



NATIONAL NOISE & VIBRATION

21 COXS LANE AND 16 GEORGE STREET,
FULLERTON COVE (LOT 201 DP 39968, LOT
1910 DP 557701, LOT 1 DP1006307 AND
LOT 991 DP627179

PLANNING PROPOSAL ACOUSTIC ASSESSMENT

AUGUST 19, 2025

Engineering Sciences
P (02) 9157 4090
E SALES@ENGINEERINGSCIENCES.COM.AU
WWW.NATIONALNOISE.COM.AU
ABN 23 682 260 402

Project Information

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Executive Summary

Engineering Sciences has been engaged to undertake a **Noise and Vibration Assessment** to support the planning process for the subject development site. This assessment addresses the acoustic requirements associated with the NSW policy framework and local planning directions and aims to demonstrate compliance with relevant noise and vibration criteria.

The assessment has been prepared to:

- Identify existing and future residential or noise-sensitive premises within and adjacent to the Place Strategy area.
- Evaluate construction and operational noise and vibration impacts on sensitive receivers, including cumulative impacts once the development is fully realised.
- Apply appropriate assessment methodologies for construction noise, in accordance with the **Interim Construction Noise Guideline (DECC, 2009)** and vibration guidelines under the **Assessing Vibration: A Technical Guideline (DEC, 2006)**.
- Assess the impacts from existing and future traffic noise, referencing key statutory documents such as the **NSW Road Noise Policy (2011)**, **State Environmental Planning Policy (Transport and Infrastructure) 2021**, and the **Development Near Rail Corridors and Busy Roads—Interim Guideline (2008)**.
- Consider noise emissions associated with the **Royal Australian Air Force Base Williamtown**.
- Ensure the noise and vibration assessment complies with **Local Planning Direction 5.3 Development Near Regulated Airport and Defence Airfields** and will be reviewed by the **Environment Protection Authority (EPA)** and the **Australian Defence Force** as required.

The scope of works has included:

- Review of the subject site and relevant planning requirements.
- Identification of existing acoustic environment conditions.
- Determination of applicable noise criteria.
- Assessment of potential impacts from key noise sources, including traffic, construction activities, and base operations.
- Recommendations for construction techniques and design measures to achieve compliance with applicable standards and policies.

Provided that the recommendations in this report are implemented, it is expected that the development can proceed without adverse impact on the surrounding residential and sensitive receivers. The proposed acoustic measures will ensure the development meets the required standards, maintaining appropriate levels of residential amenity with respect to noise and vibration.

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1 INTRODUCTION

Engineering Sciences has been engaged by Perception Planning to conduct an acoustic assessment for the Planning Proposal located at 21 Coxs Ln & 16 George St, Fullerton Cove NSW 2318.

The potential noise emissions from the reception centre have been assessed against the requirements of:

- **NSW Environment Protection Authority (EPA)**
 - Noise Policy for Industry (NPfI) 2017
 - NSW EPA Interim Construction Noise Guideline (ICNG) 2009
- **NSW Department of Planning and Environment**
 - NSW Road Noise Policy
 - Development Near Rail Corridors and Busy Roads – Interim Guideline (2008).
 - State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021.
- **Local Planning Direction 5.3** – Development Near Regulated Airport and Defence Airfields
- **Australian Standard AS 2021:2015** – Aircraft Noise Intrusion – Building Siting and Construction

This report has been prepared with reference to the architectural drawings provided by Perception Planning, outlined in Table 1.

Table 1 - Architectural Drawings

Drawing. No	Drawing Title	Revision	Date
4758, 5101	Whole Site Masterplan	A	18.09.24
5102	Vision Perspective 01		
5103	Vision Perspective 02		
5104	Vision Perspective 03		
5105	Vision Perspective 04		

2 SITE DESCRIPTION

2.1 Project Description

The proposed development assessed within this report (north of Coxs Lane), involves the creation of a new residential precinct incorporating a mix of medium-density residential units, low-density townhouses, and duplexes. Additionally, the precinct includes significant community and recreational infrastructure, such as a community sporting precinct, picnic grounds, and ecological green spaces incorporating wildlife corridors.

This acoustic assessment specifically addresses potential noise and vibration impacts associated with construction activities, ongoing residential and community operations, and traffic movements resulting from the development. Consideration will also be given to aircraft noise impacts due to the proximity to the Royal Australian Air Force Base Williamtown.

