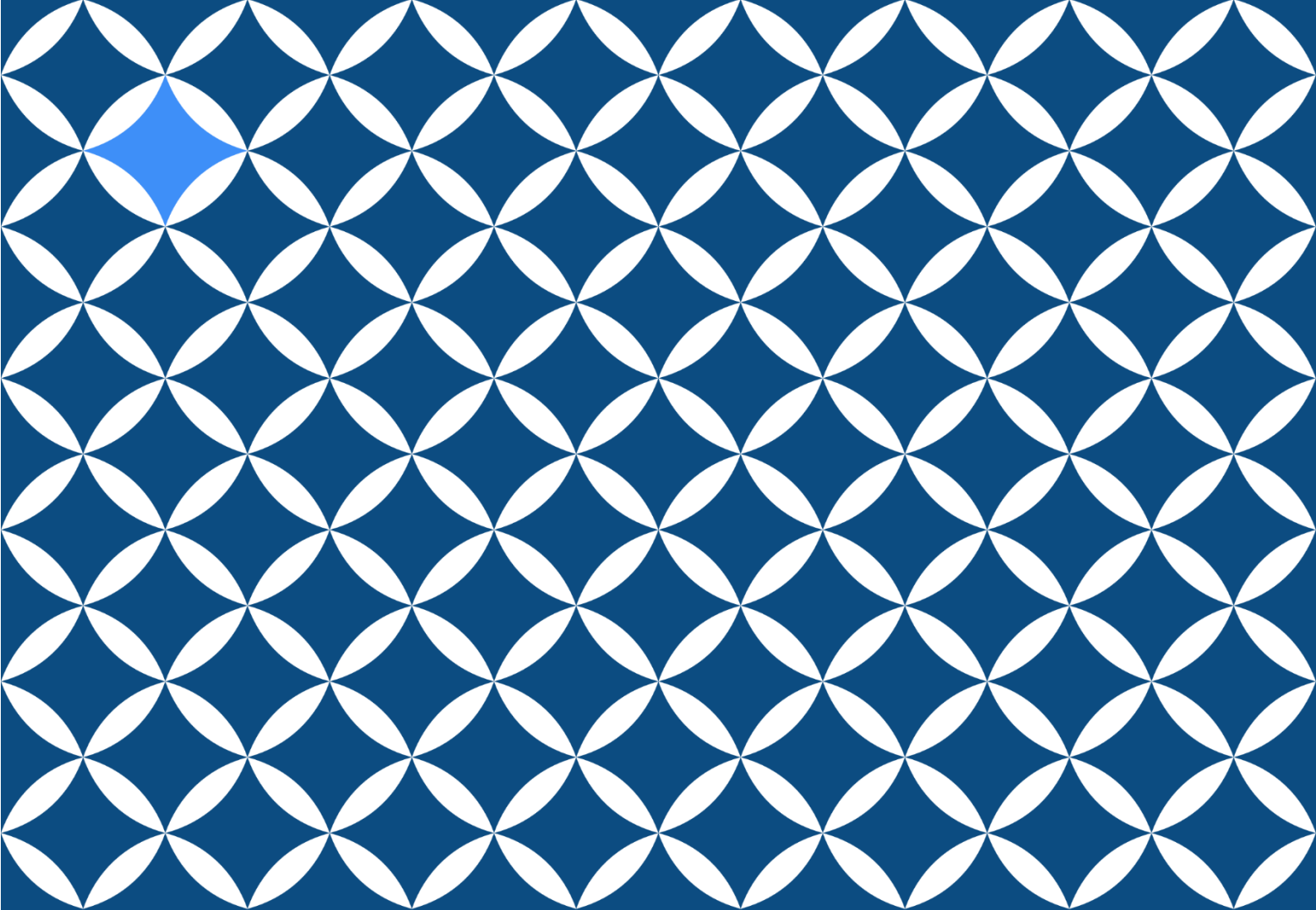




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Reading College

Plant Noise Impact Assessment

P2905-REP001-TLH P01

09 February 2026

PROJECT Reading College
Plant Noise Impact Assessment

CLIENT HI Group
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Daleside Road
Nottingham
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**DOCUMENT
REFERENCE** P2905-REP001-TLH P01

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DATE 09 / 02 / 2026

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Name of Organisation Sol Acoustics Limited
Company Registration Number 4218702

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1 Introduction

- 1.1 To support the planning application for the proposed Energy Centre at the Reading College Campus, Sol Acoustics Limited (Sol) have been instructed by HI Group (HI) to undertake a noise impact assessment in relation to new plant items proposed as part of the development.
- 1.2 An assessment of proposed plant noise levels at the nearest noise-sensitive receptors has been undertaken, based on early plant selections operating under worst-case conditions. The outcomes of this assessment are presented and discussed herein.
- 1.3 The purpose of this report is as follows:
- ◆ To identify the nearest existing noise sensitive receptors (NSRs) closest to, or most exposed to noise from the proposed plant items.
 - ◆ To quantify the prevailing background sound levels at the nearest NSRs through environmental noise measurements.
 - ◆ To set environmental plant noise limits based on the results of the environmental noise measurements and the requirements of Reading Borough Council (RBC).
 - ◆ To present the predicted future plant noise levels at the NSRs, based on preliminary plant noise selections, in order to demonstrate that, in principle, noise emissions from the proposed development can be suitably controlled.
- 1.4 This report has been produced by suitably qualified and competent professionals with relevant experience as detailed in the [Table 1](#) below.

