PREPARED: 08 May 2025

152-162 HIGH STREET, YIEWSLEY

ACOUSTIC ASSESSMENT

CONTENTS

LIST OF ATTACHMENTS

Project Ref:	AS14037	**Project Name:**	152-162 High Street, Yiewsley
Report Ref:	AS14037.250507.R1	**Report Title:**	Acoustic Assessment
Client Name:	Smith Jenkins		
Project Manager:	Ian MacArthur		
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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 the potential acoustic impacts associated with the change of use of the existing offices (Use Class E) to a Place of Worship (Use Class F1(F)) at 152-162 High Street, Yiewsley.

1.2 Environmental noise survey data has been used to quantify the acoustic impact of potential worship activity noise egress and external plant noise emissions to the nearest affected noise sensitive receptors.

1.3 Limiting noise levels for which amplified speech associated with prayer activity can be accommodated have been predicted. Results show the upper limit of allowable internal noise levels during the most sensitive early morning periods is comfortably above that which would likely be required for proposed activities. Adverse impact from worship activity is, therefore, unlikely.

1.4 Noise emissions from fixed external plant proposals have been assessed following procedures in BS4142:2014+A.1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142). The resultant rating level has been calculated as -5dB at 160 High Street and 150 High Street respectively, for the most sensitive operational period (05:00 – 07:00).

1.5 Compliance with the local authority planning guidance for plant noise emissions has been demonstrated, no further mitigation measures are required.

2.0 INTRODUCTION

2.1 Clarke Saunders Acoustics (CSA) has been appointed to conduct an acoustic assessment of the proposed change of use of existing offices (Use Class E) to a Place of Worship (Use Class F1) at 152-162 High Street, Yiewsley.

2.2 Environmental noise survey data will be used to quantify and describe the existing sound climate at the site vicinity. This will allow the future influence of worship activity be described, based on information provided by the architect.

2.3 Plant noise criteria will be set and the acoustic impact of fixed plant proposals assessed in accordance with BS4142:2014+A.1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142).

2.4 A summary of the acoustic terminology used throughout this report is provided at Appendix A.

3.0 DESCRIPTION OF SITE & PROPOSALS

3.1 The site is situated on Yiewsley High Street, in a mixed commercial and sub-urban area adjacent to Yiewsley Recreation Ground.

3.2 The site sits between Falling Lane and Fairfield Road. Residential dwellings are situated to the north and east of site, commercial uses lay to the south on the high street and a mix of commercial and industrial uses are sited to the west of site.

3.3 The proposals involve the change of use of the existing office building to a Place of Worship (Use Class F1), comprising a mix of prayer, class and multifunctional rooms spread across the building, with the main prayer hall situated at first floor, overlooking the high street.

3.4 As part of the change of use, acoustic enhancements are to be made to the building façades to improve the sound reduction performance. Existing rooflights will be removed and replaced with a solid roof element to consist of rigid insulation installed between the existing rafters and covered with insulated plasterboard. The existing single pane glazed windows to the main prayer hall will be replaced by either sealed double glazed units or fitted with internal secondary glazing. External doors will be fitted with suitable exterior perimeter weather seals.

3.5 The place of worship will be serviced by an existing car park to the rear of the property. Three new condenser units are proposed to be installed at roof level.

3.6 Proposed operating hours are belikely to range between 05:00am and 22:00pm.

3.7 Typical activities and proposed management controls are understood to comprise the following;

3.8 Five prayers through the day, each lasting approximately 5-10 minutes, within the following time periods; Morning prayer between 05:00 and 07:00, with remaining prayers occurring between 11:00 and 22:00. The specific times of prayer within these time periods will vary depending on the season.

3.9 Prayers would typically be led by the Imam from the 1st floor main prayer hall. The Imam would use a microphone which is linked to an internal sound system playing to further congregations in the ground floor Prayer room and Multifunction room.

3.10 The sound system volume will be set at an appropriate level in each zone/space such that it is audible in each space but need not be at a high volume

3.11 Control and limiting of the sound system volume will be accessible only by the management, through password protected equaliser systems, to prevent inappropriate or unauthorised adjustment.

