

Report VA5420.240903.NIA

59 Leigh Road, Eastleigh

Noise Impact Assessment

04 September 2024

Eastleigh Masjid and Islamic Centre

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Attachments

VA5420/SP1	Indicative Site Plan
VA5420/TH1-TH5	Environmental Noise Time Histories
Appendix A	Acoustic Terminology
Appendix B	Sample Complaint Form

Report Version	Author	Approved	Changes	Date
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1. Introduction

Eastleigh Masjid and Islamic Centre is proposing to establish a community centre at 59 Leigh Road, Eastleigh, and requires a change of use of the property from Class E to a Class F use.

Venta Acoustics has been commissioned by Eastleigh Masjid and Islamic Centre and to undertake an assessment of the potential noise impact of these proposals in support of an application for planning permission.

An environmental noise survey has been undertaken to determine the background noise levels at the most affected noise sensitive receptors, as well as noise breakout and on site noise propagation investigations. These levels are used to undertake an assessment of the likely impact with reference to the planning requirements of Eastleigh Borough Council.

2. Description of Proposals

As illustrated on attached site plan VA5420/SP1, the site building is a semi-detached property located to the south of Leigh Road. The other half of the building is a dental practice, and on the opposite side of the road is Eastleigh park. To the west of the building is a currently vacant building, which was previously used a nursery. To the east, on the opposite side of Desborough Road is a day care nursery. Further to the south along Desborough Road are residential dwellings at 2/2A, as well as the Churchill Club, a conservative club with external seating to the front.

The proposals for the property are for the ground floor to be used by the Eastleigh Masjid and Islamic Centre. The proposed uses are as follows:

- Education services
- Community support sessions
- Book clubs
- Health activities
- Counselling sessions
- Meetings
- Hall hire
- Children's play
- Place of worship

At first floor, the front half of the building is understood to be retained as an office, with the rear element to be refurbished into an apartment.

The new use would allow for three parking spaces to the front of the building, with a further nine to the rear, with one of the front spaces allocated for the use of a staff member, with at least one member of staff on-site whenever the premises is open.

3. Design Criterion and Assessment Methodology

3.1 Eastleigh Borough Council Requirements

Eastleigh Borough Council has provided the following comments on the pre-application for the scheme.

Noise and Disturbance

Policy DM8 states that new development will not be permitted if it is likely to cause a loss of amenity to residential properties. As a busy community centre with gatherings of up to 40 people, the proposal has the potential to generate significant noise from people taking part in activities on the site and when arriving and leaving the premise.

It is unclear whether the proposed community centre would involve the conversion of the whole of the building or be part of a mixed-use development (as consent has already been given for flats at the site). In general, premises used for public assembly are best avoided in buildings containing residential uses due to the risk of high noise transmission through the structure of the building, especially through the ceiling/ floor separation where there is likely to be relatively poor airborne sound insulation. As such the Local Planning Authority would not be able to support a community use at the site if there were also residential properties present within the building.

If the proposal encompasses the whole building, then the potential risks to residential amenity through noise transmission would be less significant. The site is adjacent to a dentist and children's day nursery and so the nearest residential property would be to the South in Desborough Road. In this case, the main concerns would relate to the operational times proposed and any use of sound amplification within the building, most notably in connection with health activities, hall hire and the place of worship.

A noise impact assessment should be provided with the application, which considers the types of uses proposed within the community centre, the likely sources of noise emission and sets out how these risks will be mitigated. For example, if loud music or noisy gathering are likely to take place in the premises then sound insulation for that part of the building will need to be designed at the outset and thought given to means of ventilation and window attenuation.

3.2 BS8233:2014

BS8233 *Guidance on sound insulation and noise reduction for buildings* provides guidance as to suitable internal noise levels for different areas within residential buildings.

The relevant section of the standard is shown below in Table 3.1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB L_{Aeq} , 16 hour	-
Dining	Dining Room	40 dB L_{Aeq} , 16 hour	-
Sleeping (daytime resting)	Bedroom	35 dB L_{Aeq} , 16 hour	30 dB L_{Aeq} , 8 hour

Table 3.1 - Excerpt from BS8233: 2014

[dB ref. 20µPa]

4. Noise Survey and Sound Insulation/Propagation Tests

4.1 Survey Procedure

In order to establish the existing noise levels in the area, a noise survey was carried out between Friday 16th and Wednesday 21st August 2024 at first floor level at the location shown in site plan VA5420/SP1. This location was chosen to be representative of the noise levels at the most affected noise sensitive receivers.

