

# Environmental Noise Assessment

The Foothills Mount Ainslie, Blocks 4 & 5, Section 38 Campbell

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The Foothills Mount Ainslie, Blocks 4 & 5, Section 38 Campbell

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## Quality Information

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## 1.0 Introduction

AECOM Australia Pty Ltd (AECOM) has been commissioned by Doma Group to prepare an Environmental Noise Emission Assessment for The Foothills Mount Ainslie.

The Foothills Mount Ainslie is a proposed residential development at Blocks 4 and 5, Section 38 Campbell, ACT.

The information set out in this report is for information in order to ensure a compliant and functional building and does not reflect the final design for the constructed building. Further development of calculations and treatment strategies will be determined in the detailed design phase of this project.

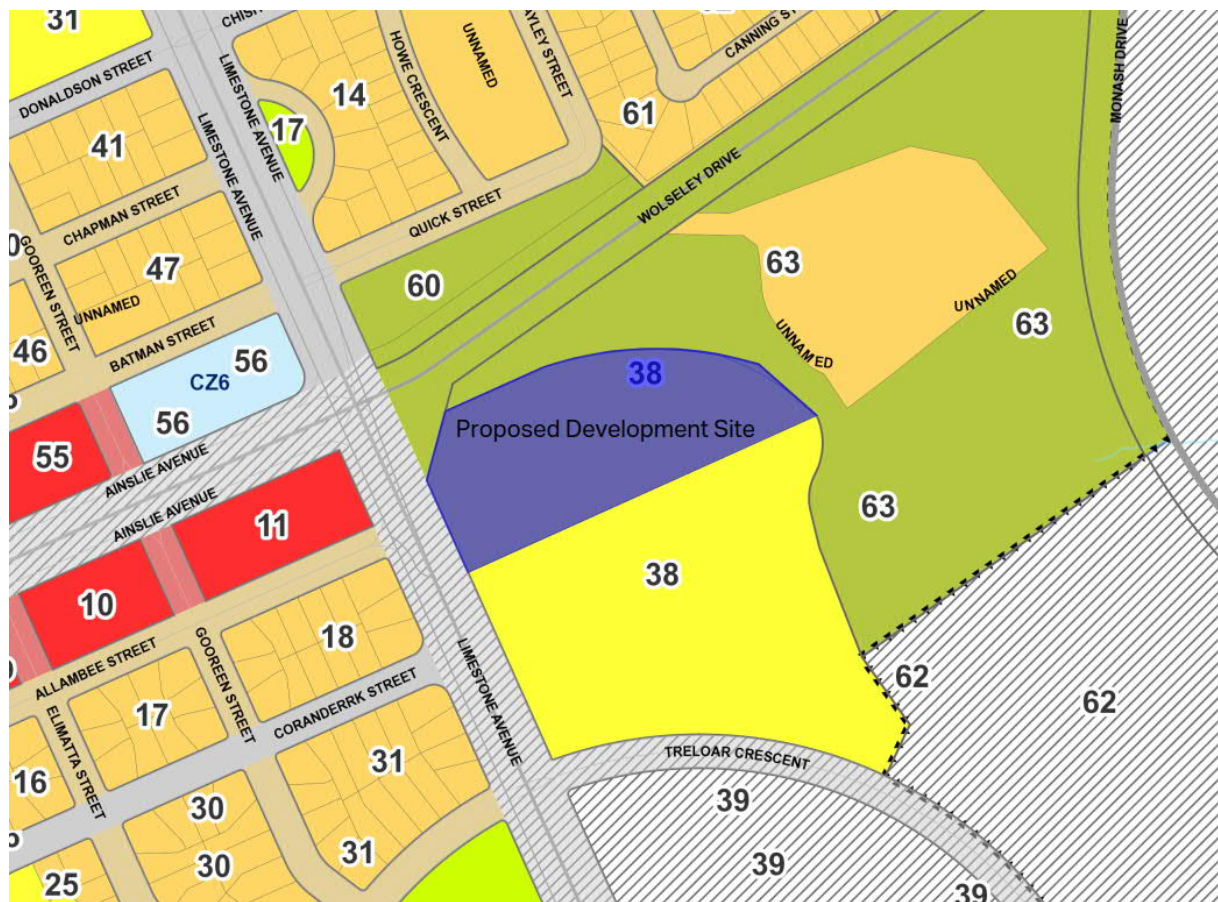
Appropriate operational environmental noise emission criteria for the development have been established in this report and are based upon Schedule 2 of the Environment Protection Regulation 2005 (EPR 2005).

The acoustic terminology used in this report is explained in Appendix A.

### 1.1 Development Description

The proposed development site is located at 30 Limestone Avenue on Blocks 4 and 5, Section 38, Campbell.