Name	Position	Qualifications	Members of professional bodies	Experience
Thomas Hunt	Acoustic Consultant	BA(Hons), AdvDip	-	1 year relevant acoustic consultancy experience
Brian Horner	Associate Director	BSc(Hons)	MIOA, Member of the Institute of Acoustics	20 years relevant acoustic consultancy experience

Table 1 **Suitably qualified and competent professionals**

2 Location & Description of Development

- 2.1 The site is the Reading College Campus located on Kings Road, Reading, RG1 4HJ. The local road network surrounding the site comprises of Kings Road to the south, Kingsgate Street to the east, and Orts Road to the north. The surrounding area predominantly comprises of residential housing.
- 2.2 The proposed energy centre will comprise the remodelling of existing external areas of the art block in the centre of the campus and will include 3no. Air Source Heat Pumps.

2.1 Noise Sensitive Receptors

- 2.1.1 The guidance presented in RBC's Local Plan 2019 – 2036 is stated to 'protect the noise environment and maintain quality of life for people living and working in the town' and therefore the defined nearest noise sensitive receptors can be considered to be any residential property.
- 2.1.2 From a comprehensive desktop review of the buildings surrounding the site, it is understood that the nearest noise sensitive receptors to the proposed energy centre are the residential properties located on Orts Road, situated at least 72m north of the proposed energy centre, and the residential properties located on Kings Road, situated at least 110m south of the proposed energy centre.
- 2.1.3 **Figure 1** shows the site, the proposed energy centre, the nearest noise sensitive receptors, and the measurement positions used during the noise survey.

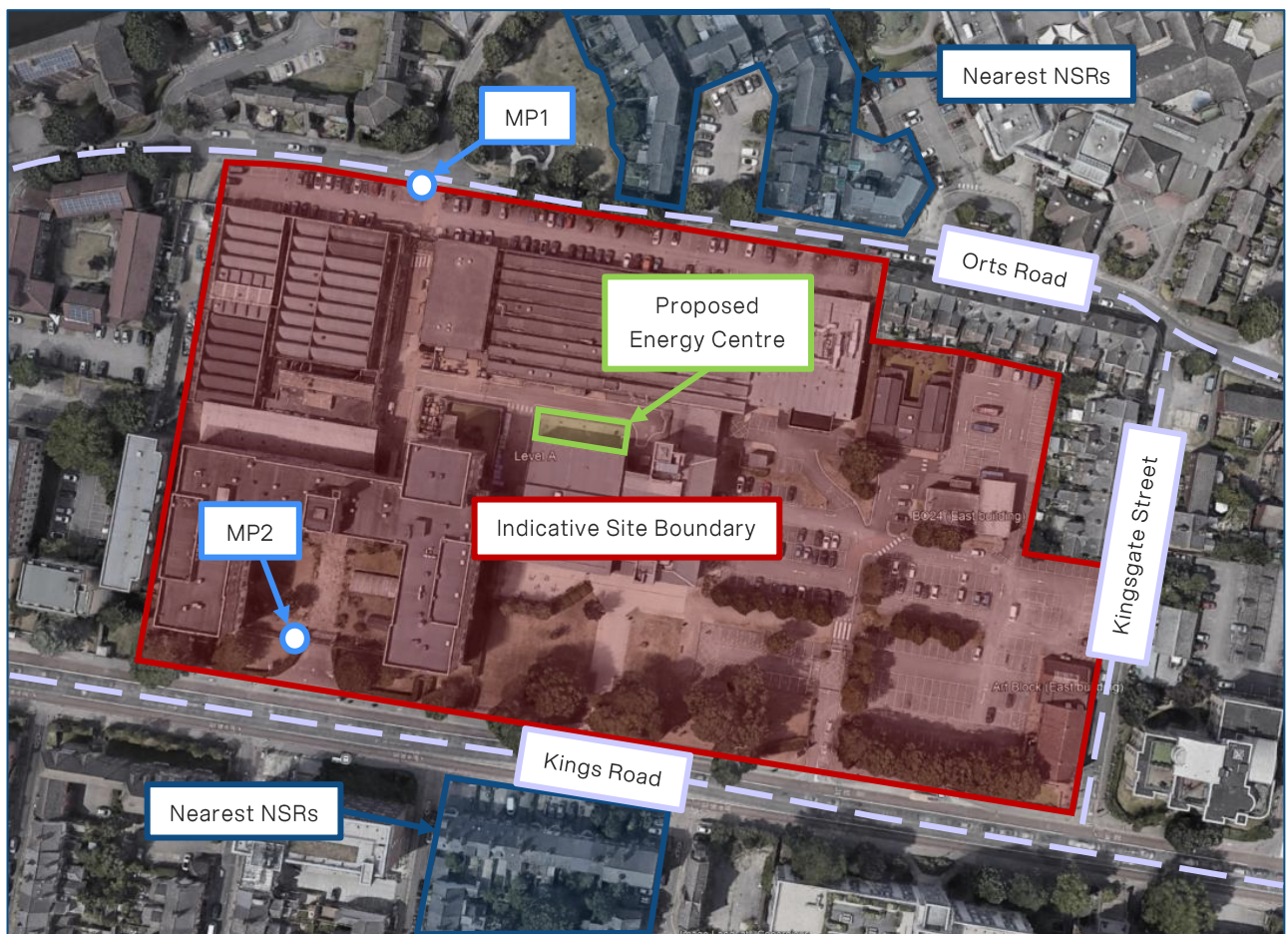


Figure 1

3 Acoustic Guidance and Criteria

3.1 Reading Borough Local Plan, 2019

Policy EN17: Noise Generating Equipment

- 3.1.1 The Reading Borough Local Plan 2019 – 2036, released by Reading Borough Council sets out the expectations for developments in the borough where new items of noise-generating equipment are introduced. The RBC noise criteria for noise-generating equipment is presented in Policy EN17 and states the following:

EN17: NOISE GENERATING EQUIPMENT

Where noise generating equipment is proposed, the noise source specific⁶¹ level (plant noise level) should be at least 10dBA below the existing background level as measured at the nearest noise sensitive receptor.

