

Aircraft Noise Strategy

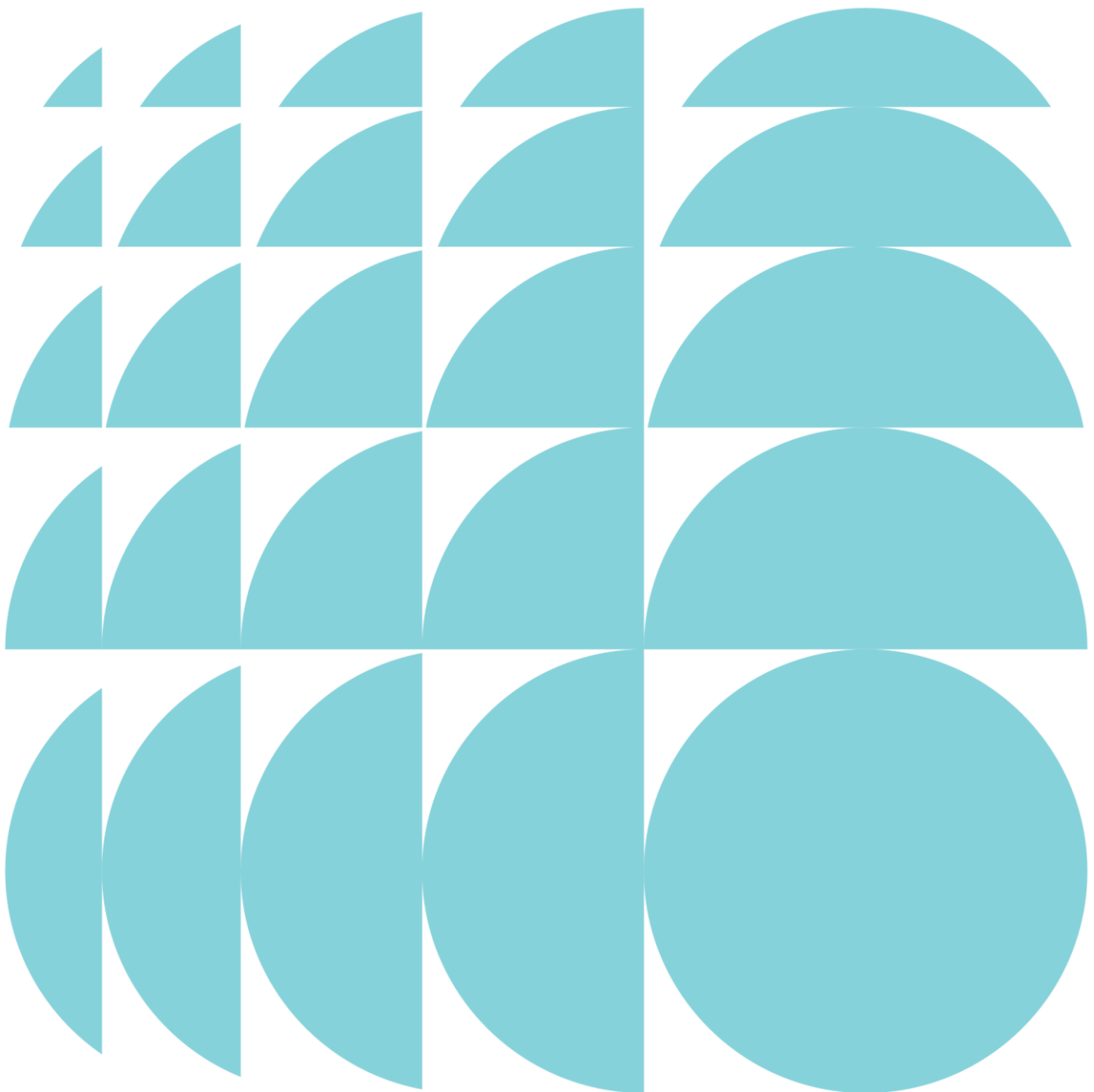
Precinct 75

67, 73-83 Mary Street, 50-52 Edith Street and 43
Roberts Street, St Peters

Submitted to the Department of Planning, Industry
and Environment

On behalf of JVMC Pty Ltd

7 June 2019 | 15869



CONTACT

Andrew Duggan	Director	ADuggan@ethosurban.com	+61 2 9409 4946
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This document has been prepared by:



Chris Patfield

07.06.2019

This document has been reviewed by:



Andrew Duggan

07.06.2019

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VERSION NO.	DATE OF ISSUE	REVISION BY	APPROVED BY
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Ethos Urban Pty Ltd
ABN 13 615 087 931.
www.ethosurban.com
+61 2 9956 6962

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	<i>EMM</i>

1.0 Introduction

1.1 Name

This document is called the Precinct 75 Aircraft Noise Strategy. This Noise Strategy is to take the form of a Development Control Plan once adopted by Inner West Council.

1.2 Land to which this strategy applies

The Precinct 75 Aircraft Noise Strategy applies to land covered by the Precinct 75 Planning Proposal as shown in **Figure 1**. This includes land at 67, 73-83 Mary Street, 50-52 Edith Street and 43 Roberts Street, St Peters



Figure 1 Land to which this strategy applies

1.3 Relationship to other planning instruments and development control plans

This Aircraft Noise Strategy has been made to provide more detailed guidance and design provisions for development proposals within Precinct 75. Once adopted, the Strategy is intended to form part of Inner West Council's planning framework, working with and supplementing other LEP and DCP planning and development controls. In the event of any inconsistency between the provisions of this Strategy and any other DCP, the provisions in this Strategy prevail to the extent of any inconsistency, but only where this inconsistency relates to land identified as being within the defined Precinct 75 site area.

1.4 Information required in a Development Application

Any development application for a noise sensitive land use in Precinct 75 is to be accompanied by adequate supporting information that responds to the requirements of this strategy, and which specifically demonstrates:

- a) the noise levels that the site and the proposal are exposed to;
- b) how the proposal achieves the objectives and principles of this Strategy;
- c) how the design and materiality of the proposed development meet the requirements of this Strategy;

- d) what residential facilities have been incorporated into the design of the proposal and how these meet the requirements of this Strategy; and
- e) what management and implementation initiatives are proposed and how these will these meet the requirements of this Strategy.

1.5 Variations to development controls

The consent authority may grant consent to a proposal to which this plan applies that does not comply with the controls in this Strategy in some circumstances, provided that the intent of the controls is achieved. Any non-compliance will need to be considered on its merits; however, it is essential that if the development is for a sensitive land use, that adequate acoustic amenity is maintained at the site.

Where a variation is sought it must be demonstrated to the satisfaction of Council how the development meets the intention of the objectives of the relevant control, as well as the overall objectives at **Section 3.2** of this Strategy.

2.0 Background

2.1 Context

Precinct 75 comprises approximately 1.5 hectares of land between Unwins Bridge Road, Edith Street and Mary Street in St Peters. It comprises seven separate allotments that together form the larger single landholding, which is surrounded on all sides by residential development with the exception of light industrial use to the west of the site across Mary Street. It is the site of the former Taubmans Paint Factory, which occupied the site from the late 1920s to the early 1940s. There are currently 11 existing buildings on site of various heights ranging from one to three storage, as well as a cottage and three residential buildings. The site is approximately 2km north west of the main north/south runway at Sydney Airport.

A brief chronology of the plans to redevelop the site include:

- **September 2015:** Preliminary Planning Proposal request was submitted with Marrickville Council to rezone the subject site from IN2 Light Industrial and R2 Low Density Residential to B4 Mixed Use.
- **February 2016:** Report prepared by Council staff recommends that Council support the Planning Proposal request (subject to a number of minor amendments) and that it be forwarded to the Department of Planning, Industry and Environment (DPIE) for Gateway Determination.
- **March 2016:** Despite the recommendation of Council staff, Council resolved to refuse the proposal.
- **February 2017:** Following the lodgement of a Pre-Gateway Review request, the Sydney Central Planning Panel recommended that the proposal proceed to Gateway.
- **July 2017:** Lodgement of revised Planning Proposal with Inner West Council.
- **October 2017:** The proposal received Gateway Determination. Whilst Council had been offered and accepted the role of Relevant Planning Authority, the Gateway determination did not provide the delegation to Council to make the instrument.
- **November 2017:** Concurrent development applications lodged with Council.
- **December 2017:** Letter from Sydney Airport (dated 12 December 2017) advising no objection to the Planning Proposal and confirming the relevant Australian Noise Exposure Forecast (ANEF) for which Council may use as their land use planning tool for Sydney Airport is the 2033 ANEF.
- **August 2018:** Sydney Airport releases 2039 draft Master Plan. The Master Plan moved the ANEF 25 contour approximately 50m across the subject site.
- **November 2018:** A report was considered by Council and Council resolved to not support the Planning Proposal in its current form for reasons including the shifted ANEF contour. The matter is to now be considered by the DPIE as the relevant plan making authority.
- **April 2019:** Sydney Airport's 2039 Master Plan is finalised.

One of the key matters to be considered by the DPIE is the amendment to the ANEF contour and the implications that this has for assessing consistency with Ministerial Directions prescribed under Section 9.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Direction 3.5 relates to 'Development near licenced aerodromes' and does not allow residential development above the 25 ANEF contour unless the proposal is supported by an appropriate Noise Strategy that mitigates the impact of noise exposure. The previous Sydney Airport 2033 Master Plan, which was the applicable Master Plan for four years following the lodgement of the Planning Proposal, did not show the 25 ANEF contour impacting proposed residential areas under the development concept and on this basis, Sydney Airport did not object to the Planning Proposal in their letter dated 12 December 2017.

