

TD/J003527/5128/01

3rd September 2021

ACOUSTIC
CONSULTANTS

**14-15, ABBEY HEY LANE, OPENSHAW,
MANCHESTER
SOUND INSULATION TESTS REPORT**

architectural

environmental

occupational

industrial

noise control at source

project management

planning

legal services

expert witness

Report Prepared For:

Wiggett Construction
Viking House
449 Middleton Road
Oldham
OL9 9LB

Email: MSexton@wiggett.co.uk

Report Prepared By:

Tom Dixon
PDA Ltd.
3 Bridgewater Court
Barsbank Lane
Lymm
Cheshire
WA13 0ER

Association of Noise Consultants Registration Number: 105
Test Report Number: 105/63317

Philip Dunbavin Acoustics Ltd.

3 Bridgewater Court · Barsbank Lane · Lymm · Cheshire WA13 0ER

Tel: 01925 759380 · www.pdaltd.com

Directors: P. R. Dunbavin · J. A. Dunbavin · M. de Salis · E. Evenden · R. Grant

Registered Number 2302847 England

Registered Office: 2 Bridgewater Court · Barsbank Lane · Lymm · Cheshire WA13 0ER





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: 63317

Task Password: TA4A3U

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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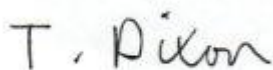
1.0 SUMMARY

PDA Ltd was commissioned to carry out sound insulation tests at the development at 14-15, Abbey Hey Lane, Openshaw, Manchester. This report is an ANC Registered Report with the unique registration number 105/63317.

Analysis of the test data has shown that the airborne and 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'.

It can be noted that in accordance with Approved Document E 2003 testing requirements, all sound insulation tests were conducted without the final floor finishes (vinyl, carpet etc) installed. An improvement to the impact sound insulation test results is predicted post the installation of the final floor coverings.

Report Prepared By:



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Tom Dixon
BEng MIOA
Acoustic Consultant

Report Approved By:



.....
Liam Kavaney
MIOA
Acoustic Consultant

Quality Approved By:



.....
Max De Salis
BEng Hons PhD CEng MIOA
Director

2.0 TEST DETAILS

2.1 Site Description

The tests were conducted at the new build residential development at 14-15, Abbey Hey Lane, Openshaw, Manchester.

The development is a new build project incorporating 1no. block consisting of 2 no. apartments.

2.2 Test Details

The tests were conducted on the 2nd September 2021. All measurements were made by Tom Dixon 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 meters, acoustic calibrators and microphones 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. A sound source is used and operated in two separate positions. 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 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 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 Wall and Floor Constructions

It is understood that the floor construction between the apartments was as follows;

- 65mm Screed on IsoRubber Layer, 150mm concrete plank, suspended single layer plasterboard ceiling, cavity 100mm with insulation

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 new build project and as such the requirements of the Building Regulations are as follows:

Table 1 – Building Regulations ADE sound insulation requirements

Purpose Built Dwelling Houses and Flats	Airborne Sound Insulation $D_{nT,w} + C_{tr}$ dB (minimum values)	Impact Sound Insulation $L'_{nT,w}$ dB (maximum values)
Walls	≥ 45	-
Floors	≥ 45	≤ 62

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 25 and 44 dB $L_{Aeq,T}$ and comprised of some construction works on site. 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.

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 are 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 walls and 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			
105/63317/01	Plot 14 Living/Kitchen	50	Plot 15 Living/Kitchen	47	53	≥ 45	Pass
105/63317/02	Plot 15 Bedroom	32	Plot 14 Bedroom	31	51	≥ 45	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			
105/63317/03	Plot 15 Living/Kitchen	47	Plot 15 Living/Kitchen	50	56	≤ 62	Pass
105/63317/04	Plot 15 Bedroom	32	Plot 14 Bedroom	31	59	≤ 62	Pass

Equipment List

Table 4 – Equipment List

Manufacturer	Type	Model	Serial Number	Calibration Date	Calibration Certificate Number	Calibration Lab	Date of Expiration of Calibration
Rion	Sound Level Meter	NA-28	680933	22/01/2021	04962/2	Salford	22/01/2023
Rion	Pre-Amplifier	NH-23	80984	22/01/2021	04962/2	Salford	22/01/2023
Rion	Half-inch Microphone	UC-59	8200	22/01/2021	04962/2	Salford	22/01/2023
Rion	Calibrator	NC-74	34683835	21/01/2021	04962/1	Salford	21/01/2022
Norsonic	Tapping Machine	211A	29716	14/11/2019	04483/1	Salford	14/11/2021
Mackie	Sound Source	SRM350	JG0252	-	-	-	-
Nokia	Pink Noise Generator	6303ci	0598827	-	-	-	-
Mackie	Sound Source	SRM350	JW0027	-	-	-	-
Nokia	Pink Noise Generator	6303ci	0587577	-	-	-	-

