BRAIDEN ACOUSTICS LTD

Innovation Forum | 51 Frederick Road | Salford | Manchester | M6 6FP

NOISE IMPACT ASSESSMENT

Prepared For : Arts Direct Ltd

Date : 25 Nov 2024

Site : 70 Oldham Rd, Manchester

Report No. : 11300revA

1 INTRODUCTION

Braiden Acoustics has been commissioned by Arts Direct Ltd to undertake an acoustic survey at the site of 70 Oldham Rd, Manchester to assess any noise sources that may affect nearby residents.

An overview of the site by the applicant:

> *We are a 60-capacity venue, mix of retail and drinking with small events, recorded music at weekends and open latest midnight on Fridays and Saturdays. We open Wednesday - Sunday and it is used as an office on the other two days. We do have residents above, but next door our only directly adjoining property is another commercial unit which is a legal firm.*

1.1 AIM

This report shall investigate all pertinent noise sources that may affect surrounding 'sensitive receptors' and propose any mitigation, where necessary, so that noise levels are within relevant guidelines.

2 DESCRIPTION OF SITE

The application site is the corner, ground floor unit within a larger, predominantly residential, building called Victoria Square.



Figure 1
Street view of site

2.1 SITE LOCATION AND SURROUNDING USES

The site is in the north-western corner of Victoria Square, on the corner of Oldham Road and Sherratt Street in the Ancoats area of Manchester.

Directly to the east, at ground floor level, is another commercial unit: a solicitors.

On the other side of the site, on Sherratt Street, is a stairwell for access to Victoria Square.

Above the site, as shown in Figure 1, is a residential flat.



Figure 2
Site location and surrounding uses

The surrounding area to the north is commercial, whilst to the east and west, along Oldham Road, is commercial at ground floor level. To the south, it is primarily residential.

2.2 PROPOSED USE

The unit is currently being used as a cultural space with books and records whilst serving alcoholic and non-alcoholic drinks. There are sometimes small, intimate events within the space.

2.2.1 Ground Floor

The proposed ground and basement floor layouts are shown below.

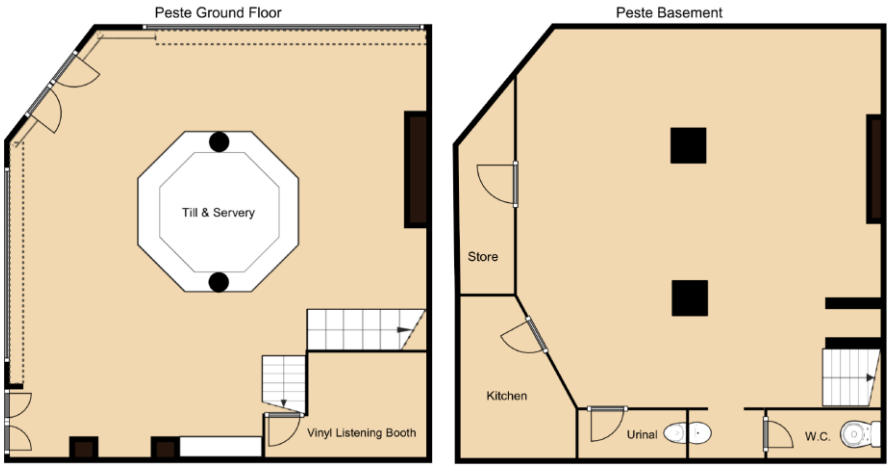


Figure 3
As Built floor plans

2.2.2 Opening hours

Mon – Thurs	11:00 – 23:00
Fri	11:00 – 00:00
Sat	10:00 – 00:00
Sun	10:00 – 23:00

with 30 minutes drinking up time.

2.2.3 Building services

There are no building services

2.2.4 Sound system

A modest 'hi-fi' type system is in-situ with only two 'bookshelf' loudspeakers.

3 ACOUSTIC CRITERIA AND METHODOLOGY

3.1 BS 4142

BS 4142:1999 "Method for rating industrial noise affecting mixed residential and industrial areas" [1] assesses industrial noise with regards to nearby residential dwellings. The guidance is commonly used to compare the equivalent noise from an industrial source only (*specific noise level*), L_{Aeq}, to the background noise level, L_{A90}, at the nearest sensitive receptor (NSR).

