14 in the report by GHD in 2009) indicates that maximum noise levels of up to between 90 and 95 dB(A) may be experienced from JSF aircraft during the daytime at the location of dwellings in the proposed subdivision.

The Fly Neighbourly policy of the RAAF minimises military jets taking off and landing at the western end of the runway and also flights during the night. The RAAF does, however, maintain that night flights are still possible. The local community is always notified in advance of specific night flying exercises.

In light of the discussion above a conservative 5 dB reduction in Lmax levels will be adopted for assessment of noise impacts on bedrooms. Noise levels from all other aircraft types are lower than those for the JSF at this location.

The Lmax noise level at the façade of any building element will depend on many factors including orientation of the building, directivity of the noise, shielding effects etc., all of which require specific consideration.

The physical parameters contained in the plans for an individual residence should be used to determine the required weighted sound reduction index (Rw) for all building elements in accordance with relevant clauses of the Standard and to comply with the PSC requirement of indoor design sound levels in Table 1.

Following is a general discussion relating to possible noise control options and generic recommendations for future residences in “affected” parts of the proposed subdivision.

Windows

In all standard housing construction, the acoustically ‘weak’ elements are the glazed windows and doors, which usually require upgrading from standard 3 or 4mm glazing in order to achieve satisfactory internal noise levels.

Minimum glazing, as calculated in accordance with AS2021-2000, are summarised in **Table 2**. The detailed Rw requirements are based on an Lmax of 90 dB(A) night time and 95 dB(A) day time as per the discussion above.

TABLE 2 INDICATIVE WINDOW Rw VALUES		
Room (window)	Required Rw	Indicative Minimum Glazing Requirement ¹
Bedrooms	40	8mm Vlam Hush Glass, 16mm gap, 10.5mm Vlam Hush
Living/Dining	40	8mm Vlam Hush Glass, 16mm gap, 10.5mm Vlam Hush
Bathroom/Laundry	35	6.5mm Vlam Hush Glass

The window systems shown in Table 2 are indicative only. The simple calculation of required Rw is based on typical sized rooms and windows which are directly exposed to the aircraft noise. Reductions in the noise exposure and, therefore, the required Rw may be achieved by the shielding of windows or glass doors by such things as pergolas, significant upper level balconies or awnings etc.

Similarly, the required Rw can generally be reduced by having windows with significantly smaller surface areas. By corollary, larger glazed areas, such as glass sliding or folding doors, can result in a higher Rw being required.

By way of example, based on the windows in Table 2, an Rw reduction of 5 would result in windows to bedrooms and living areas would require Rw 35, or 6.5mm Vlam Hush Glass and bathrooms Rw 30, or 6.38mm laminate.

Note that the sound transmission properties of windows are dependent upon the effectiveness of the seal around the glass. The seal around the perimeter is particularly important for operable windows and sliding doors. Similarly, window frames must be sealed to parent walls with no gaps remaining for the passage of sound. This may be achieved by applying two continuous beads (inside and outside) of flexible/expanding sealant after packing and levelling of windows.

The minimum glazing requirements shown in Table 2 are indicative only. Glazing suppliers must be able to show that windows to be fitted will achieve the required Rw or better. Similarly, the Vlam Hush Glass is a commercially available product from Viridian. It is not a requirement that this product be fitted, it is intended as an indication of a glazing system that will achieve the necessary Rw. Other suppliers may be able to supply glazing systems which will also achieve compliance.

The following minimum construction types would typically be required for the other construction elements to achieve satisfactory internal noise levels. Details listed in AS 3671 are for typical building constructions. Other, acoustically similar or better, construction types may be utilised if approved by an acoustic consultant.

External Walls

The Rw requirements of external walls for a residence in the subdivision would likely vary from 35 to 40 depending upon the room being assessed. Appropriate wall types with their Rw ratings from the Standard are listed in **Table 3**.

It can be seen from Table 3 that conventional brick veneer construction would be adequate.

TABLE 3 EXTERNAL WALLS	
Rw range	Description of construction
33 to 35	1. Conventional timber stud-framed walls, clad externally with 9 mm thick timber or hardboards or flat cellulose-cement sheets and, internally, 10 mm thick plasterboard or 6 mm thick hardboard.
36 to 38	2. As above, plus cavity filled with mineral wool, or weatherboards backed by 12 mm thick wood fibreboard. 3. Cellulose board on one side and 10 mm plasterboard on the other side of 100 mm x 50 mm timber studs, overall thickness 115 mm, surface density 39 kg/m ² .
39 to 41	4. Conventional brick veneer construction.

Roof/Ceiling

The Rw requirements of ceiling roof systems for a residence in the subdivision would likely be 40. Appropriate ceiling/roof systems types with their Rw ratings from the Standard are listed in **Table 4**.

It can be seen from Table 4 that system 5 or 6 type construction, or acoustically similar, would be adequate.

TABLE 4 CEILING/ROOF SYSTEMS	
Rw range	Description of construction
33 to 35	1. Pitched roof clad with tiles, or 0.5 mm corrugated galvanized iron or 6 mm corrugated cellulose-cement over 10 mm gypsum plasterboard. 2. Flat 0.6 mm galvanized steel trough roofing, attached to the same timber framework and about 150 mm above, the same ceilings as in Item 1.
36 to 38	3. As for Items 1 and 2 above, but with ceiling of two layers of gypsum plasterboard. 4. Pitched tiled roof and ceiling as for Item 1, plus 2-sided aluminium foil over rafters.
39 to 41	5. As for Item 1, plus 50 mm thick, 12 kg/m³ glass fibre blanket between ceiling joists. 6. As for Item 2, plus 75 mm thick 85 kg/m³ mineral wool batts or 100 mm thick, 45 kg/m³ cellulose fibre fluff, between ceiling joists.

The results and discussion in this report should be regarded as indicative only. The actual noise control requirements for a residence would require specific assessment based on floor plans for the residence and its location and orientation in relation to the noise source.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 49542276.

SPECTRUM ACOUSTICS PTY LIMITED



Ross Hodge
Principal/Director

Appendix I - Approximate location of 2025 ANEF 20

