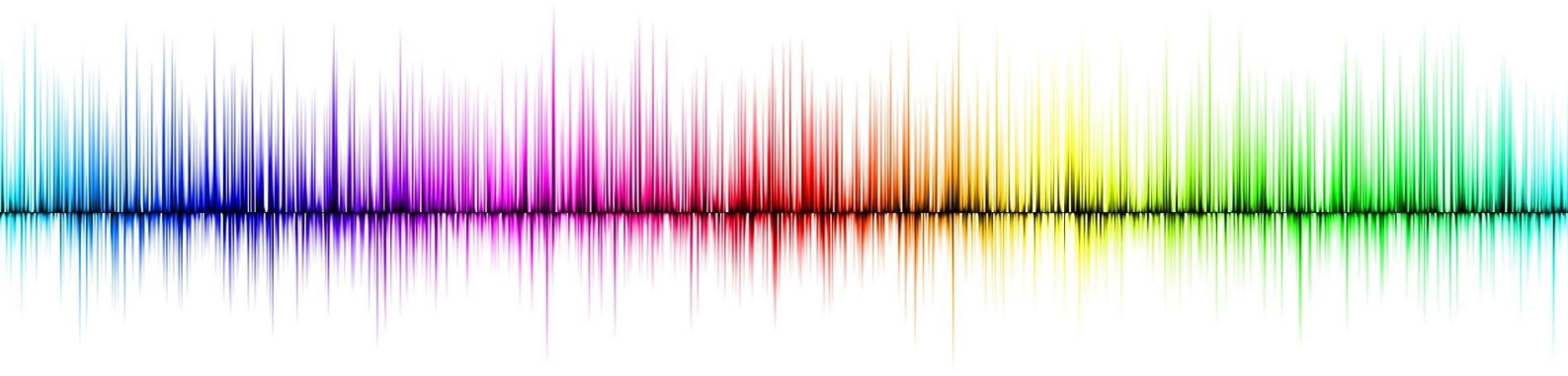


Sound Insulation Test Report



**9 Wern Road,
Ystalyfera, Swansea,
SA9 2LX**

Client <i>Ean & Sue White</i> <i>7 Wern Road</i> <i>Ystalyfera</i> <i>Swansea</i> <i>SA9 2LX</i>	Testing Organisation <i>Jigsaw Acoustics</i> <i>111 Gloucester Rd</i> <i>Bishopston</i> <i>Bristol</i> <i>BS7 8AT</i>
Tested Site <i>9 Wern Road</i> <i>Ystalyfera</i> <i>Swansea</i> <i>SA9 2LX</i>	
Test Engineer <i>Andrew Regan</i>	Test Date <i>7th May 2024</i>
Report Prepared By <i>Andrew Regan</i>	Issue Number <i>1st Issue</i>

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1.0 Introduction

Jigsaw Acoustics were appointed by Ean & Sue White to conduct Preliminary Sound Insulation Testing at 9 Wern Road, Ystalyfera in Swansea.

This report presents the outline basis of the site tests and provides the test results in relation to the airborne sound insulation of the walls and the airborne and impact sound insulation of the floors.

The sound transmission tests were carried out on the 7th May 2024 by Andrew Regan. Airborne and Impact sound tests were carried out on a Wall and two Floors between flats and commercial units at the property.

This report presents the methodology and findings of the airborne and impact sound transmission tests. Section 4.0 towards the end of the report provides the test results.

2.0 Test Methodology

The following section outlines the building test information for the Approved Document 'E' Building Regulations testing.

2.1 Equipment Calibration

Equipment Description / Manufacturer / Type	Serial Number	Date of calibration	Calibration Certification Number
Acoustic Analyzer, NTi, XL2-TA	A2A-13841-E0	19/07/2023	06228/4, 06228/5
Microphone Capsule, NTi, MC230A	A16699	29/06/2023	06228/3
Microphone Pre-Amp, NTi, MA220	8144	29/06/2023	06228/3
Calibrator, Delta OHM, HD2020	19014406	29/06/2023	06228/2
Tapping Machine, Delta OHM, HD2040	19024581	29/06/2023	06228/1
Pink Noise Generator, NTi, Minrator MR Pro	G2P-RAJSG-G1	-	-
Loudspeaker and Amplification System, Yamaha DBR10	BFZK01014	-	-

Table 2.1: Details of Equipment and Calibration Information

2.2 Airborne Sound Transmission Test (wall and floor)

Measurements of standardised level difference (D_{nT}) were carried out in accordance with BS EN ISO 140-4:1998. The ratings of airborne sound insulation were calculated in accordance with British Standard EN ISO 717-1:1997.