3.12 The site and surroundings are shown in the site plan AS14037/SP1.

4.0 LOCAL AUTHORITY REQUIREMENTS

4.1 Hillingdon Council , in association with Hounslow and Richmond upon Thames, has relevant guidance in their Supplementary Planning Document (SPD): *Development Control for Noise Generating and Noise Sensitive Development* (2016).

4.2 PLANT NOISE CRITERIA

4.2.1 Section 6.2, concerning noise impacts from fixed mechanical plant, states that an assessment should be undertaken in accordance with BS4142:2014 *Methods for rating and assessing industrial and commercial sound* to achieve the following external noise standards at the nearest noise sensitive receptors, given in Table 4.1.

NOISE IMPACT FROM RELEVANT PROPOSED...PLANT	DEVELOPMENT OUTCOME
Rating Level ($L_{Ar,Tr}$) is at least 5dB(A) below the Background Level L_{A90}	Normally acceptable
Rating Level ($L_{Ar,Tr}$) is no more than 5dB(A) above the Background Level L_{A90}	Acceptable only if there are overriding economic or social reasons for development to proceed
Rating Level ($L_{Ar,Tr}$) is more than 5dB(A) abovethe Background Level L_{A90}	Normally unacceptable

Table 4.1: London Borough of Hillingdon SPD external plant noise standards

4.2.2 For the purposes of the assessment, CSA propose use of the updated BS4142 assessment methodology (BS4142:2014+A.1:2019) targeting a criteria of at least 5dB below the existing background noise level.

4.3 NOISE FROM PLACES OF WORSHIP

4.3.1 The Hillingdon Council SPD does not contain specific guidance relating to noise impacts from places of worship, therefore reference has been made to Section 7.0 of the SPD, *Places of Entertainment, to* provide suitable criteria.

4.3.2 Section 7.0 states that the calculated entertainment noise level (in this case from worship activities) at 1 metre from the façade of the nearest noise sensitive premises should be controlled to a range of -5dB to +3dB, between the hours of 11pm to 9am, when compared to the existing ambient or background noise level.

4.3.3 It is also stated that, between the hours of 9am to 11pm (i.e. daytime) the calculated noise level should be controlled to a range of 0dB to +5dB when compared to the existing ambient or background noise level; acoustic calculations will be undertaken following the criteria given above (in section 4.3.2), representing a robust design case.

4.3.4 Achieving these entertainment noise guidance levels for potential noise breakout from the place of worship is not likely to give rise to any adverse noise impacts.

5.0 ENVIRONMENTAL NOISE SURVEY

5.1 PROCEDURES & EQUIPMENT

5.1.1 A survey of the ambient and background noise levels has been undertaken at the location shown in the attached site plan AS14037/SP1.

5.1.2 Measurements of consecutive 5-minute L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels were taken between 15:00 hours on Friday 25th April and 11:30 hours on Tuesday 29th April 2025.

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

- Rion data logging sound level meter type NL53;
- Rion sound level field calibrator type NC74;

5.1.4 The calibration of the sound level meter was verified before and after use. No significant calibration drift was detected (≤0.5dB). All equipment has current certified laboratory calibration, which is available on request.

5.1.5 The weather was generally dry with moderate winds, suitable conditions for the measurement of environmental sound.

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

5.2 SURVEY RESULTS & PLANT NOISE CRITERIA

5.2.1 Figures AS13370/TH1-TH5 show the sound pressure levels as time histories at the monitoring position. Due to site restrictions, the monitoring location was within 1 metre from the nearest external wall, therefore representing a façade noise level.

5.2.2 To present the free-field noise levels, a facade correction of -3dB has been applied to the measured levels . These levels are suitably representative of those at the window of the nearest noise sensitive dwellings.

