



CHALLENGER BUILDING SERVICES LIMITED

SOUND INSULATION TEST REPORT

CORNER OF GREENWOOD ROAD / GLADESIDE ROAD,
MANCHESTER, M22 9RA

R2165-REP02-SJW

ANC TASK NUMBER 180118800

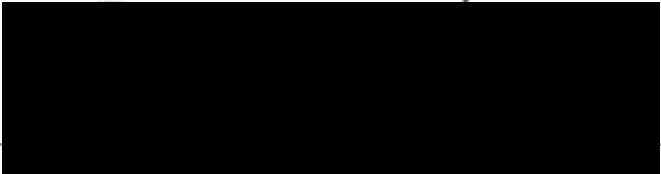
15 SEPTEMBER 2024



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REPORT DETAILS

Project	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA
Client	Challenger Building Services Ltd 140 Lee Lane Horwich BL6 7AF
Document Reference	R2165-REP02-SJW
Date Issued	15 September 2024
Revision	Initial Report
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Signed	

SUMMARY

Red Acoustics Ltd has been commissioned by Challenger Building Services Limited to measure the impact and airborne sound insulation of the party floors separating purpose built dwelling-houses and flats at Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA. The results are to be compared with the performance standards cited by Building Regulations 2010 Approved Document E.

Impact Sound Insulation tests were conducted in accordance with BS EN ISO 140-7:1998 and rated in accordance with BS EN ISO 717-2: 1997. Airborne Sound Insulation tests were conducted in accordance with BS EN ISO 140-4:1998 and rated in accordance with BS EN ISO 717-1: 1997.

This report is only valid when checked in conjunction with the ANC's online verification system using the following task number and password. Details of the online verification system are given in Appendix F.

Task Number: 118764

Task Password: 7FTDN3

The results confirm that compliance with the performance standards cited by Building Regulations 2010 Approved Document E have been met.

This is an ANC Registered Report with the unique registration number 118764.

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1.0 INTRODUCTION

Red Acoustics Ltd has been commissioned by Challenger Building Services Limited to measure the impact and airborne sound insulation of the party floors separating purpose built dwelling-houses and flats at Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA. The results are to be compared with the performance standards cited by Building Regulations 2010 Approved Document E.

Impact Sound Insulation tests were conducted in accordance with BS EN ISO 140-7:1998 and rated in accordance with BS EN ISO 717-2: 1997. Airborne Sound Insulation tests were conducted in accordance with BS EN ISO 140-4:1998 and rated in accordance with BS EN ISO 717-1: 1997.

The tests were carried out on the following dates during a quiet daytime period:

21 August 2024

A glossary of acoustic terms used in this report is given in Appendix A.

2.0 DESCRIPTION OF BUILDING & CONSTRUCTION TESTED

A normal programme of testing described in Approved Document E for every group or sub-group of dwelling type was employed.

At the time of testing all residential spaces were structurally complete and unfurnished.

If the tested rooms are of different volumes, the larger one was chosen as the source room, no dimensional step or stagger was noted in the tested room layouts.

3.0 TEST PROCEDURE & ANALYSIS

Details of the tests are given in Appendix B. Appendices C and D summarise the calculation and rating method for impact and airborne sound insulation tests respectively.

The tests detailed in this report have been carried out in full accordance within ISO 140-7 and ISO 140-4 and all the procedures in Annex B of the Approved Document to the Building Regulations have been followed.

Impact Sound Insulation

Impact sound insulation testing was carried out in accordance with the requirements of the BS EN ISO 140-7:1998: "Field Measurements of Impact Sound Insulation of Floors".

To conduct impact sound insulation tests, a tapping machine is placed on the unfinished floor in the "source room". The room directly below the floor is the "receiver room". The noise level generated in the receiver room is measured in accordance with BS EN ISO 140-7: "Field Measurements of impact sound insulation of floors" where the resultant noise level ($L_{eq,30secs}$) in this room is measured using a moving microphone with a sweep radius of at least 0.7 m. The plane of the traverse is inclined in order to cover a large proportion of the space permitted for measurement. The plane of traverse shall not lie within 10° of any plane of the room (wall, floor, ceiling). The duration of the traverse period is minimum of 30 seconds.

This procedure is repeated for a further three tapping machine positions providing a total of 4 measurements in the receiver room.

The background ($L_{eq,30secs}$) noise level in the receiver room with the tapping machine turned off is measured in accordance with BS EN ISO 140-7: "Field Measurements of impact sound insulation of floors" where the resultant background noise level ($L_{eq,30secs}$) in this room is measured using a moving microphone with a sweep radius of at least 0.7 m. The plane of the traverse is inclined in order to cover a large proportion of the space permitted for measurement. The plane of traverse shall not lie within 10° of any plane of the room (wall, floor, ceiling). The duration of the traverse period is minimum of 30 seconds.

Receiver room reverberation time (RT) measurements were conducted using fixed microphone positions and an interrupted sound source in accordance with BS EN ISO 140-7:1998: "Field Measurements of Impact Sound Insulation of Floors". Three RT's were measured for each of two loudspeaker positions (i.e. a total of 6 RT measurements). The results of the measurements in each room were averaged to establish the RT of the room.

All of the above measurements were made over one-third octave bands from 100 Hz to 3150 Hz inclusive.

The resulting frequency-dependent noise levels were then corrected for background noise and reverberation time and converted into a single number characterising the acoustical performance using the method given in BS EN ISO 717-2: "Method for rating the impact sound insulation". This single number rating is the 'Weighted Standardised Impact Sound Pressure Level' ($L'_{nT,w}$). It should be noted that a decrease in $L'_{nT,w}$ indicates an improvement in acoustic performance.

Table 3.1 contains details of each of the floors on which impact sound insulation tests were carried out in terms of the room pairs they separate.

Table 3.1: Impact Floor Sound Insulation Tests

Source Room	Receiving Room
Apartment 1.02 Bedroom (29.8m ³)	Apartment G.05 Bedroom (29.8m ³)
Apartment 1.02 Living Room / Kitchen (57m ³)	Apartment G.05 Living Room / Kitchen (57m ³)
Apartment 1.06 Bedroom (32m ³)	Apartment G.09 Bedroom (32m ³)
Apartment 1.06 Living Room / Kitchen (44m ³)	Apartment G.09 Living Room / Kitchen (44m ³)
Apartment 2.08 Bedroom (36m ³)	Apartment 1.10 Bedroom (36m ³)
Apartment 2.08 Living Room / Kitchen (53m ³)	Apartment 1.10 Living Room / Kitchen (53m ³)
Apartment 2.10 Bedroom (33m ³)	Apartment 1.12 Bedroom (33m ³)
Apartment 2.10 Living Room / Kitchen (50m ³)	Apartment 1.12 Living Room / Kitchen (50m ³)

Airborne Sound Insulation

Airborne sound insulation testing was carried out in accordance with the requirements of the BS EN ISO 140-4:1998: "Field Measurements of Airborne Sound Insulation between Rooms".

If the rooms are of different volumes, the larger one should be chosen as the source room when the standardised level difference is to be evaluated and no contradictory procedure is agreed upon.

To conduct airborne sound insulation tests, a pink noise source is placed in the "source room" and the resultant noise level ($L_{eq,30secs}$) in this room is measured using a moving microphone with a sweep radius of at least 0.7 m. The plane of the traverse is inclined in order to cover a large proportion of the space permitted for measurement. The plane of traverse shall not lie within 10° of any plane of the room (wall, floor, ceiling). The duration of the traverse period is minimum of 30 seconds.

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The room on the other side of the party construction is the “receiver room” and the noise transmitted to this room is measured using a moving microphone as described above.

The numbers of microphone and loudspeaker positions is determined from the floor area of the source and receiving rooms in accordance with the requirements of the BS EN ISO 140-4:1998: “Field Measurements of Airborne Sound Insulation between Rooms” and BS EN ISO 140-14:2004: “Measurement of Sound Insulation in Buildings and of Building Elements”. Two sets of source and receiving room measurements were required, with the loudspeaker moved between sets of measurements. This gives at least two level differences, which are then averaged arithmetically.

The background ($L_{eq,30secs}$) noise level in the receiver room with the noise source turned off is measured in accordance with BS EN ISO 140-4:1998: “Field Measurements of Airborne Sound Insulation between Rooms” and BS EN ISO 140-14:2004: “Measurement of Sound Insulation in Buildings and of Building Elements” where the resultant background noise level ($L_{eq,30secs}$) in this room is measured using a moving microphone with a sweep radius of at least 0.7 m. The plane of the traverse is inclined in order to cover a large proportion of the space permitted for measurement. The plane of traverse shall not lie within 10° of any plane of the room (wall, floor, ceiling). The duration of the traverse period is minimum of 30 seconds.

Receiver room reverberation time (RT) measurements were conducted using fixed microphone positions and an interrupted sound source in accordance with BS EN ISO 140-7:1998: “Field Measurements of Airborne Sound Insulation between Rooms”. Three RT’s were measured for each of two loudspeaker positions (i.e. a total of 6 RT measurements). The results of the measurements in each room were averaged to establish the RT of the room.

All of the above measurements were made over the one-third octave bands from 50 Hz to 5000 Hz inclusive.

The differences between source and receiver third octave band noise levels were then calculated in accordance with BS EN ISO 140-4: “Field Measurements of airborne sound insulation between rooms” and corrected for background noise and reverberation time. The resulting frequency-dependent level differences were converted into a single number characterising the acoustic performance using the method given in BS EN ISO 717-1: “Method for rating the airborne sound insulation in buildings and of interior building elements”. This single number rating is the ‘Weighted Standardised Level Difference’ ($D_{nT,W}$).

Table 3.2 contains details of each of the floors on which airborne sound insulation tests were carried out in terms of the room pairs they separate.

Table 3.2: Airborne Floor Sound Insulation Tests

Source Room	Receiving Room
Apartment 1.02 Bedroom (29.8m ³)	Apartment G.05 Bedroom (29.8m ³)
Apartment 1.02 Living Room / Kitchen (57m ³)	Apartment G.05 Living Room / Kitchen (57m ³)
Apartment 1.06 Bedroom (32m ³)	Apartment G.09 Bedroom (32m ³)
Apartment 1.06 Living Room / Kitchen (44m ³)	Apartment G.09 Living Room / Kitchen (44m ³)
Apartment 2.08 Bedroom (36m ³)	Apartment 1.10 Bedroom (36m ³)
Apartment 2.08 Living Room / Kitchen (53m ³)	Apartment 1.10 Living Room / Kitchen (53m ³)
Apartment 2.10 Bedroom (33m ³)	Apartment 1.12 Bedroom (33m ³)
Apartment 2.10 Living Room / Kitchen (50m ³)	Apartment 1.12 Living Room / Kitchen (50m ³)

Table 3.3 contains details of each of the walls on which airborne sound insulation tests were carried out in terms of the room pairs they separate.

Table 3.3: Airborne Wall Sound Insulation Tests

Source Room	Receiving Room
Apartment 1.02 Bedroom (29.8m ³)	Apartment 1.01 Bedroom (26.5m ³)
Apartment 1.02 Living Room / Kitchen (57m ³)	Apartment 1.03 Bedroom (32m ³)
Apartment 1.06 Bedroom (31.8m ³)	Apartment 1.07 Bedroom (28.1m ³)
Apartment 1.06 Living Room / Kitchen (43.8m ³)	Apartment 1.05 Bedroom (34m ³)
Apartment 2.08 Bedroom (36.3m ³)	Apartment 2.07 Bedroom (26.4m ³)
Apartment 2.08 Living Room / Kitchen (52.8m ³)	Apartment 2.09 Living Room / Kitchen (42.4m ³)
Apartment 2.10 Bedroom (32.6m ³)	Apartment 2.09 Bedroom (26.4m ³)
Apartment 2.10 Living Room / Kitchen (50.3m ³)	Apartment 2.11 Living Room / Kitchen (50.3m ³)

Equipment Calibration

Details of current calibration certificates for the instrumentation used during the sound insulation tests are presented in Appendix E.

4.0 BUILDING REGULATIONS SOUND INSULATION REQUIREMENTS

The Building Regulations 2010 Approved Document E: "Resistance to the passage of sound" gives airborne and impact sound insulation performance standards. These performance standards are given in Table 4.1 below.

Table 4.1: Building Regulations 2010 Approved Document E: Dwelling-houses and flats - performance standard for separating walls, separating floors and stairs that have a separating function.

	Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum values)
Purposes built dwellings-houses and flats		
Walls	45	-
Floors and stairs	45	62
Dwelling-houses and flats formed by material change of use		
Walls	43	-
Floors and stairs	43	64

For the purpose of this test the impact and airborne sound insulation performance the requirements for **Purpose Built Dwelling-houses and flats** is applicable.

5.0 TEST RESULTS

Table 5.1 compares the measured impact sound insulation performance of the separating floors against the target performance requirements cited by Building Regulations 2010.

Table 5.2 compares the measured airborne sound insulation performance of the separating floors against the target performance requirements cited by Building Regulations 2010.

Table 5.3 compares the measured airborne sound insulation performance of the separating walls against the target performance requirements cited by Building Regulations 2010.

Details of the Association of Noise Consultants (ANC) accredited test verification access site, task number and password associated with this project are given in Appendix E. Full test certificates for the measurements are given in Appendix F.

Table 5.1: Separating Floor Impact Sound Insulation Test Results Compared With The Performance Requirements Cited by Building Regulations 2010 Approved Document E

ANC Test No.	Source Room	Receiver Room	Test Result dB $L'_{nT,w}$	Performance Standard cited by Building Regulations 2010 Approved Document E $L'_{nT,w}$	Pass or Fail
18011880001	Apartment 1.02 Bedroom (29.8m ³)	Apartment G.05 Bedroom (29.8m ³)	55	≤62dB	Pass
18011880002	Apartment 1.02 Living Room / Kitchen (57m ³)	Apartment G.05 Living Room / Kitchen (57m ³)	54	≤62dB	Pass
18011880003	Apartment 1.06 Bedroom (32m ³)	Apartment G.09 Bedroom (32m ³)	57	≤62dB	Pass
18011880004	Apartment 1.06 Living Room / Kitchen (44m ³)	Apartment G.09 Living Room / Kitchen (44m ³)	54	≤62dB	Pass
18011880005	Apartment 2.08 Bedroom (36m ³)	Apartment 1.10 Bedroom (36m ³)	53	≤62dB	Pass
18011880006	Apartment 2.08 Living Room / Kitchen (53m ³)	Apartment 1.10 Living Room / Kitchen (53m ³)	55	≤62dB	Pass
18011880007	Apartment 2.10 Bedroom (33m ³)	Apartment 1.12 Bedroom (33m ³)	56	≤62dB	Pass
18011880008	Apartment 2.10 Living Room / Kitchen (50m ³)	Apartment 1.12 Living Room / Kitchen (50m ³)	55	≤62dB	Pass

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Table 5.2: Separating Floor Airborne Sound Insulation Test Results Compared With The Performance Requirements Cited by Building Regulations 2010 Approved Document E

