



PREPARED: 01 October 2025

BOOTS HEARINGCARE LETCHWORTH NOISE IMPACT ASSESSMENT

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Project Ref:	AS13262	Project Name:	Boots Hearingcare Letchworth
Report Ref:	AS13262.250922.R1 Letchworth	Report Title:	Noise Impact Assessment
Client Name:	Boots Hearingcare		
Project Manager:	Matt Sugden		
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Clarke Saunders Acoustics Winchester SO22 5BE		This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.	

1.0 EXECUTIVE SUMMARY

- 1.1 A pre-application memorandum issued by North Herts Council (NHC) on the 19th August 2025 (ref. 25/01748/FP) has requested a Noise Assessment of proposed plant at Boots Hearingcare Unit 2/4, Commerce Way, Rowland Way, Letchworth, SG6 3DN
- 1.2 Clarke Saunders Acoustics (CSA) has been instructed by Boots Hearingcare to conduct an assessment of the likelihood of adverse impact being experienced due to the proposed plant.
- 1.3 Assessment of mechanical plant, in accordance with BS4142:2014+A.1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142), demonstrates a numerical assessment level ($L_{Ar,Tr}$) between 1dB and 5dB above the representative background sound levels at nearest residential receptors.
- 1.4 This numerical assessment is lower than that of the existing plant that will be replaced.
- 1.5 Given this and consideration of the context in which the sound would be experienced, it is concluded that sound from the proposed plant would not adversely affect the local amenity of the residents.

2.0 INTRODUCTION

- 2.1 Clarke Saunders Acoustics (CSA) has been commissioned by Boots Hearingcare Ltd to undertake an assessment of the likelihood of adverse impact being experienced due to the plant items at Boots Hearingcare Unit 2/4, Commerce Way, Rowland Way, Letchworth, SG6 3DN.
- 2.2 A pre-application memorandum issued by North Herts Council (NHC) on 19th August 2025 (ref. 25/01748/FP) states:

“Notwithstanding there is an existing unit at ground floor level, there is a concern that replacing the existing one and introducing 4 more units may have a negative impact on the residential uses above and adjacent with regards to noise generation.

Can we obtain a noise assessment which would give an indication to its impact?”

- 2.3 The proposals in this application include the removal of existing external plant and installation of up to 6 no. condensing units.
- 2.4 An environmental noise survey has been conducted to determine the impact of sound emissions from the proposed external mechanical plant on nearby noise-sensitive receptors.
- 2.5 This assessment is based on environmental sound survey data collected at site and manufacturer provided plant sound data with reference to BS4142.
- 2.6 A summary of acoustic terminology used throughout this report is provided in Appendix A.

3.0 SITE DESCRIPTION

- 3.1 Unit 2/4 is located within Garden Square Shopping Centre, southeast of the Eastcheap and Leys Avenue intersection. Boots Hearingcare proposes opening hours of between 09:00 and 17:30 Monday to Saturday.
- 3.2 Existing building services plant sits behind the unit adjacent to Rowlands Way serving the currently tenanted unit. The new proposed plant will replace this existing plant in the same general location.
- 3.3 The most affected residential noise sensitive receptors have been identified as dwellings within Commercial House which forms part of 23-25 Leys Avenue. The nearest residential receptor window is located approximately 4m above the proposed plant area.
- 3.4 A number of surrounding premises incorporate plant in a similar location or on their roof, providing a considerable precedent for new plant installations.
- 3.5 The overall site and proposals are shown in the appended site plan AS13262/SP1.

4.0 ENVIRONMENTAL NOISE SURVEY

4.1 SURVEY METHODOLOGY

- 4.1.1 A survey of the existing ambient and background sound levels was undertaken at the location shown in the appended site plan, AS11357/SP1, at around 1.5m from the Commercial House façade at a height of approximately 2m above the loading dock.
- 4.1.2 The sound monitor was set to record measurements of consecutive 5-minute L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels between 15:00 hours on Wednesday 6th August to 10:30 hours on Monday 11th August 2025. The data collected is considered representative of conditions at the receptors' windows.
- 4.1.3 The following equipment was used during the survey:
 - 1 no. Rion sound level meter type NL32;
 - 1 no. Rion sound level calibrator type NC74.
- 4.1.4 The calibration of the equipment was verified before and after use, no significant calibration drift (≤ 0.5 dB) was observed.
- 4.1.5 Measurements were made following procedures in British Standard BS7445:1991 *Description and measurement of environmental noise Part 2: Acquisition of data pertinent to land use* and BS4142.
- 4.1.6 The meteorological conditions during the survey were noted at installation and retrieval of the meter. These observations have been supplemented with a review of historical weather records. Periods of light precipitation were recorded between 15:25 to 20:05 on Sunday 14th September and between 03:55 to 05:10 on Wednesday 17th September. Wind speeds were low which provided suitable conditions for the measurement of environmental noise.

