

Aircraft Noise Assessment

At:-

91 Townsend Street,
Condell Park,
NSW 2200

April 2025

Report No. nss24484 – Final

Prepared at the Request of:-

Inhaus Designs

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C O N T E N T S

	Page
1. INTRODUCTION	1
2. SITE AND DEVELOPMENT DESCRIPTION	1
2.1 Site Description	1
2.2 Development Description	1
3. CRITERIA	1
3.1 Indoor Design Sound Levels	1
4. NOISE LEVELS	2
5. NOISE ASSESSMENT	3
5.1 External Noise Levels	3
5.2 Internal Noise Levels	3
6. RECOMMENDATIONS	4
6.1 Roof/Ceiling Construction	4
6.2 External Wall Construction	4
6.3 Windows and Glazed Doors	5
6.4 Ventilation	6
6.5 Entry Doors	7
7. SUMMARY AND CONCLUSIONS	7
APPENDIX A – SUPPLIERS FOR MATERIALS	8

1. INTRODUCTION

Noise and Sound Services was requested by Inhaus Designs of Level 5, Suite 7, 1 Homebush Bay Drive, Rhodes, NSW 2138 to carry out an aircraft noise assessment at 91 Townsend Street, Condell Park, NSW 2200 (Subject Site). The purpose of the assessment is to provide an independent and accurate appraisal of the internal level of aircraft noise for the proposed residential development on site. The assessment is in line with Australian Standard AS 2021 – 2015, “*Acoustics – Aircraft Noise Intrusion – Building Siting and Construction*”, regarding sound insulation against air traffic noise.

2. SITE AND DEVELOPMENT DESCRIPTION

2.1 Site Description

The subject site at 91 Townsend Street, Condell Park, is situated between the NEF 25 and NEF 30 contours of the ANEF Bankstown Airport Chart. It is positioned approximately 1,000 metres north-east to the central point of the main runway at the nearby Bankstown Airport. Currently, the site consists of a single-storey residential dwelling.

2.2 Development Description

The development proposal involves the alterations and additions to the existing dwelling, allowing for a new double storey residential dwelling which is set to consist of habitable rooms pertaining to a living room, dining room, rumpus room and 4 bedrooms. A full description of the proposed development is outlined in the architectural drawings prepared by ‘*Inhaus Design*’, Revision C Drawings, Project No: 2022, Dated 23rd April 2025.

3. CRITERIA

3.1 Indoor Design Sound Levels

Indoor design sound levels for aircraft noise reduction assessments for homes are given in Table 3.3 (page 23) of the Australian Standard AS 2021 (2015). For houses, home units and flats the criteria are 50 dBA for sleeping areas and dedicated lounges, 55 dBA for other habitable spaces and 60 dBA for bathrooms, toilets and laundries.

4. NOISE LEVELS

Noise levels resulting from aircraft movements can vary considerably depending on the type of aircraft, the runway used, weather conditions, etc. However, standard aircraft noise levels are given for various centreline and sideline distances as governed in the Australian Standard AS 2021 – 2015, “*Acoustics – Aircraft noise intrusion- building siting and construction*”. For this assessment, the main runway of Bankstown Airport was determined as being the most noise generating runway, resulting from typical general aviation aircraft, with respect to the subject site’s location.

Therefore, for a centreline of approximately 210 metres from the closer end of the runway (DL), approximately 1,000 metres from the further end of the runway (DT) and a sideline of approximately 600 metres (DS), the following results are outlined in Table 1 below which were determined in accordance with Table 3.51 (A) through to Table 3.53 (B) of the Australian Standard AS 2021 for typical general aviation aircraft.

TABLE 1. AIRCRAFT NOISE LEVELS AT 91 TOWNSEND STREET, CONDELL PARK

Aircraft Type	Departures / Arrivals	Noise Level (dBA)
Beech Baron 58P	Arrivals	58
Beech Baron 58P	Departures	70
Cessna 172R	Arrivals	42
Cessna 172R	Departures	55
Cessna 182H	Arrivals	45
Cessna 182H	Departures	72

Land Height Corrections – Table 3.2 of the Australian Standard AS 2021 – 2015 gives corrections to DL and DT for the difference in elevation between the site and aerodrome. In this instance, there is a difference in elevation of approximately 15 m between the subject site and the aerodrome, therefore according to Table 3.2 of the Australian Standard AS 2021 – 2015, the following corrections have been applied:

For Landing (DL) – A distance of 290 m for all aircraft types was subtracted from the approximate true value during this assessment.