Level measurements in the Source & Receive Room (L1 & L2)

A steady spectrum of Pink Noise was generated in the source room using an active loudspeaker which was placed in the corner of the room at least 0.5m away from any reflective surface.

The level of sound was measured in both the source room and receive room, sampling as much of the room as possible. The sound level meter was always kept 0.7m away from any reflective surface as to not artificially increase or decrease noise levels into the microphone.

The measurements were taken at one third octave band intervals from 100 to 3150 Hertz using an average time of 30 seconds for each of the 2 sound source positions. The measurements in each room were arithmetically averaged.

Background Measurements in Receive Room (B2)

Where noise levels were measured in the receive room, the background noise level was also measured with the speaker turned off. This is to ensure the background noise level did not influence the result. The background noise level is measured over a time period that accurately reflects the background noise measurement at the

time of the test. This is normally between 6 & 30 seconds and can vary between the first and second background measurements.

Any receive room noise measurements that are within 6dB of the background measurements are corrected by logarithmically averaging the difference to correct the receive room measurement. The correction is applied up to 10dB, where a maximum correction of 1.6dB is applied. Any background noise level greater than 10dB over the L2 measurement will appear to reduce the sound insulation at that frequency.

Reverberation Time Measurements (T2, or T20)

A minimum of 6 reverberation time measurements were also taken in the receive room using a minimum of 3 microphone positions at each of 2 loud speaker positions in accordance with BS EN ISO 354:2003 (also complies with BS EN 20354) to accurately define the level of influence the diffuse field has on the microphone, ensuring that an increase in soft or hard surfaces does not impact the overall test result.

2.3 Impact Sound Transmission Test

Measurements of standardised level difference (L_{nT}) were carried out in accordance with BS EN ISO 140-7:1998. The ratings of impact sound insulation were calculated in accordance with British Standard EN ISO 717-2:1997.

Level measurements in the Receive Room (L2)

Level measurements were acquired in the receive room using a tapping machine, which has a set of 5 steel hammers to produce impact noise on the separating floor.

The tapping machine is always orientated at 45 degrees to the main floor axis.

The noise level was measured in the receive room at 2 microphone positions at one third octave band intervals from 100 to 3150 Hertz using an average time of at least 6 seconds for each of 4 tapping machine positions, creating 8 individual measurement readings.

Measurements were always taken at least 0.7m away from any reflective or absorptive surfaces.

Background Measurements in Receive Room (B2)

Where noise levels were measured in the receive room, the background noise level was also measured with the tapping machine turned off. This is to ensure the background noise level did not influence the result. The background noise level is measured over a time period that accurately reflects the background noise measurement at the time of the test. This is normally between 6 & 30 seconds and can vary between the first and second background measurements.

Any receive room noise measurements that are within 6dB of the background measurements are corrected by logarithmically averaging the difference to correct the receive room measurement. The correction is applied up to 10dB, where a maximum correction of 1.6dB is applied. Any background noise level greater than 10dB over the L2 measurement will appear to reduce the sound insulation at that frequency.

Reverberation Time Measurements (T2, or T20)

A minimum of 6 reverberation time measurements were also taken in the receive room using a minimum of 3 microphone positions at each of 2 loud speaker positions in accordance with BS EN ISO 354:2003 (also complies with BS EN 20354) to accurately define the level of influence the diffuse field has on the microphone, ensuring that an increase in soft or hard surfaces does not impact the overall test result. These measurements are often the same readings as the airborne test when measured in the same group of tests.

