

LK/J004347/7095/02

14 August 2023

ACOUSTIC
CONSULTANTS

**501 BARLOW MOOR ROAD, CHORLTON,
M21 8AG**

SOUND INSULATION TESTS REPORT

architectural

environmental

occupational

industrial

noise control at source

project management

planning

legal services

expert witness

Report Prepared For:

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Report Prepared By:

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Association of Noise Consultants Registration Number: 105
Test Report Number: 105/76520

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Notice to Building Control Officer

Certification of Test Results

ANC operates an online, secure, paperless certification system for sound insulation tests.

The online verification (certification) system means that Building Control Bodies will need to follow the steps below to verify the results quoted in the relevant test report:

1. Go to the ANC secure server at www.theanc.co.uk
2. Navigate to the [ADvANCE](#) page which links to the ANC site available for use by BCOs.
3. Enter the following in the spaces provided:

Task Number: 76520

Task Password: MA60ZE

4. Select role "Building Control Officer" and press "Login"
5. You will then see a summary list of results of all the Tests undertaken to date for this project (Task) as held on the secure primary server and you can print this table for your records.

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1.0 SUMMARY

PDA Ltd was commissioned by Southway Housing Trust to carry out sound insulation tests at the conversion development located at 501 Barlow Moor Road, Chorlton, Manchester, M21 8AG. This report is an ANC Registered Report with the unique registration number 105/76520.

Analysis of the test data has shown that the airborne sound insulation of the separating floors tested has met the performance standards given in the Building Regulations Approved Document E 2003 edition, and can be described as having 'passed'. It is noted that during the initial tests there was a single failure of airborne sound insulation of one of the floors, between the First and Second Floor Bedsits. It was noted that during the initial tests there was a large gap within the ceiling due to a service riser which has been subsequently sealed. In addition it was thought there were strong room modes within the rooms making the rooms less diffuse. Therefore following the remedial measures a subsequent test was retaken with added diffusers in each room and the floor passed the test.

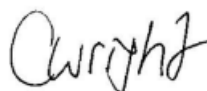
Analysis of the test data has shown that the impact sound insulation of the separating floors tested has met the performance standards given in the Building Regulations Approved Document E 2003 edition, and can be described as having 'passed'.

Report Prepared By:



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2.0 TEST DETAILS

2.1 Site Description

The tests were conducted at the conversion development located at 501 Barlow Moor Road, Chorlton, Manchester, M21 8AG.

The development comprises of a change of use of a former ground floor shop to form 3 no. residential apartments over the ground, first and second floors.

2.2 Test Details

The tests were conducted on the 9th May 2023. Further tests were undertaken on the 3rd August 2023. All measurements were made by Liam Kavaney of PDA Ltd, 3 Bridgewater Court, Barsbank Lane, Lymm, Cheshire, WA13 0ER.

PDA Ltd is accredited by the Association of Noise Consultants (ANC), accreditation number 105, to undertake sound insulation testing to demonstrate compliance with the Building Regulations, Approved Document E (2003 edition).

The equipment used during the tests is as listed in Table 4 at the end of this report. The sound level meters were calibrated before and after the tests as appropriate, during which time no significant calibration deviation was observed. The sound level meter, acoustic calibrator and microphone are all covered by current calibration certificates.

The testing methods for airborne and impact sound insulation were in full accordance with: the suggested methods presented in BS EN ISO 140-parts 4 & 7: 1998 "Field Measurements of Airborne Sound Insulation Between Rooms", "Field Measurements of Impact Sound Insulation of Floors". The results of the tests were analysed in accordance with BS EN ISO 717-parts 1 & 2: 1997, amended 2006.

In addition all the procedures in Annex B of Approved Document E, guidance to the Building Regulations, have been followed.

2.3 Basic Procedures

Airborne Sound Insulation

The field testing of structures for airborne sound insulation involves generating a controlled level of noise in one room (the source room) and measuring the resulting noise in the other room (the receiving room), separated from the source room by the element under test. The method follows test procedure 4 (airborne) as given within the ANC Practice Guidance version 1.1. Two loudspeakers of the same type and two separate signal sources in two separate positions are used to generate a sound source within the source room. Spatial and temporal averaging of the noise level in both rooms is carried out by manually sweeping the microphone through a predetermined circular path of travel in a plane not within 10° of any room surface plane. The sweeps are completed over a minimum 30-second period, with one separate measurement cycle being completed in both the source and receiving rooms.