APPENDIX

PDA LTD. TEST CERTIFICATES

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

Client: Wiggett Construction
Address: 14-15, Abbey Hey Lane, Openshaw, Manchester

Date of Test: 02 September 2021



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

Source Room: Plot 14 Living/Kitchen

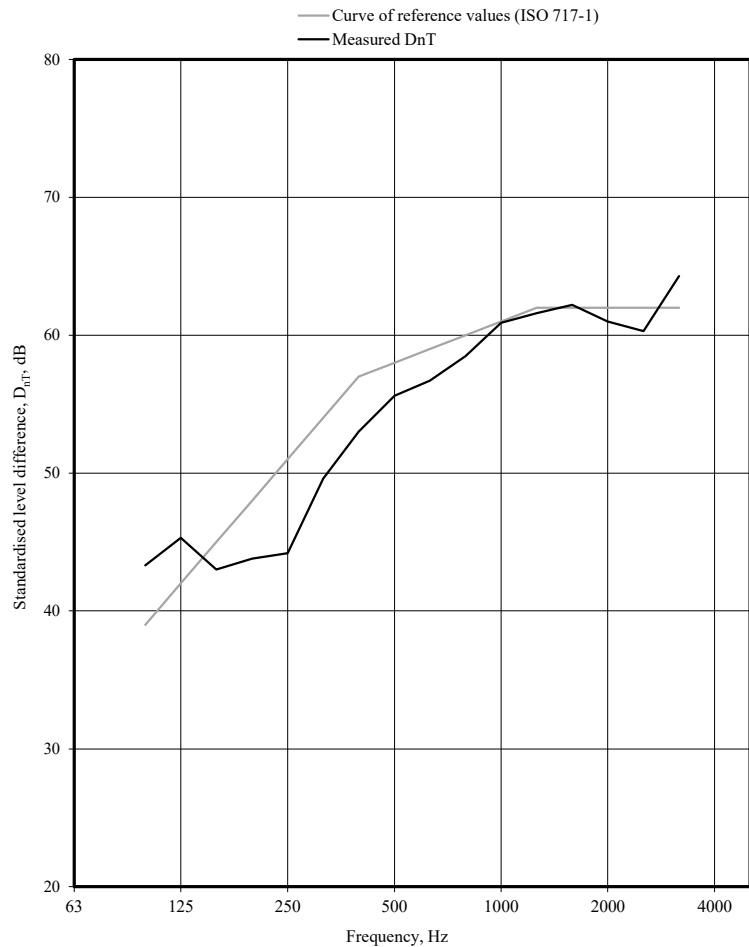
Receiver Room: Plot 15 Kitchen/Living

Floor Construction (Notional)

65mm Screed on IsoRubber Layer, 150mm concrete plank, suspended single layer plasterboard ceiling, cavity 100mm with insulation

Source Room Volume : 50 m³
 Receiver Room Volume : 47 m³

Frequency Hz	D _{nT} (one-third octave) dB
50	
63	
80	
100	43.3
125	45.3
160	43.0
200	43.8
250	44.2
315	49.6
400	53.0
500	55.6
630	56.7
800	58.5
1000	60.9
1250	61.6
1600	62.2
2000	61.0
2500	60.3
3150	64.3
4000	
5000	



Rating According to ISO 717-1

D_{nT,w} (C; Ctr) = **58** -2 -5 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1056331701

Name of Test Institute : PDA Ltd, Bridgewater Court
 3 Barsbank Lane
 Lymm WA13 0ER

Date: 03 September 2021

Notes:

≥ - measurement limited due to background

Signature :

T. Dixon

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

Client: Wiggett Construction
Address: 14-15, Abbey Hey Lane, Openshaw, Manchester