4.2 SURVEY RESULTS

- 4.2.1 Figures ASI3262/TH1-5 show the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels as a time history at the monitoring location. Data obtained during the noted periods of rain is shown in grey and has been removed from the dataset.
- 4.2.2 Owing to the windows overlooking the active service area and being exposed to noise from a variety of plant, the background and ambient sound levels at the windows show significant variation during the daytime period.
- 4.2.3 Table 4.1 details the average ambient and background sound levels during the plant operational hours. The typical lowest background level is also shown, calculated as the 10th percentile of the relevant L_{A90} dataset.

LOCATION	PERIOD	AVERAGE AMBIENT SOUND LEVEL $L_{Aeq,T}$ dB	AVERAGE BACKGROUND SOUND LEVEL L_{A90} dB	TYPICAL LOWEST BACKGROUND SOUND LEVEL L_{A90} dB
LT1	Plant operational hours (08:30 to 18:00 Monday – Saturday)	53 dB	45 dB	41 dB

Table 4.1: Results of Environmental Noise Survey

[dB ref. 20µPa]

5.0 ASSESSMENT AND DISCUSSION

5.1 PLANT SOUND EMISSIONS CRITERIA

- 5.1.1 In the absence of any specific NHC policy or guidance from NHC pre-application memorandum (ref. 25/01748/FP) to derive criteria, assessment of mechanical plant has been undertaken in accordance with BS4142:2014+A.1:2019 *Methods for rating and assessing industrial and commercial sound*, targeting a numerical assessment level ($L_{A,T}$) level not exceeding the representative background sound level. This would be indicative of a low impact at neighbouring properties, depending on the context.
- 5.1.2 Boots Hearingcare opening hours are from 09:00 to 17:30 Monday to Saturday. For the purpose of this robust assessment, the plant will be assumed operational from 08:30 to 18:00 on the relevant days.

5.2 PROPOSED PLANT

- 5.2.1 The initial plant layout is shown in ASI3262/SP1. Spatial allowance has been made for a sixth unit (Daikin RXM20M2V1B) to be installed should an additional consultation room be provided in the future
- 5.2.2 The proposed plant has been advised by the building services engineer as:
- 4 no. Daikin RXM20M2V1B condenser units (CU1-4);
 - 1 no. Daikin RAZASG71MV1 condenser unit (CU5).

5.2.3 Table 5.1 shows the manufacturer's spectral sound pressure level data at 1 metre from the condenser units during both cooling and heating modes.

Plant	Frequency (Hz)								dB(A)
	63	125	250	500	1K	2K	4K	8K	
RXM20M2V1B Cooling Mode	58	50	47	45	41	34	32	23	46
RXM20M2V1B Heating Mode	49	50	48	46	42	37	33	26	47
RAZASG71MV1	52	46	41	45	42	35	35	23	46

Table 5.1: Plant sound pressure levels at 1 metre

[dB ref. 20µPa]

5.3 BS4142 INITIAL IMPACT ESTIMATE

5.3.1 The assessment has used sound source data given in Table 5.1 and Background Sound Levels measured during the typical operating hours. The "heating mode" of the RXM20M2V1B condenser unit has a higher sound pressure level and, therefore, has been used within this assessment to form a robust approach. The sixth condenser unit has also been included within the assessment.

5.3.2 Distance propagation losses have been included from the source positions to the closest receptor at Commerce House.

5.3.3 From observations made on the Site and via desktop assessment, residential receptor windows are likely to have line of sight to the proposed condenser units. No screening attenuation has, therefore, been applied to these sources.

5.3.4 Due to their proposed location below the residential windows, an appropriate directivity correction has been applied to CU1-4. As the proposed location of CU5 and the future unit is at the corner of two walls, a location correction of +3 dB has been applied to calculate the level at the nearest window.

5.3.5 In Clarke Saunders' professional experience with similar items of plant, +3 dB character correction penalty is applicable for sound feature characteristics that are neither tonal, nor impulsive, nor intermittent, as suggested in BS4142.

5.3.6 Table 5.2 presents a summary of the initial BS4142 impact estimate to the receptor at Commerce House for the operational period.

PARAMETER	COMBINED PLANT
Specific Sound Level (heating)	43 dB
Feature Correction	+3 dB
Rating Level	$L_{A,r,T,r}$ 46 dB
Typical / Average Background Level	L_{A90} 41 dB / 45 dB
Assessment Level	+5 dB / +1 dB

Table 5.2: Initial BS4142 impact estimate

5.3.7 The assessment level shown in Table 5.2 is up to 5dB above the Background Sound Level measured at the position representative of the receptor. According to BS4142, this is likely to be an indication of an adverse impact, depending on the context.

5.4 BS4142 CONTEXTUAL DISCUSSION

5.4.1 BS4142 states;

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration ...