A minimum 30-second manual sweeping of the microphone through a predetermined circular path of travel in a plane not within 10° of any room surface plane was taken in the receiver room for a background noise measurement when the loudspeaker in the source room was turned off.

Corrections are applied to the measured levels for the effects of background noise and acoustic absorption, the latter being characterised by reverberation time

measurements. Background noise is measured in the receiving room using the sweep method over a minimum 30-second period. The corrected, measured source room and receiving room levels are used to derive the Standardised Level Difference and the data, in third octave bands, are compared with reference values using defined matching criteria to determine the single figure Weighted Standardised Level Difference. From this data a Spectrum Adaptation term is calculated which gives an indication of the performance of the element when exposed to particular types of noise. This term is additive to the Weighted Standardised Level Difference and is quoted when referring to the element's sound insulation performance.

Impact Sound Insulation

Impact sound insulation measurements are primarily applicable to floor structures and are intended to give an indication of the ability of the floor to attenuate impact sources such as footsteps. For these tests the source is a standard tapping machine, which comprises a set of 'hammers' which are controlled to rise and fall at pre-determined rates to excite the floor structure. The method follows test procedure 5 (impact) as given within the ANC Practice Guidance version 1.1. The noise produced by the operation of the tapping machine is measured in the reception room. Spatial and temporal averaging of the noise level in the receiver rooms is carried out by the selection of two randomly distributed positions for each of the four tapping machine locations and averaging the noise level of each measurement over a minimum 6-second period. Corrections are again applied to account for acoustic conditions within the reception room and the resulting figures, in third octave band frequencies, are denoted the Standardised Impact Sound Pressure Levels. As with airborne sound insulation measurements, the results are compared with standard data to determine the single figure rating, the Weighted Standardised Impact Sound Pressure Level.

Reverberation Time Measurement

The reverberation time measurements were conducted in accordance with the engineering method as presented within ISO3382-2:2008. The reverberation time measurements were conducted within the receiving rooms for each test by recording the decay from a continuous wide band pink noise generator. The equipment was set to measure T_{20} reverberation decay. Measurements were taken with one loudspeaker location and three randomly selected microphone locations. Measurements were repeated twice at each microphone location.

The source and receiving rooms were as detailed in the results summary in Tables 2 – 3 at the end of this report.

2.4 Floor Construction

We were informed on site that the floor construction between flats was as follows;

- *Acoustic flooring deck on existing floorboards on existing timber joists with 150mm acoustic roll insulation between the joists. Beneath is the existing plasterboard ceiling with an additional layer of sound resistant plasterboard hung on resilient bars*

3.0 TERMS OF REFERENCE

3.1 Building Regulations 2010 Approved Document E (2003) – Resistance to the Passage of Sound

The development is classed as a conversion project and as such the requirements of the Building Regulations are as follows:

Table 1 – Building Regulations ADE sound insulation requirements

Dwelling Houses and Flats formed by a Material Change of Use	Airborne Sound Insulation $D_{nT,w} + C_{tr}$ dB (minimum values)	Impact Sound Insulation $L'_{nT,w}$ dB (maximum values)
Floors	≥ 43	≤ 64

4.0 RESULTS

4.1 Background Noise Levels

A measurement of typical noise levels was made within the receiver rooms during the tests. The background noise levels were between 30 and 35 dB $L_{Aeq,T}$ and comprised of traffic noise on local roads. It should be noted that where low background noise levels exist, these are not taken into account by Approved Document E. Consequently, even if a wall or floor is performing satisfactorily it may still be the case that sound can be heard passing between the adjacent spaces, this being a result of a lack of masking provided by the background noise. Please see Section 2.3 for a brief description of the test procedure for background noise measurements.

The test certificates indicate whether the measurements were limited due to background noise. The implications of any limitations are that the sound insulation performance of the separating element would either be equal to or greater than the level calculated and reported here.

