

LAND OFF AYR ROAD, CHEADLE – APPROVED RESIDENTIAL DEVELOPMENT

SCHEME OF NOISE MITIGATION

On behalf of:

Persimmon Homes North West Ltd

LAND OFF AYR ROAD, CHEADLE – APPROVED RESIDENTIAL DEVELOPMENT

SCHEME OF NOISE MITIGATION

Report prepared by:
Hepworth Acoustics Ltd
21 Little Peter Street
Manchester
M15 4PS

On behalf of:
Persimmon Homes North West Ltd

Report prepared by:
David Thurstan BSc MIOA – Principal Consultant



Report checked by:
James Shaw BSc MIOA – Senior Consultant



CONTENTS

1.0	INTRODUCTION	1
2.0	NOISE SURVEY	2
3.0	NOISE MITIGATION SCHEME	3
4.0	SUMMARY	4
FIGURE 1 – SITE LOCATION & NOISE MEASUREMENT POSITION		5
FIGURE 2 – PHASE 2 SITE LAYOUT & NOISE MITIGATION SCHEME		6
APPENDIX I: NOISE UNITS & INDICES		7
APPENDIX II: NOISE SURVEY RESULTS		9

1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Persimmon Homes North West Ltd to carry out a noise assessment in connection with a reserved matters planning application for Phase 2 of the approved residential development of land off Ayr Road, Cheadle. Outline planning permission was granted on 1 December 2020, planning reference SMD/2018/0180. Condition 40 of the planning approval states that;

“40. No phase of the development hereby permitted shall commence, with the exception of site remediation works, until a site specific scheme for protecting the proposed residential units from noise has been submitted to and approved in writing by the Local Planning Authority for that phase. The submitted scheme shall have due regard to British Standard BS8233:2014 Guidance on Sound Insulation for Buildings and shall be so designed to achieve noise levels of less than 35 dB L_{Aeq} in bedrooms, less than 40 dB L_{Aeq} in living areas and 55 dB L_{Aeq} in outside living areas for that phase. A report containing all raw data and showing how calculations have been made shall be submitted to and approved in writing by the Local Planning Authority for each residential phase.

All works within a phase of development shall be carried out in accordance with the approved scheme prior to any building or dwelling to which they relate being brought into first use and shall be maintained for those purposes at all times thereafter.”

- 1.2 This report is an update to the original assessment carried out in 2016 (Hepworth report ref P17-430-R01v2) which was submitted as part of the planning application. This report provides our recommendations for noise mitigation measures for the Phase 2 development.
- 1.3 The boundary of the whole development area is shown in Figure 1. Phase 1 of the development is located off Froghall Road (A521) with Phase 2 being further east. The site is bounded and south by existing dwellings. To the north and east are open fields. The development will include a new school located in between Phases 1 and 2, as indicated in Figure 2.
- 1.4 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 NOISE SURVEY

- 2.1 Noise measurements were carried out at a location on the site and is indicated in Figure 1.
- 2.2 Noise measurements were taken in consecutive 15 minute periods between approximately 13:30 hours on Wednesday 6 and 07:00 hours on 7 Thursday September 2017 using a Rion NL-31 'Type 1' (s/n: 01120845) integrating sound level meter.
- 2.3 Acoustic calibration checks of the sound level meter were carried out before and after the noise measurements. No significant variation in the calibrated noise level was observed. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.5m above the ground. Frequency analysis was also carried out.
- 2.4 Weather conditions during the daytime survey were mild and dry with 60% cloud cover and an occasional north-westerly breeze (<5 m/s). Weather conditions during the night-time survey were cool, dry and calm (<2 m/s) with clear skies.
- 2.5 The full results of the noise surveys are shown in Appendix II and are summarised in Table 1.

