LK/J004926/7950/02

16 July 2024

ACOUSTIC CONSULTANTS

PLOTS 1, 3, 7 & 7A, NUNFIELD CLOSE, MOSTON MANCHESTER, M40 5QB

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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Association of Noise Consultants Registration Number: 105
Test Report Number: 105/118497

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: 118497 Task Password: 7QNGOI

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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[redacted]

1.0 SUMMARY

PDA Ltd was commissioned to carry out sound insulation tests at the conversion development between Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB. This report is an ANC Registered Report with the unique registration number 105/118497.

Analysis of the test data has shown that the airborne sound insulation of the separating walls 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 between Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB.

The development consists of a conversion of a former care home into 6 no. residential dwellings.

2.2 Test Details

The tests were conducted on the 11 July 2024. 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 3 at the end of this report. The sound level meter was 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 sound insulation were in full accordance with: the suggested methods presented in BS EN ISO 140-parts 4: 1998 “Field Measurements of Airborne Sound Insulation Between Rooms”. The results of the tests were analysed in accordance with BS EN ISO 717-parts 1: 1997, amended 2006.

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

- Annex B indicates that test rooms should have a volume of at least 25m^3. The Utility Room of Plot 1 and the bedroom in Plot 7a were below this and is reported here as per Annex B requirements.
- Annex B indicates that tests should ideally be undertaken between habitable rooms however where this was not possible, an airborne wall test was undertaken between the Kitchen / Dining of Plot 7 and the Utility Room of Plot 1.
- Annex B indicates that tests should be conducted in completed but unfurnished rooms. It should be noted that some of the dwellings were still under construction and subsequently some of the rooms had site materials spread across the floor space.

2.3 Basic Procedure

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 sound sources are used and operated in separate positions simultaneously. 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.

Reverberation Time Measurement

The reverberation time measurements were conducted in accordance with the engineering method as presented within ISO3382-2:2008. Measurements were carried out 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 T20 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 Table 2 at the end of this report.

2.4 Wall Construction

It is understood the separating wall constructions within this development are understood to be;

- *Existing masonry wall lined on one side with 1 no. layer of 12.5mm Soundbloc plasterboard on timber studs with 25mm mineral wool insulation in the cavity.*
- *Existing solid masonry wall with any openings infilled with 2 no. layers of 12.5mm Soundbloc plasterboard either side of twin rows of timber studs and 100mm mineral wool insulation in the cavity.*
- *2 no. layers of 12.5mm Soundbloc plasterboard either side of twin rows of timber studs and 100mm mineral wool insulation in the cavity.*

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)
Walls	≥43

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 22 and 28 dB $L_{Aeq,T}$ and comprised of some ongoing 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.

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 Walls

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 walls are presented in summary Tables 2 at the end of this report.

5.0 DISCUSSION OF RESULTS

5.1 Airborne Sound Insulation – Separating Walls

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. As such these elements may be regarded as having ‘passed’ the tests.

Results Summary Tables

Table 2 – Airborne Wall 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***			
10511849701	Plot 7 Living Room	57	Plot 7a Bedroom / Study	29	49	≥43	Pass
10511849702	Plot 7 Kitchen / Dining Room	120	Plot 7a Sitting Room	65	44	≥43	Pass
10511849703	Plot 7 Kitchen / Dining Room	120	Plot 3 Living Room	66	54	≥43	Pass
10511849704	Plot 7 Kitchen / Dining Room	120	Plot 1 Utility Room	6	44	≥43	Pass
10511849705	Plot 7 Bedroom	42	Plot 7a Bedroom	22	45	≥43	Pass
10511849706	Plot 7a Bedroom	43	Plot 7 Bedroom	26	50	≥43	Pass