4.2 Airborne Sound Insulation – Separating Floors

The airborne noise measurements obtained on site have been processed to produce the standardised level difference (D_{nT}) between the rooms. The D_{nT} is detailed with the weighted standardised level difference $D_{nT,w}$ and the C_{tr} values in the test certificate at the rear of this report. The $D_{nT,w} + C_{tr}$ allows the sound insulation performance of the elements tested to be compared with the ADE requirements detailed in Section 3 above. The obtained $D_{nT,w} + C_{tr}$ for the separating floors are presented in summary Table 2 at the end of this report.

4.3 Impact Sound Insulation – Separating Floors

The impact noise measurement obtained on site has been processed to produce the standardised impact sound pressure level (L'_{nT}) between the rooms. The L'_{nT} is detailed with the weighted standardised impact sound pressure $L'_{nT,w}$ in the test certificate at the rear of this report. The $L'_{nT,w}$ allows the impact sound insulation performance of the elements tested to be compared with the ADE requirements detailed in Section 3 above. The obtained $L'_{nT,w}$ values for the separating floors is presented in summary Table 3 at the end of this report.

5.0 DISCUSSION OF RESULTS

5.1 Airborne Sound Insulation – Separating Floors

The obtained results from the sound insulation tests show that the minimum sound insulation values as stated in ADE 2003 have been met for all separating floors. As such these elements may be regarded as having 'passed' the tests.

5.2 Impact Sound Insulation – Separating Floors

The obtained results for the floors tested did not exceed the maximum value of impact sound insulation required by ADE 2003. As such the floors may be regarded as having 'passed' the tests.

Results Summary Tables

Table 2 – Airborne Floor Sound Insulation Test Results:

ANC Test Reference	Source Room		Receiver Room		Measured $D_{nT,w} + C_{tr}$ dB	Building Regulations ADE Required Sound Insulation Performance, $D_{nT,w} + C_{tr}$ dB	'Pass' or 'Fail'
	Description	Volume, m^3	Description	Volume, m^3			
1057652001	Ground Floor Bedsit	66	First Floor Bedsit	59	50	≥ 43	Pass
1057652005	First Floor Bedsit	59	Second Floor Bedsit	41	43	≥ 43	Pass

Table 3 – Impact Floor Sound Insulation Test Results:

ANC Test Reference	Source Room		Receiver Room		Measured $L'_{nT,w}$ dB	Building Regulations ADE Required Sound Insulation Performance, $L'_{nT,w}$ dB	'Pass' or 'Fail'
	Description	Volume, m^3	Description	Volume, m^3			
1057652003	First Floor Bedsit	59	Ground Floor Bedsit	66	49	≤ 64	Pass
1057652004	Second Floor Bedsit	41	First Floor Bedsit	59	63	≤ 64	Pass

Equipment List*Table 4 – Equipment*

Manufacturer	Type	Model	Serial Number	Calibration Date	Calibration Certificate Number	Date of Expiration of Calibration
NTi	Pink Noise Generator	Minirator MR2	G2L-YWCZZ-F2	-	-	-
Nokia	Pink Noise Generator	6303e	587577	-	-	-
Mackie	Sound Source	SRM350	JG0252	-	-	-
Mackie	Sound Source	SRM350	JW0027	-	-	-
Rion	Sound Level Meter	NA-28	30431896	22/09/2021	05449/2	22/09/2023
Rion	Pre-Amplifier	NH-23	21959	22/09/2021	05449/2	22/09/2023
Rion	Half-inch Microphone	UC-59	04959	22/09/2021	05449/2	22/09/2023
Rion	Calibrator	NC-74	34683835	19/10/2022	05976/1	19/10/2023
Norsonic	Tapping Machine	211A	29735	07/09/2021	05449/3	07/09/2023

APPENDIX

PDA LTD. TEST CERTIFICATES

Standardised level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

Client: Southway Housing Trust **Date of Test:** 09 May 2023
Address: 501 Barlow Moor Road, Chorlton, M21 8AG



Description of tested construction, test arrangement and direction of measurement :