For Take-off (DT) – Distances of 90 m for domestic jet aircraft types, 110 m for international aircraft types and 170 m for domestic propeller-driven aircraft and light aircraft types were subtracted from their approximate true values during this assessment.

Note: As the subject site is situated at a higher altitude than the aerodrome, DL and DT corrections were subtracted from their approximate true values.

5. NOISE ASSESSMENT

This section of the report discusses the aircraft noise results at the existing site and details formula used to predict the internal noise levels in various rooms of the proposed development.

5.1 External Noise Levels

The logarithmic average maximum noise level from current aircraft movements of a range of aircraft, as given in Table 1 above, is typically **67 dBA** with a maximum, but rarely occurring, noise level of **72 dBA**.

5.2 Internal Noise Levels

Internal noise levels are dependent upon the sound transmission loss of the building components. For convenience, the sound transmission loss can be given in a single number known as the weighted sound reduction index (R_w). This is similar to the sound transmission class (STC) used previously. The approximate value of the required R_w is found from the Aircraft Noise Attenuation (ANA) plus 5 dB; see section G3.1 (page 165) of Australian Standard AS 2021- 2015. The ANA for each building component is found from the following formula:

$$ANA = ANR + 10 \log_{10} [S_c/S_f \times (3/h) \times 8TN] - K_c$$

Where:

- ANR** is the required aircraft noise reduction (dB);
- S_c/S_f** is the ratio of the component area and the floor area;
- h** is the ceiling height (metres);
- T** is the reverberation time of the room (seconds);
- N** is the number of building components;
- K_c** is the orientation effect for the component (dB).

By applying this formula, the selection of the weighted sound reduction index of the building components, particularly the windows and glazed doors in all four facades and the roof can be found. The glazed areas are normally the acoustically weakest partitions in the façades in nearly all situations.

It is assumed that the rooms, particularly the bedrooms, will be normally furnished (e.g., bed, carpet and curtains) giving an average reverberation time of approximately 0.5 seconds for bedrooms and 0.8 seconds for living areas.

6. RECOMMENDATIONS

This section provides the minimum construction requirements to meet the internal noise goals given in Section 3 above, in accordance with the NSW Government Department of Planning's '*Development Near Rail Corridors and Busy Roads – Interim Guideline (December 2008)*'. It was determined that the newly proposed roof/ceiling should achieve a weighted sound reduction index (R_w) of at least 43 dB and the newly proposed external walls should achieve an R_w of at least 47 dB. The newly proposed glazing should achieve an R_w as outlined in Section 6.3 below.

6.1 Roof / Ceiling Construction

The newly proposed roof/ceiling must achieve a minimum R_w of 43 dB, which is standard for a concrete/terracotta tiled roof or a metal roof (e.g., 'Colorbond™') with sarking, above a single layer of 10 mm thick standard plasterboard ceiling fixed to the ceiling joists with acoustic absorption to be laid in the roof cavity. The acoustic absorption material should be at least 50 mm thick with a Noise Reduction Coefficient (NRC) of at least 0.7. Thermal rating of R2.2 (e.g., 'Bradford™' R2.2 blanket) would be suitable to meet the acoustic requirements; however, the NRC should be checked with the relevant supplier before purchase to ensure it is at least 0.7. It is essential for sound insulation that plasterboard walls and ceilings are well sealed. For example, the joint between the wall and the ceiling can be sealed with a resilient layer such as mastic and then covered with a plasterboard cornice; or it can be sealed with tape and cornice cement.

6.2 External Wall Construction

It was determined that the newly proposed external walls must achieve a minimum R_w of 47 dB, which is standard for:

- Brick veneer consisting of 110 mm thick exterior face brick, with 90 mm deep timber stud or 92 mm metal stud, at least 40 mm clearance between the masonry and stud frame and 10 mm thick plasterboard lined internally; or
- Double brick of 2 leaves of 110 mm brickwork separated by at least a 40 mm gap; or
- Timber frame or cladding construction consisting of weatherboards or plank cladding or panel cladding or rendered foam, **plus** one layer of 6 mm compressed fibre cement sheeting, 90mm deep timber stud or 92 mm metal stud, one layer of 13 mm thick sound rated plasterboard internally (e.g., Soundcheck™) with R2 insulation laid within wall cavity.

