



BRAIDEN ACOUSTICS LTD

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

NOISE IMPACT ASSESSMENT (BASELINE)

Prepared For : Siddiq Horia Kheil

Date : 4 Jan 2024

Site : 251 Charlestown Road, Blackley

Report No. : 11242

1 INTRODUCTION

Braiden Acoustics has been commissioned by Siddiq Horia Kheil to undertake an acoustic survey at the site of the 251 Charlestown Road, Blackley in order to support planning permission 138572/FO/2023 which proposes:

Change of use of ground floor to laundrette (sui generis)

1.1 AIM

This is a 'baseline' report which will assesses noise transmission via the separating floor and determine noise limits for any potential external plant.

2 DESCRIPTION OF SITE

The proposed site is the ground floor of a two-storey semi-detached property that is part of a wider commercial parade.

The ground floor has been in commercial use with current residential use at first floor.



Figure 1
Proposed site street view

2.1 SITE LOCATION AND SURROUNDING AREA

The site is bounded by convenience store directly to the north, an access road to the east and west. Directly to the south is a parcel of green space, beyond which, is Charlestown Road.

John Braiden BSc MSc MIOA
Acoustic Consultant

0161 743 3621
john@braidenacoustics.co.uk



To the north west are more commercial units at ground floor, with the rest of the surrounding area being predominantly residential.



Figure 2
Site and surrounding uses

2.1.1 Nearest sensitive receptor

The nearest sensitive receiver (NSR) is the residential apartment on the first floor.

2.2 PROPOSED USE

The application seeks to change the use of the ground floor into a laundrette, as shown in Figure 3.

The exact machines and any potential extract system(s) are not yet known.



Figure 3
Plan drawing showing the typical layout

2.2.1 Building services

Any external plant has not yet been determined.

2.2.2 Opening hours

Monday to Saturday	09:00 – 18:00
Sunday	09:00 – 16:00



3 ACOUSTIC CRITERIA AND METHODOLOGY

Potential mitigation measures are determined by recommended indoor noise levels from BS 8233 “Sound insulation and noise reduction for buildings” [i] which, in turn, takes guidance from the research-based World Health Organisation “Guidelines for Community Noise”.

Noise level thresholds are usually given for the night-time – 2300-0700 hrs and daytime – 0700-2300 hrs.

3.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The National Planning Policy Framework is the current document for planning guidance. Paragraph 180 of the revised NPPF states:

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

Paragraph 180 refers to the Noise Policy Statement for England which shall be briefly discussed in the next Section.

3.2 NOISE POLICY STATEMENT FOR ENGLAND

The main aim of the Noise Policy Statement is to:

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

Therefore, the NPSE is mainly concerned with environmental noise.

The document sets out categories in order to help distinguish if there is an adverse effect due to noise and if there is, how significant it is.

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur

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 is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.



BS 4142:1999 “Method for rating industrial noise affecting mixed residential and industrial areas” [ii] 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” [iii]. 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.”

3.4 BS 8233: 2014

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)

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

3.4.1 Noise levels in external living areas

For external living areas such as gardens and balconies, BS 8233:2014 § 7.7.3.2 recommends an upper limit of 55dB $L_{Aeq,day}$ although there is a caveat:

However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.

3.4.2 Maximum noise levels

In the 2014 edition of the Standard, the criterion of 45dB L_{AFMax} inside bedrooms has been removed although there is Note 4:

NOTE 4 regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,P}$ depending on the character and number of events per night. Sporadic noise events could require separate values.

3.5 COUNCIL CRITERIA

3.5.1 Residential noise levels

The noise criteria from condition 8 are as follows:

- 35dB L_{Aeq} (16hr) from 0700 to 2300 within living rooms
- 30dB L_{Aeq} (8hr) from 2300 to 0700 within bedrooms



- 45dB LAFmax (individual noise events shall not exceed 45 dB LAmax,F by more than 15 times) within bedrooms
- 50dB LAeq (16hr) from 0700 to 2300 for outdoor living areas

3.5.2 Industrial noise levels

The noise criterion from condition 9 are as follows:

Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L Aeq) below the typical background (L A90) level at the nearest noise sensitive location.