Figure 1 Site location



The proposed development comprises:

		Block 1	Block 2	Block 3	Block 4
Number of Buildings		2	7	7	5
Type of Dwellings		Apartments	Townhouses	Townhouses	Townhouses
1 Bedroom Units		26	-	-	-
2 Bedroom Units		74	7	10	-
3 Bedroom Units		12	24	25	-
4 Bedroom Units		-	13	4	46
Subtotal Units		112	44	39	46
<b>Total Units</b>		<b>241</b>			
Carparking	Residents	168 Spaces (two levels of basement)	338 Spaces (garages)		
	Visitors	61 Spaces (on-grade)			
<b>Total Carparking</b>		<b>567</b>			

## 2.0 Assessment Criteria

Schedule 2 of the Environment Protection Regulation 2005 document (EPR 2005) specifies information regarding noise zones, noise standards and conditions. Noise zones are applied to ACT land and have associated noise standards (measured in  $L_{10}$  dB(A)). Part 3 (Noise) of the EPR 2005 references Schedule 2 and provides definitions and information into the noise regulations for the ACT.

The zoning of ACT land is described within Schedule 2, Part 2.1 of the EPR 2005 and is replicated in Table 1.

Schedule 2, Part 2.2 of the EPR 2005, states the allowable  $L_{10}$  noise levels for each zone as presented in Table 2.

**Table 1 Table 2.1 Environment Protection Regulation 2005**

Column 1 item	Column 2 noise zone	Column 3 ACT land	Column 4 NSW land
1	zone A	land in an industrial zone	land in the Queanbeyan city industrial zone
2	zone B	land in the city centre and town centres land in the Central National Area (City)	land in the Queanbeyan city business zone
3	zone C	land in group centres and office sites land in the Central National Area (The Parliamentary Zone; Barton; sections 39, 40 and 41 of Yarralumla; Acton; Anzac Parade and Constitution Avenue; Russell; Duntroon, ADFA and Campbell Park; Development Nodes and Clubs of Lake Burley Griffin and Foreshores)	
4	zone D	land in a commercial CZ4 zone	
5	zone E	land in— <ul style="list-style-type: none"> <li>• a restricted access recreation zone</li> <li>• a broadacre zone</li> </ul>	
6	zone F	land in— <ul style="list-style-type: none"> <li>• a commercial CZ5 zone</li> <li>• a TSZ2 services zone</li> <li>• a community facility zone</li> <li>• a leisure and accommodation zone</li> </ul>	land in the Queanbeyan city special uses zone
7	zone G	all areas other than Central National Area (Fairbairn)	other NSW land

**Table 2 Table 2.2 from the Environment Protection Regulations 2005**

Column 1 item	Column 2 noise zone	Column 3 noise standard (dB(A)) Monday-Saturday 7am-10pm Sunday and public holiday 8am-10pm	Column 4 noise standard (dB(A)) Monday-Saturday 10pm-7am Sunday and public holiday 10pm-8am
1	zone A	65	55
2	zone B	60	50
3	zone C	55	45
4	zone D	50	35
5	zone E	50	40
6	zone F	same as the noise standard for the adjoining noise zone with the loudest noise standard for the time period	
7	zone G	45	35

## 2.1 Site Specific Criteria

The development site, Blocks 4 and 5, Section 38, Campbell, are classified as CF: Community Facilities.

The adjacent noise sensitive receivers and their noise standards are presented in Table 3 below.

**Table 3 Noise sensitive receivers and applicable noise standards**

		Land Use Zone	Noise Zone	Noise standard L <sub>A10</sub> , dB(A)	
				Day	Night
North	Block 4 Section 63 Campbell	NUZ3: Hills, Ridges and Buffer Areas	Zone G	45	35
	Block 2 Section 60 Ainslie	NUZ3: Hills, Ridges and Buffer Areas	Zone G	45	35
South	Block 2 Section 38 Campbell	CF: Community Facilities	Zone F <sup>1</sup>	45	35
East	Block 4 Section 63 Campbell	NUZ3: Hills, Ridges and Buffer Areas	Zone G	45	35
	Block 1 Section 63 Campbell	RZ1: Suburban	Zone G	45	35
West	Block 5 Section 56 Braddon	CZ6: Leisure and Accommodation	Zone F	45	35
	Block 1 Section 11 Reid	RZ4: Medium Density Residential	Zone G	45	35
	Section 18 Reid	RZ1: Suburban	Zone G	45	35

Notes:

1. Takes on noise standard for the adjoining noise Zone G.

## 2.2 Modifying Factors

Where noise sources contain certain characteristics, such as tonality, modifying factors corrections are applied to account for the greater annoyance that the sources may cause.

The ACT Noise Management Manual provides the corrections to be applied. These are presented in Table 4.