6.3 Windows and Glazed Doors

The recommended minimum weighted sound reduction index (R_w) and thicknesses for all newly proposed glazing is outlined in Table 2 below.

TABLE 2 – MINIMUM GLAZING THICKNESSES AND R_w RATINGS – 91 Townsend Street, Condell Park

Room	Glazing Reference/ Approximate Dimensions (H x W) (mm)	Recommended Minimum Type and Thickness of Glazing	Required Minimum R_w or STC (dB)
Ground Floor			
Entry	W08 1900 x 1200	5 mm float fixed window with standard seals	25
Butler's Pantry	W07 600 x 4000	5 mm float sliding window with standard seals	26
Laundry	W06 600 x 2400	4 mm float sliding window with standard seals	20
Living/ Dining Room	SD01 2460 x 5920	6.38 mm laminated sliding door with acoustic seals	31
	W05 2400 x 2400	6.38 mm laminated fixed window with standard seals	
	2 x W04 2 x 2400 x 750	6.38 mm laminated awning windows with acoustic seals	
Bathroom	W03 600 x 1500	4 mm float sliding window with standard seals	22
Bedroom 2	W02 600 x 2600	8.38 mm laminated sliding window with acoustic seals	34
	W01 2400 x 1200	8.38 mm laminated fixed window with standard seals	
Bedroom 1	2 x W01 2 x 2400 x 1200	8.38 mm laminated fixed windows with standard seals	34
First Floor			
Master Bedroom/WIR	2 x D04 2 x 2480 x 580	8.38 mm laminated glazed doors with acoustic seals	34
	W12 600 x 3200	8.38 mm laminated sliding window with acoustic seals	
	SD02 2660 x 4420	8.38 mm laminated sliding door with acoustic seals	
Master Ensuite	W14 1900 x 1200	4 mm float fixed window with standard seals	24
	W13 900 x 900	4 mm float awning window with standard seals	
Rumpus Room	W11 1500 x 2600	6.38 mm laminated sliding window with acoustic seals	30
Bedroom 3	W11 900 x 2600	8.38 mm laminated sliding window with acoustic seals	34
Bathroom	W09 1500 x 1200	4 mm float double hung window with standard seals	24
Bedroom 4 WIR	W08 1900 x 1200	5 mm float fixed window with standard seals	27
Bedroom 4	2 x D04 2 x 2480 x 580	8.38 mm laminated glazed doors with acoustic seals	33

Table 2 Notes:

- All glazing specified in Table 2 above, must be in solid timber (or aluminium) frames and well-sealed when closed;
- R_w = Weighted Sound Reduction Index, covers a frequency range from 100 Hz to 3.15 kHz;
- STC = Sound Transmission Class, covers a frequency range from 120 Hz to 4 kHz;
- Glazing systems recommended are of minimum requirements for acoustic purposes. In some cases, thicker glazing or other specifications may be required for other purposes such as for example, safety or fire rating;
- Glazing reference was not provided, hence window and door allocations have been provided for purposes of this assessment;
- All other glazing within non-habitable areas of the proposed development are to be a minimum of 4 mm thick float glass for windows and 5 mm toughened glass for doors achieving a minimum R_w or STC rating of 20 dB, assuming they are of the standard window and door types;
- Alternative types of glazing are acceptable on the basis of acoustics, provided the R_w values as given in Table 2 above are met.

6.3.1 Glazing Manufacturers

Glazing manufacturers as listed in Appendix A below have provided attenuation data for their windows and will meet the requirements given in this report. Should other suppliers be used, laboratory test data to support the window system ratings must be provided.

6.4 Ventilation

An acoustically insulated building must be virtually air tight to exclude external noise. Therefore, to achieve the required R_w ratings, the glazing in habitable rooms must be closed. With windows, or external glazed doors, opened sufficiently to provide adequate ventilation, i.e., at least 5% of the floor area of the room, a 10 dB reduction from the outside to the inside is usually assumed. This gives an internal maximum noise level with open glazing of 62 dBA (i.e., 72 dBA – 10 dB). All windows/glazed doors of habitable rooms (especially bedrooms) should be able to be closed during the night hours.