Figure 1 – Proposed Master Plan



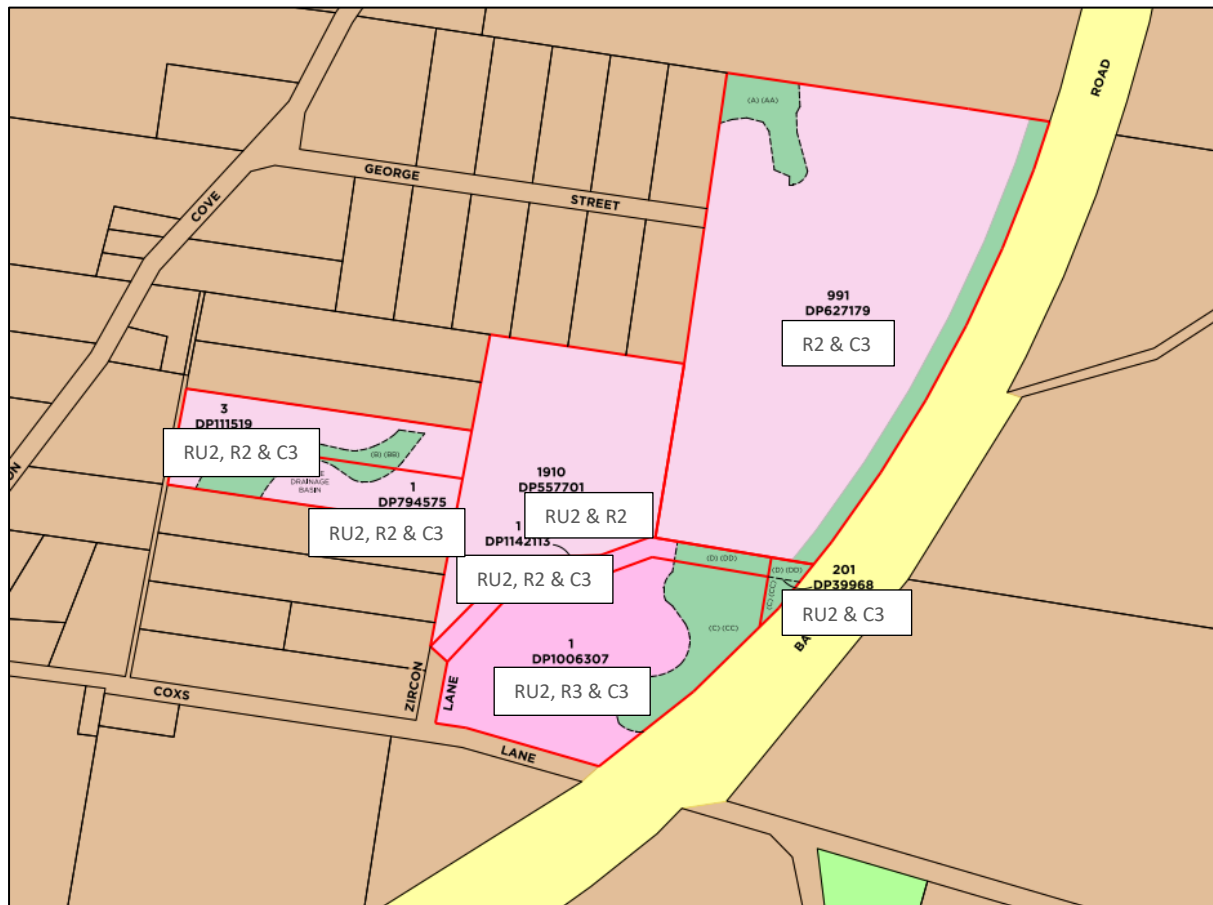
2.2 Project Locality

The subject site, outlined in a red dashed line (figure 2), is currently located within an RU2 Rural Landscape zone. The proposed development area (Figure 1) has adopted zoning classifications consistent with the Standard Instrument Local Environmental Plan (LEP) used by NSW councils. The new zoning designations include:

- **R2** – Low Density Residential: Allocated for larger lot residential dwellings and duplexes intended for lower-density living.
- **R3** – Medium Density Residential: Assigned to areas intended for townhouses and multi-unit residential developments to accommodate medium-density housing forms.
- **RE1** – Public Recreation: Includes the Community Sporting Precinct and areas designated for community leisure activities and public recreational spaces, such as picnic grounds.
- **RE2** – Private Recreation: Allocated for the Social Club/Tavern precinct, serving private recreational and entertainment purposes.
- **E2** – Environmental Conservation: Areas designated as wildlife corridors and ecologically sensitive open spaces, reserved for biodiversity preservation and environmental management.
- **C3** - Environmental Management.

These zoning categories facilitate orderly development, residential diversity, and ecological preservation, aligning with strategic planning objectives under NSW local planning frameworks.

Figure 2 – Current Zoning



2.3 Nearest Noise Sensitive Receivers

The nearest existing noise sensitive receivers are summarised in Table 3 and are presented in Figure 3. The background noise monitoring location is also included in Figure 3.

Figure 3 – Precinct Plan (Perception Planning)



TABLE 2 – Existing receiver Locations (Mecone Mosaic)

ID	Type	Receiver Description
R1	Residential	17 COXS LANE FULLERTON COVE NSW 2318
R2		1 ZIRCON LANE FULLERTON COVE NSW 2318
R3		6 FULLERTON COVE ROAD FULLERTON COVE NSW 2318
R4		11 COXS LANE FULLERTON COVE NSW 2318
R5	Commercial	10 FULLERTON COVE ROAD FULLERTON COVE NSW 2318
R6		10 FULLERTON COVE ROAD FULLERTON COVE NSW 2318
R7		16 FULLERTON COVE ROAD FULLERTON COVE NSW 2318
R8		16 FULLERTON COVE ROAD FULLERTON COVE NSW 2318
R9	Residential	4 GEORGE STREET FULLERTON COVE NSW 2318
R10		6 GEORGE STREET FULLERTON COVE NSW 2318
R11		8 GEORGE STREET FULLERTON COVE NSW 2318
R12		10 GEORGE STREET FULLERTON COVE NSW 2318
R13		12 GEORGE STREET FULLERTON COVE NSW 2318
R14		11 GEORGE STREET FULLERTON COVE NSW 2318

2.4 Sound level Descriptors

Noise level descriptors used in the assessment are explained below. For analysing noise, the following descriptors are used:

- L_{90} is known as background noise. L_{90} is a statistical sound level which describes the percentage of times a sound level is exceeded. This parameter is used to set up the allowable noise levels for intrusive noise sources since the level of disturbance of the intrusive noise source will be dependent on how audible it is above the existing noise environment.

- L_{eq} is the equivalent sound level which represents the average noise level during a measurement period. L_{eq} describes a receiver's cumulative noise exposure from all events over a specified period for compliance assessment purposes.
- L_{01} is the noise level exceeded for 1% of the measurement period. During the measurement period, the noise level is below the L_{01} level for 99% of the time
- L_{10} is the noise level exceeded for 10% of the measurement period. During the measurement period, the noise level is below the L_{10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise
- L_{Amax} is the maximum instantaneous noise level during a measurement period
- A-weighted Sound Level (instantaneous) is the most common weighting used in noise measurements, and it represents the frequency range detectable by the human ear. A-weighted is used for noise measurements and prediction purposes.

3 NOISE EMISSION CRITERIA

3.1 NSW EPA Noise Policy for Industry 2017

Noise sources covered by this code will be operational noise, including noise from mechanical plant and equipment. The *EPA Noise Policy for Industry (NPfI) 2017* has developed a method for determination of a Project Noise Trigger Level, such that exceedances of the trigger level require a management response. The Project Noise Trigger Level is determined by the most stringent of the Intrusiveness and Amenity Criteria. **Note: Childcare centres should also be designed and operated in accordance with the Association of Australian Acoustical Consultants (AAAC) - Guideline for Childcare Acoustic Assessment.**

3.1.1 Project Amenity Criteria

A project amenity criterion is determined based on the land use in the area to limit the ambient noise level within an area to a level that is consistent with the general environment, categorised as rural, urban or suburban. The subject site is classified as urban in accordance with the criteria established in Table 2.3 of the NPfI 2017 policy documentation.

3.1.2 Project Amenity Time Correction

Under the NPfI, the assessable L_{Aeq} is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. Under section 2.2 of the NPfI, the assessable L_{Aeq} is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same amount of noise heard by a person for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, the following correction applicable under the NPfI has been adopted:

- **$ANL L_{Aeq,15min}$ will be taken to be equal to $RANL L_{Aeq, period} + 3$ decibels (dB).**

The established amenity criteria for the project has been established based on the EPA's NPfI Section 2.2 and 2.4 project corrections made to the Recommended Amenity Noise Levels (RANL), as shown in Table 3 below.

