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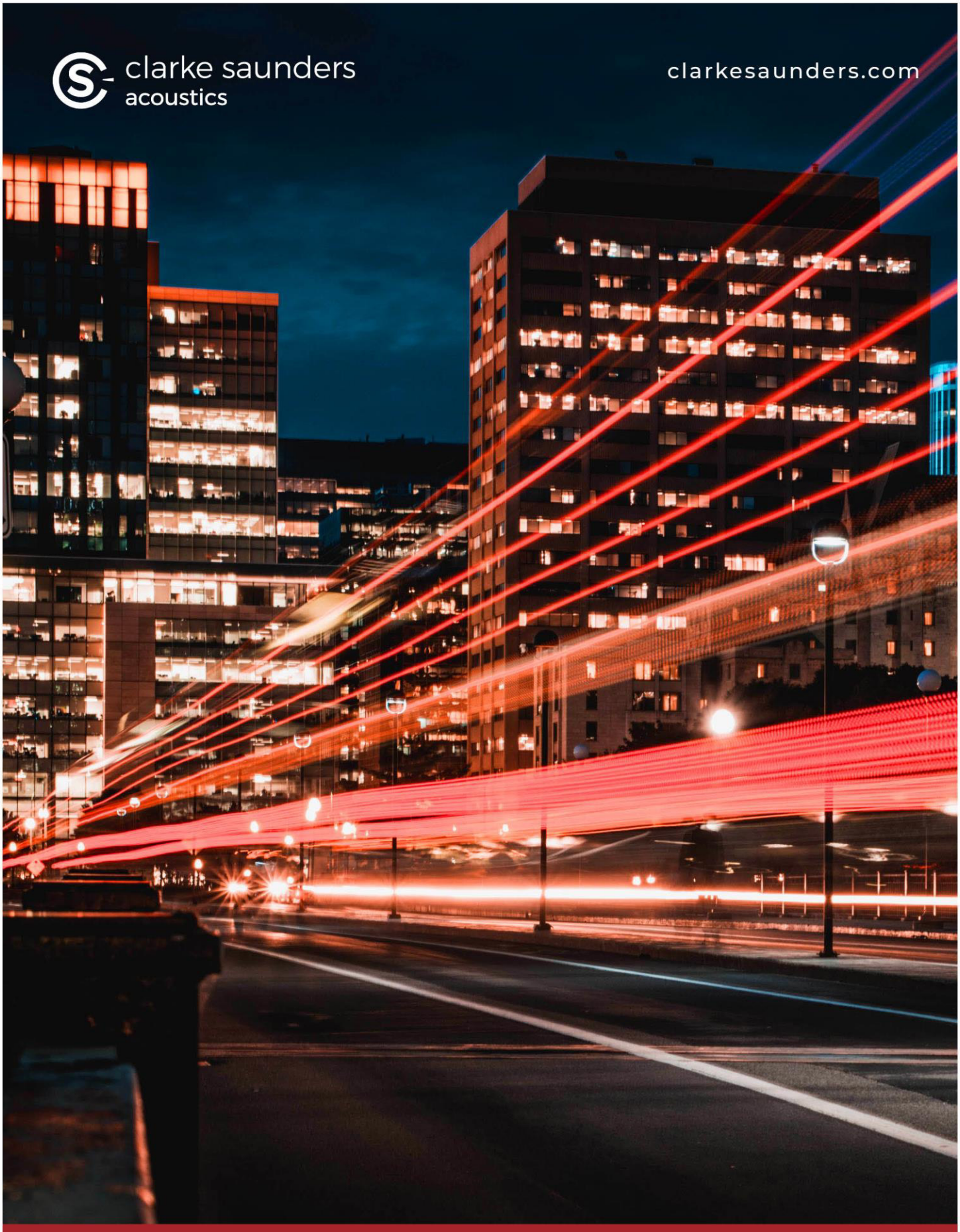

PREPARED: Tuesday, 23 April 2024

TGG LONDON 115 FINCHLEY ROAD

OPERATIONAL NOISE MANAGEMENT PLAN

CONTENTS

LIST OF ATTACHMENTS

Project Ref:	AS13377	Title:	TGG London 115 Finchley Road
Report Ref:	AS13377.240418.R1.1	Title:	Operational Noise Management Plan
Client Name:	The Gym Ltd		
Project Manager:	Ben Dymock		
Report Author:	Ben Dymock		

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1.0 EXECUTIVE SUMMARY

1.1 The Gym Ltd recognises its responsibility to the local community to operate its gyms without disturbing or causing annoyance to its neighbours.

