

APPENDIX 10. INVESTIGATIONS – ENVIRONMENTAL NOISE

Scotty's Motel

Acoustic Assessment

Planning and Design Code Amendment

S7024C2

sonus.

Document Title : Scotty's Motel
Acoustic Assessment – Planning and Design Code Amendment

Document Reference: S7024C2

Date: July 2021

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INTRODUCTION

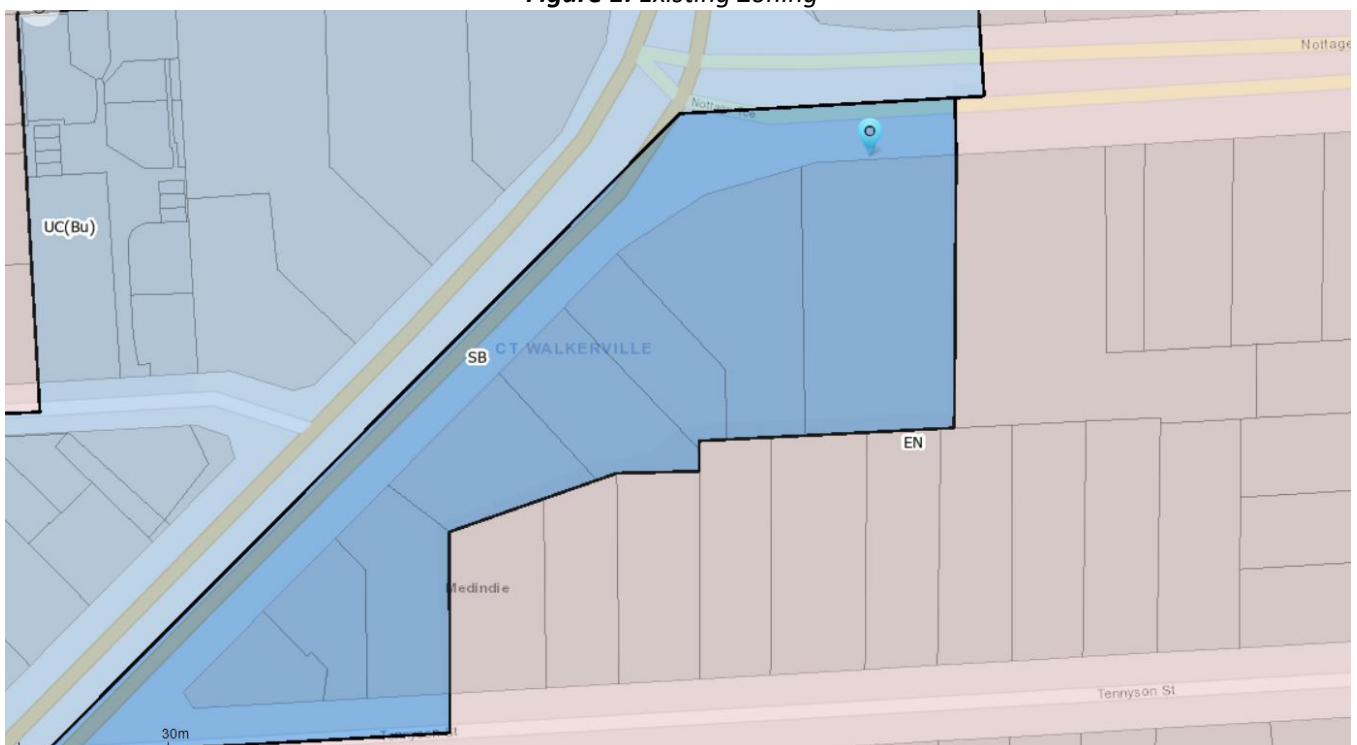
A Planning and Design Code Amendment (the **amendment**) is being considered for land on the corner of Main North Road and Nottage Terrace at Medindie (the **site**). The site currently includes Scotty's Motel amongst other residential and commercial land uses.

The amendment seeks to rezone the land to support medium rise mixed use development comprising commercial/retail and residential land uses.

The site is currently located across both a *Suburban Business (SB) Zone* and an *Established Neighbourhood (EN) Zone* of the Planning & Design Code as shown in Figure 1 below.

