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Building to the Rear of 26 High Road Wood Green, London

26 July 2023

18109-NIA-02

Noise Impact Assessment

Project Number
18109

Issued For
Mr Sadar Agha

EXECUTIVE SUMMARY

This noise impact assessment has been undertaken in order to assess a proposed bar / restaurant space, shisha balcony and ground floor banqueting space at the Building to the Rear of 26 High Road.

Proposals include amplified music played at an entertainment level within the bar / restaurant, at a high level within the banqueting space, and no amplified music in the shisha balcony area.

A background noise survey has been undertaken as detailed in the report, in order to determine an appropriate noise emission criterion, in accordance with the requirements the London Borough of Haringey and stricter criteria set out to specifically limit low frequency entertainment noise.

Calculations were undertaken for the nearest identified receivers, identified as York House and 24 Whymark Avenue. It should be noted that if there are closer receivers that Clement Acoustics is not aware of, a reassessment will be necessary, and this should therefore be confirmed by the Client.

It has been demonstrated that compliance with the established criterion is feasible, dependent on the following material considerations:

- Receiver locations are as established in this report and marked on the attached site plan.
- The shisha balcony space is to be used between 12:00 and 23:00 only.
- Mitigation is applied as recommended in this report, in the form of
 - Improved glazing at first floor level
 - Ground floor roller-shutters to be infilled with masonry construction.
 - Noise limiters to be installed and set to appropriate levels (anticipated limiting levels are discussed in this report).

If there is any deviation from the above, Clement Acoustics must be informed, in order to establish whether a reassessment is necessary.

Clement Acoustics has used all reasonable skill and professional judgement when preparing this report. The report relies on the information as provided to us at the time of writing and the assumptions as made in our assessment.

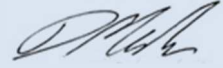
This report is designed to be suitable to discharge typical noise planning conditions, as per our original scope of work. The report should not be relied upon for further reasons, such as the detailed design of mitigation measures.

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LIST OF ATTACHMENTS

18109-NIA-02-SP1 – SP2	Indicative Site Plans
18109-NIA-02-TH1	Environmental Noise Time History
Appendix A	Glossary of Acoustic Terminology
Appendix B	CadnaA Model Calculations

Issue	Date of Issue	Author	Reviewed	Authorised
0	26/07/2023			
		Jamie Newton Senior Consultant BEng (Hons) AMIOA	Andrew Thomas Principal Consultant BSc (Hons) MIOA	Duncan Martin Director BSc (Hons) MIOA

Issue	Comment
0	First Issue

1.0 INTRODUCTION

Clement Acoustics has been commissioned by Mr Sadar Agha to measure existing background noise levels at Building to the Rear of 26 High Road. Measured noise levels have been used to determine noise emissions criteria for a bar / restaurant use space at first floor level with a balcony space used for shisha, and a banqueting hall at ground floor level in agreement with the planning requirements of the relevant British Standards and London Borough of Haringey criteria.

This report presents the results of the environmental survey followed by noise impact calculations and outlines any recommended mitigation measures.

An acoustic terminology glossary is provided in Appendix A.

2.0 SITE DESCRIPTION

The site is bounded by Bury Road to the northeast, Whymark Avenue to the southeast, commercial premises on High Road to the southwest and further units within 26 High Road to the northwest. The surrounding area is mixed commercial and residential in nature.

Current proposals are for a bar / restaurant use space at first floor level with a balcony space used for shisha, and a banqueting hall at ground floor level. It is understood that music will be played at an entertainment level within the first floor bar / restaurant and the ground floor banqueting hall, while there will be no music playback in the outdoor shisha area.

As part of the redevelopment, it is understood that ventilation and air conditioning plant is to be installed. Due to the early stage of the design process, full plant details are not currently available.

Northwest facing windows on the adjacent residential building York House, and 24 Whymark Avenue have been identified as the nearest affected receivers. These nearest noise sensitive receivers were identified through observations on-site. If there are any receivers closer than those identified within this report then a further assessment will need to be carried out. Therefore, the closest noise sensitive receiver should be confirmed by the client before the plant is installed or any noise mitigation measures are implemented.

