

NOISE IMPACT ASSESSMENT - HMO

52 MANCHESTER ROAD, BURY

REPORT NO. J005595-8889-RDC-01

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Details of Assessment	
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This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.



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1.0 SUMMARY

At the request of Cabal Capital Ltd, PDA has carried out a noise impact assessment for the proposed HMO conversion at 52 Manchester Road, Bury, BL9 0SX.

We have taken the likely worst case sound levels associated with domestic use and increased these by a factor of 2 to allow for the intensification of use of the dwelling when converted to an 8 bed HMO. The sound insulation of the proposed separating wall has been estimated by comparison with test data for a similar remediated separating wall from a building of the same period. We note that the proposed separating wall sound insulation is to be increased over the sound insulation of the tested wall by additional sound resisting plasterboard wall linings, and hence the estimated sound insulation is likely to be conservative.

The predicted sound level in the adjoining residential dwelling due to operation of the HMO is 6 dB(A) and hence sound from the normal operation of the HMO is likely to be inaudible in the adjoining houses.



2.0 BRIEF FOR CONSULTANCY

PDA Ltd. was engaged to carry out the following:

A. Noise Impact Assessment

We will use the methods of BS EN ISO 12354 "Building Acoustics - Estimation of acoustic performance of building from the performance of elements", to construct a noise transmission model of rooms within the proposed HMO to the adjacent attached dwellings.

Using noise source data from the PDA library we will estimate likely worst-case sound levels within the HMO rooms following development. The sound transmission model will be used to predict sound levels due to the HMO within habitable rooms of the adjacent houses. The calculated sound levels will be compared to the criteria derived from BS 8233:2014 "Guidance on Sound Insulation and Noise Reduction for Buildings" or other relevant criteria as appropriate for habitable rooms.

Where the calculated noise levels exceed the selected criterion, we will propose suitable remedial measures to the separating walls and / or flanking elements as necessary such that the criterion may be achieved.

The calculations, assessment and any proposed remedial works will be presented in a full technical report suitable for submission to the Local Planning Authority in support of your application to discharge the planning condition.

3.0 SITE DESCRIPTION

The house is a mid-terrace, three bedroom house which appears to be Late Victorian / Edwardian in construction. The proposal is to convert the property to an 8 bedroom HMO by converting living room spaces to bedrooms, and creating additional bedrooms in a second floor loft conversion.

Due to the increase from a 3 bedroom house to an 8 bed HMO, the Local Planning Authority are of the opinion that this will result in an intensification of the use, and that as such soundproofing to the adjoining properties should be secured by condition.

4.0 ASSESSMENT CRITERIA

4.1 Application 71638 Notice of Planning Permission, Condition 3

Condition 3 of the above planning permission notice states:

No development shall commence until a scheme for the soundproofing of the building has been submitted to and approved in writing by the Local Planning Authority. The measures shall be implemented in strict accordance with the approved details prior to the occupation of the development and shall thereafter be retained as such whilst it serves the development.

Reason. To reduce nuisance from noise to the occupiers of the adjoining dwellings pursuant to the Policy EN7/2 Noise Pollution of Bury Unitary Development Plan and the National Planning Policy Framework.

5.0 ASSESSMENT

5.1 Source noise levels

Sound levels in residential dwellings were characterised in the paper “Speech Levels in Various Environments” by Pearson, Bennett & Fidell. The typical maximum sound pressure level of speech inside houses in urban areas was found to be around 67 dB(A) (See Figure 1), whilst the typical maximum sound pressure level of TV speech was found to be around 70 dB(A) (see Figure 2).

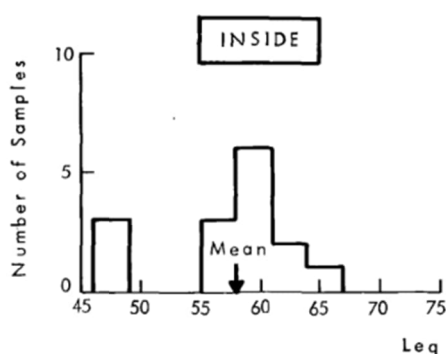


Figure 1 – Speech levels in urban homes

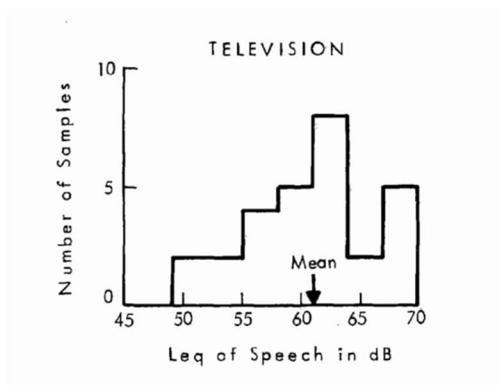


Figure 2 – Television levels in homes

Taking the maximum speech level for Television in homes of 70 dB(A), we have applied a correction for the intensification from a three bedroom house (assume typically 4 occupants), to an 8 bedroom HMO (8 occupants). Although we would not expect noise levels within habitable rooms to be particularly higher, for avoidance of doubt we have assumed a doubling of sound energy which is equivalent to a 3 dB increase in sound level taking the maximum level to 73 dB(A). As the maximum levels for Television use are associated with speech, we have taken the frequency spectrum for a male speaker at normal vocal effort and applied this spectrum to the noise level to obtain the likely worst case noise level in habitable rooms of the development.

