



PREPARED: 20 July 2026

3 RIVERSIDE NOISE IMPACT ASSESSMENT

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Project Ref:	AS14584	Project Name:	3 Riverside, Eastleigh
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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 Clarke Saunders Acoustics has conducted an assessment of sound generated by condensers serving the Oven Door Bakery, 3 Riverside, Eastleigh, SO50 6LP.
- 1.2 The condensers are currently located above the rear access walkway. The assessment shows that, to achieve sound levels in line with those discussed with Eastleigh Borough Council, the condensers should be relocated to ground-floor level beneath the external stairs leading to Flat 3A. This position reduces direct exposure to nearby windows and allows additional noise control measures.
- 1.3 The proposed mitigation includes the installation of a timber partition partially enclosing the units with an integral louvre, and sound-absorbing treatment to the surrounding walls.
- 1.4 The assessment also takes account of the local setting. Nearby properties are already exposed to higher sound levels from other commercial plant in the area.
- 1.5 Overall, the relocation and mitigation represents a clear improvement over the current arrangement. On this basis, the proposed installation would considerably reduce likelihood of adverse impact at nearby residential properties.

2.0 INTRODUCTION

- 2.1 Clarke Saunders Acoustics (CSA) has been appointed to conduct an assessment of plant sound levels associated with existing external condensers serving the Oven Door Bakery, 3 Riverside, Eastleigh, SO50 6LP.
- 2.2 Environmental sound survey data, collected on site, will be used to set plant sound targets, in accordance with the requirements stated by the Pollution Control Manager at Eastleigh Borough Council.
- 2.3 Where the survey results indicate that plant sound levels are too high in the current location, relocation and/or mitigation will be explored in order to achieve suitable sound levels.
- 2.4 A summary of the acoustic terminology is provided at Appendix A.

2.5 COMPETENCE

- 2.5.1 The sound measurements and assessment were carried out by Michael Symmonds, a Senior Consultant at CSA and the author of this report. He has over eight years' experience in consulting, holding a first-class master's degree in Acoustical Engineering.
- 2.5.2 The report adheres to the principles required by the Institute of Acoustics in their Code of Conduct, and the work is within the author's own area of knowledge and expertise. Where opinions have been expressed, these represent true and complete professional opinions on the matters to which they refer.
- 2.5.3 CSA is a full member of the Association of Noise Consultants. The author of this report is a Corporate Member of the Institute of Acoustics.

3.0 SITE DESCRIPTION

- 3.1 The Oven Door Bakery is a mid-terrace property, fronting onto Riverside to the west, with Montague Road to the east. The bakery is open between 8am and 2pm Monday to Friday, between 7am and 2pm on Saturday, and is closed on Sunday.
- 3.2 Two condensers, which provide cooling to the refrigerators, are currently located on a gantry above the rear access walkway. Owing to the refrigeration requirements, these condensers can operate 24 hours a day.
- 3.3 The proposals involve relocating these condensers to ground-floor level, underneath the external staircase.
- 3.4 Kashmir Tandoori is located at 4 Riverside, which has external extract fan ductwork on the eastern façade, terminating at roof level. The extract fan operates from late afternoon (from circa 4pm, until around 11pm). Other takeaway premises are also located along Riverside, albeit sound contributions from the associated plant are of less significance to receptors in close proximity to 3 Riverside.
- 3.5 The closest receptors to 3 Riverside are the first-floor flats at 2A, 3A and 4A Riverside, with the dwelling at 12 Montague Road also potentially affected.
- 3.6 The site and surroundings are shown in AS14584/SP1.

4.0 RELEVANT GUIDANCE

4.1 INITIAL EHO COMMENTS

- 4.1.1 Mr Andre Pires, the Pollution Control Manager (PCM) at Eastleigh Borough Council stated the following in response to the retrospective application:

... a noise impact assessment prepared by a suitably qualified acoustician is required. This assessment should include a representative background noise survey of sufficient duration, including measurements over at least one weekend period. The assessment must be undertaken in accordance with BS 4142:2014+A1:2019, Methods for Rating and Assessing Industrial and Commercial Sound. The rating level of the plant noise should be demonstrated to be 5dB below the existing background sound level at the nearest noise-sensitive receptors. The background noise survey must, of course, be carried out with the existing plant not in operation.

- 4.1.2 Following the environmental sound survey and assessment, CSA liaised with the PCM regarding the outcomes, which are discussed in Section 6.5.

4.2 BS 4142

- 4.2.1 BS 4142 describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes:
 - 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.

4.2.2 The purpose of this standard is to determine the magnitude of potential impact on nearby sensitive receptors arising from industrial or commercial sound, with respect to the existing background sound levels and relevant character penalties owing to distinguishable sound features.