Locations are shown in attached site plan 18109-SP1.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Unattended Noise Survey Procedure

Measurements were undertaken at one position as shown on indicative site drawing 18109-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the nearest affected receiver.

The surroundings and position used for the monitoring location are described in Table 3.1.

Position No.	Description
1	The microphone was mounted on a 2 nd storey flat roof at the rear of the building. The microphone was positioned > 3.5 m in front any vertical reflective surface. [1]

Table 3.1 Description of unattended monitoring locations

Note [1]: The position was considered to be free-field according to guidance found in BS 4142: 2014, and a correction for reflections has therefore not been applied.

Continuous automated monitoring was undertaken for the duration of the survey between 17:30 on 15 December 2022 and 12:00 on 19 December 2022.

The measurement procedure generally complied with BS 7445: 1991: 'Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use'.

3.2 Weather Conditions

Weather conditions were observed and noted during the set-up and collection of the monitoring equipment.

Wind speeds and temperatures were measured using a digital anemometer and thermometer, while other weather elements were determined through subjective observations.

The noted weather conditions are summarised in Table 3.2.

Position No.	Wind Speed	Wind Direction	Temperature	Cloud Cover	Comments
Meter Set-Up [15/12/2022]					
1	1.2 m/s	W	-1 °C	0 %	Light snow cover
Meter Collection [19/12/2022]					
1	3.5 m/s	W	12 °C	100 %	No Comment

Table 3.2 Noted weather conditions during surveys

It is understood that the weather conditions during the unattended survey were generally dry with wind speeds below 5 m/s and brief light showers on the afternoon of 16 and 18 December 2022. It is considered that the weather conditions were suitable for the measurement of environmental noise.

3.3 Equipment

The equipment calibration was verified, by means of a field verification check, before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 971 Class 1 Sound Level Meter
- Rion Type NC-74 Class 1 Calibrator

4.0 RESULTS

4.1 Unattended Noise Survey Results

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured at the location shown in site drawing 18109-SP1.

Measured noise levels are shown as a time history in Figure 18109-TH1, with average ambient and typical background noise levels summarised in Table 4.1.

It should be noted that the guidance of the latest revision of British Standard 4142: 2014 +A1 2019 'Methods for rating and assessing industrial and commercial sound', as detailed in Section 8.1 of the standard is as follows:

'The objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.'

Therefore, the typical background noise level will be used for the purpose of this assessment.

Position	Time Period	Average ambient noise level $L_{Aeq: T}$, dB	Typical background noise level $L_{A90: 5min}$, dB
1	Daytime (07:00 - 23:00)	57 dB(A)	50 dB(A)
	Night-time (23:00 - 07:00)	52 dB(A)	44 dB(A)

Table 4.1 Average ambient and typical background noise levels

5.0 NOISE CRITERIA

5.1 Relevant Local Policy

The assessment and recommendations in this report have been undertaken in accordance with Policy D14 of the London Plan 2021, which contains the following relevant sections:

“D14. In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:

5) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses”.

5.2 Plant Noise - Local Authority Criteria

A typical plant noise criteria for plant noise emissions are as follows:

“The system shall be mounted on anti-vibration mounts and when measured as a 15 mins LAeq value 1m from the facade of the nearest residential premises the installation shall not increase the existing background noise level (measured as the 15 min LA90 value) 1m from the facade of the nearest residential premises at any time.”

Based on the results of the environmental noise survey and requirements of The London Borough of Haringey Council, Table 5.1 presents the proposed plant noise emission criteria to be achieved at 1 m from the nearest noise sensitive receiver:

Period	Plant Noise Emission Limit LAeq,T, dB
Daytime (07:00 - 23:00)	40
Night-time (23:00 - 07:00)	34

Table 5.1 Plant noise emission limits

Full details of the proposed plant installation are not currently known, as the project is at an early stage, however, it is understood that the full installation will consist of kitchen extract plant as well as possible air conditioning plant.

5.3 Bar Operations

The London Borough of Haringey Council have been contacted to comment on relevant criteria for the assessment of bar and restaurant noise, but no reply was received.