Date of Test: 02 September 2021



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

Source Room: Plot 15 Bedroom

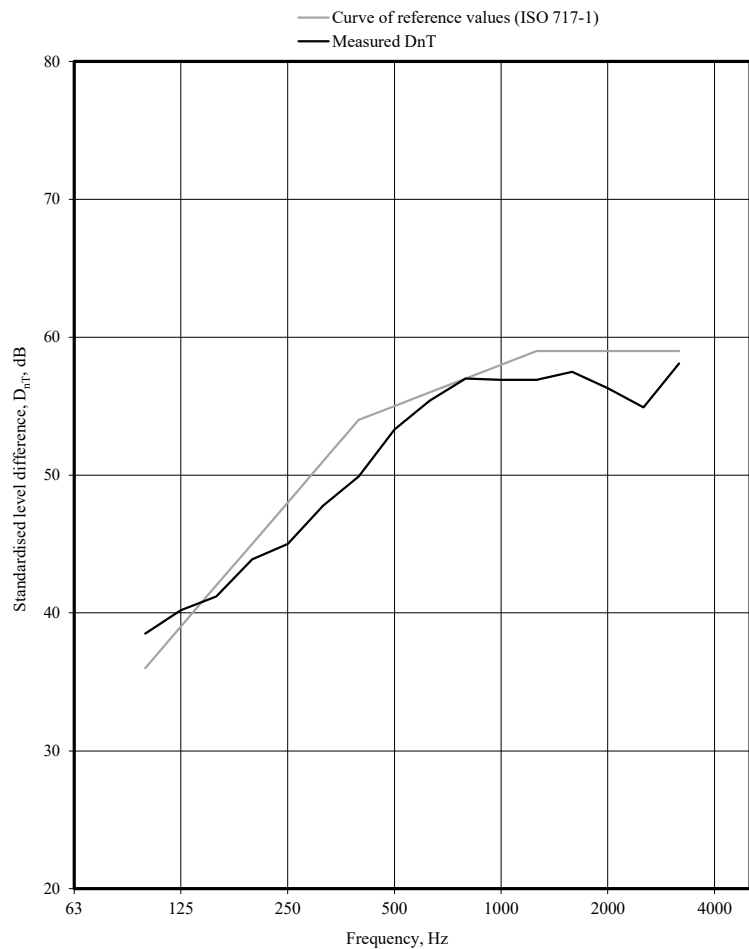
Receiver Room: Plot 14 Bedroom

Floor Construction (Notional)

65mm Screed on IsoRubber Layer, 150mm concrete plank, suspended single layer plasterboard ceiling, cavity 100mm with insulation

Source Room Volume : 32 m³
 Receiver Room Volume : 31 m³

Frequency Hz	D _{nT} (one-third octave) dB
50	
63	
80	
100	38.5
125	40.2
160	41.2
200	43.9
250	45.0
315	47.8
400	49.9
500	53.3
630	55.4
800	57.0
1000	56.9
1250	56.9
1600	57.5
2000	56.3
2500	54.9
3150	58.1
4000	
5000	



Rating According to ISO 717-1

D_{nT,w} (C; Ctr) = **55** -1 -4 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1056331702

Name of Test Institute : PDA Ltd, Bridgewater Court
 3 Barsbank Lane
 Lymm WA13 0ER

Date: 03 September 2021

Notes:

≥ - measurement limited due to background

Signature :

T. Dixon

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

Client: Wiggett Construction
Address: 14-15, Abbey Hey Lane, Openshaw, Manchester

Date of Test: 02 September 2021



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

Source Room: Plot 15 Living/Kitchen

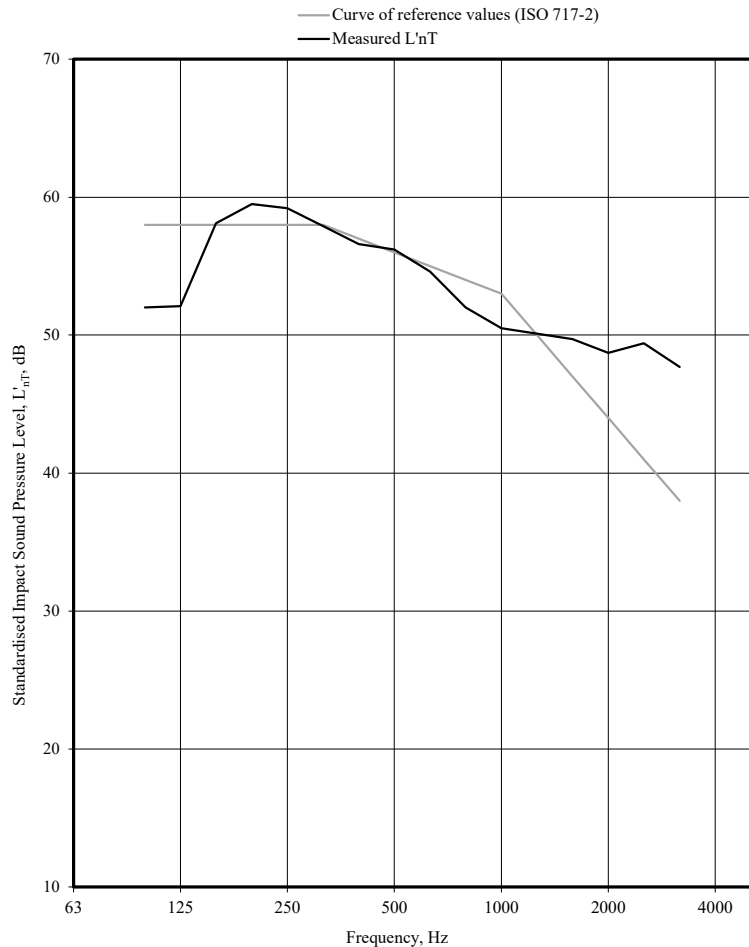
Receiver Room: Plot 14 Living/Kitchen

Floor Construction (Notional)