Sydney Airport is one of Australia's most important pieces of infrastructure, generating or facilitating the equivalent of 6% of economic activity for New South Wales, and is projected to cater for 408,000 per annum by 2039. Given its importance, it is vital to ensure that Sydney Airport's ongoing operation is not compromised by new development within Precinct 75. This includes development that would limit or impact on the Airport's ability to operate in accordance with current or future practices as outlined in the Sydney Airport Master Plan 2033 and 2039.

This Noise Strategy has therefore been prepared to provide an appropriate framework to assist in achieving a balance between urban renewal of Precinct 75 and the protection of Sydney Airport's ongoing operations. The

Noise Strategy therefore puts in place measures, standards and requirements to ensure that future development is designed to respond to aircraft noise related impacts, and in doing so is intended to provide the necessary certainty that an appropriate development outcome can be achieved that responds to the relevant State Government policies, including Section 9.1 Direction 3.5 relating to licensed aerodromes.

2.2 Understanding Noise

To understand the importance and rationale behind this Noise Strategy it is essential to appreciate the nature of aircraft noise and how it affects an area and people's experience, perception and enjoyment of that area. To provide this necessary background we below:

- Discuss how aircraft noise is perceived, measured and analysed;
- Outline who is responsible for ensuring aircraft noise levels are in accordance with relevant Australian standard and regulations; and
- Identify how technological and legislative advancements are assisting with reductions in aircraft noise levels.

2.3 Aircraft Noise

Sound is a normal part of everyday life that constantly engages the individual and influences the way that individuals experience daily life. Such is the constant nature of sound that it is often not appreciated or even recognised until it becomes a particular aspect that draws the individual's attention, be it through the enjoyment or alternatively the annoyance of the sound. Generally, when sound becomes an annoyance or unwanted then it is commonly referred to as 'noise'.

In highly urbanised areas such as St Peters and inner Sydney, a cacophony of varying sounds can be heard at any one time, including but not limited to workers and machinery, motor vehicles, people's voices, sirens, music, trains and aircraft. The fact sound from an aircraft is associated with a particular and distinct event (i.e. aircraft passing over) and given it is at a generally higher level than other sounds translate it to a distinguishable and recognisable noise.

Nuisance caused by sound from an aircraft can take several forms. It can be annoying to the individual by virtue of its volume compared to the background sound level or because it affects a person's ability to carry out or enjoy an activity. For instance, waking someone from sleep, interrupting a discussion, or preventing the person from clearly hearing music or the television. The annoyance level of aircraft noise can also depend on other factors such as the tone of the noise, the duration of the noise, the degree of frequency, or the time of day that it is experienced (e.g. aircraft noise at 3am is likely to cause more interruption than at 1pm during the daytime).

2.4 How is aircraft noise generated and how is technology reducing impacts?

Noise from aircraft flying overhead is generated in two main ways:

- Engine noise – Noise associated with engines is primarily generated from the air intake, exhaust mechanisms of the engine as well as other major engine components that are required to operate at high speed to propel the aircraft. Engine noise is the predominant noise heard when an airplane is taking off from the ground; and
- Aerodynamic noise – Aerodynamic noise arises from the airflow around the aircraft body and wings, with the level of noise increasing with aircraft speed and also at low altitude due to the density of the air. Noise associated with the plane's aerodynamics is predominantly heard when an airplane is coming into land at the airport.

Technological innovation and improvements are constantly being made in the fields of engine design and development and airframe design, both of which are continually helping to advance aircraft safety and minimise their environmental impacts. This includes reducing noise levels and impacts on the public.

This is confirmed in the Sydney Airport Master Plan, which highlights that the global fleet of commercial aircraft are presently undergoing substantial technological transformation, which is resulting in jet aircraft being significantly quieter, cleaner and more fuel efficient than ever before. In the competitive Australian aviation industry, Australian and international airlines are ordering newer aircraft such as Boeing 777s and 787s, as well as Airbus A330s, A350s and A380s, all of which continue to replace older, louder and less fuel efficient jets, such as the Boeing 747s

and 767s to maintain competitiveness on Australian routes. New generation larger aircraft are also enabling more passengers to be transported per flight with less impact on the environment.

2.5 How loud are aircraft?

Noise is primarily referred to and measured in the sound measurement unit of the decibel (dB(A)). Human hearing ranges from 0 dB(A), which is the lowest level at which sound can be detected by the human ear, to over 140 dB(A), which is the threshold for the human ear to experience pain from sound. The decibel is a logarithmic unit used to express the ratio between two values of physical quantity, in this case being the overall power and intensity of sound. The smallest change in sound which can be perceived by the human ear is approximately 3 dB(A), while scientific research has identified that a 10 dB(A) increase to the sound level is required in order for the human ear to perceive a doubling of the sound level. **Figure 2** below illustrates and benchmarks the decibel levels associated with everyday sounds.

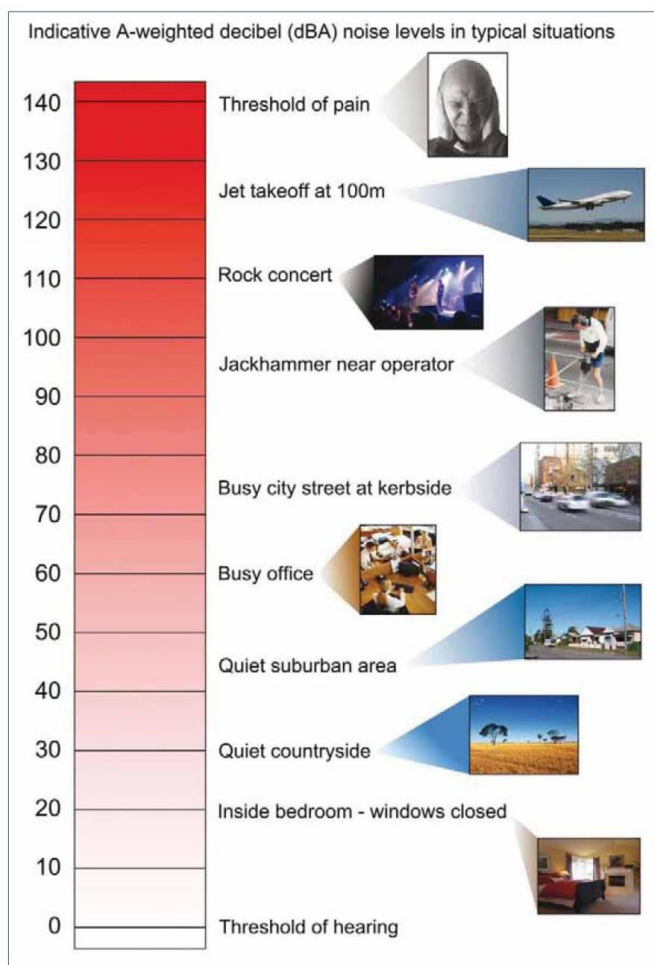


Figure 2 Noise Levels of Different Activities

2.6 Why has this noise strategy been prepared for Precinct 75?

Under Australian Standards the benchmark or threshold used in measuring noise events associated with aircraft is 70 dB(A). This noise level is used commonly within the industry as extensive research has shown that when a noise event exceeds 70 dB(A), it is at this point when aircraft noise has the potential to impede on everyday household activities. The 70 dB(A) benchmark has been established on the basis that:

- 60 dB(A) is the point at which a sound is likely to interfere with conversation in a home,
- the exterior walls of a house with the windows open have been shown to reduce the external noise level by approximately 10 dB(A).

It is noted that an individual during any standard day is highly likely to be experience a multitude of sounds that are louder than 70 dB(A). For instance, cars, domestic appliances, music, machinery, elevated voices and construction activities are all everyday sounds that are likely to exceed 70 dB(A). Whilst this is the case people as a collective are generally more socially accepting of some sounds over others as they are able to better associate with those sounds or because the tone, frequency, duration and intensity of those sounds is perceived to be less intrusive and impactful on their enjoyment of the area or a particular activity.

The external sound levels from aircraft noise affecting Precinct 75 have been measured and are shown in **Figure 3**. As shown, external noise levels from aircraft within Precinct 75 range between 75 and 88 dB(A). These noise levels are in excess of 70dB(A) which means that the area is subject to noise levels that exceed the traditional threshold for when people inside their home can be affected by aircraft noise if all of their windows are open. Notwithstanding, the measurements reflect those recorded in relation to a 747-400 aircraft in accordance with AS2021:2015, however these aircraft movements are relatively infrequent, with only one take-off captured during on site observations on 31 January 2019.

In addition to this, EMM have undertaken analysis for the subject site which demonstrates that actual LAS_{max} noise levels calculated in accordance with the procedures of AS 2021:2015 do not alter and would remain consistent whether the ANEF 2033 or ANEF 2039 is applied for the purpose of land use planning. That is, the real-world impact of these changes in the ANEF contours do not have a perceptible impact on noise levels on different parts of the site that straddle the two contours.

It is noted that under Section 9.1 Direction 3.5, rezoning of land for residential purposes may only be carried out in areas above ANEF 25 when it is accompanied and justified by a Noise Strategy.

This Noise Strategy is therefore required to address both the environmental and statutory requirements for the precinct. To do this, it sets out the mitigation and attenuation measures required for new development in the precinct to achieve appropriate internal noise amenity.



Figure 3 Site $L_{A_{Smax}}$ noise levels – Boeing 747 – 400 (long range)

Source: EMM

3.0 Purpose of this Strategy

3.1 Purpose

The Precinct 75 Noise Strategy has been prepared taking into consideration Section 9.1 Direction 3.5 relating to 'Development near licenced aerodromes'. Specifically, the Noise Strategy is intended to:

- a) Inform development proponents and the broader community about the facts surrounding aircraft noise resulting from operations at Sydney Airport, and their potential impact on Precinct 75;
- b) Inform development proponents on the level of noise attenuation required to be achieved in future development proposals within Precinct 75;
- c) Provide a policy framework to be used in the assessment and determination of future development proposals for land within Precinct 75; and
- d) Ensure that future development is appropriately designed in a manner which achieves an adequate level of amenity for future residents, and does not impact on the operations of Sydney Airport.