5.4.2 The context of this site is a critical factor in the assessment.

5.4.3 The current soundscape is characterised by existing plant sound and servicing activity. The impact of sound produced by the new plant will be moderated by the precedent of commercial units with external plant in the vicinity of the receptors, the influence of which would reduce the potential adverse impact of the proposed installation.

5.4.4 Residents are already exposed to daytime sound of a commercial nature; the nature of the proposed plant is consistent with the extant soundscape.

5.4.5 It is also noted that the proposed plant will replace two existing items currently serving the retail unit. An assessment of the sound produced from these units, with application of the same +3dB character correction, shows a likely Rating Level of $L_{A,T,r}$ 48dB. In addition, the existing use is noted as also trading between 10:00 and 16:00 on Sundays. The proposed scheme, therefore, represents a reduced sound impact at the receptor from the existing scenario.

5.4.6 This assessment assumes that all of the units simultaneously operating at full duty. In practice, this is likely to occur only in extreme circumstances; the units would generally operate on lower duties, resulting in lower sound levels.

5.4.7 Given consideration of the context, it is deemed justifiable to modify the initial estimate to one of the proposed scheme having a low impact.

5.5 UNCERTAINTY

5.5.1 As per the requirements of BS4142, the uncertainty in the assessment is considered and reported. This is not an indication of error, but an acknowledgment of possible variability of the factors contributing to this assessment.

5.5.2 The spectral data provided by the plant manufacturer aids in reducing the uncertainty in the assessment.

5.5.3 The environmental sound survey data was selected during over a suitable period, with appropriate weather conditions, thereby allowing representative background sound levels to be measured. Use and reference of the average and typical lowest background levels has reduced uncertainty in relation to background levels.

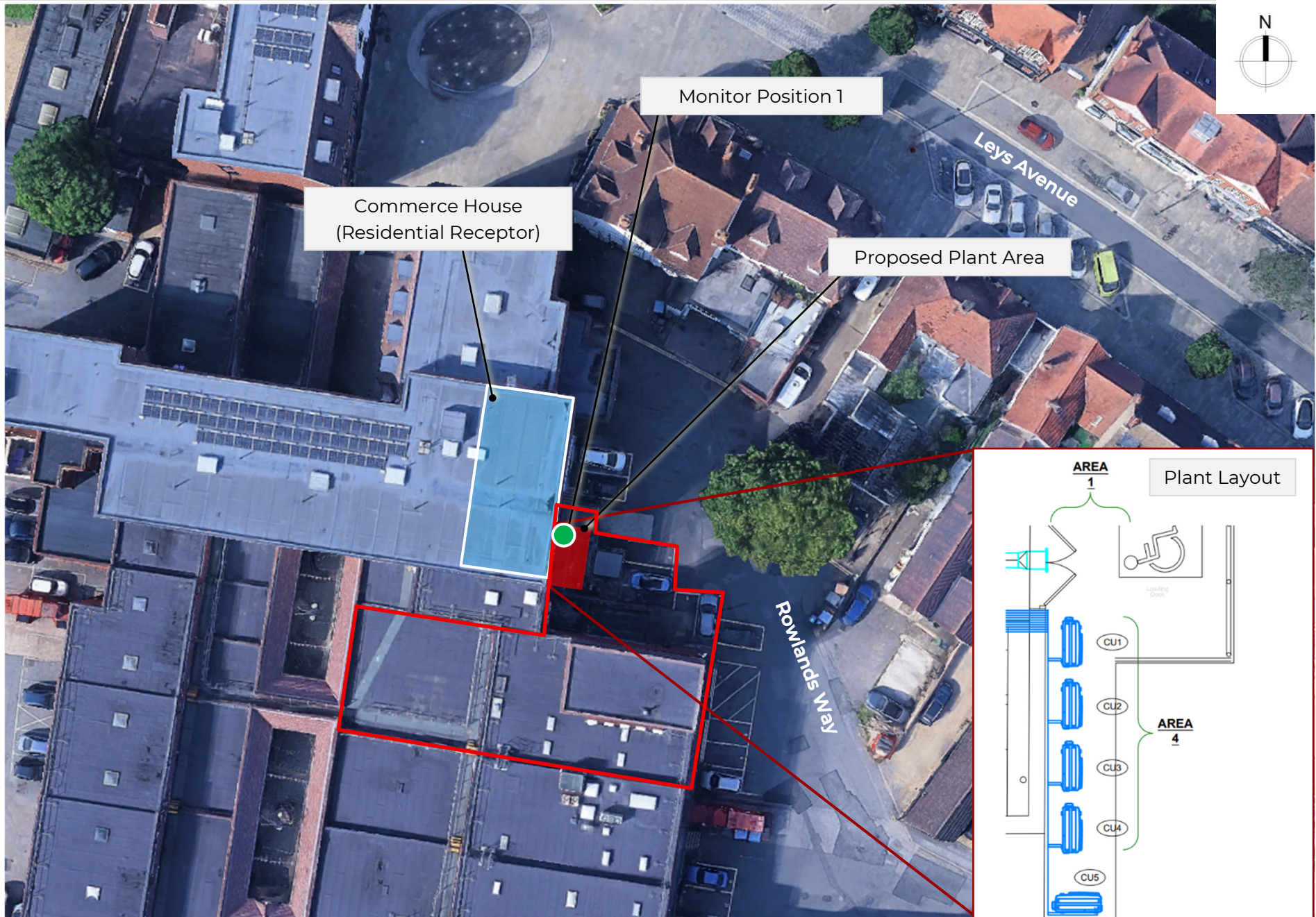
5.5.4 Consideration of all the units operating at full heating duty and application of an appropriate character correction has reduced uncertainty with regards to the initial assessment outcome.