65mm Screed on IsoRubber Layer, 150mm concrete plank, suspended single layer plasterboard ceiling, cavity 100mm with insulation

Source Room Volume : 47 m³
Receiver Room Volume : 50 m³

Frequency Hz	L' _{nT} (one-third octave) dB
50	
63	
80	
100	52.0
125	52.1
160	58.1
200	59.5
250	59.2
315	57.9
400	56.6
500	56.2
630	54.6
800	52.0
1000	50.5
1250	50.1
1600	49.7
2000	48.7
2500	49.4
3150	47.7
4000	
5000	



Rating According to ISO 717-2

L' _{nT,w} = **56** dB

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1056331703

Name of Test Institute : PDA Ltd, Bridgewater Court
3 Barsbank Lane
Lymm WA13 0ER

Date: 03 September 2021

Notes:

≤ - measurement limited due to background

Signature :

T. Dixon

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

Client: Wiggett Construction
Address: 14-15, Abbey Hey Lane, Openshaw, Manchester

Date of Test: 02 September 2021



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

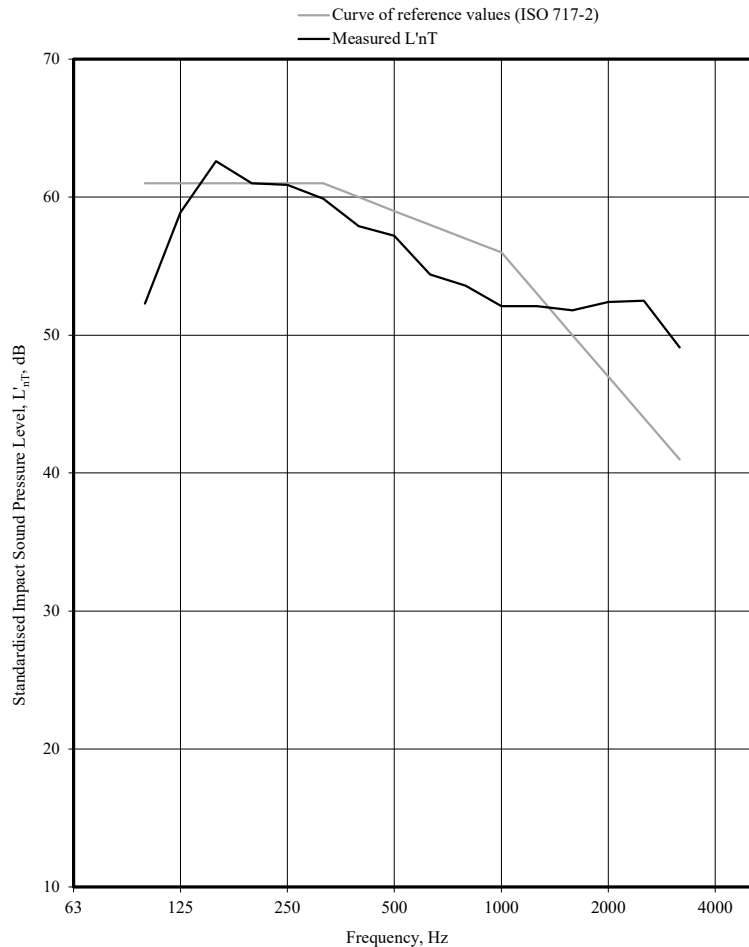
Source Room: Plot 15 Bedroom
Receiver Room: Plot 14 Bedroom

Floor Construction (Notional)

65mm Screed on IsoRubber Layer, 150mm concrete plank, suspended single layer plasterboard ceiling, cavity 100mm with insulation

Source Room Volume : 32 m³
Receiver Room Volume : 31 m³

Frequency Hz	L' _{nT} (one-third octave) dB
50	
63	
80	
100	52.3
125	58.9
160	62.6
200	61.0
250	60.9
315	59.9
400	57.9
500	57.2
630	54.4
800	53.6
1000	52.1
1250	52.1
1600	51.8
2000	52.4
2500	52.5
3150	49.1
4000	
5000	



Rating According to ISO 717-2

L' _{nT,w} = **59** dB

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 1056331704

Name of Test Institute : PDA Ltd, Bridgewater Court
3 Barsbank Lane
Lymm WA13 0ER

Date: 03 September 2021

Notes:

≤ - measurement limited due to background

Signature :

T. Dixon