ANC Test No.	Source Room	Receiver Room	Test Result dB $D_{nT,w} + C_{tr}$	Performance Standard cited by Building Regulations 2010 Approved Document E $D_{nT,w} + C_{tr}$	Pass or Fail
18011880009	Apartment 1.02 Bedroom (29.8m ³)	Apartment G.05 Bedroom (29.8m ³)	50	≥45dB	Pass
18011880010	Apartment 1.02 Living Room / Kitchen (57m ³)	Apartment G.05 Living Room / Kitchen (57m ³)	47	≥45dB	Pass
18011880011	Apartment 1.06 Bedroom (32m ³)	Apartment G.09 Bedroom (32m ³)	54	≥45dB	Pass
18011880012	Apartment 1.06 Living Room / Kitchen (44m ³)	Apartment G.09 Living Room / Kitchen (44m ³)	51	≥45dB	Pass
18011880013	Apartment 2.08 Bedroom (36m ³)	Apartment 1.10 Bedroom (36m ³)	49	≥45dB	Pass
18011880014	Apartment 2.08 Living Room / Kitchen (53m ³)	Apartment 1.10 Living Room / Kitchen (53m ³)	48	≥45dB	Pass
18011880015	Apartment 2.10 Bedroom (33m ³)	Apartment 1.12 Bedroom (33m ³)	51	≥45dB	Pass
18011880016	Apartment 2.10 Living Room / Kitchen (50m ³)	Apartment 1.12 Living Room / Kitchen (50m ³)	50	≥45dB	Pass

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Table 5.3: Separating Wall Airborne Sound Insulation Test Results Compared With The Performance Requirements Cited by Building Regulations 2010 Approved Document E

ANC Test No.	Source Room	Receiver Room	Test Result dB $D_{nT,w} + C_{tr}$	Performance Standard cited by Building Regulations 2010 Approved Document E $D_{nT,w} + C_{tr}$	Pass or Fail
18011880017	Apartment 1.02 Bedroom (29.8m ³)	Apartment 1.01 Bedroom (26.5m ³)	57	≥45dB	Pass
18011880018	Apartment 1.02 Living Room / Kitdhen (57m ³)	Apartment 1.03 Bedroom (32m ³)	56	≥45dB	Pass
18011880019	Apartment 1.06 Bedroom (31.8m ³)	Apartment 1.07 Bedroom (28.1m ³)	≥57	≥45dB	Pass
18011880020	Apartment 1.06 Living Room / Kitchen (43.8m ³)	Apartment 1.05 Bedroom (34m ³)	≥51	≥45dB	Pass
18011880021	Apartment 2.08 Bedroom (36.3m ³)	Apartment 2.07 Bedroom (26.4m ³)	50	≥45dB	Pass
18011880022	Apartment 2.08 Living Room / Kitchen (52.8m ³)	Apartment 2.09 Living Room / Kitchen (42.4m ³)	56	≥45dB	Pass
18011880023	Apartment 2.10 Bedroom (32.6m ³)	Apartment 2.09 Bedroom (26.4m ³)	56	≥45dB	Pass
18011880024	Apartment 2.10 Living Room / Kitchen (50.3m ³)	Apartment 2.11 Living Room / Kitchen (50.3m ³)	≥57	≥45dB	Pass

The **test results** marked with '≥' indicate that the results are at the limit of measurement on account of the received noise level (L_2) in any unfavourable frequency band is not measurable due to contamination by background noise sources (e.g. traffic noise). The actual results are expected to be either greater than or equal to those reported.

Details of the background noise during the tests are given in Table 5.4.

Table 5.4: Details of Background Noise in Receiver Rooms During Testing

ANC Test No.	Receiver Room	Details
18011880001	Apartment G.05 Bedroom (29.8m ³)	Typically very quiet. Occasional road traffic.
18011880002	Apartment G.05 Living Room / Kitchen (57m ³)	Typically very quiet. Occasional road traffic.
18011880003	Apartment G.09 Bedroom (32m ³)	Typically very quiet. Occasional road traffic.
18011880004	Apartment G.09 Living Room / Kitchen (44m ³)	Typically very quiet. Occasional road traffic.
18011880005	Apartment 1.10 Bedroom (36m ³)	Typically very quiet. Occasional road traffic.
18011880006	Apartment 1.10 Living Room / Kitchen (53m ³)	Typically very quiet. Occasional road traffic.
18011880007	Apartment 1.12 Bedroom (33m ³)	Typically very quiet. Occasional road traffic.
18011880008	Apartment 1.12 Living Room / Kitchen (50m ³)	Typically very quiet. Occasional road traffic.
18011880009	Apartment G.05 Bedroom (29.8m ³)	Typically very quiet. Occasional road traffic.
18011880010	Apartment G.05 Living Room / Kitchen (57m ³)	Typically very quiet. Occasional road traffic.
18011880011	Apartment G.09 Bedroom (32m ³)	Typically very quiet. Occasional road traffic.
18011880012	Apartment G.09 Living Room / Kitchen (44m ³)	Typically very quiet. Occasional road traffic.
18011880013	Apartment 1.10 Bedroom (36m ³)	Typically very quiet. Occasional road traffic.
18011880014	Apartment 1.10 Living Room / Kitchen (53m ³)	Typically very quiet. Occasional road traffic.
18011880015	Apartment 1.12 Bedroom (33m ³)	Typically very quiet. Occasional road traffic.
18011880016	Apartment 1.12 Living Room / Kitchen (50m ³)	Typically very quiet. Occasional road traffic.
18011880017	Apartment 1.01 Bedroom (26.5m ³)	Typically very quiet. Occasional road traffic.
18011880018	Apartment 1.03 Bedroom (32m ³)	Typically very quiet. Occasional road traffic.
18011880019	Apartment 1.07 Bedroom (28.1m ³)	Typically very quiet. Occasional road traffic.
18011880020	Apartment 1.05 Bedroom (34m ³)	Typically very quiet. Occasional road traffic.
18011880021	Apartment 2.07 Bedroom (26.4m ³)	Typically very quiet. Occasional road traffic.
18011880022	Apartment 2.09 Living Room / Kitchen (42.4m ³)	Typically very quiet. Occasional road traffic.
18011880023	Apartment 2.09 Bedroom (26.4m ³)	Typically very quiet. Occasional road traffic.
18011880024	Apartment 2.11 Living Room / Kitchen (50.3m ³)	Typically very quiet. Occasional road traffic.

6.0 CONCLUSION

The results confirm that compliance with the performance standards cited by Building Regulations 2010 Approved Document E have been met.

APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Decibel (dB)

This is the unit used to quantify sound levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). We therefore use a logarithmic scale to describe sound pressure level, intensities and sound power levels. The logarithms used are to base 10. Hence, an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in acoustic pressure in Pascals. Subjectively, this corresponds to a doubling in the perceived loudness of sound.

Octave & One-Third Octave Bands

The human ear is sensitive to sound over a range of frequencies between approximately 20Hz to 20000Hz (20kHz), and is generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum is divided into frequency bands, and the sound pressure level is measured in each band. The most commonly used frequency bands are octave bands, in which the mid-frequency of each band is twice that of the band below it. For instance, the octave bands above and below the 500Hz octave band are 1kHz and 250 Hz respectively. For finer analysis, each octave band may be split into three one-third octave bands or in some cases, finer frequency bands (e.g. 1/12 octaves).

APPENDIX B: TEST DETAILS

Location

Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA

Property Type(s)

Purpose Built Dwelling-houses and flats

Date of Tests

21 August 2024

Tests Conducted By

Simon Webster BEng. (Hons) MIOA

Johnathan Whittle BSc (Hons), Pg. Dip. IOA AMIOA MCIEH

Red Acoustics Limited, Unit 8 Cable Court, Pittman Way, Preston PR2 9YW

Members of the Association of Noise Consultants

Accredited Test Organisation Number 180



Instrumentation Used

Table B1: List of Instrumentation Used

Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Calibration	Calibration Certificate Number
Active Sound Reinforcement System Loudspeaker	EON 515	JBL	NA	NA	NA
Noise Generator	MR1	Neutrik	NA	NA	NA
Sound Level Meter	Type 118 IEC 60651 Type 1	Norsonic	30560	01/05/2024	47687
Preamplifier	Nor 1206	Norsonic	30247	01/05/2024	47686
Microphone Capsule	Nor 1225	Norsonic	25117	01/05/2024	47686
Sound Calibrator	Type 1251 Class 1	Norsonic	34390	01-May-24	47685
Tapping Machine	Type 277	Norsonic	2775892	31-Oct-23	45822

Calibration Procedure

Before and after the measurements the Norsonic Type 118 was check calibrated to an accuracy of $\pm 0.3\text{dB}$ using the Norsonic Type 1251 Sound Calibrator. The calibrator produces a sound pressure level of $114.0\text{ dB re } 2 \times 10^{-5}\text{ Pa @ } 1\text{kHz}$.

Calibration certificates are held on file and available upon request.

APPENDIX C: CALCULATION OF WEIGHTED STANDARDISED IMPACT LEVEL

Standardised impact sound pressure level (L'_{nt}) is calculated using the formula given in BS EN ISO 140 part 7.

$$L'_{nt} = L_i + 10 \log(T/T_0) \text{ dB}$$

Where:

L_i is the average sound pressure level in the receive room

T is the reverberation time in the receiving room

T_0 is the reference reverberation time (0.5 seconds)

To calculate the Weighted Standardised Impact Sound Pressure Level ($L'_{nt,w}$) the reference curve defined in BS EN ISO 717 part 2: 1998 is compared with the results of the above calculation. The reference curve is shifted in steps of 1 dB towards the measured curve until the mean unfavourable deviation is less than or equal to 32 dB. The weighted level is then the value of the shifted reference curve at 500Hz.

APPENDIX D: CALCULATION OF WEIGHTED STANDARDISED LEVEL DIFFERENCE

Standardised level difference (D_{nT}) is



4.

$$D_{nT} = L_1 - L_2 + 10 \log(T/T_0) \text{ dB}$$

Where:



L_1 is the average sound pressure level in the source room

L_2 is the average sound pressure level in the receiving room

T is the reverberation time in the receiving room

T_0 is the reference reverberation time (0.5 seconds)

To calculate the Weighted Standardised Level Difference ($D_{nT,w}$) the reference curve defined in BS EN ISO 717-1: 1997 is compared with the results of the above calculation. The reference curve is shifted in steps of 1 dB towards the measured curve until the mean unfavourable deviation is less than or equal to 32dB. The weighted level is then the value of the shifted reference curve at 500Hz.

APPENDIX E: ANC SOUND TEST VERIFICATION FOR ADE

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: 118764

Task Password: 7FTDN3

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 will be displayed and can be printed for your records.

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APPENDIX F: TEST CERTIFICATES

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

Project No:	R2165	ANC Test No:	11880001	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.02 Bedroom to Apartment G.05 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				

Receiving room volume: 29.8 m³

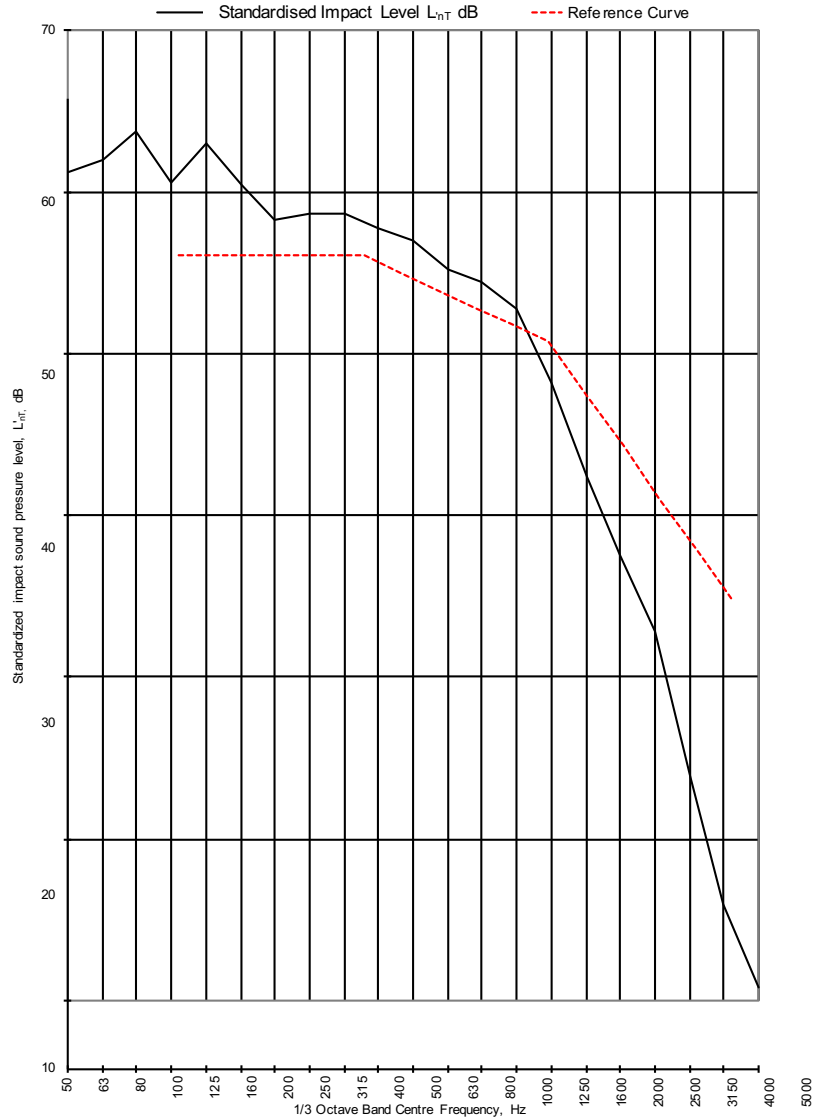
Test Engineer:
Simon Webster

Test Engineer Signature

[Redacted Signature]

1/3 Octave Band Centre Frequency Hz	Standardised Impact Level L'_{nT} dB
50	61.6
63	62.4
80	64.1
100	61.0
125	63.5
160	60.8
200	58.7
250	59.1
315	59.0
400	58.2
500	57.3
630	55.6
800	54.8
1000	53.2
1250	48.6
1600	42.8
2000	37.9
2500	33.3
3150	24.3
4000	16.4
5000	11.2

$L'_{nT,w} = 55$



Rating according to BS EN ISO 717-2

$L'_{nT,w} (C_1) = 55 (0) \text{ dB}$

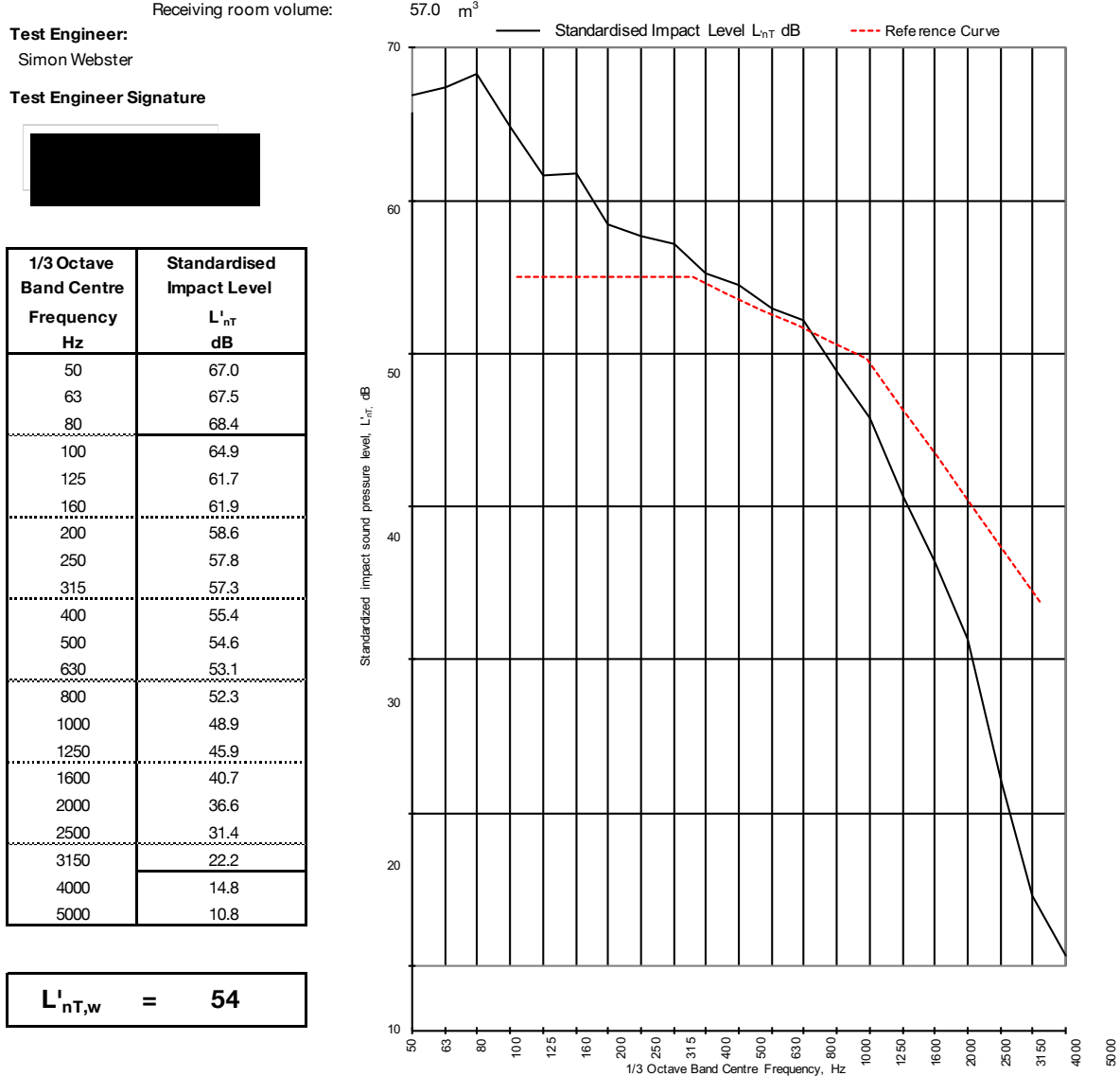
Evaluation based on field measurement results obtained by an engineering method