This Standard has been recently updated, BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" [2]. Whereas the old standard added 5dB 'penalty' to the Specific Noise Level (SNL) if the noise source has a 'character' that can draw attention that may be described as tonal, intermittent or impulsive, the new standard gives clearer guidance on noise 'character'. Furthermore, the previous Standard gave only one 5 dB penalty whereas the new Standard may not. When added to the specific noise level it forms the *rating level*. The new Standard gives the guidance for the following types of noise character:

> *Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.*
>
> *Correct the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.*
>
> *NOTE 1 The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases the amount of masking varies as the residual sound changes in level and possibly character. The source's tonal and/or impulsive characteristics could also vary with time.*
>
> *Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.*
>
> *Tonality*
>
> *For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.*
>
> *Impulsivity*
>
> *A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.*
>
> *Other sound characteristics*
>
> *Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.*
>
> *NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be*

appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Once a penalty for noise character is added to the Specific Noise Level then this is termed the *Rating Level*.

The background level is then compared to the rating level. It is usual that the rating level due to the source should be below the background noise level at the nearest sensitive receptor; indeed BS 4142 states:

"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."

3.1.1 Council BS4142 criterion

Hitherto, there has been no mention of a BS4142 noise criterion.

However, section 11 d) of BS 4142:2014 says

"Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact"

Therefore, minimally, the Rating Level should not exceed the Background Level to ensure any potential noise has a low or no impact.

3.2.1 Residential

The British Standard BS 8233:2014 "Guidance on sound insulation and noise reduction for buildings" gives guidance on recommended indoor ambient noise levels for residential dwellings.

Room	Criterion	$L_{Aeq,T}$	
		night	day
Bedroom	Sleeping	30	35
Dining Room/Area	Dining	--	40
Living Room	Resting	--	35

Table 1
Recommending indoor ambient noise level thresholds from anonymous noise (taken from Table 4, BS 8233:2014)

Internal levels are simply predicted by the subtraction of the estimated sound reduction index (SRI) of the building façade from the external free field noise measurements. When considering the SRI of a particular façade it is usual to only consider the glazing as this is the weakest element acoustically.

Table 2 in BS 8233:2014 give a range of target noise levels for a variety of internal spaces, such as offices. The upper limits should not be breached in order for the occupants of the space to not be disturbed. However, for open-plan offices for example, a minimum noise level can be useful to provide masking for acoustic privacy.

Table 2 **Indoor ambient noise levels in spaces when they are unoccupied and privacy is also important**

Objective	Typical situations	Design range $L_{Aeq,T}$ dB
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40 – 55
	Open plan office	45 – 50
	Night club, public house	40 – 45
	Ballroom, banqueting hall	35 – 40
	Living room	35 – 40

NOTE See Noise control in building services [28] and BS EN ISO 3382.

Table 2
Target internal noise levels of unoccupied spaces

As Table 2 above shows, the noise levels within an open plan office should be between 45 – 50 dB(A).

4 Measurement Details

4.1 Internal noise levels

A microphone was placed on a shelf within the ground floor unit and measured internal noise levels during a typical Friday night.

NB As the microphone was placed on a shelf, and therefore, near a wall, 3dB should be deducted from the noise levels to give the 'free field' reverberant noise level, i.e. away from surfaces.



Cursor: Position=2024-10-04 23:07:00 LAeq_dt=85.0 dB LAeq_15'=83.8 dB

Figure 3
Internal measured noise levels

To obtain a steadier reading, noise measurements were averaged over 15 minutes. The highest $L_{Aeq,15min}$ was 83.8 dB between 23:00 – 23:15.

The predominant noise was 'chatter' from patrons. Noise from the hi-fi system was only at a low 'background' level.

4.2 Sound insulation of separating floor

A sound insulation test of the separating floor to the adjoining dwelling above was taken according to relevant standards and guidance.

The construction of the separating floor was concrete – exact thickness unknown.

The result from the sound insulation test was at least :

$$50(-0; -2)\ \text{dB}\ D_{nT,w}(C; C_{tr})$$

Details of the sound insulation test are given In the Appendix.

5 Acoustic assessment

The potential noise issues to be assessed are:

- Noise transfer to the flat above

5.1 Noise transfer

The highest 15-minute noise level was 81 (84-3)dB which was after 23:00 when the allowable noise level in the flat above is 30dB.

The sound insulation of the separating floor was 50 dB.

Therefore, the noise level in the flat would be 31 dB which is only 1dB over the 30dB night time limit.

NB** It should be noted that the sound insulation of the separating floor is likely to be higher due to the elevated levels of background noise in the apartment above due to the single glazed sash windows.