This document is to be read in conjunction with other key relevant Strategic Plans and Policies as outlined in **Section 4.0** and with the Noise Impact Assessment prepared by EMM at **Appendix A**.

3.2 Objectives

Through the effective implementation of this Noise Strategy, all new development within Precinct 75 will be designed to minimise exposure to noise and vibration occurring from industrial, road and aircraft noises. The key objectives of this strategy are:

- To demonstrate that the adoption of the Strategy will result in buildings which will comply with Australian Standard 2021:2015 regardless of where the building is situated on site.
- To ensure that all new development in Precinct 75 is designed to achieve an appropriate level of amenity for its occupants, whether residents or workers, taking into consideration its land use.
- To ensure that all residential development satisfies key necessary design criteria relating to building siting, design, materiality and facilities.
- To ensure that future residents within Precinct 75 are appropriately informed about aircraft noise within Precinct 75.
- To protect the ongoing operation of Sydney Airport and minimise the potential for reverse impacts from new development within Precinct 75.

4.0 Policy Directions

The following section outlines the policy framework and context relevant to proposed development within areas affected by aircraft noise.

4.1 Section 9.1 Direction – Development near licenced aerodromes

Section 9.1 Direction 3.5 relating to ‘Development near licenced aerodromes’ applies when a relevant planning authority prepares a planning proposal that will create, alter or remove a zone or a provision relating to land in the vicinity of a licensed aerodrome.

The objectives of this direction are:

- a) *to ensure the effective and safe operation of aerodromes, and*
- b) *to ensure that their operation is not compromised by development that constitutes an obstruction, hazard or potential hazard to aircraft flying in the vicinity, and*
- c) *to ensure development for residential purposes or human occupation, if situated on land within the Australian Noise Exposure Forecast (ANEF) contours of between 20 and 25, incorporates appropriate mitigation measures so that the development is not adversely affected by aircraft noise.*

As is described in **Section 4.5** below, the Planning Proposal as initially lodged was consistent with the provisions of this Section 9.1 Direction, as no residential development was located above the 25 ANEF contour under the applicable maps provided by Sydney Airport in their 2033 Master Plan. Throughout the assessment of the Planning Proposal, Sydney Airport released their 2039 Master Plan, which increased the 25 ANEF contour approximately 50m across the subject site to include proposed residential areas (refer to **Figure 4** and **Figure 5**).

Notwithstanding the change in the location of the 25 ANEF contour, EMM have undertaken analysis for the subject site which **demonstrates that actual $L_{AS_{max}}$ noise levels calculated in accordance with the procedures of AS 2021:2015 do not alter and would remain consistent whether the ANEF 2033 or ANEF 2039 is applied for the purpose of land use planning.** That is, the real-world impact of these changes in the ANEF contours do not have a perceptible impact on noise levels on different parts of the site that straddle the two contours.

Whilst the Planning Proposal was lodged at the time the ANEF 2033 was applicable, this Strategy has been prepared to remove any doubt regarding which Master Plan should apply for the purposes of land use planning.

As a standard approach, the Section 9.1 Direction seeks to restrict residential from occurring on land where the ANEF exceeds 25. Whilst this is the case, an exception to this limitation is possible where the Secretary of the DPIE (or an officer of the DPIE nominated by the Secretary) is satisfied that the provisions of the planning proposal that are inconsistent are:

- a) *justified by a strategy which:*
 - (i) *gives consideration to the objectives of this direction, and*
 - (ii) *identifies the land which is the subject of the planning proposal (if the planning proposal relates to a particular site or sites), and*
 - (iii) *is approved by the Director-General of the Department of Planning, or*

This Aircraft Noise Strategy has been prepared with the specific intention of providing a robust precinct specific strategy to address aircraft noise related issues associated with the redevelopment of the Precinct 75 and has been formulated taking into consideration the key objectives of the Section 9.1 direction in order to remove any ambiguity regarding whether the ANEF 2033 or ANEF 2039 contour should be applied. Specifically, the following is noted in regard to the key objectives:

- The Noise Strategy will not result in future development which could compromise the effectiveness or safety of Sydney Airport. The measures outlined at **Section 6.0** have been designed to minimise potential impacts on residents from aircraft, as well as outline measures to minimise potential for ‘reverse impacts’ on Sydney Airport from future residents within the Precinct.

- The operation of the airport will not be affected by the Noise Strategy in any manner which will constitute a hazard / potential hazard to aircraft flying in the vicinity of development. All proposed LEP height limits will meet the relevant OLS and PAN OPS requirements.
- Although the Noise Strategy envisages the potential for residential development to occur in areas which have ANEF contours of between 25 and 30, the controls measures and initiatives outlined in this Noise Strategy will ensure that development in Precinct 75 is not adversely affected by aircraft noise, and that it will achieve an appropriate level of residential amenity for human occupation.

4.2 National Airports Safeguarding Framework

The National Airports Safeguarding Framework is a national land use planning framework applying to all states and territories in Australia, which aims to:

- *“improve community amenity by minimising aircraft noise-sensitive developments near airports; and*
- *improve safety outcomes by ensuring aviation safety requirements are recognised on land use planning decisions through guidelines being adopted by jurisdictions on various safety related issues”* (Department of Infrastructure and Regional Development).”

The Framework is underpinned by seven (7) key principles that have been prepared by planning and transport officials at all levels of government, with the objective of developing a consistent and effective national framework to safeguard both airports and communities from inappropriate on and off-airport developments. These principles have been designed on the basis that a national approach can improve consistency across the country and can assist in improving planning outcomes near airports and under flight paths. These principles along with commentary on how the strategy responds are outlined below:

Principle 1: The safety, efficiency and operational integrity of airports should be protected by all governments, recognising their economic, defence and social significance.

Response: Sydney Airport is of national significance and is one of the main economic gateways to Sydney and Australia. The provision of residential development in Precinct 75 will be required to be implemented in accordance with the objectives and controls of this Noise Strategy along with other key local, State and National Government controls. As a result, all future development within the precinct will not affect the safety, efficiency and operational integrity of Sydney Airport.

Principle 2: Airports, governments and local communities should share responsibility to ensure that airport planning is integrated with local and regional planning.

Response: The Noise Strategy has been prepared in response to Section 9.1 Direction 3.5 and has been drafted taking into consideration the National Aviation Framework, AS 2021 Aircraft Noise Intrusion, the Greater Sydney Region Plan and the Sydney Airport Masterplan 2033.

Principle 3: Governments at all levels should align land use planning and building requirements in the vicinity of airports.

Response: This Noise Strategy has been prepared to specifically support land use planning for the Precinct 75. It provides a robust planning framework, including setting out clear building requirements, to ensure that all new development within the precinct is designed to achieve an appropriate level of amenity for its occupants taking into consideration its land use.

All development proposals for land within Precinct 75 will be required to comply with the requirements of this Noise Strategy and will be the subject of assessment by Inner West Council and any other applicable levels of government. The measures outlined at **Section 5.0** in many cases exceed those usually required to be demonstrated at the Development Application Stage. However, in the context of Precinct 75, such considerations are necessary to achieve adequate amenity and not impact on the operations of Sydney Airport.

Principle 4: Land use planning processes should balance and protect both airport / aviation operations and community safety and amenity expectations.

Response: As outlined in **Section 2.0** this Noise Strategy has been drafted to provide a robust planning framework that ensures that all new development in Precinct 75 achieve an appropriate level of amenity for its occupants, that future residents are appropriately informed about aircraft noise, and that new development will not result in any impact on airport / aviation operations, and that it is safeguarded against the potential for any 'reverse impacts' of future development on the airport operations. For the purposes of this Noise Strategy, a 'reverse impact' is understood to mean an impact on the operations of Sydney Airport directly arising from the population of residential development within the vicinity of air corridors, with an example being objections from future residents further expanding the curfew hours of Sydney Airport.

Principle 5: Governments will protect operational airspace around airports in the interests of both aviation and community safety.

Response: The underlying purpose of this strategy is to guide and regulate new development within Precinct 75 to ensure it achieves adequate amenity for future occupants, and does not impact on the operations of Sydney Airport.

Principle 6: Strategic and statutory planning frameworks should address aircraft noise by applying a comprehensive suite of noise measures.

Response: This Noise Strategy has been specifically drafted to outline a comprehensive suite of noise measures, initiatives and requirements, that future developments within Precinct 75 are required to meet in order to ensure an acceptable level of amenity for future occupants. Once adopted the Noise Strategy will take the form of a Development Control Plan and form part of the Council's planning framework.

Principle 7: Airports should work with governments to provide comprehensive and understandable information to local communities on their operations concerning noise impacts and airspace requirements.

Response: **Section 5.0** of this Noise Strategy sets out controls and requirements for the implementation and management of new development within Precinct 75. Central to this is the need to provide an information pack to new residents and business operators upon occupation of premises, to ensure that they are appropriately informed about aircraft noise within Precinct 75.

4.3 Australian Standard 2021:2015 – Acoustics, Aircraft Noise Intrusion, Building Siting and Construction

Australian Standard 2021:2015 works in conjunction with the ANEF relevant charts for Sydney Airport to provide standards for developments which are subject to noise generated by the movements of aircraft. Specifically, the Standard provides guidelines for determining:

- a) "whether the extent of aircraft noise intrusion makes building sites 'acceptable', 'unacceptable' or 'conditionally acceptable' for the types of activity to be, or being undertaken;
- b) for 'conditionally acceptable' sites, the extent of noise reduction required to provide acceptable noise levels indoors for the types of activity to be, or being undertaken; and
- c) the types of building construction necessary to provide a given noise reduction, provided that external windows and doors are closed."

