BRAIDEN ACOUSTICS LTD

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

NOISE IMPACT ASSESSMENT

Prepared For :	Murtaza Nafees	Date :	1 Jul 2025
Site :	171 Great Ducie St, Cheetham Hill	Report No. :	11409revA

1 INTRODUCTION

Braiden Acoustics has been commissioned by Murtaza Nafees to undertake an acoustic survey at the site of 171 Great Ducie St, Cheetham Hill in order to support a planning application which proposes "Prior Approval for conversion of first and second floors from Offices (Class E) to 2no apartments (Class C3) at 171 Great Ducie Street, Manchester, M3 1FF".

1.1 AIM

This report assesses noise break-in to the proposed residential accommodation and suggest mitigation, where necessary, so the noise levels within the accommodation meet the council's requirements.

The separating partitions will be subject to Building Regulations Part E : Resistance to the passage of sound, so these will also be assessed.

2 DESCRIPTION OF SITE

The site is semi-detached property that is over 2 stories.

The ground floor is a shop that seems to be a retail space for 'white goods'.



Figure 1
Site street view

2.1 SITE LOCATION AND SURROUNDING AREA

The site is bounded by Great Ducie Street to the east, a commercial property to the north, a rear yard to the west and an archway to the south that gives access to the rear yard. Beyond the rear yard is Barker Street, beyond which is Gurdwara Sri Guru Harkrishan Sahib, a Sikh place of worship.

Great Ducie Street primarily commercial, at ground floor level, with the some of the local uses as follows:

171-173	KM Graded Appliances	White Goods retailer
175	Prime Technologies	Laptop etc retailer
177	Bettys Beauty Bar	Beauty & Massage
179	MCR E-bike & scooter	Ebikes / Escooters sales & repair
167-169	Vacant retail / offices	former bank then a Cash & Carry
165	Avan Lounge Restaurant & Shisha Bar	

On the other side of Great Ducie Street is car parking, with Stangeways prison beyond.



Figure 2
Site location and surrounding uses

2.2 PROPOSED USE

The proposal is to convert the upper floors to residential accommodation.

On the first floor there will be a two-bedroom apartment.

On the second floor, in the loft space, will be a one-bedroom apartment.



Figure 3
Proposed floor plans

2.2.1 Separating floor detail

From the drawings it states that the party floor build up is as follows:

> *Floor finish, on Cellecta Screedboard 28 high density composite acoustic floorboards, fixed to top of Mitek Posi-Joists (to be sized by Structural Engineer). Fit 50mm thick Cellecta FIBREfon Micro 50 insulation between joists and two layers of 15mm thick British Gyspsum Gyroc SoundBloc, on CELLECTA HP30 Deep Resilient Bars, to underside of joists. Plasterboard to receive skim and paint finish.*

To summarize:

- Cellecta Screedboard 28 acoustic flooring, fixed to the top of
- Mitek Posi joists with 50mm Cellecta FIBREfon Micro 50 insulation between joists
- 2 x 15mm Sounbloc on CELLECTA HP30 Deep Resilient Bars.

However, a different acoustic flooring product has been installed, which is JCW Acoustic Deck.

