PREPARED: Thursday, 11 April 2024

39 QUEEN STREET, LONDON

NOISE IMPACT ASSESSMENT

CONTENTS

LIST OF ATTACHMENTS

Project Ref:	AS13477	**Title:**	39 Queen Street, London
Report Ref:	AS13477.240320.NIA.1	**Title:**	Noise Impact Assessment
Client Name:	Verity Trustees Ltd		
Project Manager:	Alec Korchev		
Report Author:	Alec Korchev		
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 Clarke Saunders Acoustics has been commissioned to undertake a noise impact assessment of the proposed development at 39 Queen Street, London, and to provide outline mitigation measures where necessary to protect existing noise sensitive receptors from potential impacts of noise from the proposed commercial use. The assessment uses current good practise in determining the significance of impact on the existing noise sensitive receptors in the context of the prevailing sound climate.

1.2 An environmental sound survey has been conducted at the Site. This has established the baseline acoustic climate which has been used to determine potential noise impact associated with the proposed development including fixed plant proposals as well as movements from commercial vehicles associated with the Site.

1.3 A 'low impact', as set out in BS4142, is expected at the nearest noise sensitive receptors.

1.4 This report describes the assessment undertaken, including calculations, and findings. Technical terminology is used throughout this report and a glossary of the relevant terminology is presented in Appendix A.

2.0 INTRODUCTION

2.1 Planning approval is being sought for the redevelopment 39 Queen Street, London, N17 8HZ (the Site). The proposals include redevelopment of the site for industrial and warehousing purposes (within Classes E(g)(ii), (iii), B2 and B8, with ancillary office accommodation) along with related access, service yard, car and cycle parking, landscaping, boundary treatment and other related works including demolition.

2.2 Clarke Saunders Acoustics has been commissioned by Verity Trustees Ltd to undertake an environmental sound survey and assessment of commercial noise impact of the proposals on nearby noise sensitive receptors in accordance with the planning requirements of the London Borough of Haringey (LBH).

2.3 This assessment will also consider the requirement for any mitigation measures as appropriate.

3.0 SITE DESCRIPTION

3.1 The Site is located circa 560m northwest of White Hart Lane London Overground Station in the Haringey Council area. The Site is flanked to the west by commercial premises, to the north by Bull Lane Playing Fields, to the east by commercial/industrial premises, and to the south by residential receptors. Following an inspection of the Site, the nearest noise sensitive receptors are the residential properties at 34 to 64 Allington Avenue directly adjacent to the south. Further receptors are located at the north end of Selby Road, though these are further away and screened by the building mass of the Selby Centre. Additional receptors are also located near to the entrance of the Site along Queens Street, however in the context of the existing development when compared to the proposed, no significant change in impact is expected to arise as a result of the proposals and as such this receptor is not assessed further.

3.2 The proposed development seeks a flexible range of uses falling amongst Class E(g) (iii), B2, and B8.

4.0 ASSESSMENT METHODOLOGY

4.1 LOCAL AUTHORITY REQUIREMENTS

4.1.1 Through review of the Haringey Council planning portal, a typical planning condition is seen to be adopted for fixed plant items at other similar sites. The condition wording is reproduced below.

"The design and installation of new items of fixed plant shall be such that, when in operation, the cumulative noise level LAeq 15 min arising from the proposed plant, measured or predicted at 1 metre from the facade of nearest residential premises shall be a rating level at least 5dB(A) below the background noise level LAF90. The measurement and/or prediction of the noise should be carried out in accordance with the methodology contained within BS 4142:2014 +A1:2019. Within 30 days of any request by the Council a noise report shall be produced by a competent person and shall be submitted to and approved by the Council to demonstrate compliance with the above criteria.

Reason: In order to protect the amenities of residential occupiers consistent with Policy 7.15 of the London Plan (2016) and Saved Policy UD3 of the Haringey Unitary Development Plan (2006)."

4.1.2 For other commercial activity such as commercial transportation sources, an assessment following procedures in BS4142:2014+A1:2019[1] using the magnitude of impact in the context of the existing background sound climate to determine appropriate mitigation is adopted. The assessment targets minimising adverse impact on noise sensitive receptors. This method is consistent with the application of this Standard for these types of noise sources.

5.0 SURVEY PROCEDURE & EQUIPMENT

5.1 A survey of existing background sound levels was undertaken in the two locations indicated in the attached site plan AS13347/SP1 between 12:00hrs on Thursday 18th January and 14:00hrs on Tuesday 23rd January 2024.

5.2 Automated measurements of consecutive 5-minute L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels were recorded at both measurement positions.

5.3 The following equipment was used during the survey.

- 2no. Rion sound level meter type NL52; and
- 1no. Rion field sound level calibrator type NC-74.

5.4 The field calibration of the sound level meters was verified before and after use. No significant calibration drift was detected.

5.5 The weather during the survey was generally dry with light winds which made the conditions suitable for environmental sound measurements,

[1] British Standard BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*

5.6 Measurements were made following procedures in BS 7445:1991[2] and BS 4142:2014&A.1:2019.

6.0 RESULTS

6.1 Figures AS13347/TH1-TH12 show the L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels as time histories at the automated survey position.

6.2 The background sound climate at the Site and its nearest noise-sensitive receptors is determined by distant traffic noise from nearby roads and commercial noise from the industrial units to the east of the site.

6.3 The results of the environmental sound survey are presented in Table 1. The typical background sound level has been calculated from the 10th percentile of the L_{A90} dataset measured during each period.

MEASUREMENT LOCATION	ASSESSMENT PERIOD	TYPICAL BACKGROUND SOUND LEVEL $L_{A90, 5MIN}$	AVERAGE NOISE LEVEL $L_{Aeq, T}$
LT1	07:00 to 23:00 hours	44 dB	54 dB
	23:00 to 07:00 hours	40 dB	51 dB
LT2	07:00 to 23:00 hours	40 dB	50 dB
	23:00 to 07:00 hours	36 dB	45 dB

Table 1: Measured average noise levels and typical background sound pressure levels [dB re. 20µPa]

6.3.1 On the basis of the standard planning requirement of LBH, the fixed plant emissions level not to be exceeded are at the nearest noise sensitive receptors are presented in Table 2.

RECEPTOR LOCATION	DAYTIME (07:00 TO 23:00 HOURS)	NIGHT-TIME (23:00 TO 07:00 HOURS)
Selby Road (LT1)	$\leq L_{Ar,Tr}$ 39 dB	$\leq L_{Ar,Tr}$ 35 dB
Allington Avenue (LT2)	$\leq L_{Ar,Tr}$ 35 dB	$\leq L_{Ar,Tr}$ 31 dB

Table 2: Plant noise emissions criteria [dB re. 20µPa]

6.3.2 Where required, adequate attenuators for the external duct terminations of internally housed building services plant will be specified to control external emissions as the design progresses.

7.0 ASSESSMENT OF FIXED PLANT

7.1 External building services plant serving the commercial units will be installed at ground level around the development. The proposals include provision of 3no. Mitsubishi PURY-M250YNW-A1 condensing units, with two units located along the north elevation and one unit at the south elevation. The location of these is indicated on the attached site plan AS13347/SP1. The Site is also bound to the south and west by an imperforate masonry screen with an estimated height of 2.5m above ground.

[2] British Standard BS7445:1991 *Description and measurement of environmental noise* Part 2 *Acquisition of data pertinent to land use*

7.2 The plant will serve the proposed development and as such may operate on a 24-hour basis. Sound emission levels of the condensing units have been confirmed by the manufacturer and are presented in Table 3.

PLANT ITEM	FREQUENCY (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
PURY-M250YNW-A1	78	63	62	59	52	49	49	43	60

Table 3: Sound pressure level of fixed plant at 1 metre [dB re. 20μPa]

7.3 Plant sound calculations have been undertaken accounting for distance propagation as well as screening losses afforded by the boundary screen and building mass, respectively. A summary of the predicted levels is presented in Table 4.

RECEPTOR	PREDICTED LEVEL	LIMITING EMISSION CRITERIA
Allington Avenue Receptors	L_{Aeq} 25 dB	≤ $L_{Ar,Tr}$ 35 dB
Selby Road Receptors	L_{Aeq} 22 dB	≤ $L_{Ar,Tr}$ 31 dB

Table 4: Summary of plant sound calculations [dB re. 20μPa]

7.4 Results of the calculations demonstrate that the plant would comfortably comply with the planning requirements of LBH.

8.0 ASSESSMENT OF COMMERCIAL TRANSPORTATION NOISE

8.1 The proposals will support LGV and HGV movements throughout the work yard along the north section of the Site. Given the uncertainty regarding future tenants 3no. road traffic scenarios have been produced by TTP Consultants, one for each use case, Class B8, Class E (g)(iii), and Class B2. For the purposes of this assessment, the predicted flows for each use case are generally similar in terms of flow rates and distribution of vehicle types. As such, flows associated with use case B8 have been used primarily in this assessment for a robust assessment.

8.2 CSA library data has been used to assess specific operations such as drive bys, and door closures of these commercial transportation vehicles to predict the impact on nearby receptors.

