109 UXBRIDGE ROAD, HAYES UB4 0RJ

NOISE IMPACT ASSESSMENT

29 August 2024

Five Rivers Bar & Grill

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Document Reference: RP.240829.0 - 109 UXBRIDGE ROAD HAYES - NOISE ASSESSMENT.DOCX

Revision	Description	Issued by	Issue date
-	First Issue – Noise Assessment	Damien Hesnan	02/09/2019

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ARAN ACOUSTICS

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1.0 INTRODUCTION

Aran Acoustics in collaboration with Airtight Building Solutions Ltd have been appointed to carry out a noise impact assessment for the proposed single storey extension of the existing Bar & Grill at 109 Uxbridge Road, Hayes.

A noise survey and assessment has been requested to ensure that noise levels from activities associated with the proposed extension does not cause undue disturbance to nearby noise sensitive locations.

The purpose of this assessment is to determine the existing noise levels at nearby noise sensitive locations and establish the maximum permissible noise level from the Seating Hall.

This assessment has been benchmarked against an environmental noise survey carried out on 17 July 2024. This report therefore describes the noise survey and its results. Figure 4.1 contains a graphical representation of the noise measurements taken on site. Section 5.0 provides a review of applicable guidance documentation. Section 6.0 provides an assessment of noise levels for the proposed Seating Hall.

2.0 SITE DESCRIPTION

The site is located at 109 Uxbridge Road, Hayes in the London Borough of Hillingdon. The existing premises is currently run as a Bar & Grill. Current proposals are for a single storey extension to the rear of the premises to provide a Seating Hall.

The site is located in a built up area of mixed use. Uxbridge Road runs along the southern boundary of site and contain mainly commercial units at ground floor level with a mixture of office and residential accommodation on the upper floors of buildings in the immediate area. Uxbridge Road was seen to carry a moderately high volume of road traffic. To the rear of site are the back garden of residential houses located on Whitington Avenue.

A subjective noise assessment on site determined that the predominant noise sources in the area to impact the site and nearby sensitive receptors is noise levels from road traffic on Uxbridge Road and plant associated with nearby commercial units.

Figure 2.1 below shows a location map and aerial photo of the site and surrounding area.

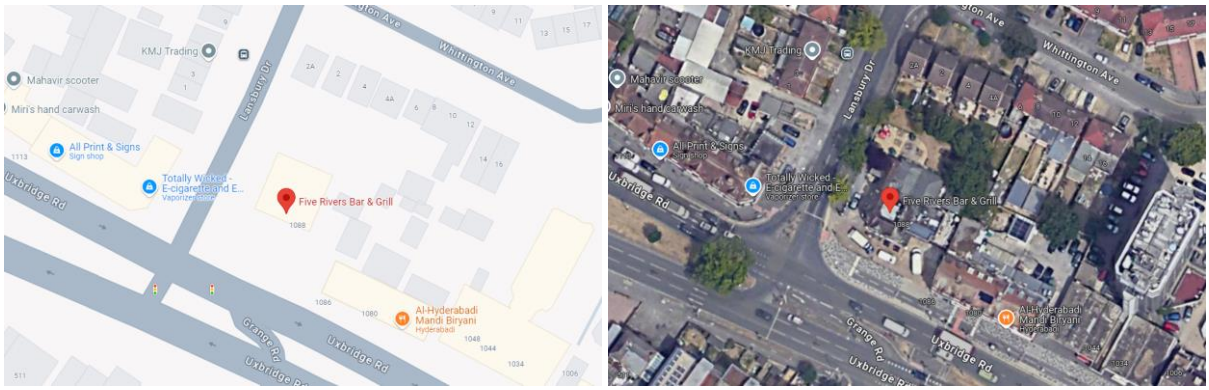


Table 2.1 – Location map and aerial photo of the site*

**Imagery courtesy of Google Maps*

3.0 ENVIRONMENTAL NOISE SURVEY

An environmental noise survey was carried out at the site between Wednesday 17 and Thursday 18 July 2024. The survey incorporated both day and night-time measurements.

A single noise monitor was placed at the front elevation of the building at first floor level overlooking Uxbridge Road. The microphone was placed on a boom pole and extended approximately 1m from the front façade of the building. Noise levels measured at this location are considered worst case to impact the site and surrounding area.

Measured noise levels have been used to calibrate a noise model for the site and surrounding area to establish noise levels at nearby noise sensitive receptors.

A site plan showing the microphone location is provided in Appendix A. Site photos of the microphone position are provided in Appendix B.

3.1 Measurement Equipment

The following measurement equipment was used, which complies with the performance specifications for a Class 1 device in accordance with BS EN 61672-1, BS EN 61260 and BS EN 60942.