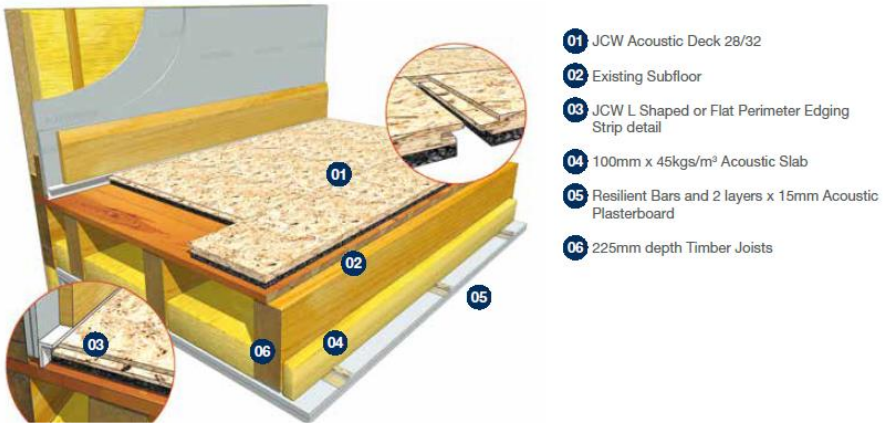


Figure 4
JCW Acoustic Deck flooring detail

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NB** It should be noted that 12.5mm acoustic boards have been installed instead of 15mm

The 28mm Acoustic Deck has been used.

The shop ceiling is assumed to be one layer of standard plasterboard.

3 ACOUSTIC CRITERIA AND METHODOLOGY

Below are relevant standards and guidance.

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 is if there is an adverse effect due to noise and if there is, how significant is it.

> *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.*

3.3 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).

When measuring the Background Noise Level, the Standard states:

> *Choose outdoor measurement locations that will give results that are representative of the ambient sound and residual sound at the assessment location(s). Make the measurement of the ambient sound level, the residual sound level and the background sound level at a height of 1.2 m to 1.5 m above the ground, unless there is a specific reason to use an alternative height (which should be justified), and under similar conditions, e.g. similar influence of reflections and measurement height above the ground. Where practical, minimize the influence of reflections by making the measurements at least 3.5 m from any reflecting surface other than the ground.*
>
> *Where it is necessary to undertake measurements above ground floor level, choose a location which is approximately 1 m from the facade on the relevant floor of the building if it is not practical to make the measurements at least 3.5 m from the facade at this elevation. NOTE When measurements for distant sources are made at 1 m from a facade, the measured level can be adjusted to an equivalent free-field level by subtracting a 3 dB correction factor. For sources that are relatively close or not perpendicular to the facade the correction may be 1 dB or 2 dB, in which case the reasons for not using a correction of 3 dB ought to be explained.*

Essentially, background noise measurement should be made free field. If measurements are made at the façade, then a correction should be made in order to represent the free field.

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."

3.4 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)

3.5 COUNCIL NOISE CRITERIA

3.5.1 Residential noise criteria

For residential developments, the noise thresholds are taken from BS8233:

- *Bedrooms (night time - 23.00 - 07.00) 30 dB LAeq (individual noise events should not normally exceed 45 dB LAmax,F by more than 15 times)*
- *Living Rooms (daytime - 07.00 - 23.00) 35 dB LAeq*
- *Gardens and terraces (daytime) 55 dB LAeq*

3.5.2 Industrial noise criteria

For external plant the noise criterion is as follows:

> *'The development should be designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location'.*

4 Monitoring Details

New windows have already been installed on site, so noise measurements were made internally with windows closed but trickle vents open.

Monitoring took place internally over a weekend, that included Friday rush hour.

4.1 Noise monitoring

4.1.1 Overview

Personnel:	John Braiden, BSc & MSc Acoustics, MIOA.
Equipment:	NTi XL2 integrated real time analyser & B&K 4231 calibrator.
Weather	14- 18degC, <5m/s wind, 20-40% cloud
Time / Date:	Friday 30/05/2025 at 16:45 for over 24 hours.

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

Monitoring was unmanned.

Background noise (L_{A90}), 'average' noise levels (L_{Aeq}) and maximum noise levels (L_{Amax}) where taken in 15-minute intervals.

4.1.1.1 Monitoring Locations

Internal noise monitoring took place at the front and rear of the property.