8.3 It should be noted these are understood to primarily take place in the north yard of the Site, and therefore, significantly screened to the nearest noise sensitive receptors on Allington Avenue and Selby Road by the building mass. A pessimistic correction of -10 dB has been taken to account for the screening, however in-situ performance is likely to be significantly greater.

8.4 The library spectral sound pressure level data accounted for within the assessment of the above specified operations is shown in Table 5. These data are for a complete cycle of each activity.

OPERATION	DISTANCE	FREQUENCY (Hz)								$L_{eq,T}$ dB(A)
		63	125	250	500	1k	2k	4k	8k	
HGV Arrival	3 m	80	75	70	67	65	62	59	55	70
HGV Reversing	5 m	69	63	66	63	65	62	59	50	69
HGV Departure	3 m	72	66	66	64	67	67	63	56	72
Door Closure	1 m	90	81	82	79	72	71	66	56	80

Table 5: Activity sound levels used in assessment [dB re. 20µPa]

8.5 A summary of the predictions is presented in Table 6. Detailed calculations are presented in Appendix C. The calculations account for distance propagation, building mass screening, source specific 'on-time,' and accumulation effects. Character corrections as per section 9.2 of BS4142:2014+A1:2019 (see Appendix B attached to this report) have been applied as follows:

- A +2dB character correction for tonality is applied to reversing HGVs and LGVs on the basis that reversing alarms could be just perceptible at the receptors during the quietest periods; and
- A + 3dB character correction for impulsivity is applied to door closures on the basis that these could be just perceptible at the receptors during the quietest periods.

RECEPTOR	PREDICTED TOTAL RATING LEVEL	TYPICAL BACKGROUND SOUND LEVEL FOR PERIOD	
		DAYTIME	NIGHT-TIME
Selby Road	$L_{Ar,15min}$ 17 dB	L_{A90} 44 dB	L_{A90} 40 dB
Allington Avenue	$L_{Ar,15min}$ 19 dB	L_{A90} 40 dB	L_{A90} 36 dB

Table 6: Predicted sound level from commercial vehicle sources [dB re. 20µPa]

8.6 Commercial vehicle movements for night-time periods are not available. The results presented in Table 6 demonstrate that even if daytime and night-time movements were to be the same the Rating Sound Level of the activity would still be circa 20 dB below the existing background sound levels. Nevertheless, it would not be unreasonable to assume that night-time movements would in fact be reduced, which is expected to result in in-situ levels being lower still.

8.7 Based on the above, the Assessment Level would be between -24 dB and -26 dB for daytime periods and between up to -20 dB to -22 dB for night-time periods, when compared to the respective Background Sound Level. This is an indication of 'low impact' depending on context, given the broad definition of BS4142. The context of the sound climate in and around the Site is that of an existing commercial development with regular commercial goods and civilian vehicular movements. The context therefore supports a conclusion of low impact.

9.0 CONCLUSION

9.1 A noise impact assessment has been undertaken by Clarke Saunders Acoustics for the installation of new building services plant as well as for the commercial transportation sound sources proposed as part of the development at 39 Queens Street, London.

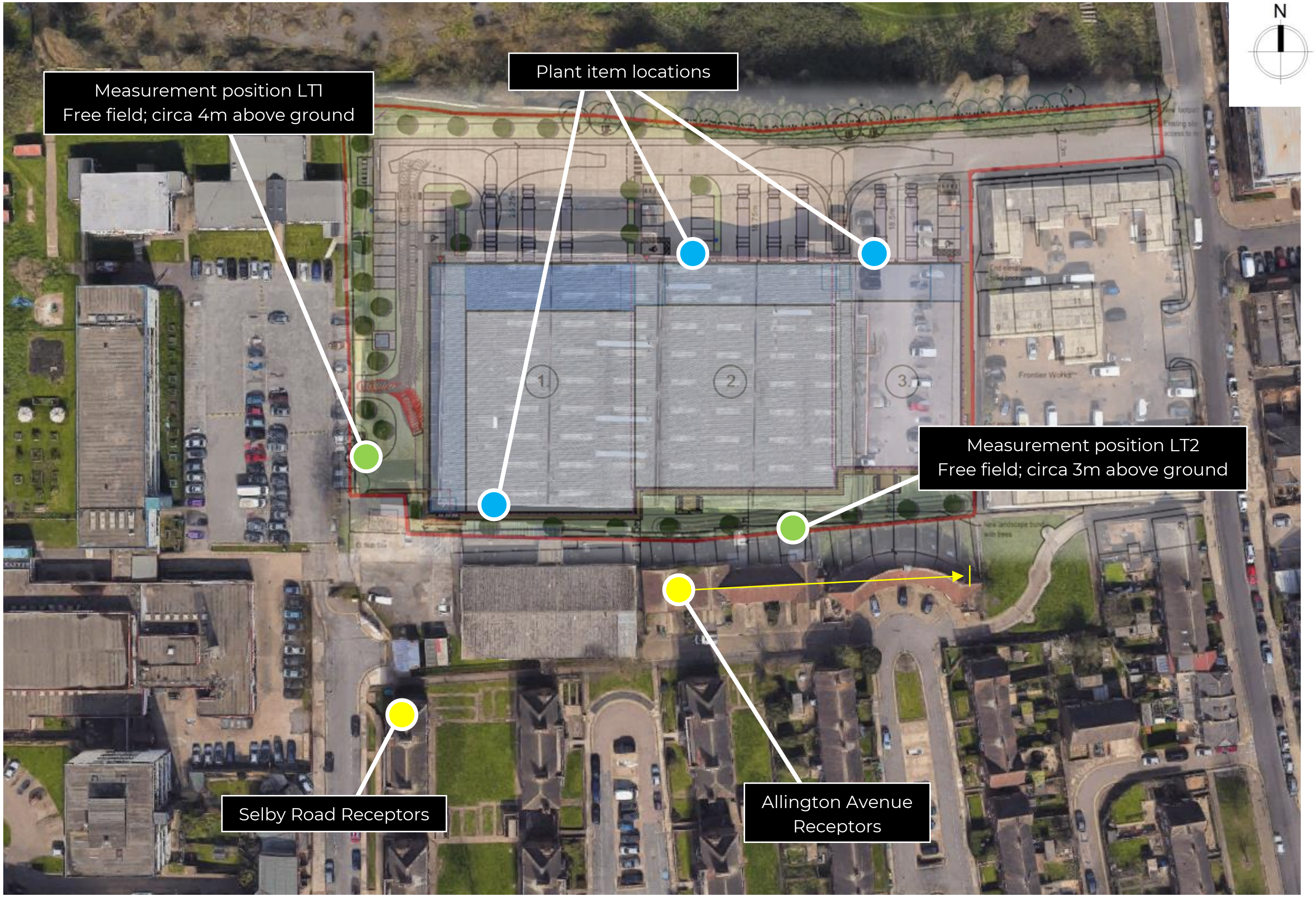
9.2 Results of an environmental sound survey have established the existing acoustic climate, which has enabled sound limits to be set for the control of plant sound emissions and informed a noise impact assessment of commercial transportation sources to the nearby noise sensitive properties.

9.3 Manufacturer data has been used in the assessment of external fixed plant noise. The results of the assessment demonstrate a comfortable compliance with the planning requirements of London Borough of Haringey and no further mitigation is required.

9.4 Historical sound data of transportation sources similar to those likely to be associated with the proposed development has been used to predict the commercial noise impact at the neighbouring receptors. A low impact to the nearest noise sensitive receptors is expected, noting the broad definition in BS4142, and no further mitigation is expected to be required.

A Korchev

Alec Korchev MIOA
CLARKE SAUNDERS ACOUSTICS


N
Measurement position LT1
Free field; circa 4m above ground
Plant item locations
Measurement position LT2
Free field; circa 3m above ground
Selby Road Receptors
Allington Avenue
Receptors