The Standard has the overall objective of working as a guidance document for the relevant stakeholders in the planning process regarding the siting and construction of new buildings against aircraft noise intrusion. This Noise Strategy is based on the methodology and findings of the study of aircraft noise impact undertaken by EMM following the change in the ANEF contours across the subject site (refer to **Section 4.5** for further detail). The design initiatives for aircraft noise which are the subject of EMM's report have been incorporated at **Section 5.0** of this Noise Strategy.

As the Study undertaken by EMM was fundamentally set out in accordance with AS2021:2015, this Noise Strategy is consistent with the subject Australian Standard. The measures proposed to ameliorate potential acoustic impacts from aircraft at **Section 5.0** reflect the recommendations of the 'Design Initiatives for Aircraft Noise' report prepared by EMM and will result in the ultimate delivery of dwellings which are of a satisfactory acoustic amenity level.

4.4 Greater Sydney Region Plan

The *Greater Sydney Region Plan* sets out a vision, objectives, strategies and actions for a metropolis of three cities across Greater Sydney. It includes 40 objectives across the themes of:

- Infrastructure and collaboration;
- Liveability;
- Productivity;
- Sustainability; and
- Implementation

The *Greater Sydney Region Plan* acknowledges the significant housing pressures that are currently facing Sydney, and outlines in the form of objectives, the methods in which the Government plans to achieve the outcomes associated with the various themes.

The development proposal has demonstrated its ability to meet relevant objectives of the *Greater Sydney Region Plan* and the *Eastern City District Plan*. This includes, but is not limited to, a demonstration that the proposal satisfies the precautionary principle of limiting the conversion of industrial zoned land to residential development, including conversion to mixed uses. Reference should be made to the Planning Proposal and associated documents for further information on the objectives and outcomes of these plans which do not relate to noise and noise management.

Objectives which are relevant to this Noise Strategy include the following.

Objective 16: Freight and logistics network is competitive and efficient

This objective acknowledges the role that Sydney Airport plays in ensuring that supply chain operations are efficient to maintain Greater Sydney's global competitiveness. It proposes to manage the interfaces of industrial areas, trade gateways and intermodal facilities by, among other things, improving the capacity of existing stakeholders to implement existing planning noise standards for incoming sensitive developments.

This proposal is responsive to and consistent with the planning controls relating to rezoning related noise standards. Specifically, this includes Section 9.1 Direction 3.5 relating to 'Development near licenced aerodromes'. Refer to **Section 4.1** for further detail.

Objective 37: Exposure to natural and urban hazards is reduced

Noise pollution is listed as an urban hazard that is to be reduced under the *Greater Sydney Region Plan*. The Plan recommends buffers between noise sources and sensitive receivers and refers to Australian Standards which are in place to manage impacts from aircraft noise. As demonstrated in **Section 4.3**, this proposal is consistent with the relevant Australian Standards and ensures that residential amenity is maintained without adversely impacting the operations of the Airport.

4.5 Sydney Airport Master Plan 2039

The Sydney Airport Master Plan 2039 (Master Plan) represents the vision for the operation of Sydney Airport and is to be used as a tool to forecast growth in air travel for tourism and trade to and beyond 2039. The Master Plan is stated to be based on the premise that there will be no changes to the curfew, aircraft movement cap, noise sharing arrangements, flight paths and runways. The location of the precinct in close proximity to the airport makes this document a relevant consideration as part of the Noise Strategy.

Chapter 15 of the Master Plan titled 'Aircraft Noise' details methods in which aircraft noise can be measured, and the various noise benchmarks which are currently applied to aircraft operations and surrounding land uses. It details aircraft flight paths, how noise is measured, mapped and communicated and has information on ground-based noise. The key points in this chapter also include Sydney Airport's acknowledgement of the noise impacts it produces on the community and its commitment to working with the community, governments and the aviation industry to manage and mitigate these impacts. The Master Plan states that despite modern aircraft technology and

airline fleet replacement continuing to reduce the measured noise levels for individual aircraft on approach to and departure from the runways, public concern around noise remains.

The 2039 Master Plan was finalised in April 2019. Prior to this, the 2033 Master Plan applied to the site. The Planning Proposal for the subject site was initially submitted in 2015 under the applicable guidelines of the 2033 Master Plan. This include ANEF noise contours, whereby the extent of the 25 ANEF contour has been extended by approximately 50m across the subject site. As a result, the extent of exposure for the site within the 25-30 ANEF zone comprises an area of approximately 7,600m². Refer to the 2033 ANEF contours as they apply to the site in **Figure 4** compared to those of 2039 in **Figure 5**.