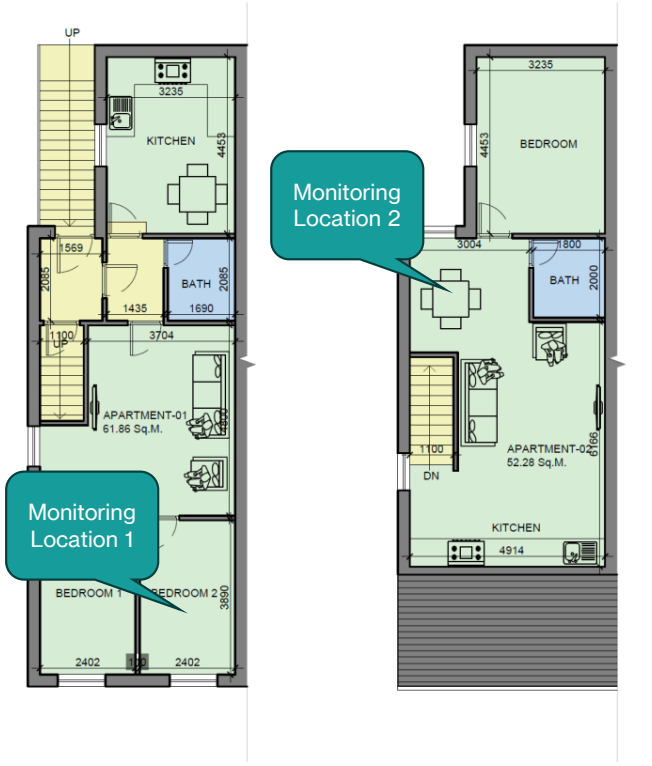


Figure 5
Monitoring locations front and rear

4.1.2 Front

The predominant noise impacting the eastern façade is road traffic noise from Great Ducie Street.

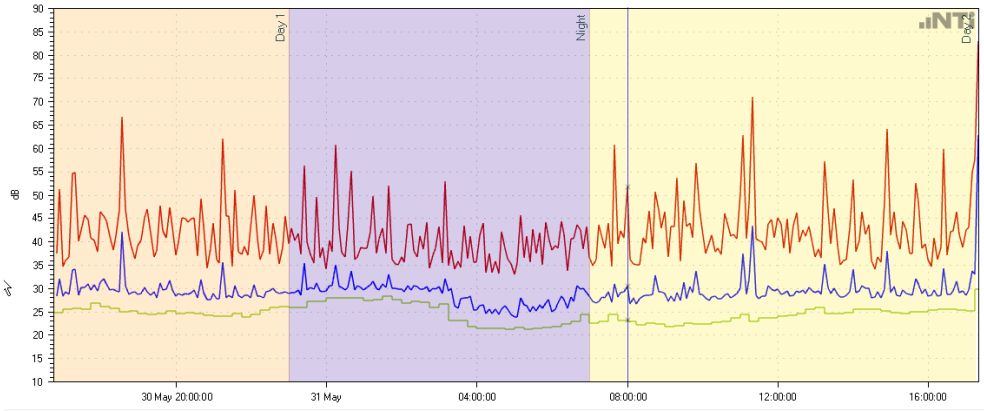


Figure 6
Time history - FRONT

A summary of the overall noise levels at the front is given in Table 2.

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Day	Time		Duration	Time Period	L_{A90} dB	L_{Aeq} dB	L_{Amax} dB
	Start	Finish					
Fri 30/05/25	16:00:00	23:00:00	06:15:00	day	24.9	30.6	66.6
	23:00:00	07:00:00	08:00:00	night	22.0	29.2	60.8
	07:00:00	17:14:00	10:14:00	day	23.7	30.5	71.0

Table 2
Summary of noise monitoring results - internal FRONT

The overall internal noise levels are as follows:

L_{Aeq} (night) 29 dB

L_{Aeq} (day) 31 dB

The day and night levels reflect the ebb and flow of road traffic noise.