4.2.3 The numerical impact assessment may then be modified by considering the context in which the sound occurs.

4.2.4 A detailed overview of the BS 4142 methodology is provided in Appendix C.

5.0 SOUND SURVEY

5.1 PROCEDURES AND EQUIPMENT

5.1.1 A survey of the existing ambient and background sound levels was undertaken outside the first-floor window of 3A Riverside, as shown in site plan AS14584/SP1. The monitoring position is suitably representative of the background sound levels experienced at 2A, 3A and 4A.

5.1.2 The monitor was set to record measurements of consecutive 5-minute L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels between 08:35 hours on Friday 15th May and 08:30 hours on Tuesday 19th May 2026.

5.1.3 The following equipment was used during the course of the survey:

- 1 no. Rion data logging sound level meter type NL32;
- 1 no. Rion sound level field calibrator type NC74.

5.1.4 For the purposes of source identification, a separate monitor was installed on the condenser gantry. This monitor was used purely for source identification purposes, not for determining sound levels.

5.1.5 The calibration of the sound level meter was verified before and after use, with no significant calibration drift detected (≤ 0.5 dB). Certificates of laboratory calibration of all equipment used in the survey are available on request.

5.1.6 Measurements were made following procedures in BS 4142 and BS 7445:1991 (ISO1996-2:1987) *Description and measurement of environmental noise Part 2: Acquisition of data pertinent to land use*.

5.1.7 From inspection of publicly available meteorological data, the majority of the measurement period was dry with light winds.

5.2 RESULTS

5.2.1 Figures AS14584/TH1-TH5 show the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels as time histories at the monitoring location. The trace from the source identification monitor is also included on these time histories.

- 5.2.2 A number of features are apparent in the time histories, primarily the operation of the Kashmir Tandoori extract fan, resulting in the relatively high sound levels between circa 4pm and 11pm.
- 5.2.3 When the condensers are operational during the night-time period, the background level (L_{A90}) also notably increases. The background sound levels used for the assessment have, therefore, been taken from the periods when the condensers were not operating, resulting in those stated in Table 5.1.

Period	Background sound levels in absence of condenser operation, L_{A90}
07:00 – 23:00 hours	44 dB
23:00 – 07:00 hours	36 dB

Table 5.1: Environmental sound survey results

6.0 ASSESSMENT

6.1 PLANT DATA

- 6.1.1 The installed units have been confirmed as the following:

- 1 no. J&E Hall JEHS-0400-B3-L-3
- 1 no. J&E Hall JEHS-0300-B2-M-1

- 6.1.2 The manufacturer has provided the following sound pressure levels, measured 1m from the unit.

Unit	Frequency								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
JEHS-0400-B3-L-3 L_p at 1m	-	58	57	55	53	48	42	32	57
JEHS-0300-B2-M-1 L_p at 1m	-	61	57	54	50	48	39	32	56

Table 6.1: Plant sound source data

6.2 SOUND LEVEL CALCULATIONS

- 6.2.1 The proposal is for the units to be moved to beneath the external staircase leading to Flat 3A, where the steps and staircase landing would subsequently provide acoustic screening losses to the window of Flat 3A. The building massing on either side of the staircase will provide screening losses to Flat 2A and 12 Montague Road.
- 6.2.2 The window of Flat 4A is, therefore, likely to be the most affected receptor.
- 6.2.3 As shown in drawing ref 01305-00-C, submitted within the planning application, a removable timber partition will enclose the condensers on the north and west sides, with

an integrated louvre on the north side. This louvre shall be acoustically rated, achieving the following minimum insertion losses.

Louvre	Frequency							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Insertion losses	6	6	8	10	14	18	16	15

Table 6.2: Louvre insertion losses

6.2.4 To reduce reverberant build-up, a Class A acoustically absorptive product shall be installed on the internal walls of the timber partition, and on the rear wall of 3 Riverside, against which the condensers are installed.

6.2.5 Acoustic losses afforded by distance propagation, the louvre, and line of sight screening, have been incorporated into the calculations, where the predicted sound level has been compared to the most stringent night-time target to provide a robust assessment.

6.2.6 Owing to the possibility of intermittency being distinguishable at the receptor position, a +3dB character correction has been applied.

6.2.7 Table 6.3 presents the calculated specific and rating levels against the night-time target.

Period	Calculated Specific Sound Level	Character Correction	Rating Sound Level	Target*
23:00 – 07:00 hours	$L_{Aeq,15mins}$ 32 dB	+3dB for potential intermittency	$L_{Ar,15mins}$ 35 dB	$L_{Ar,15mins}$ 31 dB

Table 6.3: Assessment outcome

*As discussed with PCM at Eastleigh Borough Council. See Section 4.1.1.