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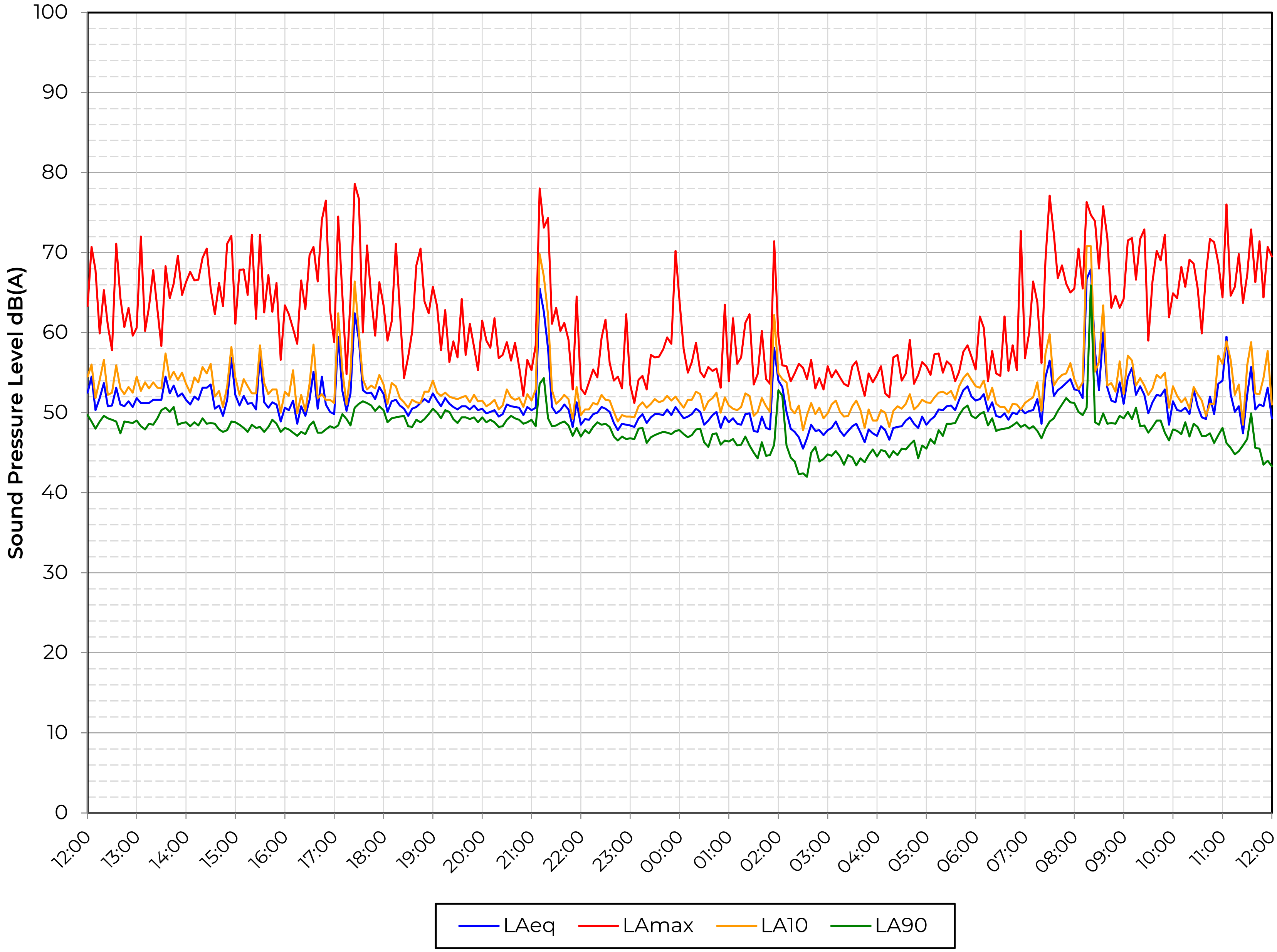
39 Queen Street, Tottenham

Position LT1



Thu 18 Jan to Fri 19 Jan

Figure AS13347/TH1

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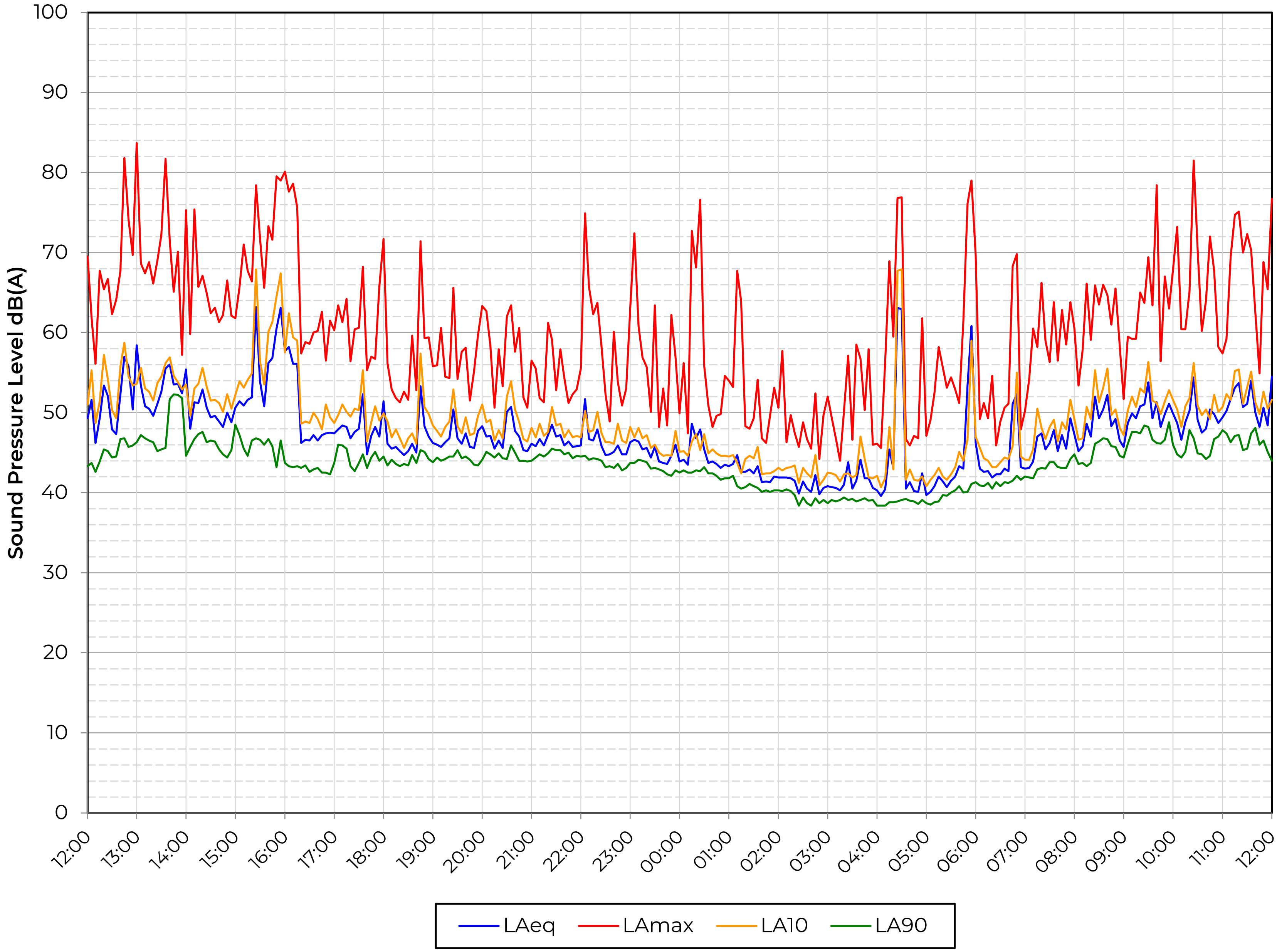
39 Queen Street, Tottenham