4.1.3 Rear

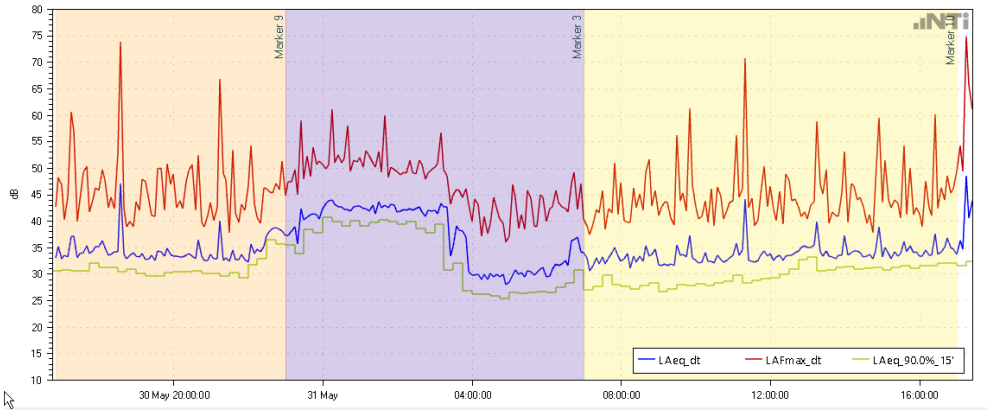


Figure 7
Time history – REAR

Road noise is evident at the rear of the property also. However, in addition to road noise, there was clearly entertainment noise break-out from approximately 22:00 – 04:00. It is assumed that it was emanating from the Sikh temple on the other side of Barker Street.

A summary of the overall noise levels at the rear is given in Table 3.

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Day	Time		Duration	Time Period	L_{A90} dB	L_{Aeq} dB	L_{Amax} dB
	Start	Finish					
Fri 30/05/25	16:45:00	23:00:00	06:15:00	day	30.5	35.6	73.8
	23:00:00	07:00:00	08:00:00	night	27.3	39.8	61.1
	07:00:00	17:14:00	10:14:00	day	29.1	34.3	70.7

Table 3
Summary of noise monitoring results - internal REAR

The measured noise levels at the rear were higher than the front, even though the main noise in the area is road traffic noise from Great Ducie Street. A further visit revealed that there is only on skin of brickwork around the window, which was in poor condition, with even some visible gaps.

When road traffic is the prevalent noise source, the noise level at the rear of a property is typically 5-10dB less than the front, therefore, a conservative 9dB[1] will be subtracted from the figures given in Table 3.

The overall internal noise levels at the rear as follows:

L_{Aeq} (night) 40 – 9 = 31dB

L_{Aeq} (day) 35 – 9 = 26dB

The higher night time noise levels reflect the entertainment noise break-in.

5 ACOUSTIC ASSESSMENT

5.1 ENVIRONMENTAL NOISE BREAK-IN

Given the internal noise levels, the initial glazing scheme can be suggested. However, it should be noted that this assumes windows closed in order to achieve the internal noise levels based on BS8233:2014.

The sound insulation of the open window is taken from Section G.1 in BS8233:2014:

> *If partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15 dB*

Furthermore, NOTE 7 of Table 4 "Indoor ambient noise levels for dwellings" states:

> *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.*

Therefore, if 'reasonable internal conditions' can be achieved with open windows then there would be no need for alternative ventilation.

4mm double glazed windows have been fitted, which gives a Sound Reduction Index (SRI) of 25dB. The SRI decreases to 15dB when the window is open.

5.1.1 BS 8233 assessment

The measured internal levels for the day and night periods, are as follows:

[1] Subtracting 9dB results in the daytime noise level at the rear 5dB less than the front.