A *Suburban Business Zone* principally promotes “a range of emerging businesses which have low level off-site impacts. Residential development within the area is subordinate to employment uses and generally includes medium-density housing designed to complement and not prejudice the operation of existing businesses”. An *Established Neighbourhood Zone* principally promotes “a neighbourhood that includes a range of housing types”.

Figure 1: Existing Zoning



The acoustic considerations for the Code Amendment are to ensure future development on the site:

1. incorporates a reasonable and practical level of acoustic treatment to provide adequate acoustic amenity (indoors) for residents exposed to **traffic** on Main North Road and Nottage Terrace;
2. does not adversely affect the existing acoustic amenity of residences at the **interface** with the *Established Neighbourhood (EN) Zone*;
3. does not adversely affect the ongoing development and operation of businesses at the **interface** with the *Suburban Business (SB) Zone*.

ASSESSMENT

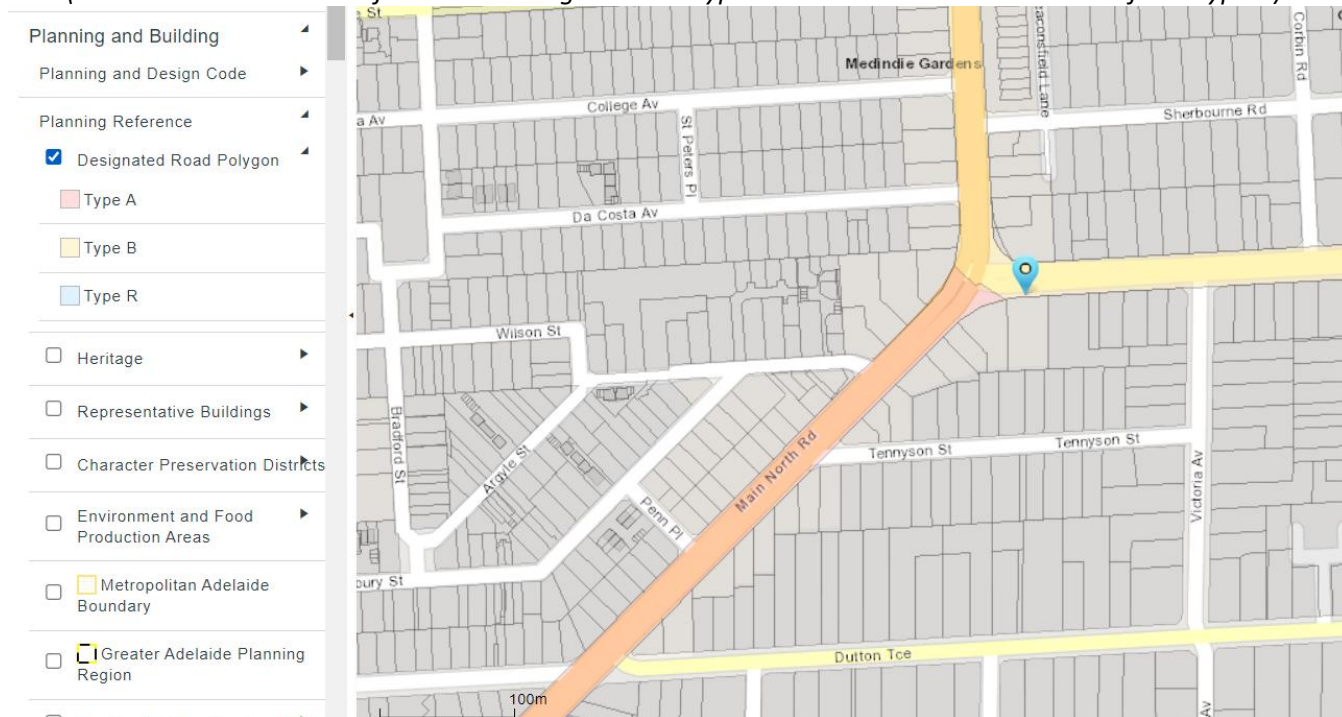
Traffic

The *Ministerial Building Standard MBS 010 Construction requirements for the control of external sound (MBS 010)* is a Ministerial Building Standard under the *Planning, Development and Infrastructure Act 2016* (the Act). MBS-010 “contains provisions for reducing the intrusion of unacceptable levels of sound into habitable rooms of residential buildings”. It is predominantly applied to residential development adjacent transport corridors but also applies to residential development in a mixed use environment. The Noise and Air Emissions Overlay within the Planning and Design Code mandates MBS-010 as part of Building Rules Consent.