1.2 This report has been prepared by Clarke Saunders Acoustics to form part of a planning application for use of the premises at 115 to 121 Finchley Road, London, NW3 6HY as a 24/7 gym.

1.3 The report details physical measures and managerial policies to be implemented to suitably manage the environmental effects of airborne and structure-borne noise and vibration transmission into the above residential properties, operational noise breakout from the building, and building services noise emissions.

1.4 Where necessary, mitigation measures will be determined according to planning controls set by Camden Council.

2.0 INTRODUCTION

2.1 The Gym Ltd (TGG) intends to occupy the ground and basement floor units located at 115-121 Finchley Road, London for use as a 24/7 gym.

2.2 TGG recognises its responsibility to the local community to operate its gyms without disturbing or causing annoyance to its neighbours. This primarily means controlling noise disturbance. As such, this report has been instructed to support the proposed hours of operation and demonstrates the measures that will be adopted to ensure that operation of the gym does not adversely affect nearby receptors.

2.3 Acoustic issues arising from the gym would primarily be limited to airborne and structure-borne noise and vibration transmission into the above residential properties, operational noise breakout from the building, and building services noise emissions. Noise from reasonable external activity from the members and staff is therefore not expected to disturb occupants of nearby residential properties.

2.4 This report details physical measures and policies to be implemented to suitably manage the environmental effects associated with the proposed gym operation.

2.5 Atmospheric plant noise emissions associated with new external plant items will be assessed following procedures in BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* in line with the requirements set out in the 'Camden Local Plan 2017', which also makes reference to the 'National Planning Policy Framework' and 'Planning Practice Guidance'.

3.0 GENERAL DEFINITIONS

3.1 Neighbours:

3.1.1 The term 'neighbour' in the context of this document refers to any resident of the community whose amenity could be affected by operation of the gym.

3.1.2 In this case, the closest neighbours are the residential properties situated above units 115-121 Finchley Road.

3.2 Staff:

3.2.1 All employees, contractors or casual labour under the direct control of the gym's management, including management personnel.

3.3 Gym Members:

3.3.1 This refers to all non-staff users of the gym.

4.0 CONTROL OF POTENTIAL NOISE EFFECTS

4.1 It is understood that identification and recognition of potential causes of disturbance assist greatly in planning to avoid difficulties with neighbours. Management of operational noise as well as that from patrons/staff accessing the premises should, therefore, be considered and assessed to satisfy the requirements of Camden Council.

4.2 TRANSMISSION TO ABOVE RESIDENTIAL

Weight Impact Noise & Vibration Transmission

4.2.1 In line with gym brand standards and guidance in *ProPG: Gym Acoustics Guidance March 2023* [GAG], the gym shall control noise and vibration transfer from gym activities such that it does not exceed NR(G)20 within the adjacent residential living areas when measured with a precision grade sound level meter set to "fast" meter response. Vibration from gym activity will be controlled to 15mm/s^2.

4.2.2 The following matting build-ups will be installed, found capable of controlling noise and vibration from typical gym activities to project targets within the residential areas above:

Functional Zone [Ground Floor]

- 12mm Sportec Roll; over
- 1 no. layer of 20mm TVS Vibsorb 20; over
- 1 no. layer of 17mm TVS Vibsorb 10; over
- TVS Resi-Dry Floating Floor.

Free Weights Area [Lower Ground Floor, rear of unit]

- 40mm TVS Sportec Tile; over
- 1 no. layer of 20mm TVS Vibsorb 20; over
- 1 no. layer of 17mm TVS Vibsorb 10.

Resistance Equipment

4.2.3 Pin loaded resistance equipment will be fitted with isolating washer collars.

4.2.4 8-stack, cable machines and plate loaded equipment will be located on free weight flooring systems as described above.

4.3 FIXED EXTERNAL PLANT

Anticipated Plant Scheme

4.3.1 It is understood that several mechanical plant items will provide heating / cooling and ventilation to the premises after fitout. Specific details, including unit numbers and manufacturer / model selections, will be at the preference of the design contractor but TGG currently anticipates the following, or a similar scheme:

- 1 no. Swegon air handling unit type Gold RX
- 5 no. Mitsubishi heat pump units type PUZ-M250YKA
- 1 no. Mitsubishi hot water heat pump unit type QAHV-N560YA
- 1 no. Mitsubishi air conditioning unit type PURY-P500

4.3.2 The manufacturer of the heat pump units has published sound pressure levels, measured at one metre. These data are presented in Table 1. It has been confirmed that PUZ-M250YKA units will operate with a night-time setback setting, which reduces the overall sound pressure level to $L_{Aeq,T}$ 58 dB.