Front

L_{Aeq} (night) 29 dB
L_{Aeq} (day) 31 dB

Reat

L_{Aeq} (night) 31dB
L_{Aeq} (day) 26dB

Façade	period	room	Internal Levels measured / calc'd L_{Aeq} (dB)	Internal Levels measured / calc'd $L_{Aeq\ window\ open}$ (dB)	Internal Levels recommended L_{Aeq} (dB)	Internal Levels recommended $L_{Aeq\ window\ open}$ (dB)	Required alternative ventilation>
REAR	night	bedroom	31(30[2])	41	30	35	YES
	day	lounge	26 (35)	36	35	40	NO
FRONT	night	bedroom	29 (30)	39	30	35	YES
	day	lounge	31 (35)	41	35	40	YES

Table 4
Calculated SRI values and recommended glazing

Adequate internal noise level can be achieved with the current glazing for all but the bedrooms at the rear, although there will need to be alternative ventilation.

NB** The bedroom windows at the rear / side need to be changed to 4 / (6-16) / 6mm windows

NB** The lounges at the rear / side do NOT need mechanical ventilation



Figure 8
Floor plans showing one window needs upgrading

[2] Allowable internal noise levels, as described in Table 1.

5.1.2 Ventilation

All habitable windows, except for the side / rear lounges, will require alternative mechanical ventilation; such a unit is the Sonair 3 by Titon[3].

The Sonair 3 is a mechanical acoustic vent.

The brochure (see Appendix) states:

> *Sonair provides mechanical input ventilation when switched on, when switched off provides background trickle ventilation which includes a controllable shutter.*

*****NB there should be no trickle vents in the frames of the windows***

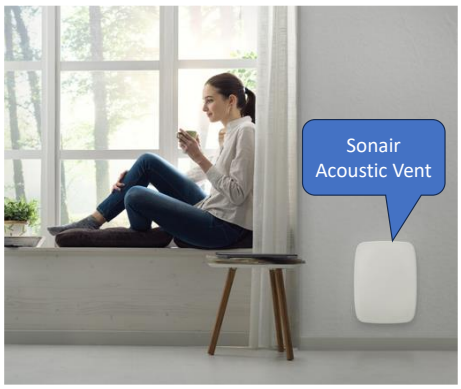


Figure 9
In-situ Titon Sonair acoustic vent

The Sonair unit provides a minimum sound reduction index of 50 dB $D_{n.e.w} + C_{tr}$.

The unit can also clean the air via filters. More details can be found at:

https://www.titon.com/uk/products/ventilation-systems/supply_ventilation/sonair3/

Installation guidance should be sought from the manufacturer above.

5.2 SOUND INSULATION OF SEPARATING PARTITIONS

5.2.1 Second Floor

The build up using the JCW Acoustic Deck 28 is shown using 15mm acoustic boards (see Figure 4) therefore an extra acoustic or fire board should be added to the ceiling of the second floor.

NB** An extra 12.5mmr acoustic board should be added to the ceiling, so there are three acoustics boards in total.

5.2.2 First Floor

The ceiling of the first floor, in the shop, should have an independent ceiling constructed as per Floor Treatment in Approved Document E (ADE).

[3] There are other mechanical ventilators and systems are available and will need to assessed individually.

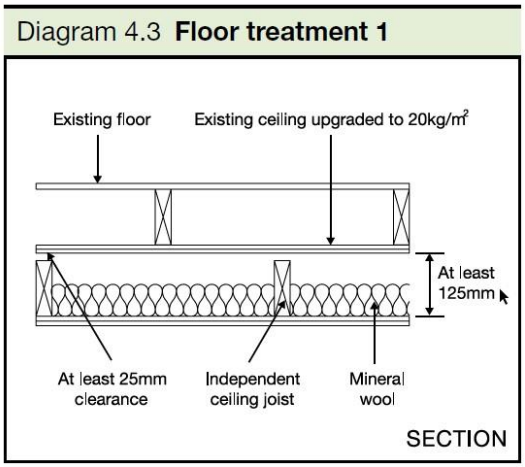


Figure 10
ADE Floor Treatment 1

The existing ceiling should be 'made good' with an independent ceiling built underneath, as shown in Figure 10. The independent ceiling should be constructed as follows:

- independent joists attached to the surrounding walls with additional support provided by acoustic hangers attached directly to the existing floor base.
- 2 layers of 12.5mm Soundbloc (21kgm^{-2}) with staggered joints.
- an absorbent layer of mineral wool laid in the cavity, minimum thickness 100mm with a minimum density of 10 kg/m^3.
- Seal the perimeter of the of the independent ceiling with acoustic sealant.