Name	Serial Number	Last Calibrated	Calibration Due
Norsonic Precision Sound Analyser Type 140	1404768	Nov 2022	Nov 2024
Norsonic Type 1209 Pre-amplifier	31313	Nov 2022	Nov 2024
Norsonic Type 1225 Microphone	157320	Nov 2022	Nov 2024
Rion Type NC-74 Acoustic Calibrator	35046846	Feb 2024	Feb 2025

Table 3.1 – Measurement equipment used on site

The meter was calibrated before and after testing - no deviations were found. The meter was set to measure consecutive 'A' weighted 10-minute time samples.

3.2 Weather Conditions

The weather was fine and dry for the duration of the survey. Wind speed remained below 5 m/s. The temperature varied between approximately 14 - 24 ^{o}C.

The weather conditions were seen as suitable for environmental noise surveying in accordance with BS 7445-1:2003 '*Description and measurement of environmental noise*'.

4.0 SURVEY RESULTS

The noise levels measured during the survey period are shown in Figure 4.1 below. The full set of acoustic data measured on site is available upon request.

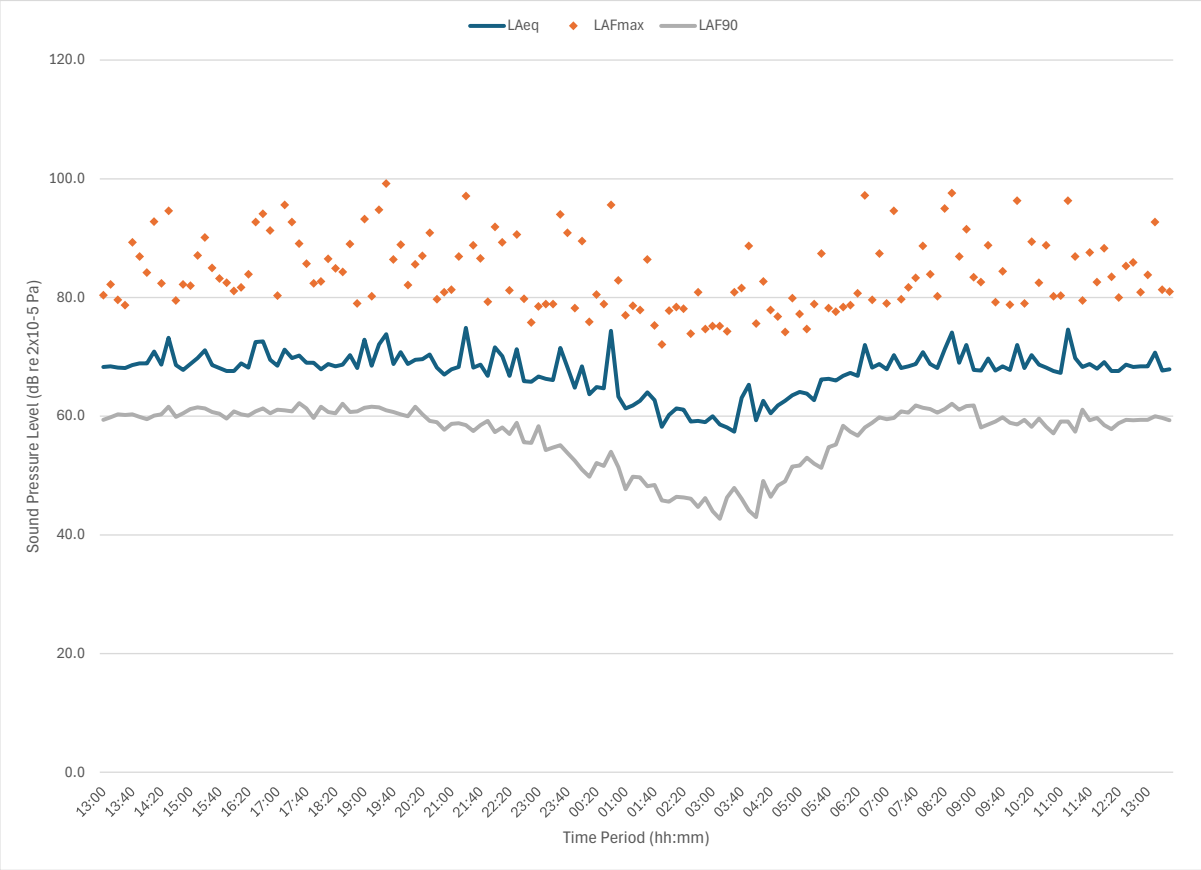


Figure 4.1 – Measured 24-hour noise levels

The following table provides a summary of the noise levels measured on site at the fixed microphone position during the survey period including the equivalent continuous A-weighted sound pressure level; $L_{Aeq,T}$ and representative background noise level; $L_{A90,T}$.