Table 1: Summary of measured noise levels (dB)

Location	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$
Eastern area of the site	44	37

- 2.6 The measured noise levels were due to the sound of distant road traffic.
- 2.7 The road traffic noise exposure levels shown in Table 1 are low. Short-term peaks of noise from passing vehicles at night on the site were also low, being in the range 38 – 70 dB L_{AFmax} , and with the 10th highest value being 51 dB L_{AFmax} .
- 2.8 The levels of road traffic noise at the site are sufficiently low that they do not warrant the implementation of any specialist noise mitigation measures. However, we recommend that some noise mitigation measures are provided due to the proximity of the proposed new school, as described in Section 3.0.

3.0 NOISE MITIGATION SCHEME

Gardens

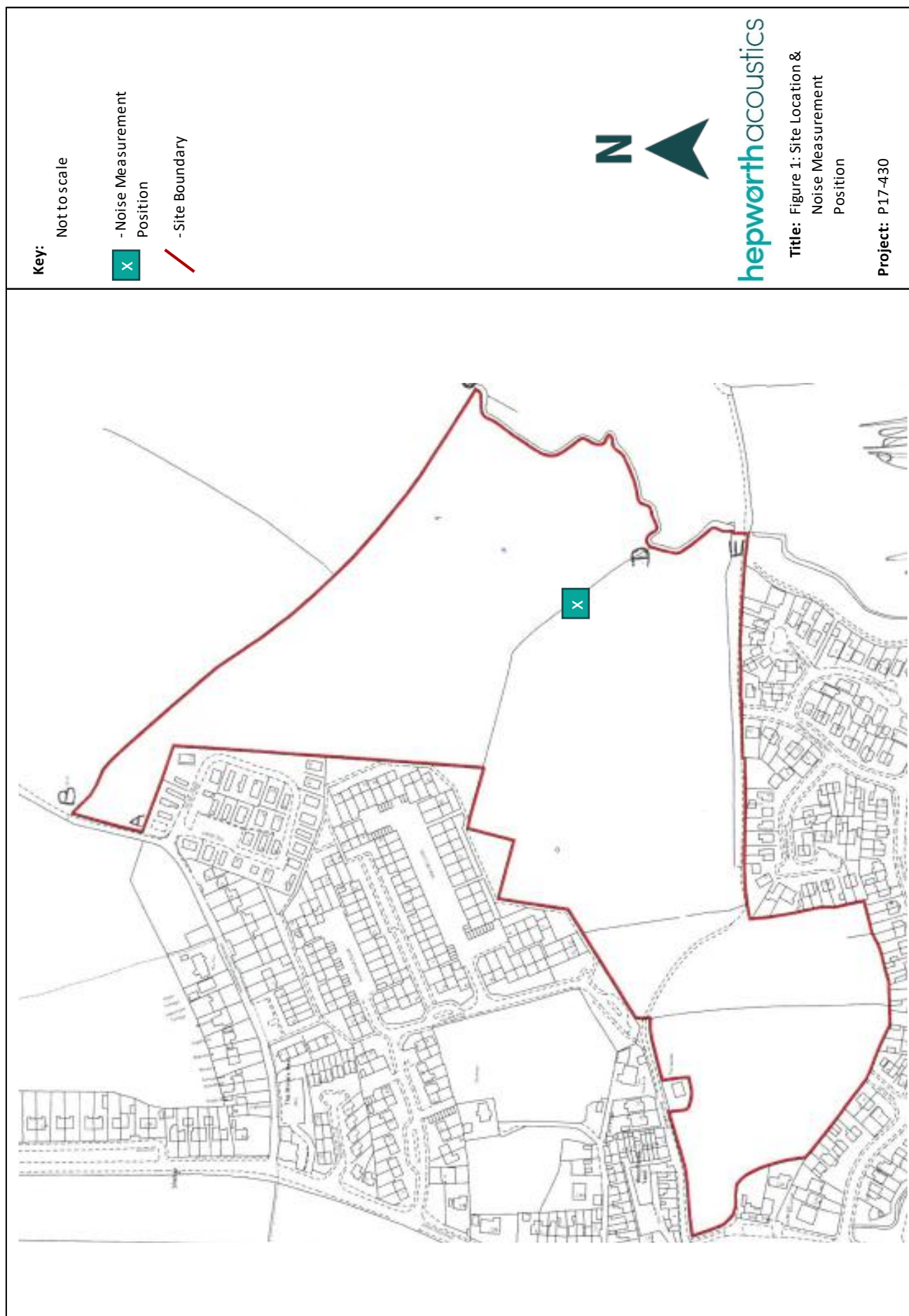
- 3.1 There are no specific guidelines for controlling the impact of noise from children at a school or a multi-use games area on new residential developments. Nevertheless, in order to protect the amenity of the residents in the new dwellings close to the proposed primary school (and multi-use games area), we would recommend that a proprietary acoustic fence of at least 2 metres in height is installed for the nearest rear gardens, as indicated in Figure 2.
- 3.2 The acoustic fencing must be imperforate (i.e. have no holes or gaps), have a surface mass no less than 10 kg/m^2 . It should be constructed with boards of at least 20mm thickness using double-rebated edged boards, or cover strips over joints, to ensure that there are no gaps between the boards.
- 3.3 Suppliers of proprietary acoustic fences include GRAMM Barrier Systems Ltd (www.grammbarriers.com), Jacksons Fencing (www.jacksons-fencing.co.uk), and Ransfords (www.ransfords.co.uk).