Position LT1

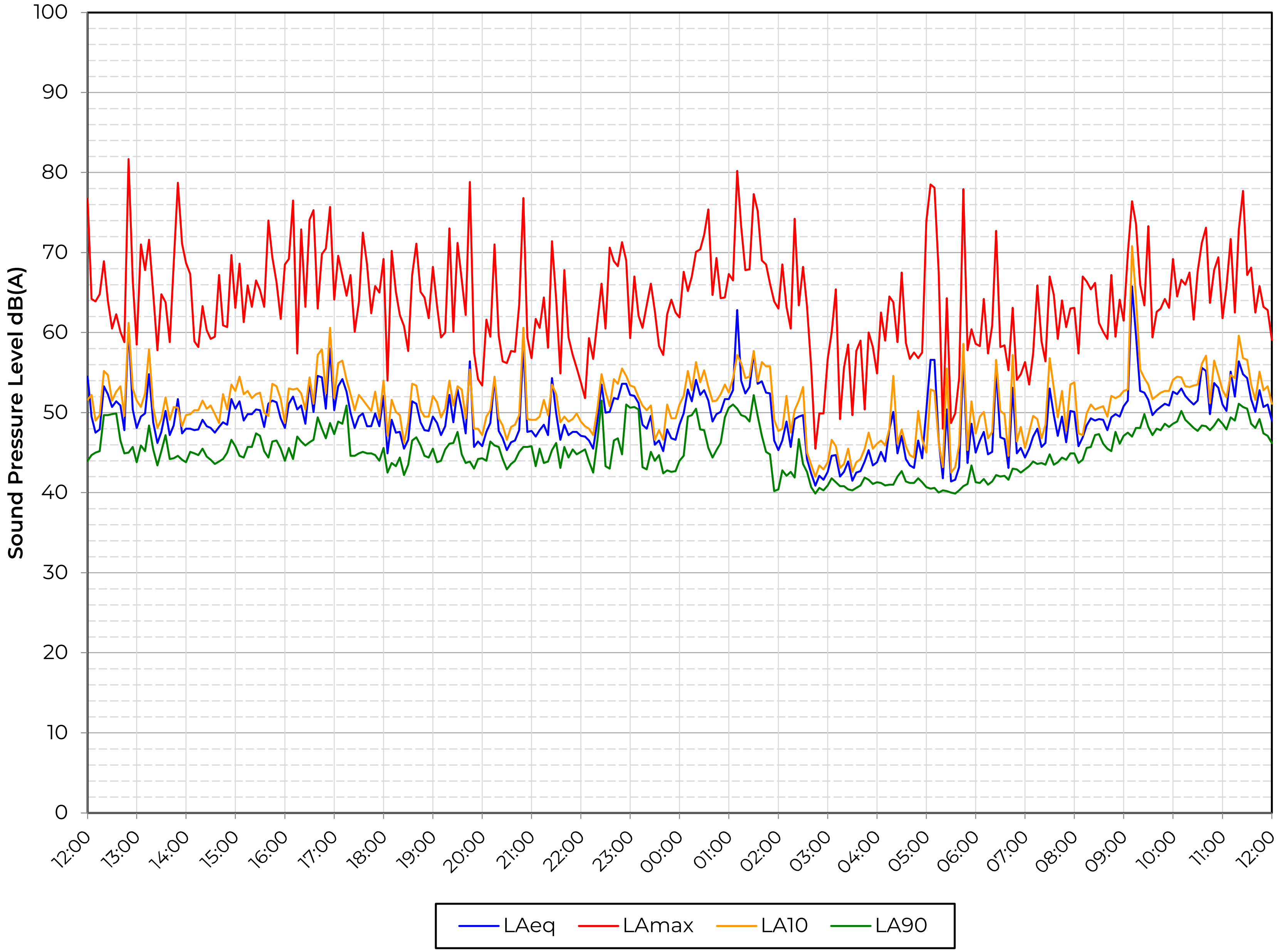


Fri 19 Jan to Sat 20 Jan

Figure AS13347/TH2

39 Queen Street, Tottenham

Position LT1



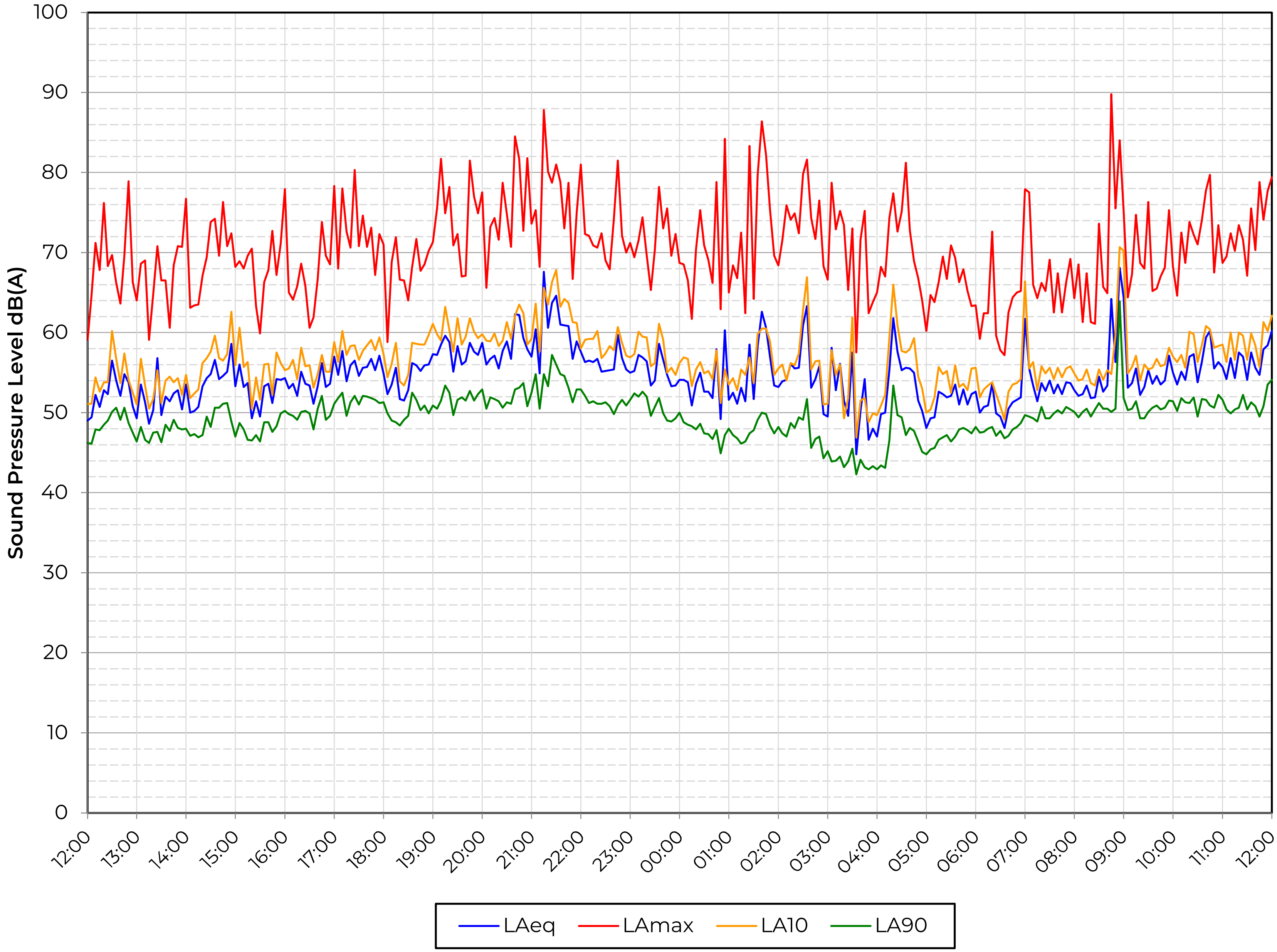
Sat 20 Jan to Sun 21 Jan

Figure AS13347/TH3

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT1



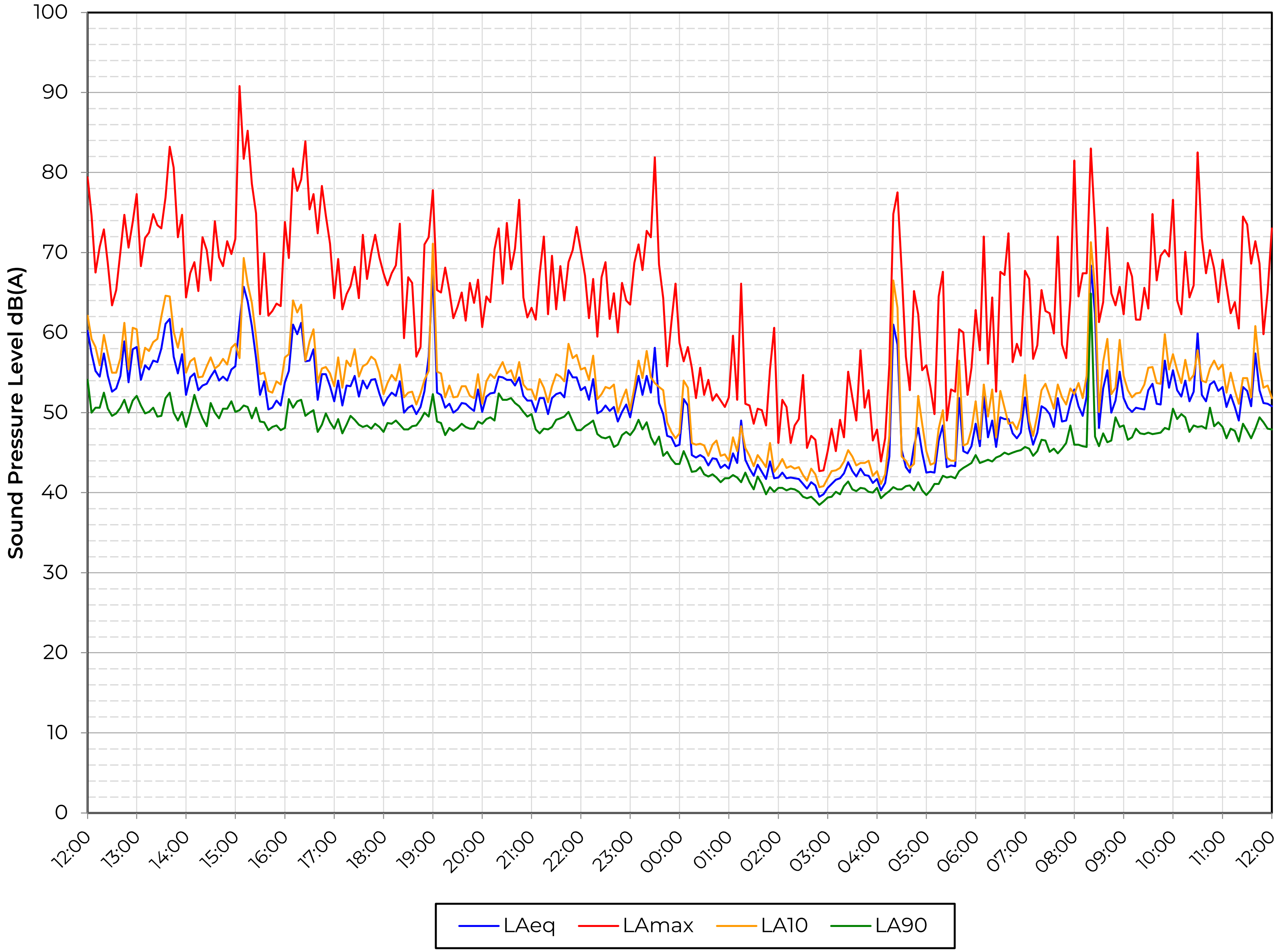
Sun 21 Jan to Mon 22 Jan

Figure AS13347/TH4

