



BRAIDEN ACOUSTICS LTD

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

NOISE IMPACT ASSESSMENT

Prepared For : Gold Sketch Studios Ltd

Date : 18 Jun 2024

Site : 72 - 74 Kings Road, Prestwich

Report No. : 11283revB

1 INTRODUCTION

Braidens Acoustics Ltd has been commissioned by Gold Sketch Studios Ltd to undertake an acoustic survey at the site of 72 - 74 Kings Road, Prestwich in order to support a planning application which proposes:

Change of use of 72 Kings Road from residential dwelling (Class C3) to synagogue (Class F1(f)) with single storey side extension to link to existing synagogue at 74 Kings Road and external alterations.

1.1 AIM

This report shall determine the noise sources and receivers, their baseline noise thresholds and assess according to relevant standards and guidance.

In particular this report will address noise transmission to the newly adjoined residential property.

2 DESCRIPTION OF SITE

The site is a two-storey brick building on the corner of Kings Road and Mowbury Avenue in Prestwich.



Figure 1
Street view of site (left) and neighbouring property

2.1 SITE LOCATION AND SURROUNDING USES

The proposed site is at 72-74 Kings Road which is in a residential area of Prestwich.

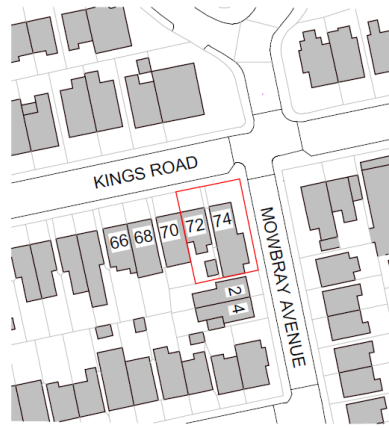


Figure 2
Site location and surrounding uses

2.1.1 Nearest sensitive receivers

The nearest sensitive receptor (NSR) will be the property at 70 Kings Road which adjoins 72 Kings Road as they are currently a semi-detached pair of dwellings.

2.2 EXISTING USE

Currently, 72 and 74 Kings Road are two separate properties, with 72 being a residential building, as shown in the figure below.

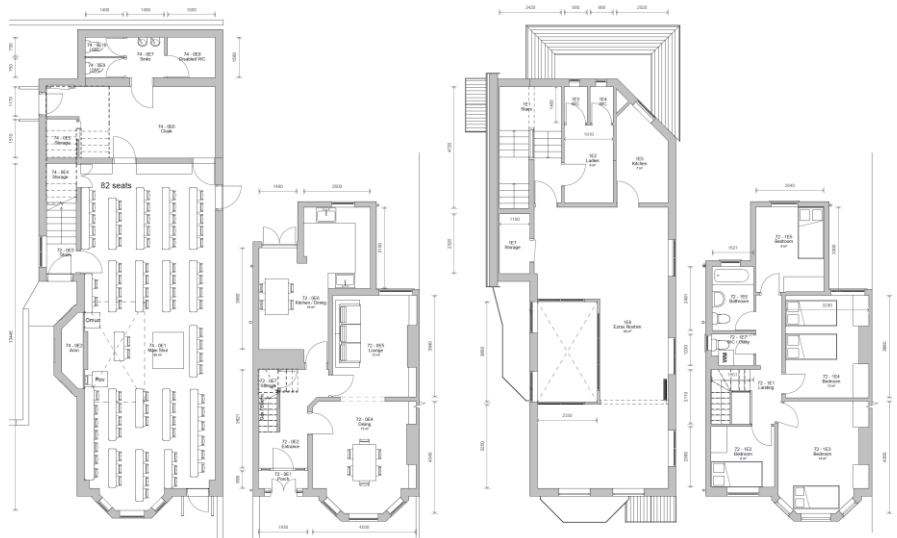


Figure 3
Existing floor layouts

2.3 PROPOSED USE

It is proposed to knock through to the adjacent (but not adjoining) property at 72 Kings Road at ground floor level only – as shown Figure 4.