Table 3 – Amenity Noise Criterion (NPfI)

Receiver	Period	Recommended Amenity Noise Level (ANL), $L_{eq,period}$ dB(A)	Project Amenity Criterion (ANL-5dB + 3dB), $L_{eq,period}$ dB(A)
Residential - Suburban	Day	55	53
	Evening	45	43
	Night	40	38
Commercial	When in Use	65	63
Note:	Assessment Period is defined in accordance with the NPfI as: Day: - 7 am to 6 pm Monday to Saturday or - 8 am to 6 pm on Sundays and public holidays Evening: - 6 pm to 10 pm Night: - All other times		

3.2 Resultant Criteria

Following a review of the relevant noise regulations and standards in this Section, the resultant criteria applicable to this project have been established and presented in the Table below. These criteria are tailored to ensure that all operational noise levels meet the stipulated guidelines for environmental noise control.

Table 4 – Project Noise Trigger Levels (PNTLs)

Receiver	Period	Project Noise Trigger Levels, $L_{eq,15min}$ dB(A)
Residential	Day	53
	Evening	43
	Night	38
Commercial	When in Use	63

4 NOISE EMISSION ASSESSMENT

4.1 Operational Scenario

The operational noise assessment scenario represents typical maximum capacity and activity levels within a Retail, Leisure, and Sporting precincts to evaluate potential noise impacts on surrounding sensitive receivers. It is recommended that each future occupation is to complete an acoustic assessment specific to any site proposals.

Retail Precinct (Supermarket and Specialty Shops):

- Peak trading hours with supermarket, specialty stores (gym, hair salon, medical centre, café, offices, bottle shop) at maximum occupancy.
- Delivery and loading dock activity involving multiple truck arrivals, simultaneous unloading/loading operations, and the operation of associated mechanical equipment such as forklifts, pallet jacks, and trolley movements.
- Maximum car park usage with frequent vehicle arrivals and departures, including noise from engines, car doors, and customer conversations.

Leisure Precinct (Social Club / Venue / Tavern/Childcare Centre):

- Maximum capacity during peak weekend evening hours.
- Amplified music or live performances, including internal and external speakers set to high but compliant volume levels, with venue doors and windows potentially open for ventilation purposes.
- External patron congregation, social interaction noise including elevated conversation and laughter, movement between indoor and outdoor areas, and high-frequency vehicle arrivals and departures during late-night operating hours.

Community Sporting Precinct:

- Simultaneous utilisation of all outdoor sporting fields, with competitive events and training sessions occurring concurrently.
- Presence of spectators at full capacity, contributing additional noise from cheering, announcements via public address systems, and crowd activities.
- Operation of associated ancillary equipment, including maintenance machinery, sporting whistles, and air horns.

This worst-case scenario provides a robust basis to quantify maximum anticipated noise impacts, ensuring acoustic treatments and management strategies can effectively address peak operational conditions in compliance with relevant NSW noise policies and guidelines.

4.2 Noise Sources

The sound power level of people's voices has been taken from AAAC Licenced Premises Noise Assessment Technical Guideline. The sound power level of background music & miscellaneous kitchen noises and activity was taken from our technical database. Octave band sound power levels are reported in linear Z-weighting while overall sound power levels are expressed in A-weighting (Equivalent loudness perceived by human ear).

Table 5 – Sources Sound Power Levels

Noise Source	Overall Sound Power Level, dB(A)	Sound Power Level, Lw (dB(Z)), Octave Band Frequency, Hz								
		31.5	63	125	250	500	1k	2k	4k	8k
Retail Precinct	75	55	59	63	65	69	70	67	63	58
Leisure Precinct	95	72	78	83	87	90	92	90	86	81
Community Sporting Precinct	95	74	79	84	88	91	93	91	87	82

4.2.1 Noise Modelling

Noise emissions levels at the nearest noise sensitive receivers have been calculated using computer-based 3D acoustic noise modelling software iNoise version 2023.1.1. iNoise utilizes ISO 9613 calculation algorithms to determine noise emission levels at the nearest affected noise sensitive receivers. The following assumptions have been included within the noise model:

- Distance attenuation.
- Atmospheric attenuation.
- Directivity.
- Ground absorption (G = 0.5)
- Barrier effects/screening.
- Ground Elevation Contours.

4.3 Predicted Noise Levels

Noise produced by the proposed sites are assessed for compliance with the criteria presented in Section 4. External noise predictions at the boundaries of the nearest noise sensitive receivers are outlined in Table 6.

Table 6 - Predicted Noise Levels at the Nearest Receivers

Receiver	Period	Noise Criteria L_{Aeq} dB(A)	Predicted Noise Level L_{Aeq} dB(A)	Compliant?
R1	Day	53	45	✓
	Evening	48		✓
	Night-time	43		✗
R2	Day	53	48	✓
	Evening	48		✓
	Night-time	43		✗
R3	Day	53	43	✓
	Evening	48		✓
	Night-time	43		✓
R4	Day	53	45	✓
	Evening	48		✓
	Night-time	43		✗
R5	When-in-use	63	45	✓
R6				
R7				
R8				
R9	Day	53	45	✓
	Evening	48		✓
	Night-time	43		✗
R10	Day	53	43	✓
	Evening	48		✓
	Night-time	43		✓
R11	Day	53	53	✓
	Evening	48		✗
	Night-time	43		✗
R12	Day	53	53	✓
	Evening	48		✗
	Night-time	43		✗
R13	Day	53	53	✓
	Evening	48		✗
	Night-time	43		✗

5 GENERAL RECOMMENDATIONS

The following recommendations are provided based on the noise modelling outcomes and compliance assessment undertaken in accordance with the NSW EPA Noise Policy for Industry (NPfI) 2017. These recommendations address areas where predicted noise levels may exceed established criteria and outline standard acoustic measures to mitigate and manage noise impacts associated with the development:

Operational Noise Controls

- **Noise Management Plan:**

A detailed Noise Management Plan (NMP) should be prepared for each site proposal and implemented, specifically addressing identified exceedances during evening and night-time periods. The NMP should clearly define operational restrictions, permissible operating hours, and noise control practices for the Retail, Leisure, and Sporting precincts.

- **Mechanical Plant and Equipment:**

All mechanical plant and equipment associated with the Retail and Leisure precincts (including refrigeration, ventilation, and air-conditioning systems) should be selected, installed, and operated to ensure compliance with the Project Noise Trigger Levels (PNTLs). Acoustic enclosures, silencers, or attenuators must be implemented where required to achieve noise reductions.