Continuous 5-minute samples of the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were undertaken at the measurement location.

The weather during the survey period was generally dry with light winds. The background noise data is not considered to have been compromised by these conditions.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

4.2 Sound Insulation/Propagation Tests

Sound propagation tests were undertaken to ascertain the sound insulation/breakout from the building and noise propagation from the building on Friday 16th August 2024.

4.3 Measurements During Prayers

In addition to the above, measurements were undertaken for the duration of a Friday afternoon prayer meeting on Friday 16th at the Cranbury Centre, which the Islamic Centre currently uses. The premises is larger than 59 Leigh Road, and as it was the summer holiday, attendance was high, with nearly 80 worshippers present by the end of the prayers.

The prayer meeting lasted for approximately one hour, with prayers being led by a single person. There was no amplification of speech used for the prayers, and it is understood that this would be the same for the smaller space at 59 Leigh Road.

The noise levels measured during the meeting were broadly in the range of L_{Aeq} 60-65dB during louder parts of the prayers, with maxima reaching up to L_{AFmax} 76dB(A).

4.4 Equipment

The following equipment was used in the course of the survey:

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-11586-E0	1509201-2	19/7/24
Svantek Class 1 SLM	971	143568	1508506-1	22/4/24
Larson Davis calibrator	CAL200	13049	1509201-3	19/7/24

Table 4.1 – Equipment used for the tests

The calibration of the sound level meter was verified before and after use with no significant calibration drift observed.

5. Results

5.1 Environmental Noise Survey

The measured sound levels are shown as time-history plots on the attached charts VA5420/TH1-5.

During the site visit on the Friday, there was a funfair at Eastleigh Park. The microphone was located to the rear of the building in a location screened from the park. Interrogation of the data once the funfair had left the park on the 20th August showed little difference in the noise levels between the days, confirming the meter location was suitably screened to provide representative noise levels for the local area, without influence from the funfair.

The noise levels in the area are determined by road traffic in the surrounding area. The noise levels measured were:

Monitoring Period	Typical ¹ LA90,5min	LAeq, T
07:00 – 23:00 hours	43 dB	56 dB
23:00 – 07:00 hours	37 dB	46 dB

Table 5.1 – Typical background noise levels

[dB ref. 20 µPa]

¹ The typical LA90 value is taken as the 10th percentile of all LA90 values measured during the relevant period.

The above noise levels are not particularly high or low, and are in the range which would be expected in a suburban, town centre location such as this.

5.2 Sound Insulation/Noise Breakout

When the site visit was undertaken, the building had been partially stripped out, with areas of the ceiling removed in the ground floor space. The floor build-up that could be seen was comprised of floorboards, approximately 150mm joists, and a ceiling (although this was missing in some areas).

Although the floor construction was compromised, sound insulation tests were undertaken to evaluate if there were any flanking paths up the external walls or via other paths. None were

apparent, and the result is reported below, although it should be noted that this is for a partial floor build-up and so is significantly poorer than could otherwise be expected to be achieved.

The measured sound insulation performance of the floor, in Weighted Level Difference (D_w), is summarised below:

Source	Receive	Sound Insulation, D_w
Ground floor	First floor	32 dB

Table 5.2 – Airborne sound insulation test result

In addition to the above, noise breakout tests from the building were undertaken with the windows closed, which showed that the level of sound reduction from inside to outside is 31dB.

6. Discussion

As previously noted in the report, at first floor level, it is understood that the intention is to retain the front office space, with the rear part of the first floor refurbished as a residential use.

The comments from Eastleigh Borough Council do highlight that they do not consider that they can support an application where there is a residential use within the building. However, it is considered that, with uprated sound insulation performance from the floors and walls, and suitable space management, the first floor apartment to the rear of the property could co-exist with the community centre use without negatively impacting the future residents.

The ground floor space comprises two areas, with a large open area to the front, which is then separated by a spine wall and staircase up to first floor level, and a smaller area to the rear which runs under the proposed apartment, and then into a room in the single storey rear extension.

To mitigate noise transfer between the areas, it is recommended that the flat is accessed via a corridor shared with the first floor office accessed from the front of the building. This would allow for the existing staircase located in the middle of the building to be removed and the floor between the ground and first floor to be reinstated.

The noisier activities, namely prayer meetings and children playing should only be permitted to occur within the front area under the office, with the rear space used for more administrative uses, or quieter activities such as teaching, meetings and counselling.