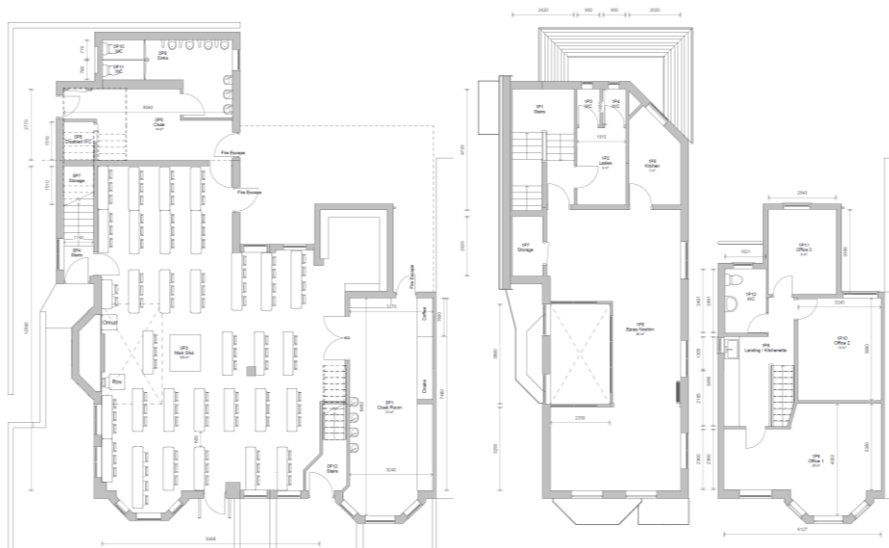


Figure 4
Ground and first floor proposed layouts

Abutting up to the party wall with 70 Kings Road will be a cloakroom at ground floor level and offices at first floor level.

The main worship room (denoted as ‘Main Shul’ in Figure 4) will be double height.

2.3.1 Opening hours

The synagogue will be open daily:

07:00 – 23:00

2.3.2 Building services

There will be no building services associated with this application.

2.3.3 Sound system

There is no amplified sound, either in the existing synagogue or the proposed extended synagogue.

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” [1] 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. As the synagogue will only be in use from 09:00 – 19:30 then only the daytime noise threshold in habitable rooms needs to be considered.

3.1 BUILDING REGULATIONS – PART E

The currently methodology for the assessment of sound insulation within a building is taken from The Building Regulations Part E: Resistance to the Passage of Sound, otherwise known as Approved Document E (ADE). The testing procedure is described in Annex B with reference to ISO 140-4 [2], ISO 140-7 [3], ISO 717-1 [4] and ISO 717-2 [5] which describe the testing methodology for airborne and structure borne noise as well as descriptions of the various relevant parameters and nomenclature.

The proposed site is classed as rooms for residential purposes and so fall under the directions of part E1 of the Building Regulations document.



E1. Dwelling houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings.

According to Building Regulations Approved Document E (ADE) the proposed development comes under the category material change of use.

Table 0.1b Rooms for residential purposes – performance standards for separating walls, floors and stairs that perform a separating function	Sound Insulation Requirement	
	$D_{nT,w} + C_{tr}$ (dB)	$L'_{nT,w}$ (dB)
Purpose built rooms for residential purposes		
Walls	≥43	-
Floors and stairs	≥45	≤62

Table 1
Tables 0.1b from Approved Document E

As there is only a separating wall between the proposed synagogue and the adjacent residential dwelling, then consideration of a separating floor is not required.

The separating wall, therefore, should achieve a sound insulation value of a minimum of 43 dB.

3.2 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:

- 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.*
- 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*
- 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.

3.3 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.

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 2

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.

3.5 COUNCIL CRITERIA

3.5.1 Residential noise levels

The exact noise criteria from the Council are not known at the time of writing, however, this assessment will treat all living areas the same and follows the levels given in BS8233.

The noise criteria this assessment will follow are:

L_{Aeq} 30 dB 8 hours – indoors, night-time (23.00-07.00)

L_{Aeq} 35 dB 16 hours – indoors, daytime **all** living areas (07.00-23.00)

4 MEASUREMENT DETAILS

The only potential issue of noise is that of raised voices being transferred via the party wall to the adjacent property at 70 Kings Road.

Noise measurements were taken during a four-hour period within the current synagogue to ascertain typical noise levels within the proposed synagogue. The same number of attendees will occupy both the current and proposed worship room.

NB It should be noted that the main worship area does NOT abut up to the party wall. However, this assessment assumed that it does, as a worst-case methodology when, for example, a door is opened to the cloakroom at ground floor level. It is also assumed that the noise levels in the first-floor offices will be similar**



to those in the main worship (in reality, the office noise levels will be lower than the main worship area as the offices are much smaller and hold far fewer people).

4.1 MONITORING DETAILS

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

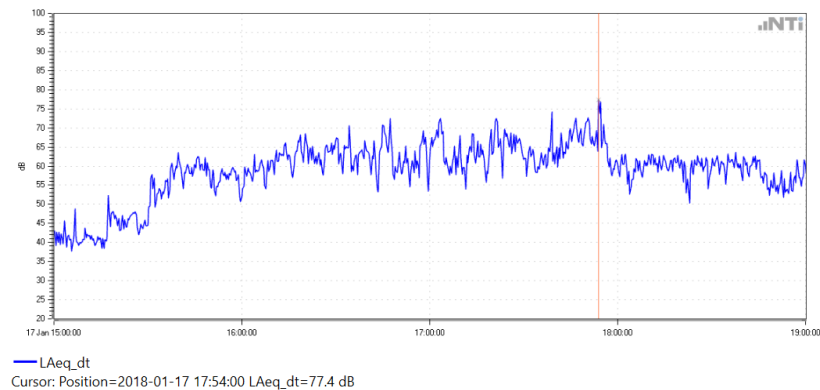
Location: microphone placed protruding from bookshelf approximately 1.5m from the floor.