5.2.3 Free-field results from the environmental noise survey are summarised in Table 5.1.

MONITORING PERIOD	AVERAGE $L_{Aeq,5mins}$	TYPICAL* BACKGROUND L_{A90}	AVERAGE MAXIMUM L_{AFmax}
07:00 – 23:00 hrs	63 dB	43 dB	75 – 82 dB
23:00 – 07:00 hrs	56 dB	34 dB	71 – 75 dB
Operating Hours 05:00 – 22:00 hrs	64 dB	42 dB	75 – 82 dB
Early Morning 05:00 – 07:00 hrs	58 dB	36 dB	74 – 77 dB

Table 5.1: Summary of corrected, free-field environmental noise survey data [dB ref. 20µPa]
**typical background derived from the 10th percentile of the measured L_{A90} dataset*

5.2.4 The ambient sound climate during core daytime hours is primarily determined by road traffic on the High Street, whilst the sound climate during early morning/late evening periods is primarily determined by more distant sources such as the wider road network (M25 to the west), and the Elizabeth Line to the south.

5.2.5 Based on environmental noise survey data and targeted Local Authority guideline criteria, the external plant noise criteria is summarised below in Table 5.2.

MONITORING PERIOD	TYPICAL* BACKGROUND L_{A90}	PLANT NOISE CRITERIA
07:00 – 23:00 hrs	43 dB	L_{Aeq} ≤ 38 dB
23:00 – 07:00 hrs	34 dB	L_{Aeq} ≤ 29 dB

Operating Hours 05:00 – 22:00 hrs	42 dB	$L_{Aeq} \leq 37$ dB
Early Morning 05:00 – 07:00 hrs	36 dB	$L_{Aeq} \leq 31$ dB

Table 5.2: Plant noise criteria [dB ref. 20μPa]
**typical background derived from the 10th percentile of the measured L_{A90} dataset*

6.0 PREDICTED NOISE IMPACT

6.1 EXTERNAL CONDENSING PLANT

6.1.1 The proposed condensing plant, to be installed at roof level as shown in the site plan, has been confirmed as the following:

- 3 no. Mitsubishi SUZ-M50VAR2 Inverter Heat Pumps

6.1.2 Sound data for the mechanical plant has been confirmed by the manufacturer, given as an overall sound pressure level, shown below in Table 6.1.

FREQUENCY (Hz)	SPL @ 1m
SUZ-M50VAR2 Cooling	48 dB(A)
SUZ-M50VAR2 Heating	49 dB(A)

Table 6.1: Source noise data [dB ref. 20μPa]

6.1.3 It has been assumed that the operation of the building services plant will coincide with that of the operating hours of the premises. i.e. 05:00 to 22:00 hours.

6.1.4 Residential receptors in the vicinity have been determined from on-site inspections and publicly available council tax information for the surrounding area. This has resulted in the following properties being identified as the most affected noise sensitive receptors:

- No. 160 High Street 1st floor rear window
- No. 150 High Street 1st floor front window

6.1.5 Calculations have been conducted implementing propagation and building-afforded screening losses based on the architect drawings provided. The plant is not anticipated to be notably tonal or intermittent at the receptor locations.

6.1.6 The overall predictions are given in Table 6.2.

RECEPTOR	PREDICTED NOISE LEVEL	CRITERION*	BS4142 RATING LEVEL
160 High Street	26 dB(A)	Early Morning: $L_{Aeq} \leq 31$ dB	-10 dB
150 High Street	23 dB(A)		-13 dB

Table 6.2: Predicted noise levels at the nearest noise sensitive receptors [dB ref. 20μPa]
**05:00 – 07:00 hours provide the most onerous criterion, as night-time operations are not expected*

6.1.7 Calculations have been undertaken for a worst-case scenario, assuming all 3 units are operating at 100% capacity at the same time. In a real-world scenario, it is unlikely all units will be running simultaneously and, therefore, the resultant noise level would likely be lower than the above predictions.

6.1.8 Compliance with the Local Authority requirements has been demonstrated without need for further mitigation measures.

6.2 INDOOR PRAYER & AMPLIFIED SPEECH

6.2.1 Owing to the use of indoor amplified speech as part of the prayer, consideration has been given to the potential acoustic impacts of such activity on the nearest noise sensitive receptors.