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT1



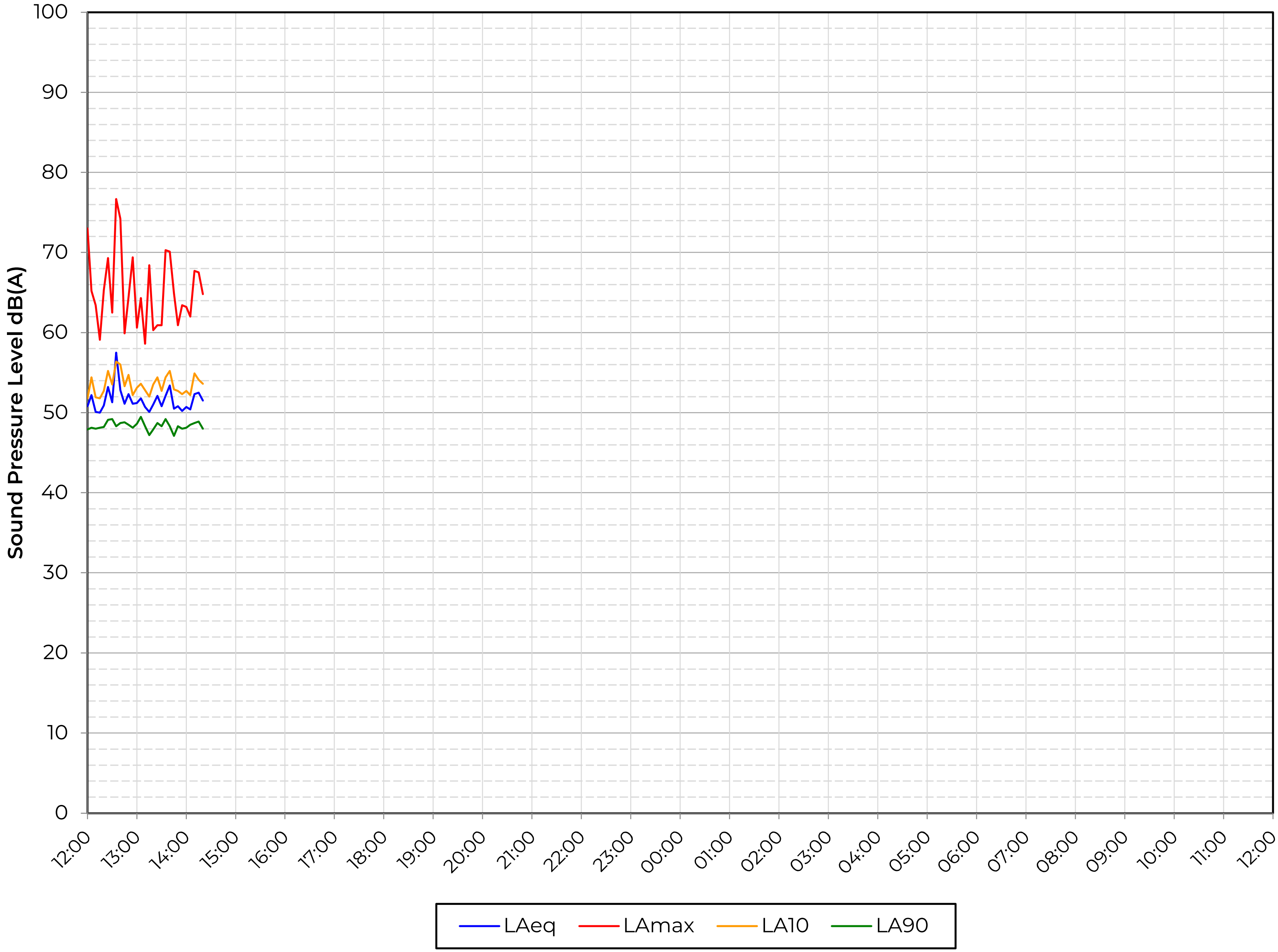
Mon 22 Jan to Tue 23 Jan

Figure AS13347/TH5

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT1

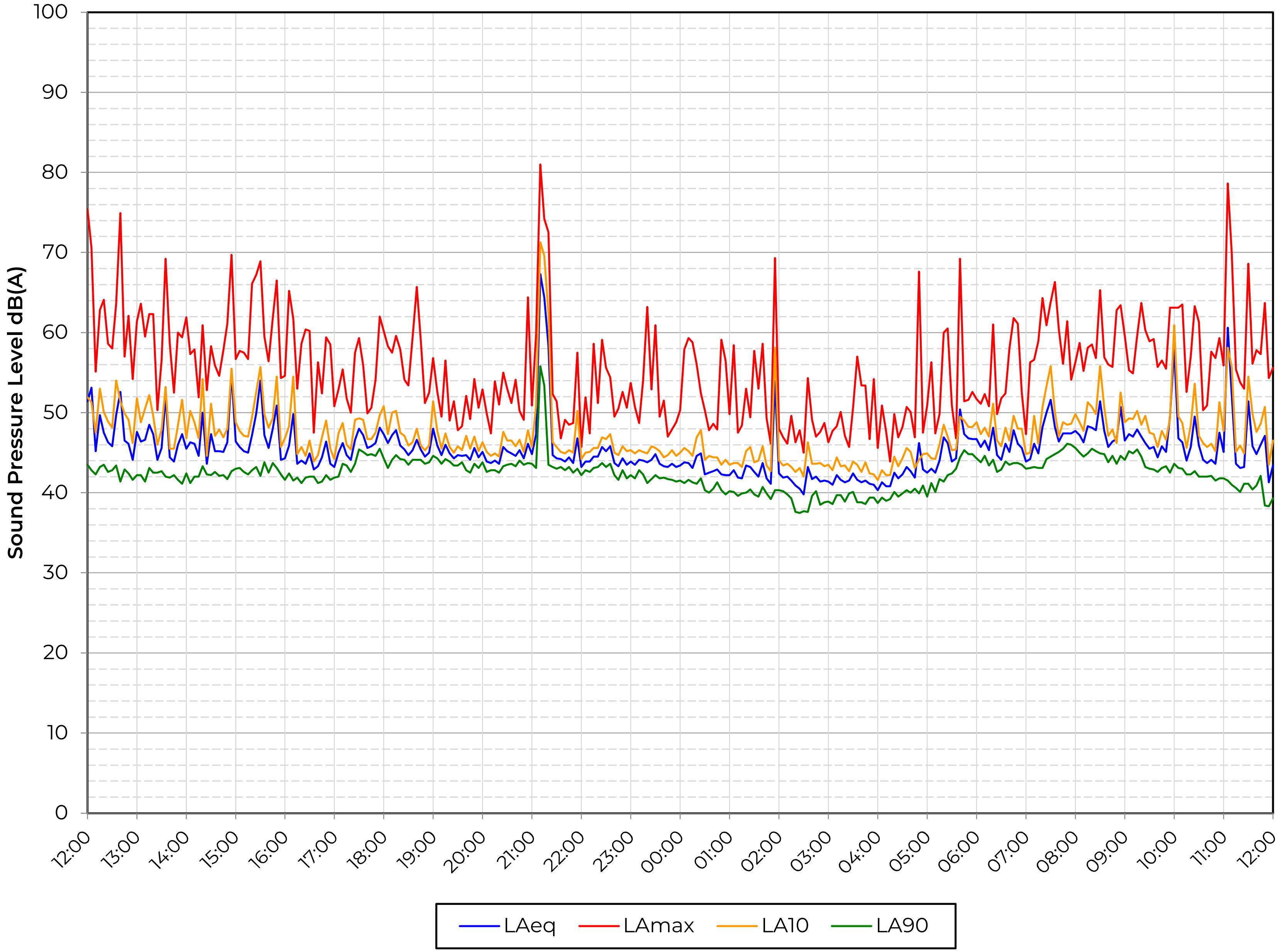


Tue 23 Jan to Wed 24 Jan

Figure AS13347/TH6

39 Queen Street, Tottenham

Position LT2



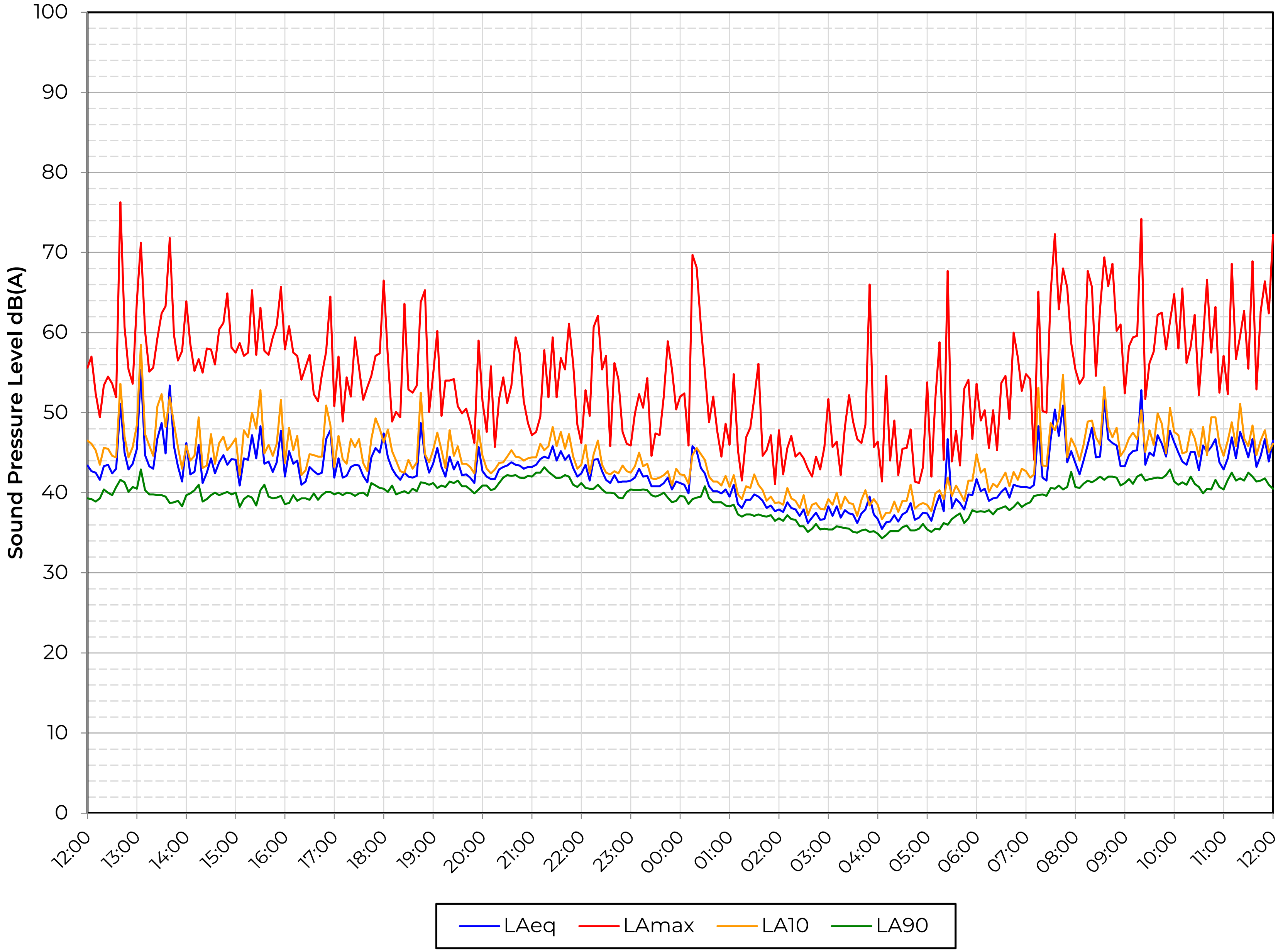
Thu 18 Jan to Fri 19 Jan

Figure AS13347/TH7