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

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

Monitoring was unmanned with audio recorded.

4.2 RESULTS



Figure

5

Noise monitoring of the synagogue was in full use approximately between 16:15 to just before 18:00. The equivalent single figure noise level for that period was 66 dB L_{Aeq} .

The highest noise level recorded in the room was 77 dB $L_{Aeq,20secs}$. This is also the noise level that is to be expected in a café, so this is a reasonable upper noise limit to be assumed within the proposed worship room. Even so, as a worst case, an upper noise level of 80 dB(A) is to be used in the noise assessment.

5 ASSESSMENT

The assessment is based upon noise transfer from the proposed worship room to the adjacent living room at 70 Kings Road, via the party wall.

5.1 PARTY WALL

5.1.1 Existing

The party wall is two courses of brickwork : 230mm(9") solid masonry. From the sound insulation software Insul, the predicted on-site performance of the party wall is:

$$44 \text{ dB } D_{nT,w} + C_{tr}.$$

5.1.2 Proposed

It is proposed to acoustically line the party wall as shown in Figure 6 and Figure 7.



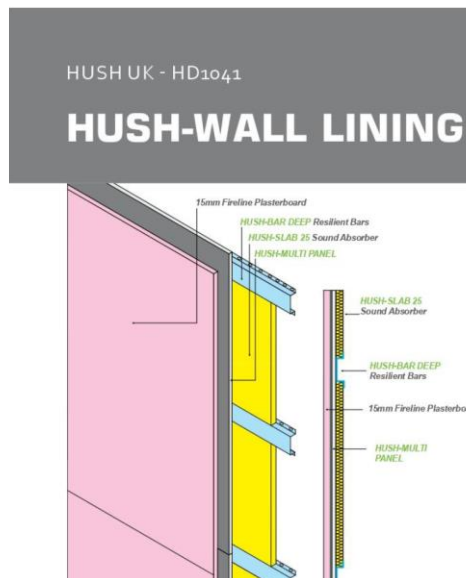


Figure 6
Proposed party wall lining

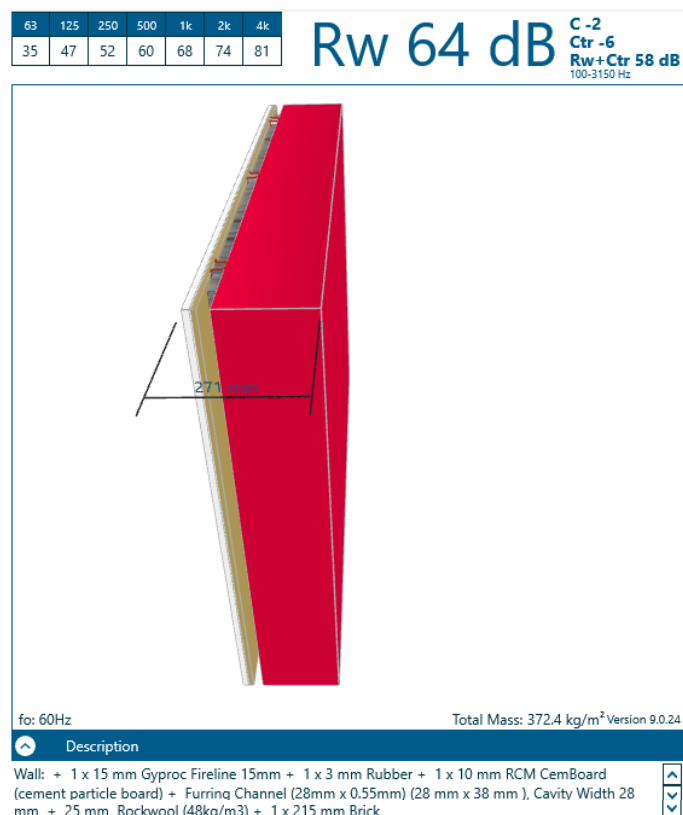


Figure 7
SRI of proposed upgraded party wall

Assuming correct installation, the sound insulation of the upgraded party wall is predicted to be 50 dB $D_{nT,w}$ + C_{tr} .

As the proposed party wall should achieve 50 dB then this far exceeds the Building Regulations Part E threshold of a minimum of 43 dB.

5.1.2.1 Construction advice

The following construction recommendations should be strictly followed to ensure the acoustic integrity of the separating wall.