6.0 CONCLUSIONS

- 6.1 Clarke Saunders Acoustics (CSA) has been commissioned by Boots Hearingcare to undertake an assessment of the likelihood of adverse impact being experienced due to the plant items at Boots Hearingcare Unit 2/4, Commerce Way, Rowland Way, Letchworth, SG6 3DN.
- 6.2 Assessment of mechanical plant in accordance with BS4142:2014+A.1:2019 Methods for rating and assessing industrial and commercial sound (BS4142), demonstrates a numerical assessment level ($L_{A,r,Tr}$) between 1dB and 5dB above to the representative background sound levels at nearest residential receptors.
- 6.3 This numerical assessment is lower than that of the existing plant that will be replaced.
- 6.4 It is concluded that sound from the proposed new mechanical plant will have a low impact and should not adversely affect the amenity of local residents.

Matt Sugden

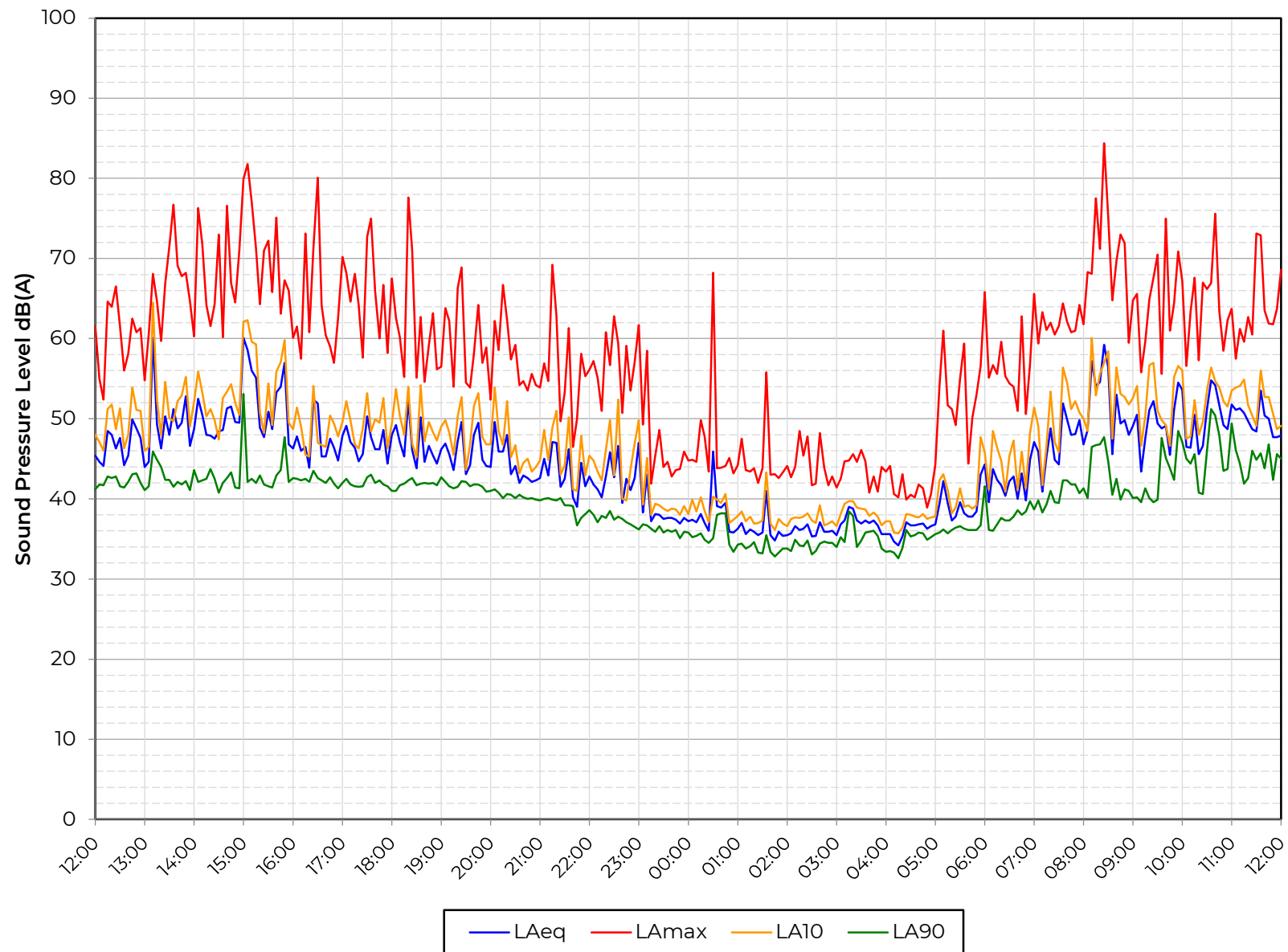
Matt Sugden MIOA
CLARKE SAUNDERS ACOUSTICS