6.3 CONTEXTUAL DISCUSSION

6.3.1 The context forms a key part of any BS4142 assessment and must be considered alongside the numerical assessment.

6.3.2 The most affected receptors are directly next to a large extract fan associated with Kashmir Tandoori. Whilst this does not operate during the night-time period, when it does operate this plant exposes the receptors to far higher sound levels than the condensers in the proposed (or existing) location.

6.3.3 The absolute sound level of the condenser operation is predicted to be lower than the lowest measured background sound level throughout the survey, and significantly lower than typical ambient noise levels.

6.3.4 Whilst the condenser sound may possibly present a distinguishable feature outside the receptor windows, it is not considered likely that this would be perceptible inside the dwellings.

- 6.3.5 The relocation presents a significant betterment over the existing scenario. It is, therefore, anticipated that the likelihood of adverse impact and, therefore, complaints, will substantially reduce.

6.4 UNCERTAINTY

- 6.4.1 As per BS 4142, the uncertainty in the assessment is considered and reported. This is not an indication of error, but an acknowledgement of possible variability of the factors contributing to the assessment.
- 6.4.2 The use of a calibrated Type 1 sound level meter is considered to reduce measurement instrument error to insignificant levels compared with environmental variations.
- 6.4.3 Survey measurements were collected over multiple days, during which daily ambient and background sound fluctuations were observed. The close proximity to the receptor windows also reduced uncertainty in the representativeness of the measured background sound levels.
- 6.4.4 An allowance for potential intermittency has been included in the assessment, although it is uncertain how noticeable this would be to the receptors.
- 6.4.5 The uncertainty involved does not change the conclusion, where there is unlikely to be adverse impact.

6.5 DISCUSSION WITH THE EHO

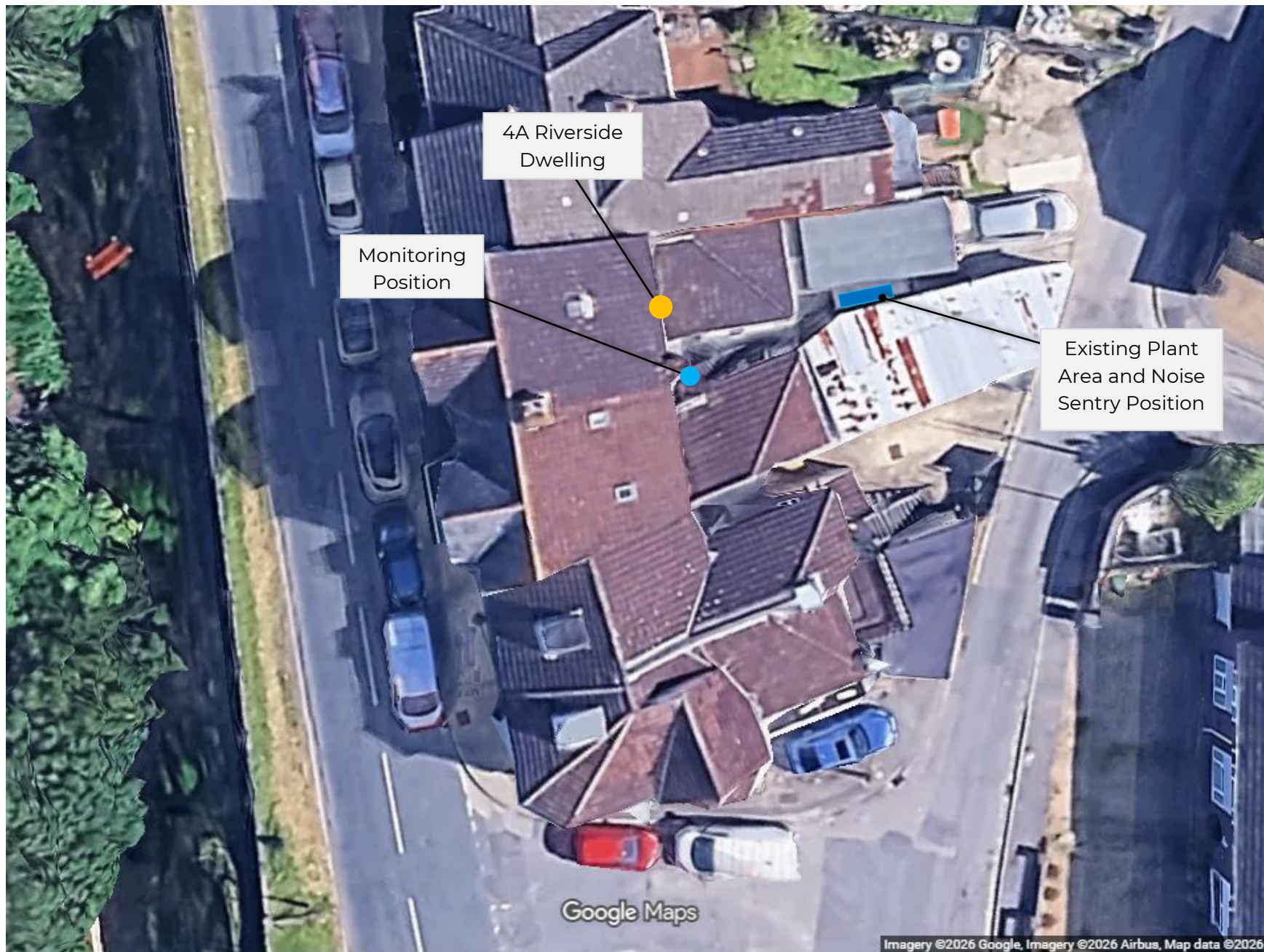
- 6.5.1 CSA discussed the outcomes of the assessment with Mr Andre Pires on 19th June 2026, the PCM who originally commented on the retrospective application.
- 6.5.2 The relocation, mitigation and predicted sound levels were discussed in the context of the site constraints, and the proposed location has been optimised accordingly.