UNIT	FREQUENCY (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
PUZ-M250YKA, Heating	72	63	62	61	55	53	49	43	62
QAHV-N560YA	71	58	59	56	52	49	44	39	58

Table 1: Heating plant sound pressure levels at 1 metre [dB ref. 20µPa]

4.3.3 The manufacturers of the air conditioning unit and air handling unit (AHU) have confirmed the following sound power levels. AHU levels assume operation at maximum duty.

UNIT	FREQUENCY (Hz)							
	63	125	250	500	1k	2k	4k	8k
PURY-P500, Heating	81	80	80	79	79	76	75	68
Gold RX Intake	75	74	72	59	57	55	50	49
Gold RX Exhaust	81	77	85	82	82	77	72	69
Gold RX Casing	73	65	58	62	47	46	43	46

Table 2: Cooling/ventilation plant sound power levels [dB ref. 10^{-12}w]

4.3.4 The plant will be installed internally within a dedicated lower ground floor plantroom that will be louvred through the southern façade of the building envelope.

Assessment

4.3.5 The most affected receptors with regards to the proposed plant louvre are the residential windows, approximately 10m to the south of units 115-121 Finchley Road, along Dobson Close.

4.3.6 Atmospheric plant noise emissions associated with new external plant items will be assessed following procedures in BS4142:2014+A1:2019 Methods for rating and assessing

industrial and commercial sound in line with the requirements set out in the 'Camden Local Plan 2017', which also makes reference to the 'National Planning Policy Framework' and 'Planning Practice Guidance'.

4.3.7 An environmental noise survey was undertaken[1] between 10th January and 12th January 2024, to determine the prevailing background sound pressure levels over the most acoustically-sensitive times of day (07:00 – 23:00 hours) and night (23:00 – 07:00 hours). The monitoring position for this survey is indicated in attached figure AS13377/SP1. Survey data is presented as environmental noise time histories in attached figures AS13377/TH1 – TH2. The ambient and typical lowest background sound pressure levels for each period have been determined to be:

- $L_{Aeq,16hr}$ 56 dB during the daytime;
- $L_{Aeq,8hr}$ 52 dB during the night-time;
- $L_{A90,5min}$ 45 dB during the daytime;
- $L_{A90,5min}$ 38 dB during the night-time.

4.3.8 The plant room aperture will be made of an acoustically rated louvre to provide the following minimum insertion losses, which are indicative of a 300mm deep acoustic louvre:

	FREQUENCY (Hz)							
	63	125	250	500	1k	2k	4k	8k
Minimum Insertion Loss	6	7	10	12	18	18	14	14

Table 3: Minimum insertion losses for plant room louvre

4.3.1 In-duct attenuation will be installed on the exhaust side of the anticipated AHU selection in order to ensure that levels are suitably limited at the most-affected receptors to offer the following minimum insertion losses:

MINIMUM INSERTION LOSS	FREQUENCY (Hz)							
	63	125	250	500	1k	2k	4k	8k
Exhaust ductwork (indicative of 40% FA, 900mm length silencer)	4	7	13	19	23	23	16	13

Table 4: Minimum insertion losses for in-duct silencers

4.3.2 All rotating plant, e.g. fans and pumps, will be installed on appropriate anti-vibration mountings and all connected piping and ductwork will be isolated as required to control vibration.

[1] following procedures in BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* and BS 7445:1991 (ISO1996-2:1987) *Description and measurement of environmental noise Part 2- Acquisition of data pertinent to land use*

4.3.3 On the basis of plant layout drawings and the noise data described in Tables 1 and 2, cumulative plant noise emissions at the nearest receptor are predicted not to exceed $L_{Aeq,T}$ 33 dB during either the daytime or night-time.

4.3.4 These predicted levels are equivalent to a BS4142 Assessment Level of -12 and -5, for daytime and night-time, respectively. This is a strong indication of the plant selections having a low impact at the receptors, resulting in green (LOAEL) and the lower range of amber (LOAEL to SOAEL) noise risk in line with Camden Council's requirements.

4.3.5 A summary of the calculations is shown in Appendix B.

4.4 OPERATIONAL NOISE BREAKOUT

4.4.1 The units at 115-121 Finchley Road, London, are single height spaces. The facades are of a brickwork construction and the eastern facade frontage along Finchley Road is glazed.