5.2 Mitigation

A follow up site visit has confirmed that the entrance doors to the ground floor unit are well fitted with acoustic seals. Furthermore, none of the windows are openable.

Therefore, no further acoustic mitigation is required.

6 Conclusion

An acoustic survey has taken place at 70 Oldham Rd, Manchester to determine noise transfer from the proposed ground floor site to the flat above.

A sound insulation test of the separating floor was undertaken.

Noise levels within the ground floor space, during a busy Friday evening, were measured.

The predominant noise source was 'chatter' from the patrons. Noise from the sound system was only low 'background' level.

As assessment of noise transfer has shown that noise levels within the flat are only 1dB above the 30dB night time limit.

In order to reduce noise leakage from the venue, the doors and windows are as airtight as possible due to acoustic seals being fitted. Furthermore, none of the windows are openable.

No further mitigation is required.

7 References

[1] BS 4142: 1997
Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.

[2] BS 4142: 2014
Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.

Appendix

John Braiden BSc & MSc Acoustics, MIOA
Acoustic Consultant

0161 743 3621
john@braidenacoustics.co.uk

A1 Sound insulation test

Standardized level difference in accordance with ISO 140-4
Field measurements of airborne sound insulation between rooms

Client: Arts Direct Ltd

Date of test: 04/10/2024

Location: 70 Oldham Road, Ancoats

Concrete Floor - details unknown

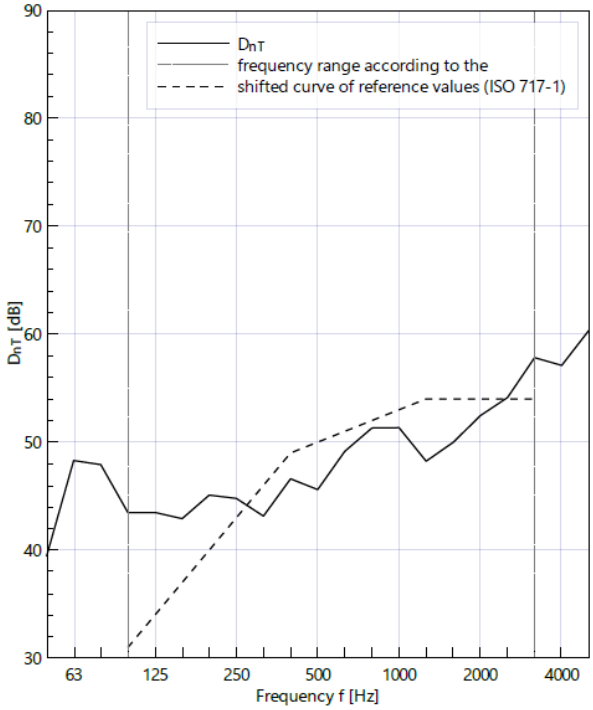
BRAIDEN
ACOUSTICS

Sound Level Meter: A2A-04393-D1 (M2230: 1617), A2A-04393-D2 (M2230: 1617)

Receiving room volume: 50.00 m³

Frequency f Hz	D_{nT} 1/3 octave dB
50	≥ 39.4
63	48.3
80	47.9
100	43.5
125	43.5
160	42.9
200	45.1
250	44.8
315	43.2
400	46.6
500	45.6
630	≥ 49.2
800	≥ 51.3
1000	≥ 51.3
1250	≥ 48.2
1600	≥ 50.0
2000	≥ 52.5
2500	≥ 54.1
3150	≥ 57.8
4000	≥ 57.1
5000	≥ 60.3

≥: 1.3 dB correction applied,
value at the limit of measurement



Rating in accordance with ISO 717-1:

$D_{nT,w}(C;C_{tr})$ = 50 (-0; -2) dB

$C_{50\text{-}3150}$ = -0 dB; $C_{50\text{-}5000}$ = 1 dB; $C_{100\text{-}5000}$ = 1 dB

$C_{tr,50\text{-}3150}$ = -2 dB; $C_{tr,50\text{-}5000}$ = -2 dB; $C_{tr,100\text{-}5000}$ = -2 dB

Evaluation based on field measurement using results obtained by an engineering method.

Report No.: 11330.1

Name: Braiden Acoustics

Date: 28/10/2024

Signature:

John Braiden BSc & MSc Acoustics, MIOA
Acoustic Consultant

0161 743 3621
john@braidenacoustics.co.uk