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

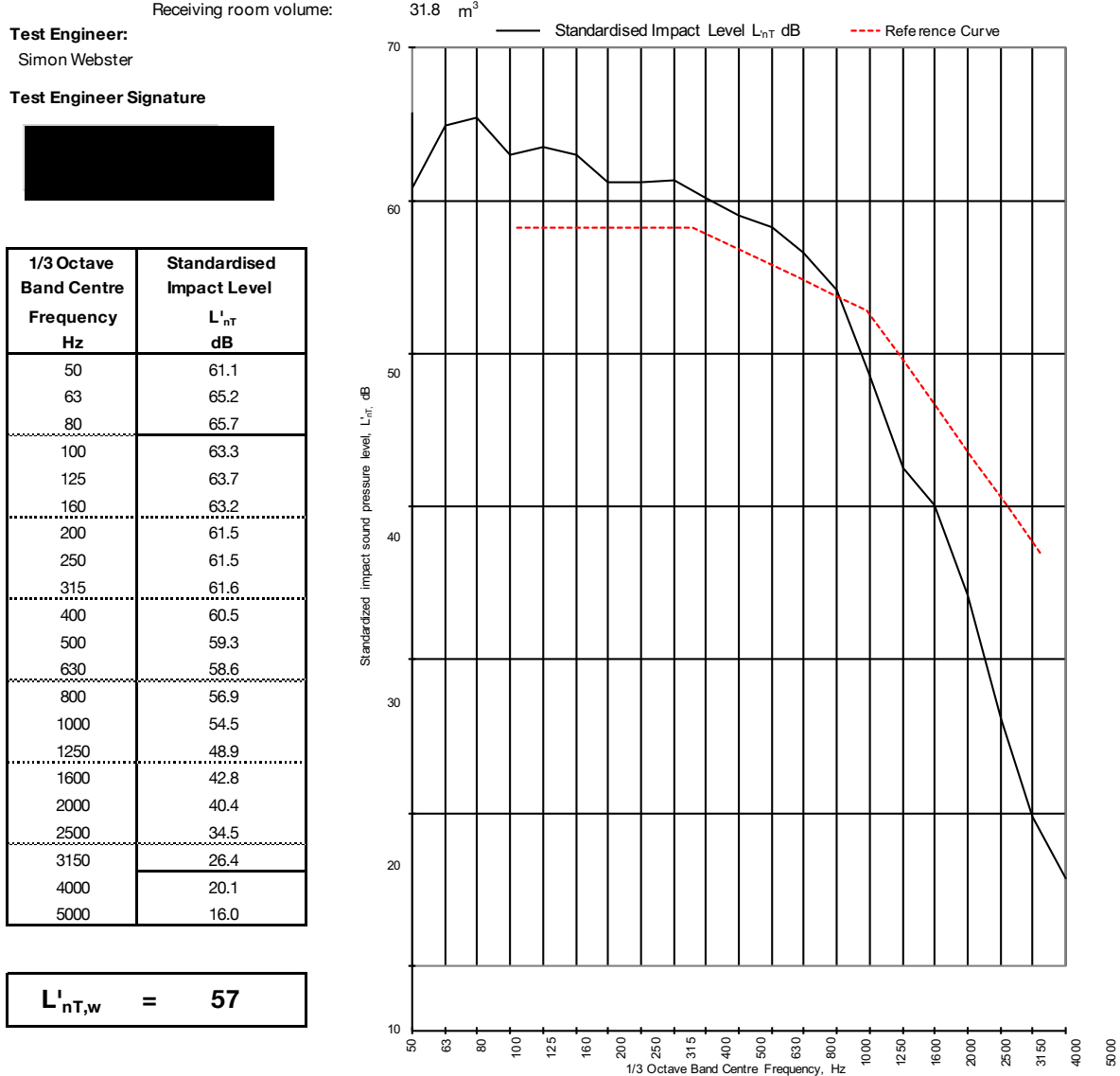
Project No:	R2165	ANC Test No:	11880002	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.02 Living Room / Kitchen to Apartment G.05 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2	L'_{nT,w} (C₁) = 54 (1) dB
Evaluation based on field measurement results obtained by an engineering method	

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

Project No:	R2165	ANC Test No:	11880003	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.06 Bedroom to Apartment G.09 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2

L'_{nT,w} (C₁) = 57 (0) dB

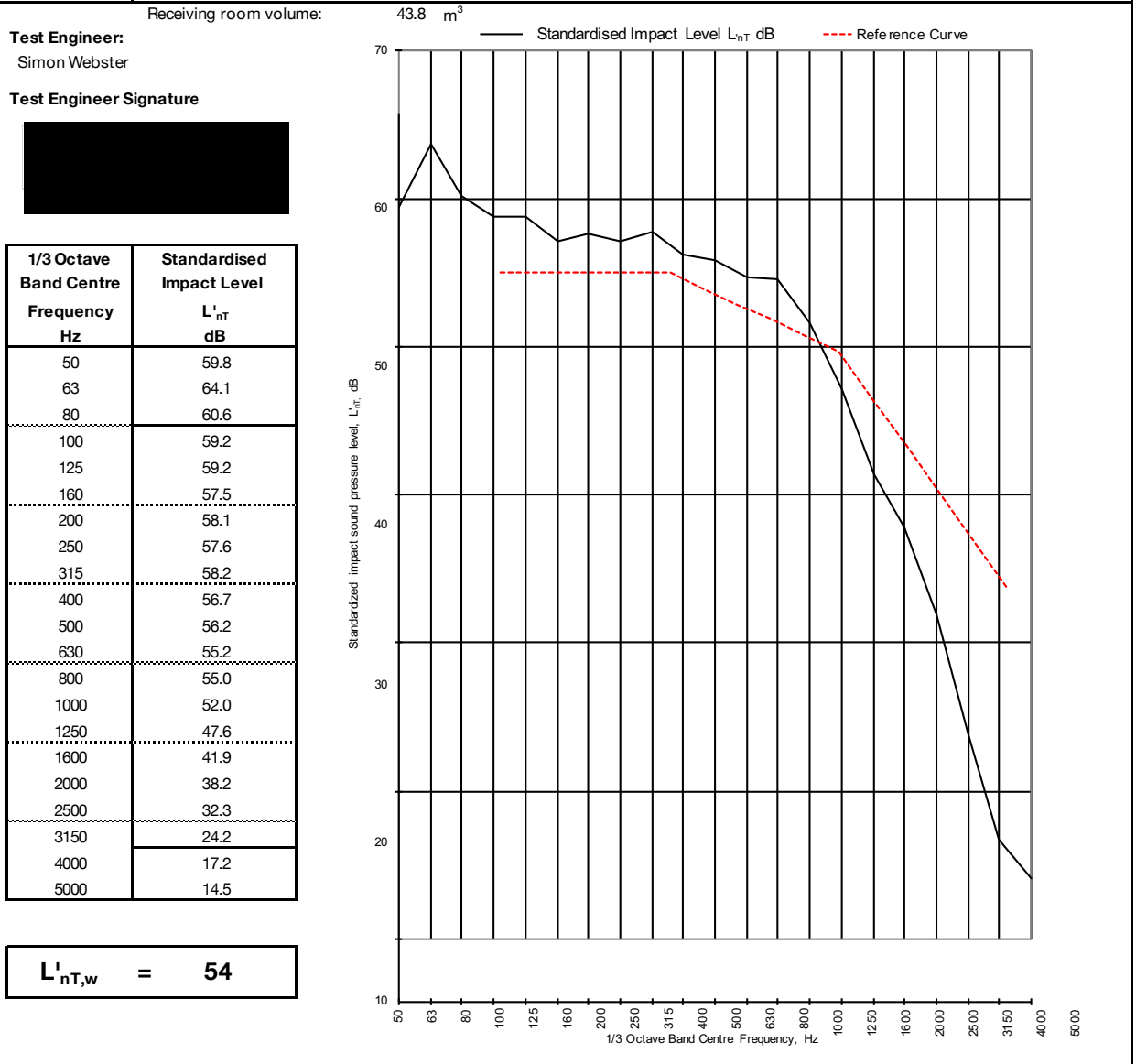
Evaluation based on field measurement results obtained by an engineering method

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

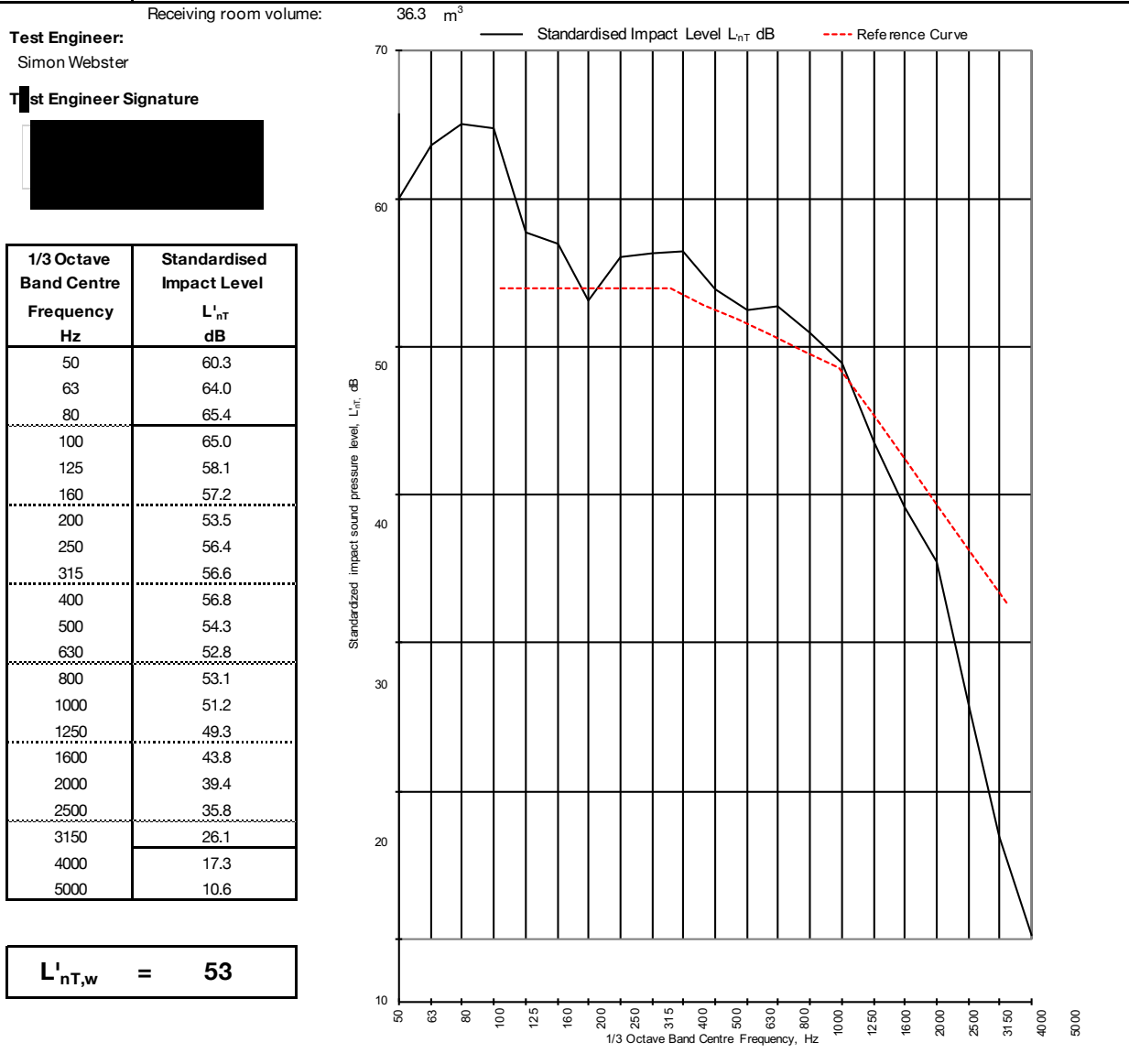
Project No:	R2165	ANC Test No:	11880004	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.06 Living Room / Kitchen to Apartment G.09 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2	L'_{nT,w} (C₁) = 54 (-1) dB
Evaluation based on field measurement results obtained by an engineering method	