4.4.2 There are currently emergency exits both at lower ground and ground floor levels, on the eastern and southern facades respectively with metal roller shutters located on the eastern facade. To control noise breakout via these potential acoustic weak points in the facade, gym layout has been orientated so that these areas will primarily be lobbied away from noise activity within the gym. One fire door will remain accessible directly from the main gym area on the southern facade although will remain closed during gym operation.

4.4.3 A portal entrance system will be integrated into the gym design, lobbying the gym entrance, providing an acoustic buffer zone away from gym activity to minimise noise breakout via the entrance onto Finchley Road. The remainder of the frontage will be glazed. There is a covering that extends over the main entrance that will also provide a good level of acoustic screening between the gym facade and residential windows above.

4.4.4 Amplified music is not played at a high volume within TGG premises, however the rhythmic nature of the background music that is played should be considered. From data obtained at other TGG sites, average reverberant noise levels of $L_{Aeq,5min}$ 70dB to 73dB and maximum levels of up to around $L_{AF,max}$ 85dB are typical inside the gym.

4.4.5 The entertainment system within the gym will incorporate an electronic music limiter to constrain the volume to levels of this magnitude. The limiter will be set prior to opening and, thereafter, locked away to prevent unauthorised tampering.

4.4.6 Given the current degree of sound insulation offered by the building envelope, the gym layout, orientation and anticipated source noise, resultant levels at the most affected dwellings are expected to reach L_{Aeq} 23 dB / $L_{Amax,fast}$ 35 dB at the closest receptor windows on Dobson Close and L_{Aeq} 22 dB / $L_{Amax,fast}$ 35 dB at residential windows above the gym frontage on Finchley Road.

4.4.7 The predicted levels are below the background noise levels measured at site and although may still slightly exceed the very lowest night-time background levels,

resultant internal levels in receptor bedrooms via partially open windows[2] would be generally inaudible to occupants and therefore unlikely to result in sleep disturbance.

5.0 MANAGEMENT CONTROLS

5.1 In order that activity from the gym or its members and staff does not adversely affect nearby residents, the following management controls will also be implemented. The responsibility for this will be assumed by the Duty Manager, although other members of staff may assume the role in the future following suitable training.

5.2 NOISE FROM SERVICING

5.2.1 It is unlikely that the gym will require any regular servicing other than waste collection. TGG will ensure that any servicing or delivery occurs between the hours of 07:00h and 20:00h. Drivers will also be required to switch off engines and vehicle radios during deliveries.

5.3 CCTV

5.3.1 As part of its practice of monitoring member activity, The Gym premises are covered by CCTV with time-stamped video being recorded and stored.

5.3.2 Cameras in the entrance lobby will provide footage of activity immediately outside the entrance and, in conjunction with records of members' keycoded access, can assist in the identification of individuals whose behaviour outside the gym raises any concerns.

[2] Assuming an approximate 15 dB loss as per BS8233:2014, *pp* 64

6.0 COMPLAINTS HANDLING PROCEDURE

6.1 Neighbour complaints will be received via a published contact telephone number which will be answered during gym office opening hours, via answerphone out of hours, or via a dedicated email address. These details will be publicised in the local community prior to opening of the gym. Clear instructions will be given to relevant TGG staff on the procedures for handling complaints politely and respectfully.

6.2 The Duty Manager will keep a timed and dated log will be kept of any complaints, including actions taken and responses given. Other information recorded in the complaints log will include the approximate number of gym members and staff present at the time of the complaint, and any specific activities or conditions considered noteworthy at the time. Any other notes or email communications will be copied, and a record kept in the complaint log folder.

6.3 Gym staff will aim to respond within one working day, but certainly within a week of the complaint being made, with a response/explanation, as well as any future actions or possible improvements that will be implemented to resolve the issue.

6.4 The Gym Ltd will review the frequency of any noise complaints regularly, if necessary, in liaison with the Local Authority, to assess whether further management/control measures are required.