Main North Road and Nottage Terrace are *designated roads* in the Planning and Design Code as shown in Figure 2. Designated roads integrate with MBS-010 and the Overlay to assist in determining the extent of treatment for a building exposed to traffic noise (that is, there is no requirement to designate roads as part of the amendment process as these are already designated in the Planning & Design Code).

Figure 2: Designated Roads

(Main North Road north of site and Nottage Terrace Type B and Main North Road south of site Type A)



The provisions of the Overlay in the Planning and Design Code are provided below:

Noise and Air Emissions Overlay

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Community health and amenity is protected from adverse impacts of noise and air emissions.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome <i>Siting and Design</i>	Deemed-to-Satisfy Criteria / Designated Performance Feature
<p>PO 1.1 Sensitive receivers adjoining high noise and/or air pollution sources are designed and sited to shield sensitive receivers from the emission source using measures such as:</p> <ol style="list-style-type: none"> 1. placing buildings containing non-sensitive receivers (such as retail and commercial) between the emission source and sensitive receivers 2. within individual buildings, placing rooms more sensitive to air quality and noise impacts (such as living rooms and bedrooms) further away from the emission source 3. providing appropriate separation or erecting noise attenuation barriers, provided the requirements for safety, urban design and access can be met 4. the use of building design elements such as podiums and jutting, deep or enclosed balconies (including with solid balustrades). 	<p>DTS/DPF 1.1 Sensitive receivers satisfy all of the following:</p> <ol style="list-style-type: none"> 1. do not adjoin a: <ol style="list-style-type: none"> 1. Designated Road: Type A 2. Designated Road Corridor: Type B 3. Designated Road: Type R 4. Train Corridor 5. Tram Corridor 2. adjoining development incorporating music includes noise attenuation measures to achieve a noise level in any bedroom exposed to music noise (L10) less than: <ol style="list-style-type: none"> 1. 8 dB above the level of background noise (L90,15 min) in any octave band of the sound spectrum; and 2. 5 dB(A) above the level of background noise (LA90,15 min) for the overall (sum of all octave bands) A-weighted levels.
<p>PO 1.2 Development incorporating a sensitive receiver adjoining high air pollution sources use building design elements such as varying building heights, widths, articulation, setbacks and shapes to increase wind turbulence and the dispersion of air pollutants.</p>	<p>DTS/DPF 1.2 Sensitive receivers do not adjoin any of the following:</p> <ol style="list-style-type: none"> 1. Designated Road: Type A 2. Designated Road: Type B 3. Designated Road: Type R 4. Train Corridor 5. Tram Corridor.
<p>PO 1.3 Development incorporating a sensitive receiver adjoining high noise and/or air pollution sources locates private open space (including ground level courtyards and balconies), common open space and outdoor play areas within educational establishments and pre-schools away from the emission source.</p>	<p>DTS/DPF 1.3 Open space associated with a sensitive receiver is not adjoining any of the following:</p> <ol style="list-style-type: none"> 1. Designated Road: Type A 2. Designated Road: Type B 3. Designated Road: Type R 4. Train Corridor 5. Tram Corridor 6. Development incorporating music.

The Performance Outcomes in the Overlay introduce specific design elements such as placing retail between the road and the residences, placing rooms such as bedrooms further away from the corridor, erecting barriers where practical and using podiums and jutting, deep or enclosed balconies (including with solid balustrades).

The Overlay will require building façades to be designed to reduce traffic noise in accordance with MBS-010, which specifies acoustic treatment to dwellings based on the “Sound Exposure Category” (SEC). The SECs range from 1 to 5, with SEC 1 requiring a base level of acoustic treatment and SEC 5 requiring specific extensive treatment. The SEC will vary according to the distance from the corridor, shielding from the corridor, the speed limit and the designated type of road.

Once assigned an SEC, the extent of treatment for each building element varies according to design factors such as the size of glazing relative to the floor area of the room. For example, for a given SEC, the larger the glazing system into a room, the thicker the glazing must be. That is, for a future development application, the actual acoustic treatments will depend on the final design adjusted according to the methodology provided by MBS-010.