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

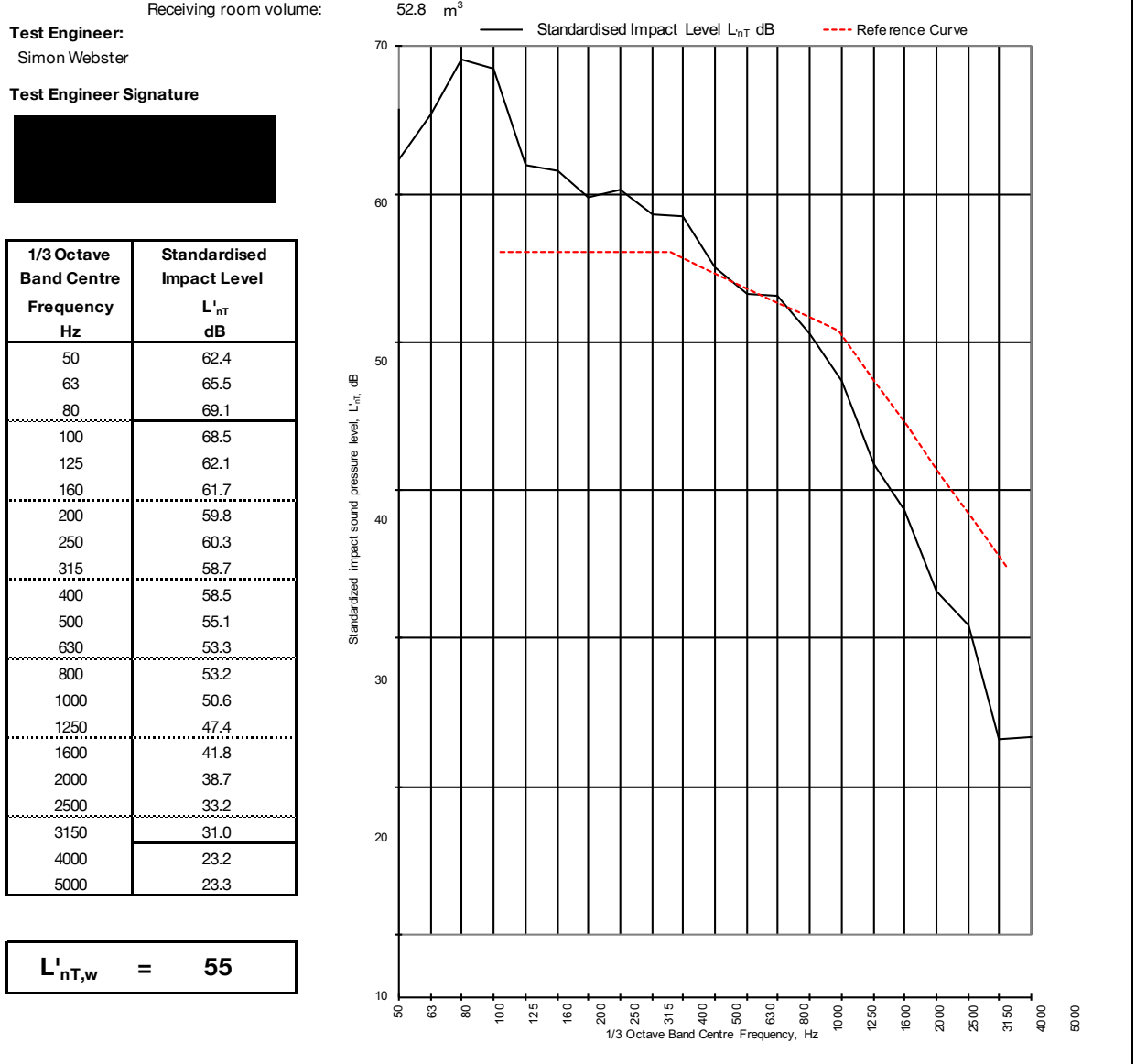
Project No:	R2165	ANC Test No:	11880005	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.08 Bedroom to Apartment 1.10 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2	L'_{nT,w} (C₁) = 53 (0) dB
Evaluation based on field measurement results obtained by an engineering method	

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

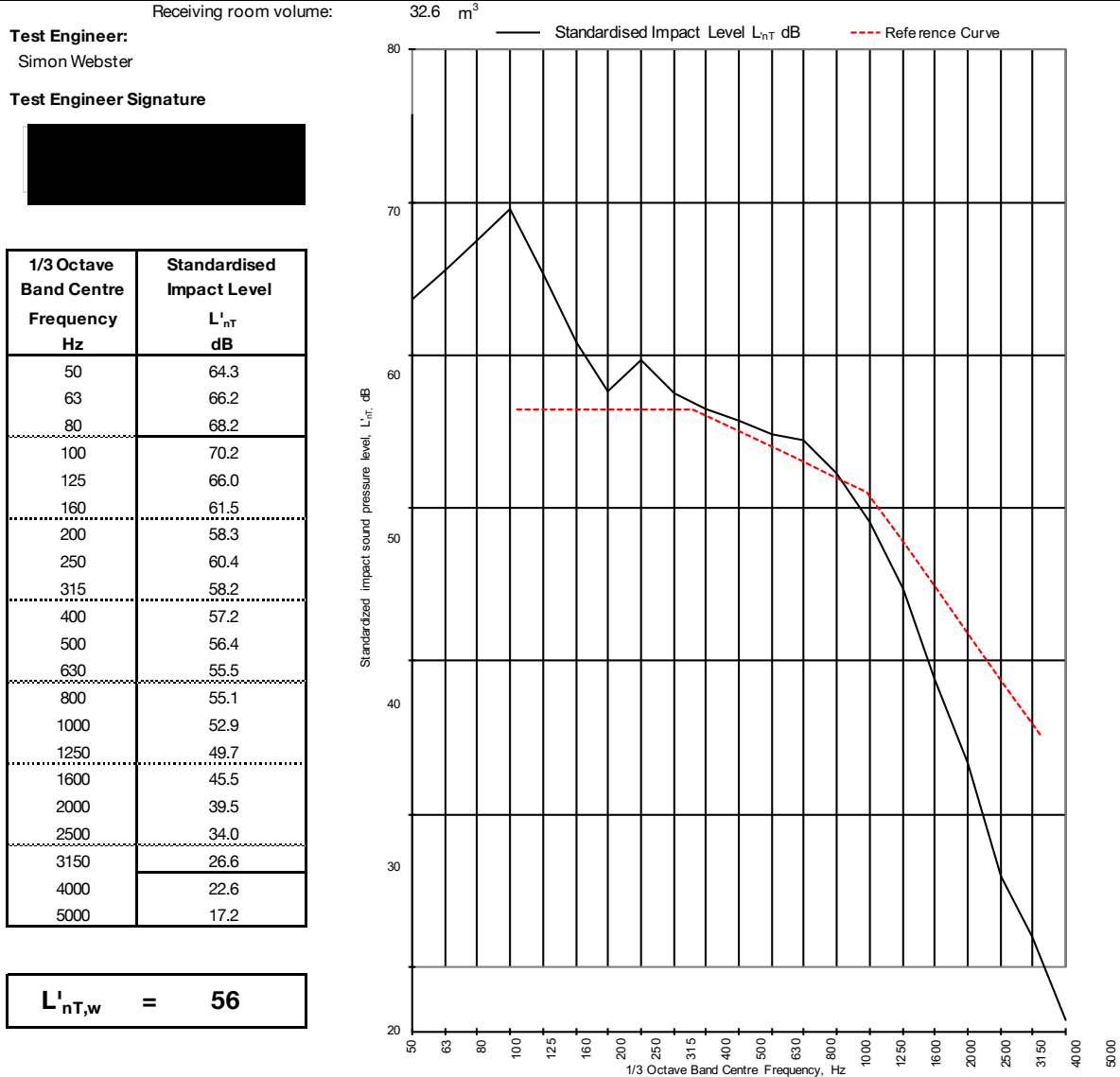
Project No:	R2165	ANC Test No:	11880006	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.08 Living Room / Kitchen to Apartment 1.10 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2	L'_{nT,w} (C₁) = 55 (2) dB
Evaluation based on field measurement results obtained by an engineering method	

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

Project No:	R2165	ANC Test No:	11880007	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.10 Bedroom to Apartment 1.12 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2

L'_{nT,w} (C₁) = 56 (2) dB

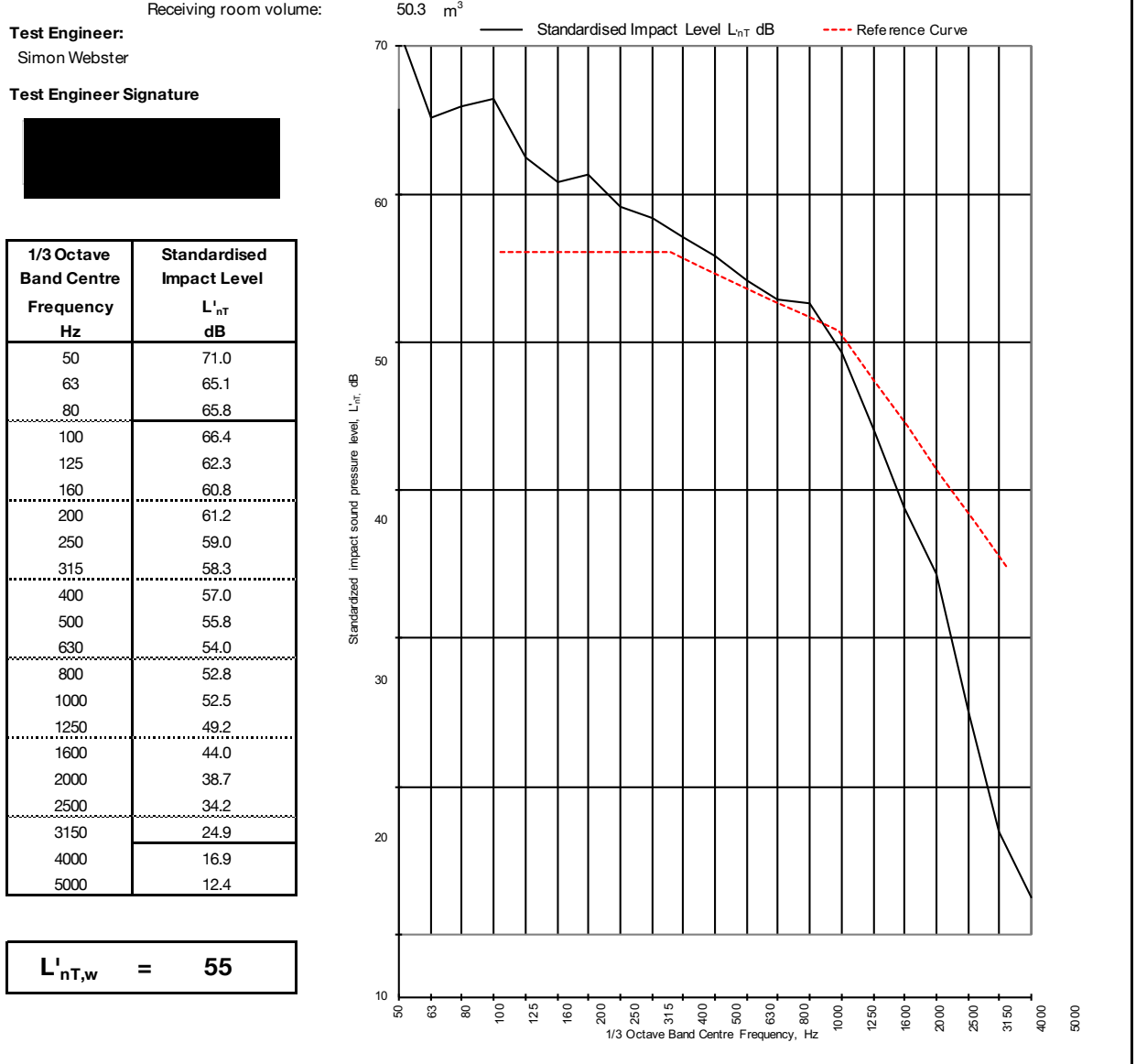
Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880008	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.10 Living Room / Kitchen to Apartment 1.12 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	Timber Floor				



Rating according to BS EN ISO 717-2	L'_{nT,w} (C₁) = 55 (1) dB
Evaluation based on field measurement results obtained by an engineering method	

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

Project No:	R2165	ANC Test No:	11880009	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.02 Bedroom to Apartment G.05 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

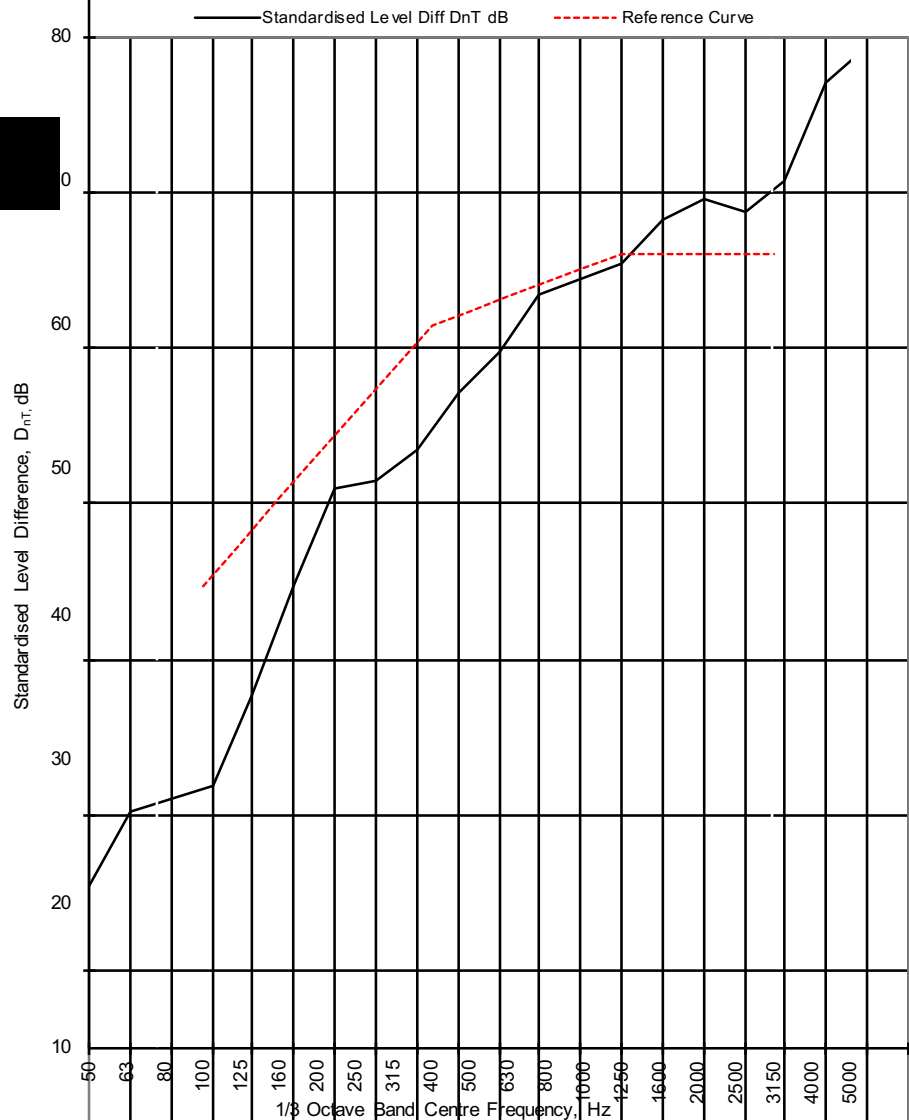
Source room volume: 29.8 m³
 Receiving room volume: 29.8 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	25.5
63	30.3
80	31.1
100	32.0
125	37.7
160	44.8
200	51.1
250	51.5
315	53.6
400	57.3
500	59.8
630	63.5
800	64.5
1000	65.5
1250	68.3
1600	69.7
2000	68.9
2500	70.8
3150	77.1
4000	≥ 79.5
5000	≥ 81.2



D_{nT,w} = 61 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = 61 (-4; -11) dB

C₅₀₋₃₁₅₀ = -5 dB

C₅₀₋₅₀₀₀ = -4 dB

C₁₀₀₋₅₀₀₀ = -3 dB

C_{tr,50-3150} = -16 dB

C_{tr,50-5000} = -16 dB

C_{tr,100-5000} = -11 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880010	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.02 Living Room / Kitchen to Apartment G.05 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