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT2



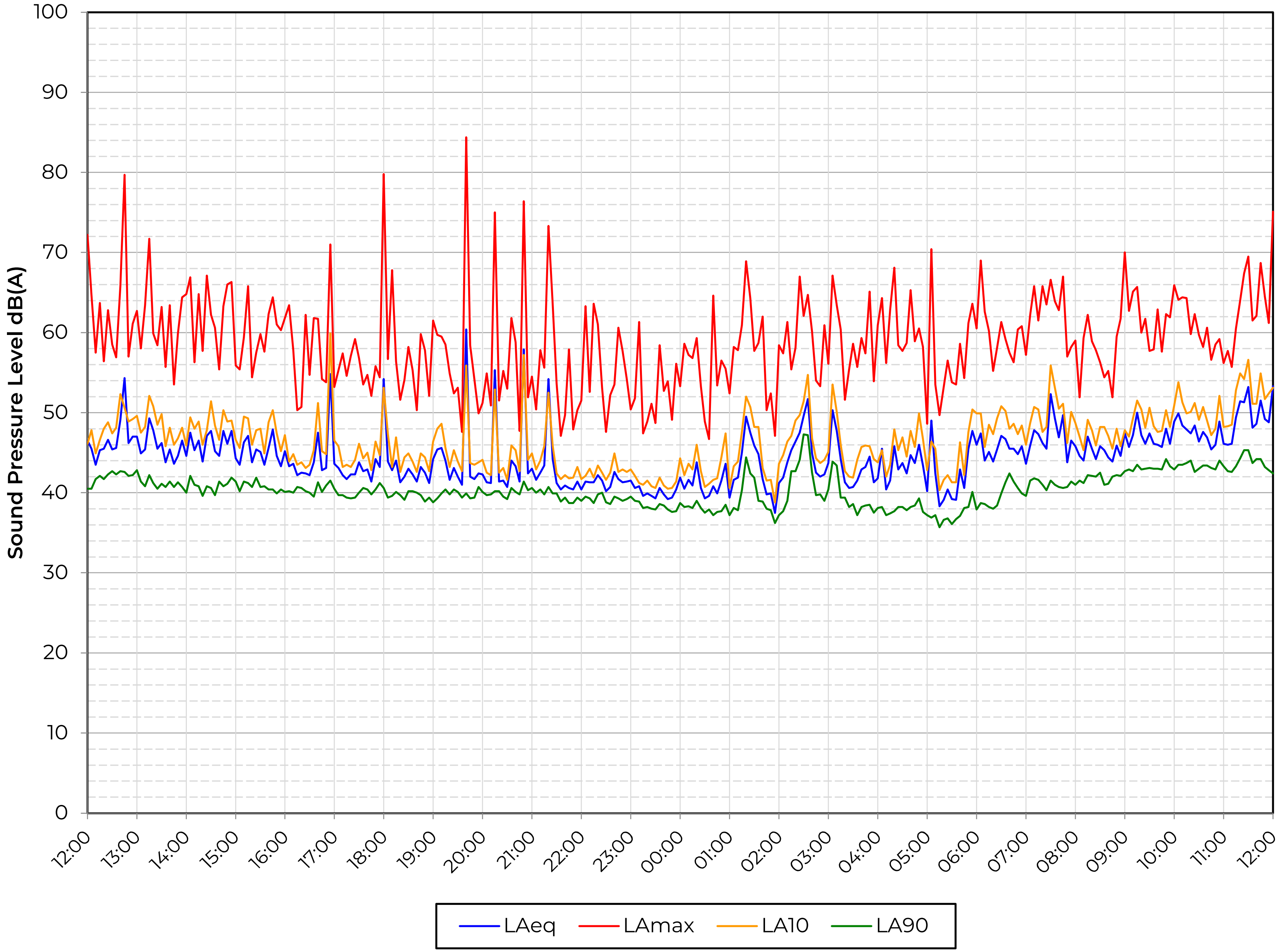
Fri 19 Jan to Sat 20 Jan

Figure AS13347/TH8

clarke saunders
acoustics

39 Queen Street, Tottenham

Position LT2



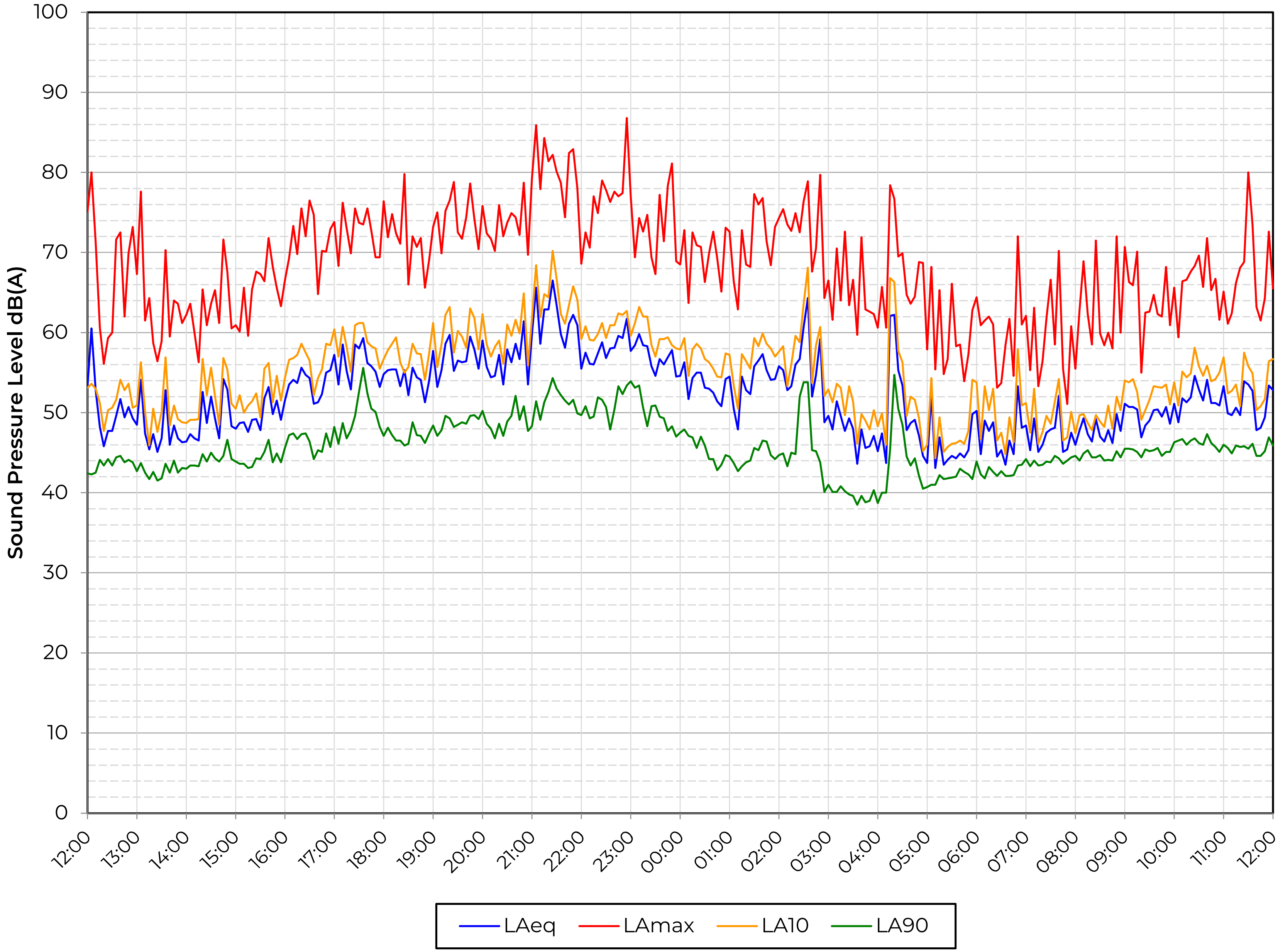
Sat 20 Jan to Sun 21 Jan

Figure AS13347/TH9

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT2



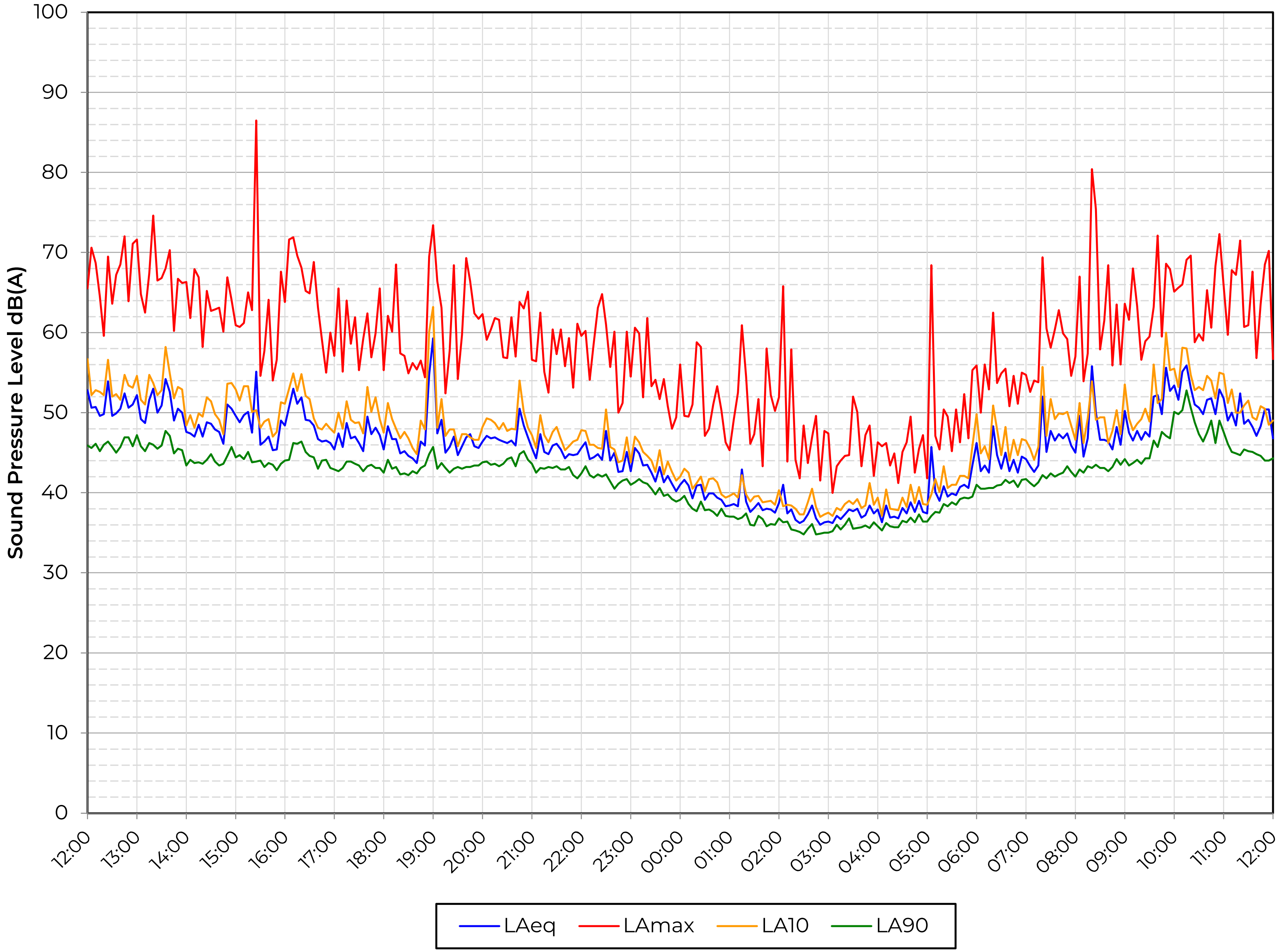
Sun 21 Jan to Mon 22 Jan