2.4 Deviations

If any deviation from the testing method was necessary, details of the deviation are indicated on each individual test certificate (Appendix A-1 and A-2 on pages 8 - 12). Some deviations, such as background noise levels, are often an unavoidable part of testing as testing must take place on a live building site.

2.5 Construction of Separating Element

Floor Description: Timber joists and floorboards, original ceiling

Wall Description: Masonry Brick, plasterboard either side

3.0 Building Regulation Criteria

The sound insulation requirements of the Building Regulations 2000 are addressed in Approved Document 'E' - Resistance to the passage of sound. This section of the Regulations was released in 2003 and subsequently amended in 2004, 2010, 2013, and 2015. It addressed sound insulation requirements for "dwelling-houses and flats" and for "rooms for residential purposes".

Requirement E1 specifically relates to the protection against sound from other parts of the building and adjoining buildings, it states: "Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings."

To satisfy Requirement E1 it is necessary to construct separating walls and floors to the standard displayed in either 'Table 0.1a' where the properties are 'Dwelling-houses and flats' or 'Table 0.1b where the Rooms are for 'Residential Purposes'. In this report the criteria in Table 0.1a are relevant, details of which are displayed below:

Table 0.1a: Dwelling-houses and flats - performance standards 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)
Dwelling-houses and flats formed by material change of use		
Walls	43	-
Floors and stairs	43	64

Table 3.1: Table 0.1a Taken from Approved Document 'E' (2003)

4.0 Test Results

4.1 Wall Tests

The minimum required level of $D_{nT,w} + C_{tr}$ is 43dB.

The results are as follows:

Source Room		Receive Room		Measured $D_{nT,w} + C_{tr}$ (dB)	Criteria (dB)	Test Report No.
Details	Volume (m ³)	Details	Volume (m ³)			
Living, Commercial Gr Floor	35	Studio Flat Hallway, Gr Floor	25	35	43	JA0509/1

Table 4.1: Wall Test Results

Graphical representations of the above results are displayed in Appendix A-1 on page 8 of this report.

4.2 Floor Tests

The minimum required level of $D_{nT,w} + C_{tr}$ is 43dB. The maximum required level of $L'_{nT,w}$ is 64dB.

The results are as follows:

Source Room		Receive Room		Measured		Criteria (dB)	Test Report No.
Details	Volume (m ³)	Details	Volume (m ³)	$D_{nT,w} + C_{tr}$ (dB)	$L'_{nT,w}$ (dB)		
Bedroom, 1st Floor Flat	25	Chinese Takeaway - Kitchen	40	33		43	JA0509/2
Bedroom, 1st Floor Flat	25	Chinese Takeaway - Kitchen	40		69	64	JA0509/3
Living, 1st Floor Flat	25	Chinese Takeaway – Waiting area	40	28		43	JA0509/4
Living, 1st Floor Flat	25	Chinese Takeaway – Waiting area	40		76	64	JA0509/5

Table 4.2: Floor Test Results

Graphical representations of the above results are displayed in Appendix A-1 and A-2 on page 9-12 of this report.