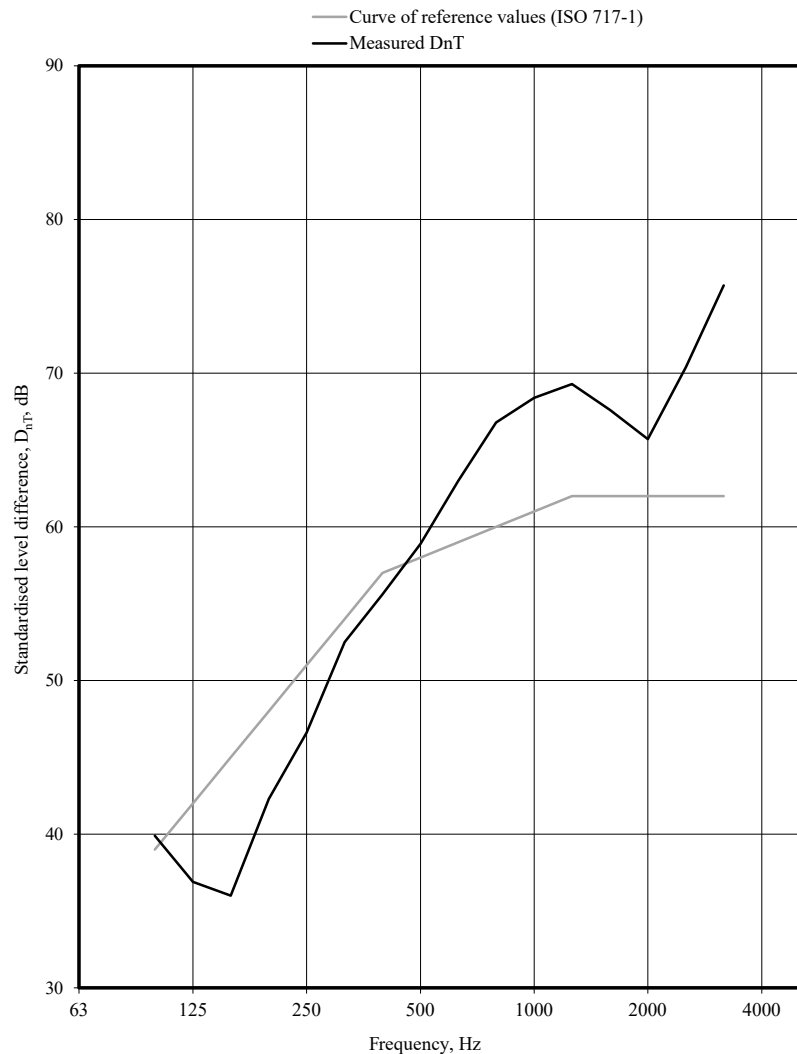
Source Room: Ground Floor Bedsit
 Reciever Room: First Floor Bedsit

Floor Construction (Notional)

Acoustic flooring deck on existing floorboards on existing timber joists with 150mm acoustic roll insulation between the joists.
 Beneath is the existing plasterboard ceiling with an additional layer of sound resistant plasterboard hung on resilient bars

Source Room Volume : 66 m³
 Receiver Room Volume : 59 m³

Frequency Hz	D _{nT} (one-third octave) dB
50	
63	
80	
100	39.9
125	36.9
160	36.0
200	42.3
250	46.6
315	52.5
400	55.6
500	58.9
630	63.0
800	66.8
1000	68.4
1250	69.3
1600	67.6
2000	65.7
2500	70.4
3150	75.7
4000	
5000	



Rating According to ISO 717-1

D_{nT,w} (C; Ctr) = **58** -3 -8 dB

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1057652001 **Name of Test Institute :** PDA Ltd, 3 Bridgewater Court
 Barsbank Lane, Lymm
 Cheshire, WA13 0ER

Date: 14 August 2023

Notes:

≥ - measurement limited due to background

Signature :

Standardised level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

Client: Southway Housing Trust **Date of Test:** 03 August 2023
Address: 501 Barlow Moor Road, Chorlton, M21 8AG