As such, the requirements for breakout of entertainment noise at a similar site are proposed as follows:

“The scheme shall provide that the total LAeq of entertainment noise does not exceed the representative background noise level LA90 (without entertainment noise), and the single octave Leq of entertainment noise will not exceed the background noise level LA90 (without entertainment noise) in octaves between 63 and 125Hz when measured at the nearest noise sensitive premises. The approved scheme shall be retained thereafter.”

In order to provide a robust assessment, the predicted level of entertainment noise will be compared with the typical background noise shown in Table 4.1. Table 5.2 shows a representative background noise level and corresponding spectral levels, including in the 63 Hz and 125 Hz frequency bands.

Period	Measured Typical Background Noise Level, dB in each Frequency Band, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Day	57	52	47	45	47	43	33	22	50
Night	51	46	41	39	41	35	29	19	44

Table 5.2 Typical background noise level by frequency

Note: The L90 spectrum has been derived from the Leq spectrum and shifted by the difference between the Broadband LAeq and Broadband LA90

In order to protect surrounding residential amenity as much as possible, all mitigation will be designed to ensure night-time background noise levels are not exceeded at time during the bar’s operation.

5.4 Bar Operations – British Standard 8233:2014

BS 8233: 2014: ‘Guidance on sound insulation and noise reduction for buildings’ [BS 8233] describes recommended acceptable internal noise levels for residential spaces during daytime and night-time hours. These levels are shown in Table 5.3.

Activity	Location	Design Range Leq,T	
		Daytime (07:00 - 23:00)	Night-time (23:00 – 07:00)
Resting	Living Room	35 dB(A)	-
Dining	Dining Room/Area	40 dB(A)	-
Sleeping	Bedroom	35 dB(A)	30 dB(A)

Table 5.3 BS 8233: 2014 recommended internal background noise levels

According to BS 8233: 2014, a typical building facade with a partially open window offers 15 dB attenuation. It is proposed that any operation noise from the site does not exceed the levels shown in Table 5.3.

6.0 OPERATION NOISE

6.1 Proposed Activities

As the building is not currently in use as a bar, attended measurements were taken of similar sized venue, with patrons present and music played back at a level considered to be an entertainment level. In this way, an assessment will be provided for the worst-case scenario of loudest noise levels.

For the first floor bar / restaurant area, a measurement taken within a busy bar, with patrons present and music played at what was considered an entertainment level. A measurement taken in an outdoor shisha area with approximately 50 patrons talking, and no music playback has been used for the shisha balcony. The banqueting hall measurement was taken in a similar sized wedding venue space, where both live and amplified music was played as part of eating and a party.

The measured noise levels that will be used in calculations are as shown in in Table 6.1.

Unit	Sound Pressure Level (at 1 m, dB) in each Frequency Band, Hz								
	63	125	250	500	1k	2k	4k	8k	dB(A)
First Floor Bar / Restaurant – Busy bar with music	91	92	90	90	85	77	69	64	90
Shisha Area – ~ 50 patrons talking	64	59	59	61	57	54	50	44	62
Ground Floor Banqueting Hall – Live and amplified music	102	97	93	97	88	85	83	80	96

Table 6.1 Measured noise emissions levels

7.0 NOISE IMPACT CALCULATIONS

7.1 Façade Calculations

Noise breakout calculations have been carried out for the south-east facade of the site.

It is understood that the façade will consist of the following:

- Standard masonry façade construction
- New window systems, which will be open in the shisha area during operations

Table 7.1 sets out the minimum sound reduction index performance for the non-glazed elements of the façade. A minimum required performance for new glazing is set out in Section 8.1 of this report.

Element	Sound Reduction Index, dB, in each Frequency Band, Hz							
	63	125	250	500	1k	2k	4k	8k
Standard masonry construction	39	41	43	48	50	55	55	55
Glazing	See Section 8.1							
Doors	See Section 8.2							

Table 7.1 Façade Element SRI

Using the data shown in Table 7.1, a composite SRI has been calculated for the south-eastern façade of the site. This composite SRI was then used in Equation 7.1 to calculate noise levels at the nearest sensitive receiver.

$$SPL_{outdoor} = SPL_{indoor} - SRI_{Composite} + 10 \log_{10} S - 20 \log_{10} r - 14$$

Equation 7.1 Noise Breakout Calculations

7.2 Noise Modelling

In order to provide an accurate and robust assessment of proposed activities, noise emissions have been considered by developing a noise map.