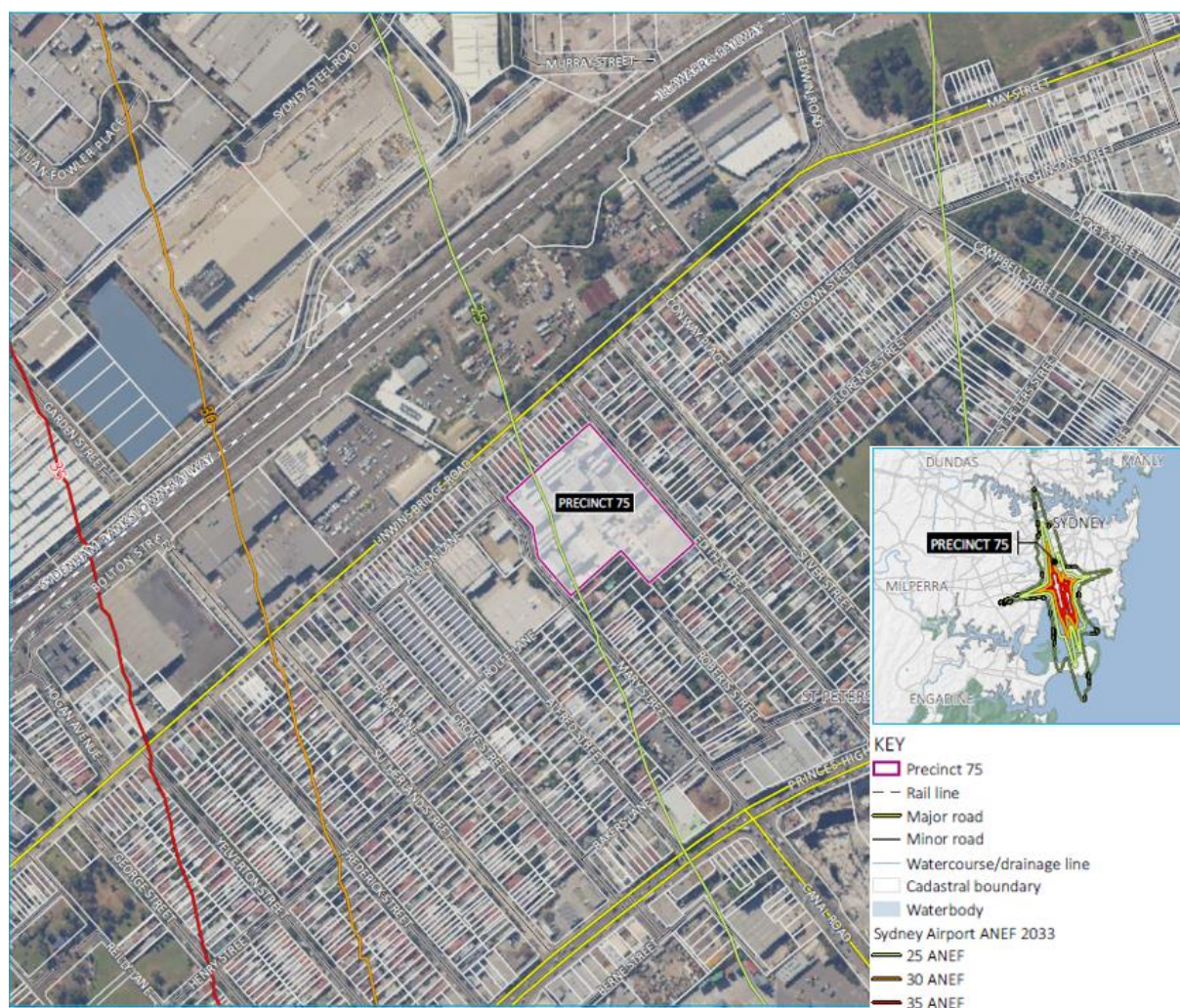


Figure 4 2033 ANEF Contours as they apply to the subject site

Source: EMM

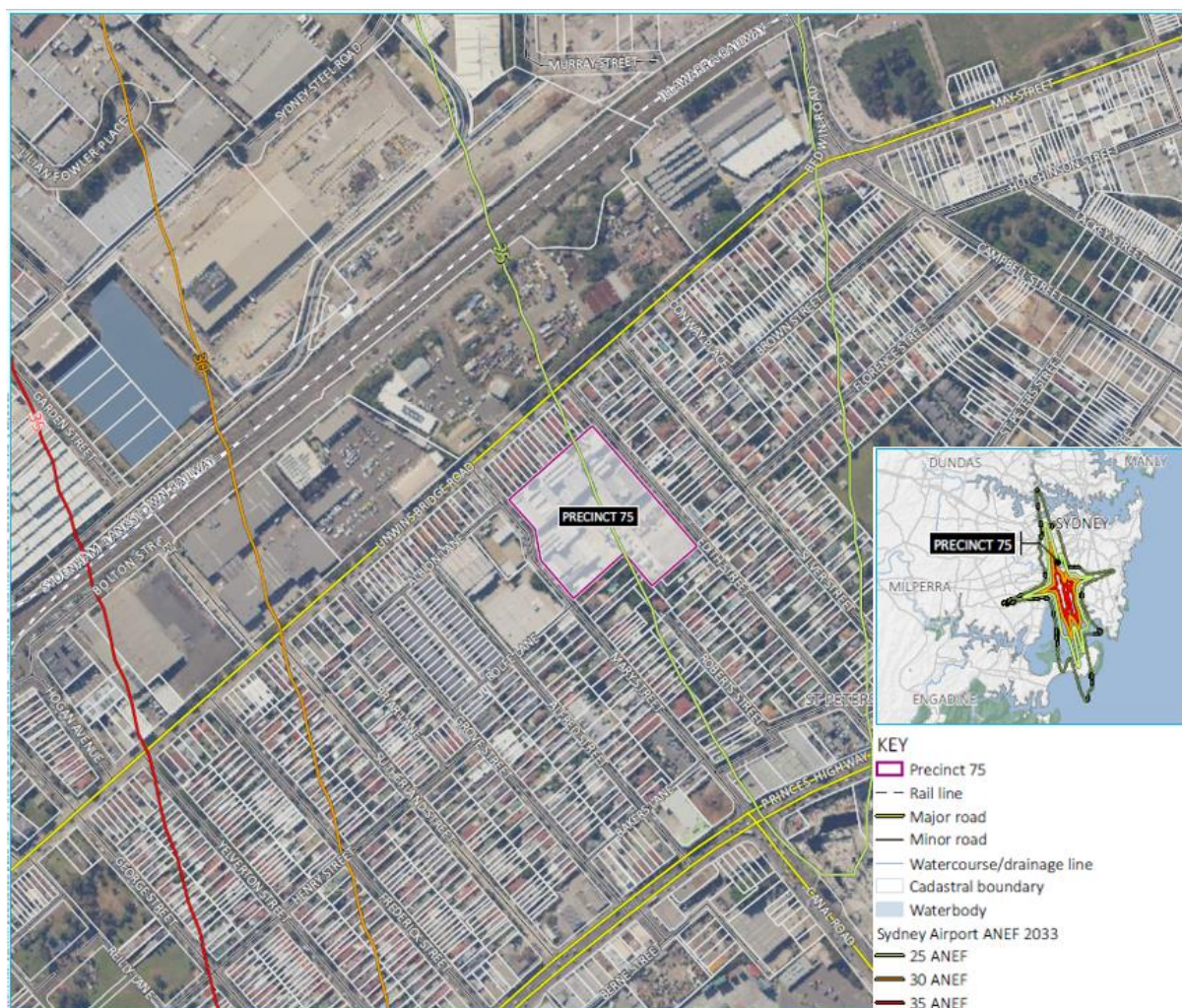


Figure 5 2039 ANEF Contours as they apply to the subject site

Source: EMM

The Master Plan states that the reasons why some contours in ANEF 2039 are, in some areas, different to those in the previous ANEF 2033 can be summarised as follows:

- forecast increased aviation activity over the planning period, which will see flights increase to just over 408,000 per annum;
- international passengers are expected to be the main driver of growth, increasing as a proportion of overall passengers (and therefore international flights) over the period to 2039. Aircraft flying to or from international destinations tend to be larger than those flying to or from domestic or regional destinations;
- to ensure balanced operations between the airport's two north-south runways, it has been assumed that some of this growth in international flights will be accommodated on Sydney Airport's parallel north-south runway, noting that such international flights operate from that runway now;
- the new ANEF 2039 assumes Western Sydney Airport opens in late 2026 and the aviation activity forecasts that underpin the ANEF reflect that; and
- updated meteorological data.

Sydney Airport Corporation also recognises within its Master Plan that the responsibility of managing aircraft noise impacts is shared by many organisations, including the NSW Government and local councils. The Master Plan makes reference to the thresholds for different land uses set in the Section 9.1 Directions as a primary measure for controlling development in areas subject to aircraft noise, and also reference land use planning controls and acoustic standards as being the most effective measure to control aircraft noise from the land use planning perspective.

5.0 Technical Analysis

EMM has undertaken a technical assessment of aircraft noise and its impacts on land located in the vicinity of Precinct 75 (refer to **Appendix A**). This study has been prepared to recommend acoustic treatments to ensure compliance with the requirements of AS2021-2015. These are known as Aircraft Noise Reduction (ANR) requirements.

In order to determine these requirements, EMM undertook attended noise measurements at the site in accordance with the procedures of AS2021-2015. To determine the typical L_{ASmax} noise exposure for the site and surrounding area, a 50m grid was developed and a worse case prediction of a Boeing 747-400 (long haul) departure and arrival on the main north-south runway (16R/34L) was considered. As shown in **Figure 3** in **Section 2.6**, external noise levels from aircraft within Precinct 75 range between 75 and 88 dB(A).

The overall ANR of a building is simply the external aircraft noise level (e.g. up to 88 dB(A) for the subject site) less the AS2021-2015 internal noise goal (e.g. 50 dB(A) for sleep areas and dedicated lounges). Therefore, a maximum ANR of 38dB(A) is applicable to the subject site.

Overall, following detailed technical analysis the EMM Noise Impact Assessment concludes that current building materials can be reasonably applied to new development and will be sufficient to achieve internal noise goals set by AS 2021-2015. Subject to the implementation of these measures and achievement of the internal noise levels, EMM conclude that an appropriate level of internal residential amenity is to be achieved.

Using the outcomes and recommendations of the EMM Noise Impact Assessment, an area specific noise strategy has been developed which is set out in **Section 6.0** below.

6.0 Strategy

This section outlines the objectives, design principles and design solutions relating to noise impacts on new development proposals within Precinct 75. Proponents for all new development proposals within Precinct 75 are to be designed in accordance with the principles and design solutions set out below. Development applications are to be accompanied by adequate supporting technical information that demonstrates how the proposed development has been designed to meet the requirements of this strategy.

6.1 Objectives

- To ensure that all new development in Precinct 75 is designed to achieve an appropriate level of amenity for its occupants taking into consideration its land use.
- To ensure that all residential development satisfies key necessary design criteria relating to building design, building materials and facilities.
- To ensure that new development within Precinct 75 complies with Australian Standard AS 2021-2015.
- To ensure that future residents within Precinct 75 are appropriately informed about aircraft noise within the vicinity.
- To protect the ongoing operation of Sydney Airport and minimise the potential for reverse impacts from new development within Precinct 75.

6.2 Building Design

Effective mitigation against aircraft noise begins with the fundamentals of design. Effective and thoughtful use of site layout, orientation, internal building configuration and apartment design can significantly assist with laying the foundations to ensuring high quality amenity is achieved for future occupants of buildings. **Table 1** sets out the design principles and solutions for achieving effective design for new development within Precinct 75.

Table 1 Design Principles relating to Building Design

Design Principles		Design Solution
DP1	To minimise the level of noise exposure to future development	Where possible, the following design solutions should be achieved for new development:
DP2	To ensure buildings are designed to respond to site specific aircraft noise constraints taking into consideration site layout, building orientation, building configuration and apartment design.	DS1 The internal configuration of new residential buildings should be designed to minimise the number of apartments facing toward the flight path (i.e. to the south west).
DP3	To ensure that occupants of new buildings, particularly residents of new residential buildings, are afforded an appropriate level of internal amenity in accordance with AS 2021-2015	DS2 Apartment layouts should be configured so that less sensitive non-habitable rooms and spaces (e.g. bathrooms, kitchens, laundries, hallways) are positioned along facades that have a higher level of noise exposure.
DP4	To ensure that all new dwellings are provided with adequate and useable private amenity space.	DS3 Building facades should be designed to minimise potential acoustic impacts (e.g. engineered brickwork will be more appropriate than large glazed facades for Precinct 75), whilst still achieving a high-quality design outcome.
DP5	To allow flexibility in the balance between ventilation and sound insulation taking into account the precinct specific constraints	DS4 Building rooftops should be designed to mitigate sound exposure to the internal components of the building.
		DS5 A combination of natural and/or mechanical ventilation may be used as an alternative design solution to satisfy ventilation requirements where developments are unable to be naturally ventilated due to aircraft noise constraints.
		DS6 Where mechanical ventilation is proposed it still must be demonstrated that a minimum of 60% of apartments within the development are capable of being naturally ventilated.

6.3 Building Materials and Treatments

Use of the correct building materials is essential to ensure the internal acoustic environment for new development within Precinct 75 is conducive with its intended land use and achieves the necessary internal noise goals in accordance with AS 2021-2015. The following section sets out the relevant internal noise goals, outlines the acoustic performance requirement of key building elements and provides illustrative examples on how a new apartment/building might be designed to satisfy these requirements.