- seal all mortar joints of existing party wall. This can be achieved with a thick coat (min. 10mm) of render, for example.
- when double-boarding, joints should be staggered.
- leave 2-3mm around the perimeter to allow for movement and fully seal with acoustic sealant.
- there should be NO penetrations in the acoustic plasterboard apart from the screws attaching the boards to the Hush Panel frame.

5.2 NOISE TRANSFER CALCULATION

In order to determine the noise transfer to the adjacent property, the following calculation is used.

$$SPL_r = SPL_s - SRI + 10 \log S_p - 10 \log A \quad (1)$$

where

- SPL_r = noise level in receiving room
- SPL_s = noise level in source room
- SRI = sound reduction index of building element, dB
- S_p = area of partition, m²
- A = total absorption, S $\bar{\alpha}$
- S = surface area of room, m²
- $\bar{\alpha}$ = average absorption coefficient

The above values are known and have been calculated, as shown in the table below.

Description	Value	dB
Noise Level in Worship Room, SPLs		80.0
Sound Reduction Index of partition, SRI		-50.0
Area of partition, Sp	24	13.8
Surface area of the room, S	276.5728	
Absorption coefficient, alpha bar	0.3	
Total absorption		-19.2
Noise level in adjacent Living Room, Sr		25

Table 3
Noise transfer calculation

The calculated noise level transmitted to the adjacent property has been rounded up to **25 dB(A)**. This is well below the 35 dB limit shown in Table 1 and therefore no further sound insulation work is required.

However, the existing party wall should be checked for integrity and any holes, gaps etc. filled appropriately and 'made good' where necessary. The party wall should have a minimum of a 13mm coat of plaster or similar throughout prior to installing the Hush wall lining system.

6 CONCLUSION

An acoustic building detail survey has taken place at 72 - 74 Kings Road, Prestwich so that the proposed party wall adheres to both planning and Building Regulations Part E.



An additional Hush panel acoustic lining is proposed to the party wall. This should give a sound reduction of 50 dB. This is far in excess of the minimum value of 43dB required for Building Regulations Part E and therefore compliant.

BS8233 requires that noise within a daytime habitable room does not exceed 35 dB. Calculations of noise transfer via the party wall predict that the noise level within the adjacent habitable rooms will be 25 dB. This is far less than the maximum value of 35 dB therefore, also compliant.

Following the recommendations and the design detailed in this report the party wall will ensure compliance with both planning and Building Regulations Part E.

7 REFERENCES

[1] BS8233: 2014

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

[2] BS EN ISO 140-4:1998

Acoustics. Measurement of sound insulation in buildings and of building elements. Field measurements of airborne sound insulation between rooms
British Standards, 1998.

[3] BS EN ISO 140-7:1998

Acoustics. Measurement of sound insulation in buildings and of building elements. Field measurements of impact sound insulation of floors
British Standards, 1998.

[4] BS EN ISO 717-1:1997

Acoustics. Rating of sound insulation in buildings and of building elements. Airborne sound insulation
British Standards, 1997.

[5] BS EN ISO 717-2:1997

Acoustics. Rating of sound insulation in buildings and of building elements. Impact sound insulation
British Standards, 1997.



Appendix



Appendix D

HUSH UK - HD1041

HUSH-WALL LINING SYSTEM

Specification

- 15mm Fireline to be installed over the Hush-Multi panel, ensuring that all joints are staggered. All perimeters are to be sealed using the Hush-Isolation Tape and the Hush acoustic sealant. Both boards to be fixed to the Hush-Deep Resilient Bars.
- Hush-Slab 25 Sound Absorber to be fitted between the Hush-Bars.
- Hush-Bar Deep Resilient Bars fixed horizontally at 450mm centres to the wall.

Features

- ✓ Approved Document E
- ✓ Timber stud, steel stud, brick or block walls
- ✓ High standards of airborne sound reduction
- ✓ Can reduce both flanking and direct sound transmission
- ✓ Minimum loss of space

Acoustic Performance

Airborne $D_{nT,w}$ dB	Airborne $D_{nT,w} + C_v$ dB
58	48

Results based on 100mm timber stud wall

Approved Document E

- UK Building Regulations approved Document E 2003 incorporates a unit of measurement to determine low frequency airborne sound transmission.
- Due to proven intrinsic difficulties of measuring low frequency sound, in domestic sized rooms, it must be expected that there could be significant deviations in the accuracy of these measurements. Furthermore, there will be variations from site to site due to structural differences in buildings, general site conditions and workmanship.
- All these factors can influence the repeatability of both impact and airborne acoustic test results. Therefore, any test results must be considered as an indication only and no warranty can be given or implied as to the actual acoustic performance in any particular situation.

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