Equipment List

Table 3 – Equipment List

Manufacturer	Type	Model	Serial Number	Calibration Date	Calibration Certificate Number	Date of Expiration of Calibration
NTi	Pink Noise Generator	Minirator MR2	G2L-YWCZZ-F2	-	-	-
Mackie	Sound Source	SRM350	JW0027	-	-	-
Nokia	Pink Noise Generator	6303e	587577	-	-	-
Mackie	Sound Source	SRM350	JG0252	-	-	-
Rion	Sound Level Meter	NA-28	30431896	03/10/2023	06454/2	03/10/2025
Rion	Pre-Amplifier	NH-23	21959	03/10/2023	06454/2	03/10/2025
Rion	Half-inch Microphone	UC-59	04959	03/10/2023	06454/2	03/10/2025
Rion	Calibrator	NC-74	34536106	02/10/2023	06454/1	02/10/2024



APPENDIX

PDA LTD. TEST CERTIFICATES

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

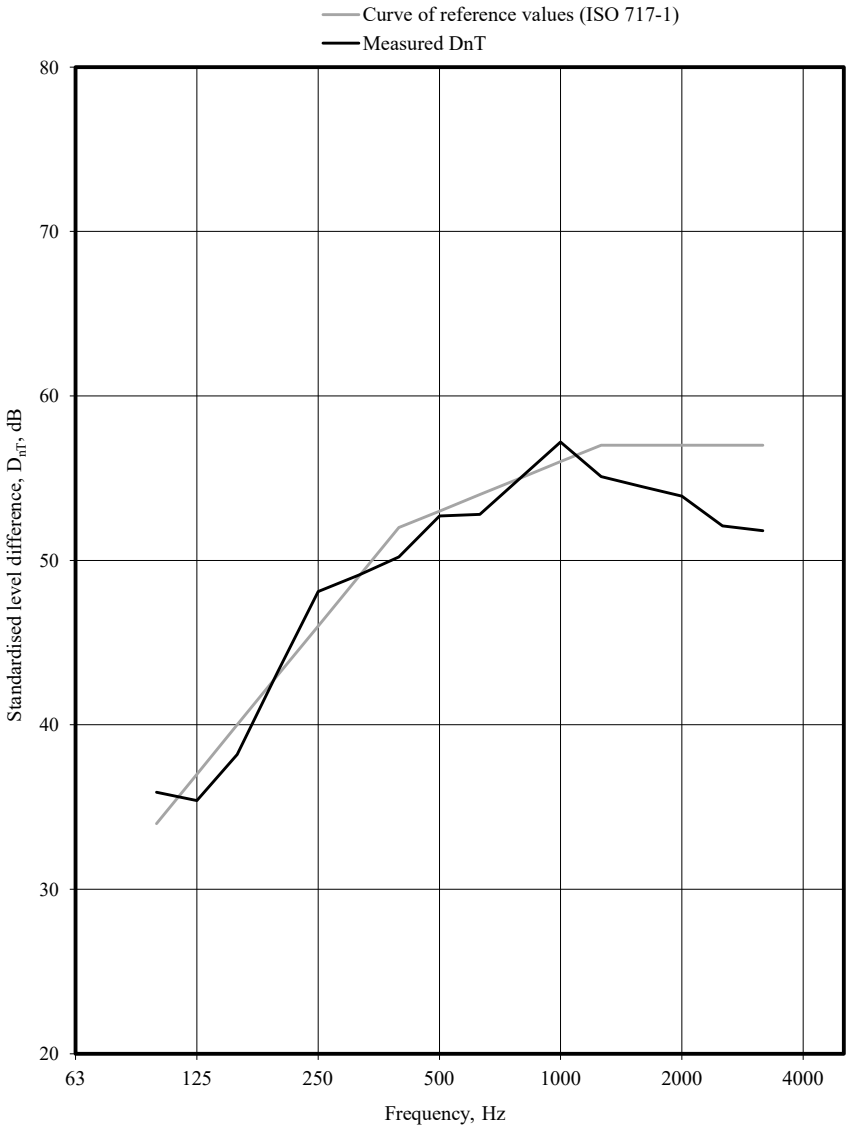
Client: Arica Helsby **Date of Test:** 11 July 2024
Address: Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB

Description of tested construction, test arrangement and direction of measurement :
Source Room: Plot 7 Living Room
Reciever Room: Plot 7a Bedroom / Study

Wall Construction (Notional)
Existing masonry wall lined on one side with 1 no. layer of 15mm Soundbloc plasterboard on timber studs with 25mm mineral wool insulation in the cavity

Source Room Volume : 57 m^3
Receiver Room Volume : 29 m^3

Frequency Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	35.9
125	35.4
160	38.2
200	43.2
250	48.1
315	49.1
400	50.2
500	52.7
630	52.8
800	55.0
1000	57.2
1250	55.1
1600	54.5
2000	53.9
2500	52.1
3150	51.8
4000	
5000	



Rating According to ISO 717-1

$D_{nT,w}$ (C; Ctr) = **53** -1 -4 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 10511849701 **Name of Test Institute** : PDA Ltd, 3 Bridgewater Court Barsbank Lane, Lymm Cheshire, WA13 0ER

Date: 16 July 2024

Notes:

≥ - measurement limited due to background

Signature : [redacted]

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

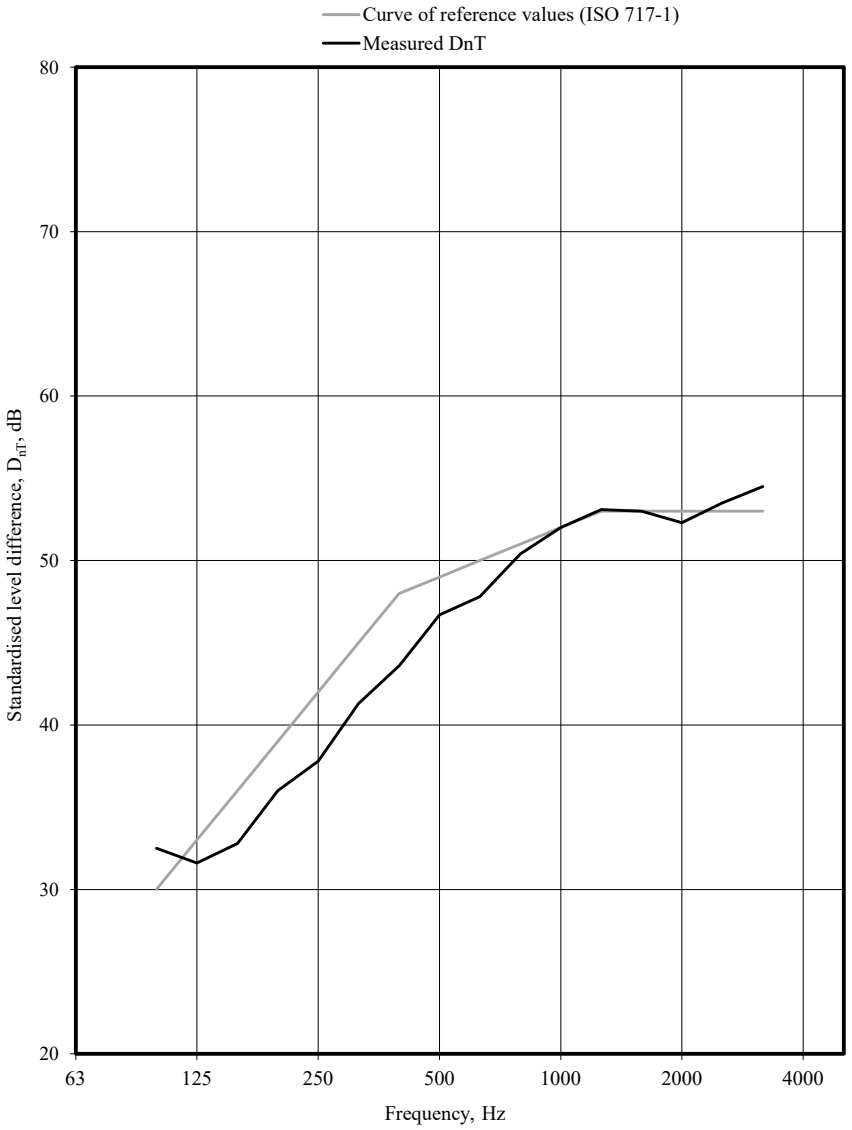
Client: Arica Helsby **Date of Test:** 11 July 2024
Address: Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB

Description of tested construction, test arrangement and direction of measurement :
Source Room: Plot 7 Kitchen / Dining Room
Reciever Room: Plot 7a Sitting Room

Wall Construction (Notional)
Existing masonry wall lined on one side with 1 no. layer of 15mm Soundbloc plasterboard on timber studs with 25mm mineral wool insulation in the cavity

Source Room Volume : 120 m^3
Receiver Room Volume : 65 m^3

Frequency Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	32.5
125	31.6
160	32.8
200	36.0
250	37.8
315	41.3
400	43.6
500	46.7
630	47.8
800	50.4
1000	52.0
1250	53.1
1600	53.0
2000	52.3
2500	53.5
3150	54.5
4000	
5000	



Rating According to ISO 717-1

$D_{nT,w}$ (C; Ctr) = **49** -2 -5 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 10511849702 **Name of Test Institute** : PDA Ltd, 3 Bridgewater Court, Barsbank Lane, Lymm, Cheshire, WA13 0ER

Date: 16 July 2024

Notes:

≥ - measurement limited due to background

Signature : [redacted]

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

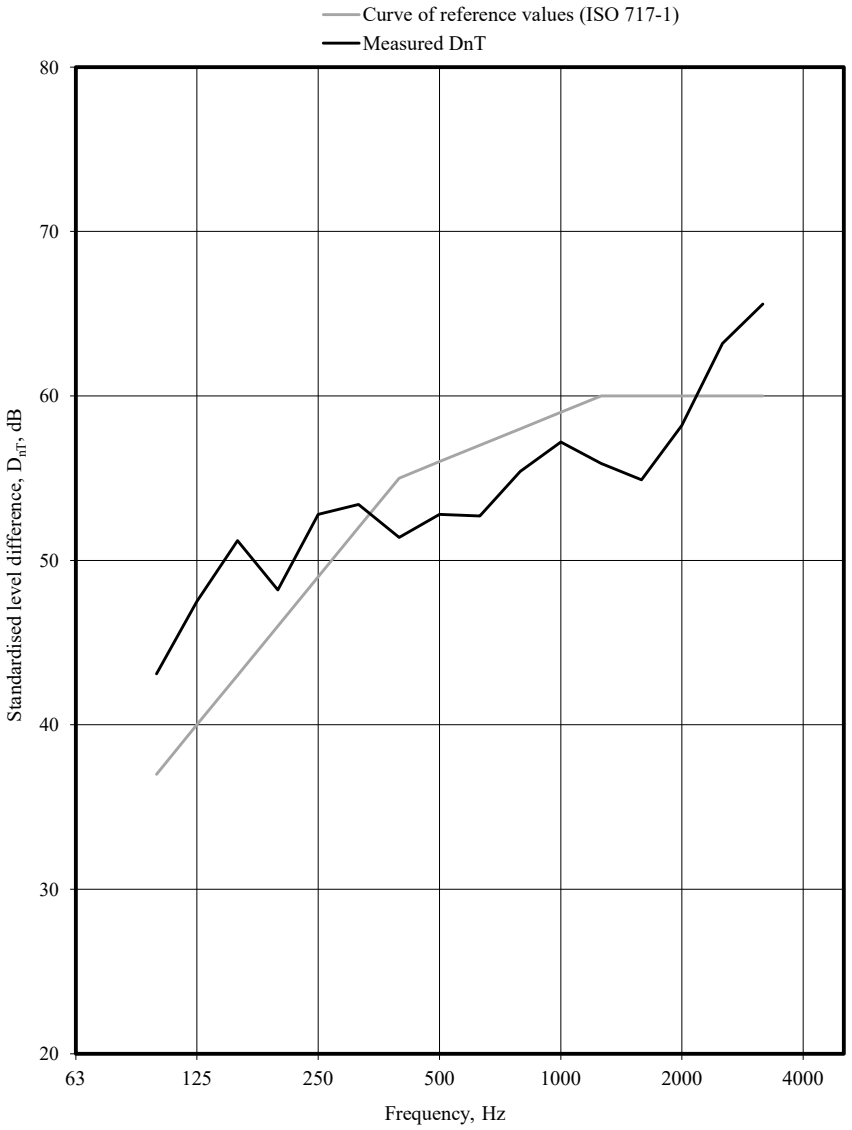
Client: Arica Helsby **Date of Test:** 11 July 2024
Address: Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB

Description of tested construction, test arrangement and direction of measurement :
Source Room: Plot 7 Kitchen / Dining Room
Reciever Room: Plot 3 Living Room

Wall Construction (Notional)
Existing solid masonry wall with any openings infilled with 2 no. layers of 15mm Soundbloc plasterboard either side of twin rows of timber studs and 100mm mineral wool insulation in the cavity

Source Room Volume : 120 m^3
Receiver Room Volume : 66 m^3

Frequency Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	43.1
125	47.5
160	51.2
200	48.2
250	52.8
315	53.4
400	51.4
500	52.8
630	52.7
800	55.4
1000	57.2
1250	55.9
1600	54.9
2000	58.2
2500	63.2
3150	65.6
4000	
5000	



Rating According to ISO 717-1

$D_{nT,w}$ (C; Ctr) = **56** 0 -2 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 10511849703 **Name of Test Institute** : PDA Ltd, 3 Bridgewater Court, Barsbank Lane, Lymm, Cheshire, WA13 0ER

Date: 16 July 2024

Notes:

≥ - measurement limited due to background

Signature : [redacted]

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

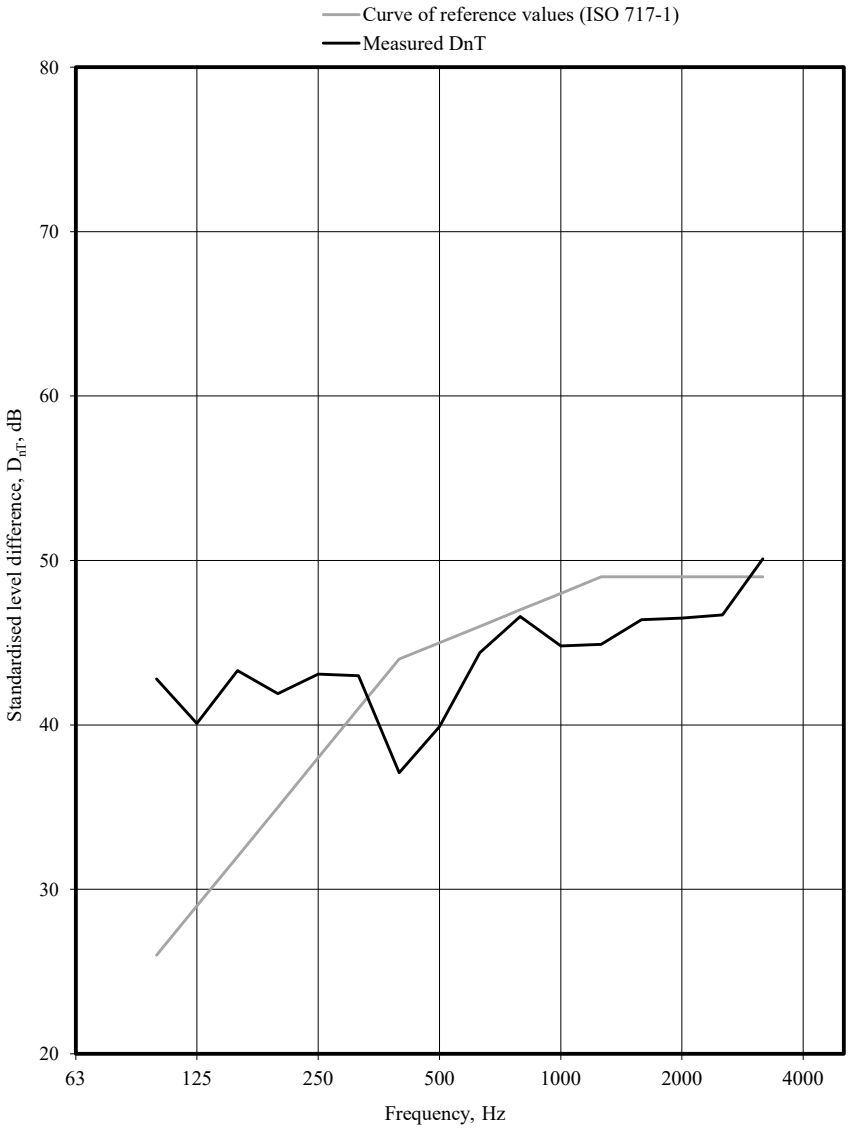
Client: Arica Helsby **Date of Test:** 11 July 2024
Address: Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB

Description of tested construction, test arrangement and direction of measurement :
Source Room: Plot 7 Kitchen / Dining Room
Reciever Room: Plot 1 Utility Room

Wall Construction (Notional)
Existing masonry wall lined on one side with 1 no. layer of 15mm Soundbloc plasterboard on timber studs with 25mm mineral wool insulation in the cavity

Source Room Volume : 120 m^3
Receiver Room Volume : 5.8 m^3

Frequency Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	42.8
125	40.1
160	43.3
200	41.9
250	43.1
315	43.0
400	37.1
500	39.9
630	44.4
800	46.6
1000	44.8
1250	44.9
1600	46.4
2000	46.5
2500	46.7
3150	50.1
4000	
5000	



Rating According to ISO 717-1

$D_{nT,w}$ (C; Ctr) = **45** 0 -1 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 10511849704 **Name of Test Institute** : PDA Ltd, 3 Bridgewater Court Barsbank Lane, Lymm Cheshire, WA13 0ER

Date: 16 July 2024

Notes:

≥ - measurement limited due to background

Signature : [redacted]