Table 2 Design Principles relating to Building Materials and Treatments

Design Principles	Design Solution																																																					
DP1 To ensure that all new buildings are designed with materials and treatments that appropriately insulate against aircraft noise to achieve internal noise levels in accordance with AS 2021-2015, no matter where the building is located on site.	Where possible, the following design solutions should be achieved for new development:																																																					
	DS1 Building materials are to be selected to achieve appropriate construction acoustic performance ratings taking into consideration the intended land use and site-specific noise exposure level.																																																					
	DS2 Internal noise levels of new development within Precinct 75 are to have internal noise levels no greater than the identified maximum noise values when an aircraft passes overhead:																																																					
	<table> <tr> <th>Building Type and Activity</th><th>Indoor L_Smax Design Sound Level, dB(A)</th></tr> <tr> <td colspan="2">Houses, home units, flats, caravan parks</td></tr> <tr> <td>Sleeping areas, dedicated lounges</td><td>50</td></tr> <tr> <td>Other habitable spaces</td><td>55</td></tr> <tr> <td>Bathrooms, toilets, laundries</td><td>60</td></tr> <tr> <td colspan="2">Hotels, motels, hostels</td></tr> <tr> <td>Relaxing, sleeping</td><td>55</td></tr> <tr> <td>Social activities</td><td>70</td></tr> <tr> <td>Service activities</td><td>75</td></tr> <tr> <td colspan="2">Schools/Universities</td></tr> <tr> <td>Libraries, study areas</td><td>50</td></tr> <tr> <td>Teaching areas, assembly areas</td><td>55</td></tr> <tr> <td>Workshop, gymnasia</td><td>75</td></tr> <tr> <td colspan="2">Hospitals, nursing homes</td></tr> <tr> <td>Wards, theatres, treatment and consulting rooms</td><td>50</td></tr> <tr> <td>Laboratories</td><td>65</td></tr> <tr> <td>Service areas</td><td>75</td></tr> <tr> <td colspan="2">Public Buildings</td></tr> <tr> <td>Churches, religious activities</td><td>50</td></tr> <tr> <td>Theatres, cinemas, recording studios</td><td>40</td></tr> <tr> <td>Court houses, libraries, galleries</td><td>50</td></tr> <tr> <td colspan="2">Commercial buildings, offices, shops</td></tr> <tr> <td>Private offices and conference rooms</td><td>55</td></tr> <tr> <td>Drafting, open offices</td><td>65</td></tr> <tr> <td>Typing, data processing</td><td>70</td></tr> <tr> <td>Shops, supermarkets, showrooms</td><td>75</td></tr> <tr> <td colspan="2">Industrial</td></tr> </table>	Building Type and Activity	Indoor L _S max Design Sound Level, dB(A)	Houses, home units, flats, caravan parks		Sleeping areas, dedicated lounges	50	Other habitable spaces	55	Bathrooms, toilets, laundries	60	Hotels, motels, hostels		Relaxing, sleeping	55	Social activities	70	Service activities	75	Schools/Universities		Libraries, study areas	50	Teaching areas, assembly areas	55	Workshop, gymnasia	75	Hospitals, nursing homes		Wards, theatres, treatment and consulting rooms	50	Laboratories	65	Service areas	75	Public Buildings		Churches, religious activities	50	Theatres, cinemas, recording studios	40	Court houses, libraries, galleries	50	Commercial buildings, offices, shops		Private offices and conference rooms	55	Drafting, open offices	65	Typing, data processing	70	Shops, supermarkets, showrooms	75	Industrial
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Industrial																																																						

Design Principles	Design Solution	
	Inspection, analysis, precision work	75
	Light machinery, assembly, bench work	80
	Heavy machinery, warehouse, maintenance	85

6.4 Illustrative Examples

Using the above principles, guidelines and treatments, the following indicative floor layouts (**Figure 6** and **Figure 7**) illustrate how a future residential development within Precinct 75 could be designed to respond to this Noise Strategy and other key relevant requirements.

It is important to note that the acoustic requirements do not result in the need to design an apartment in a particular way. As demonstrated by the illustrative examples, numerous designs and layouts can still be achieved whilst adhering to the principles and requirements set out in this Noise Strategy.



Figure 6 Indicative floor layout for a studio and one-bedroom apartment

Source: Tonkin Zulaikha Greer

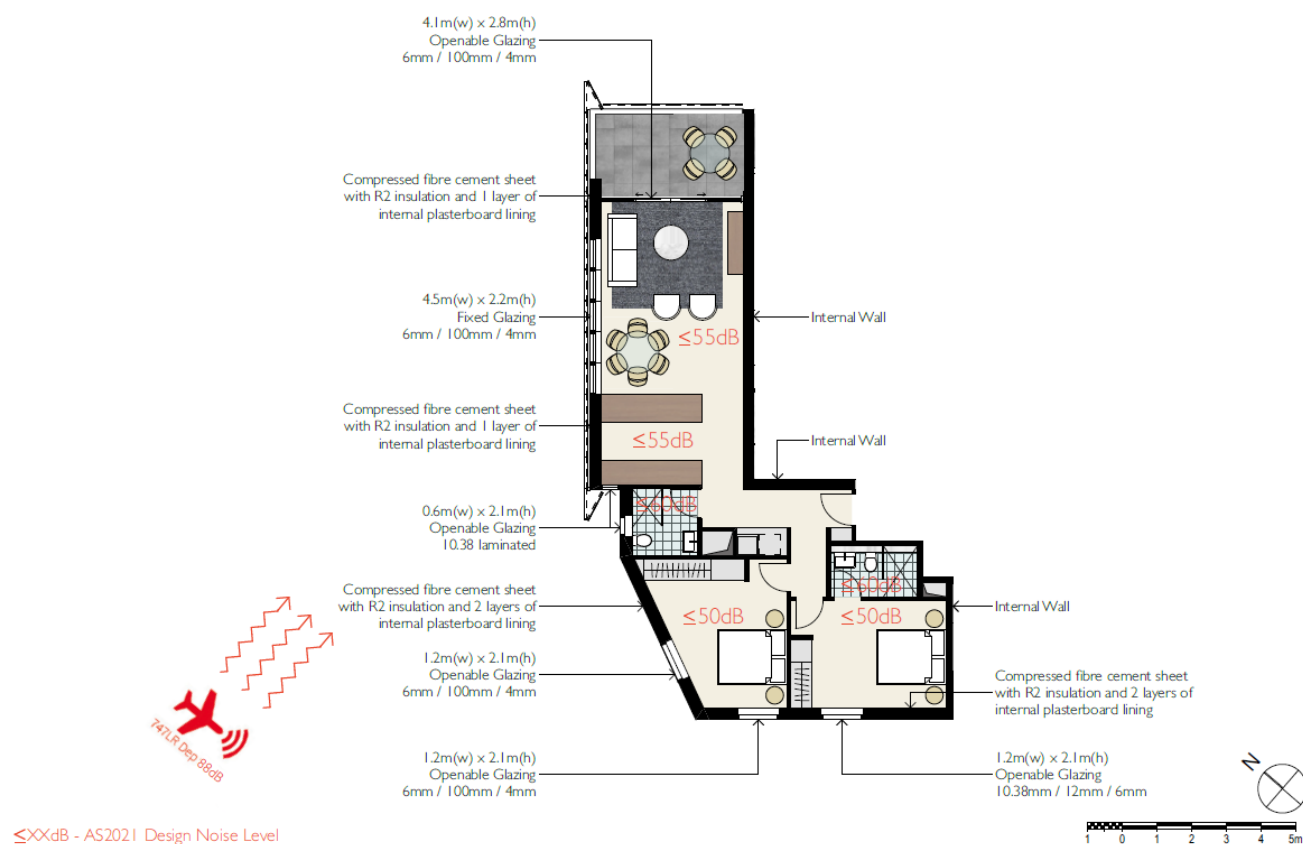


Figure 7 Indicative floor layout for a two-bedroom apartment

Source: Tonkin Zulaikha Greer

6.4.1 Recommended Treatments for Residential Dwellings at Precinct 75

Below is guidance on how the required internal noise levels might be achieved for a proposed development within Precinct 75. **Table 3** lists construction acoustic performance ratings (or weighted sound reduction index, R_w) for glazing constructions, whilst **Table 4** lists acoustic ratings for façade constructions. These performance ratings are minimum requirements and should be used as the base starting point for new development proposals within Precinct 75.

Table 3 Minimum glazing constructions

Glazing Type	Construction	Acoustic Rating R_w
1	6.38mm / 150mm / 5mm	45
2	6mm / 100mm / 4mm	43
3	10.38mm / 12mm / 6mm	39
4	10.38mm laminated	35

Table 4 Minimum façade constructions

Façade Type	Construction	Acoustic Rating R_w
1	9mm fibre cement sheeting externally, 92mm metal stud, 2 x 13 mm standard plasterboard internally with R2 insulation in wall cavity (including infill panels above windows and doors). Similar treatments are permitted as long as the R_w rating is achieved.	48
2	9mm fibre cement sheeting, 92mm deep 92mm metal stud, 1 x 13mm standard plasterboard internally with R2 insulation in wall cavity (including infill panels above windows and doors). Similar treatments are permitted as long as the R_w rating is achieved.	45

Using the above principles, guidance and treatments, the following indicative floor layouts illustrate how a future residential development at Precinct 75 could be designed to respond to this Noise Strategy and other key relevant acoustic requirements. These building layouts are based on the submitted development applications for Precinct 75. As shown in **Figure 8**, buildings proposed for residential development (as highlighted in red) include Buildings A, B, C and 8. There is no residential development proposed for other buildings outside of the red area, including Buildings 1, 2, 6 and 7.