Table 4 Modifying factor corrections

Factor	Assessment/Measurement	When to Apply	Correction
Tonality	One third octave or narrow band analysis	Level of one-third octave band exceeds the level of the adjacent bands on both sides by: <ul style="list-style-type: none"> <li>• 5 dB or more if the centre frequency of the band containing the tone is above 400 Hz</li> <li>• 8 dB or more if the centre frequency of the band containing the tone is 160 to 400 Hz inclusive</li> <li>• 14 dB or more if the centre frequency of the band containing the tone is below 160 Hz</li> </ul>	5 dB
Low-frequency noise	Measurement of C-weighted and A-weighted level	Measure to assess C- and A-weighted levels over the same time period. Correction to be applied if the difference between the two levels is 15 dB or more	5 dB
Impulsive noise	A-weighted fast response and impulse response	If a difference in A-weighted maximum noise levels between fast response and impulse response is greater than 2 dB	Apply difference in measured levels as the correction up to a maximum of 5 dB
Intermittent noise	Subjectively assessed	Level varies by more than 5 dB	5 dB
Duration	Single-event noise duration may range from 1.5 min to 2.5 hr	One event in any 24 hour period	0 to -20 dB

### 3.0 Noise Emission Assessment

Noise emission from the proposed development is expected to be produced by building services external plant serving the development. The types of plant serving the development have not been determined at the date of issue of this report, however is expected to consist of individual split units servicing individual dwellings, a centralised plant scheme or a mixture of both.

Noise emission from the plant will be treated to meet the criteria presented in Section 2.0. Typical treatments that may be incorporated include the following:

- Selection of 'quiet' equipment
- Acoustic barriers
- Acoustic enclosures
- Attenuators
- Internal lining of mechanical ductwork

## 4.0 Conclusion

This report has developed environmental noise emission criteria for the proposed The Foothills Mount Ainslie development at Blocks 4 and 5, Section 38 Campbell, ACT.

The types and location of noise producing plant have not been determined at the time of writing of this report, however, it is expected that standard acoustic treatments will be sufficient to control environmental noise emission to meet the criteria established in this report.

# Appendix A

## Glossary of Acoustic Terminology

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The following is a brief description of acoustic terminology used in this report.

<i>Sound power level</i>	The total sound emitted by a source																						
<i>Sound pressure level</i>	The amount of sound at a specified point																						
<i>Decibel [dB]</i>	The measurement unit of sound																						
<i>A Weighted decibels [dB(A)]</i>	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).																						
<i>Decibel scale</i>	<p>The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:</p> <table> <tr> <td>0dB(A)</td> <td>Threshold of human hearing</td> </tr> <tr> <td>30dB(A)</td> <td>A quiet country park</td> </tr> <tr> <td>40dB(A)</td> <td>Whisper in a library</td> </tr> <tr> <td>50dB(A)</td> <td>Open office space</td> </tr> <tr> <td>70dB(A)</td> <td>Inside a car on a freeway</td> </tr> <tr> <td>80dB(A)</td> <td>Outboard motor</td> </tr> <tr> <td>90dB(A)</td> <td>Heavy truck pass-by</td> </tr> <tr> <td>100dB(A)</td> <td>Jackhammer/Subway train</td> </tr> <tr> <td>110 dB(A)</td> <td>Rock Concert</td> </tr> <tr> <td>115dB(A)</td> <td>Limit of sound permitted in industry</td> </tr> <tr> <td>120dB(A)</td> <td>747 take off at 250 metres</td> </tr> </table>	0dB(A)	Threshold of human hearing	30dB(A)	A quiet country park	40dB(A)	Whisper in a library	50dB(A)	Open office space	70dB(A)	Inside a car on a freeway	80dB(A)	Outboard motor	90dB(A)	Heavy truck pass-by	100dB(A)	Jackhammer/Subway train	110 dB(A)	Rock Concert	115dB(A)	Limit of sound permitted in industry	120dB(A)	747 take off at 250 metres
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<i>Frequency [f]</i>	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.																						
<i>Equivalent continuous sound level [L<sub>eq</sub>]</i>	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.																						
<i>L<sub>max</sub></i>	The maximum sound pressure level measured over the measurement period																						
<i>L<sub>min</sub></i>	The minimum sound pressure level measured over the measurement period																						
<i>L<sub>10</sub></i>	The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the L <sub>10</sub> .																						

<i>L<sub>90</sub></i>	The sound pressure level exceeded for 90% of the measurement period. For 90% of the measurement period it was louder than the <i>L<sub>90</sub></i> .
<i>Ambient noise</i>	The all-encompassing noise at a point composed of sound from all sources near and far.
<i>Background noise</i>	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The <i>L<sub>90</sub></i> sound pressure level is used to quantify background noise.
<i>Traffic noise</i>	The total noise resulting from road traffic. The <i>L<sub>eq</sub></i> sound pressure level is used to quantify traffic noise.
<i>Day</i>	The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays.
<i>Evening</i>	The period from 1800 to 2200 h Monday to Sunday and Public Holidays.
<i>Night</i>	The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays.

\*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 "Acoustics – Glossary of terms and related symbols".