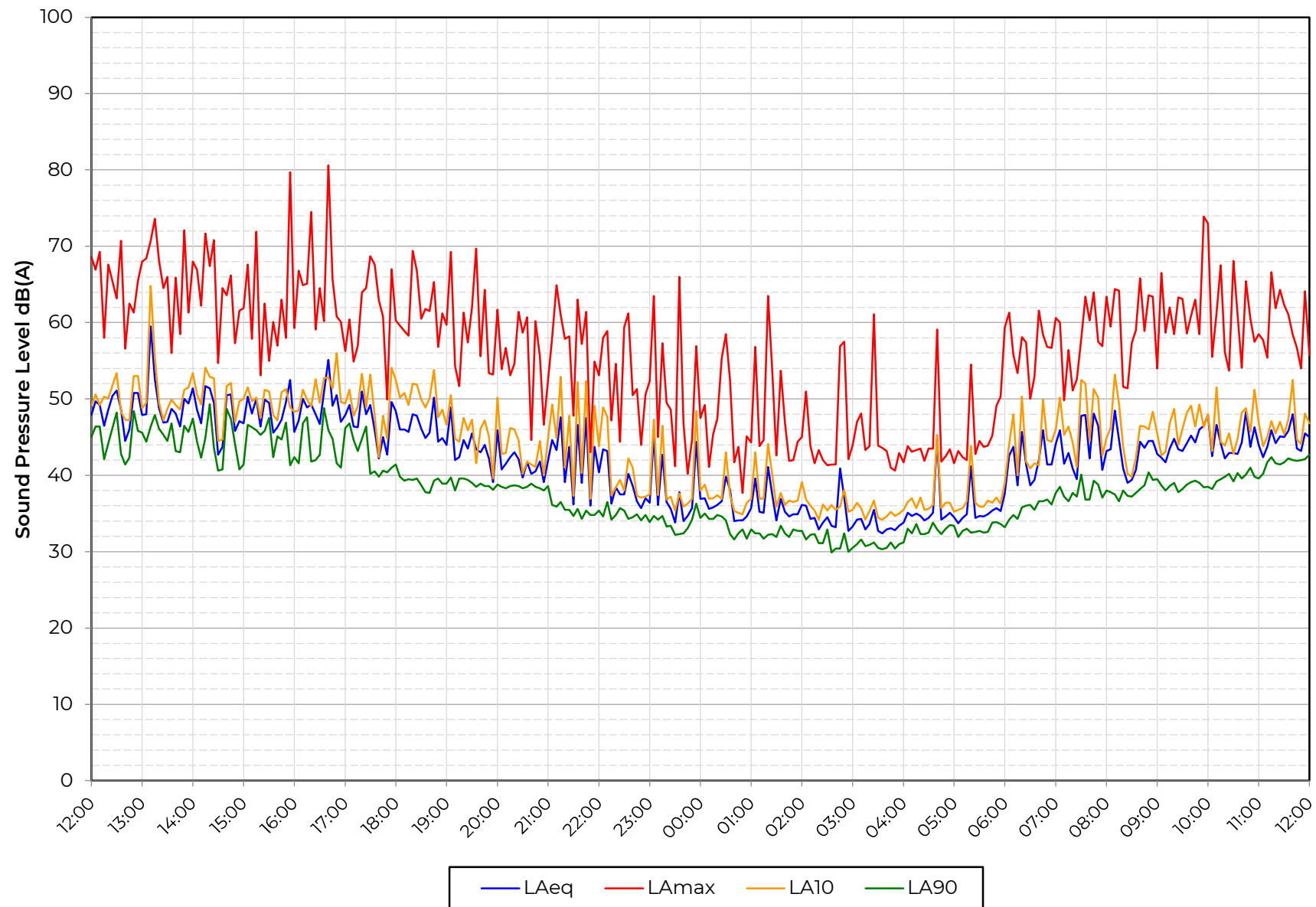
Indicative Site Plan

Figure 13262.250908.SP1AS13262/SP1

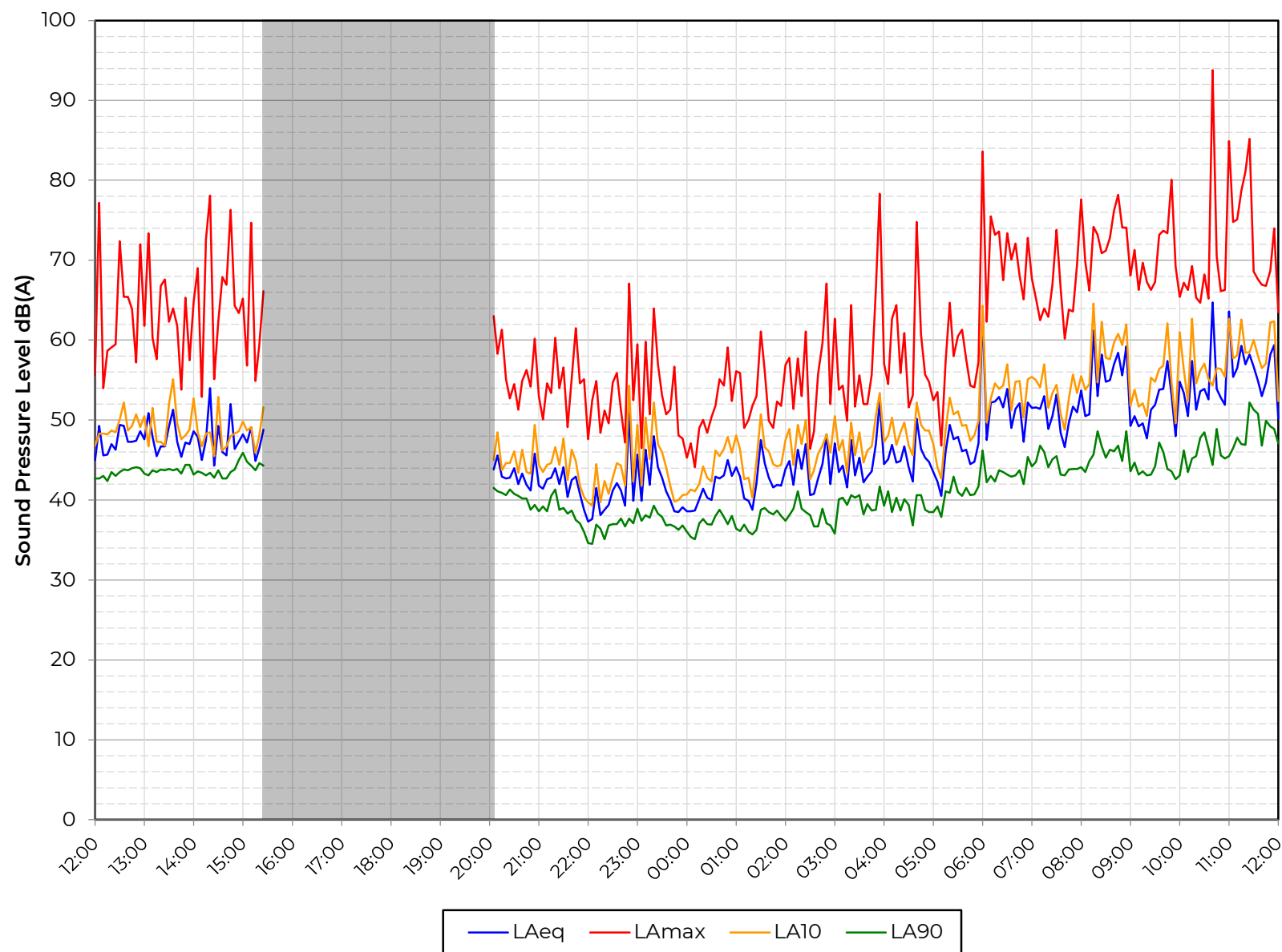
Position LT1



Position LTI

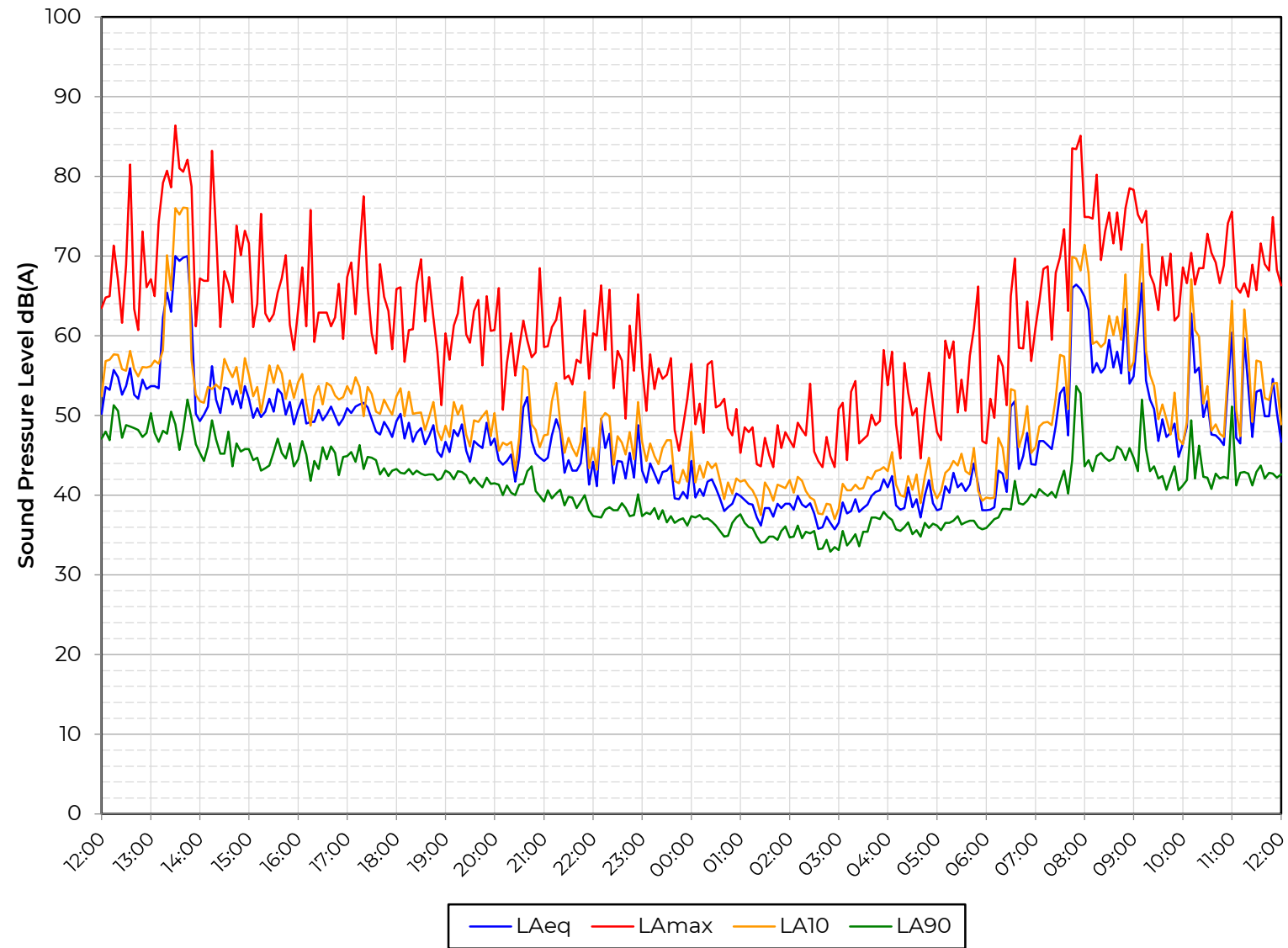


Position LT1



Data omitted due to adverse weather

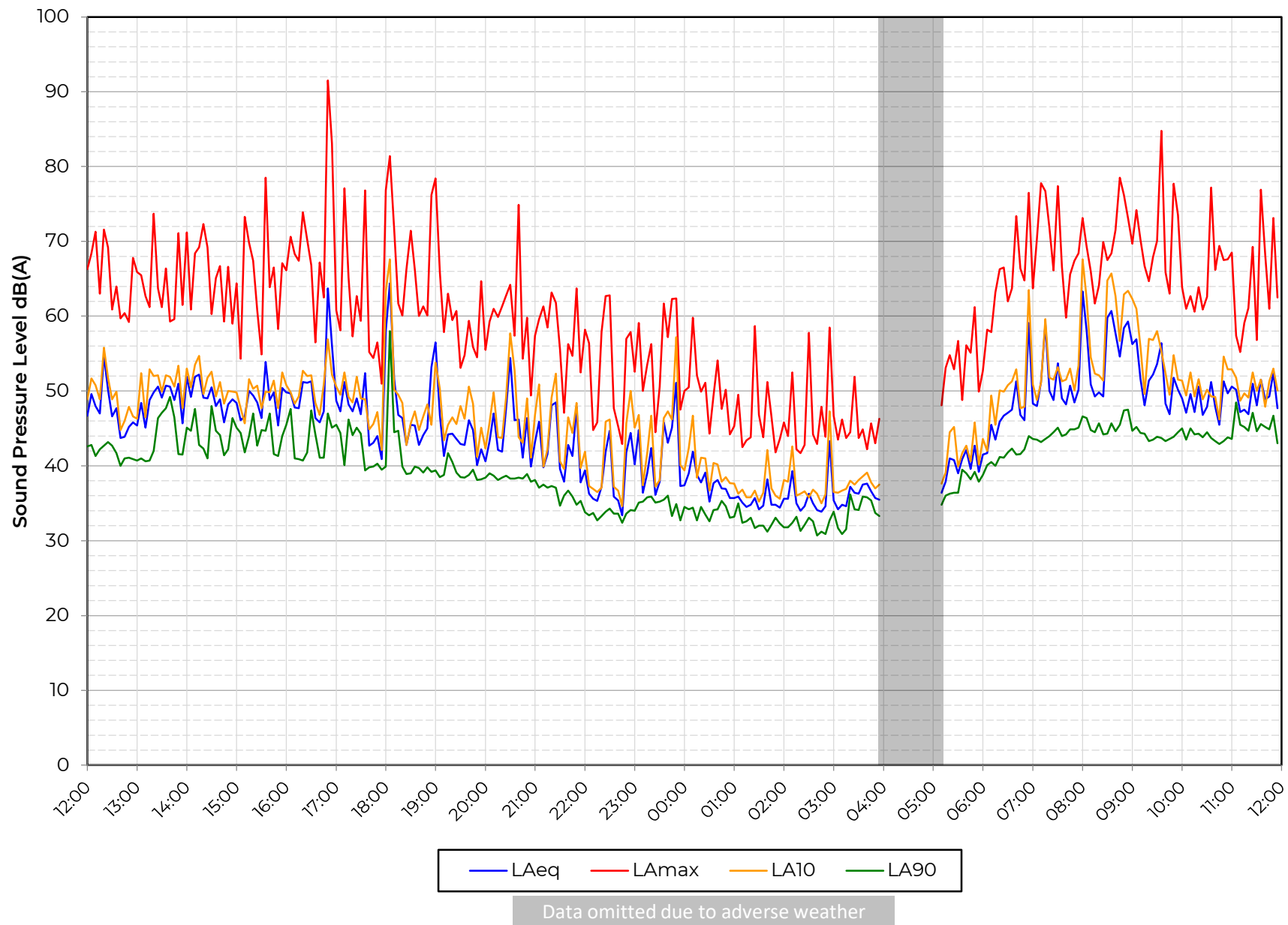
Position LT1



Mon 15 Sep to Tue 16 Sep

Figure AS13262/TH4

Position LTI



Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A .
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90}:	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max}:	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band.