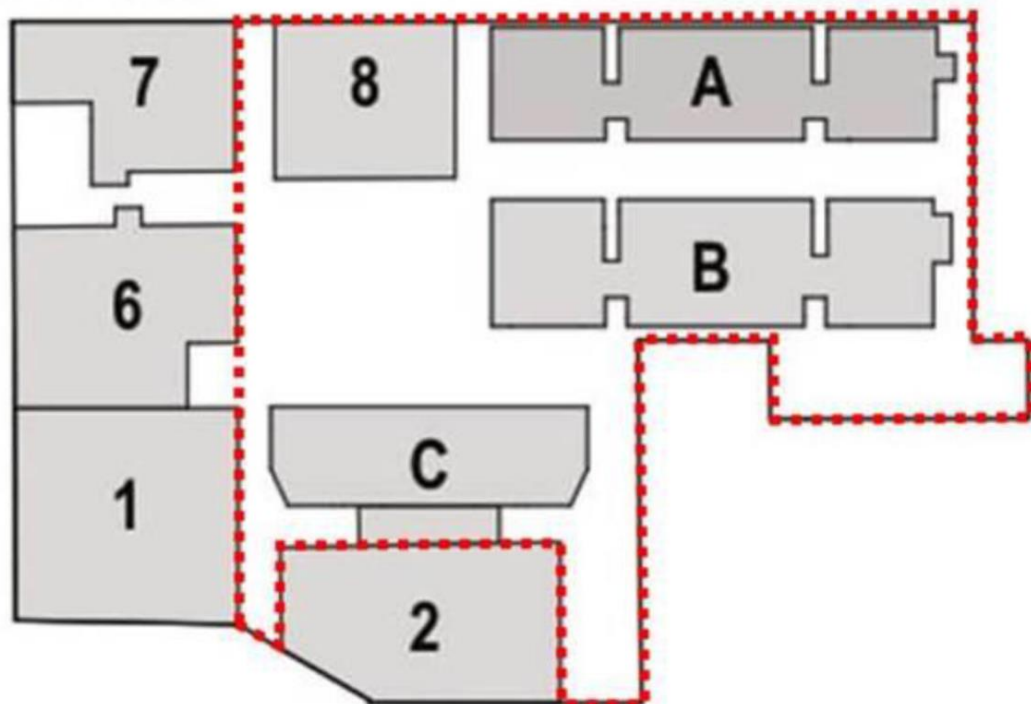


Figure 8 Site Plan for Precinct 75, showing buildings with proposed residential use circled in red

Recommended treatments per dwelling for each building are outlined below.

Building A

Building A is proposed to comprise five residential levels above the ground floor. A typical layout of a residential level is shown in **Figure 9** below, with 'X' referring to the level, which is typically representative of Levels 1-3.

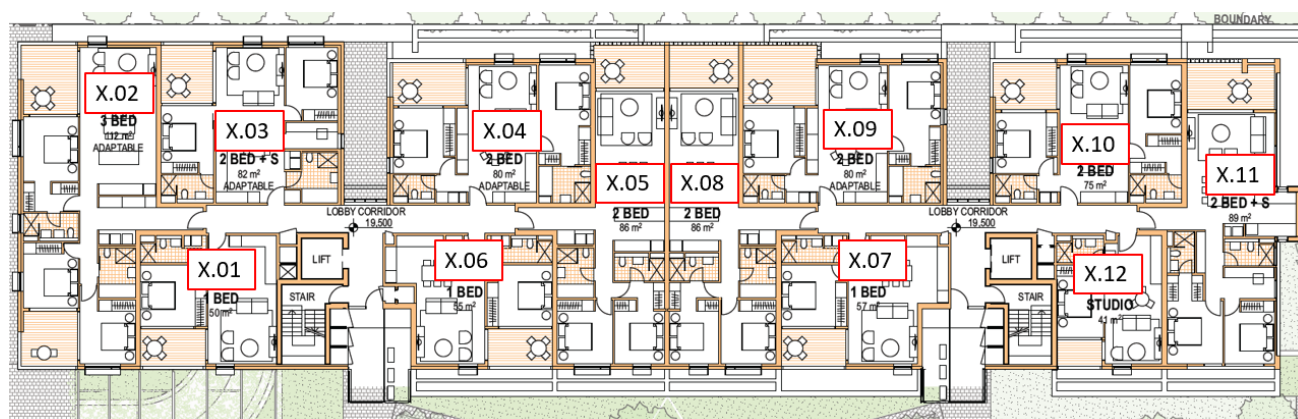


Figure 9 Typical Residential Layout for Building A

Source: Tonkin Zulaikha Greer

The recommended acoustic treatments for Building A are shown in **Table 5** below.

Table 5 Recommended Acoustic Treatments – Building A

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
Ground	G.01, G.06, G.07	Beds	2	2
		Living	4	2
	G.02 & G.05	Beds	2	2
		Living	4	2
	G.03 & G.04	Beds	2	2
		Living	3	2
	G.08	Bed (E)	2	2
		Bed (W)	3	2
		Living	3	2
	G.09	Bed	2	2
		Living	4	2
Typical	X.01	Bed	2	2
		Living	4	2
	X.02	Bed (N)	2	1
		Bed (W)	1	1
		Bed (E)	1	1
		Living	4	2
	X.03	Bed (E)	3	1
		Bed (W)	2	2
		Living	4	2
	X.04	Bed (E)	3	2
		Bed (W)	2	1
		Living	4	2
	X.05 & X.08	Beds	3	2
		Living	4	2
	X.06 & X.07	Bed	2	2
		Living	4	2
	X.09	Bed (E)	3	1
		Bed (W)	2	1
		Living	4	2
	X.10	Bed (E)	3	2
		Bed (W)	2	2
		Living	4	2
	X.11	Bed (E)	3	1
		Bed (W)	3	2
		Living	3	2
	X.12	Bed	2	2
		Living	4	2

Building B

Building A is proposed to comprise three residential levels above the ground floor. A typical layout of a residential level is shown in **Figure 10** below, with 'X' referring to the level, which is typically representative of Levels 1-3.

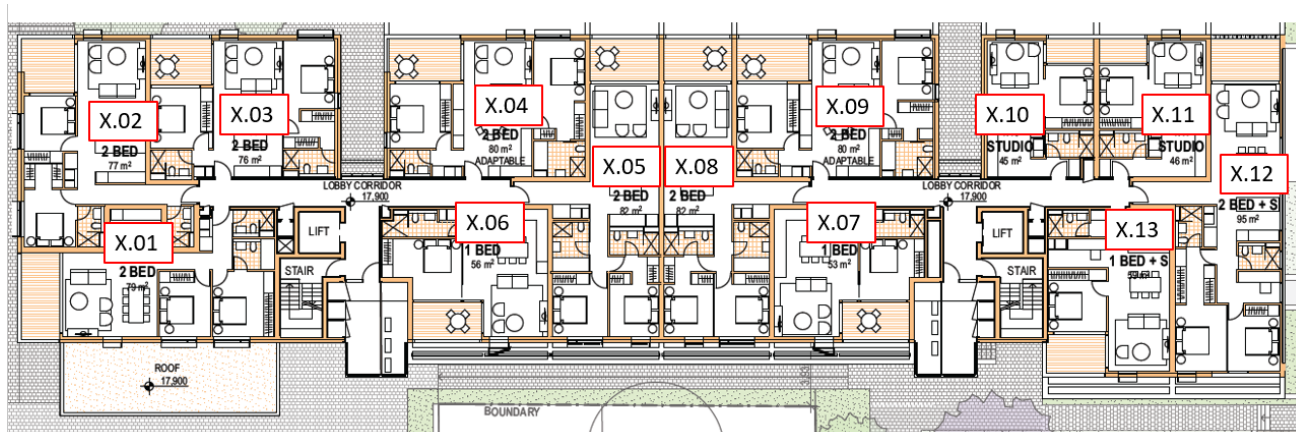


Figure 10 Typical Residential Layout for Building B

Source: Tonkin Zulaikha Greer

The recommended acoustic treatments for Building B are shown in **Table 6** below.

Table 6 Recommended Acoustic Treatment – Building B

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
Ground	G.01	Bed (E)	2	2
		Bed (W)	1	1
		Living	3	2
	G.02 & G.05	Beds	3	2
		Living	3	2
	G.03 & G.04	Beds	1	2
		Living	3	2
	G.06	Bed (E)	2	2
		Bed (W)	2	2
	G.07 & G.08	Bed	2	2
		Living	4	2
	G.09	Bed (E)	3	1
		Bed (W)	3	2
		Living	3	2
	G.10	Bed	2	2
		Living	3	2
Typical	X.01	Bed (E)	3	2
		Bed (W)	3	2
		Living	3	2
	X.02	Bed (N)	1	1
		Bed (S)	3	2

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
		Bed (E)	1	1
		Living	3	2
	X.03	Bed (E)	2	1
		Bed (W)	2	1
		Living	3	2
	X.04	Bed (E)	3	2
		Bed (W)	1	1
		Living	3	2
	X.05 & X.08	Bed (E)	3	2
		Bed (W)	3	2
		Living	3	2
	X.06 & X.07	Bed	2	2
		Living	3	2
	X.09	Bed (E)	3	2
		Bed (W)	2	2
		Living	3	2
	X.10	Bed	2	2
		Living	4	2
	X.11	Bed	2	2
		Living	4	2
	X.12	Bed (E)	3	1
		Bed (W)	3	2
		Living	2	2
	X.13	Bed	2	2
		Living	4	2

Building C

Building C is proposed to comprise seven residential levels above the ground floor. A typical layout of a residential level is shown in **Figure 11** below, with 'X' referring to the level.