⁶¹ The noise source specific level is the measured noise level, as opposed to the rating level, which is the specific level with correction factors included.

3.2 BS 4142:2014+A1:2019: 'Methods for Rating and Assessing Industrial and Commercial Sound'

- 3.2.1 BS 4142:2014+A1:2019 'Method for rating and assessing industrial and commercial sound' (BS 4142) is intended to be used to assess noise of an industrial and commercial nature, which includes sound from fixed installations comprising mechanical and electrical plant and equipment.
- 3.2.2 The procedure contained in BS 4142 for assessing environmental noise impact is to compare the measured or predicted noise level from the source in question, the Specific Sound Level immediately outside the noise sensitive premises, with the corresponding Background Sound Level. Where the noise contains attention attracting characteristics such as tonal, impulsive, and/or intermittent elements, it may be appropriate to apply a correction to the Specific Sound Level to obtain the Rating Level.
- 3.2.3 BS 4142 states that the significance of sound arising from an industrial and/or commercial nature depends upon both the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, and also the context in which the sound occurs:
- ◆ Typically, the greater this difference, the greater the magnitude of the impact.
 - ◆ A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - ◆ A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
 - ◆ The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.

For the daytime, the assessment is carried out over a one-hour period, and over a 15-minute period at night. The daytime and nighttime periods are defined as occurring between 07:00 hours to 23:00 hours, and 23:00 hours to 07:00 hours, respectively.

4 Baseline Noise Survey

4.1 Survey Methodology

- 4.1.1 To quantify the baseline noise levels at a location representative of the noise sensitive receptors to the site, a long-term unattended noise survey was undertaken at two monitoring locations from Friday 30th January to Tuesday 3rd February 2026.
- 4.1.2 The monitoring locations are shown in [Figure 1](#) and described in [Table 2](#) below.

Measurement position	Description
MP1	Mast-mounted microphone sited in free field conditions, positioned at the northern boundary of Reading College Campus overlooking Orts Road, c.2.6m from ground level
MP2	Mast-mounted microphone sited in free field conditions, positioned at the southern boundary of Reading College Campus overlooking Kings Road, c.2.2m from ground level

Table 2 Description of noise monitoring positions

- 4.1.3 It is noted that due to limited secure infrastructure for the monitoring equipment to be mounted to, MP1 was placed as close to the identified NSRs on Orts Road as possible. The prevailing noise climate at the northern boundary of the campus is driven by road traffic along Orts Road and general human activity from the residential properties. Similar noise sources are present at the identified NSRs and are expected to influence the background noise environment in a comparable manner. On this basis, the selected measurement position is considered representative of the prevailing background noise climate at the NSRs.
- 4.1.4 The prevailing noise climate at the southern boundary of the campus is dominated by road traffic from Kings Road. Due to the frequency of traffic and its consistency as a noise source, selected measurement position is considered representative of the prevailing background noise climate at the NSRs.
- 4.1.5 The noise survey was carried out using Type-1 Precision Grade noise monitoring equipment, and the complete measuring system was field-calibrated immediately prior to and following the noise survey period; No significant calibration drift was observed. Full details of the noise monitoring systems are retained on file by Sol, including traceable calibration records; these are available for review if needed.
- 4.1.6 Weather conditions were deemed suitable for the measurement of environmental noise, with average wind speeds remaining under 5m/s and dry ground conditions throughout the noise survey period. Nevertheless, the microphone system was entirely weatherproofed and fitted with all-weather environmental windshields, and with a bird spike.

4.2 Noise Survey Results Summary

4.2.1 [Appendix B](#) provides detailed time history graphs presenting the environmental noise levels recorded for the duration of the survey, while [Table 3](#) provides a summary of the typical measured A-weighted noise levels.

Monitoring Position	Daytime		Night-time	
	Residual Sound Level dB $L_{Aeq,T}$	Background Sound Level dB $L_{A90, 15 \text{ min}}$	Residual Sound Level dB $L_{Aeq,T}$	Background Sound Level dB $L_{A90, 15 \text{ min}}$
MP1	53	44	46	40
MP2	67	56	65	43

Table 3 Summary of typical A-weighted measured noise levels

5 Noise Impact Assessment

5.1 Description of Proposals

- 5.1.1 3no. Air Source Heat Pumps items are proposed as a part of the energy centre. The location of the proposed energy centre within their surrounding context are shown in [Figure 1](#).
- 5.1.2 The proposed energy centre is shielded by the existing and adjacent buildings up to 9m to the north, south, east, and west. All plant items are proposed to be installed at ground level. [Figure 2](#) and [Figure 3](#) illustrates the proposed plan for the plant in further detail.

Proposed Plant Acoustic Specifications

- 5.1.3 Sol received proposed plant selections from HI Group in January 2026. It is understood that the proposed energy centre will include 3no. HiRef 30NHA604HL0 Air Source Heat Pumps.
- 5.1.4 [Table 4](#) below outlines the details and available noise data of the proposed plant.