7.0 CONCLUSION

- 7.1 Clarke Saunders Acoustics has conducted an assessment of sound generated by condensers serving the Oven Door Bakery, 3 Riverside, Eastleigh, SO50 6LP.
- 7.2 The assessment has indicated that condenser relocation is required in order to achieve sound levels in line with the requirements of Eastleigh Borough Council.
- 7.3 Relocation of the condensers to a position beneath the stairs leading to the first-floor Flat 3A inherently reduces the number of residential windows with line of sight to the unit. The installation of a timber partition partially enclosing the units with an integral louvre further reduces the sound levels at the most affected receptor at Flat 4A. An absorptive lining shall also be installed on the removable timber partition and the walls surrounding the condensers, to reduce reverberant buildup.
- 7.4 Once the condensers are relocated and the proposed mitigation is installed, the sound levels are predicted to be below the measured background sound level during the most sensitive night-time period. Even allowing for the possibility that the condenser operation may be noticeable at times, the predicted rating level remains below the background sound level.
- 7.5 The relocation, mitigation and predicted sound levels were discussed with the Pollution Control Manager at Eastleigh Borough Council in the context of the site constraints. The proposed location has been optimised and the sound levels mitigated as far as practicable.



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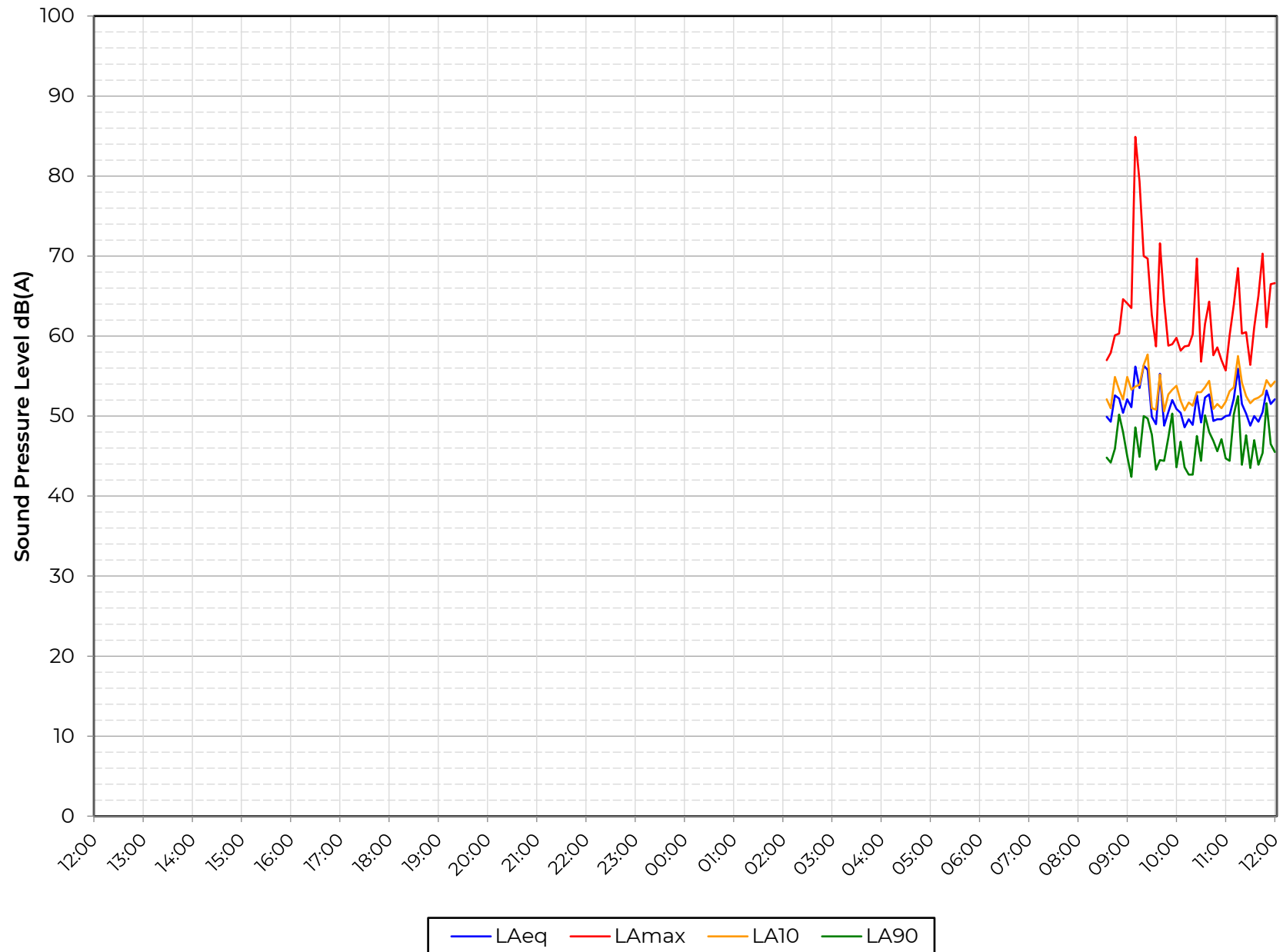


