

# Plympton DPA

## Environmental Noise Assessment

S5869C2

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## GLOSSARY

A-weighting	Frequency adjustment representing the response of the human ear
dB(A)	A-weighted noise level (sound pressure level) measured in decibels
$L_{Aeq}$	The A-weighted equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.
$L_{Aeq9hr}$	The A-weighted equivalent continuous noise level over a 9 hour period from 10pm to 7am.

## INTRODUCTION

A Development Plan Amendment is proposed for land on Mooringe Avenue, Plympton, as marked in Figure 1 below.



**Figure 1: Subject Land**

The subject land is currently located within an Industry Zone of the West Torrens Council Development Plan, which promotes industrial land uses. The surrounding area includes predominantly residential zoning, with Castalloy in an Industry Zone to the northwest. The Adelaide airport is also located further to the northwest of the site.

This assessment considers the potential impact of noise on the amenity at potential future residences on the subject site as well as the potential for future residents to constrain the existing and future desired land uses in the vicinity. In particular the assessment considers the noise from existing and future industrial land uses at Castalloy to the northwest, aircraft at Adelaide Airport and traffic on Mooringe Avenue.

On-site observations of the noise sources at the existing industrial land use were conducted on 7 and 13 February 2019. Continuous measurements of traffic noise were also conducted at the Mooringe Avenue boundary of the subject site. Appendix A shows the location of Castalloy and Mooringe Ave relative to the subject site.

The assessment has been based on:

- observations conducted on and around the subject land on 7 and 13 February 2019; and,
- Continuous noise measurements at the Mooringe Avenue boundary of the site from 13 to 14 February 2019.

This report summarises the assessment and provides a method to ensure appropriate amenity for residences in close proximity to the existing noise sources without constraining existing and potential future land uses desired in the locality.

## DEVELOPMENT PLAN

The West Torrens Council Development Plan (consolidated 12 July 2018) has been reviewed, and the relevant provisions summarised below:

### GENERAL SECTION

#### ***Building near Airfields***

##### *PRINCIPLES OF DEVELOPMENT CONTROL*

6. *Development within areas affected by aircraft noise should be consistent with Australian Standard AS2022: - Acoustics - Aircraft Noise Intrusion - Building Siting and Construction.*
7. *Residential development on land within areas affected by aircraft noise as shown on Overlay Map WeTo/8 - Development Constraints should incorporate noise attenuation measures.*

#### ***Interface Between Land Uses***

##### *OBJECTIVES*

3. *Protect desired land uses from the encroachment of incompatible development.*

##### *PRINCIPLES OF DEVELOPMENT CONTROL*

2. *Development should be sited and designed to minimise negative impacts on existing and potential future land uses desired in the locality.*
4. *Residential development adjacent to non-residential zones and land uses should be located, designed and/or sited to protect residents from potential adverse impacts from non-residential activities.*

#### ***Residential Development***

29. *External noise and artificial light intrusion into bedrooms should be minimised by separating or shielding these rooms from:*
  - (a) *active communal recreation areas, parking areas and vehicle access ways*
  - (b) *service equipment areas and fixed noise sources on the same or adjacent sites.*

The Development Plan requires residential development to protect desired land uses from future constraint as a result of encroachment, while also providing suitable amenity for occupants with respect to the noise from aircraft, industrial land uses and road traffic.

To provide an objective assessment, the following criteria have been considered;

- *Australian/New Zealand Standard AS/NZS2107 (AS/NZS2107)* to assess road traffic noise;
- *Environment Protection (Noise) Policy 2007* to address existing and potential future industry;
- *Australian Standard AS2021: - Acoustics - Aircraft Noise Intrusion - Building Siting and Construction (AS2021)* to address the noise from aircraft.

## ROAD TRAFFIC NOISE

The Development Plan does not provide mandatory objective noise criteria for the assessment of roads at the subject site. In addition, other relevant state traffic noise policies, such as the *South Australian Planning Policy Noise and Air Emissions-Overlay 3* and the *Minister's Specification SA 78B*, do not designate Mooringe Avenue as a noise source requiring assessment.

Notwithstanding, the Development Plan includes provisions which suggest a suitable level of amenity should be achieved within dwellings from external noise sources. An assessment of road traffic noise could therefore be required at the development application stage to ensure suitable levels of amenity are achieved for each dwelling.

In order to provide an indication of the likely acoustic treatments, the noise from Mooringe Avenue was measured at the site boundary, continuously from 13 to 14 February 2019. The logging resulted in an average night time ( $L_{Aeq9hr}$ ) noise level of 61 dB(A) at the site boundary. The results of the noise logging have been used to determine possible acoustic treatments for bedrooms to achieve the recommendation of 35 dB(A) from AS/NZS2107.