Description of tested construction, test arrangement and direction of measurement :

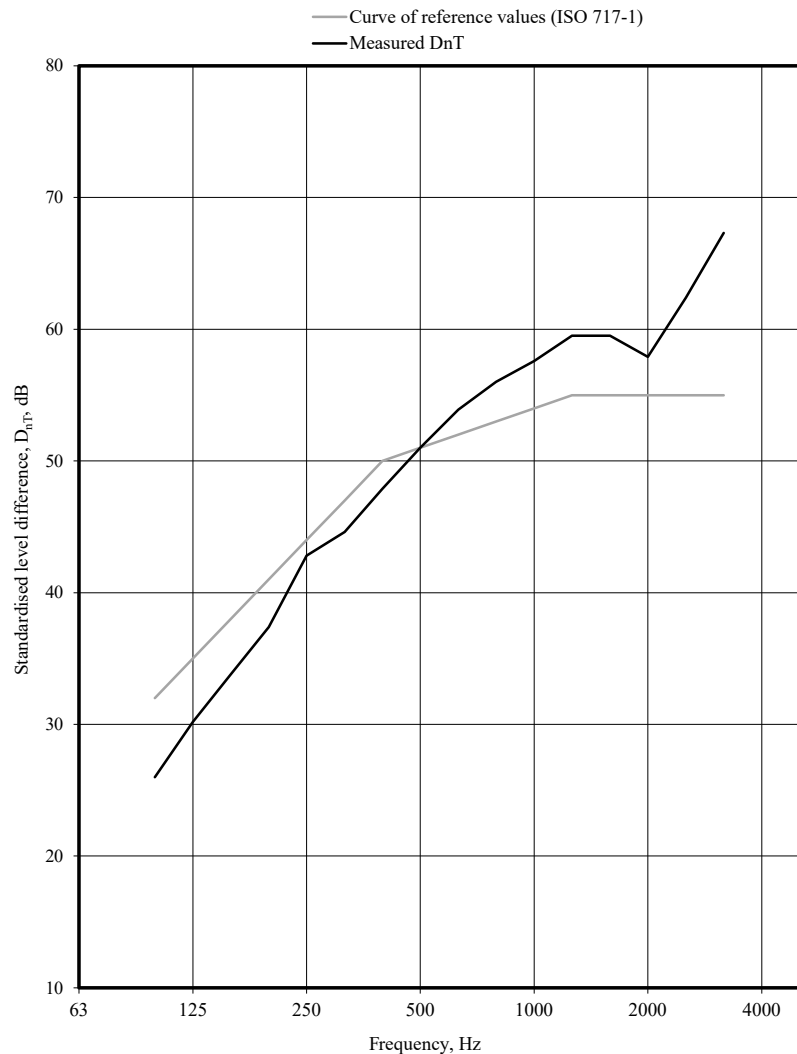
Source Room: First Floor Bedsit
Receiver Room: Second Floor Bedsit

Floor Construction (Notional)

Acoustic flooring deck on existing floorboards on existing timber joists with 150mm acoustic roll insulation between the joists. Beneath is the existing plasterboard ceiling with an additional layer of sound resistant plasterboard hung on resilient bars

Source Room Volume : 59 m³
Receiver Room Volume : 41 m³

Frequency Hz	D _{nT} (one-third octave) dB
50	
63	
80	
100	26.0
125	30.2
160	33.8
200	37.4
250	42.8
315	44.6
400	47.9
500	51.0
630	53.9
800	56.0
1000	57.6
1250	59.5
1600	59.5
2000	57.9
2500	62.4
3150	67.3
4000	
5000	



Rating According to ISO 717-1

D_{nT,w} (C; Ctr) = **51** -2 -8 dB

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1057652005 **Name of Test Institute :** PDA Ltd, 3 Bridgewater Court
Barsbank Lane, Lymm
Cheshire, WA13 0ER

Date: 14 August 2023

Notes:

≥ - measurement limited due to background

Signature :

Standardised impact sound pressure levels according to ISO 140-7
Field measurements of impact sound insulation of floors

Client: Southway Housing Trust **Date of Test:** 09 May 2023
Address: 501 Barlow Moor Road, Chorlton, M21 8AG