Hence, there is a **requirement** for air-conditioning or mechanical ventilation to provide fresh air to control odours. Specific ventilation requirements are outside of our scope of expertise, however requirements for indoor-air quality are given in Australian Standard AS 1668.2 - 2012, “*The use of ventilation and air-conditioning in buildings - Ventilation design for indoor air contaminant control*”. Internal noise levels from mechanical ventilation or air-conditioning should not exceed 35 dBA for bedroom areas and 40 dBA for all other habitable areas. External noise levels from mechanical ventilation or air-conditioning should not exceed 5 dB over the lowest existing background noise level (L_{AF90}) when in day time use and when measured at the neighbouring boundary. Night time noise levels

must meet the requirements of the Protection of the Environment Operations (Noise Control) Regulation 2017.

6.5 Entry Doors

The main external entry door should be at least 35 mm thick and of solid-core construction, or with minimum 6 mm toughened glass or similar. The door should also be fitted with acoustic seals (for e.g., *Lorient*[™] IS7025 and IS8011si or *Raven*[™] RP47 frame and RP38 bottom seals) to give a certified R_w rating of at least 32 dB.

The laundry external entry door should be at least 35 mm thick and of solid-core construction or with 5 mm toughened glass or similar. Acoustic door seals are optional.

7. SUMMARY AND CONCLUSIONS

An aircraft noise assessment for the proposed development at 91 Townsend Street, Condell Park, NSW 2200 has been carried out. The assessment is in line with Australian Standard AS 2021 – 2015, “*Acoustics – Aircraft noise intrusion - building siting and construction*”.

It is concluded that the internal noise criteria as given in Australian Standard AS 2021 – 2015, will be fully met for the proposed development at the subject site. This is based on aircraft using Bankstown Airport, Sydney and is providing that the recommendations given in section 6 above are fully complied with.

Status	Date	Prepared by:	Position
Draft	18 th April 2025	Anthony Nachar B.Eng. MIEAust. MAAS	Acoustician
Status	Date	Checked by:	Position
Draft	19 th April 2025	Mark Scannell B.A. Planning, MAAS	Acoustician
Status	Date	Issued by:	Position
Final	24 th April 2025	Anthony Nachar B.Eng. MIEAust. MAAS	Acoustician

Important Note: *All products and materials suggested by ‘Noise and Sound Services’ are selected for their acoustical properties only. All other properties such as airflow, aesthetics, chemical, corrosion, combustion, construction details, decomposition, expansion, fire rating, grout or tile cracking, loading, shrinkage, ventilation, etc. are outside of ‘Noise and Sound Services’ field of expertise and **must be** checked with the supplier or suitably qualified specialist before purchase.*

APPENDIX A – SUPPLIERS FOR MATERIALS

Acoustic Glazing:

‘Wideline Pty Ltd’, telephone: (02) 8304 6400.

www.wideline.com.au

‘Southern Star Windows’, telephone: 1300 733 599

<https://www.windowsanddoors.build/contactus>

‘Trend Windows & Doors Pty Ltd’, telephone: (02) 9840 2000.

www.trendwindows.com.au

‘Vantage Windows’, telephone: 1300 026 189

<http://www.awsaustralia.com.au>

‘Christoffel Pty Ltd’, telephone: (02) 9627 4811

www.christoffel.com.au/contact.htm

‘Sound Barrier Systems Pty Ltd’, telephone: (02) 9540 4333

www.soundbarrier.com.au

‘Safetyline Jalousie’, telephone: 1300 863 350

www.safetylinejalousie.com.au

‘Velux Australia’, telephone: 1300 859 856

www.velux.com.au

‘Majestic Glass’, telephone: 1800 452 946

www.majesticglass.com.au

Acoustic Door Seals:

‘Kilargo’, telephone: 1300 858 010

www.kilargo.com.au

‘Raven’, telephone: 1800 888 123

www.raven.com.au

Internal Wall-Mounted Air Ventilators:

Active:

‘Acoustica’, telephone: 1300 722 825

www.acoustica.com.au

‘Sonair’, telephone: 1300 858 674

www.edmonds.com.au

Passive:

‘Silenceair[®]’, telephone: (02) 9555 7215

www.silenceair.com