Ben Dymock FIOA
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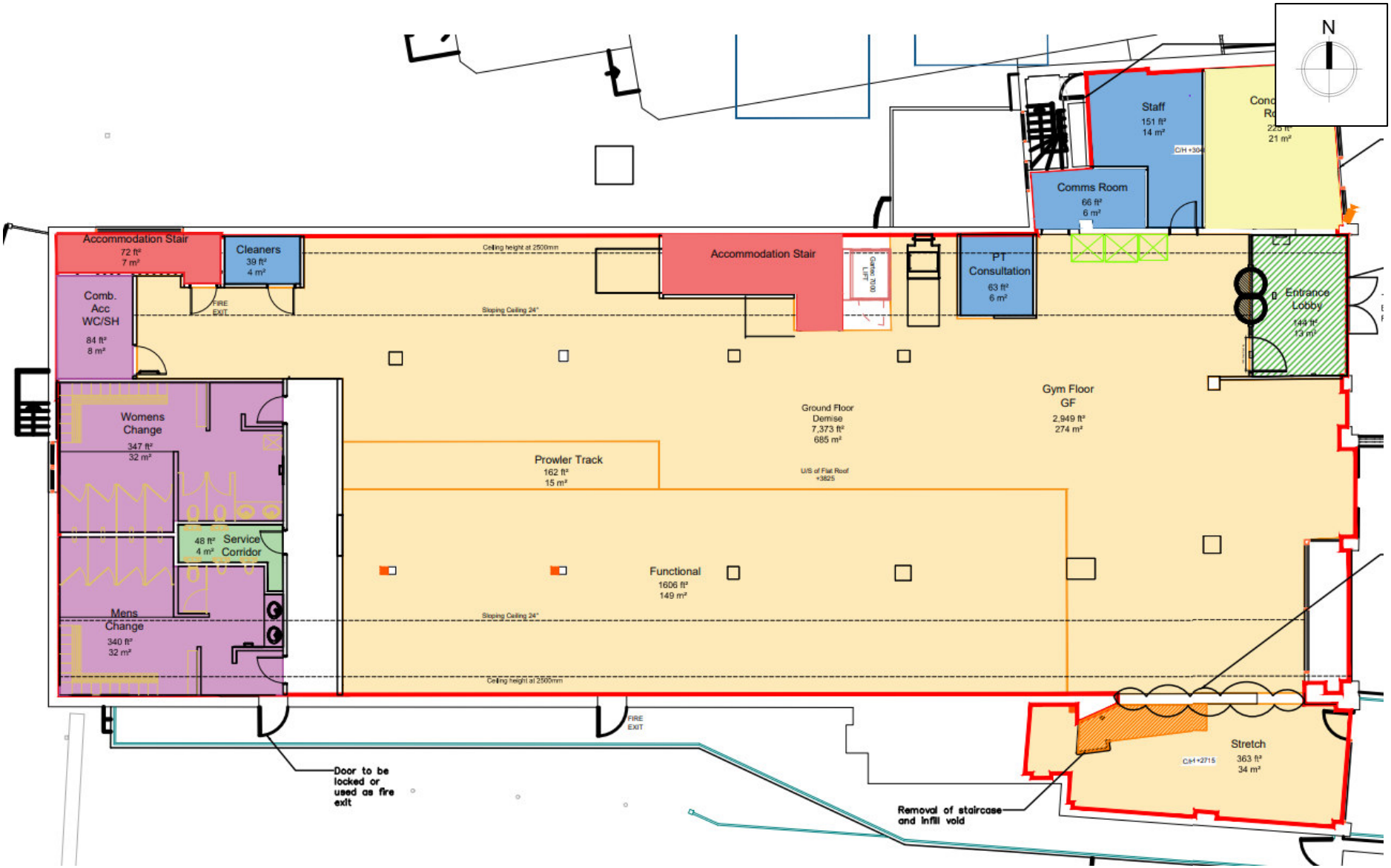