4 MONITORING DETAILS

4.1 SITE VISIT 1

4.1.1 Monitoring details

Personnel: John Braiden, BSc & MSc Acoustics, MIOA.

Weather: 8°C temperature; ~5ms⁻¹ wind; ~20-40% cloud;

Equipment: NTi XL2 integrated real time analyser & B&K 4231 calibrator.

Date: Sundry 17th December 2023.

The sound level meter was calibrated before after the measurements with no significant drift reported.

Monitoring was unmanned with audio recorded.

4.1.2 Monitoring location

The microphone was 1.2m from ground at 3.5m from the southern elevation.



Figure 4
Site location showing monitoring location

4.1.3 Monitoring results

Noise levels were measured continuously for 15 minutes during a quiet time of the week when the site would be open – Sunday morning.



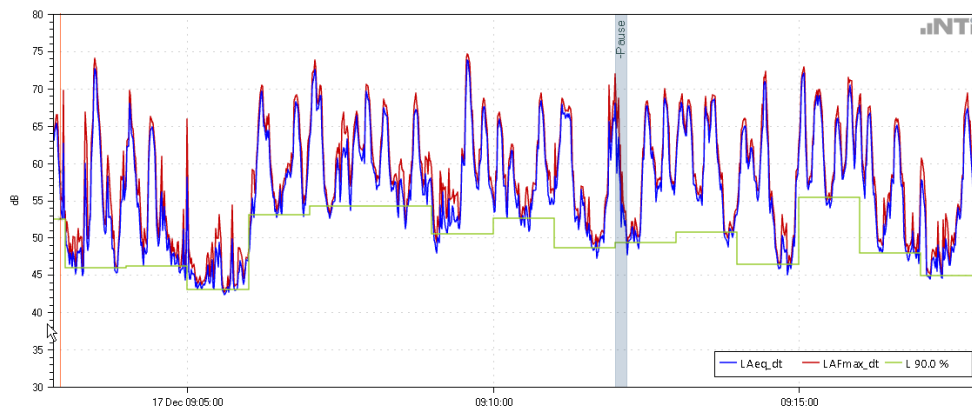


Figure 5
Time history

Noise levels in the area were relatively quiet. The only noise source of note was passing vehicles on Charlestown Road.

The typical Background Noise Level when the laundrette would be open is 43.4 dB L_{A90} .

Time		Duration	Time Period	L_{A90} dB	L_{Aeq} dB	L_{Amax} dB
Start	Finish					
09:02:48	09:17:58	00:15:10	day	46.6	61.7	74.6

Table 2
Summary of noise monitoring results

5 ACOUSTIC ASSESSMENT

5.1 EXTERNAL PLANT

The details of any external plant are not yet known. However, the combined Rating Level of any such equipment should not exceed 5 dB below the Background Noise Level. Therefore, the target Rating Level, at the nearest habitable room, is 41 dB(A).

5.2 INTERNAL NOISE TRANSFER

5.2.1 Internal noise level in laundrette

The number and type of machines in the laundrette are not yet known; however, noise measurement of a typical industrial washing machine have previously taken place at another site.

Noise monitoring took place of a 15 -20kg washing machine at Hawler Laundry & Dry Cleaners in Rusholme. The highest noise level, measured at one metre, was 70dB(A).

5.2.2 Ground to First Floor

The existing separating floor is concrete that is assumed to be 150mm thick.

Using computer modelling software, the performance of the floor can be estimated.

It is advised that there should be the addition of an acoustic ceiling.



5.2.2.1 Proposed ceiling upgrade

It is proposed to remove with existing suspended ceiling to reveal the original ceiling. The original ceiling should be checked and 'made good/ where appropriate. Once made-good, there should be an independent ceiling underdrawn that conforms to Floor Treatment 1 in Approved Document E.