Building Design and Layout

- **Orientation and Shielding:**

Where possible, buildings within the Retail and Leisure precincts should be designed or oriented to provide acoustic shielding toward sensitive receivers. Solid barriers or acoustically treated boundary walls can be utilised to attenuate noise transmission towards residential properties.

- **Loading Dock Management:**

Restrict loading dock activities in the Retail precinct during sensitive evening and night-time periods. Where loading activities are unavoidable during these periods, mitigation measures such as enclosed loading docks, acoustic barriers, or operational controls must be implemented to minimise noise emissions.

Leisure Precinct (Social Club/Venue/Tavern)

- **Amplified Music Controls:**

Implement volume-limiting devices on sound amplification systems to ensure compliance with applicable noise criteria. Doors and windows should remain closed during amplified entertainment events to minimise noise breakout. Where doors or windows must be open, supplementary noise barriers or acoustic curtains should be installed.

- **Patron Noise Management:**

Patron noise should be managed through operational controls, such as staff monitoring, designated outdoor areas with noise mitigation measures (e.g., acoustic screening or buffer zones), and limiting external patron activity during late-night periods.

Sporting Precinct

- **Public Address (PA) System Controls:**

Ensure PA systems utilise directional loudspeakers oriented away from sensitive receivers and operated at minimum practical volumes consistent with clear audibility within sporting fields only.

- **Hours of Operation:**

Sporting activities, including training and competitive events, should be managed to avoid

late-evening operation. Specifically, limit events that utilise loud announcements or attract large crowds during evening or night-time periods.

Implementing these recommendations will ensure that operational noise associated with the proposed development complies with the established NSW EPA Noise Policy for Industry (2017) criteria, effectively managing acoustic impacts on surrounding noise-sensitive receivers.

6 CRITERIA FOR ASSESSING CONSTRUCTION IMPACTS

6.1.1 NSW EPA Interim Construction Noise Guideline (ICNG) 2009

The NSW Interim Construction Noise Guideline (ICNG or Guideline) provides recommended noise levels for airborne construction noise at sensitive land uses. The guideline provides construction noise management levels above which all feasible and reasonable work practices should be applied to minimise the construction noise impact. The ICNG works on the principle of a 'screening' criterion – if predicted or measured construction noise exceeds the ICNG levels then the construction activity must implement all 'feasible and reasonable' work practices to reduce noise levels.

The ICNG provides two methods for assessing construction noise, varying typically based on the project duration, being either a quantitative or a qualitative assessment. A quantitative assessment is recommended for major construction projects of significant duration and involves the measurement of background noise levels for determination of noise management levels and prediction of construction noise levels. A qualitative assessment is recommended for small projects with a duration of less than three weeks and focuses on minimising noise disturbance through the implementation of reasonable and feasible work practices, and community notification.

6.1.2 Management Levels for Noise Receivers

Table 2 of the NSW EPA Interim Construction Noise Guideline sets out management levels for noise intrusions to affected residences and provide strategies to determine noise management levels based on the Rating Background Level (RBL) at the nearest noise sensitive receivers, during or outside the recommended standard hours. The NMLs are provided below in Table 7.

Table 7 – ICNG Noise Management Levels

Time of Day	Noise Management Level (L _{Aeq} 15-min)	How to Apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. - Where the predicted or measured L_{Aeq} (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. - The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details
	Highly noise affected 75 dB(A)	- The highly noise affected level represents the point above which there may be strong community reaction to noise. - Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:

		1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences) 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected. RBL + 5dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2 of the ICNG.
Note:	Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.	

6.1.3 Project Construction Noise Targets

Based on the ICNG guideline and the monitoring carried out, Table 8 outlines the project specific targets for the surrounding receivers.

Table 8 – Construction noise emission criteria summary

Period	Location (Receiver)	Measured Background Noise Level dB(A) L _{90,15min}	“Noise Affected” Emission Criterion dB(A)		“Highly Noise Affected” Emission Criterion dB(A)
Day (7am-6pm)	Stockton Street	48	RBL + 10dB	58	75

6.1.4 Australian Standard 2436:2010

Australian Standard 2436:2010 – *Guide to Noise Control on Construction, Maintenance and Demolition Sites*, provides guidance on noise control in respect to construction and demolition sites, the preparation of noise management plans, work method statements and impact studies. The Standard states that:

Some construction and demolition activities are by their very nature noisy. The authorities responsible for setting noise level criteria for essential works will take note of the constraints imposed by such activities, especially when they are of short duration.

Construction, demolition and maintenance works pose different problems of noise and vibration control when compared with most other types of industrial activity, since.

- they are mainly carried on in the open.*
- they are often temporary in nature although they may cause considerable disturbance whilst they last.*
- the noise and vibration arise from many different activities and kinds of plant, and their intensity and character may vary greatly during different phases of the work; and*
- the sites cannot be separated by planning controls, from areas that are sensitive to noise and vibration.*

The standard provides advice and guidelines for the prediction of impacts and the methods available to manage impacts. The guideline presents feasible and reasonable mitigation strategies and controls, including stakeholder liaison, in the effort to reach a realistic compromise between site activities and impacts on neighbouring properties.

7 CONSTRUCTION NOISE ASSESSMENT

7.1 Noise Emission Predictions

Noise generated by the work activities will be managed to comply with the nominated noise criteria outlined in Section 6. Where the noise goal exceeds the nominated criteria, noise will be managed based on principles consistent with the ICNG.

Noise emission predictions to the nearest noise sensitive receivers should be provided once the construction schedule is released.

7.1.1 ICNG 4.5 Predicting noise levels – Quantitative assessment

Under Section 4.5 of the ICNG it is stated that a 5dB addition to the predicted noise levels needs to be to be factored for the following activities taking place during the night-time (Particularly annoying activities to nearby residents):

- *Use of ‘beeper’ style reversing or movement alarms, particularly at night-time*
- *Use of power saws, such as used for cutting timber, rail lines, masonry, road pavement or steel work*
- *Grinding metal, concrete or masonry*
- *Rock drilling*
- *Line drilling*
- *Vibratory rolling*
- *Rail tamping and regulating*
- *Bitumen milling or profiling*
- *Jackhammering, rock hammering or rock breaking*
- *Impact piling.*

8 CONSTRUCTION NOISE MITIGATION MEASURES

It is suggested to follow mitigation strategies outlined in the ICNG which can be found in Section 8.1.

8.1 ICNG Construction noise mitigation strategies applicable to all construction stages

These mitigation measures are considered to represent ‘feasible and reasonable’ mitigation measures suitable for implementation during construction of the project for all stages.