Based on a noise level of 61 dB(A) at the Mooringe Avenue boundary, indicative acoustic treatments have been developed which would achieve suitable levels of amenity from traffic noise. Treatments have been developed for distances of less than 10m from the road corridor and between 10m and 25m of the road corridor. At distances greater than 25m, suitable levels of amenity would be achieved with standard building techniques.

The indicative acoustic treatments are provided as Appendix B of this report to show that suitable noise levels can be achieved inside dwellings with reasonable and practical building techniques.

## INDUSTRIAL ACTIVITY

### Criteria

For noise from industrial land uses, the Policy is most relevant and is referenced by the Development Plan.

The Policy is underpinned by the World Health Organisation Guidelines<sup>1</sup> for community noise. The Policy provides an objective measure of acceptable noise levels for residential amenity and for the protection of the ongoing operation of existing industrial land uses. That is, achieving the relevant requirements of the Policy at residences on the subject site would provide suitable noise levels at those residences and would protect the existing land uses from any action under the *Environment Protection Act 1993* in the event of a noise complaint.

The Policy provides noise criteria:

- outside of a residence, such as in a backyard or other private open space; or
- inside habitable rooms of a residence, such as bedrooms and living areas, in situations where acoustic treatment is applied to a facade.

Where the assessment location is inside a habitable room, the applicable noise criteria are determined to be the external criterion less 20 dB(A).

The Policy provides goal noise levels based on the Development Plan zones of the area. Based on the proposed Residential Zone of the subject land and Industrial Zone of the existing and potential future industrial activity, the Policy provides the following goal noise levels to be achieved at residences on the subject land from activity at the surrounding land uses:

- Daytime (7am to 10pm) noise levels directly outside residences of no greater than 59 dB(A); or daytime noise levels within habitable rooms of the residences of 39 dB(A) (with the internal noise level achieved by applying acoustic treatment to the facades of the residence); and,
- Night-time (10pm to 7am) noise levels directly outside residences of no greater than 50 dB(A); or night time noise levels within habitable rooms of the residences of 30 dB(A) (with the internal noise level achieved by applying acoustic treatment to the façades of the residence).

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<sup>1</sup> Berglund, Lindvall and Schwela, 1999, "Guidelines for Community Noise"



## Assessment

Observations were conducted around the existing Castalloy site to the northwest. At the time of the observations, there was no significant noise being emitted from the site and it is understood that the site is in the process of being shut down. Any noise currently being emitted from the site is well below the goal noise levels of the Policy.

Given the existing low level of activity and noise from the Castalloy site, the focus of the industrial noise assessment should be to ensure that any future industrial land use on the Castalloy site is not constrained by the presence of residences resulting from the DPA. A future use of the Castalloy site will need to ensure that appropriate noise levels are achieved at existing residences, including the existing double storey units on Mooringe Avenue between Streeters Road and Whelan Avenue. As these units are closer to the Castalloy site than the proposed DPA, achieving appropriate noise levels at the units would result in appropriate noise levels also being achieved at the site of the DPA.

Notwithstanding, the inclusion of acoustic treatments for traffic noise at the closest residences to Mooringe Avenue will provide a further buffer to noise from industry, effectively allowing noise levels in excess of the outdoor goal noise levels of the Policy, yet still achieving the internal goal noise levels.

## AIRCRAFT

The subject site is not designated as an “*area affected by aircraft noise*” in the Development Plan, however AS2021 is referenced by the Development Plan provisions and provides guidance for the extent of noise reduction required to provide acceptable noise levels at sites exposed to aircraft noise. The standard classifies land for noise sensitive development as either:

- unconditionally acceptable, without any need to upgrade building facades;
- conditionally acceptable, with specific upgrades to building facades; or,
- unacceptable.

AS2021 uses a descriptor known as the ANEF (Australian Noise Exposure Forecast) to objectively determine the classification. For residential buildings, the following table summarises the classifications;

ANEF Contour	Classification
<20	Unconditionally acceptable
20-25	Conditionally acceptable
>25	Unacceptable

The proposed site is outside of the Adelaide Airport ANEF 20 contour and therefore is deemed to be unconditionally acceptable without any need for upgraded building construction.

## CONCLUSION

An environmental noise assessment has been made of the proposed Development Plan Amendment at Mooringe Avenue, Plympton.

The assessment addresses the noise from the potential impact of noise from traffic, existing industrial land uses surrounding the site, the potential impacts of future industrial uses and aircraft.

The conclusion of the assessment is that:

- The noise from Mooringe Avenue can be adequately attenuated with practical residential building construction;
- The noise from the current Castalloy site is not significant;
- The presence of residences on the subject site will not constrain future industry on the Castalloy site beyond the constraint imposed by existing residences;
- The site is unconditionally acceptable for residential development with respect to aircraft noise.