Description of tested construction, test arrangement and direction of measurement :

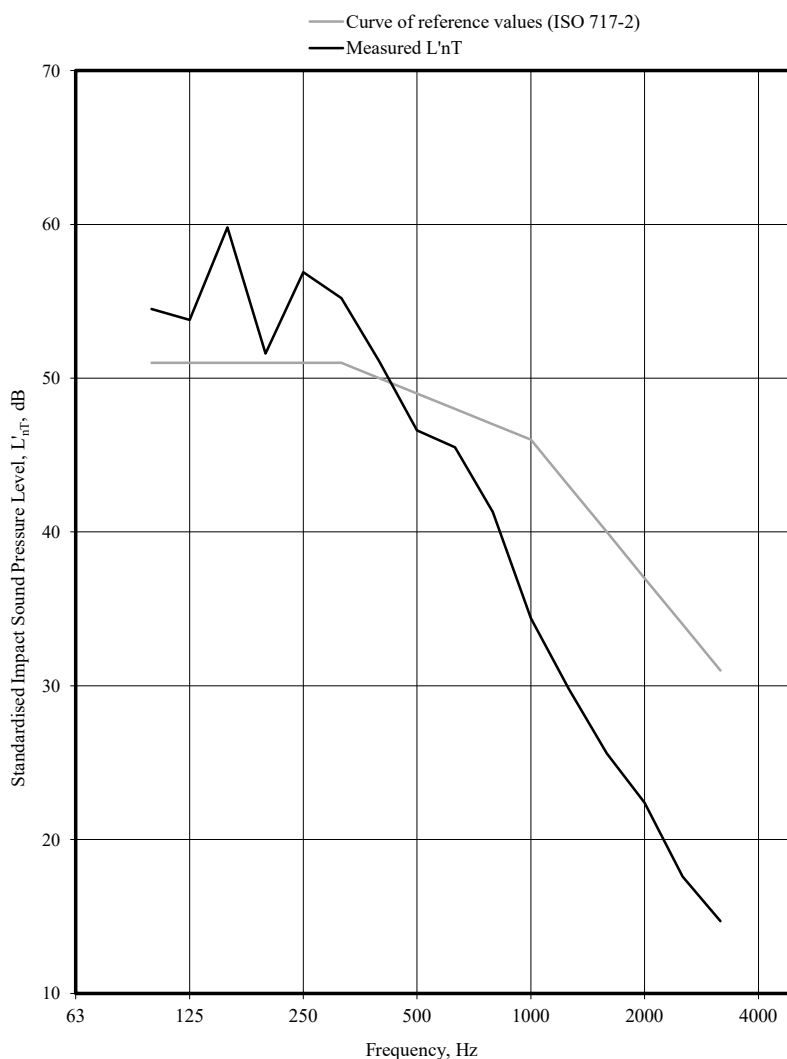
Source Room: First Floor Bedsit
 Reciever Room: Ground Floor Bedsit

Floor Construction (Notional)

Acoustic flooring deck on existing floorboards on existing timber joists with 150mm acoustic roll insulation between the joists.
 Beneath is the existing plasterboard ceiling with an additional layer of sound resistant plasterboard hung on resilient bars

Source Room Volume : 59 m³
 Receiver Room Volume : 66 m³

Frequency Hz	L' _{nT} (one-third octave) dB
50	
63	
80	
100	54.5
125	53.8
160	59.8
200	51.6
250	56.9
315	55.2
400	51.1
500	46.6
630	45.5
800	41.3
1000	34.4
1250	29.8
1600	≤ 25.6
2000	≤ 22.4
2500	≤ 17.6
3150	≤ 14.7
4000	
5000	



Rating According to ISO 717-2

L'_{nT,w} = **49** dB

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1057652003 **Name of Test Institute :** PDA Ltd, 3 Bridgewater Court
 Barsbank Lane, Lymm
 Cheshire, WA13 0ER

Date: 14 August 2023

Notes:

≤ - measurement limited due to background

Signature :

Standardised impact sound pressure levels according to ISO 140-7
Field measurements of impact sound insulation of floors