ICNG Strategy 1 - Universal Work Practices

Additional Work Practices at Night:

- a) Avoid the use of equipment which generates impulsive noise.
- b) Minimise the need for reversing or movement alarms as described in Table 7.
- c) Avoid dropping materials from a height.
- d) Avoid metal-to-metal contact on equipment.
- e) Schedule truck movements to avoid residential streets if possible.
- f) Avoid mobile plant clustering near residences and other sensitive land uses.
- g) Ensure periods of respite are provided in the case of unavoidable maximum noise level events

ICNG Strategy 2 - Consultation and Notification

Notification Before and During Construction:

- a) Provide, reasonably ahead of time, information such as total building time, what works are expected to be noisy, their duration, what is being done to minimise noise and when respite periods will occur. For works outside standard hours, inform affected residents and other sensitive land use occupants between five and 14 days before commencement.
- b) Provide information to neighbours before and during construction through media such as letterbox drops, meetings or individual contact. In some areas, the proponent will need to provide notification in languages other than English. A website could also be established for the project to provide information.
- c) Use a site information board at the front of the site with the name of the organisation responsible for the site and their contact details, hours of operation and regular information updates. This signage should be clearly visible from the outside and include afterhours emergency contact details.
- d) Maintain good communication between the community and project staff.
- e) Appoint a community liaison officer where required.
- f) For larger projects consider a regular newsletter with site news, significant project events and timing of different activities.
- g) Provide a toll-free contact phone number for enquiries during the works.
- h) Facilitate contact with people to ensure that everyone can see that the site manager understands potential issues, that a planned approach is in place and that there is an ongoing commitment to minimise noise.

Complaints Handling:

- a) Provide a readily accessible contact point, for example, through a 24-hour toll-free information and complaints line.
- b) Give complaints a fair hearing.
- c) Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow.
- d) Call back as soon as possible to keep people informed of action to be taken to address noise problems. Call back at night-time only if requested by the complainant to avoid further disturbance.
- e) Provide a quick response to complaints, with complaint handling staff having both a good knowledge of the project and ready access to information.
- f) Implement all feasible and reasonable measures to address the source of complaint.
- g) Keep a register of any complaints, including details of the complaint such as date, time, person receiving complaint, complainant's contact number, person referred to, description of the complaint, work area (for larger projects), time of verbal response and timeframe for written response where appropriate.

ICNG Strategy 3 - Plant and Equipment**Use Quieter Methods:**

- a) Examine and implement, where feasible and reasonable, alternatives to rock-breaking work methods, such as hydraulic splitters for rock and concrete, hydraulic jaw crushers, chemical rock and concrete splitting, and controlled blasting such as penetrating cone fracture. The suitability of alternative methods should be considered on a case-by-case basis.
- b) Use alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric controlled units where feasible and reasonable. Where there is no electricity supply, use an electrical generator located away from residences.

- c) Examine and implement, where feasible and reasonable, alternatives to transporting excavated material from underground tunnelling off site at night. For example, stockpile material in an acoustically treated shed at night and load out the following day.

Use Quieter Equipment:

- a) Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine. For example, rubber wheeled tractors can be less noisy than steel tracked tractors.
- b) Noise labels are required by NSW legislation for pavement breakers, mobile compressors, chainsaws and mobile garbage compactors. These noise labels can be used to assist in selecting less noisy plant.
- c) Pneumatic equipment is traditionally a problem – select super silenced compressors, silenced jackhammers and damped bits where possible.
- d) When renting, select quieter items of plant and equipment where feasible and reasonable.
- e) When purchasing, select, where feasible and reasonable, the most effective mufflers, enclosures and low-noise tool bits and blades. Always seek the manufacturer's advice before making modifications to plant to reduce noise.

Operate Plant in a Quiet and Efficient Manner:

- a) Reduce throttle setting and turn off equipment when not being used.
- b) Examine and implement, where feasible and reasonable, the option of reducing noise from metal chutes and bins by placing damping material in the bin.

Maintain equipment:

- a) Regularly inspect and maintain equipment to ensure it is in good working order. Also check the condition of mufflers.
- b) Equipment must not be operated until it is maintained or repaired, where maintenance or repair would address the annoying character of noise identified.
- c) For machines with enclosures, check that doors and door seals are in good working order and that the doors close properly against the seals.
- d) Return any hired equipment that is causing noise that is not typical for the equipment – the increased noise may indicate the need for repair.
- e) Ensure air lines on pneumatic equipment do not leak.

8.1.1 Applicable Strategies Where Noise is Likely to Exceed the Highly Noise Affected Criterion.

The following mitigation strategies are recommended for construction stages where the highly noise affected criterion is expected to be exceeded.

ICNG Strategy 4 - On Site**Location Of Plant:**

- a) Place as much distance as possible between the plant or equipment and residences and other sensitive land uses.
- b) Restrict areas in which mobile plant can operate so that it is away from residences and other sensitive land uses at particular times.
- c) Locate site vehicle entrances away from residences and other sensitive land uses.
- d) Carry out noisy fabrication work at another site (for example, within enclosed factory premises) and then transport to site.

Alternatives to reversing alarms:

- e) Avoid use of reversing alarms by designing site layout to avoid reversing, such as by including drive-through for parking and deliveries.
- f) Install where feasible and reasonable fewer annoying alternatives to the typical 'beeper' alarms taking into account the requirements of the Occupational Health and Safety legislation; examples are smart alarms that adjust their volume depending on the ambient level of noise and multifrequency alarms that emit noise over a wide range of frequencies.
- g) In all circumstances, the requirements of the relevant Occupational Health and Safety legislation must be complied with. For information on replacing audible warning alarms on mobile plant with less annoying alternatives.

Maximise Shielding:

- a) Reuse existing structures rather than demolish and reconstruct.
- b) Use full enclosures, such as large sheds, with good seals fitted to doors to control noise from night-time work.
- c) Use temporary site buildings and materials stockpiles as noise barriers.
- d) Schedule construction of permanent walls so that they can be used as early as possible as noise barriers.
- e) Use natural landform as a noise barrier – place fixed equipment in cuttings, or behind earth berms.
- f) Note large reflecting surfaces on and off site that might increase noise levels and avoid placing noise-producing equipment in locations where reflected noise will increase noise exposure or reduce the effectiveness of mitigation measures.