Typical treatments are outlined in the following table for information purposes. The final extent of treatment will be determined at the development application stage:

Table 1: Example Acoustic Treatments under MBS-010

Building Element	Acoustic Treatment Requirements
Ground Floor	Floor construction that achieves an R_w+C_{tr} of 50 or higher for all habitable rooms. This can be easily achieved with a standard concrete slab-on-ground construction.
External walls	Wall construction that achieves an R_w+C_{tr} of 50 or higher, such as those listed in the Table 2 of Specification F5.2 in Volume One of NCC 2019 that has a minimum specified R_w+C_{tr} of 50. This criterion can be easily achieved with a typical masonry external wall construction comprising: <ul style="list-style-type: none"> • A layer of 90mm thick clay bricks; • A 25mm cavity between the masonry and the studs; • 70mm timber studs or 64mm steel studs; • 75mm thick fiberglass insulation with a minimum density of 11kg/m^3 in the cavity; and, • A layer of 10mm thick plasterboard internal lining.
Windows and external glazed doors	Glazed area constructions that achieve an R_w+C_{tr} of 30 or higher in the living spaces and the Master Bedroom/WIR/Ensuite and that achieve an R_w+C_{tr} of 32 or higher in all other bedrooms. This can be achieved with the following glazing thicknesses: <ul style="list-style-type: none"> • R_w+C_{tr} of 30: 6mm thick glass for fixed or awning windows and 10mm thick glass for sliding windows and external doors. • R_w+C_{tr} of 32: 10mm thick glass for fixed or awning windows, 6.38mm thick laminated glass for sliding windows and 12.5mm thick laminated glass for external doors.
External doors other than glazed doors	External doors other than glazed doors that achieve an R_w of 30 or higher for all habitable rooms. This can be achieved with a 40mm thick solid core door fitted with seals to the threshold and frame. Any glass inserts in such a door should be constructed from a minimum of 6mm thick glass.
Roof and Ceiling	Floor construction that achieves an R_w+C_{tr} of 40 or higher for all bedrooms and an R_w+C_{tr} of 35 or higher for all other habitable rooms. This can be achieved with the following construction option: <ul style="list-style-type: none"> • Sheet metal roofing or tiled roof system complying the with Building Code of Australia; • 165mm thick fiberglass insulation with a density of at least 7kg/m^3 above the ceiling; and, • Two layers of 10mm thick plasterboard ceiling lining.
Ventilation	The ventilation system provided across the facade must incorporate acoustically insulated ductwork, designed to achieve an R_w of 30.

The outcomes of placing the site in a Noise and Air Emissions Overlay include:

1. Mandating the inclusion of high levels of acoustic treatment into the façade of the residential component of the future development to address the influence of traffic noise into those residences (as outlined above);
2. Assisting with the interface with the *Suburban Business Zone* due to the inclusion of that acoustic treatment. That is, the treatment will assist any future residential component to not adversely affect the ongoing development and operation of businesses in the *Suburban Business (SB) Zone*;
3. Assisting with the interface of future ground level retail and commercial space on the site due to the inclusion of that acoustic treatment. That is, the treatment will assist any residential component to not adversely affect the ongoing development and operation of future businesses on the site.

Based on the above, it is recommended the Code Amendment incorporate the Noise and Air Emissions Overlay over the site.

Interface

There are two acoustic aspects to the interface created by the Code Amendment:

1. Ensuring future development does not adversely affect the acoustic amenity of dwellings in the *Established Neighbourhood (EN) Zone* due to operations on the site;
2. Ensuring future development does not adversely impact on the operation and development of businesses in the *Suburban Business Zone* due to the future residential component.

With respect to each aspect:

1. The *Environment Protection (Noise) Policy 2007* (the **Policy**) under the *Environment Protection Act 1993* provides an objective tool to assess whether a noise source is unreasonably interfering with the acoustic amenity of a locality. The Policy is based on the *World Health Organisation Guidelines* (the WHO Guidelines) to prevent annoyance, sleep disturbance and unreasonable interference on the amenity of an area and is therefore utilised within the Planning and Design Code to assist in objectively assessing development.

In this circumstance, the Policy will deliver goal noise levels which protect against adverse impacts on amenity to be achieved at existing and future residences within the *Established Neighbourhood (EN) Zone* due to activity on the development site arising from use of car parking, commercial and retail activity and operation of mechanical plant serving the building/s.