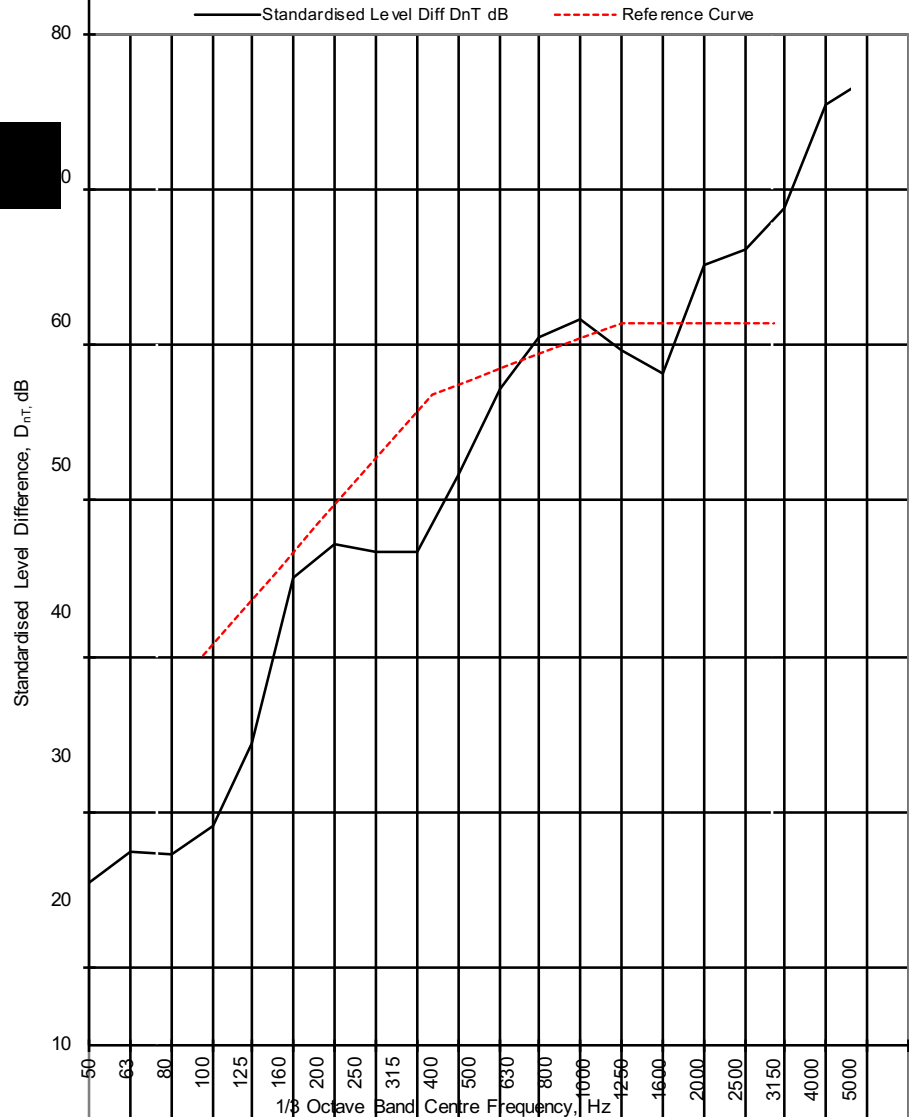
Source room volume: 57.0 m³
 Receiving room volume: 57.0 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	≥ 25.3
63	27.3
80	27.1
100	28.9
125	34.2
160	44.9
200	47.0
250	46.5
315	46.6
400	51.5
500	57.1
630	60.4
800	61.5
1000	59.6
1250	58.1
1600	65.0
2000	66.1
2500	68.7
3150	75.4
4000	≥ 77.0
5000	≥ 78.1



D_{nT,w} = 56 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = 56 (-2; -9) dB

C₅₀₋₃₁₅₀ = -4 dB

C₅₀₋₅₀₀₀ = -3 dB

C₁₀₀₋₅₀₀₀ = -1 dB

C_{tr,50-3150} = -13 dB

C_{tr,50-5000} = -13 dB

C_{tr,100-5000} = -9 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880011	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.06 Bedroom to Apartment G.09 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

Source room volume: 31.8 m³
 Receiving room volume: 31.8 m³

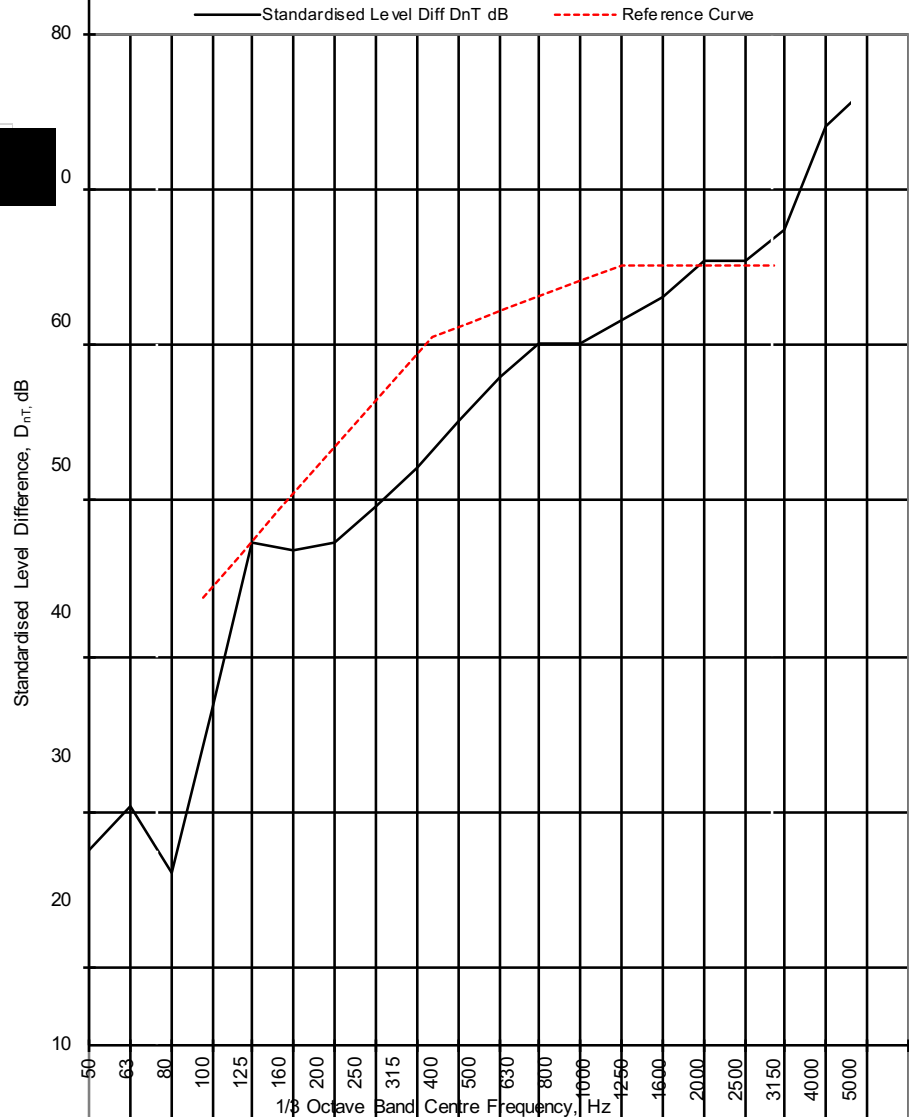
----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature



1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	27.4
63	30.3
80	26.0
100	36.7
125	47.3
160	46.8
200	47.2
250	49.6
315	52.0
400	55.1
500	57.9
630	60.1
800	60.1
1000	61.6
1250	63.0
1600	65.3
2000	65.4
2500	67.4
3150	74.0
4000	≥ 76.5
5000	≥ 79.0



D_{nT,w} = 60 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **60 (-1; -6) dB**

C₅₀₋₃₁₅₀ = **-5 dB**

C₅₀₋₅₀₀₀ = **-4 dB**

C₁₀₀₋₅₀₀₀ = **0 dB**

C_{tr,50-3150} = **-15 dB**

C_{tr,50-5000} = **-15 dB**

C_{tr,100-5000} = **-6 dB**

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880012	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.06 Living Room / Kitchen to Apartment G.09 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

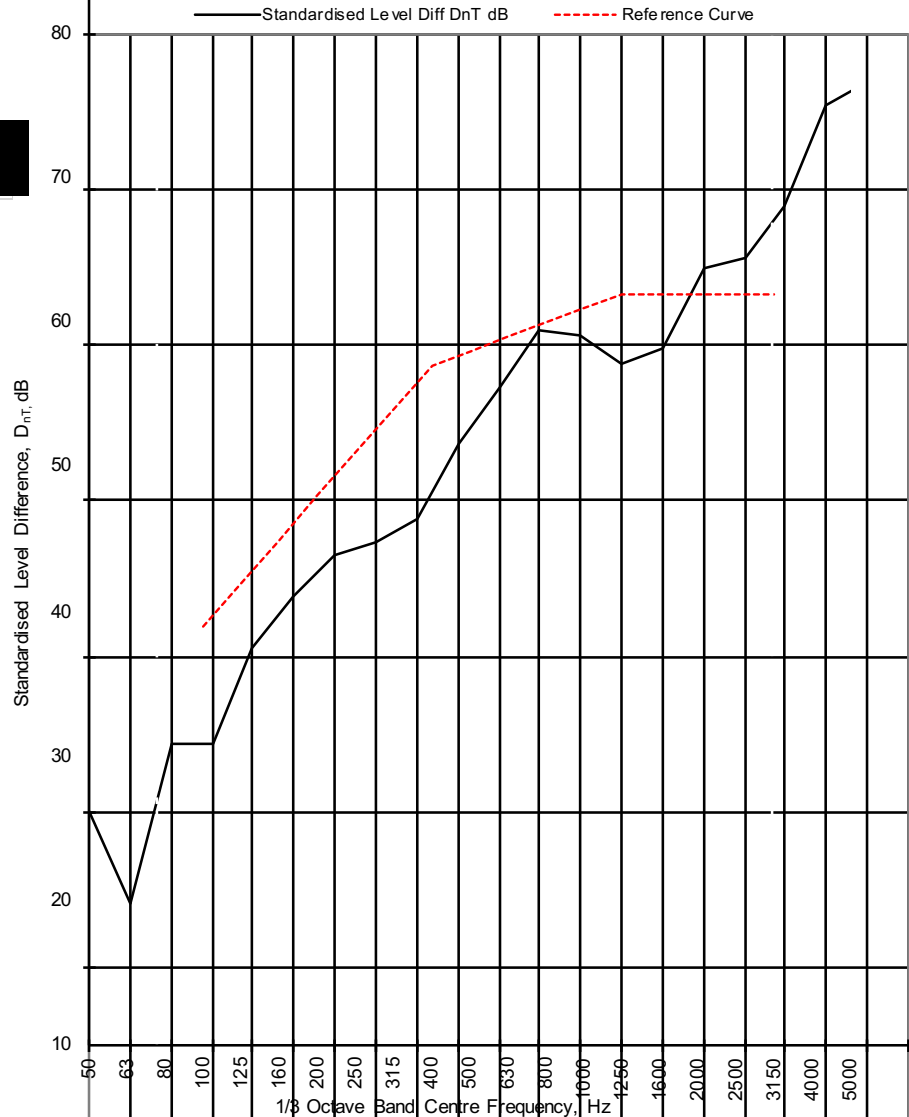
Source room volume: 43.8 m³
 Receiving room volume: 43.8 m³

Frequency range according to curve of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	29.9
63	24.0
80	34.2
100	34.2
125	40.5
160	43.8
200	46.4
250	47.3
315	48.8
400	53.5
500	57.3
630	60.8
800	60.6
1000	58.7
1250	59.7
1600	64.9
2000	65.6
2500	68.9
3150	75.3
4000	≥ 76.8
5000	≥ 78.7



D_{nT,w} = 58 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = 58 (-2; -7) dB

C₅₀₋₃₁₅₀ = -4 dB

C₅₀₋₅₀₀₀ = -3 dB

C₁₀₀₋₅₀₀₀ = -1 dB

C_{tr,50-3150} = -13 dB

C_{tr,50-5000} = -13 dB

C_{tr,100-5000} = -7 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880013	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.08 Bedroom to Apartment 1.10 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

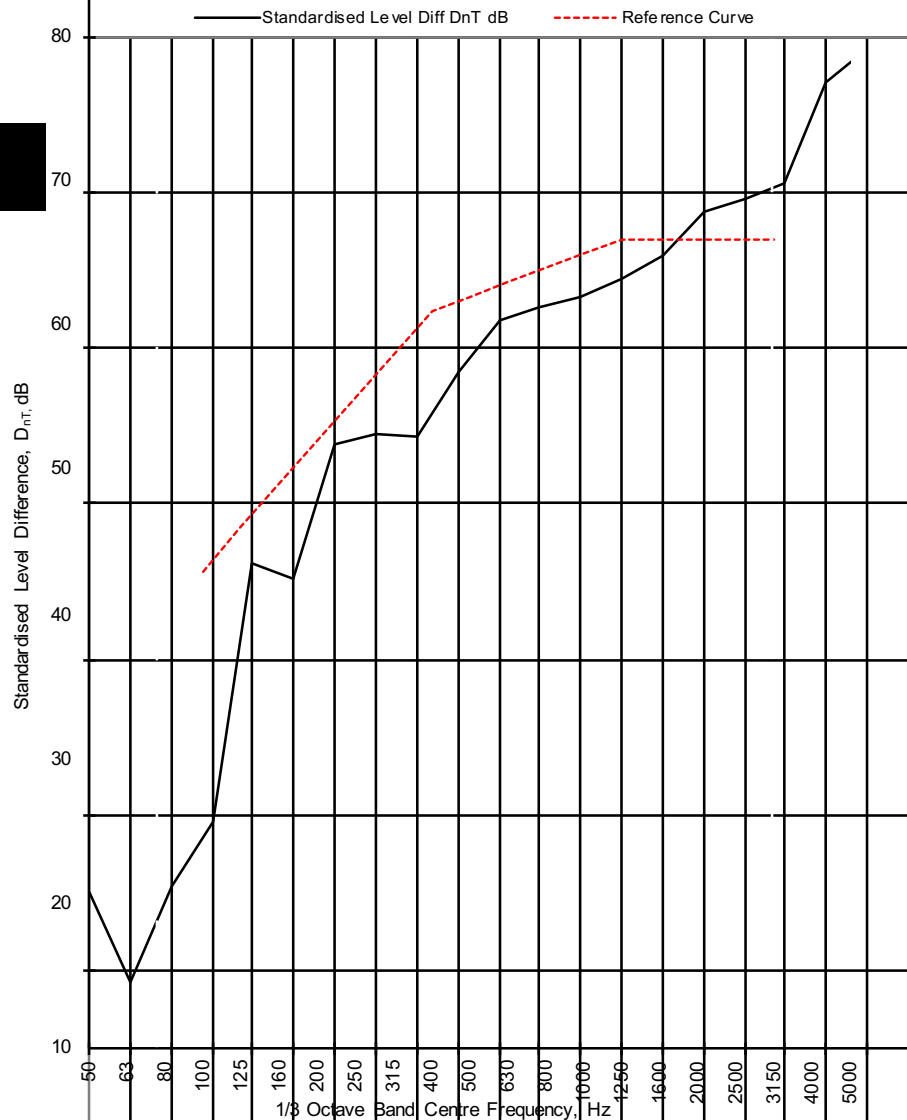
Source room volume: 36.3 m³
 Receiving room volume: 36.3 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	25.1
63	19.3
80	25.4
100	29.7
125	46.2
160	45.2
200	53.9
250	54.5
315	54.4
400	58.5
500	61.8
630	62.7
800	63.4
1000	64.5
1250	66.1
1600	68.8
2000	69.7
2500	70.7
3150	77.1
4000	≥ 79.4
5000	≥ 81.0



D_{nT,w} = 62 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = 62 (-5; -13) dB

C₅₀₋₃₁₅₀ = -10 dB

C₅₀₋₅₀₀₀ = -9 dB

C₁₀₀₋₅₀₀₀ = -4 dB

C_{tr,50-3150} = -22 dB

C_{tr,50-5000} = -22 dB

C_{tr,100-5000} = -13 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880014	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.08 Living Room / Kitchen to Apartment 1.10 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