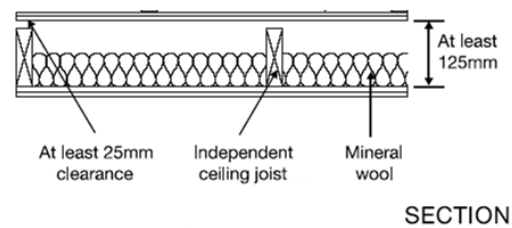


Figure 6
ADE Floor treatment 1 - Independent ceiling with absorbent material

The resistance to airborne and impact sound depends on the :

- the combined mass of the existing floor and the independent ceiling,
- the absorbent material,
- the isolation of the independent ceiling and
- the airtightness of the whole construction.

The construction of the separating floor is as follows:

- **make good original ceiling so that it is airtight;**
- the independent ceiling shall be supported by independent joists fixed only to the surrounding walls. A clearance of at least 25mm should be left between the top of the independent ceiling joists and the underside of the existing ceiling.
- any supporting beams should sit within the cavity of the independent ceiling
- at least 2 layers of 15mm acoustic plasterboard with staggered joints, minimum mass per unit area 20kg/m²;
- an absorbent layer of mineral wool laid on the ceiling , minimum thickness 100mm, minimum density of 10 kg/m³

NB The plasterboards attached to the underside of the independent ceiling should be below any beams, so that the beams are within the cavity of the independent ceiling. Please contact Braiden Acoustics for further information.**

For services such as lights, smoke alarm etc. then there should be a sacrificial ceiling as shown below.



Sacrificial ceiling:
Metal ceiling system with a 100mm (min) void fixed to underside of primary ceiling. One layer of nominal 8kg/m² gypsum based board.

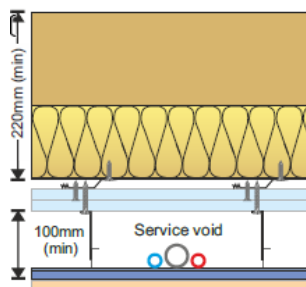


Figure 7
Typical sacrificial ceiling

The sacrificial ceiling should be directly screwed to the underside of the joists of the acoustic ceiling above.

The acoustic ceiling should create a minimum of 100mm cavity.

One layer of standard plasterboard is sufficient for the sacrificial ceiling, as it will have no real acoustic performance.

5.2.2.2 Noise transfer to first floor flat

The above construction described in Section 5.2.2.1 will give an on-site sound insulation performance of, at least, 50 dB. Considering that the likely upper noise level in the laundrette will be 70 dB(A), as described in Section 5.2.1, then the noise level in the first-floor accommodation will be $70 - 50 = 20$ dB. This is 15 dB below the 35 dB daytime internal noise limit in habitable spaces.

5.2.2.3 Vibration

All washing machines, dryers and ductwork should be connected to the building use anti-vibration mounts.

6 CONCLUSION

An acoustic survey has taken place at the 251 Charlestown Road, Blackley to discharge noise conditions relating to a planning application for the erection of a new building with A1 retails at ground floor and storage and a flat on first floor level.

Noise from external plant

The combined Rating Level of any external plant should exceed 41 dB(A).

Noise breakout from the ground floor unit

The construction of the separating floor is as follows:

- ***make good original ceiling so that it is airtight;***
- an independent ceiling shall be supported by independent joists fixed only to the surrounding walls. A clearance of at least 25mm should be left between the top of the independent ceiling joists and the underside of the existing ceiling.
- any supporting beams should sit within the cavity of the independent ceiling;
- at least 2 layers of 15mm acoustic plasterboard with staggered joints, minimum mass per unit area 20kg/m²;



- an absorbent layer of mineral wool laid on the ceiling , minimum thickness 100mm, minimum density of 10 kg/m³

NB The acoustic ceiling shall NOT be penetrated, but if absolutely necessary than is shall be fully sealed using appropriate building methods. Contact Braiden Acoustics for further advise if need be.**

For services such as lights, smoke alarm etc. then there should be a sacrificial ceiling as described in the report.

7 REFERENCES

[i] BS8233: 2014

Sound Insulation and noise reduction for buildings – Code of Practice,
British Standards Institute, 2014.

[ii] BS 4142: 1997

Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.

[iii] BS 4142: 2014

Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.



A1 DRAWING