It is not known if the premises intend to host activities with amplified music but if this is case, due to the close proximity to the apartment, and the potential transmission of music throughout the building, it is recommended that this is limited to 'ambient' music at a level of approximately 65dB(A).

Due to the distance to the nearest noise sensitive receivers to Leigh Road, where any noisier activities are proposed to be held, noise breakout from the premises is not considered likely to cause any impact on nearby residents.

During the site visits and in the applicant's pre-application submission, it was highlighted that the Eastleigh Masjid and Islamic Centre serves the local community, with the majority of attendees to the prayer meeting arriving on foot, and some using the carpark at the Cranbury Centre. This is expected to remain the same at 59 Leigh Road, being located approximately 500m from the Cranbury Centre. Prayers are held during Friday lunchtime, and the area around Leigh Road was noted as being vibrant with people out on their lunch breaks, shopping in the nearby High Street and surrounding area and sitting outside Churchills Club having food or drink. In the context of the local area, which includes a Masonic Centre, church, fast food restaurants, restaurants and drinking establishments, it is not expected that the footfall from the proposed new community centre is likely to adversely impact nearby residents.

Even considering this, good management of the premises is always important in controlling impacts on the surrounding dwellings, which will be discussed in more detail in section 8.

7. Noise Mitigation Measures/Impact Assessment

As previously highlighted, the ground floor space currently has an incomplete plasterboard/plaster and lath ceiling.

It is assumed that the ceiling is being removed for aesthetic reasons, and it should be replaced with a new ceiling comprising two layers of 15mm dense plasterboard such as SoundBloc (or Fireboard), and a single layer of 18mm cement particle board (min mass 22kg/m²) hung on an m/f grid mounted on isolated hangers, such as Mason LDS hangers, or similar. A minimum of 100mm mineral wool (density 10-36kg/m³) should be installed between the joists.

Should there be an intent to have downlighters or any services in the ceiling void, a secondary ceiling should be installed below the primary ceiling to avoid penetration of the construction.

It is recommended that during the fit out works, any risers, services or penetrations in the floor, are identified and then filled with mineral wool and then pattressed or boxed in with two layers of 15mm dense plasterboard such as SoundBloc.

A high quality doorset (R_w 35dB) with automatic self-closer should be fitted between the front and rear areas of the ground floor, with the door kept closed through prayer services and children play activities.

An assessment of a general noise level of 82dB(A) in the front, equivalent to loud play by children has been undertaken to the space above, and suggests an internal noise level in the office of NR26. Considering the diagonal adjacency of the apartment to the front space, it is considered highly likely that noise in the apartment would be at least 5-10dB lower than this, so approximately NR16-21, which is considered to be at a level which is unlikely to disturb future residents.

It is also recommended that a noise management plan is implemented to create a collaborative process through which the operator, the Local Authority and residents can liaise to control noise impact to acceptable levels.

8. Noise Management Plan

The following noise management plan includes many measures that would be recommended for adoption by management of the premises. These measures are intended to minimise the noise impact on the neighbours.

8.1 Potential Noise Sources

The management understand that the identification and recognition of potential causes of disturbance assists greatly in planning to avoid disturbances to the surroundings.

The following noise sources have been identified in relation to the proposed operation of the premises:

- Noise from indoor areas;
- Noise from users of the community centre;
- Users leaving the premises throughout the day and in the evening.

8.2 Management Controls

The responsibility for the management controls will be assumed by the manager. Other members of staff may assume the role in the future following suitable training. Where the venue is hired out, this responsibility will be shared with the event organisers as will be included in the contract for the hire of the venue.

To minimise noise break-out from the premises, the external door to the premises will be kept closed during the evening, except when being used for immediate access and egress.

A culture of neighbourly consideration will be encouraged amongst users of the hall through the use of signs and polite reminders from staff, if required.

Users are expected to access and leave the premises on foot. Signs will be installed reminding users of the amenity of neighbours.

8.2.1 Music Noise

As previously highlighted, it is recommended that music is only permitted at low, 'ambient' levels. Should there be any desire to play music at a higher noise level than this, a sound limiter system should be installed to control the upper limits for noise emissions from site. Any music played in the venue would have to be through this system.

It is recommended that the limit for noise levels would be set through a joint exercise with Eastleigh Borough Council Environmental Health and the apartment where music in the premises is adjusted until an agreeable level is achieved in the neighbouring dwellings. The limiter would then be set with this level as the maximum permitted level.