The proposed activity noise emissions have been modelled using the following source types:

- Building Facades and Balcony Area
 - Vertical area sources matching the façade dimensions

The noise model was constructed using the proprietary noise modelling software package CadnaA, utilising the following assumptions and parameters:

Noise levels modelled and calibrated using the measured noise levels described in Section 6.1

- Locations of obstacles such as building envelopes
- Presence of reflecting surfaces
- Hardness of the ground between the sources and receivers
- The site is modelled as reflective
- Attenuation due to atmospheric absorption
- Receiver height for first floor windows 4 m above ground

It should be noted that all calculations in the CadnaA model, including those for distance and screening of intermediate building envelopes are undertaken according to International Standard ISO 9613-2:1996 '*Acoustics – Attenuation of sound during propagation outdoors. Part 2: General method of calculation*'. This standard is the preferred method stated in BS 4142 to minimise uncertainty.

The specific noise level has been derived by the use of the 3D noise map model following the calculation method stated in ISO 9613.

Calculations are performed over single octave band from 63 Hz to 8 kHz. Figure 7.1 shows a plan view of noise propagation from the site, towards the identified receptors, with all measured noise sources operational.

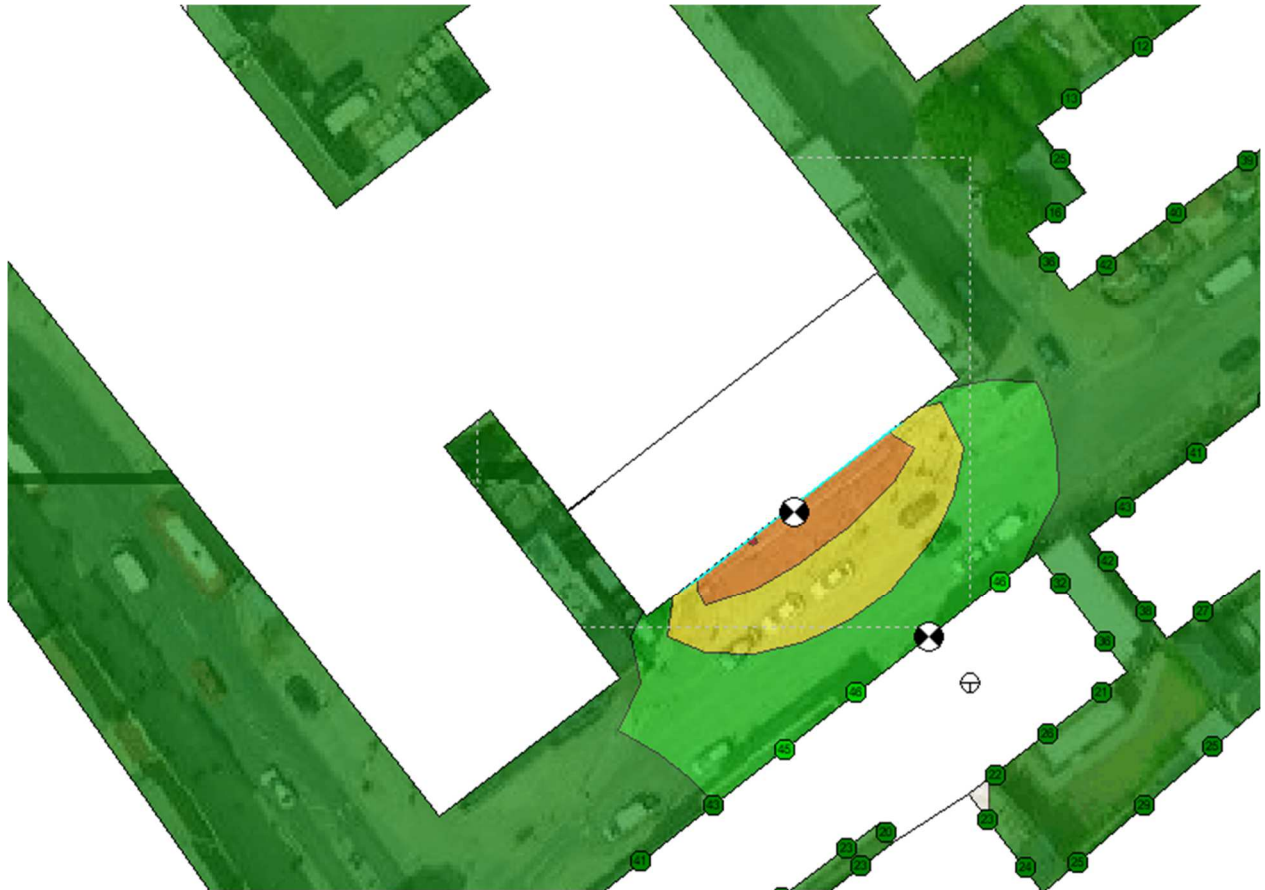


Figure 7.1 Plan view of noise propagation in 3D noise mapping model

8.0 PROPOSED MITIGATION MEASURES

8.1 Window Upgrades

As part of the refurbishment works at the site, new glazing is proposed for the south-eastern façade of the site. Current plans are for the ground floor openings currently covered by roller-shutters to be replaced by glazing, including glazed doors providing fire exits. In addition to this, all first floor glazing will be replaced, including bottom-hung windows at the shisha area providing ventilation.

A minimum sound reduction index for all new ground floor glazing and first floor bar glazing has been proposed. As windows to the shisha area are to be open when the area is in use, this performance requirement does not apply to these windows.

The minimum sound reduction index (SRI) value required for all glazed elements to be installed is shown in Table 8.1. **The performance is specified for the whole window unit, including the frame and other design features.**

Minimum Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)					
125	250	500	1k	2k	4k
32	30	35	41	43	50