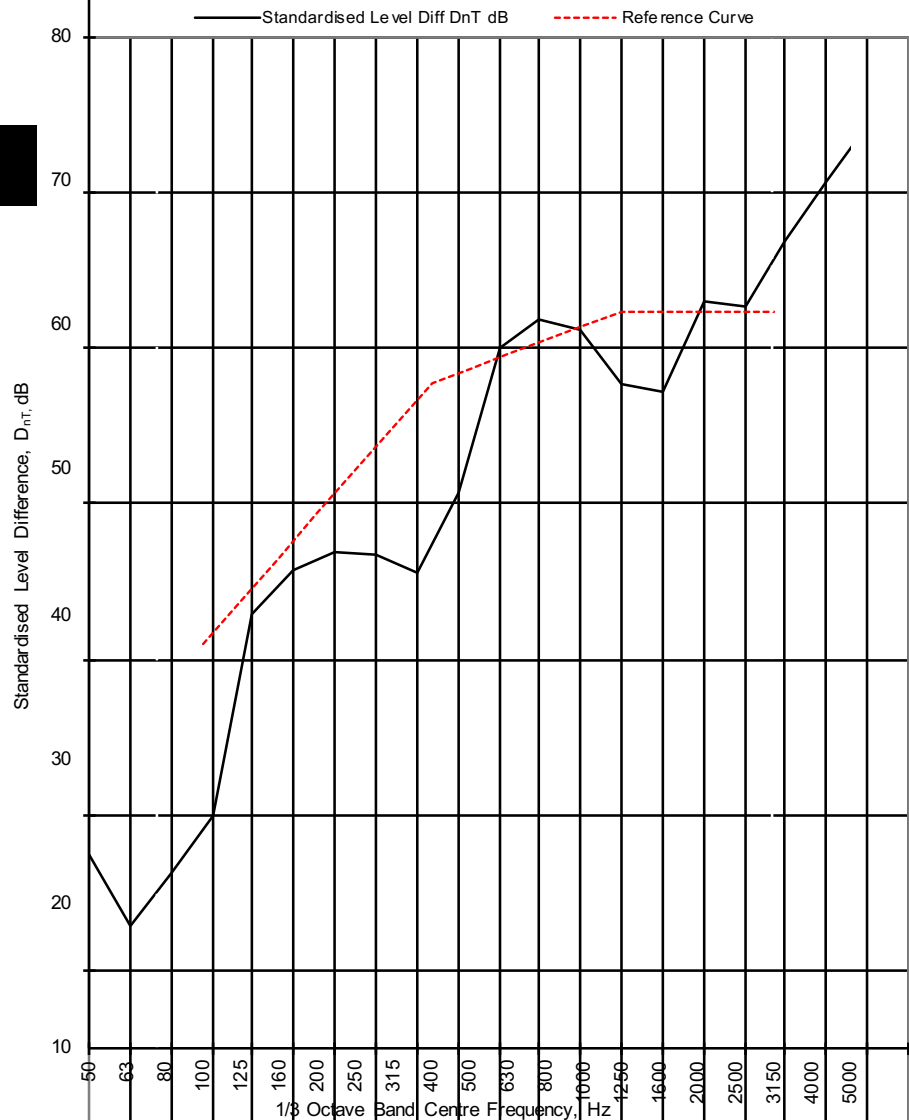
Source room volume: 52.8 m³
 Receiving room volume: 52.8 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	27.3
63	22.7
80	26.1
100	29.8
125	42.8
160	45.6
200	46.8
250	46.6
315	45.4
400	50.6
500	59.9
630	61.7
800	61.1
1000	57.5
1250	57.0
1600	62.8
2000	62.5
2500	66.7
3150	70.5
4000	74.1
5000	≥ 77.9



D_{nT,w} = 57 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C; C_{tr}) = 57 (-3; -9) dB

C₅₀₋₃₁₅₀ = -5 dB

C₅₀₋₅₀₀₀ = -4 dB

C₁₀₀₋₅₀₀₀ = -2 dB

C_{tr,50-3150} = -15 dB

C_{tr,50-5000} = -15 dB

C_{tr,100-5000} = -9 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880015	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.10 Bedroom to Apartment 1.12 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

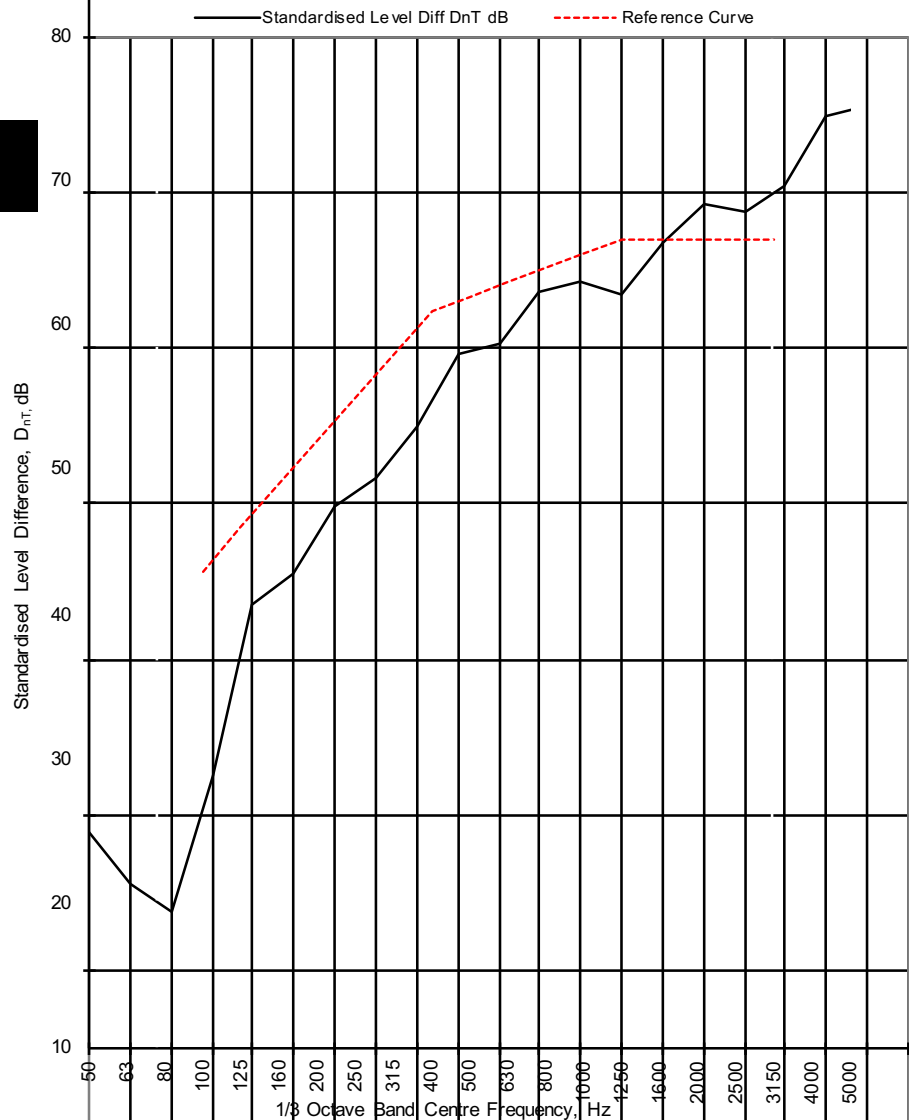
Source room volume: 32.6 m³
 Receiving room volume: 32.6 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	28.7
63	25.3
80	23.5
100	32.3
125	43.2
160	45.3
200	49.6
250	51.4
315	54.8
400	59.3
500	60.1
630	≥ 63.4
800	≥ 64.0
1000	≥ 63.2
1250	≥ 66.5
1600	≥ 69.0
2000	≥ 68.5
2500	≥ 70.2
3150	≥ 74.7
4000	≥ 75.3
5000	≥ 76.4



D_{nT,w} = 62 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **62 (-4; -11) dB**

C₅₀₋₃₁₅₀ = **-9 dB**

C_{tr,50-3150} = **-20 dB**

C₅₀₋₅₀₀₀ = **-8 dB**

C_{tr,50-5000} = **-20 dB**

C₁₀₀₋₅₀₀₀ = **-3 dB**

C_{tr,100-5000} = **-11 dB**

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880016	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.10 Living Room / Kitchen to Apartment 1.12 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Floor
Construction:	4				

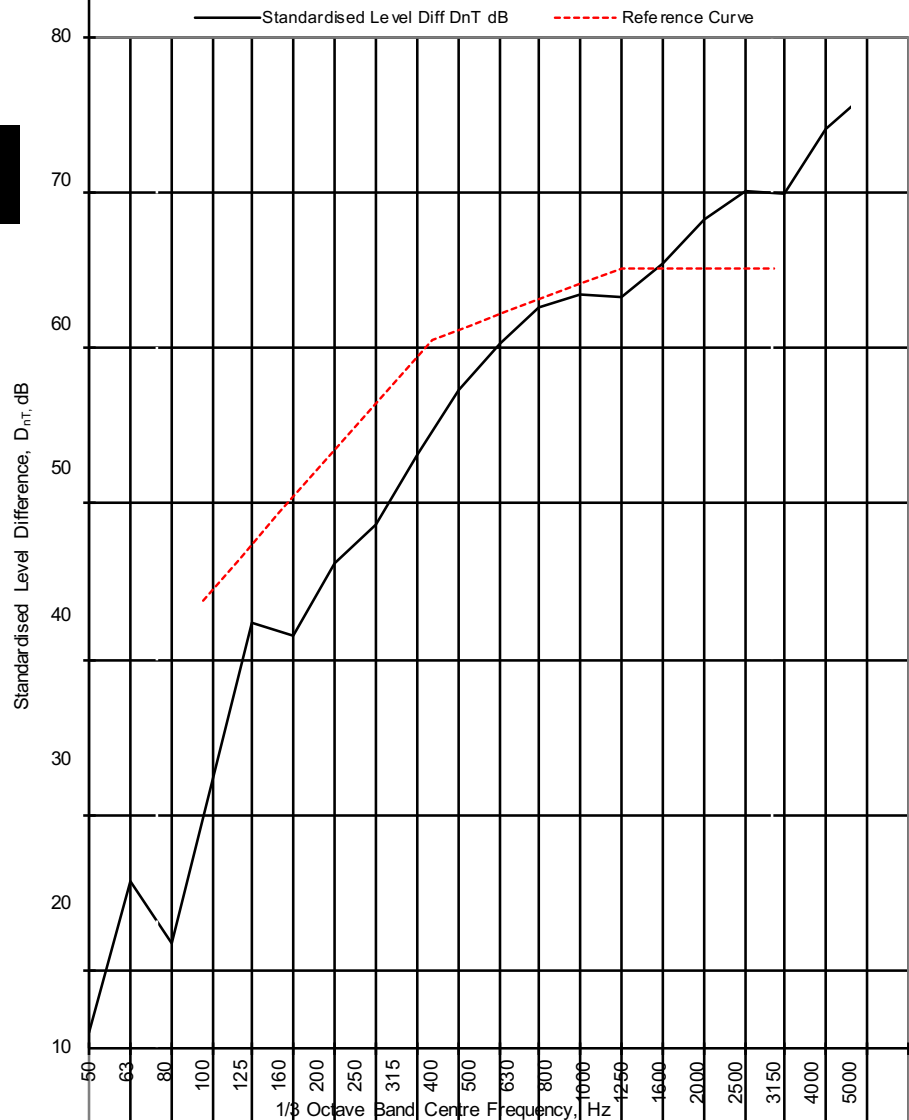
Source room volume: 50.3 m³ Frequency range according to curve
Receiving room volume: 50.3 m³ of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	15.9
63	25.6
80	21.7
100	32.2
125	42.2
160	41.4
200	46.0
250	48.6
315	53.0
400	57.2
500	60.2
630	62.6
800	63.3
1000	63.2
1250	65.4
1600	68.2
2000	70.0
2500	69.8
3150	74.0
4000	≥ 76.4
5000	≥ 78.7

D_{nT,w} = 60 dB



Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = 60 (-3; -10) dB

C₅₀₋₃₁₅₀ = -9 dB

C₅₀₋₅₀₀₀ = -8 dB

C₁₀₀₋₅₀₀₀ = -2 dB

C_{tr,50-3150} = -22 dB

C_{tr,50-5000} = -22 dB

C_{tr,100-5000} = -10 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880017	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.02 Bedroom to Apartment 1.01 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

Source room volume: 29.8 m³
 Receiving room volume: 26.5 m³

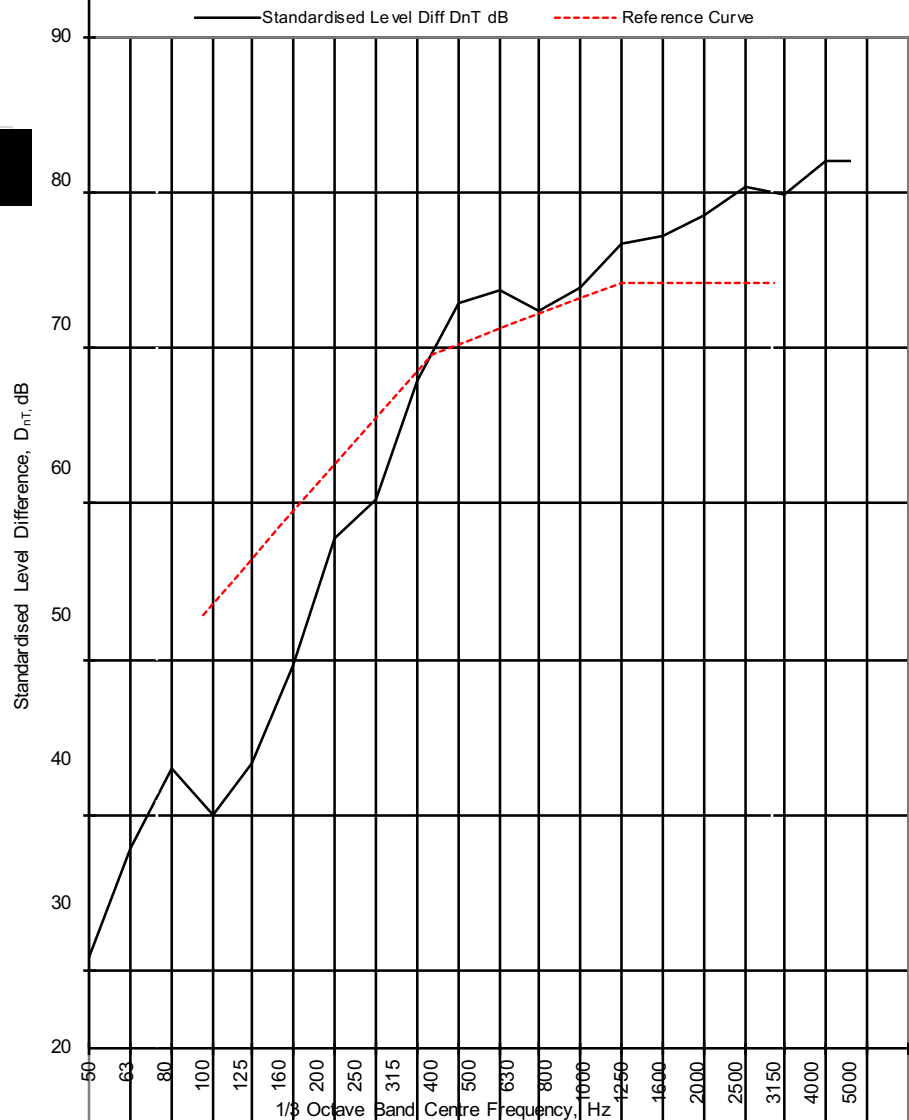
----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature



1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	≥ 30.3
63	37.3
80	42.5
100	39.5
125	42.7
160	49.1
200	57.3
250	59.7
315	67.4
400	72.3
500	73.2
630	71.8
800	73.4
1000	76.2
1250	76.7
1600	78.0
2000	79.9
2500	79.3
3150	≥ 81.6
4000	≥ 81.6
5000	≥ 82.5