Indicative Site Plan

Figure AS14584.SP1 rev A

3 Riverside, Eastleigh

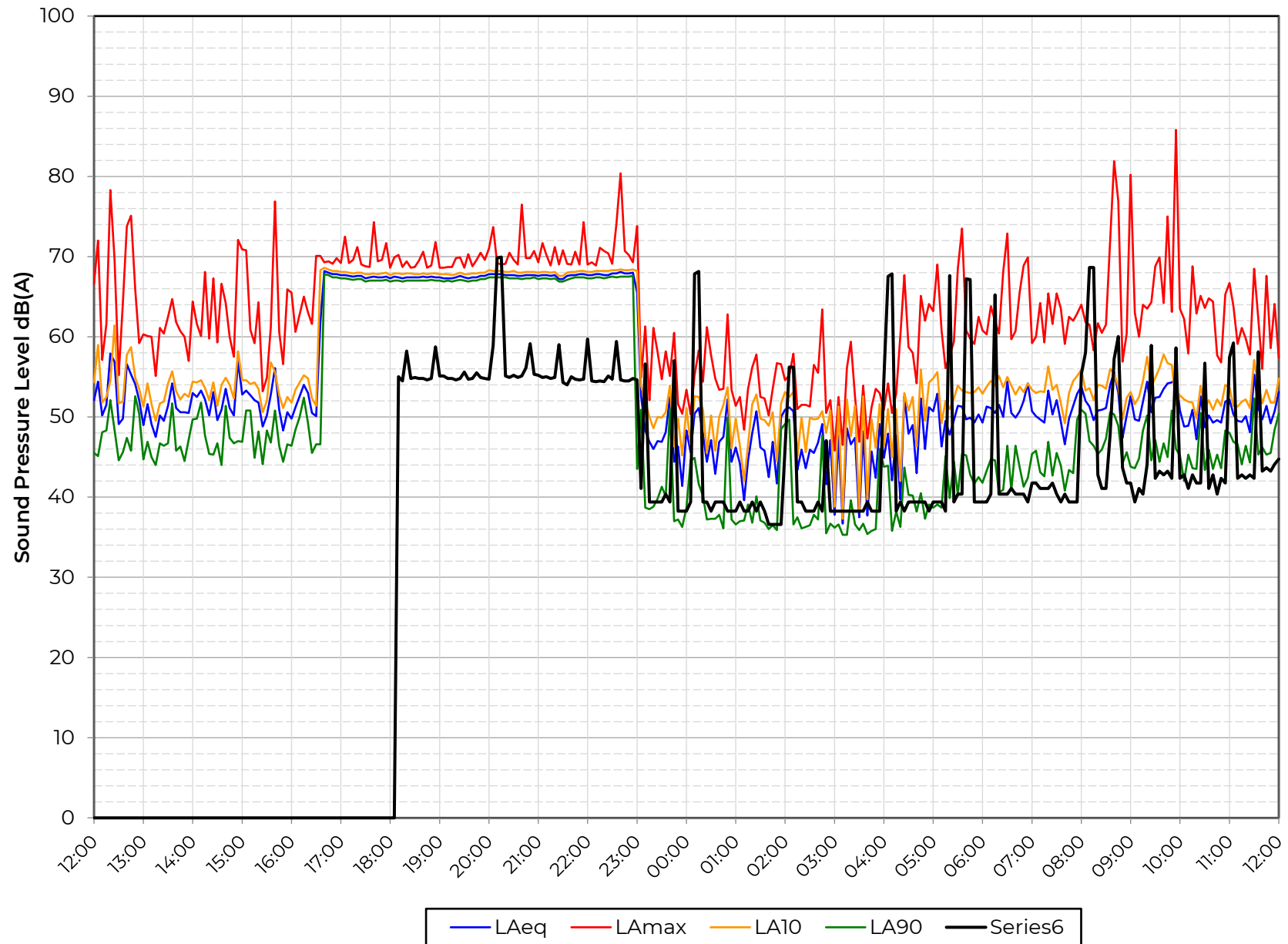
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