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

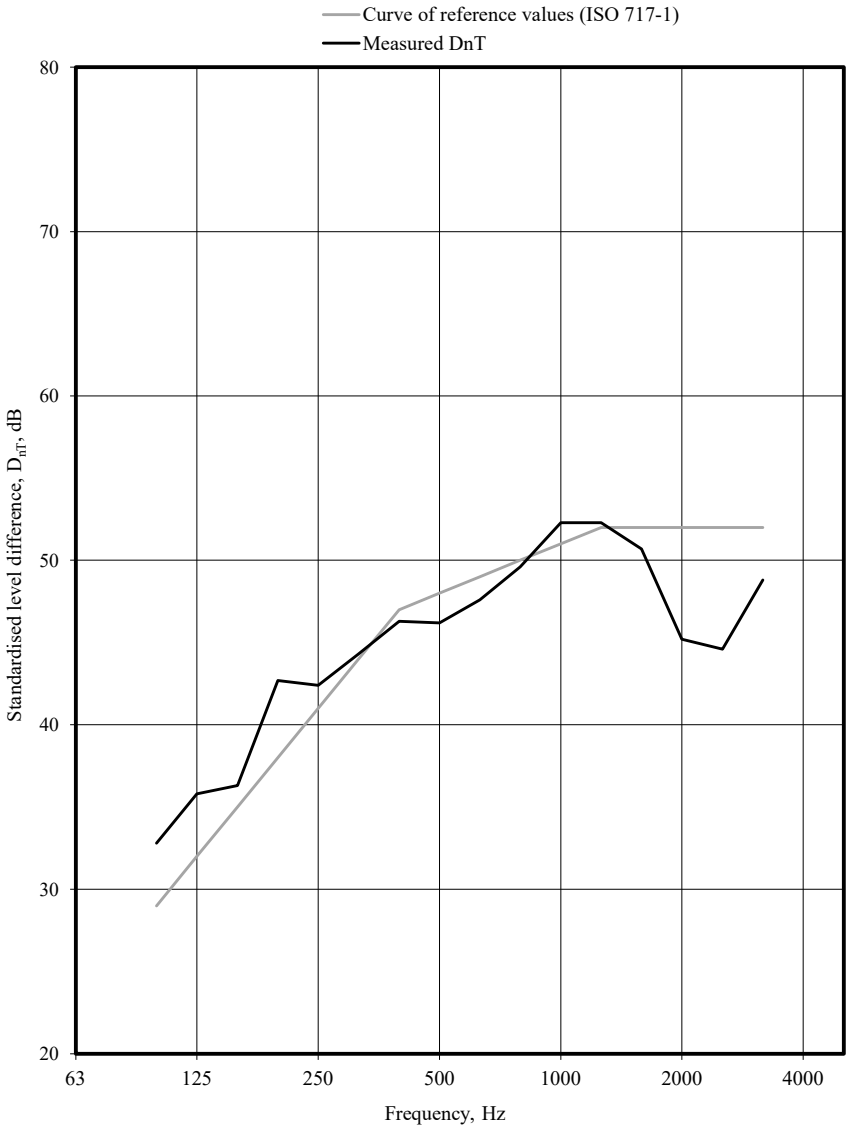
Client: Arica Helsby **Date of Test:** 11 July 2024
Address: Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB

Description of tested construction, test arrangement and direction of measurement :
Source Room: Plot 7 Bedroom
Reciever Room: Plot 7a Bedroom

Wall Construction (Notional)
2 no. layers of 15mm Soundbloc plasterboard either side of twin rows of timber studs and 100mm mineral wool insulation in the cavity

Source Room Volume : 42 m^3
Receiver Room Volume : 22 m^3

Frequency Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	32.8
125	35.8
160	36.3
200	42.7
250	42.4
315	44.3
400	46.3
500	46.2
630	47.6
800	49.6
1000	52.3
1250	52.3
1600	50.7
2000	45.2
2500	44.6
3150	48.8
4000	
5000	



Rating According to ISO 717-1

$D_{nT,w}$ (C; Ctr) = **48** -1 -3 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 10511849705 **Name of Test Institute** : PDA Ltd, 3 Bridgewater Court Barsbank Lane, Lymm Cheshire, WA13 0ER

Date: 16 July 2024

Notes:

≥ - measurement limited due to background

Signature : [redacted]