8.3 Neighbour Relations

The management will endeavour to maintain a friendly, open and informative relationship with the nearby residents to allow concerns to be raised and addressed without hostility. Residents will be made aware of planned events with a reasonable notice period and concerns regarding these will be noted and acted upon.

8.3.1 Complaints Procedure

A phone number and email address will be provided to nearby residents to allow efficient notification of the premises if noise levels are causing a disturbance. Clear instructions would be given to those likely to answer on these procedures for handling complaints.

A complaint action procedure will be produced and made available to staff who will be instructed to follow it on receiving a complaint.

A timed and dated log will be kept in the office of all complaints, including actions taken and responses given. Other information recorded in the complaints log will include the approximate number of guests and staff present at the time of the complaint, and any specific activities or conditions which were noteworthy at the time. A sample complaint log sheet is attached at Appendix B. Any other notes or email communications should be copied and a record kept in the complaint log folder.

All complaints will be addressed promptly, with a response/explanation as well as any future actions or improvements that can be implemented.

9. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the noise climate in the locality of 59 Leigh Road, Eastleigh, as well as an assessment of noise breakout and sound insulation within the building.

It is considered that, with suitable space management and remedial works as part of the building refurbishment, noise from the proposed community centre use would be unlikely to cause disturbance to nearby receivers.

Should the premises be used for louder events, measures will be required to mitigate noise sufficiently to control noise levels, such as a noise limiter.

A noise management plan has been proposed to minimise the impact of operation on the surrounding residents and a procedure for efficiently dealing with complaints has been suggested.

It is considered that with the adoption of the recommendations of this report and good management of the venue, noise from the proposed new community centre would not be expected to negatively impact on nearby residents or the proposed new residential use within the building.