Make / Model	Description	No. of Units	A-Weighted Sound Power Level (dB $L_{Aeq,T}$)
HiRef 30NHA604HL0	Air Source Heat Pump	3	87

Table 4 Details of proposed plant

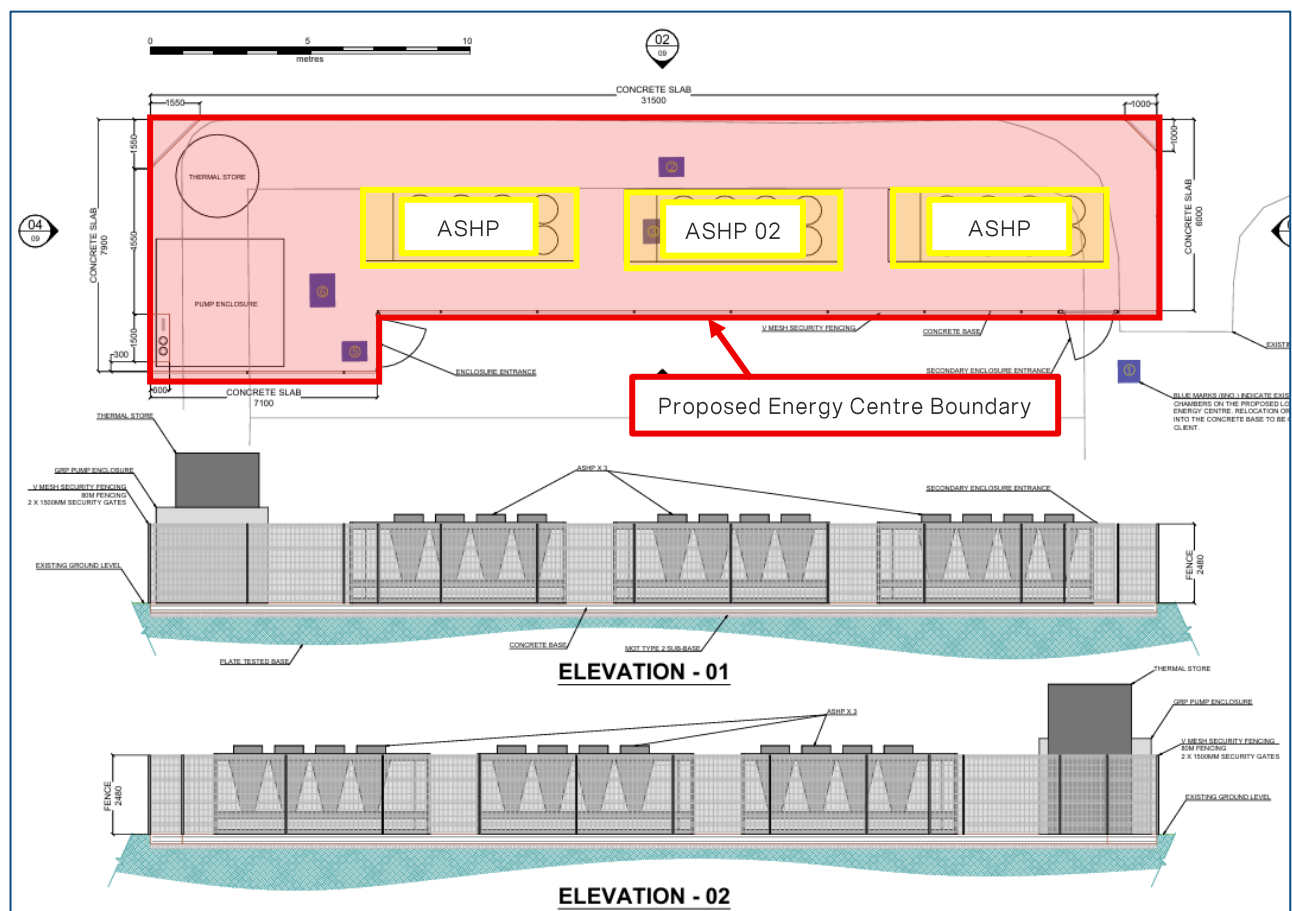


Figure 2

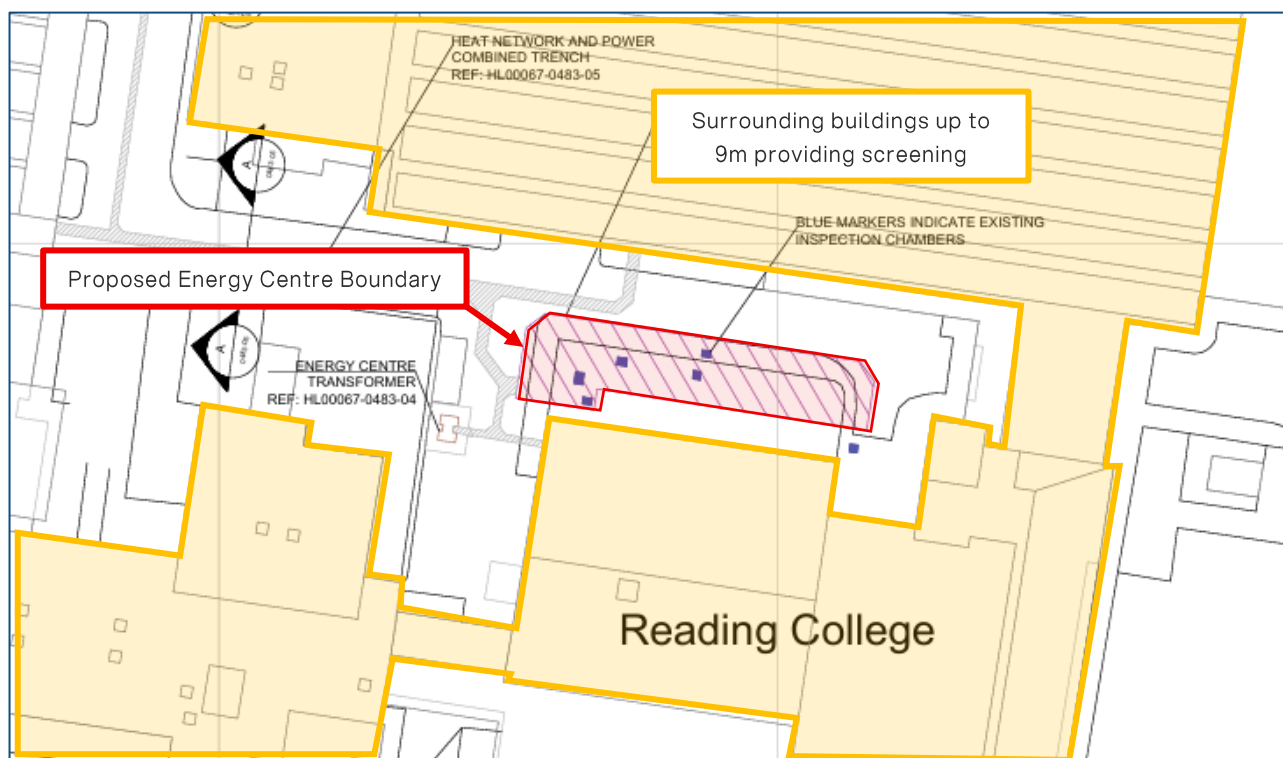


Figure 3

5.2 Environmental Plant Noise Limits

- 5.2.1 Based upon the results of the background noise survey and the requirements of Reading Borough Council, [Table 5](#) presents the maximum permissible cumulative plant noise level to be achieved by the proposed plant, as assessed 1 metre from the nearest noise sensitive window. **Note**, these plant noise limits are subject to approval by Reading Borough Council.

Nearest NSR Location	Maximum Permissible Plant Noise Level Limit 1m from Nearest Residential Façade, dB $L_{Aeq,T}$	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Orts Road	34	30
Kings Road	46	33

Table 5 Maximum permissible cumulative plant noise levels

5.3 Plant Noise Calculations

- 5.3.1 It is understood that the proposed plant items will typically only operate during the daytime hours when the building is occupied. However, as a worst-case, an assessment has been undertaken for both the daytime and the night-time periods, assuming all plant is operating at their maximum design duty, simultaneously.
- 5.3.2 It is also considered that the plant items in the proposed energy centre are immediately screened by the existing structure of the surrounding buildings (up to 9m high barrier). All such screening has been incorporated into the assessment, the results of which are summarised in [Table 6](#) and [Table 7](#) below. Detailed calculations can be found in [Appendix C](#).

Orts Road NSRs

	Daytime (T = 07:00 – 23:00)	Nighttime (T = 23:00 – 07:00)	Comments
Residual Sound Level	53dB $L_{Aeq,T}$	46dB $L_{Aeq,T}$	As measured at MP1