6.2.2 Layout drawings show windows on primary prayer rooms are situated on the southern and western façades only, hence the most affected noise sensitive receptor is 150 High Street, circa 6m from the building façade.

6.2.3 Indicative sound insulation testing of the existing façade facing the receptor position was undertaken, although limited by the high ambient noise levels, these tests indicateda basic sound reduction of around R_w 20 dB afforded by the single pane glazing currently in place. It is understood that the existing glazing will either be replaced by sealed double glazed units or fitted with internal secondary glazing. These measures are expected to improve the sound reduction performance of these elements to a minimum of R_w 30 dB.

6.2.4 Calculations have been undertaken incorporating distance propagation losses to the nearest residential window and a minimum sound reduction of R_w 30 dB.

6.2.5 Based on Local Authority guidance and a typical background noise level of 36dB(A) for early morning periods, our calculations suggest that internal noise levels up to L_{Aeq} 82dB could potentially be accommodated in the prayer rooms.

6.2.6 This is well above the level which will likely be required in order for the amplified speech levels from a well distributed sound system to be clearly audible within the prayer rooms.

6.2.7 The sound system, to be installed as part of the change of use, will use a digital equalizer controlled by management only, via a password protected tablet to allow individual control to each zone/prayer room.

6.2.8 Adverse acoustic impact is not expected to arise from the use of amplified speech as part of normal prayer activities within the building, provided that the proposed glazing upgrades are installed and the sound system is suitably managed and controlled.

7.0 CONCLUSIONS

7.1 Clarke Saunders Acoustics has conducted an assessment of the potential acoustic impacts associated with the change of use of the existing offices (Use Class E) to a Place of Worship (Use Class F1(F)) at 152-162 High Street, Yiewsley.

7.2 Environmental noise survey data has been used to quantify the acoustic impact of potential worship activity noise egress and external plant noise emissions to the nearest affected noise sensitive receptors.

7.3 Limiting noise levels for which amplified speech associated with prayer activity can be accommodated have been predicted. Results show the upper limit of allowable internal noise levels during the most sensitive early morning periods is comfortably above that which would likely be required for proposed activities. Adverse impact from worship activity is, therefore, unlikely.

7.4 Noise emissions from fixed external plant proposals have been assessed following procedures in BS4142:2014+A.1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142). The resultant rating level has been calculated as 5dB below the background level at 160 High Street and 150 High Street respectively, for the most sensitive operational period (05:00 – 07:00)..