Time Period	Average Noise Level L_{Aeq}, dB	Representative Background L_{A90}, dB
Day (07:00 – 23:00 hours)	70	60
Night (23:00 – 07:00 hours)	66	50

Table 4.1 - Summary of measured noise levels

4.1 Noise Modelling Results

To establish noise levels at the façades of nearby noise sensitive receptors a noise model was created using CadnaA noise prediction software. The noise model was calibrated using the lowest 10-minute average noise level ($L_{Aeq,10min}$) during the proposed periods of operation. The following table provides the calculated lowest façade noise levels at nearby noise sensitive receptors.

Receptor Location	Time Period	Lowest $L_{Aeq,10min}$ dB
6-16 Whittington Close	Day (13:00 – 23:00 hours)	48
6-16 Whittington Close	Night (23:00 – 01:00 hours)	46

Table 4.2 – Lowest façade noise levels

5.0 ASSESSMENT CRITERIA

The section above provides a summary of the noise levels on site. The purpose of this section is to provide a summary of guidance documentation relating to this development.

5.1 National Planning Policy Framework

The Government published the National Planning Policy Framework (NPPF) which sets out the Government's planning policies for England and how these are expected to be applied.

The Framework replaced many of the Planning Policy documents including Planning Policy Guidance 24: Planning and Noise that provided guidance on the control of noise to sensitive developments which may be affected by noise and vice versa. The NPPF provides a framework within which local people and their council can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

With regards to noise, the Framework states that 'Planning policies and decisions should aim to:

- avoid noise from giving rise to significant adverse impacts[27] on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impacts[27] on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;[28] and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

[27] See Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs).

[28] Subject to the provisions of the Environmental Protection Act 1990 and other relevant law.

With regards to 'adverse impacts' and 'significant adverse impacts' the NPPF does make reference to The Noise Policy Statement for England, published by Defra in March 2010.

5.2 Noise Policy Statement for England

The aim of the Noise Policy Statement for England (NPSE) is to provide clarity regarding current policies and practices to enable noise management decisions to be made within the

wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion. The NPSE applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

Noise Policy Vision: Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

Noise Policy Aims: Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life

The NPSE explanatory note provides further guidance on 'adverse' and 'significant adverse' impacts as follows:

- NOEL - No Observed Effect Level: the level below which no effect can be detected. Below this level there is no detectable effect on health and quality of life due to noise;
- LOAEL - Lowest Observable Adverse Effect Level: the level above which adverse effects on health and quality of life can be detected;
- SOAEL - Significant Observed Adverse Effect Level: the level above which significant adverse effects on health and quality of life occur.

The NPSE states that: *it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.*

It can be concluded that the NPPF and NPSE define the concepts for the various levels of effect from noise however do not provide specific values. It is seen that it is up to the discretion of the Local Planning Authority to decide on what is deemed acceptable taking into account the specific circumstances for the proposed development.

5.3 World Health Organisation Guidelines

The World Health Organisation (WHO) document 'Guidelines for Community Noise' 1999 provides guidance to local authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments. Section 4 of the document provides guideline values with regards to specific environments and effects. The WHO document states the following:

In dwellings, the critical effects of noise are on sleep, annoyance and speech interference. To avoid sleep disturbance, indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for single sound events. Lower levels may be annoying, depending on the nature of the noise source.

WHO guidelines are typically adopted and applied to various noise sources with the criteria that indoor ambient noise levels in bedrooms at night does not exceed 30 dB L_{Aeq} and individual noise events should not normally exceed 45 dB L_{AFmax}.

5.4 British Standard 8233:2014

BS8233:2014 'Guidance for sound insulation and noise reduction for buildings' provides information on the design of buildings that have internal acoustic environments appropriate to their functions. It provides guidance on the control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations.

BS8233 provides a range of internal noise levels within unoccupied spaces depending on the buildings use. BS8233 states that for bedrooms at night, it is desirable that the indoor ambient noise level does not exceed 30 dB L_{Aeq}. For living rooms during the daytime, indoor ambient noise levels should not generally exceed 35 dB L_{Aeq}.

BS8233:2014 advises that: *Regular individual noise events can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values.*

5.5 British Standard 4142:2014

BS 4142:2014 'Methods for rating and assessing industrial and commercial sound' describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity.

The likelihood of complaints in response to a specific noise depends on various factors. BS 4142 assesses the likelihood of complaints by considering the margin by which the noise in question exceeds the background noise level. BS 4142 states that:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

This standard also allows for an appropriate correction for the acoustic features present in the noise using a number of methods. A correction should be applied if one or more of the following features (see the list below), are present within the noise sources in question.