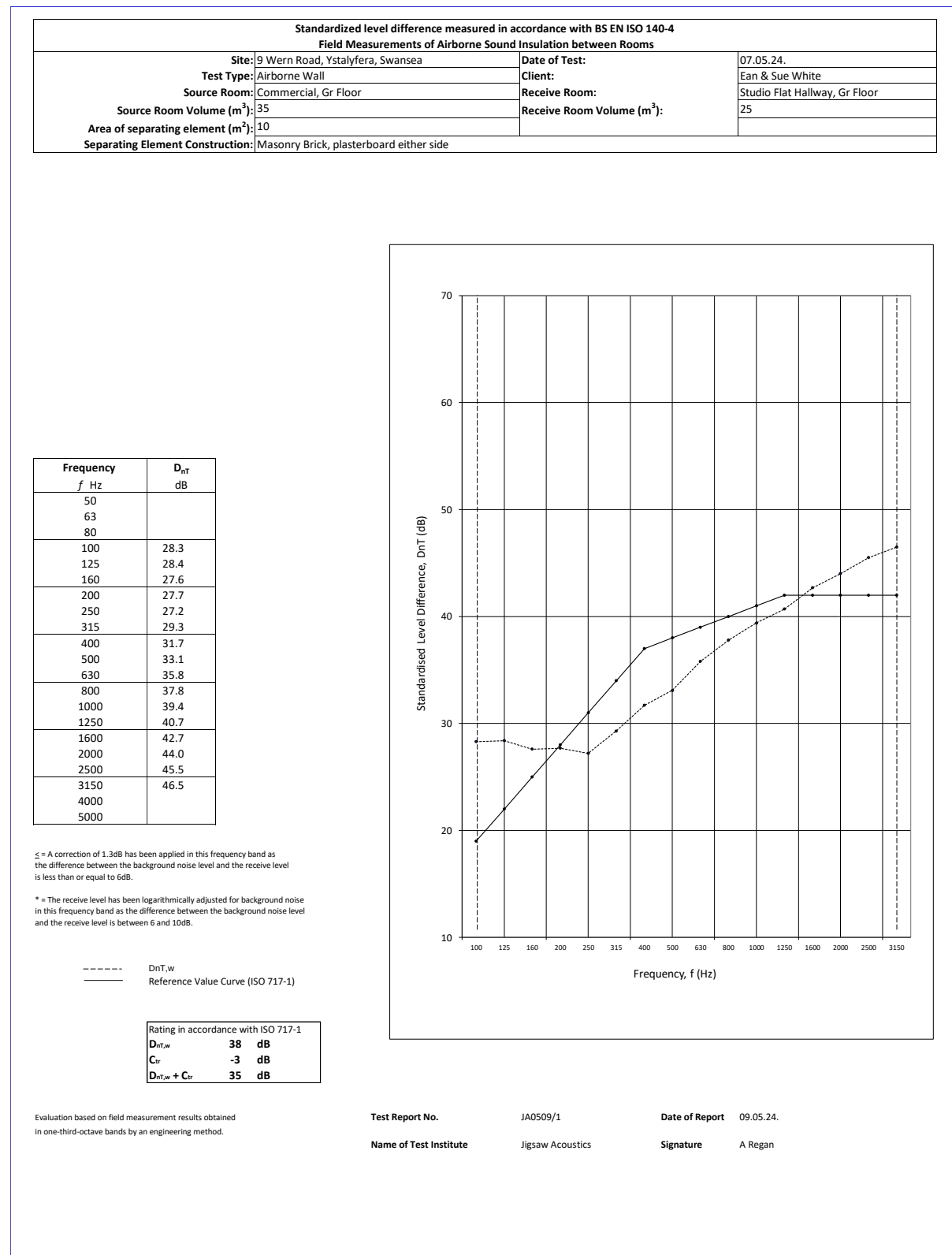
5.0 Limitations

Test results for each test are authorised by the Testing Engineer. The report has been prepared for, and is for the sole use of, the 'Client' indicated at the beginning of this report. Results from the testing are from in-situ tests conducted on specific wall and floor constructions as stated in Section 2.5, and at the location stated in Section 1.0 of this report. The results are inclusive of flanking and workmanship, and therefore, cannot be transferred to any other construction or building type. Floor coverings and furnishings were present during testing due to the timing of the tests, which will have affected the results. Therefore, performance ratings should be used as a guide only.

The report may not be presented other than in full electronic or printed form, without the written permission of the Testing Organisation. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above. The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to any third party and no liability is accepted outside the scope of this report.

6.0 Appendices

6.1 Appendix A-1: Airborne Test Results



Standardized level difference measured in accordance with BS EN ISO 140-4 Field Measurements of Airborne Sound Insulation between Rooms			
Site:	9 Wern Road, Ystalyfera, Swansea	Date of Test:	07.05.24.
Test Type:	Airborne Floor	Client:	Ean & Sue White
Source Room:	Bedroom, 1st Floor Flat	Receive Room:	Chinese Takeaway - Kitchen
Source Room Volume (m ³):	25	Receive Room Volume (m ³):	40
Area of separating element (m ²):	10		
Separating Element Construction:	Timber joists and floorboards, original ceiling		