Figure AS13377/SP1

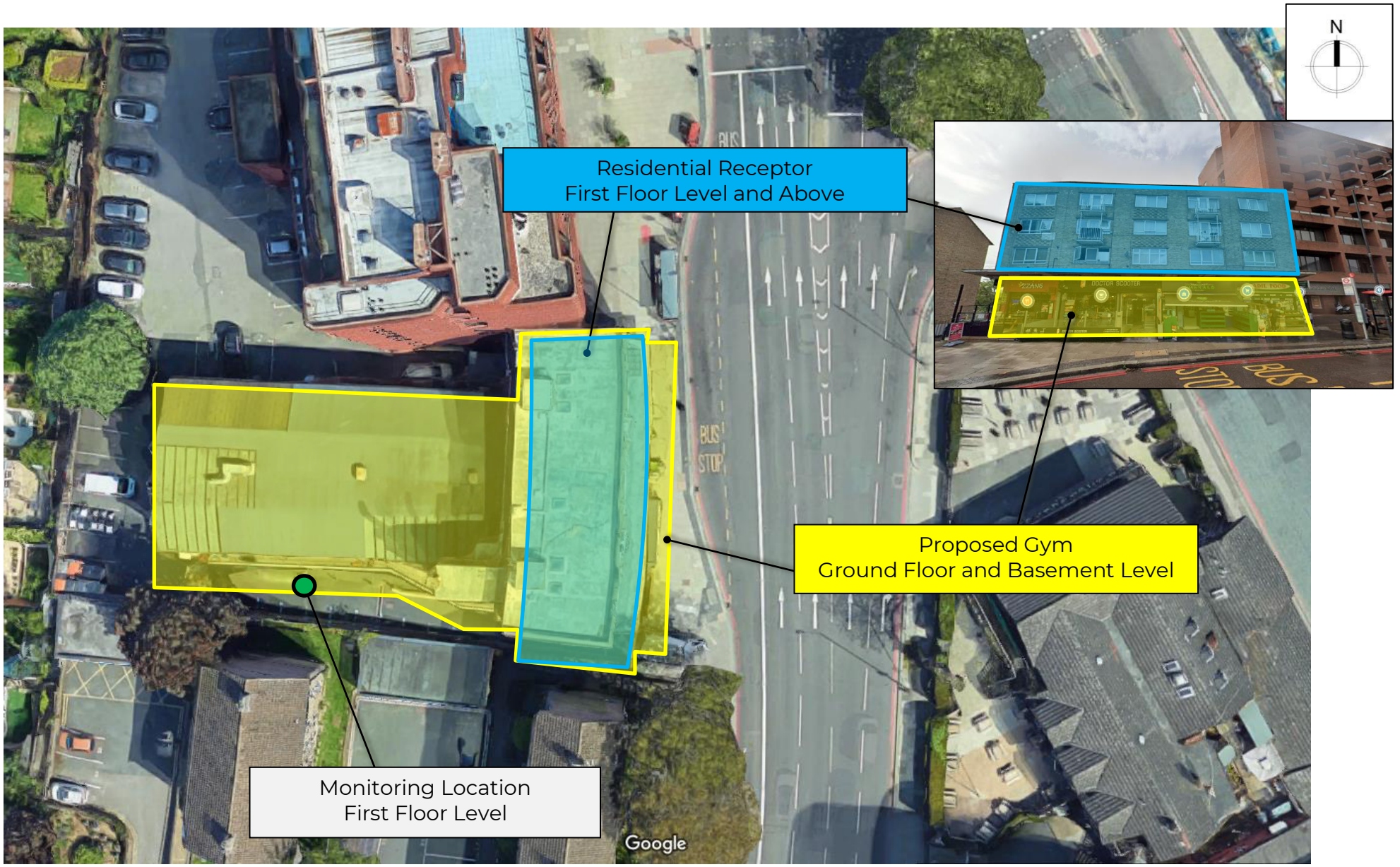

Figure AS13377/SP1

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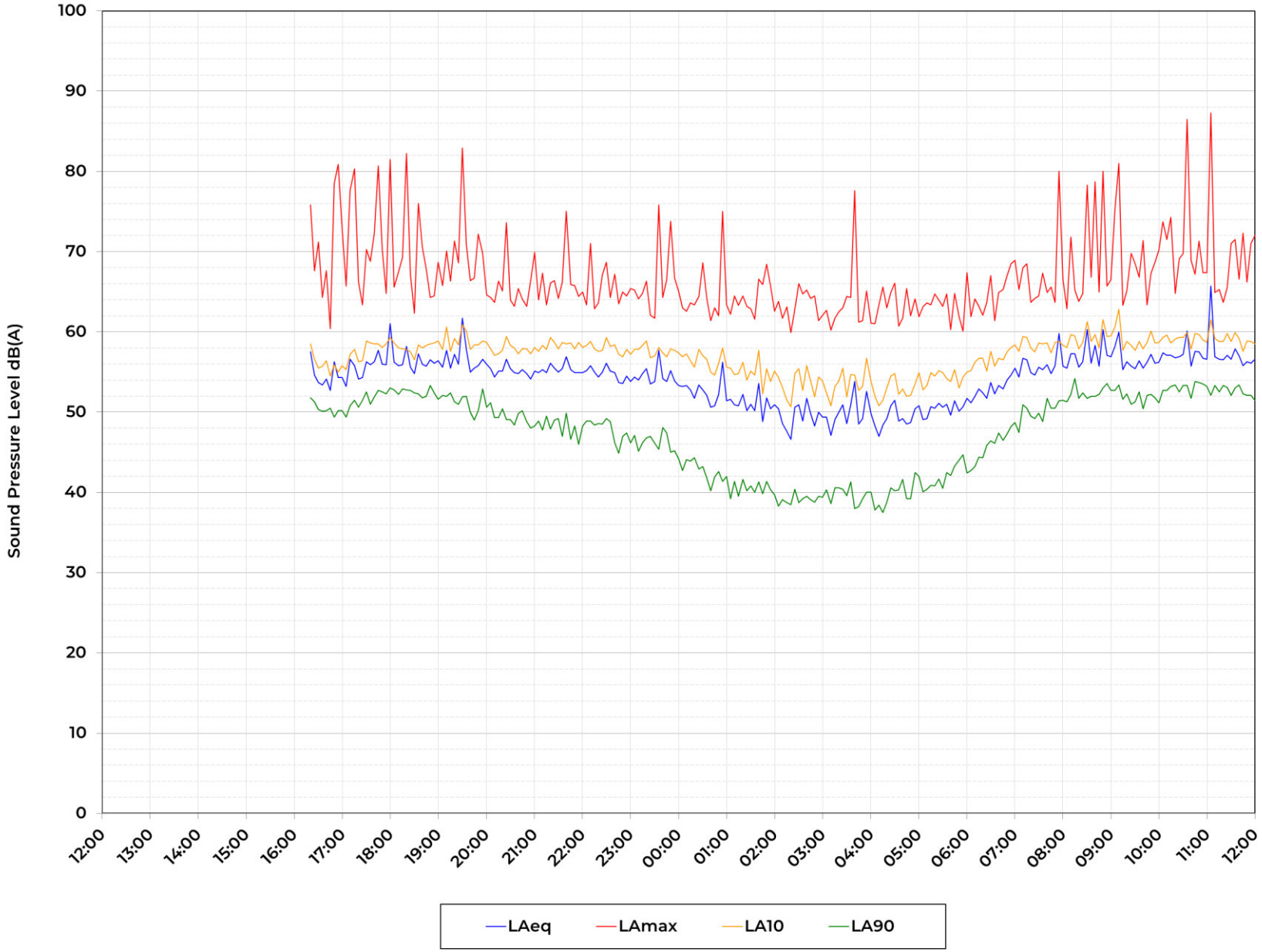
TGG 115 Finchley Rd