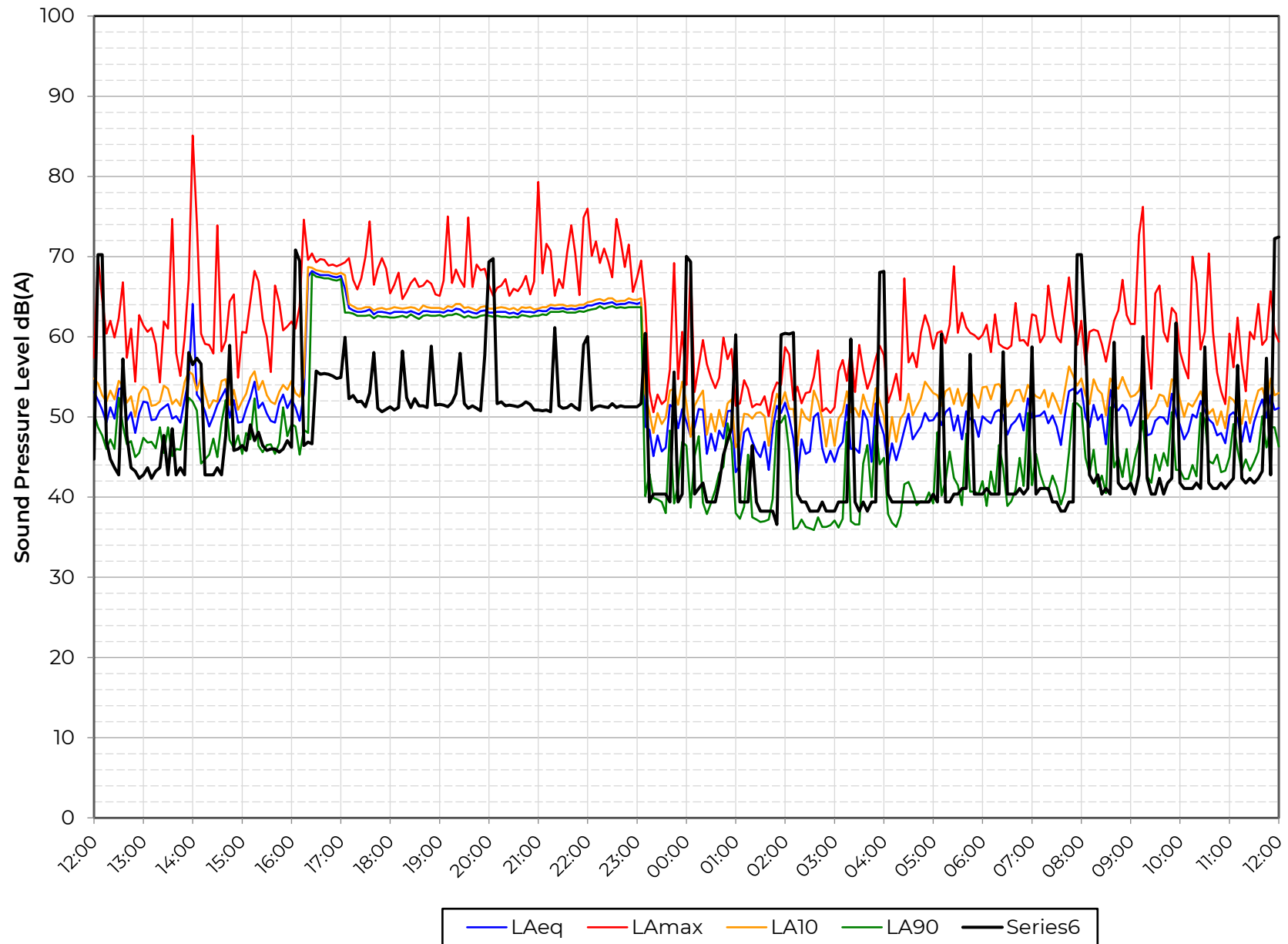
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Figure AS14584/TH1