These goal noise levels will be consistent with those which would otherwise apply at the residences in the absence of the Code Amendment and therefore, the use of the Policy will not, in and of itself, result in adverse outcomes for the surrounding residential area (that is, the Policy will not establish goal noise levels which are inconsistent with those which currently apply at residences under the current zoning arrangement).

With respect to the broader implications of the interface, it is worthwhile noting that the dominant influence on the acoustic amenity of existing dwellings in the *Established Neighbourhood (EN) Zone* is related to traffic on Main North Road and Nottage Terrace. The use of the site for medium rise mixed use development will provide a significant acoustic barrier between the public road network and dwellings in the EN Zone which can deliver a noticeable reduction in ambient noise levels and commensurate improvement in acoustic amenity. That is, future medium rise mixed use development on the site can both improve the acoustic amenity of the area and protect (through application of the Policy) that improved amenity.

2. The Policy also establishes goal noise levels to be achieved inside residential components of future development when exposed to activity in the *Suburban Business Zone*. As noted above, due to the influence of traffic noise on the site, the extent of acoustic treatment incorporated into the residential component under the mandatory requirements of MBS-010 is likely to be sufficient to achieve the Policy even if exposed to intensive operations in the *Suburban Business Zone*; however, this will depend on the actual activities occurring in the *Suburban Business Zone* at the relevant time.

In addition to providing an adequate level of acoustic amenity inside the residential components of future development, achieving the goal noise levels inside when exposed to activity in the *Suburban Business (SB) Zone* will ensure no further action can be taken against that activity under the *Environment Protection Act 1993* (as stated in the Policy), therein protecting the ongoing operations in the SB zone. In addition, it provides protection against an assessment location outside the residential components of future development (the Policy requires the assessment location to be inside where acoustic treatment is provided to the building facades (as it will be due to MBS-010 and potentially the Policy)).

With respect to application of the Policy, it is invoked in Part 4 *Activities Generating Noise or Vibration* PO 4.1 of the Planning and Design Code. That is, no further changes need to be made within the Code Amendment to apply the Policy to future development at the site:

Part 4 - General Development Policies

Interface between Land Uses

Assessment Provisions (AP)

Desired Outcome (DO)

DO 1: Development is located and designed to mitigate adverse effects on or from neighbouring and proximate land uses.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
General Land Use Compatibility	
Activities Generating Noise or Vibration	
PO 4.1 Development that emits noise (other than music) does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers).	DTS/DPF 4.1 Noise that affects sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria.

The outcomes of applying PO 4.1 to the site include:

1. Addressing the interface with residences in the *Established Neighbourhood (EN) Zone*. Future operations and activity at the site will need to achieve the Policy goal noise levels at the existing residences (and in doing so, will ensure future development does not adversely affect the existing acoustic amenity of those residences); and
2. Addressing the interface with the *Suburban Business Zone*. Acoustic treatment will need to be incorporated into the residential component of future development to achieve the Policy goal noise levels when exposed to activity in the *Suburban Business (SB) Zone* (and in doing so, will ensure development does not adversely affect the ongoing development and operation of businesses in the SB Zone).

Aircraft

The site is within the Aircraft Noise Exposure Overlay which states:

Desired Outcome (DO)

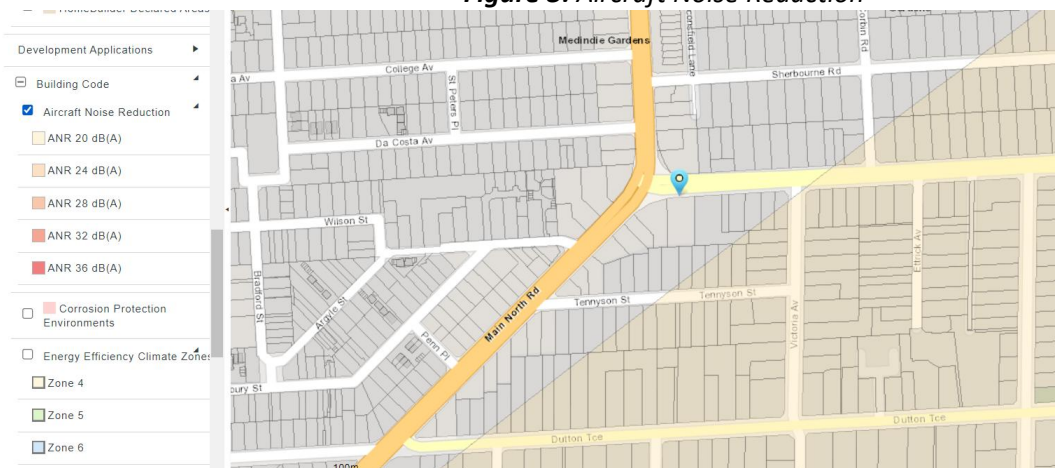
Desired Outcome	
DO 1	Development sensitive to aircraft noise is designed and located to manage noise intrusion to reduce land use conflict and protect human health.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
PO 1.1 Buildings that accommodate activities sensitive to aircraft noise are designed and located to minimise aircraft noise intrusion and provide appropriate interior acoustic amenity.	DTS/DPF 1.1 Buildings accommodating sensitive receivers are not located within an area having an ANEF value of 30 or more.