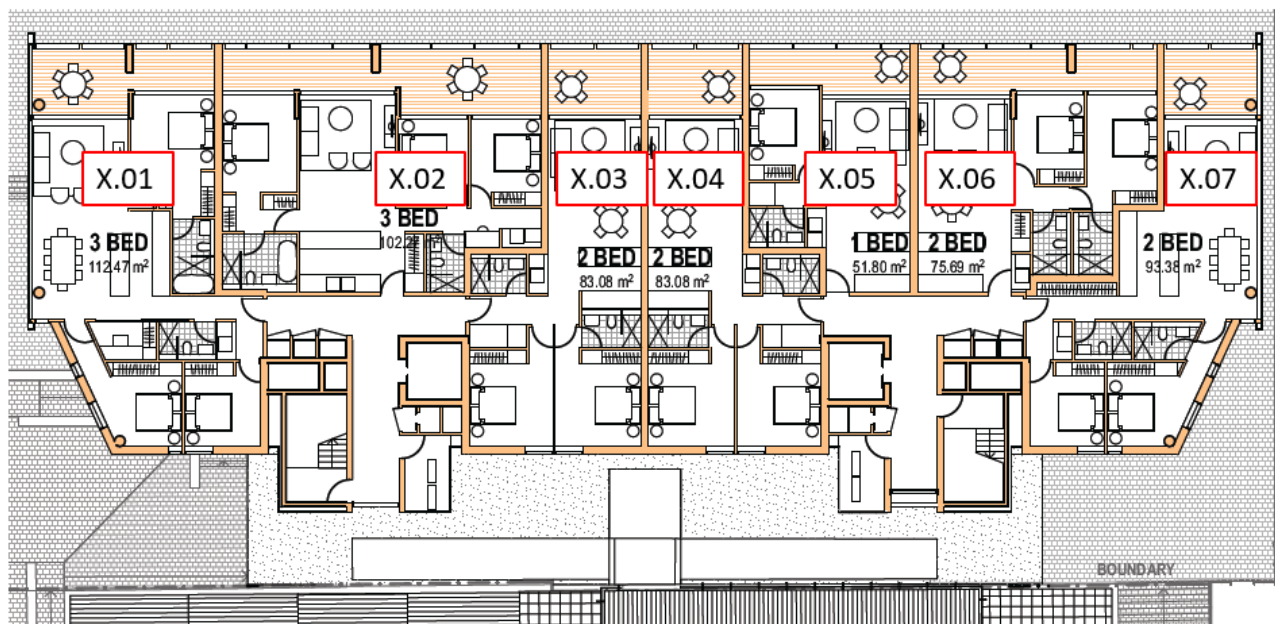


Figure 11 Typical Residential Layout for Building C

Source: Tonkin Zulaikha Greer

The recommended acoustic treatments for Building C are shown in **Table 7** below.

Table 7 Recommended Acoustic Treatment – Building C

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
1-3	X.01 & X.08	Bed (E)	3	2
		Bed (W)	3	1
		Living	2	2
	X.02 & X.07	Bed (E)	2	2
		Bed (W)	2	2
		Living	3	2
	X.03 & X.06	Bed	2	2
		Living	3	2
	X.04 & X.05	Beds	3	2
		Living	3	2
4-7	X.01	Bed (E)	3	2
		Bed (W)	3	1
		Bed (N)	2	2
		Living	2	2
	X.02	Beds	2	2
		Living	3	2
	X.03 & X.04	Beds	3	2
		Living	3	2
	X.05	Bed	2	2
		Living	3	2
	X.06	Bed (E)	2	2
		Bed (W)	2	2

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
	X.07	Living	3	2
		Bed (E)	3	2
		Bed (W)	3	1
		Living	2	2

Building 8

Building 8 is proposed to comprise four levels above the ground floor, with the Ground Level and Level 1 proposed to be commercial and Levels 2-4 proposed to be residential. A typical layout of a residential level is shown in **Figure 12** below, with 'X' referring to the level, which is typically representative of Levels 2-4.

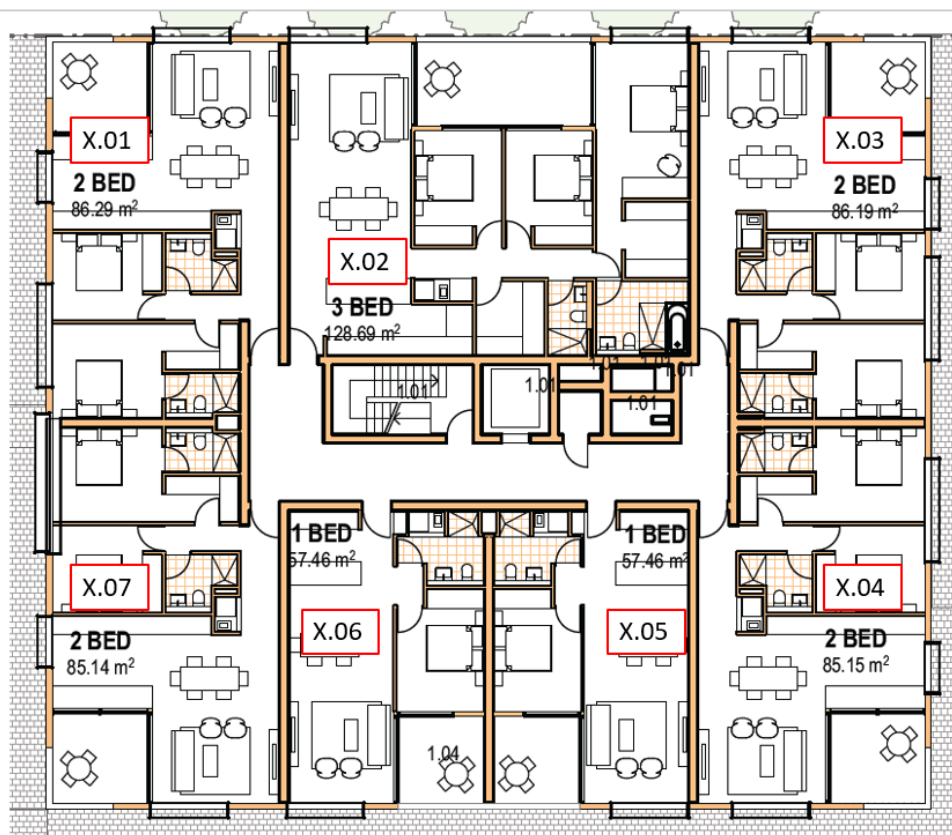


Figure 12 Typical Residential Layout for Building 8

Source: Tonkin Zulaikha Greer

The recommended acoustic treatments for Building 8 are shown in **Table 8** below.

Table 8 Recommended Acoustic Treatments – Building 8

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
2-4	X.01, X.03, X.04	Beds	3	2
		Living	3	2
	X.02	Bed (E)	1	2
		Beds	2	2
		Living	3	2
	X.05 & 6	Beds	2	2
		Living	3	2

Level	Unit	Space	Glazing Recommendation	Lightweight Façade Panel
	X.07	Bed (N)	2	2
		Bed (S)	3	2
		Living	3	2

6.5 Implementation and Management

The following outlines the implementation and management measures that are to be put in place to ensure that new development is designed in accordance with the Noise Strategy and any approved plans and conditions. In addition, it also sets out the requirements relating to the ongoing implementation, management, information sharing and the raising of awareness for all matters associated with aircraft related noise impacts in Precinct 75.

Table 9 Design Principles relating to Implementation and Management

Design Principles	Design Solution
DP1 To ensure that new development, once constructed, incorporates all the necessary approved acoustic insulation treatments and measures.	Where possible, the following design solutions should be achieved for new development:
DP2 To ensure that occupants of new buildings are informed about aircraft noise and how this affects Precinct 75 prior to purchasing a property.	DS1 At Construction Certificate stage, there is to be written verification from an appropriately qualified acoustic expert that the noise mitigation measures approved as part of the development application have been incorporated into the detailed construction plans.
DP3 To ensure that information about aircraft noise is readily available for residents, property and business owners within Precinct 75.	DS2 Prior to Occupation Certificate being issued final sign-off is to be obtained from an appropriately qualified acoustic consultant confirming that the building materials and acoustic treatments have been constructed in accordance with the detailed construction plans.
DP4 To encourage flexibility in the way that communal space and facilities are provided within new development.	DS3 Aircraft Noise Information Packs are to be provided to any potential purchaser as part of the Contract of Sale. All Contracts of Sale are to include a clause that specifies that the prospective purchaser has read and acknowledges the contents within the Aircraft Noise Information Pack.
	DS4 A community notice board is to be provided in the common lobby area for all residential buildings. An information notice about Aircraft Noise is to be provided on the community notice board at all times.
	DS5 The Aircraft Noise Information Packs are to contain the following information: <ul style="list-style-type: none"> • An explanatory note on aircraft noise and how it may affect living within Precinct 75; • An explanation of the policies and controls that govern aircraft noise; • An explanation of Sydney Airport's operations and its relationship to Precinct 75; • Sydney Airport's hours of operation and likely times that aircraft noise will affect Precinct 75; • Likely average number of aircraft movements per day; • Aircraft noise affecting Precinct 75; • A list of the material treatments used in the construction of the building; • A map of the current/latest ANEF Contours in relation to the site; and • A plan of the apartment/building confirming the building materials and acoustic mitigation measures in accordance with the approved plans and documents.
	DS6 A copy of the Draft Aircraft Noise Information Pack is to be submitted with any development application for a new building.

Dictionary

The terms used in this strategy are defined in the Standard Instrument – Principal Local Environmental Plan. Additional definitions that apply to this Noise Strategy include:

Aircraft Noise Exposure Forecast (ANEF) – contour maps that show a forecast of aircraft noise levels that are expected to exist in the future. They are prepared for all of the major and regional airports (in this case Sydney Airport) that have a large number of annual movements.

Aircraft Noise Exposure Index (ANEI) – contour maps that show actual historical aircraft noise levels over a given period of time.

Aircraft Noise Information Pack (ANIP) – a package of information that is collated and used as the basis for informing all new residents, property and business owners about how aircraft noise affects land within the Precinct 75, including their property. At a minimum the ANIP must include:

- The airports hours of operation and likely times that aircraft noise will affect Precinct 75;
- Likely average number of aircraft movements per day;
- Aircraft noise affecting Precinct 75;
- A list of the material treatments used in the construction of the building;
- A map of the current/latest ANEF Contours in relation to the site;
- A plan of the apartment/building confirming the building materials and acoustic mitigation measures in accordance with the approved plans and documents.
- A signed declaration from an appropriately qualified acoustic expert that the building has been constructed in accordance with the approved noise mitigation measures as set out in the associated Development Approval.

DPIE – Department of Planning, Industry and Environment.

Precinct 75 – The area of land to which this strategy applies as shown in **Section 1.2**.