Table 1 – Worst case sound pressure level

L _{Aeq}	L _{Zeq}						
	125	250	500	1000	2000	4000	8000
73	49	62	70	66	64	60	51

5.2 Sound insulation of proposed separating wall

The proposed separating wall consists of the existing 230mm party wall which is to be upgraded by removal of the existing finishes, making good any missing mortar and facing with 2 x layers of 15mm Soundbloc sound resisting gypsum board.

PDA have previously tested a similar construction between similar buildings of the same period with an upgraded 225mm brick separating wall. In this case the separating wall was finished with 12.5mm wallboard, hence we would expect the proposed finish with 2 x layers of 15mm Soundbloc board to exceed the sound insulation of the tested wall. The results of the test are shown in Figure 3 below:

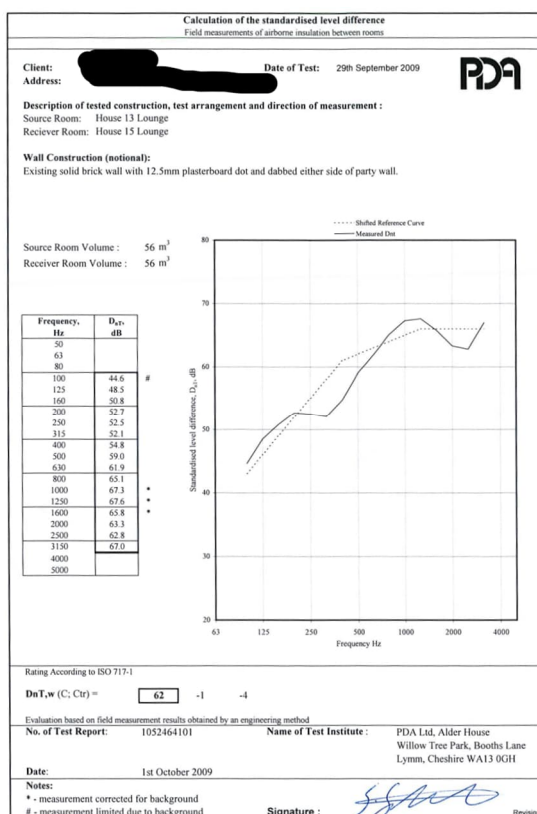


Figure 3 – Measured sound insulation of similar (although lesser) construction

5.3 Predicted sound levels in neighbouring properties

We have calculated the sound insulation in octave frequency bands from the previous test to calculate the sound pressure level in the neighbouring dwelling due to the worst case sound pressure level shown in Table 1 above.

The calculation of sound pressure in the neighbouring dwelling is shown in Table 2 below.

Table 2 – Predicted sound level in neighbouring dwellings

Parameter	dB(A)	dB(Z)						
		125	250	500	1000	2000	4000	8000
A. Sound level in development (worst case)	73	49	62	70	66	64	60	51
B. Sound insulation between dwellings (D)		49	52	59	67	64	67	67
Predicted sound level next door (A. – B.)	6	0	10	11	0	-1	-7	-16

The predicted sound level in the neighbouring dwelling based on typical worst case habitable noise levels (increased by a factor of 2 to allow for intensification of use) is approximately 6 dB(A) which is unlikely to be audible in a normal residential setting.

6.0 CONCLUSION

At the request of Cabal Capital Ltd, PDA has carried out a noise impact assessment for the proposed HMO conversion at 52 Manchester Road, Bury, BL9 0SX.

We have taken the likely worst case sound levels associated with domestic use and increased these by a factor of 2 to allow for the intensification of use of the dwelling when converted to an 8 bed HMO. The sound insulation of the proposed separating wall has been estimated by comparison with test data for a similar remediated separating wall from a building of the same period. We note that the proposed separating wall sound insulation is to be increased over the sound insulation of the tested wall by additional sound resisting plasterboard wall linings, and hence the estimated sound insulation is likely to be conservative.

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APPENDIX A – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB L_{Aeq} . Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq} . It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB L_{An} . It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max} , dB L_{Amax} , etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq} , L_{90} , L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.