- The noise is of a tonal nature, i.e. it contains a distinguishable, discreet, continuous note such as whine, hiss, screech, hum;
- The noise is impulsive, i.e. it contains distinct impulses such as bangs, clicks, clatters, or thumps;
- The noise contains other characteristics that are neither tonal nor impulsive but is irregular enough to attract attention.

5.6 IOA Code of Practice on the Control of Noise from Pubs and Clubs' (1999)

The IOA Code of Practice is intended as guide in the prevention of noise complaints from entertainment venues and states the following:

It should be the aim of all local authority policies to adopt a criterion which will ensure, so far as reasonably practicable, that such noise is inaudible inside noise sensitive premises between 23:00 and 10:00.

The following noise limits for all hours are presented as an example in the document:

The $L_{Aeq,5min}$ level measured 1 metre outside a window to a habitable room, with entertainment taking place, shall show no increase when compared with the representative $L_{Aeq,5min}$ level measured from the same position under the same conditions and during a comparable period; and the $L_{Aeq,5min}$ level in the 63Hz and 125Hz octave bands measured 1 metre outside a window to a habitable room, with entertainment taking place, shall show no increase when compared with the representative $L_{Aeq,5min}$ level in the 63Hz and 125Hz octave bands measured from the same position under the same conditions and during a comparable period.

5.7 Summary of Guidance Documentation

It can be concluded from guidance documents that a range of criteria can be adopted in the assessment of noise impact from entertainment venues. For the purpose of this development it is proposed that noise from the Seating Hall should be inaudible during any 10 minute time

period when assessed against the prevailing noise climate at the window of nearby noise sensitive receptors.

Inaudibility of a secondary noise source is normally considered to be at a level of -10 dB below the prevailing noise climate. This is generally seen as a positive indication of low noise impact in accordance with BS 4142.

Where the noise source in question contains a distinguishable acoustic feature, a suitable correction should be applied to the rating level. It is understood that the proposed Seating Hall is generally for food and drinks. No live events with amplified music is proposed therefore low frequency noise will not be of concern and no acoustic feature correction is required.

5.8 Target Noise Levels

It is understood that the Bar and Grill operates between 13:00 – 23:00 hours on weekdays and extends until 01:00 hours on Friday and Saturday nights and closes at 22:00 hours on Sundays. Based on the lowest 10 minute representative ambient noise level during the proposed operating periods the following table shows the maximum permissible noise level from the Seating Hall when measured at the window of the nearby residential receptors on Whittington Close.

Time Period	Lowest Representative Ambient Noise Level, $L_{Aeq,10min}$	Tolerance Factor	Max Noise Level at Residential
13:00 – 23:00 hours	48 dBA	-10 dB	**38 dBA**
23:00 – 01:00 hours	46 dBA	-10 dB	**36 dBA**

Table 5.1 - Noise Level Target at residential facades

6.0 NOISE IMPACT ASSESSMENT

Proposals are for a single storey ground floor extension at the rear of the premises to provide a Seating Hall area. The purpose of the Seating Hall is primarily for food and drink with no live music. Entrance to the Seating Area is from the main Bar area to the front of the building. Access to the existing outdoor area will be through a lobby with walking distance between both doors to ensure one door remains closed at all times. It is understood ventilation will be provided by alternative means without the need for opening windows.

6.1 External Envelope Construction

The noise that breaks out of a building is principally determined by its interior sound level and the amount of sound transmitted through the building structure. The sound level incident upon the interior room surfaces is what is transmitted into the walls and roof. The sound that escapes into the adjacent space is called breakout noise. The sound energy can travel through walls, ceilings, vents, windows, doors, to name a few features, that all have very different acoustical properties. In order to meet noise limit targets, the building envelope constructions should be selected to meet the sound reduction values R_w, presented in Table 6.1.

Building Element	Sound Insulation R_w	Example Construction
Brick/Block Cavity Wall	**53 dB**	100mm Brick or Block / 100mm cavity / 100mm Block /12.5mm Plasterboard lining
Flat Roof	**42 dB**	3-5mm Membrane / 18mm Plywood deck / 200mm Joists / 200mm Mineral Wool / 12.5mm Plasterboard Ceiling
Glazing	**31 - 33 dB**	4mm Glass / 12mm Spacer / 4mm Glass

Table 6.1 - Building envelope sound insulation performance requirements

6.2 Internal Noise Levels

As the development is in the early design stage measurement of internal noise levels was not possible. We have therefore used noise levels within a busy Café during a lunch time period. The following table provides noise levels from a busy Café including background music.