Table 8.1 Required glazing performance

Where door sets are proposed as part of glazed elements, such as fire-escape doors at the ground floor banqueting hall, they should provide sound reduction performance at least equal to that required of the glazing in order to maintain the acoustic integrity of the external building fabric.

It is essential that prospective glazing system suppliers can demonstrate compliance with the acoustic performance detailed in our specification rather than simply offering a generic glazing configuration. The complete glazing system should achieve the performance requirements stated in Table 8.1 when tested in accordance with BS EN 10140-2: 2010.

It is essential that the performance presented in Table 8.1 is met. However, the following typical configurations would be expected to meet the required levels of sound insulation.

- 13 mm Laminated Glass / 10 mm Gap / 6 mm Glass – R_w 39 dB

8.2 Door sets

In order to limit noise emissions from the proposed first floor bar / restaurant through doors to the proposed shisha balcony, as well as noise emitting from the proposed ground floor banqueting hall, a lobby door system is proposed with sealed door sets with a performance of R_w 35 dB each be placed at any point where patrons move from inside spaces to outside. The locations of these lobby doors are shown in 18109-SP2.

It is proposed that these lobby door systems are used from 22:00 onward to offer further protection to the amenity of nearby noise sensitive receivers.

8.3 Noise Limiters

To reduce noise emissions, it is recommended a noise limiter is fitted and set such that the music from the first floor bar and ground floor banqueting hall is not audible at the identified receivers. This is expected to be achievable with the noise limits shown below in Table 8.2. These limits should be met at 1 m from inside the restaurant windows.

Location	Low Frequency Limits		Overall Limit
	63 Hz	125 Hz	
First Floor Bar / Restaurant	91 dB	90 dB	90 dB(A)
Ground Floor Banqueting Hall	97 dB	91 dB	96 dB(A)

Table 8.2 Proposed noise limits

It should be noted that the noise limits shown in Table 8.2 are slightly lower than those measured on similar sites and shown in Table 6.1. This is to ensure compliance with the proposed criteria but is not expected to impact the operating of the site.

Note: It must be noted that these noise limits are a prediction only, based on the expected performance of the external façades, and acoustic formulae. A final commissioning exercise should be undertaken to determine the appropriate limits in practice, which could be lower.