Background Sound Level	44dB $L_{A90,15min}$	40dB $L_{A90,15min}$	Background Sound Level, as measured at MP1
Resultant Plant Noise Limit	34dB $L_{Aeq,T}$	30dB $L_{Aeq,T}$	As per RBC guidance
Plant Noise Level at Receptor	28dB $L_{Aeq,1h}$	28dB $L_{Aeq,15min}$	Daytime and night-time levels taken at nearest noise sensitive window
Difference between Plant Noise Level and Noise Limit	-6dB	-2dB	

Table 6 Plant noise assessment for Orts Road NSRs

Kings Road NSRs

	Daytime (T = 07:00 – 23:00)	Nighttime (T = 23:00 – 07:00)	Comments
Residual Sound Level	67dB $L_{Aeq,T}$	65dB $L_{Aeq,T}$	As measured at MP2
Background Sound Level	56dB $L_{A90,15min}$	43dB $L_{A90,15min}$	Background Sound Level, as measured at MP2
Resultant Plant Noise Limit	46dB $L_{Aeq,T}$	33dB $L_{Aeq,T}$	As per RBC guidance
Plant Noise Level at Receptor	18dB $L_{Aeq,1h}$	18dB $L_{Aeq,15min}$	Daytime and night-time levels taken at nearest noise sensitive window
Difference between Plant Noise Level and Noise Limit	-28dB	-15dB	

Table 7 Plant noise assessment for Kings Road NSRs

5.4 Uncertainty

5.4.1 Section 10 of BS 4142:2014+A1:2019 states the following with regards to uncertainty:

'... Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty...'

5.4.2 In accordance with the requirements of BS 4142, Sol have undertaken numerous and significant steps to limit the level of uncertainty in the assessment. Specifically, the following measures have been undertaken:

- ◆ Measurement positions have been selected to be as representative of the nearest noise sensitive receptors as possible;
- ◆ The sound level meters were calibrated immediately before and after each survey. No noticeable drift in calibration was recorded;
- ◆ All practicable measures were taken to minimise the effect of any prevailing meteorological conditions during the survey periods;
- ◆ Surveys were undertaken for an appropriate duration to ensure a robust data set.