Octave Band Centre Frequency, dB							
63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1.0 K Hz**	**2.0 K Hz**	**4.0 K Hz**	**dBA**
70	70	65	68	66	64	63	**71**

Table 6.2 – Café Noise Levels

6.3 Noise Breakout

Based on the proposed envelope constructions in Section 6.1 and internal noise levels in Section 6.2, calculations were carried out to determine noise levels at the nearest noise sensitive receptor using the following equation:

$$Lp2 = Lp1 - SRI + 10\log(S) - 20\log(r) - 14\ dB \qquad \text{Equation 6.1}$$

Where:
Lp2 is the sound pressure level in dB at a distance of r meters from the building.
Lp1 is the reverberant sound pressure level in dB inside of the building adjacent to the area where noise breakout will occur
S is the area of the building envelope through which noise breaks out
SRI is the sound reduction index of any attenuator (Building Envelope in this case).

Calculations show that noise levels at 1m from the façade of the nearest noise sensitive receptor would be 25 dBA. This does not exceed the noise levels targets in Table 5.1 which is a positive indication of low noise impact and that complaints are deemed unlikely therefore no further mitigation is proposed at this stage.

Calculation sheets are provided in Appendix C. Insul data sheets in Appendix D

6.4 Noise Control Mitigation

In order to regulate the noise levels from background music and avoid the cocktail effect it is advised that a noise limiter is placed on any music system. This shall be calibrated by a competent acoustician and set to a maximum noise level of 70 dBA prior to operation with the area empty except for furnishings.

The limiter must be set with the amplifiers on maximum so that once set; the system cannot play any louder. It must not be possible to turn the volume up any louder in any area other than by adjusting the settings of the noise limiter. Once the limiter is set it must be made tamper proof with a lockable/sealed cover under the control of management.

The limiter should be a compressor type with adjustable levels at different frequencies such that frequency noise can be limited.

To prevent noise breakout, loudspeakers should be facing away from the rear façade of the building. Careful placement of loudspeaker should allow for background music to be distributed evenly throughout the space.

7.0 SUMMARY AND CONCLUSION

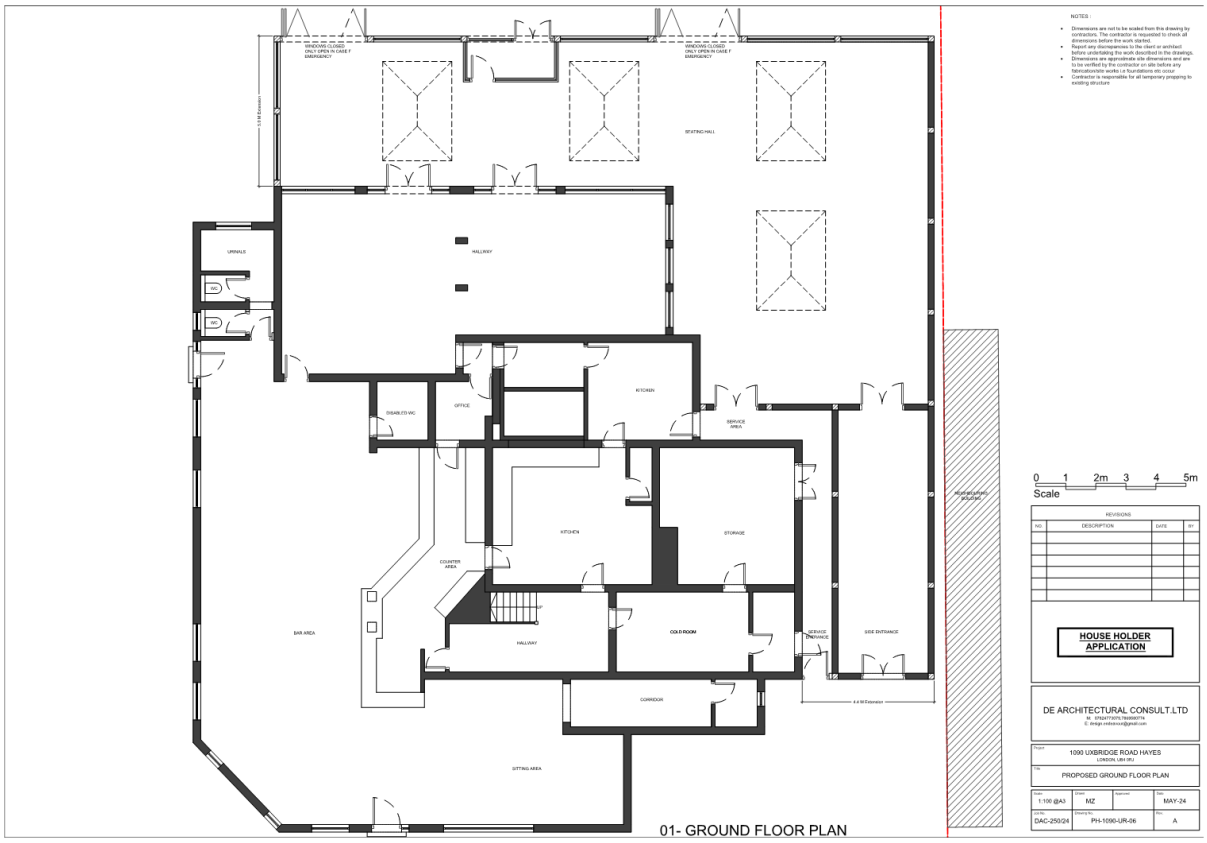
A noise survey was carried out at the proposed location of a ground floor extension to provide a Seating Hall at 109 Uxbridge Road, Hayes on 17 July 2024.