8.4 Noise Management Plan

Additional forms of noise limiting include managing patron noise with the following noise management plan:

- Behaviour of patrons should be monitored by regular patrols to ensure there is no unnecessary or excessive noise.
 - The behaviour of patrons can be a significant factor in the levels of generated noise, particularly where the sale of alcohol is concerned. Regular patrols should be undertaken to identify and prevent any potential for unnecessary noise due to the behaviour of patrons.
- During night time operations, the proposed lobby door system should be monitored to ensure only one door set is open at a time
- Entrance doors should remain closed when not in use, and monitored to ensure this
 - Open doors will also provide a path of low noise attenuation, ensuring they are closed when not in use will limit restaurant noise travelling to nearby noise sensitive receivers
- Ground floor fire exit doors, and first floor bar windows should remain closed at all times

9.0 NOISE IMPACT ASSESSMENT

The closest receiver has been identified as the window on the north-west facade of a residential property opposite which is a minimum of 20 m from the site, and a window on the south-east of a residential house adjacent which is a minimum of 15 m from the site.

Considering all necessary acoustic corrections, and the proposed mitigation stated in Section 0, the resulting noise level at the identified residential windows would be as shown in Table 9.1. Modelled noise levels are shown in Appendix B.

Receiver	Period	Criteria, dB			Noise Level due to Site Operations, dB(A)		
		63 Hz	125 Hz	dB(A)	63 Hz	125 Hz	dB(A)
1: York House	Night 23:00 – 07:00	51	46	44	51	46	43
2: 24 Whymark Avenue	Night 23:00 – 07:00	51	46	44	4	41	37

Table 9.1 Modelled noise levels at receiver due to proposed operations

As presented in Table 9.1 and Appendix B, the proposed operations are expected to comply with the established criteria with the mitigation proposed in this report in place. Further to this, modelled low frequency noise levels have been found to be not exceeding existing low frequency background noise levels.

With loudest external daytime levels of 48 dB(A), and night-time levels of 43 dB(A), acceptable internal conditions would be met by taking the attenuation of the window itself into consideration. According to BS 8233, a typical building facade with a partially open window offers 15 dB attenuation. Predicted levels are shown in Table 9.2

Receiver	Period	BS 8233 Criteria, dB(A)	Noise Level due to Site Operations, dB(A)
1: Inside York House	Night 23:00 – 07:00	30	28
2: Inside 24 Whymark Avenue	Night 23:00 – 07:00	30	22

Table 9.2 Modelled noise levels at receiver due to proposed operations

10.0 CONCLUSION

An environmental noise survey has been undertaken at Building to the Rear of 26 High Road. The results of the survey have enabled criteria to be set for noise emissions from the proposed plant in accordance with the requirements the London Borough of Haringey and stricter criteria set out to specifically limit low frequency entertainment noise.

A noise impact assessment has then been undertaken using source noise levels previously measured at similar premises.

Calculations show that noise emissions from the proposed operations are expected to not exceed existing low frequency background noise levels and are expected to be below internal noise limits set out by BS 8233 with the use of mitigation set out in this report.

Further noise impact calculations of fixed plant will be undertaken once more plant details are available, to demonstrate that the requirements of the London Borough of Haringey can be met, with mitigation as required.