ICNG Strategy 5 - Work Scheduling**Provide Respite Periods:**

- a) Where night work near residences cannot be feasibly or reasonably avoided, restrict the number of nights per week and/or the number of nights per calendar month that the works are undertaken, in consultation with residents who will be most affected.
- b) Schedule activities to minimise noise impacts:
- c) Organise work to be undertaken during the recommended standard hours where possible.
- d) Schedule work when neighbours are not present (for example, commercial neighbours, colleges and schools may not be present outside business hours or on weekends).
- e) Schedule noisy activities around times of high background noise (local road traffic or when other local noise sources are active) where possible to provide masking or to reduce the amount that the construction noise intrudes above the background.
- f) Consult with affected neighbours about scheduling activities to minimise noise impacts.
- g) Care should be taken to minimise noise from any refuelling at night.

Organise Deliveries & Access:

- a) Nominate an off-site truck parking area, away from residences, for trucks arriving prior to gates opening.
- b) Amalgamated loads can lead to less noise and congestion in nearby streets.
- c) Optimise the number of vehicle trips to and from the site – movements can be organised to amalgamate loads rather than using a number of vehicles with smaller loads.
- d) Designate access routes to the site, through consultation with potentially noise-affected residences and other sensitive land uses and make drivers aware of nominated vehicle routes.
- e) Provide on-site parking for staff and on-site truck waiting areas away from residences and other sensitive land uses. Truck waiting areas may require bunding or walls to minimise noise.
- f) Schedule deliveries to nominated hours only.

Strategy 6 - Transmission path

- a) Reduce the line-of-sight noise transmission to residences or other sensitive land uses using temporary barriers.
- b) Temporary noise barriers can be constructed from hoarding (plywood boards, panels of steel sheeting or compressed fibre cement board) with no gaps between the panels at the site boundary. Stockpiles, shipping containers and site office transportable can be effective barriers.
- c) Erect temporary noise barriers before work commences to reduce noise from works as soon as possible.
- d) Where high-rise dwellings adjoin the construction site, the height of a barrier may not be sufficient to effectively shield the upper levels of the residential building from construction noise. Check whether this is a consideration for the project and examine alternative means of mitigation where needed.
- e) Consult with most affected neighbours about how effective the proposed noise mitigation measures will be in addressing their concerns.

Strategy 7 At residences or other sensitive land uses**Temporary relocation:**

- Examine and implement, where feasible and reasonable, the option of relocating noise-affected occupants for short periods of time, such as when high noise levels from construction occur at night and there are no feasible and reasonable ways of reducing noise levels. For example, the proponent could offer alternative accommodation or other respite measures (such as movie tickets) where mitigation is sought and there are no feasible and reasonable work methods available.

Architectural treatments:

- Examine and implement, where feasible and reasonable, the option of acoustical treatment to residences affected by construction noise, such as to windows at the building façade – however, alternative means of ventilation may be needed where windows are closed and airflow into a building does not meet building requirements. Note that the effectiveness of closing existing windows may be limited by the performance of the window seals.

8.1.2 Complaints management

Noise impacts from activities associated with the construction of the development shall meet the noise criteria set by the relevant guidelines and regulations.

The contractor is responsible for implementing this Construction Noise Management Plan and ensuring that all feasible and reasonable strategies are implemented to minimise noise impacts at nearby sensitive receivers.

A noise complaint management procedure are recommended to be set in place to provide owners and occupants of nearby affected properties with means to report complaints related to the operation of the construction activities such as a direct telephone line and contact representative to liaise with complaints.

9 EXTERNAL ROAD TRAFFIC NOISE

The road traffic noise assessment for the proposed residential precinct north of Coxs Lane, Fullerton Cove, has been undertaken in accordance with the NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011). The RNP provides a systematic framework for assessing potential noise impacts from road traffic generated by developments and establishes clear noise criteria to manage impacts at surrounding residential and sensitive receivers. This assessment identifies appropriate noise criteria for arterial roads, such as Nelson Bay Road, and local roads, including Coxs Lane, George Street and the internal road network, considering both absolute noise criteria and relative increases in noise levels attributable to the proposed development. The assessment includes predictions of future noise conditions and, where necessary, recommends feasible and reasonable noise mitigation measures to ensure compliance with the RNP criteria and maintain acoustic amenity for existing residents.

9.1 NSW Road Noise Policy (RNP)

Based on the NSW Road Noise Policy, the following typical criteria apply for residential receivers:

- **Local Roads** (existing residences affected by additional traffic):
 - Day (7 am–10 pm): **55 dB(A) LAeq(1-hour)**
 - Night (10 pm–7 am): **50 dB(A) LAeq(1-hour)**

Table 9 – Existing Measured Traffic Noise at Property Facade

Location	Date	Day Period $L_{Aeq\ 15h}$ (07:00am – 10:00pm)	Night Period $L_{Aeq\ 9h}$ (10:00pm – 07:00am)
21 COXS LN, FULLERTON COVE NSW 2318	Thursday, 20 th March 2025	42	30
	Friday, 21 st March 2025	43	30

In addition to absolute traffic noise level criteria, the NSW Road Noise Policy (2011) also requires an assessment of relative noise level increases where a development generates additional traffic on existing arterial or sub-arterial roads. This assessment considers whether the proposed development causes a significant increase in traffic noise at nearby sensitive receivers, even if the absolute noise levels remain below standard thresholds. Under Section 2.4 of the Policy, an increase of more than +12 dB(A) above the existing measured traffic noise level is considered significant and may trigger the need for mitigation. Based on monitoring conducted at 21 Coxs Lane, Fullerton Cove, existing traffic noise levels were measured at 43 dB(A) during the day and 30 dB(A) during the night. Accordingly, the applicable relative increase thresholds for compliance are 54 dB(A) (daytime) and 42 dB(A) (night-time). Predicted post-development traffic noise levels at affected receivers are assessed against these criteria to determine the potential need for noise control measures.

Table 10 – Project Specific Noise Criteria

Road Category	Assessment Period	Noise Descriptor	Criteria dB(A)
Local Roads (Coxs Lane, George Street, internal roads)	Day (7 am–10 pm)	LAeq(1-hour)	54 dB(A)
	Night (10 pm–7 am)	LAeq(1-hour)	42 dB(A)

9.2 Traffic Noise Predictions

Traffic noise predictions have been conducted to assess the potential acoustic impacts resulting from additional traffic movements associated with the proposed residential precinct north of Coxs Lane. Traffic noise measurements have been validated by using the calculation of Road Traffic Noise (CoRTN). The CoRTN method is defined in the United Kingdom, Department of Environment/Transport (UKDOE), Welsh Office HMSO, 'Calculation of Road Traffic Noise' manual published 1988. This method is an updated version of the 1975 version method.