Frequency <i>f</i> Hz	<i>D</i> _{nt} dB
50	
63	
80	
100	22.7
125	19.1
160	22.3
200	22.8
250	27.1
315	30.6
400	36.1
500	39.3
630	42.9
800	44.6
1000	45.6
1250	47.0
1600	48.8
2000	48.8
2500	48.6
3150	49.9
4000	
5000	

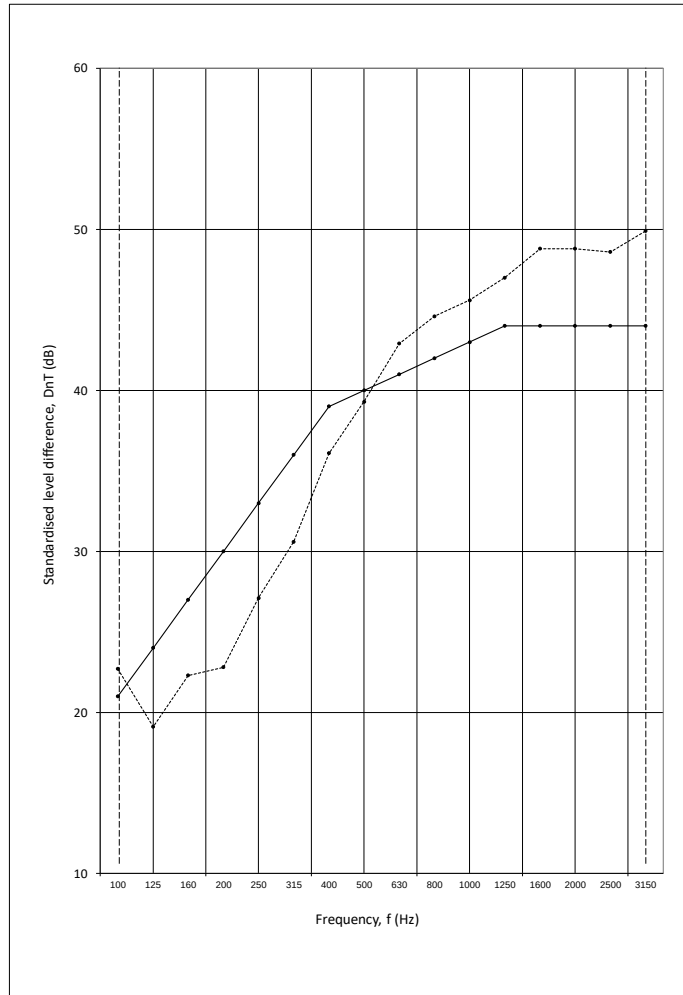
≤ = A correction of 1.3dB has been applied in this frequency band as the difference between the background noise level and the receive level is less than or equal to 6dB.

* = The receive level has been logarithmically adjusted for background noise in this frequency band as the difference between the background noise level and the receive level is between 6 and 10dB.

----- *D*_{nt,w}
 ————— Reference Value Curve (ISO 717-1)

Rating in accordance with ISO 717-1			
<i>D</i> _{nt,w}	40	dB	
<i>C</i> _{tr}	-7	dB	
<i>D</i> _{nt,w} + <i>C</i> _{tr}	33	dB	

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method.



Test Report No. JA0509/2

Date of Report 09.05.24.

Name of Test Institute Jigsaw Acoustics

Signature A Regan

Standardized level difference measured in accordance with BS EN ISO 140-4 Field Measurements of Airborne Sound Insulation between Rooms			
Site:	9 Wern Road, Ystalyfera, Swansea	Date of Test:	07.05.24.
Test Type:	Airborne Floor	Client:	Ean & Sue White
Source Room:	Living Room, 1st Floor Flat	Receive Room:	Chinese Takeaway - Waiting area
Source Room Volume (m ³):	25	Receive Room Volume (m ³):	40
Area of separating element (m ²):	10		
Separating Element Construction:	Timber joists and floorboards, original ceiling		

Frequency <i>f</i> Hz	<i>D_{nT}</i> dB
50	
63	
80	
100	19.5
125	15.2
160	17.3
200	19.4
250	23.5
315	24.4
400	28.4
500	31.4
630	33.9
800	35.8
1000	36.6
1250	37.8
1600	38.9
2000	39.1
2500	37.9
3150	40.1
4000	
5000	

<= A correction of 1.3dB has been applied in this frequency band as the difference between the background noise level and the receive level is less than or equal to 6dB.