**APPENDIX A:**  
**DPA Site, Mooringe Avenue, Castalloy and Existing Residences**



## APPENDIX B: Example Acoustic Treatments

Example of acoustic treatments required within 10m of Mooring Avenue.

BUILDING ENVELOPE ELEMENT	ACOUSTIC REQUIREMENTS		
	Room	Area of Glazing	Requirement
Windows and glazed doors	Bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 40% of the floor area	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: <ul style="list-style-type: none"> <li>minimum 10mm thick glass in sliding doors;</li> <li>minimum 6.38mm thick laminated glass as fixed panes, awning, casement, or side hung doors.</li> </ul>
	Room	Area of Glazing	Requirement
Windows and glazed doors	Habitable rooms other than bedrooms (including attached non-habitable rooms)	Restrict total glazing area to no more than 60% of the floor area	Ensure the following glass is incorporated into systems that can be sealed airtight when closed: <ul style="list-style-type: none"> <li>minimum 10mm thick glass in sliding doors;</li> <li>minimum 6.38mm thick laminated glass as fixed panes, awning, casement, or side hung doors.</li> </ul>
	Room		
External walls	All habitable rooms	Ensure external walls are the acoustic equivalent of a brick veneer construction incorporating: <ul style="list-style-type: none"> <li>single leaf of minimum 90mm thick brick;</li> <li>a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick;</li> <li>75mm thick insulation with a minimum density of 11kg/m<sup>3</sup> between studwork, and;</li> <li>one layer of 10mm thick plasterboard fixed to the inside face.</li> </ul>	
	Room	Requirement	
Roof and ceiling systems	Bedrooms	Ensure the roof is sheet metal or tile, and ceilings are constructed from 1 layer of 10mm thick plasterboard with 165mm thick insulation (with a minimum density of 7kg/m <sup>3</sup> ) laid over the ceiling.	
	Room	Requirement	
Ventilation	All	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.	
	Room	Requirement	
External Doors (other than external glazed doors)	All habitable rooms	Ensure external doors are a minimum 35mm thick solid core, fully fitted with Raven "RP8" and "RP10" (or equivalent) acoustic doors seals. These seals should be fitted and adjusted to ensure that the doors are sealed as close as practicable to airtight when closed. If a glass infill is proposed a minimum of 6.38mm thick laminated glass should be incorporated and sealed airtight into the door.	
	Room	Requirement	
Ground Floor	All habitable rooms	Ensure the dwelling is constructed on a concrete slab.	

Example of acoustic treatments required between 10m and 25m of Mooringe Avenue.

BUILDING ENVELOPE ELEMENT	ACOUSTIC REQUIREMENTS		
	<i>Room</i>	<i>Area of Glazing</i>	<i>Requirement</i>
Windows and glazed doors	<i>Bedrooms (including attached non-habitable rooms)</i>	Restrict total glazing area to no more than 40% of the floor area	Ensure a minimum 6.38mm thick laminated glass is incorporated into systems that can be sealed airtight when closed.
	<i>Habitable rooms other than bedrooms (including attached non-habitable rooms)</i>	Restrict total glazing area to no more than 60% of the floor area	Ensure a minimum 6.38mm thick laminated glass is incorporated into systems that can be sealed airtight when closed.
	<i>Room</i>	<i>Requirement</i>	
External walls	<i>All habitable rooms</i>	Ensure external walls are the acoustic equivalent of: <ul style="list-style-type: none"> <li>• brick veneer construction incorporating:               <ul style="list-style-type: none"> <li>○ single leaf of minimum 90mm thick brick;</li> <li>○ a row of minimum 64mm thick studwork with minimum 25mm cavity to the brick;</li> <li>○ 75mm thick insulation with a minimum density of 11kg/m<sup>3</sup> between studwork, and;</li> <li>○ one layer of 10mm thick plasterboard fixed to the inside face.</li> </ul> </li> <li>OR;</li> <li>• Hebel construction incorporating:               <ul style="list-style-type: none"> <li>○ a row of minimum 90mm thick timber studwork;</li> <li>○ 75mm thick Hebel Powerpanel fixed to the studwork with minimum 22mm thick battens</li> <li>○ 90mm thick insulation with a density of 10.5kg/m<sup>3</sup> between the studwork, and;</li> <li>○ one layer of 10mm plasterboard fixed to the inside face.</li> </ul> </li> </ul>	
	<i>Room</i>	<i>Requirement</i>	
Ventilation	<i>All</i>	No outside air ventilation (other than openable windows) should be provided across these facades, with the exception of outside air into a ducted system via a minimum 3m length of acoustically insulated ductwork.	