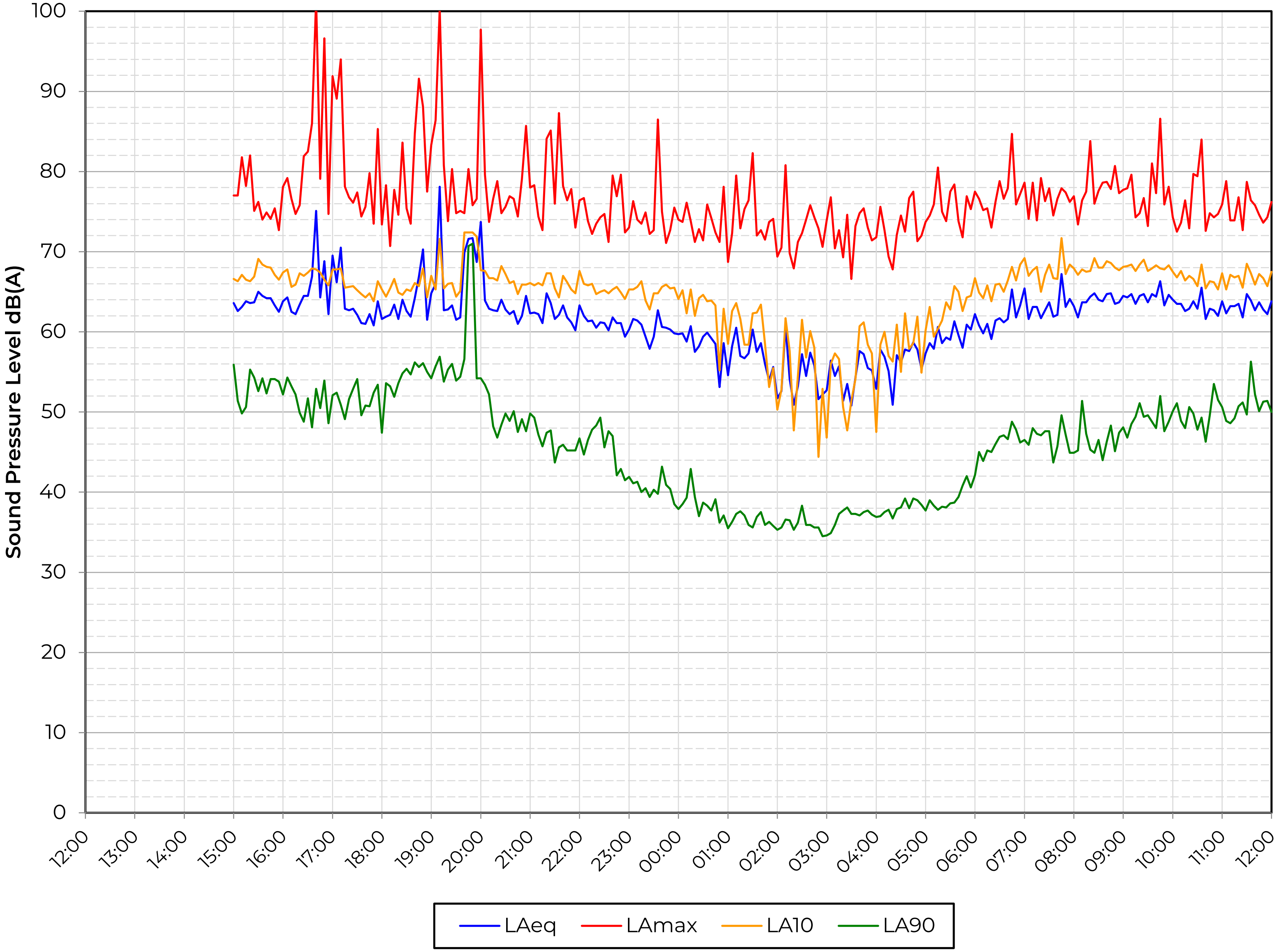
7.5 Compliance with the Local Authority supplementary planning guidance for plant noise emissions has been demonstrated, no further mitigation measures are required.

Ian MacArthur MIOA
CLARKE SAUNDERS ACOUSTICS


N
Site Boundary
Plant Location
Monitoring Location
Noise Sensitive Receptors
High Street
Google