To undertake this assessment, traffic data, including possible future traffic volumes, heavy vehicle percentages, posted speed limits, and road surface types, have been considered. Predictions of road traffic noise levels were performed at identified noise-sensitive receiver locations, incorporating existing residential and commercial receivers surrounding the site.

Predicted noise levels at each receiver were calculated for daytime (7 am–10 pm) and night-time (10 pm–7 am) periods, in accordance with relevant descriptors specified in the RNP:

- For **local roads (Coxs Lane, George Street and internal precinct roads)**, predictions employed LAeq(1-hour) descriptors for both day and night periods.

Results from noise predictions are summarised clearly in the following section (**Section 4.3: Predicted Noise Levels**) and assessed for compliance with the relevant RNP criteria previously established. Where noise levels exceed the applicable criteria, feasible and reasonable noise mitigation measures have been considered and are recommended accordingly.

Table 11 – Predicted Additional Traffic Volume

Road Category	Period	Vehicles/hour	Heavy Vehicles (%)
Local roads	Day Peak Hour	~300	5%
	Night (10 pm–7 am)	~10–15	5%

Table 12 – Predicted Noise Levels (50km p/h @15m)

Road Category	Assessment Period	Noise Descriptor	Criteria dB(A)	Predicted Noise Level dB(A)	Compliance
Local Roads (Coxs Lane, George Street, internal roads)	Day (7 am–10 pm)	LAeq(1-hour)	54 dB(A)	58 dB(A)	✗
	Night (10 pm–7 am)	LAeq(1-hour)	42 dB(A)	44 dB(A)	✗

10 RECOMMENDATIONS

The following recommendations are made to ensure that road traffic noise associated with the proposed development remains compliant with both absolute noise criteria and relative increase thresholds.

Traffic Reporting

A detailed traffic report should be prepared by a suitably qualified traffic engineer to accurately quantify anticipated traffic volumes, including daily and peak-hour movements, vehicle classifications (light/heavy), and distribution patterns across arterial and local road networks. This data is essential

for refining the acoustic model and determining whether post-development noise levels will comply with both:

- Absolute traffic noise criteria (e.g. 55 dB(A) for local roads, 60 dB(A) for arterials); and
- Relative increase thresholds (+12 dB(A) from existing levels for arterials/sub-arterials only).

Acoustic recommendations, including the need for mitigation, should be confirmed or refined once updated traffic volumes are provided.

Mitigation of Exceedances on Local Roads

Noise modelling indicates that traffic noise on local roads may exceed the relevant daytime criterion of 55 dB(A) LAeq(1hr). To mitigate this:

- **Roadside acoustic treatments** such as low-height noise barriers or landscaped earth berms should be considered adjacent to sensitive receiver boundaries, particularly where dwellings are located within 15–20 metres of the road carriageway.
- **Traffic management measures**, including reduced speed limits (e.g. 40 km/h) and traffic calming devices (e.g. speed humps, chicanes), should be considered where feasible to reduce traffic noise at the source.
- **Building orientation and setbacks** should be optimised during the subdivision design phase to increase distance between road edges and habitable spaces wherever possible.

11 INTERNAL ROAD TRAFFIC NOISE (New Development)

The proposed residential precinct north of Coxs Lane includes a mix of medium-density housing, townhouses, and duplexes that will be exposed to low levels of road traffic noise, including from the proposed local roads and potentially Nelson Bay Road. The following criteria is applicable.

11.1 NSW Department of Planning and Environment – State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021

Section 2.120 of Subdivision 2 *Development in or adjacent to road corridors and road reservations of the NSW State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP) stipulates the following regarding road traffic noise:

2.120 Impact of road noise or vibration on non-road development

- (1) *This section applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of TfNSW) and that the consent authority considers is likely to be adversely affected by road noise or vibration—*
 - *residential accommodation,*
 - *a place of public worship,*
 - *a hospital,*
 - *an educational establishment or centre-based child care facility.*
- (2) *Before determining a development application for development to which this section applies, the consent authority must take into consideration any guidelines that are issued by the Planning Secretary for the purposes of this section and published in the Gazette.*
- (3) *If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—*

- *in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7 am,*
 - *anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.*
- (4) *Subsection (3) does not apply to a building to which State Environmental Planning Policy (Housing) 2021, Chapter 3, Part 7 applies.*
- (5) *In this section, freeway, tollway and transitway have the same meanings as they have in the Roads Act 1993.”*

11.2 NSW Department of Planning – Development Near Rail Corridors and Busy Roads – Interim Guideline 2008

Section 3.5 of the *NSW Department of Planning – Development near Rail Corridors and Busy Roads (Interim Guideline)* states the following:

“The following provides an overall summary of the assessment procedure to meet the requirements of clause 102 of the Infrastructure SEPP. The procedure covers noise at developments for Road.

For Clauses 102 (Road):

(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7 am, anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.”

11.3 Summary of Noise Intrusion Criteria

Summarised internal noise criteria for each internal space are presented in Table 13 below.

Table 13 - Resultant Noise intrusion Criteria

Room	Assessment Criteria	Applicable Time Period
Sleeping Areas (Bedrooms)	35	Night (10pm to 7am)
Other Habitable Rooms	40	At any time
Note	airborne noise is calculated as Leq (9h) (night) and Leq (15h)(day)	

12 RECOMMENDATION

In accordance with Clause 10.1 of the NSW State Environmental Planning Policy (Transport and Infrastructure) 2021, an internal noise intrusion assessment is required where external traffic noise levels are expected to exceed 60 dB(A) LAeq(15hr) during the day or 55 dB(A) LAeq(9hr) during the night. Based on predicted traffic volumes and modelling undertaken for this development, it is not expected that external road traffic noise levels at the future residential dwellings will exceed these thresholds. As such, the requirement to assess internal noise intrusion and implement specific acoustic treatments under the SEPP does not apply. External noise levels across the site are anticipated to remain within acceptable limits, and internal amenity is expected to be achieved through conventional construction practices without the need for specialised acoustic mitigation.

13 AIRCRAFT NOISE INTRUSION ASSESSMENT (New Development)

The subject site is located approximately 5 km south of RAAF Base Williamtown, an operational military airfield regulated under Commonwealth legislation. While the base operates a range of high-performance aircraft, including the F-35A Lightning II, the project site is located outside the mapped Australian Noise Exposure Forecast (ANEF) contours (Figure 4), which define land use compatibility thresholds for aircraft noise exposure.