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

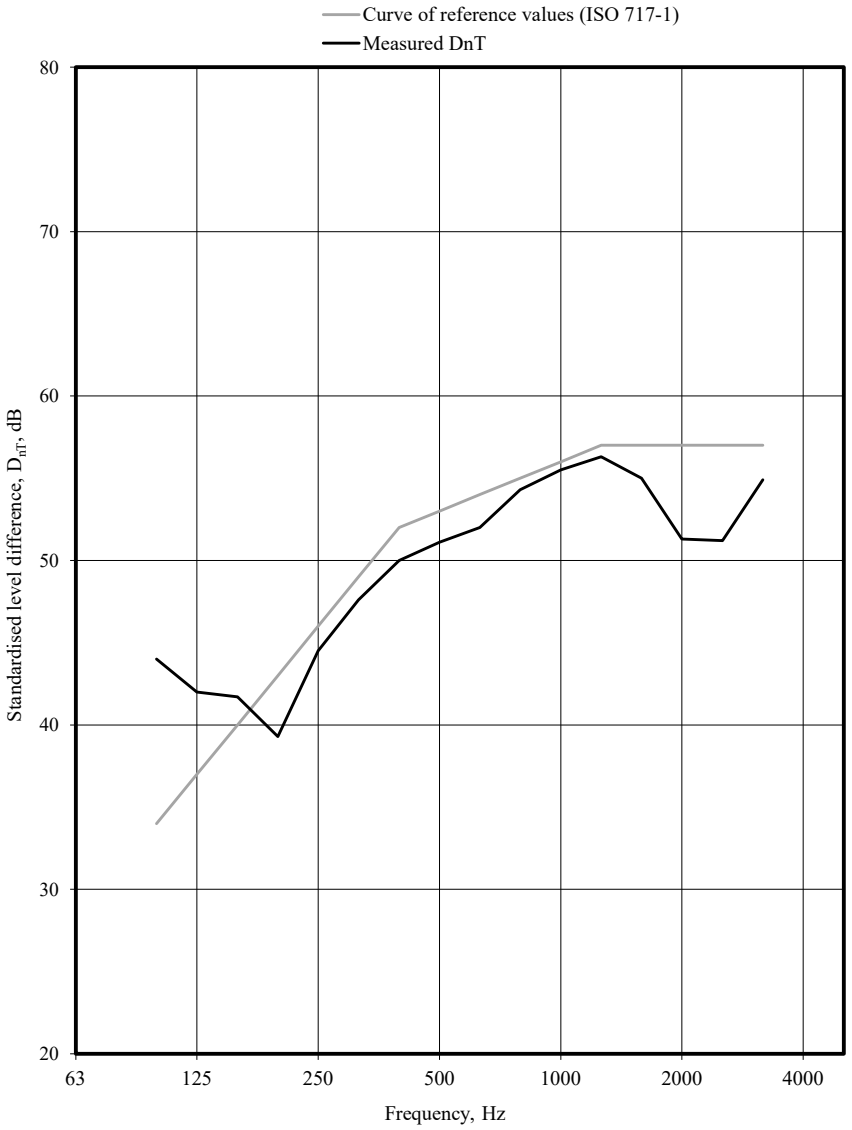
Client: Arica Helsby **Date of Test:** 11 July 2024
Address: Plots 1, 3, 7 & 7A, Nunfield Close, Moston, Manchester M40 5QB

Description of tested construction, test arrangement and direction of measurement :
Source Room: Plot 7a Bedroom
Reciever Room: Plot 7 Bedroom

Wall Construction (Notional)
2 no. layers of 15mm Soundbloc plasterboard either side of twin rows of timber studs and 100mm mineral wool insulation in the cavity

Source Room Volume : 43 m^3
Receiver Room Volume : 26 m^3

Frequency Hz	D_{nT} (one-third octave) dB
50	
63	
80	
100	44.0
125	42.0
160	41.7
200	39.3
250	44.5
315	47.6
400	50.0
500	51.1
630	52.0
800	54.3
1000	55.5
1250	56.3
1600	55.0
2000	51.3
2500	51.2
3150	54.9
4000	
5000	



Rating According to ISO 717-1

$D_{nT,w}$ (C; Ctr) = **53** -1 -3 **dB**

Evaluation based on field measurement results obtained by an engineering method

No. of Test Report: 10511849706 **Name of Test Institute** : PDA Ltd, 3 Bridgewater Court Barsbank Lane, Lymm Cheshire, WA13 0ER

Date: 16 July 2024

Notes:

≥ - measurement limited due to background

Signature : [redacted]