152-162 High Street, Yiewsley

Position 1

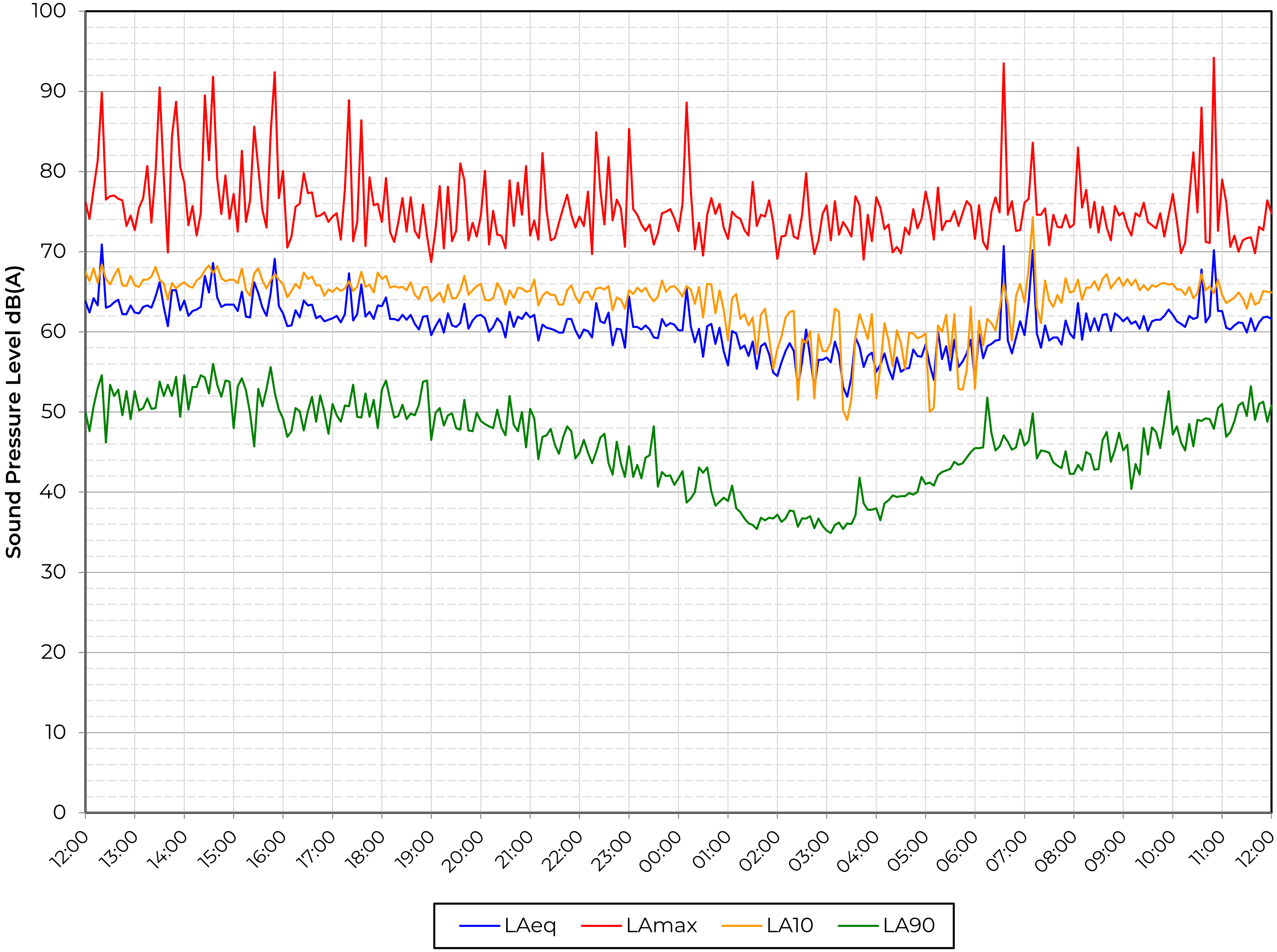


Fri 25 Apr to Sat 26 Apr

Figure AS14037/TH1

152-162 High Street, Yiewsley

Position 1

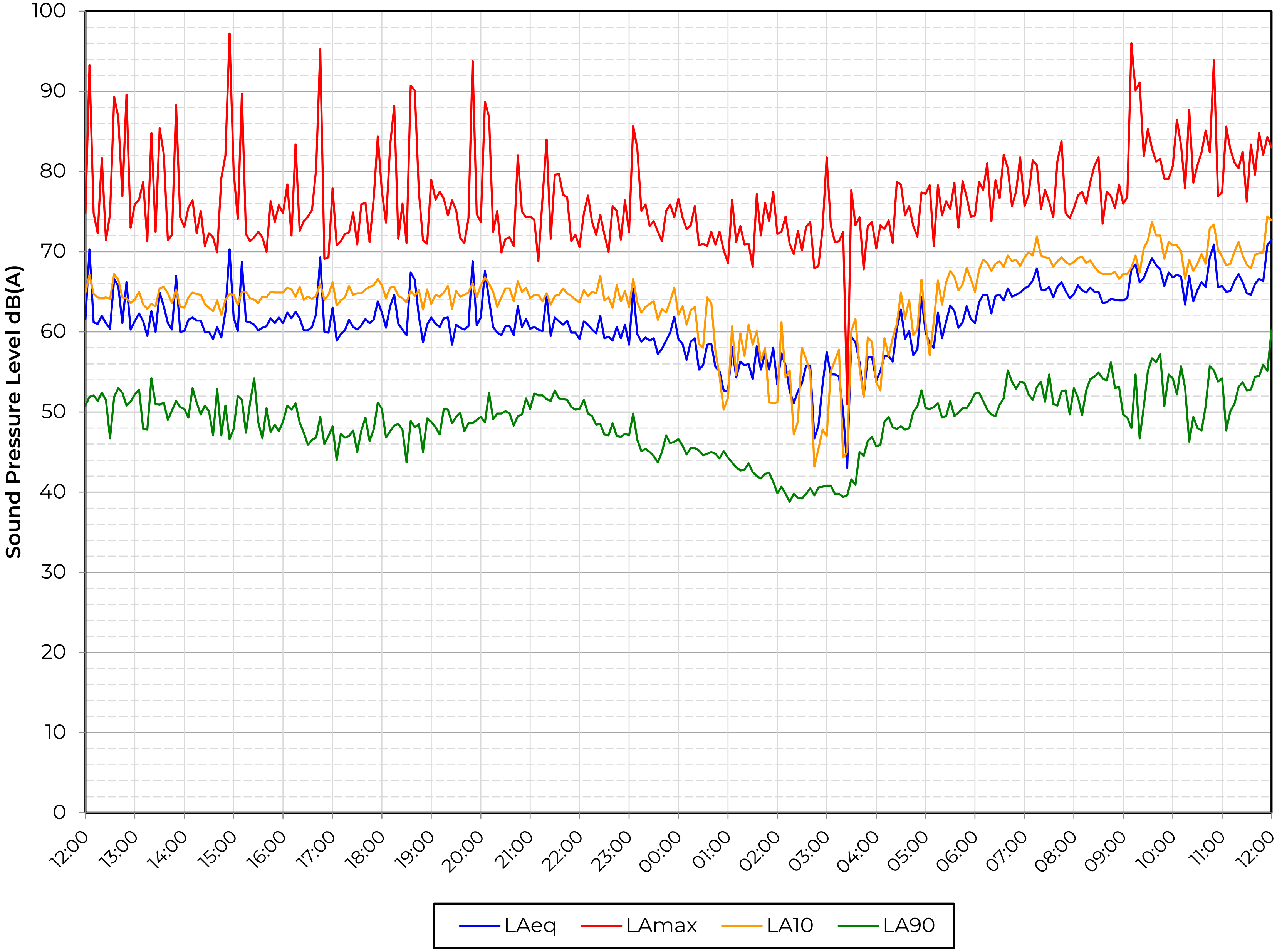


Sat 26 Apr to Sun 27 Apr

Figure AS14037/TH2

152-162 High Street, Yiewsley

Position 1



Sun 27 Apr to Mon 28 Apr

Figure AS14037/TH3

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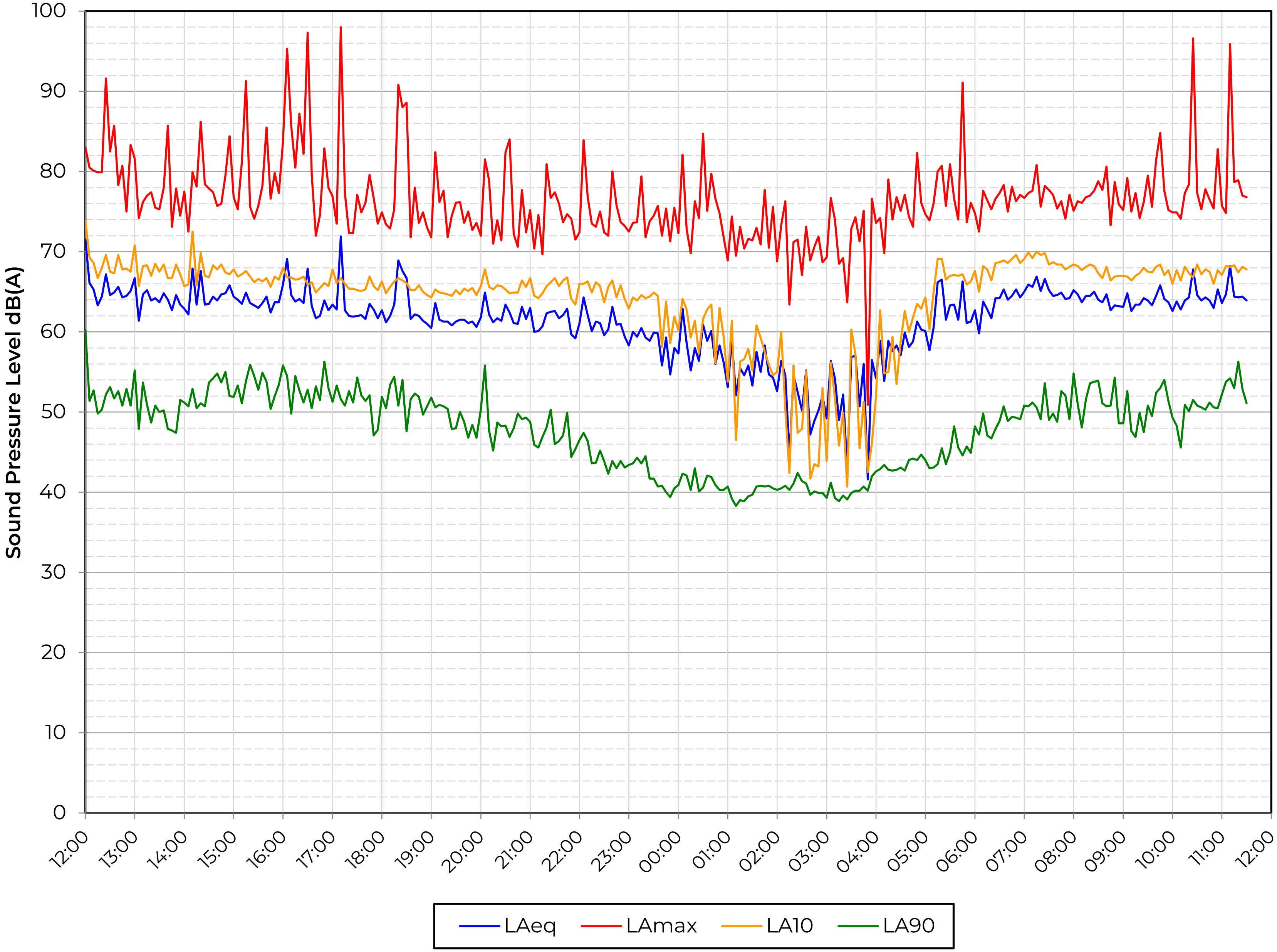
acoustics

152-162 High Street, Yiewsley

Position 1



Mon 28 Apr to Tue 29 Apr

Figure AS14037/TH4

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.
NR	*Noise Rating*. A single figure noise level rating that takes into account the frequency content of an acoustic environment.
R	*Sound Reduction Index*. Effectively the Level Difference of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.
D	The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. D is the arithmetic Level Difference in decibels between the

source and receive sound levels when filtered into frequency bands.

D_{nT}	*Weighted Standardised Level Difference*. As defined in BS EN ISO 717-1, representing the Weighted Level Difference, when standardised for reference receiving room reverberant characteristics.
$D_{n,e}$	Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010.
$D_{n,f}$	Flanking sound insulation of lightweight elements, such as curtain wall mullions, measured in an accredited laboratory test suite in accordance with the procedures laid down in ISO 10848-2:2006
R_w D_w $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$	Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value.
C, C_{tr}	Spectral adaptation terms to be added to a single number quantity such as DnT,w, to take account of the sound insulation within frequency ranges of particular interest.
$L'_{nT,w}$	*Weighted Standardised Impact Sound Pressure Level* as defined in BS EN ISO 717-2, representing the level of sound pressure when measured within a space where the floor above is under excitation from a calibrated tapping machine, standardised for the receiving room reverberant characteristics.
ΔL_w	Change in impact sound pressure level when a floor is fitted with a 'soft' or resilient covering, as measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-3:2010.

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.