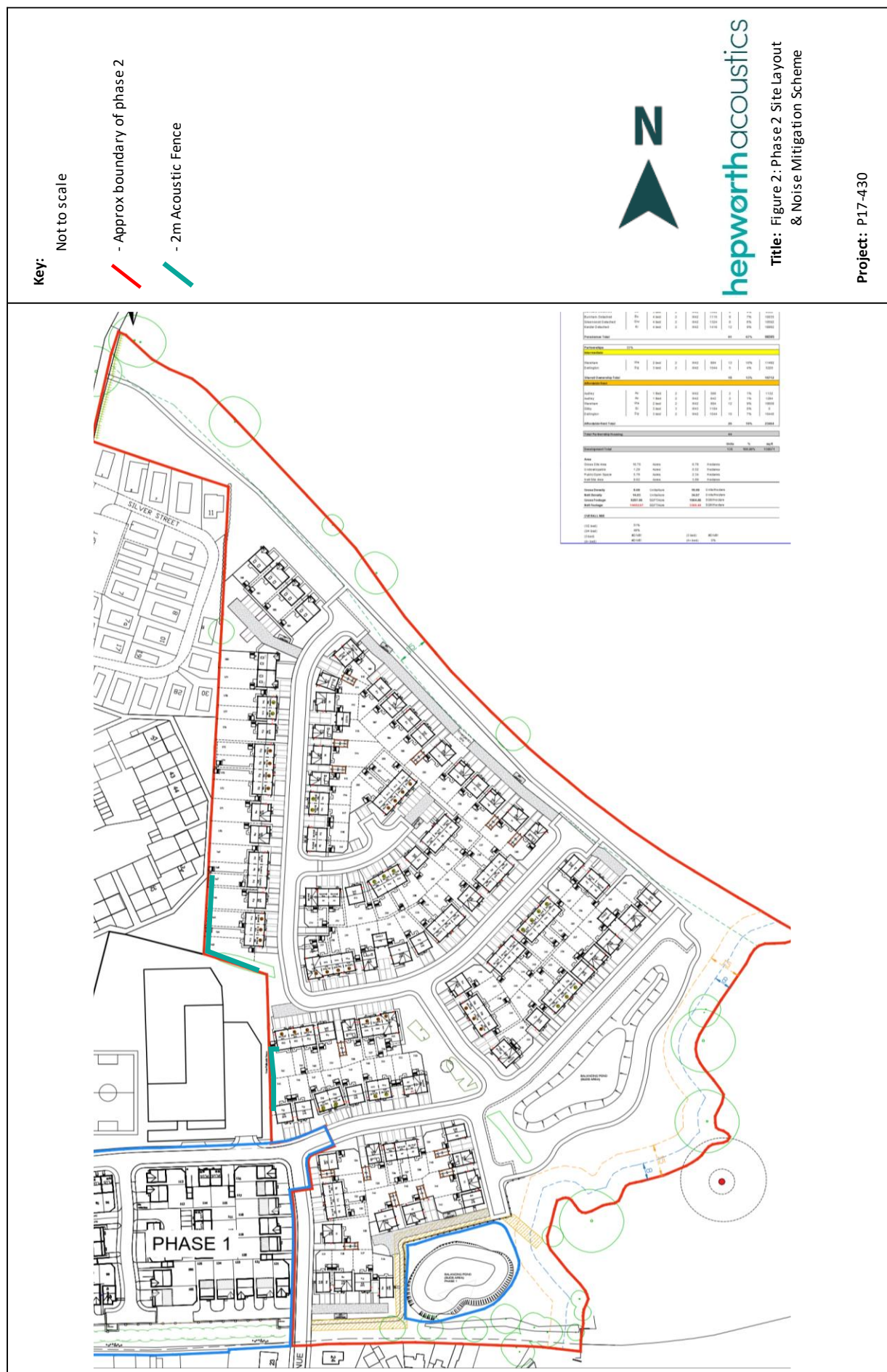
Dwellings

- 3.4 For living rooms and bedrooms of all dwellings on this development well-fitted standard double glazing of 4mm glass - nominal (8-20mm) cavity - 4mm glass ($25 \text{ dB } R_w + C_{tr}$), and standard trickle ventilation (i.e. with an acoustic performance above $30 \text{ dB } D_{n,e,w}$), will be adequate to achieve the requirements of the noise planning condition.

4.0 SUMMARY

- 4.1 A noise mitigation scheme has been recommended in connection with the reserved matters application for the approved residential development on Land off Ayr Road, Cheadle. The noise mitigation scheme is required by Condition 40 of the outline planning permission.
- 4.2 The assessment for Phase 2 has included a review of the results of our previous road traffic noise survey.
- 4.3 Traffic noise levels on the Phase 2 site were found to be low and therefore no special mitigation measures are necessary in relation to road traffic noise.
- 4.4 However, we have recommended the provision of acoustic fencing for gardens of the houses that will be nearest to the proposed new school.





Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

- C_{tr} This is an A-weighted urban traffic noise spectrum, which can be added to $D_{nT,w}$ or R_w in some standards to take into account different source spectra such as low frequency sound.
- R This is the 'Sound Reduction Index' as measured in a laboratory, and is a measure of the sound insulation properties of an building element in a stated frequency band.
- R_w This is the 'Weighted Sound Reduction Index', and is a single figure quantity of R , the laboratory measured Sound Reduction Index.
- $D_{n,e,w}$ This is the weighted element normalized level difference as measured in a laboratory, and is a measure of the sound insulation properties of small building elements such as ventilators.
- $L_{Aeq,T}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.
- L_{Amax} This is the maximum A-weighted noise level that was recorded during the monitoring period.
- $L_{A90,T}$ This is the A-weighted noise level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

Appendix II: Noise Survey Results

Date(s): Daytime - Thursday 6 September 2017
 Night-time – Thursday 7 September 2017

Equipment: Rion NL-31 'Type 1' sound level meter (serial no. 01120845) with all weather kit
 pole, windshield

Weather: Daytime – Dry, mild with a north-westerly breeze (<5 m/s)
 Night-time – Dry, cool, overcast and calm (<2 m/s)

All levels in dB(A)

Location: Eastern area of the site