5.5 Discussion of Results

5.5.1 As can be seen from [Table 6](#) and [Table 7](#), the plant noise levels are expected to be compliant with the Reading Borough Council requirements. As defined in BS 4142:2014, such levels indicate a **"low impact"** to the nearest NSRs during the daytime the night-time periods.

6 Conclusion

- 6.1 To support the planning application for the proposed Energy Centre at the Reading College Campus, Sol Acoustics Limited (Sol) have been instructed by HI Group (HI) to undertake a noise impact assessment in relation to new plant items proposed as part of the development.
- 6.2 An environmental noise survey was undertaken at the site to establish and quantify background noise levels (L_{A90}) at the nearest identified noise sensitive receptors on Orts Road, at least 72m from the proposed energy centre location, and on Kings Road, at least 110m from the proposed energy centre location.
- 6.3 Based on preliminary plant specifications provided by HI Group in January 2026, an indicative assessment of the proposed plant noise levels at the nearest NSRs was undertaken, accounting for losses due to distance and acoustic screening provided by existing and proposed building structures.
- 6.1.1 The results of the assessment indicate that the plant noise is expected to comply with Reading Borough Council's standard noise generating equipment policy, and result in a **low impact** in accordance with BS 4142:2014+A1:2019.

APPENDIX A

Glossary of Acoustic Terms

Term	Abbreviation	Description
Decibel	dB	A scale for comparing the ratios of two quantities, including sound pressure and sound power.
A-weighting	dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the change in sensitivity of the human ear at varying frequencies.
Sound Pressure Level	L_{pA}	A measure of the sound pressure at a particular location. Typically expressed in dB(A) referenced to 2×10^{-5} Pascals.
Equivalent Continuous Sound Level	$L_{Aeq,T}$	The steady level of sound over a prescribed period of time which would contain the same total sound energy as the actual fluctuating noise under consideration in the same period of time.
Statistical Sound Levels	L_{A10} and L_{A90}	The level of noise exceeded for a percentage of the time period being sampled, namely 10% or 90% respectively.
Background Sound Level	$L_{A90,T}$	The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of the time period being sampled.
Maximum Sound Level	L_{Amax}	The maximum sound or noise level determined with instrumentation set to either a fast time weighting, L_{AFmax} or a slow time weighting, L_{ASmax} as occurring during the time period being sampled.
Sound Power Level	L_{WA}	A measure of the total sound energy radiated from a source. Like sound pressure levels, this is also expressed in dB(A) terms, but it is referenced to 1×10^{-12} W.
Broadband		Sound sampled over a wide range of frequencies.
Narrow band		Sound sampled over a specific, restricted frequency range. Used to ascertain the amplitude and significant of individual, audible tones, and to assist in identifying particular sources of noise within a complex, multi-source soundscape environment.
Ambient Sound	$L_{eq,T}$	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, both near and far.
Specific Sound Level	$L_{eq,T}$	The Equivalent Continuous A-Weighted Sound Level at an assessment position produced by a specific sound over a given reference time interval, T_r
Rating Level	L_{Ar,T_r}	The Specific Sound Level plus any adjustment for the acoustic characteristic features of the noise (e.g. intermittency, tones etc.).
Residual Noise	$L_{Aeq,T}$	The ambient sound remaining at given position in a given situation, when the specific sound source is suppressed to such an extent that it no longer contributes to the ambient sound.
Sound Reduction Index	SRI	The reduction in sound energy when transmitted through a panel or similar planar element, typically used in relation to single octave or one-third octave frequency band values.
Weighted Sound Reduction Index	R_w	The Sound Reduction Index expressed as a single figure, as expressed against a reference curve.
Dynamic Insertion Loss	DIL	Reduction in acoustic energy resulting from the insertion of a noise control element (e.g. an attenuator, acoustic enclosure etc.).
Free Field		Noise measuring location that is free from the presence of sound reflecting objects (except the ground), usually taken to mean being at least 3.5 metres distance from reflective surface(s) or greater.

APPENDIX B

Noise Survey Details

LOCATION

Reading College Campus, Kings Road, Reading, RG1 4HJ

DATES AND TIMES

c.10:00 hours on Friday 30th January 2026 to c.11:30 hours on Tuesday 3rd February 2026.

WEATHER CONDITIONS

Weather conditions were understood to be typically dry with light winds and considered to be suitable for environmental noise measurements.

PERSONNEL

Thomas Hunt – Sol Acoustics Ltd

INSTRUMENTATION

01dB Cube Sound Level Meter (serial no. 11495)

01dB Pre22 Microphone Preamplifier (serial no. 1805327)

Gras 40CD Microphone Capsule (serial no. 331753)

01dB Cube Sound Level Meter (serial no. 11228)

01dB Pre22 Microphone Preamplifier (serial no. 1610782)

Gras 40CD Microphone Capsule (serial no. 287832)