D_{nT,w} = 69 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C; C_{tr}) = **69 (-5; -12) dB**

C₅₀₋₃₁₅₀ =

-6 dB

C₅₀₋₅₀₀₀ =

-5 dB

C₁₀₀₋₅₀₀₀ =

-4 dB

C_{tr,50-3150} =

-17 dB

C_{tr,50-5000} =

-17 dB

C_{tr,100-5000} =

-12 dB

Evaluation based on field measurement results obtained by an engineering method

RED ACOUSTICS LIMITED Unit 8 Cable Court, Pittman Way, Preston, PR2 9YW
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Standardised level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

Project No:	R2165	ANC Test No:	11880018	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.02 Living Room / Kitdhen to Apartment 1.03 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

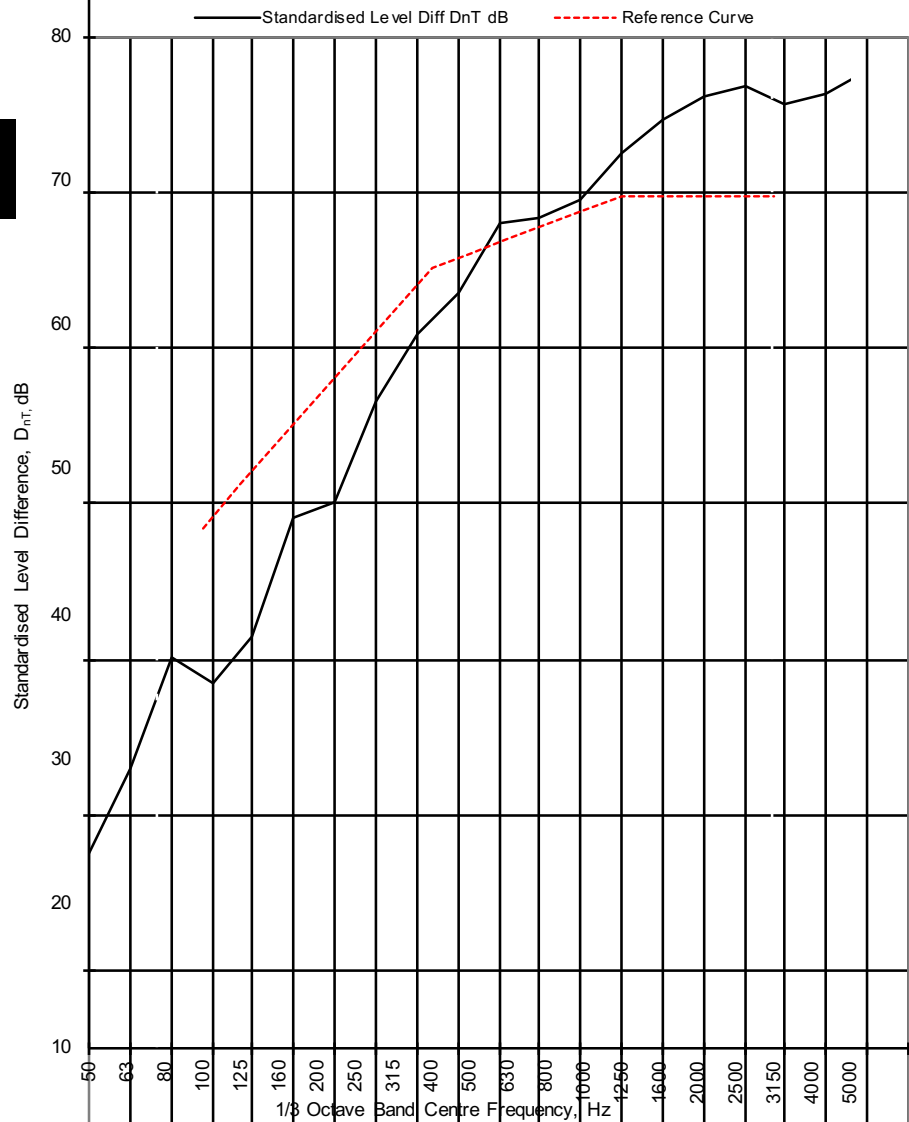
Source room volume: 57.0 m³
 Receiving room volume: 32.0 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	27.5
63	33.0
80	40.1
100	38.4
125	41.4
160	49.0
200	50.0
250	56.5
315	60.9
400	63.5
500	68.0
630	68.4
800	69.5
1000	72.5
1250	≥ 74.6
1600	≥ 76.2
2000	≥ 76.8
2500	≥ 75.6
3150	≥ 76.4
4000	≥ 77.8
5000	≥ 79.6



D_{nT,w} = 65 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = 65 (-3; -9) dB

C₅₀₋₃₁₅₀ = -5 dB

C₅₀₋₅₀₀₀ = -4 dB

C₁₀₀₋₅₀₀₀ = -2 dB

C_{tr,50-3150} = -16 dB

C_{tr,50-5000} = -16 dB

C_{tr,100-5000} = -9 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880019	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.06 Bedroom to Apartment 1.07 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

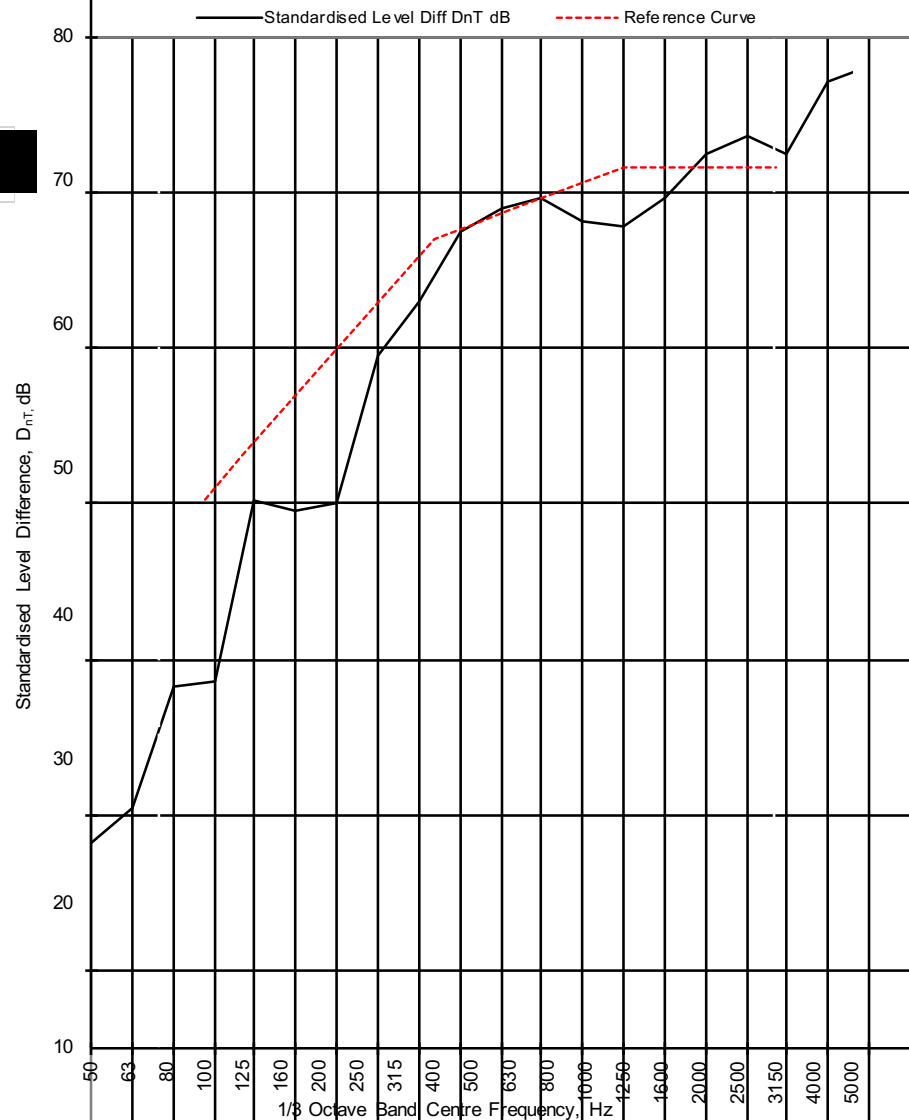
Source room volume: 31.8 m³ Frequency range according to curve
Receiving room volume: 28.1 m³ of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature



1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	≥ 28.2
63	30.4
80	38.3
100	38.6
125	50.2
160	49.5
200	50.0
250	59.6
315	63.0
400	≥ 67.6
500	≥ 69.0
630	≥ 69.7
800	≥ 68.2
1000	≥ 67.8
1250	≥ 69.7
1600	≥ 72.5
2000	≥ 73.7
2500	≥ 72.5
3150	≥ 77.2
4000	≥ 78.2
5000	≥ 80.3



D_{nT,w} ≥ 67 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **67 (-3; -10) dB**

C₅₀₋₃₁₅₀ = **-7 dB**

C_{tr,50-3150} = **-18 dB**

C₅₀₋₅₀₀₀ = **-6 dB**

C_{tr,50-5000} = **-18 dB**

C₁₀₀₋₅₀₀₀ = **-2 dB**

C_{tr,100-5000} = **-10 dB**

Evaluation based on field measurement results obtained by an engineering method

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

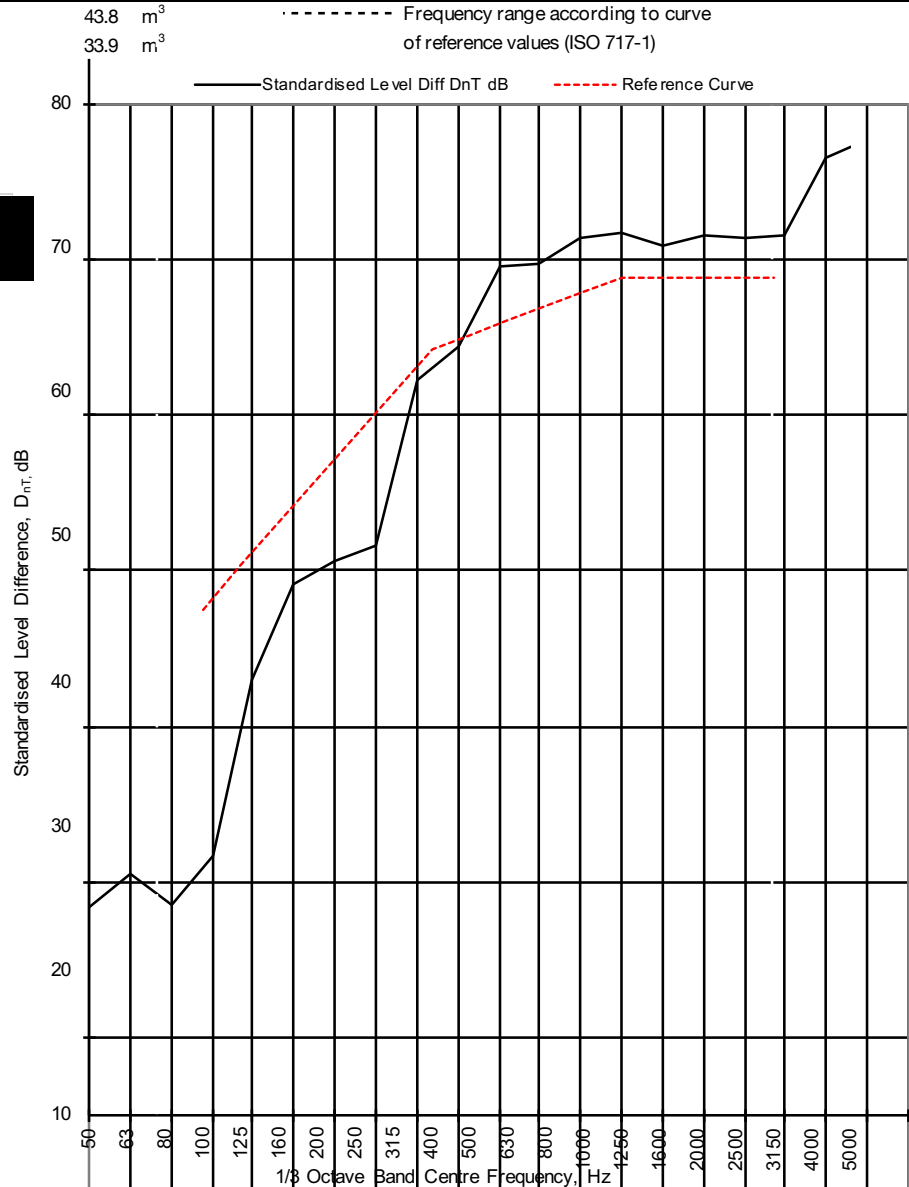
Project No:	R2165	ANC Test No:	11880020	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 1.06 Living Room / Kitchen to Apartment 1.05 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

Source room volume: 43.8 m³
Receiving room volume: 33.9 m³

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	28.3
63	30.5
80	28.4
100	31.6
125	43.0
160	49.1
200	≥ 50.6
250	51.6
315	≥ 62.2
400	≥ 64.4
500	≥ 69.5
630	≥ 69.7
800	≥ 71.3
1000	≥ 71.7
1250	≥ 70.9
1600	≥ 71.6
2000	≥ 71.4
2500	≥ 71.5
3150	≥ 76.5
4000	≥ 77.6
5000	≥ 79.2



D_{nT,w} ≥ 64 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **64 (-5; -13) dB**

C₅₀₋₃₁₅₀ = **-8 dB**

C_{tr,50-3150} = **-19 dB**

C₅₀₋₅₀₀₀ = **-7 dB**

C_{tr,50-5000} = **-19 dB**

C₁₀₀₋₅₀₀₀ = **-4 dB**

C_{tr,100-5000} = **-13 dB**

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880021	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.08 Bedroom to Apartment 2.07 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