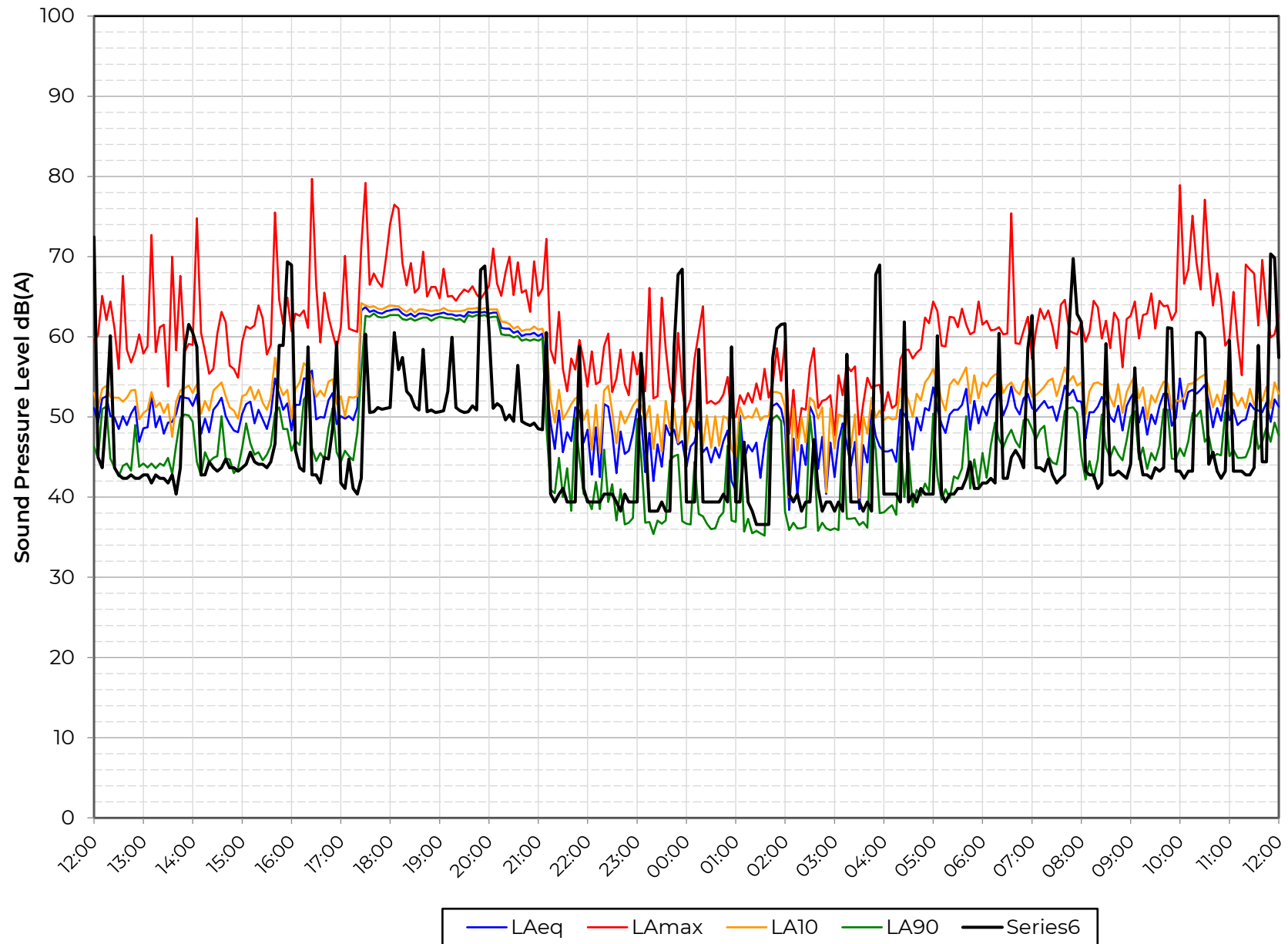
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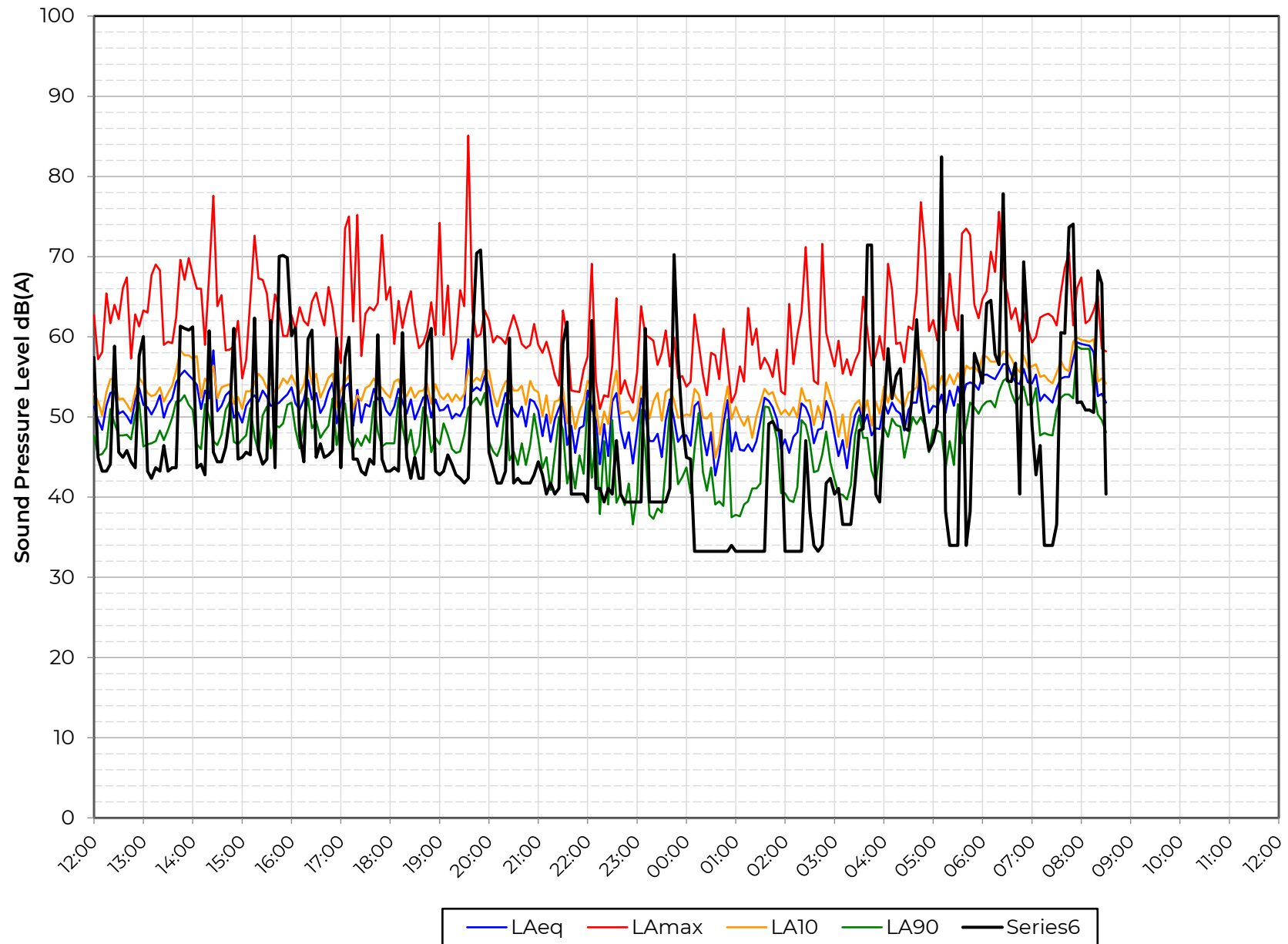
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Position 1