In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
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Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.

APPENDIX B

AS13262 - Boots Hearingcare Letchworth SUMMARY OF PLANT SOUND CALCULATIONS

PLANT SOUND TO RESIDENTIAL		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
<u>Source CU1</u>										
RXM20M Heating Mode Manufacture	Lp @ 1m	49	50	48	46	42	37	33	26	47
Number of	1no	0	0	0	0	0	0	0	0	
Directivity		-1	-3	-3	-3	-3	-3	-3	-3	
Screening Loss		0	0	0	0	0	0	0	0	
Distance Loss	4.0m	-12	-12	-12	-12	-12	-12	-12	-12	
	Subtotal	36	35	33	31	27	22	18	11	32
<u>Source CU2</u>										
RXM20M Heating Mode Manufacture	Lp @ 1m	49	50	48	46	42	37	33	26	47
Number of	1no	0	0	0	0	0	0	0	0	
Directivity		-1	-3	-3	-3	-3	-3	-3	-3	
Screening Loss		0	0	0	0	0	0	0	0	
Distance Loss	4.0m	-12	-12	-12	-12	-12	-12	-12	-12	
	Subtotal	36	35	33	31	27	22	18	11	32
<u>Source CU3 & 4</u>										
RXM20M Heating Mode Manufacture	Lp @ 1m	49	50	48	46	42	37	33	26	47
Number of	2no	3	3	3	3	3	3	3	3	
Directivity		-1	-3	-3	-3	-3	-3	-3	-3	
Screening Loss		0	0	0	0	0	0	0	0	
Distance Loss	3.5m	-11	-11	-11	-11	-11	-11	-11	-11	
	Subtotal	40	39	37	35	31	26	22	15	37
<u>Source CU5</u>										
RAZASG7IMV1	Lp @ 1m	52	46	41	45	42	35	35	23	46
Location correction factor		3	3	3	3	3	3	3	3	
Number of	1no	0	0	0	0	0	0	0	0	
Directivity		0	0	0	0	0	0	0	0	
Screening Loss		0	0	0	0	0	0	0	0	
Distance Loss	4.0m	-12	-12	-12	-12	-12	-12	-12	-12	
	Subtotal	43	37	32	36	33	26	26	14	37
<u>Source CU Future</u>										
RXM20M Heating Mode Manufacture	Lp @ 1m	49	50	48	46	42	37	33	26	47
Location correction factor		3	3	3	3	3	3	3	3	
Number of	1no	0	0	0	0	0	0	0	0	
Directivity		0	0	0	0	0	0	0	0	
Screening Loss		0	0	0	0	0	0	0	0	
Distance Loss	4.0m	-12	-12	-12	-12	-12	-12	-12	-12	
	Subtotal	40	41	39	37	33	28	24	17	38
Specific sound level at receptor	L_{eq} 1hr	47	45	43	42	38	32	30	21	43