Figure AS13347/TH10

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT2



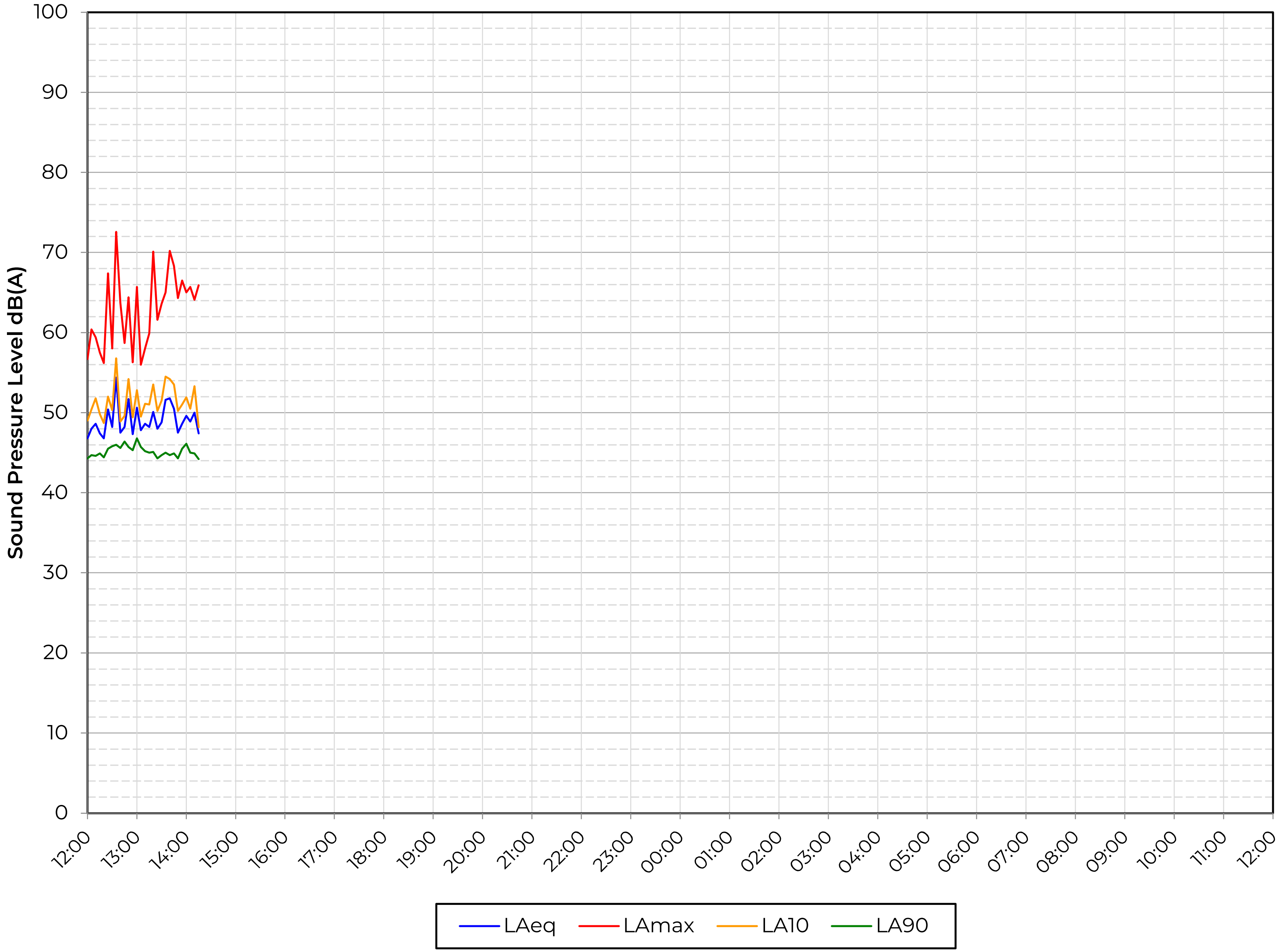
Mon 22 Jan to Tue 23 Jan

Figure AS13347/TH11

clarke saunders acoustics

39 Queen Street, Tottenham

Position LT2



Tue 23 Jan to Wed 24 Jan

Figure AS13347/TH12

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

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.