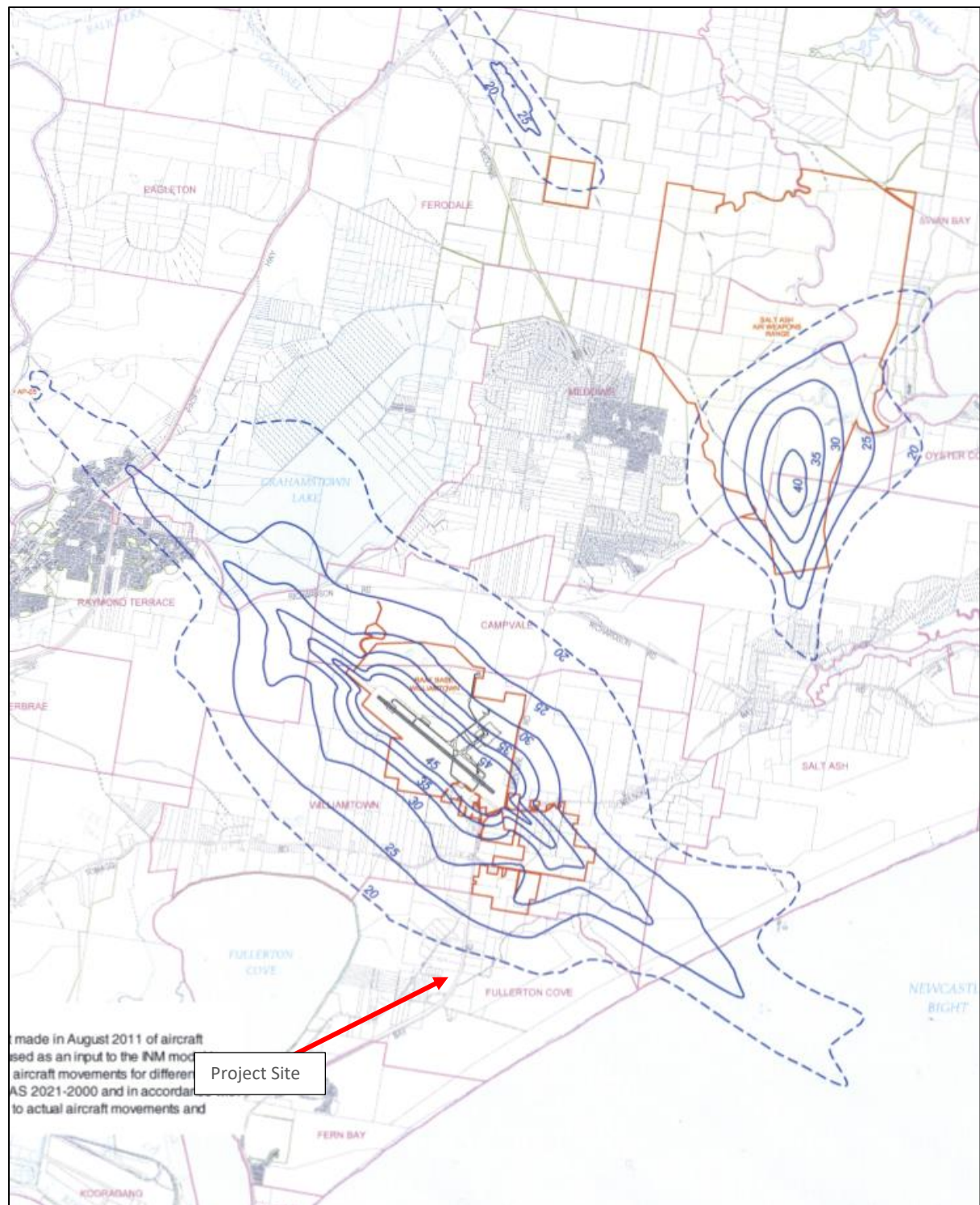
Given the site's position beyond the outer 20 ANEF contour, the development is not subject to mandatory aircraft noise intrusion assessment under AS 2021:2015 – Acoustics – Aircraft noise intrusion – Building siting and construction. As such, no specialised acoustic mitigation or building treatments are required to address aircraft noise.

In accordance with Local Planning Direction 5.3 – Development Near Regulated Airports and Defence Airfields, it is concluded that:

- Aircraft noise has been appropriately considered in the context of the site's location.
- The proposed residential and community land uses are compatible with current and forecast aircraft operations.
- The development will not result in land use conflict or unreasonable exposure of future residents to aircraft noise.

Although intermittent aircraft overflight noise may still be audible at times, the development is not considered noise-affected for planning purposes, and conventional construction methods are expected to provide adequate acoustic protection.

Figure 4 - ANEF contour map, RAAF Base Williamstown



14 CONCLUSION

An acoustic assessment has been undertaken to evaluate the potential noise and vibration impacts associated with the proposed residential and community development located north of Coxs Lane, Fullerton Cove. The assessment has been prepared in accordance with relevant planning policies and technical guidelines, including the NSW Noise Policy for Industry (2017), NSW Road Noise Policy (2011), State Environmental Planning Policy (Transport and Infrastructure) 2021, and Local Planning Direction 5.3 – Development Near Regulated Airports and Defence Airfields.

Key noise sources assessed include:

- Operational noise from proposed retail, leisure, and sporting precincts;
- Construction noise and vibration impacts;
- Traffic noise impacts on existing and proposed sensitive receivers;
- Aircraft noise exposure from RAAF Base Williamtown.

Noise modelling has demonstrated that, with the implementation of feasible and reasonable mitigation measures as outlined in this report, operational and construction noise can be managed to comply with relevant criteria. Although traffic noise levels on local roads are predicted to slightly exceed the daytime and night-time criteria, this exceedance can be addressed through appropriate mitigation strategies such as acoustic fencing, road design optimisation, and traffic management. A detailed traffic impact assessment should be completed to confirm vehicle volumes and refine acoustic modelling prior to final design.

Importantly, the site is located outside the mapped ANEF contours for RAAF Base Williamtown, and therefore an aircraft noise intrusion assessment under AS 2021:2015 is not required. Residential development at the site is considered compatible with aircraft operations.

Internal traffic noise intrusion assessments under SEPP (Transport and Infrastructure) 2021 are also not warranted, as predicted external noise levels fall below the thresholds requiring internal treatment.

In conclusion, subject to adoption of the recommendations in this report, the proposed development is considered to be acoustically suitable and can proceed without unreasonable impact on surrounding land uses or future residents.

Please contact us if you have any further queries.

Sincerely,

Michael Phillips

Head of Engineering
M.A.A.S.
MArchSc (Audio & Acoustics), AssocDeg (Audio Eng.)



P (02) 9199 9689
E hello@nationalnoise.com.au
W www.nationalnoise.com.au