A typical acoustic hanger is the Gypframe GAH1 Acoustic Hanger from British Gypsum.



Figure 11
Gypframe GAH1 Acoustic Hanger

https://www.british-gypsum.com/products/metal-products/gypframe-gah1-acoustic-hanger

5.2.3 Stair treatment

The stairs should be treated in accordance with Diagram 4.8 in ADE – see below.

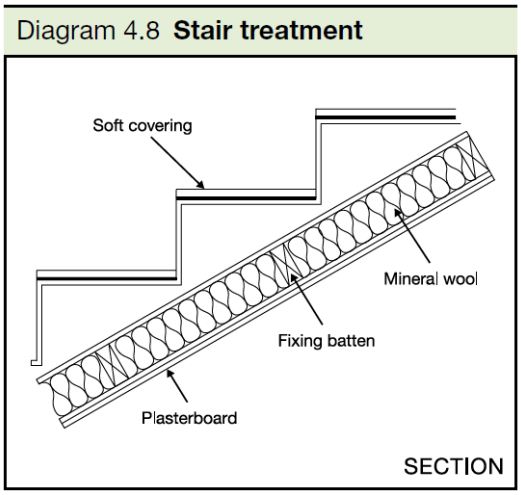


Figure 12
Stair treatment

Approved Document E states:

4.35 Stairs are subject to the same sound insulation requirements as floors where they perform a separating function.

4.36 The resistance to airborne sounds depends mainly on the mass of the stair, the mass and isolation of any independent ceiling, and the airtightness of any cupboard or enclosure under the stair. The stair covering reduces impact sound at source.

Stair covering and independent ceiling with absorbent material

4.37 Lay a soft covering of at least 6mm thickness over the stair treads. Ensure it is securely fixed (e.g. glued).

Where there is no cupboard under the stair construct an independent ceiling under the stairs (see Figure 12)

- *1no. layer of acoustic plasterboard*
- *minimum of 100mm deep timber batten*
- *100mm of loosely laid acoustic mineral wool (min. density of 10 kg/m3) in the cavity*
- *2no. layers of acoustic plasterboard*

The stair tread treatment can be a product like the one below:



Figure 13
dB FFR 6mm stair tread treatment

dB FFR 6mm

www.soundinsulationstore.co.uk

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https://www.soundinsulationstore.co.uk/products/db-ffr-6mm?_gl=1*1m8tc3n*_up*MQ..*_gs*MQ..&gclid=Cj0KCQjwjo7DBhCrARIsACWauSkqI9CjDePAvwoknxMOjHGTp3yJwTp4UXKKZzUvC7kbMMLXXu8oHM0aAojyEALw_wcB&gbraid=0AAAADGb-CgFPoWXHhSoQ6_hXcnk4mRUa

6 Conclusion

An acoustic survey has taken place at the 171 Great Ducie St, Cheetham Hill to support a planning application for the change of use of the upper floor to residential accommodation.

Environmental noise break-in assessment revealed the following mitigation:

- Windows of bedrooms to the rear / side should be upgraded to 4 / (6-16) / 6mm
- All habitable room, except for lounges to the rear, should have mechanical ventilation; such a unit is the Sonair 3 by Titon.

In addition, recommendations for the separating floors have been presented.

Pending the recommendations above, amenity of the future residents should be protected.

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

A1 Drawings

A1.1 Proposed plans