Jamie Duncan MIOA

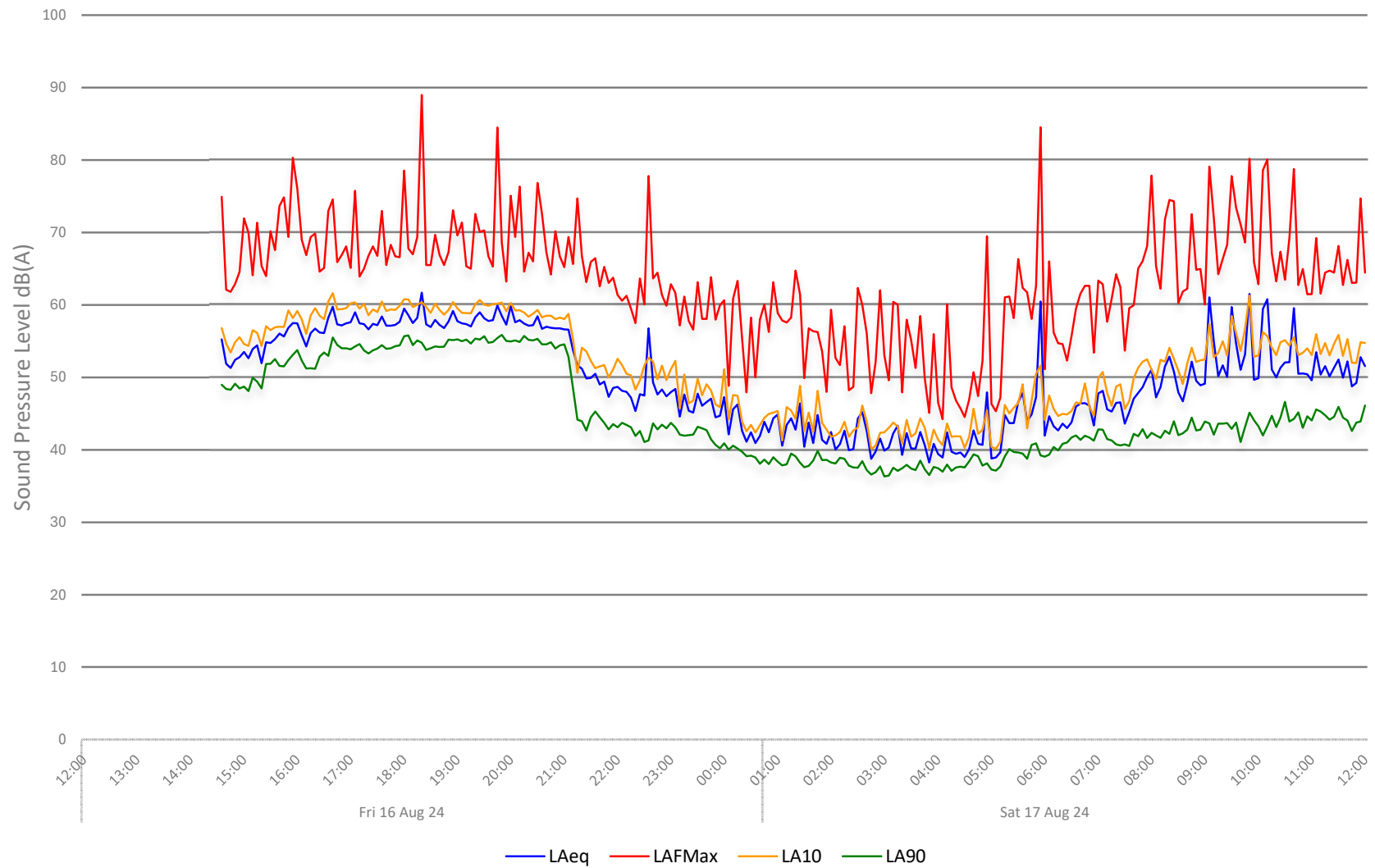


59 Leigh Road, Eastleigh

Environmental Noise Time History: 1

 **VENTA** ACOUSTICS

Figure VA5420/TH1

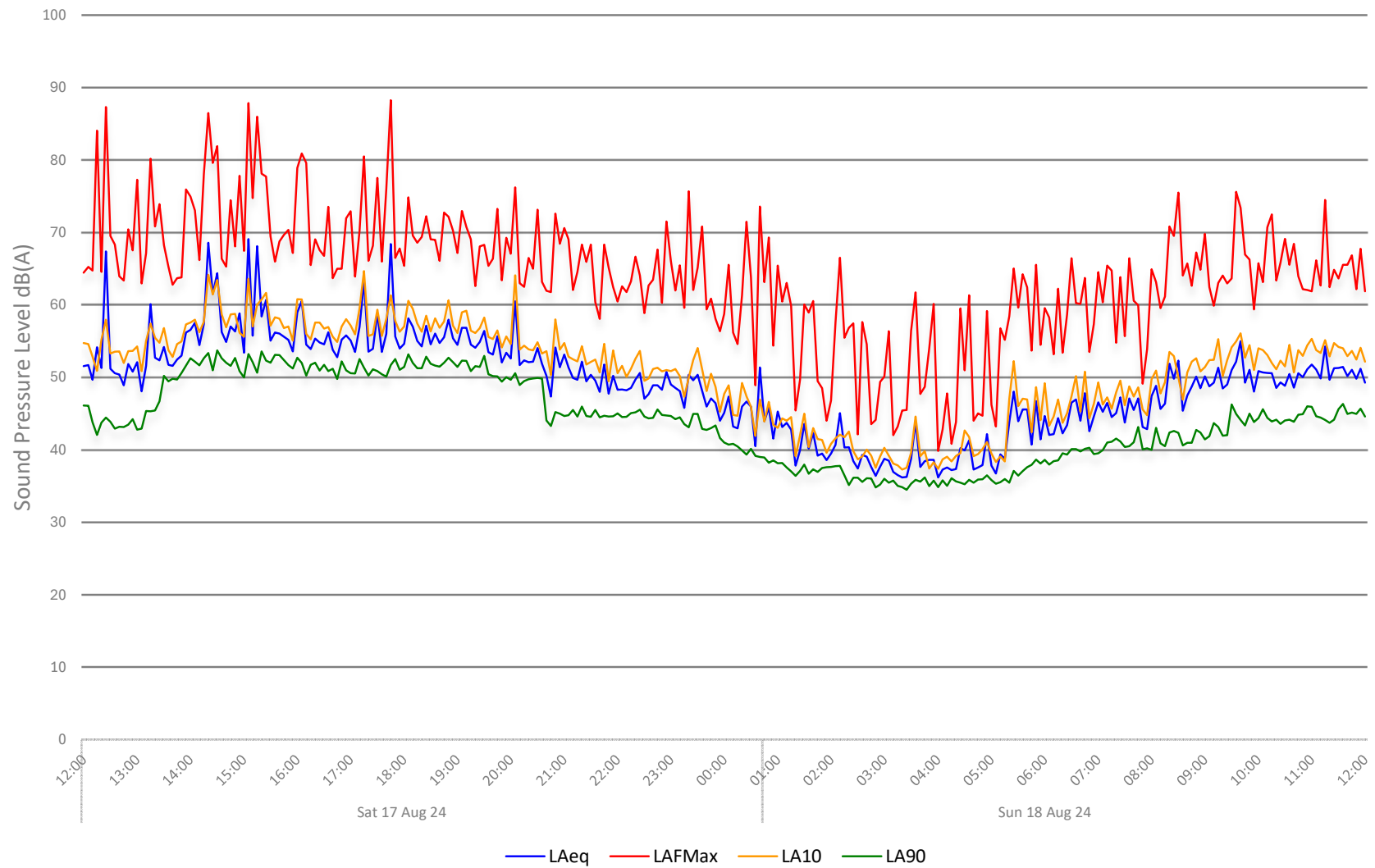


59 Leigh Road, Eastleigh

Environmental Noise Time History: 2



Figure VA5420/TH2

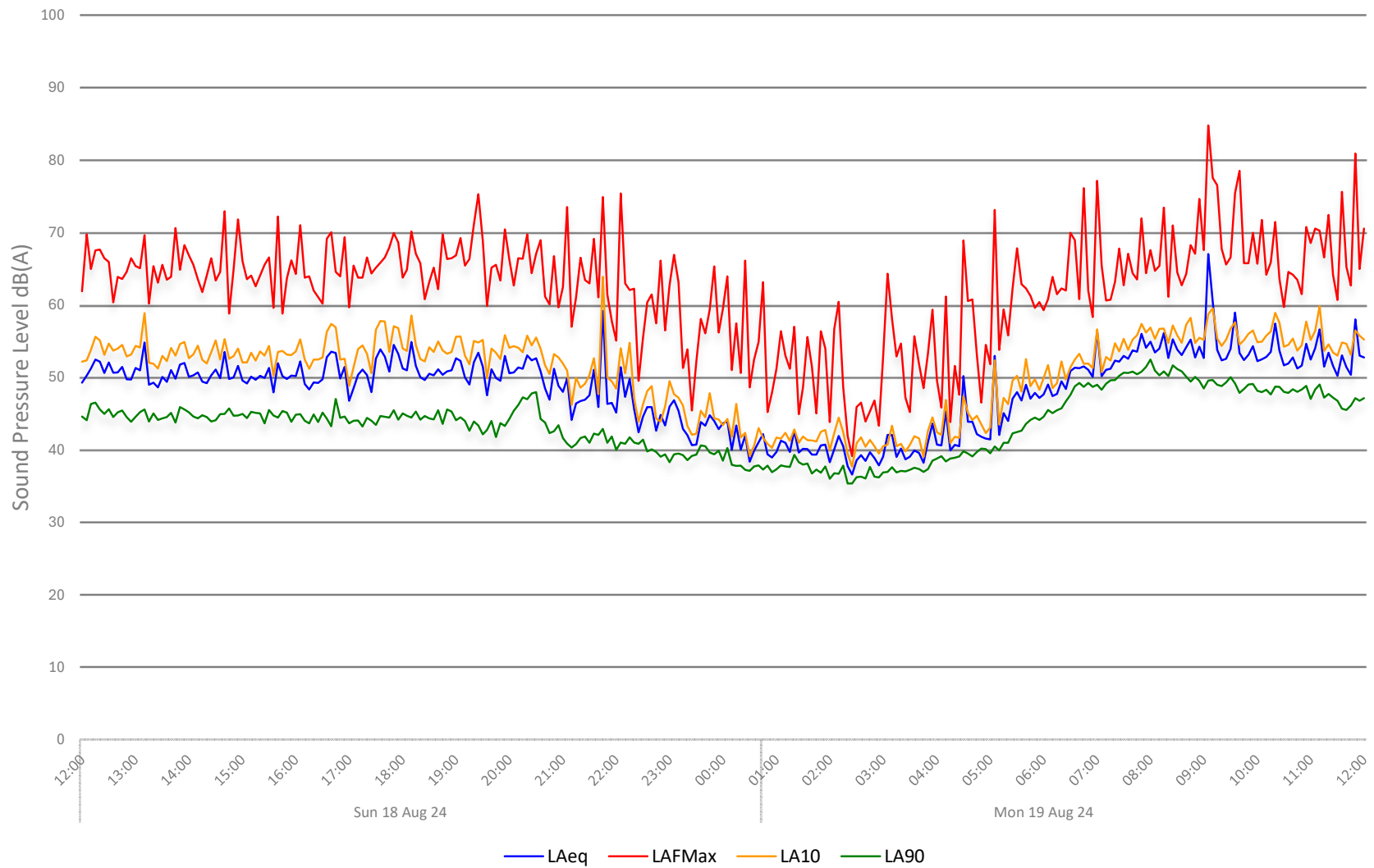


59 Leigh Road, Eastleigh