Not to scale

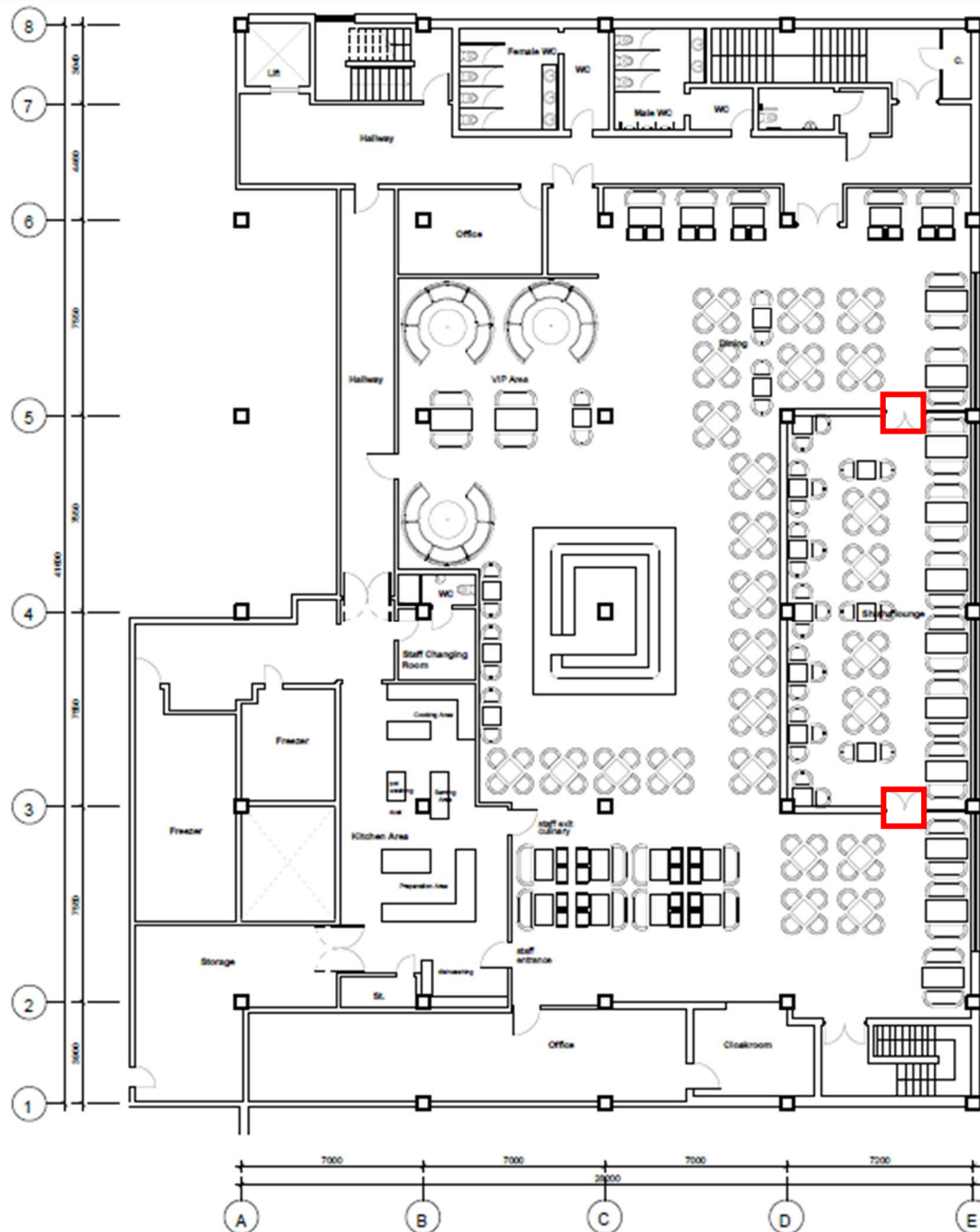
Description:

Indicative site plan showing noise monitoring position and nearest sensitive receiver

Date	26 July 2023
Reference	18109-NIA-02-SP1
Project Name	26 High Road, Wood Green,
Image ©	Google Earth

Key:

	Unattended Noise Survey Position
	Noise Sensitive Receiver



Not to scale

Description:

Indicative site plan showing noise
proposed location of lobbied doors

Date	26 July 2023
Reference	18109-NIA-02-SP2
Project Name	26 High Road, Wood Green, London
Image ©	Sleep Design Studio