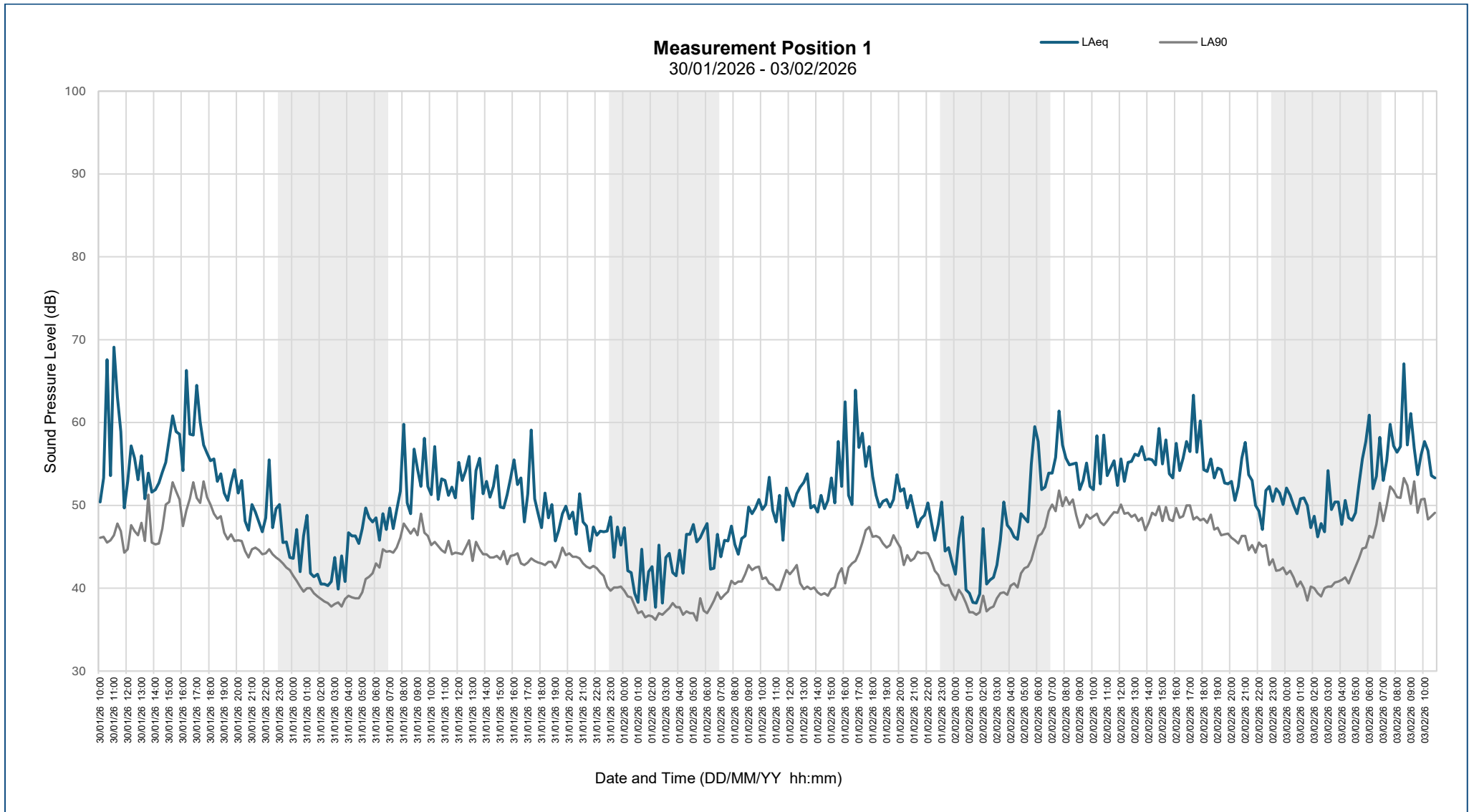
Cirrus CR:515 Sound Calibrator (serial no. 101383)