From this survey and subsequent noise modelling the minimum representative 10-minute ambient noise levels at the nearby noise sensitive property was established during the proposed operational hours.

Using guidance within a range of documentation it is proposed that noise levels from the Seating Hall should not exceed 10 dBA below the lowest ambient noise level during any 10 minute period at the window of the nearest residential dwelling.

Based on the location of the nearest noise sensitive receptor, calculations show that noise levels from the Seating Area would be 25 dBA when measured at 1m from the nearest noise sensitive window. This does not exceed the noise levels target for both the day and night time period which is a positive indication of low noise impact and complaints are deemed unlikely.

APPENDIX A – SITE DRAWINGS



01- GROUND FLOOR PLAN

APPENDIX B – SITE PHOTOS

APPENDIX C – CALCULATION SHEET

		63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz	
Café Source Level (Lp)		70	70	65	68	66	64	63	**71**
Building Elements	**Area m2**	**63 Hz**	**125 Hz**	**250 Hz**	**500 Hz**	**1.0 kHz**	**2.0 kHz**	**4.0 kHz**	**Rw**
External Walls	81.60	37	44	42	46	56	67	78	
Roof	129.60	10	19	35	42	47	52	55	
Doors & Glazing	42.20	19	21	18	30	41	46	45	
Roof Lights	34.40	19	21	18	30	41	46	45	
Composite SRI	287.80	13.1	21.1	23.6	35.2	45.1	50.2	50.1	**37**
Noise Breakout	**QTY**	**63 Hz**	**125 Hz**	**250 Hz**	**500 Hz**	**1.0 kHz**	**2.0 kHz**	**4.0 kHz**	**dBA**
Source Level (Lp)	1	70	70	65	68	66	64	63	**71**
Building SRI	1	13.1	21.1	23.6	35.2	45.1	50.2	50.1	
10Log(S) -14	287.8	10.6	10.6	10.6	10.6	10.6	10.6	10.6	
Distance Attenuation (-20Log(R))	15.4	-23.8	-23.8	-23.8	-23.8	-23.8	-23.8	-23.8	
SPL at Receiver (Lp)		44.1	35.7	28.7	19.2	8.1	0.7	-0.4	**25**

APPENDIX D – INSUL DATA SHEETS

Sound Insulation Prediction (v8.0.7)

Program copyright Marshall Day Acoustics 2015

- Key No. 1548

Margin of error is generally within Rw +/- 3 dB

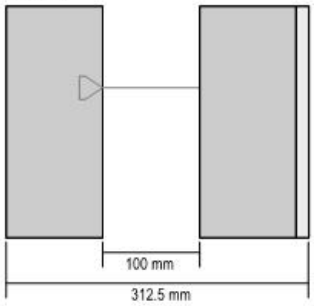
Job Name:

Job No.: Page No.:

Date: 29 Aug 24 Initials:dhesn

File Name: insul

Notes:



Rw 53 dB
C -1 dB
C_{tr} -4 dB
D_{nTw} 55 dB

System description

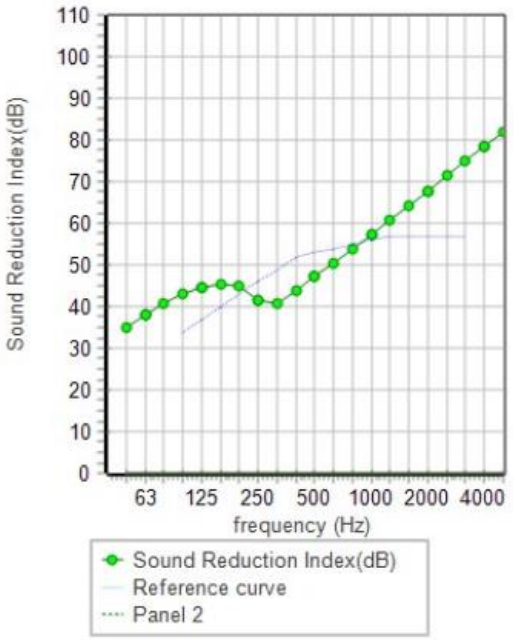
Panel 1 : 1 x 100.0 mm mm Concrete Block (?:1350 kg/m3,E:8.3GPa,?:0.02)