Position LT1



Wed 10 Jan to Thu 11 Jan

Figure AS13377/TH1

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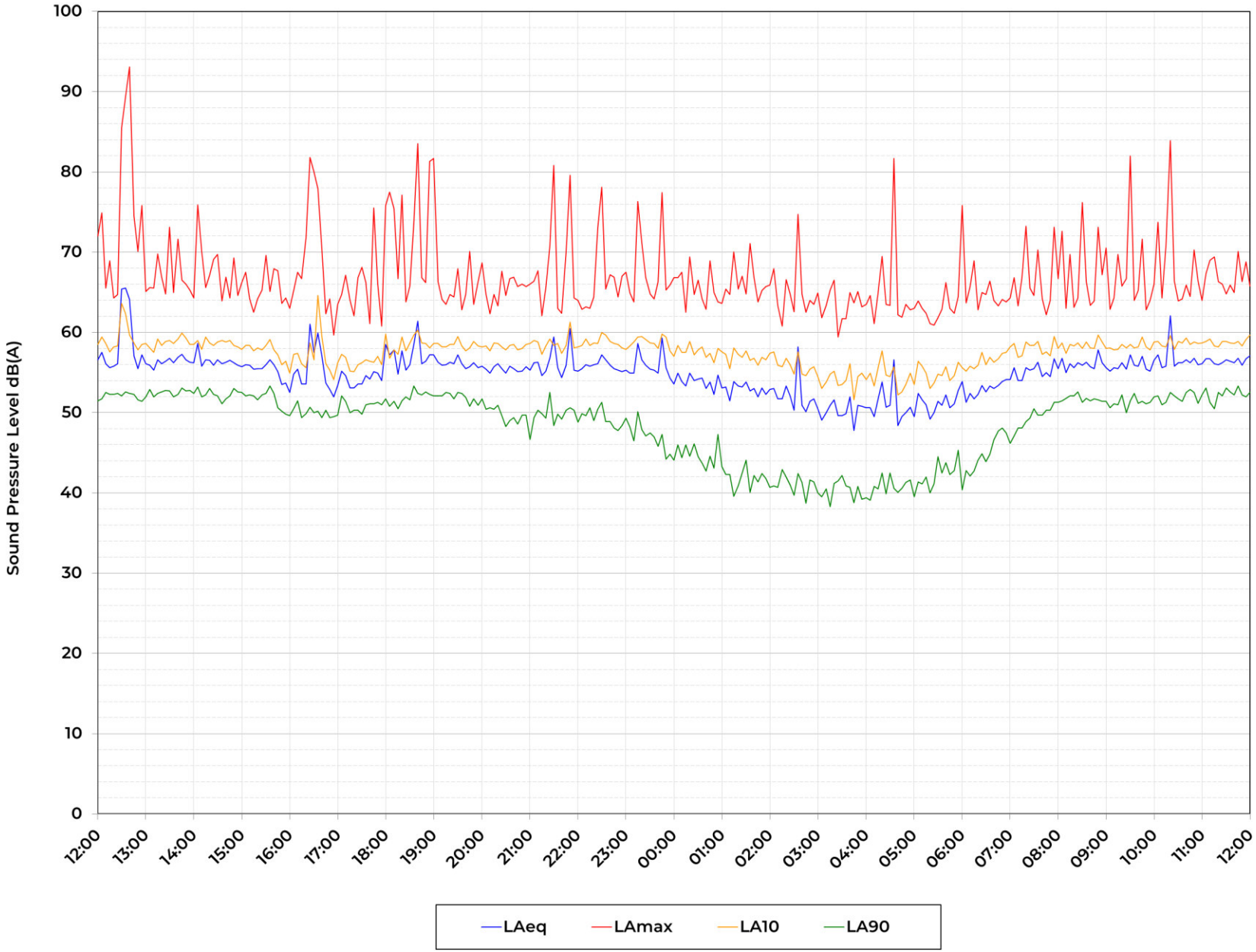
TGG 115 Finchley Rd