Position 1



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 they climb up a ladder (and are closer to the top of the barrier) than if they were standing at ground level. Equally if they sat on the ground the sound would seem quieter than if 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

AS14584 - 3 Riverside SUMMARY OF PLANT SOUND CALCULATIONS

PLANT SOUND TO Flat 4A		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
JEHS-0400-B3-L-3	Lp @ 1m	57	58	57	55	53	48	42	32	57
Lw to Lp @ 1m	-	0	0	0	0	0	0	0	0	
Attenuation Loss	SL-150	-6	-6	-8	-10	-14	-18	-16	-15	
Surface Area Correction	1.2m ²	1	1	1	1	1	1	1	1	
Sound Power Over Louvre	Subtotal	52	52	50	46	40	31	26	18	47
JEHS-0300-B2-M-1	Lp @ 1m	61	61	57	54	50	48	39	32	56
Lw to Lp @ 1m	-	0	0	0	0	0	0	0	0	
Attenuation Loss	SL-150	-6	-6	-8	-10	-14	-18	-16	-15	
Surface Area Correction	1.2m ²	1	1	1	1	1	1	1	1	
Sound Power Over Louvre	Subtotal	56	56	50	44	37	30	24	18	46
Cumulative SWL Over Louvre	Lw	57	58	53	48	42	34	28	21	50
Directivity	1 - Louvre	1	1	1	1	1	1	1	1	
End Reflection	1 - Louvre	-6	-2	-1	0	0	0	0	0	
Screening Loss	Line of Sig	-5	-5	-5	-5	-5	-5	-5	-5	
Distance Loss	5m	-13	-13	-13	-13	-13	-13	-13	-13	
	Subtotal	34	38	35	31	25	16	11	4	32
Specific sound level at receptor	L_{eq} 1hr	34	38	35	31	25	16	11	4	32

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,T_r}), at the relevant assessment position(s). The Rating Level is compared against the existing Background Sound Level, (L_{A90,T_r}), 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, (known as the Ambient Sound Level, $L_a = L_{Aeq,T_r}$) 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, $L_r = L_{Aeq,T_r}$ 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.