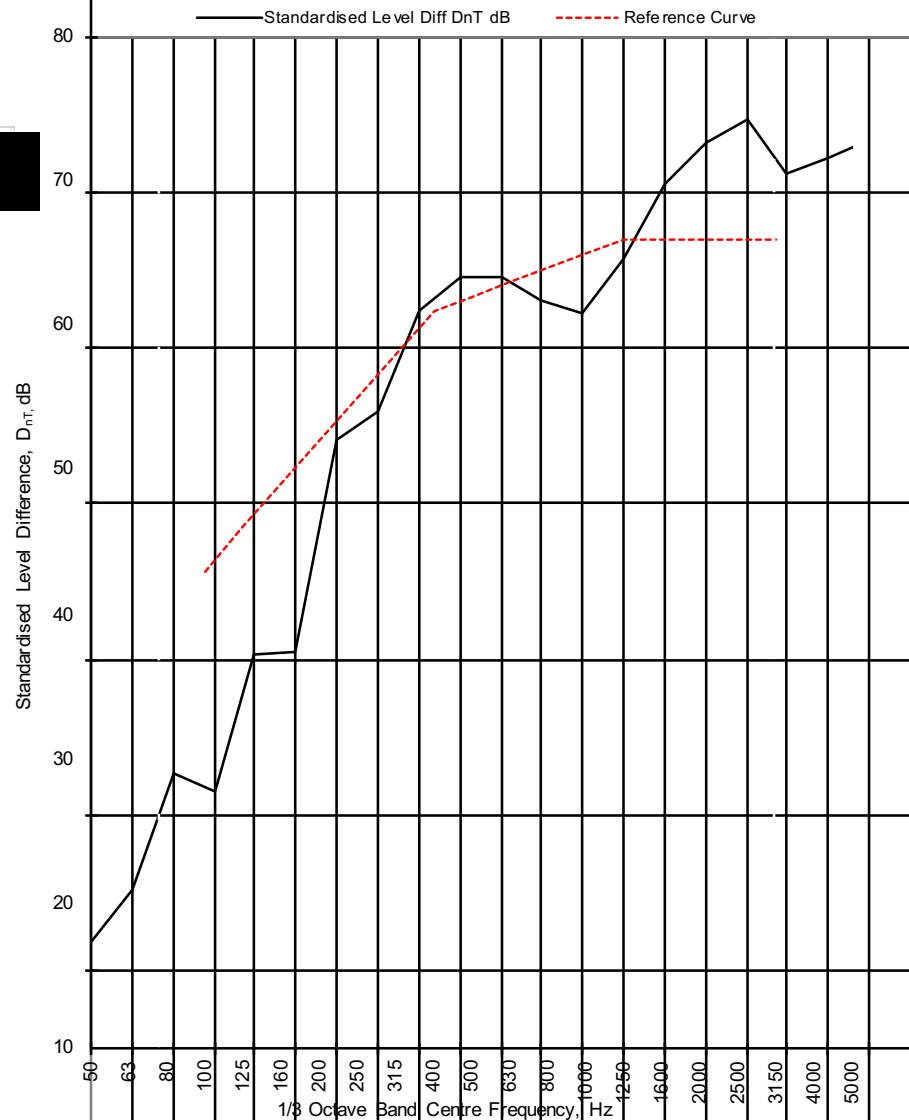
Source room volume: 36.3 m³
 Receiving room volume: 26.4 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	21.6
63	24.9
80	32.4
100	31.2
125	40.1
160	40.3
200	53.9
250	55.8
315	62.2
400	64.4
500	64.3
630	62.9
800	62.1
1000	65.6
1250	70.4
1600	≥ 73.0
2000	74.5
2500	71.1
3150	72.0
4000	≥ 73.2
5000	≥ 77.0



D_{nT,w} = 62 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **62 (-5; -12) dB**

C₅₀₋₃₁₅₀ = **-8 dB**

C_{tr,50-3150} = **-19 dB**

C₅₀₋₅₀₀₀ = **-7 dB**

C_{tr,50-5000} = **-19 dB**

C₁₀₀₋₅₀₀₀ = **-4 dB**

C_{tr,100-5000} = **-12 dB**

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880022	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.08 Living Room / Kitchen to Apartment 2.09 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

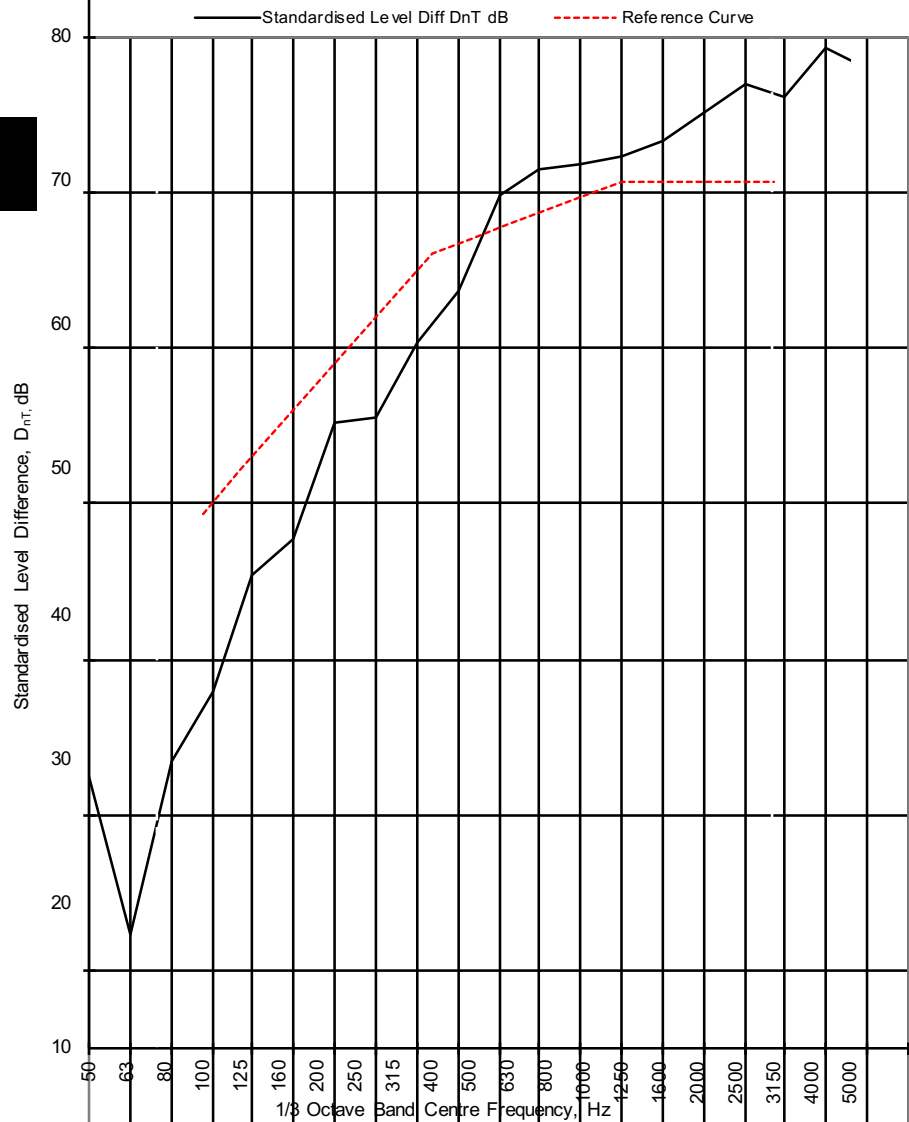
Source room volume: 52.8 m³
 Receiving room volume: 42.4 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	32.4
63	22.3
80	33.4
100	38.0
125	45.4
160	47.8
200	55.3
250	55.6
315	60.4
400	63.7
500	69.9
630	≥ 71.5
800	≥ 71.8
1000	≥ 72.4
1250	≥ 73.3
1600	≥ 75.2
2000	≥ 77.0
2500	≥ 76.2
3150	≥ 79.4
4000	≥ 78.0
5000	≥ 80.1



D_{nT,w} = 66 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C; C_{tr}) = 66 (-3; -10) dB

C₅₀₋₃₁₅₀ = -10 dB

C₅₀₋₅₀₀₀ = -9 dB

C₁₀₀₋₅₀₀₀ = -2 dB

C_{tr,50-3150} = -22 dB

C_{tr,50-5000} = -22 dB

C_{tr,100-5000} = -10 dB

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880023	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.10 Bedroom to Apartment 2.09 Bedroom
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

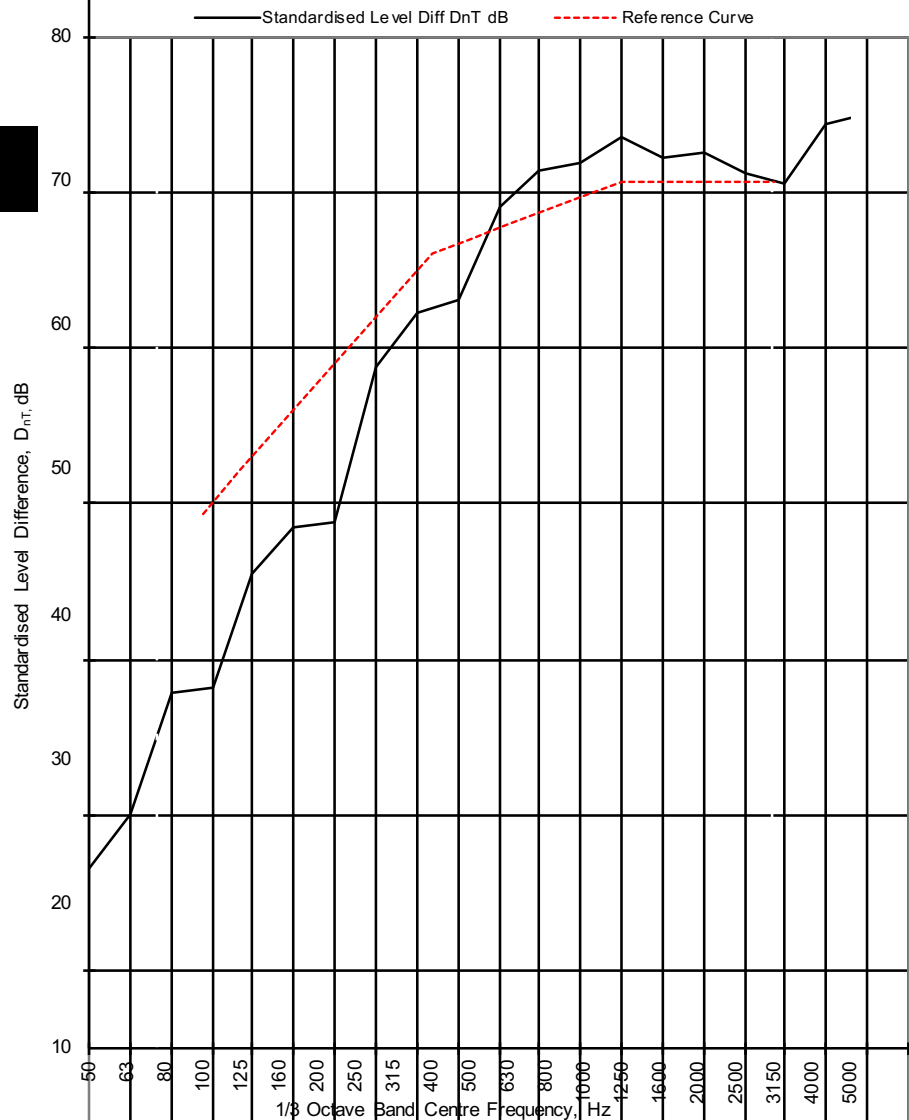
Source room volume: 32.6 m³
 Receiving room volume: 26.4 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	26.3
63	29.8
80	37.6
100	37.9
125	45.3
160	48.2
200	48.5
250	58.6
315	≥ 62.0
400	62.9
500	≥ 68.8
630	≥ 71.2
800	≥ 71.7
1000	≥ 73.3
1250	≥ 72.0
1600	≥ 72.3
2000	≥ 71.1
2500	≥ 70.4
3150	≥ 74.2
4000	≥ 74.9
5000	≥ 76.6



D_{nT,w} = 66 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **66 (-4; -10) dB**

C₅₀₋₃₁₅₀ = **-7 dB**

C_{tr,50-3150} = **-18 dB**

C₅₀₋₅₀₀₀ = **-6 dB**

C_{tr,50-5000} = **-18 dB**

C₁₀₀₋₅₀₀₀ = **-3 dB**

C_{tr,100-5000} = **-10 dB**

Evaluation based on field measurement results obtained by an engineering method

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

Project No:	R2165	ANC Test No:	11880024	Date of Test:	21-Aug-24
Client:	Challenger Building Services Limited, BL6 7AF			Transmission Path:	Apartment 2.10 Living Room / Kitchen to Apartment 2.11 Living Room / Kitchen
Location:	Corner of Greenwood Road / Gladeside Road, Manchester, M22 9RA			Building Element:	Party Wall
Construction:	4				

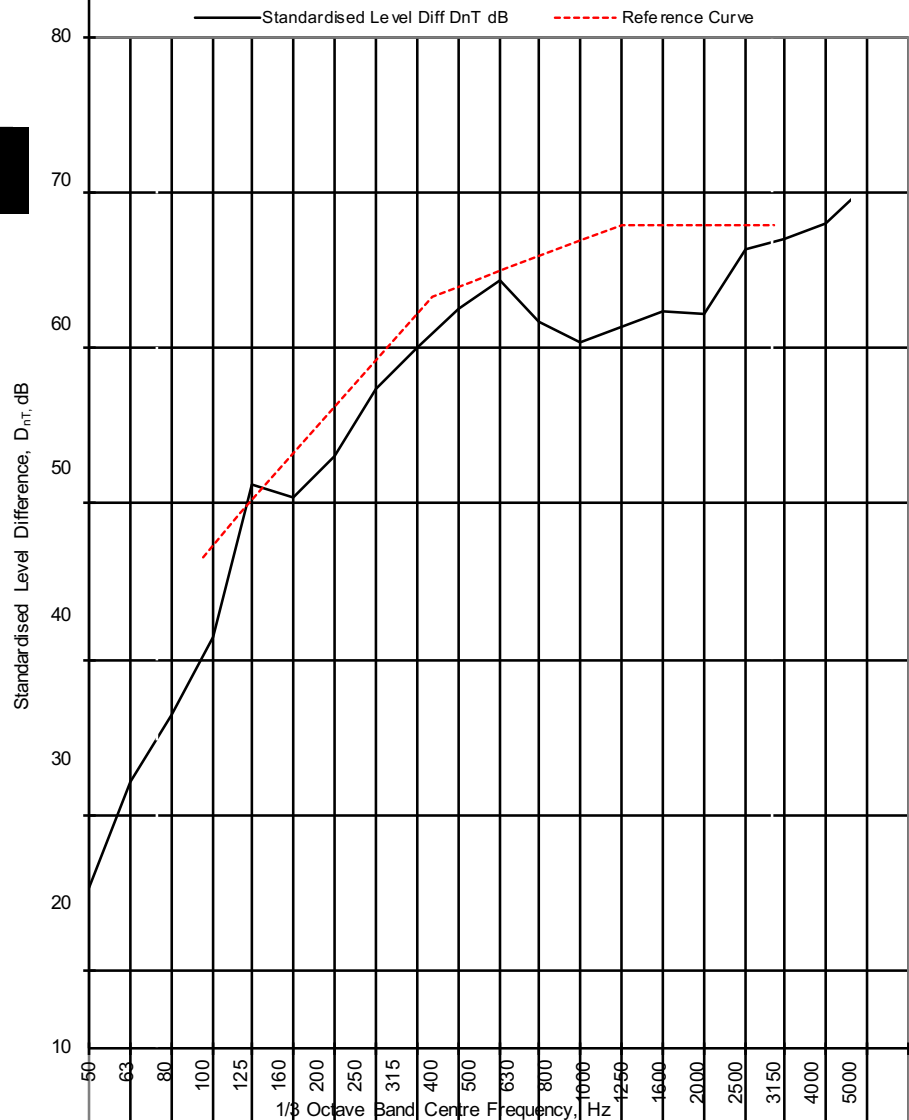
Source room volume: 50.3 m³
 Receiving room volume: 50.3 m³

----- Frequency range according to curve
 of reference values (ISO 717-1)

Test Engineer Simon Webster

Signature

1/3 Octave Band Centre Frequency Hz	Standardised Level Diff D _{nT} dB
50	24.8
63	31.6
80	36.0
100	41.0
125	50.7
160	49.9
200	≥ 52.6
250	≥ 56.9
315	≥ 59.5
400	62.0
500	63.8
630	61.2
800	59.8
1000	60.8
1250	61.9
1600	61.7
2000	65.9
2500	≥ 66.6
3150	≥ 67.5
4000	≥ 70.0
5000	≥ 72.9



D_{nT,w} ≥ 63 dB

Rating according to BS EN ISO 717-1

D_{nT,w} (C;C_{tr}) = **63 (-2; -6) dB**

C₅₀₋₃₁₅₀ = **-4 dB**

C₅₀₋₅₀₀₀ = **-3 dB**

C₁₀₀₋₅₀₀₀ = **-1 dB**

C_{tr,50-3150} = **-16 dB**

C_{tr,50-5000} = **-16 dB**

C_{tr,100-5000} = **-6 dB**

Evaluation based on field measurement results obtained by an engineering method

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