Cavity: Butterfly Tie: Stud spacing 600 mm
Panel 2 + 1 x 100.0 mm mm Concrete Block (?:1350 kg/m3,E:8.3GPa,?:0.02) + 1 x 12.5 mm Gyproc Wallboard 12.5mm (?:640 kg/m3,E:1.6GPa,?:0.01)

Mass-air-mass resonant frequency =22 Hz

frequency (Hz)	R(dB)	R(dB)
50	35	
63	38	37
80	41	
100	43	
125	45	44
160	46	
200	45	
250	42	42
315	41	
400	44	
500	47	46
630	50	
800	54	
1000	57	56
1250	61	
1600	64	
2000	68	67
2500	71	
3150	75	
4000	78	78
5000	82	

Panel Size 2.7x4 m; Mass 278.0 kg/m2



Sound Insulation Prediction (v8.0.7)

- Key No. 1548

Margin of error is generally within Rw +/- 3 dB

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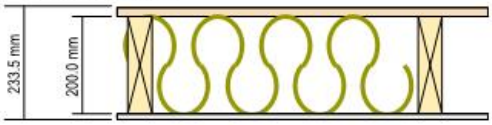
Job No.: Page No.: Notes:

Date: 29 Aug 24 Initials:

File Name: insul



Rw	44 dB
C	-3 dB
C_{tr}	-10 dB
D_{nTw}	46 dB [V:50m3] [A:11m2]

System description

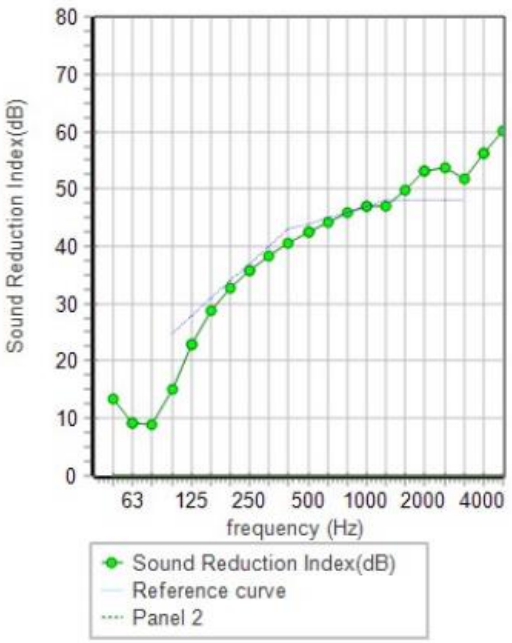
Panel 1 : 1 x 3.0 mm Rubber (?:920 kg/m3,E:0.03GPa,?:0.20) + 1 x 18.0 mm Plywood (?:560 kg/m3,E:4.4GPa,?:0.01)

Cavity: Solid joist(timber or Twinaplate): Stud spacing 600 mm , Infill Fibreglass (10kg/m3) Thickness 200 mm (?:10 kg/m3, Rf:4000 Pa.s/m2)
Panel 2 + 1 x 12.5 mm Gyproc Wallboard 12.5mm (?:640 kg/m3,E:1.6GPa,?:0.01)

Mass-air-mass resonant frequency =53 Hz

frequency (Hz)	R(dB)	R(dB)
50	13	
63	9	10
80	9	
100	15	
125	23	19
160	29	
200	33	
250	36	35
315	38	
400	40	
500	42	42
630	44	
800	46	
1000	47	47
1250	47	
1600	50	
2000	53	52
2500	54	
3150	52	
4000	56	55
5000	60	

Panel Size 2.7x4 m; Mass 22.8 kg/m2



Sound Insulation Prediction (v8.0.7)

- Key No. 1548

Margin of error is generally within Rw +/- 3 dB

Job Name:

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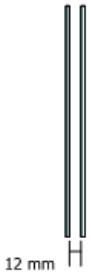


Rw	33 dB
C	-2 dB
C_{tr}	-6 dB
D_{nTw}	35 dB [V:50m3] [A:11m2]