Environmental Noise Time History: 3



Figure VA5420/TH3

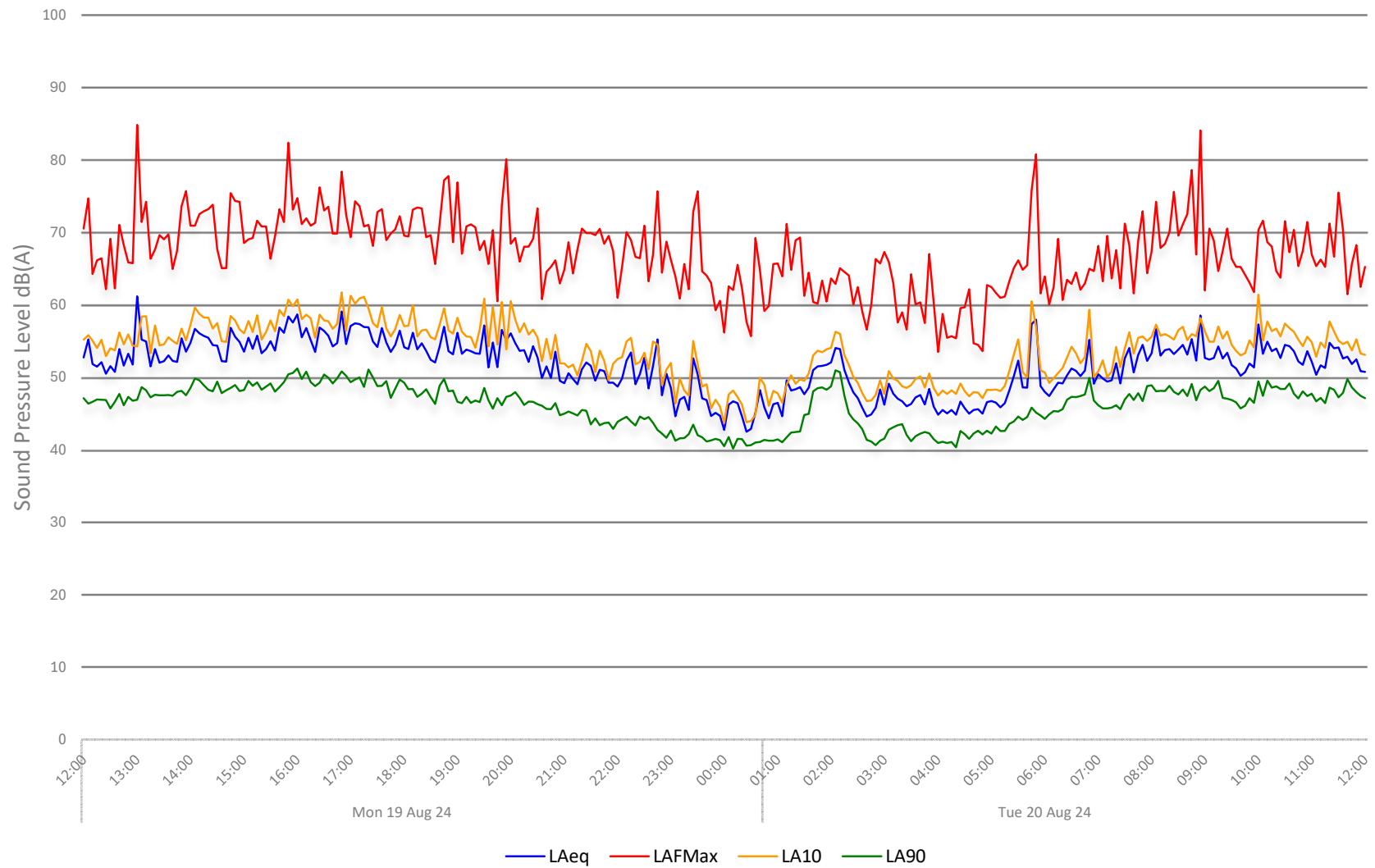


59 Leigh Road, Eastleigh

Environmental Noise Time History: 4



Figure VA5420/TH4

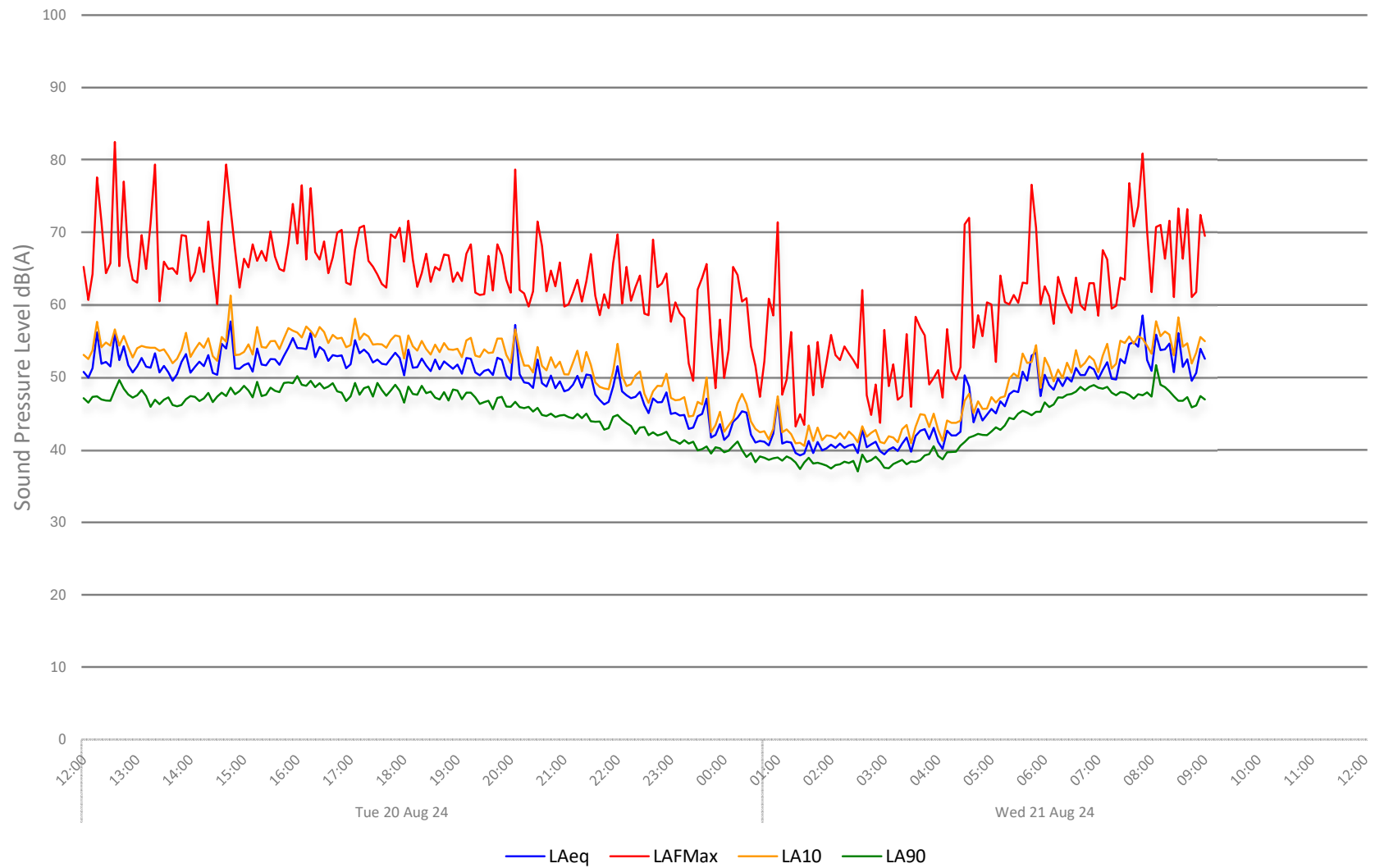


59 Leigh Road, Eastleigh

Environmental Noise Time History: 5

 **VENTA** ACOUSTICS

Figure VA5420/TH5



APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.1 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 . 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).
L_{eq} :	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.

1.2 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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APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.3 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.

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

Appendix B

Sample Noise Complaint Log Sheet

Date	Time	Staff Name	No. of Staff & Users	Complainant			Details			Response Details ¹
				Name	Address	Phone/email	Description ¹	Duration	Solution?	

¹ Attach noted and email correspondence as appropriate