Position LT1



Thu 11 Jan to Fri 12 Jan

Figure AS13377/TH2

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.

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APPENDIX B
AS13377
PLANT SOUND CALCULATIONS

Plant Sound to Closest Receptor		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dB(A)
PUZ-ZM250YKAR1 Lw	Lw	80	71	70	69	63	61	57	51	70
Number of	6no	8	8	8	8	8	8	8	8	
	Set Back	-4	-4	-4	-4	-4	-4	-4	-4	
	Subtotal	**84**	**75**	**74**	**73**	**67**	**65**	**61**	**55**	**74**
QAHV-N560YA-HPB(-BS) Lw	Lw	72	59	62	62	61	57	52	47	65
Number of	1no	0	0	0	0	0	0	0	0	
	Subtotal	**72**	**59**	**62**	**62**	**61**	**57**	**52**	**47**	**65**
AHU intake	Lw	76	75	75	64	56	53	49	52	69
Lw to Lp @ 1m	Q = 2	-8	-8	-8	-8	-8	-8	-8	-8	
Attenuation Loss	None	0	0	0	0	0	0	0	0	
Number of	1no	0	0	0	0	0	0	0	0	
	Subtotal	**68**	**67**	**67**	**56**	**48**	**45**	**41**	**44**	**61**
AHU exhaust	Lw	82	77	79	81	78	77	75	75	84
Lw to Lp @ 1m	Q = 2	-8	-8	-8	-8	-8	-8	-8	-8	
Attenuation Loss	40-900	-4	-7	-13	-19	-23	-23	-16	-13	
Number of	1no	0	0	0	0	0	0	0	0	
	Subtotal	**70**	**62**	**58**	**54**	**47**	**46**	**51**	**54**	**59**
AHU Breakout, Lw	Lp @ 0m	72	65	63	63	51	46	40	40	62
Number of	1no	0	0	0	0	0	0	0	0	
	Subtotal	**72**	**65**	**63**	**63**	**51**	**46**	**40**	**40**	**62**
Internal Combined Lw	**Lw**	**85**	**76**	**75**	**74**	**68**	**66**	**62**	**58**	**75**
Direct Contribution at Louvre	**Lp**	**77**	**68**	**67**	**66**	**60**	**58**	**54**	**50**	**67**
Reverberent Contribution[1]	**Lp**	**78**	**70**	**69**	**67**	**62**	**59**	**55**	**52**	**68**
Combined SPL at Louvre	**Lp**	**80**	**72**	**71**	**70**	**64**	**61**	**58**	**54**	**71**
Louvre Attenuation	SL-300	-6	-7	-10	-12	-18	-18	-14	-13	
Combined SWL at louvre face		73	64	60	57	45	42	43	40	**57**
Lw to Lp at louvre		-9	-9	-9	-9	-9	-9	-9	-9	
Directivity[2]		4	5	6	6	6	6	6	6	
Rathe Decay[3]		-21	-21	-21	-21	-21	-21	-21	-21	
Specific sound level at receptor	$L_{eq\ 1hr}$	**48**	**39**	**36**	**33**	**21**	**19**	**19**	**16**	**33**