System description

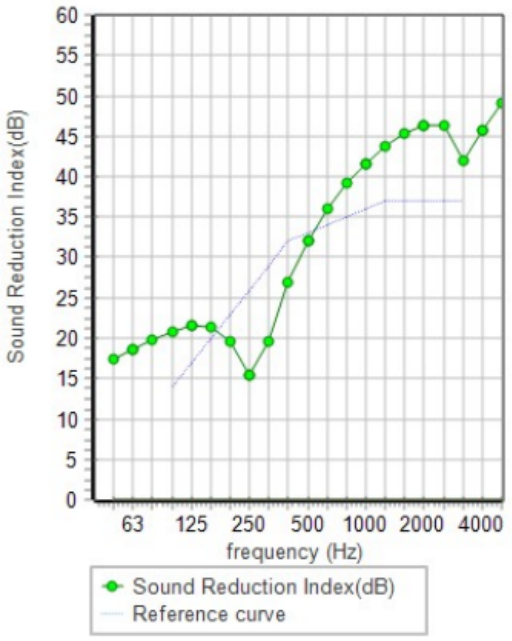
+ 1 x 4.0 mm Glass (?:2430 kg/m3,E:52GPa,?:0.02)

+ 1 x 4.0 mm Glass (?:2430 kg/m3,E:52GPa,?:0.02)

Mass-air-mass resonant frequency =245 Hz

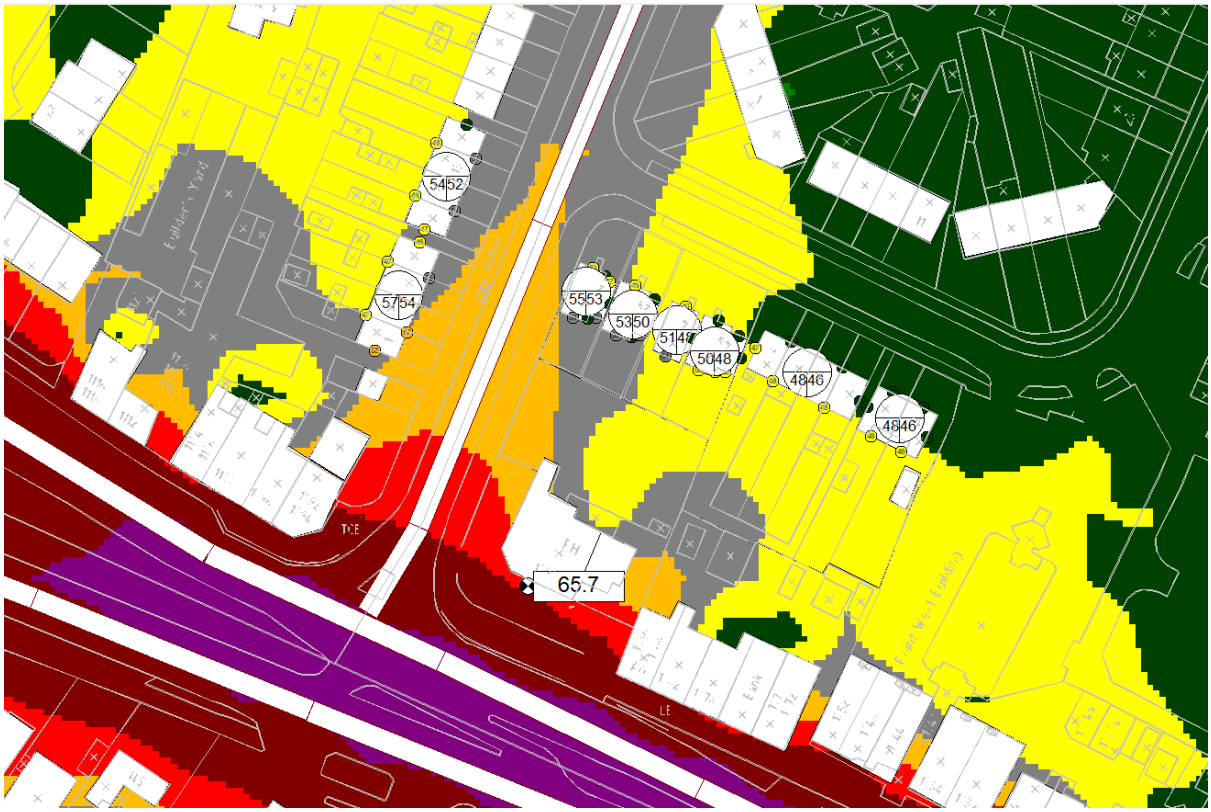
frequency (Hz)	R(dB)	R(dB)
50	17	
63	19	19
80	20	
100	21	
125	22	21
160	21	
200	20	
250	15	18
315	20	
400	27	
500	32	30
630	36	
800	39	
1000	42	41
1250	44	
1600	45	
2000	46	46
2500	46	
3150	42	
4000	46	45
5000	49	

Panel Size 2.7x4 m; Mass 19.7 kg/m2



APPENDIX E – NOISE MAPS

Daytime Façade Noise Levels



Night time Façade Noise Levels