Client: Southway Housing Trust **Date of Test:** 09 May 2023
Address: 501 Barlow Moor Road, Chorlton, M21 8AG



Description of tested construction, test arrangement and direction of measurement :

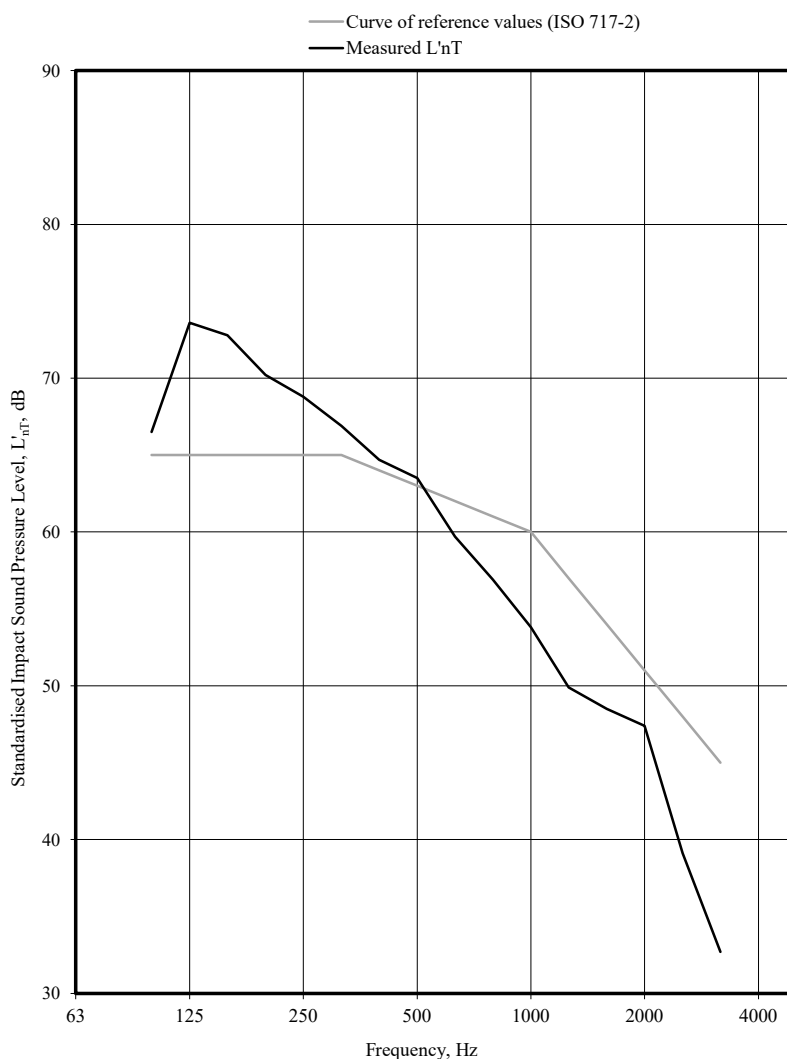
Source Room: Second Floor Bedsit
 Reciever Room: First Floor Bedsit

Floor Construction (Notional)

Acoustic flooring deck on existing floorboards on existing timber joists with 150mm acoustic roll insulation between the joists.
 Beneath is the existing plasterboard ceiling with an additional layer of sound resistant plasterboard hung on resilient bars

Source Room Volume : 41 m³
 Receiver Room Volume : 59 m³

Frequency Hz	L' _{nT} (one-third octave) dB
50	
63	
80	
100	66.5
125	73.6
160	72.8
200	70.2
250	68.8
315	66.9
400	64.7
500	63.5
630	59.7
800	56.9
1000	53.8
1250	49.9
1600	48.5
2000	47.4
2500	39.1
3150	32.7
4000	
5000	



Rating According to ISO 717-2

L'_{nT,w} = **63** dB

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1057652004 **Name of Test Institute :** PDA Ltd, 3 Bridgewater Court
 Barsbank Lane, Lymm
 Cheshire, WA13 0ER

Date: 14 August 2023

Notes:

≤ - measurement limited due to background

Signature :