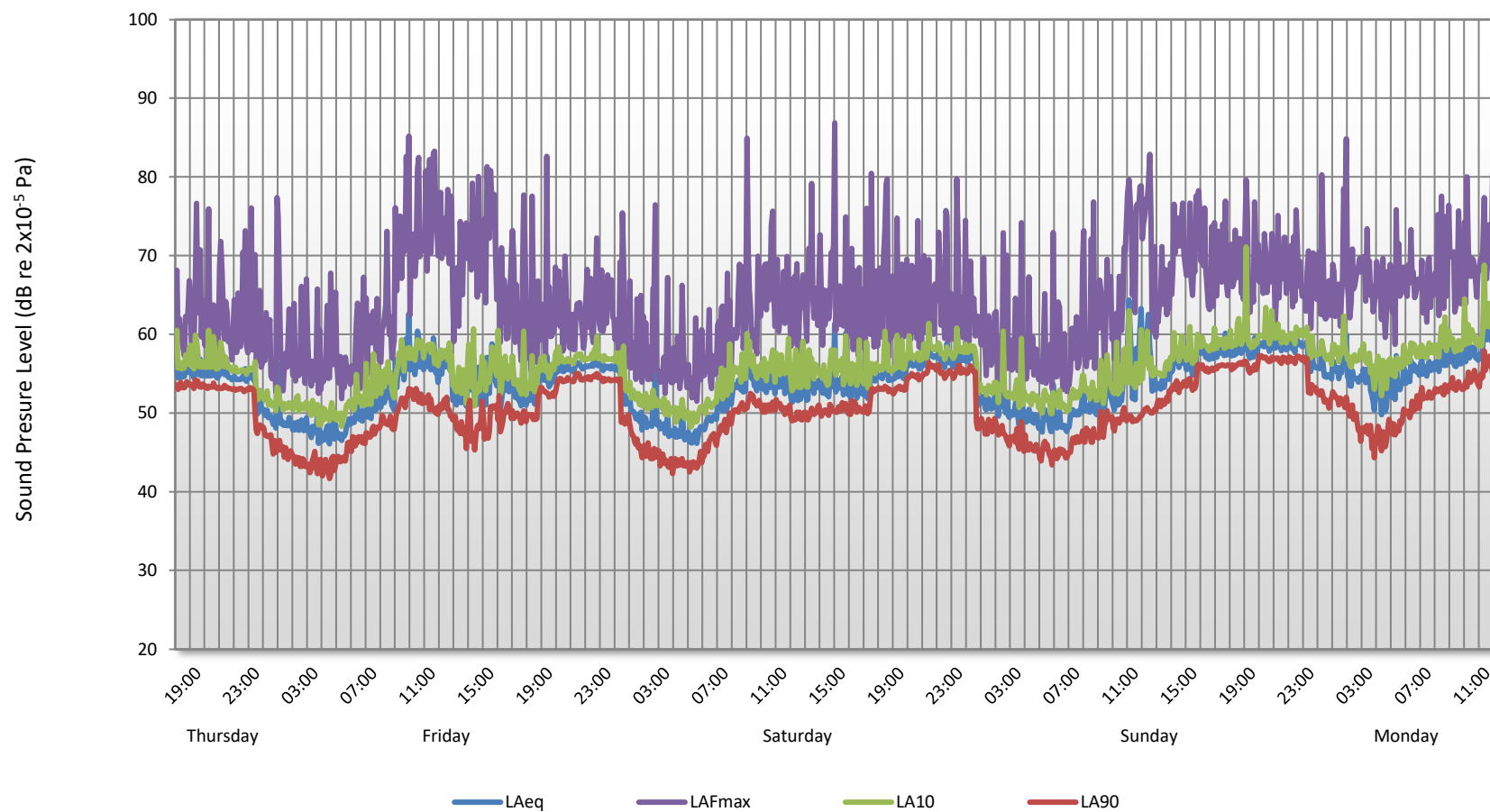
Key:

 	Proposed Lobby Door Locations
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26 High Road, Wood Green, London

Position 1

Environmental Noise Time History
15 December 2022 to 19 December 2022



GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10 dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3 dB for each doubling of distance.

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.



Night-Time LAeq

	Notes: The noise model was constructed using the proprietary noise modelling software package Cadna A. The potential noise mitigation of a barrier at the nearby proposed buildings has been predicted using the calculation methodology outlined in ISO 9613-2. The noise model was constructed utilising the following assumptions and parameters: • Locations of obstacles such as screens or barriers in the propagation path • Presence of reflecting surfaces • Hardness of the ground between the sources and receivers • Attenuation due to atmospheric absorption	... < 45 dB 45 <= ... < 50 dB 50 <= ... < 55 dB 55 <= ... dB	vert. Area Source Building Receiver Building Evaluation Calculation Area	
		18109-Appendix_B 1Bc Yukon Road, London SW12 9PZ T: 0203 475 2280 info@clementacoustics.co.uk www.clementacoustics.co.uk		