The site is not exposed to high levels of aircraft noise and the aircraft noise reduction required is accordingly limited (ANR 20) as depicted in Figure 3 below taken from the Planning and Design Code:

Figure 3: Aircraft Noise Reduction



The application of MBS-010 will inherently address the ANR 20 requirements (that is, the treatment required under MBS-010 will easily satisfy the treatment required to achieve an aircraft noise reduction (ANR) of 20).

Based on the above, the Code Amendment could remove the Aircraft Noise Exposure Overlay without affecting any outcomes. Conversely, there will be no design impacts if the Overlay is retained as part of the Code Amendment.

SUMMARY

A Planning and Design Code Amendment is being considered for land on the corner of Main North Road and Nottage Terrace at Medindie.

The amendment seeks to rezone the land to support medium rise mixed use development comprising commercial/retail and residential land uses.

The acoustic considerations for the Code Amendment are to ensure:

1. the residential component of the site can incorporate acoustic treatment to provide adequate acoustic amenity (indoors) when exposed to traffic on Main North Road and Nottage Terrace;
2. the residential component of the site does not adversely affect the ongoing development and operation of businesses in the *Suburban Business (SB) Zone*; and
3. the operations at the site do not adversely affect the existing acoustic amenity of residences in the *Established Neighbourhood (EN) Zone*.

Item 1 is addressed and Item 2 is assisted by the introduction of the Noise and Air Emissions Overlay through the Code Amendment process.

The Overlay mandates the application of the *Ministerial Building Standard MBS 010 Construction requirements for the control of external sound (MBS 010)* to the site. In addition to the Performance Outcomes in the Overlay, MBS-010 will require the residential façade component to be designed to reduce traffic noise. The extent of acoustic treatment will vary with the design features of future development.

The Overlay and in turn, MBS-010, will:

1. Mandate high levels of acoustic treatment into the façade of future residential development to address the influence of traffic noise into those residences;
2. Assist with the interface with the *Suburban Business Zone* by introducing acoustic treatment into future residential development;
3. Assist with the interface between ground level retail and commercial development by introducing acoustic treatment into the residential component.

Items 2 and 3 are addressed by Part 4 *Activities Generating Noise or Vibration* PO 4.1 of the Planning and Design Code which references the *Environment Protection (Noise) Policy 2007* (the **Policy**).

The Policy establishes goal noise levels to be achieved at existing and future residences within the *Established Neighbourhood (EN) Zone* and to be achieved inside the residential component of future development when exposed to activity in the *Suburban Business Zone*.

The outcomes of applying the Policy to the site (as required under the Planning & Design Code) include:

1. Addressing the interface with residences in the *Established Neighbourhood (EN) Zone*. Future operations and activity at the site will need to achieve the Policy goal noise levels at the existing residences, and in doing so, will ensure future development does not adversely affect the existing acoustic amenity of those residences; and
2. Addressing the interface with the *Suburban Business Zone*. Achieving the Policy goal noise levels when exposed to external commercial activity will ensure the future development of the site will not adversely affect the ongoing development and operation of businesses in the *Suburban Business (SB) Zone*.

With respect to the broader implications of the interface, the use of the site for medium rise mixed use development will provide a significant acoustic barrier between the public road network and dwellings in the *Established Neighbourhood (EN) Zone* which can deliver an improvement in acoustic amenity for the area.

Finally, whilst the site is located in a Aircraft Noise Exposure Overlay, no further action is required to address this due to the application of MBS-010 in combination with the low level of aircraft noise exposure.