BS4142 is designed to allow contextual assessment of impact from commercial, or industrial sound on sensitive receptors. Examples covered by the Standard include:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

In brief, the assessment procedure involves establishing sound levels from the items or processes of interest, (the specific sound source(s)), corrected for any acoustic features to derive the Rating Level, ($L_{Ar,Tr}$), at the relevant assessment position(s). The Rating Level is compared against the existing Background Sound Level, ($L_{A90,T}$), to provide an initial estimate of impact. The Standard offers the following guidance with regard to the significance of estimated impact:

a) *Typically, the greater this difference, the greater the magnitude of the impact;*

b) *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;*

c) *A difference of around +5dB could be an indication of an adverse impact, depending on the context;*

d) *Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context. The lower the rating level is relative to the background sound level, the less likely it is that the specific sound source will have an adverse impact.*

Where relevant, the initial estimate should then be modified by accounting for contextual aspects of the operation of the specific sound source and / or the context of the character of the area.

Other Assessment Parameters and Guidance on Character Corrections

The Specific Sound Level (L_s) is expressed in terms of an L_{Aeq} for a reference time interval, (T_r) of one-hour during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours). The Rating Level is also expressed in terms of the reference time interval, T_r.

The Specific Sound Level can be determined by various means, which can include prediction based on manufacturer's data and accompanying propagation calculations to the assessment position(s). This method could be used, for instance, where the specific sound source is not yet in-situ, or is in-situ but not yet operational.

Where the specific sound source is already operational and in-situ, measurements of the sound climate resulting from both the specific sound source and all other contributing sources, (knows as the Ambient Sound Level, L_a = $L_{Aeq,T}$) should be measured over a representative time period, ideally at the assessment position(s).

Depending on the relative contribution of other sources not related to the specific sound, (known as the residual sound), the Specific Sound Level can be derived by logarithmically subtracting the Residual Sound Level, $L_r = L_{Aeq,T}$, from the Ambient Sound Level.

With justification, representative proxy locations can be used for the measurement of the ambient and/or residual sound climate. Where these measurement locations are not fully representative of the assessment position(s), measurement can be supplemented with calculation.

The Background Sound Level should ideally also be measured at the assessment position(s) but can be measured at representative proxy locations where suitable reasons can be provided. The Background Sound Level should be measured over a period which is suitable to characterise the background sound climate during the period of interest and should normally be at least 15 minutes.

When deriving the Rating Level from the Specific Sound Level, consideration is given to the character of the sound. The Standard provides several methods for deriving appropriate character corrections, offering the following advice for subjective assessment:

Tonality

For sound ranging from not tonal to prominently tonal, the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be allocated as a penalty of 2 dB for a tone which is just perceptible at the sound receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9dB can be applied for sound that is highly impulsive considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be allocated as a penalty of 3dB for impulsivity which is just perceptible at the receiver, 6dB where it is clearly perceptible and 9dB where it is highly perceptible.

Other sound characteristics

Where the specific sound contains characteristics that are neither tonal nor impulsive, but are otherwise startling, disturbing or incongruous with the residual acoustic environment, a penalty of +3dB can be applied.

Intermittency

When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3dB can be applied.

APPENDIX C

Plant Sound Calculations

Selby Road Receptors		63	125	250	500	1000	2000	4000	8000	dBA
		Frequency (Hz)								
Unit 1										
PURY-M250YNW-A1 (L_p @ 1m)		78	63	62	59	52	49	49	43	60
Propagation (m)	49	-34	-34	-34	-34	-34	-34	-34	-34	
Line of sight screening		-5	-5	-5	-5	-5	-5	-5	-5	
Unit 3 Total		**39**	**24**	**23**	**20**	**13**	**10**	**10**	**4**	**22**
Unit 2										
PURY-M250YNW-A1 (L_p @ 1m)		78	63	62	59	52	49	49	43	60
Propagation (m)	122	-42	-42	-42	-42	-42	-42	-42	-42	
Building mass screening		-10	-10	-10	-10	-10	-10	-10	-10	
Unit 2 Total		**26**	**11**	**10**	**7**	**0**	**-3**	**-3**	**-9**	**9**
Unit 3										
PURY-M250YNW-A1 (L_p @ 1m)		78	63	62	59	52	49	49	43	60
Propagation (m)	146	-43	-43	-43	-43	-43	-43	-43	-43	
Building mass screening		-10	-10	-10	-10	-10	-10	-10	-10	
Unit 3 Total		**25**	**9**	**8**	**6**	**-1**	**-5**	**-5**	**-10**	**7**
Total		**40**	**24**	**23**	**21**	**14**	**10**	**10**	**5**	**22**

Allington Avenue Receptors		63	125	250	500	1000	2000	4000	8000	dBA
		Frequency (Hz)								
Unit 1										
PURY-M250YNW-A1 (L_p @ 1m)		78	63	62	59	52	49	49	43	60
Propagation (m)	35	-31	-31	-31	-31	-31	-31	-31	-31	
Line of sight screening		-5	-5	-5	-5	-5	-5	-5	-5	
Unit 3 Total		**42**	**27**	**26**	**23**	**16**	**13**	**13**	**7**	**25**
Unit 2										
PURY-M250YNW-A1 (L_p @ 1m)		78	63	62	59	52	49	49	43	60
Propagation (m)	68	-37	-37	-37	-37	-37	-37	-37	-37	
Building mass screening		-10	-10	-10	-10	-10	-10	-10	-10	
Unit 2 Total		**31**	**16**	**15**	**12**	**5**	**2**	**2**	**-4**	**14**
Unit 3										
PURY-M250YNW-A1 (L_p @ 1m)		78	63	62	59	52	49	49	43	60
Propagation (m)	65	-36	-36	-36	-36	-36	-36	-36	-36	
Building mass screening		-10	-10	-10	-10	-10	-10	-10	-10	
Unit 3 Total		**32**	**16**	**15**	**13**	**6**	**2**	**2**	**-3**	**14**
Total		**43**	**27**	**26**	**24**	**17**	**13**	**13**	**8**	**25**

Daytime Background Sound Pressure Level	L_{A90}	40
Night-Time Background Sound Pressure Level	L_{A90}	36

APPENDIX C

Commercial Vehicle Calculations

Selby											
17:00 - 18:00	Distance, m	Count	On-time, s	Screening, dB	On-time, dB	Propagation, dB	Accumulation Effect, dB	Source L_{pA} @ 1m	Specific Sound Level	Character Correction, dB	Rating Sound Level
HGV Arrival	76	2	5	-10	-29	-38	3	75	2	0	2
HGV Reversing	76	3	10	-10	-26	-38	5	76	8	2	10
HGV Departure	76	3	5	-10	-29	-38	5	77	5	0	5
Door Closure	105	29	1	-10	-36	-40	15	80	9	3	12
LGV Arrival	115	2	5	-10	-29	-41	3	74	-3	0	-3
LGV Departure	115	2	5	-10	-29	-41	3	74	-3	2	-1
Car Arrival	115	5	5	-10	-29	-41	7	78	5	0	5
Car departure	115	15	5	-10	-29	-41	12	80	12	0	12
Total Level									**16 dBA**		**17 dBA**

Allington Avenue Receptors											
17:00 - 18:00	Distance, m	Count	On-time, s	Screening, dB	On-time, dB	Propagation, dB	Accumulation Effect, dB	Source L_{pA} @ 1m	Specific Sound Level	Character Correction, dB	Rating Sound Level
HGV Arrival	84	2	5	-10	-29	-38	3	75	1	0	1
HGV Reversing	84	3	10	-10	-26	-38	5	76	7	2	9
HGV Departure	84	3	5	-10	-29	-38	5	77	5	0	5
Door Closure	75	29	1	-10	-36	-38	15	80	12	3	15
LGV Arrival	84	2	5	-10	-29	-38	3	74	0	0	0
LGV Departure	84	2	5	-10	-29	-38	3	74	0	2	2
Car Arrival	84	5	5	-10	-29	-38	7	78	8	0	8
Car departure	84	15	5	-10	-29	-38	12	80	15	0	15
Total Level									**18 dBA**		**19 dBA**