METHODOLOGY

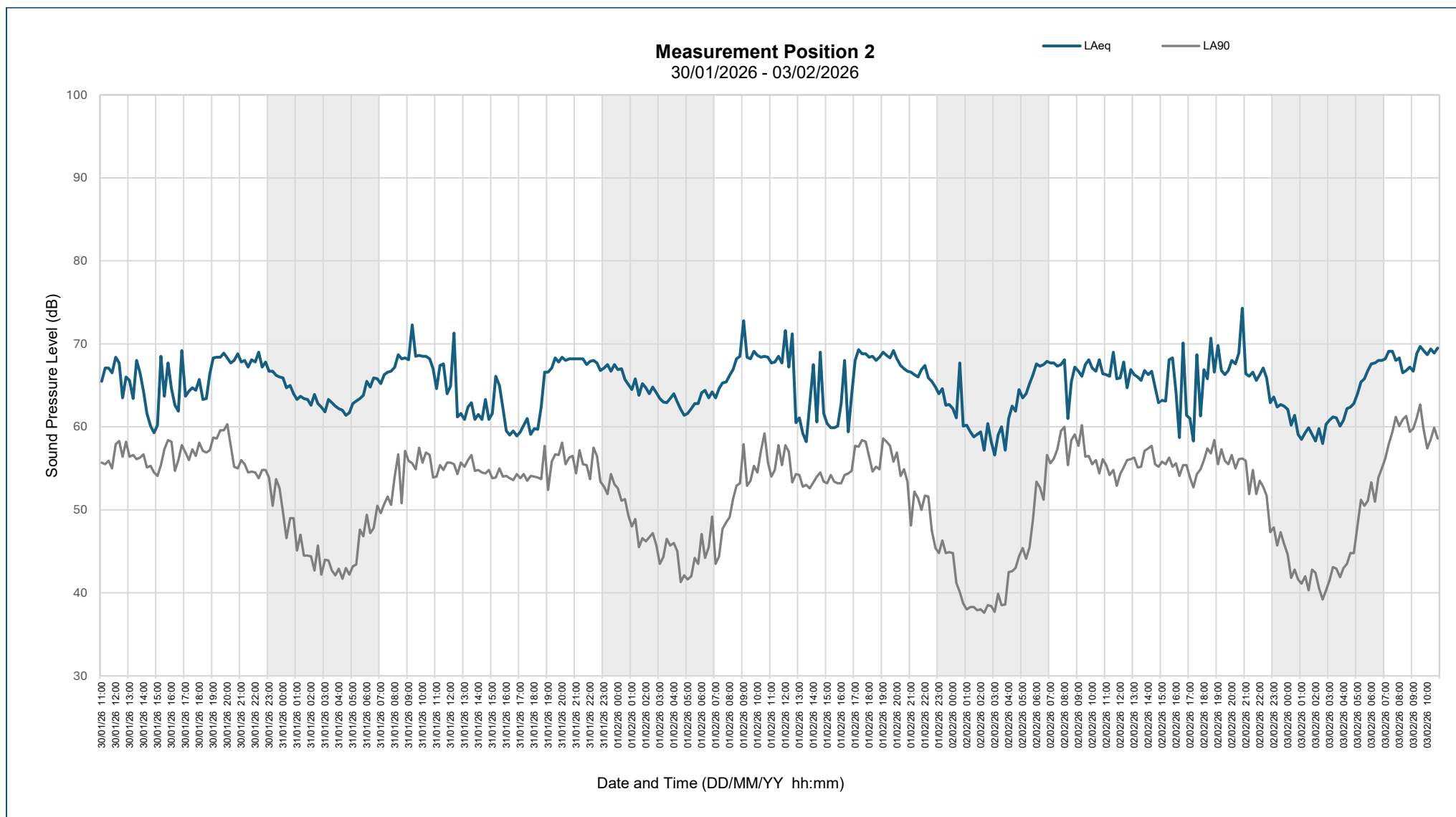
Before and after the measurements the noise monitoring equipment was calibrated to an accuracy of ± 0.4 dB using the Cirrus CR:515 Sound Calibrator. The calibrator produces a sound pressure level of 94 dB re 2×10^{-5} Pa @ 1 kHz.

MEASUREMENT RESULTS

Graphs B1 and B2 summarise the broadband A-weighted results obtained during the survey.



Graph B1



Graph B2

APPENDIX C

Calculation Tables

Calculation Table 1 - Daytime (Orts Road NSRs)

Item	Sound Power Level (dB L _{WA})	Distance to Receptor (m)	Hemi-spherical Distance Attenuation (dB)	Screening Attenuation (dB)	Reflective surfaces (dB)	Specific Sound Level at Receptor (dB L _{Aeq,Tr})	Rating Penalty	Rating Level at Receptor (dB L _{Ar,Tr})
ASHP 01	87	72	-48	-18	3	24	0	24
ASHP 02	87	72	-48	-18	3	24	0	24
ASHP 03	87	72	-48	-18	3	24	0	24
At nearest sound sensitive receptor		Cumulative Sound Level at Nearest Receptor (dB L _{Aeq,Tr})				28		28

Figure C1

Calculation Table 2 - Night time (Orts Road NSRs)

Item	Sound Power Level (dB L _{WA})	Distance to Receptor (m)	Hemi-spherical Distance Attenuation (dB)	Screening Attenuation (dB)	Reflective surfaces (dB)	Specific Sound Level at Receptor (dB L _{Aeq,Tr})	Rating Penalty	Rating Level at Receptor (dB L _{Ar,Tr})
ASHP 01	87	72	-48	-18	3	24	0	24
ASHP 02	87	72	-48	-18	3	24	0	24
ASHP 03	87	72	-48	-18	3	24	0	24
At nearest sound sensitive receptor (Openable Window)		Cumulative Sound Level at Nearest Receptor (dB L _{Aeq,Tr})				28		28

Figure C2

Calculation Table 1 - Daytime (Kings Road NSRs)

Item	Sound Power Level (dB L_{wA})	Distance to Receptor (m)	Hemi-spherical Distance Attenuation (dB)	Screening Attenuation (dB)	Reflective surfaces (dB)	Specific Sound Level at Receptor (dB $L_{Aeq,Tr}$)	Rating Penalty	Rating Level at Receptor (dB $L_{Ar,Tr}$)
ASHP 01	87	110	-52	-25	3	13	0	13
ASHP 02	87	110	-52	-25	3	13	0	13
ASHP 03	87	110	-52	-25	3	13	0	13
At nearest sound sensitive receptor		Cumulative Sound Level at Nearest Receptor (dB $L_{Aeq,Tr}$)				18		18

Figure C3

Calculation Table 2 - Night time (Kings Road NSRs)

Item	Sound Power Level (dB L_{wA})	Distance to Receptor (m)	Hemi-spherical Distance Attenuation (dB)	Screening Attenuation (dB)	Reflective surfaces (dB)	Specific Sound Level at Receptor (dB $L_{Aeq,Tr}$)	Rating Penalty	Rating Level at Receptor (dB $L_{Ar,Tr}$)
ASHP 01	87	110	-52	-25	3	13	0	13
ASHP 02	87	110	-52	-25	3	13	0	13
ASHP 03	87	110	-52	-25	3	13	0	13
At nearest sound sensitive receptor (Openable Window)		Cumulative Sound Level at Nearest Receptor (dB $L_{Aeq,Tr}$)				18		18

Figure C4