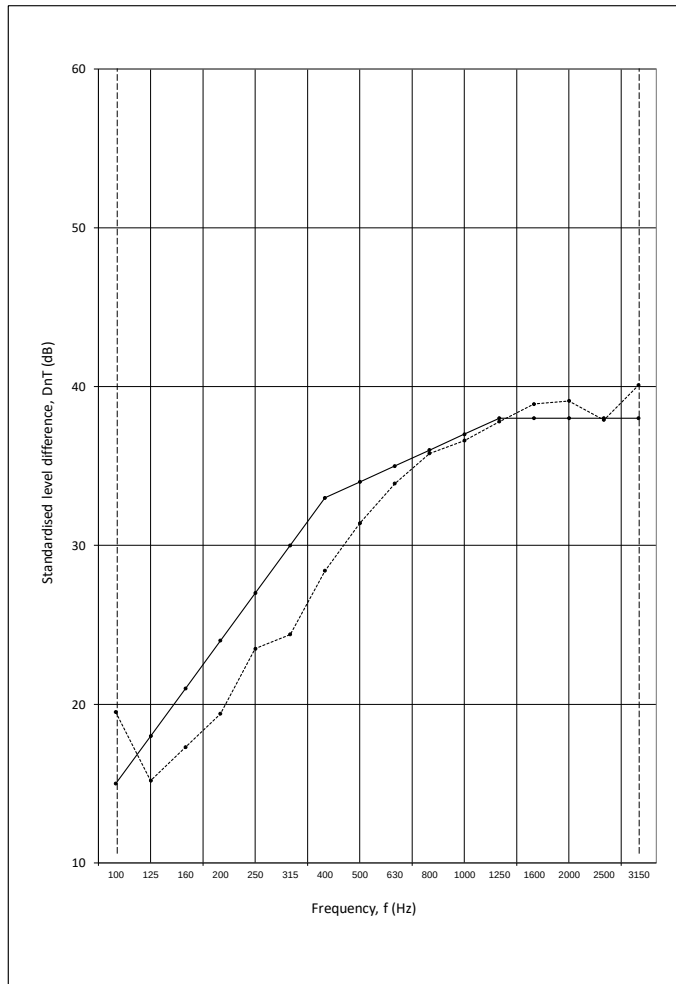
* = The receive level has been logarithmically adjusted for background noise in this frequency band as the difference between the background noise level and the receive level is between 6 and 10dB.

----- *D_{nT,w}*
 ————— Reference Value Curve (ISO 717-1)

Rating in accordance with ISO 717-1

<i>D_{nT,w}</i>	34	dB
<i>C_{tr}</i>	-6	dB
<i>D_{nT,w} + C_{tr}</i>	28	dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method.



Test Report No. JA0509/4

Date of Report 09.05.24.

Name of Test Institute Jigsaw Acoustics

Signature A Regan

6.2 Appendix A-2: Impact Test Results

Standardized level difference measured in accordance with BS EN ISO 140-7 Field Measurements of Impact Sound Insulation of Floors			
Site:	9 Wern Road, Ystalyfera, Swansea	Date of Test:	07.05.24.
Test Type:	Impact Floor	Client:	Ean & Sue White
Source Room:	Bedroom, 1st Floor Flat	Receive Room:	Chinese Takeaway - Kitchen
Source Room Volume (m ³):	25	Receive Room Volume (m ³):	40
Area of separating element (m ²):	10		
Separating Element Construction:	Timber joists and floorboards, original ceiling		

Frequency <i>f</i> Hz	<i>L'</i> _{nT} dB
50	
63	
80	
100	69.1
125	76.6
160	75.2
200	76.2
250	77.1
315	73.2
400	69.9
500	69.2
630	67.7
800	64.4
1000	62.1
1250	61.0
1600	58.7
2000	56.5
2500	57.5
3150	53.9
4000	
5000	

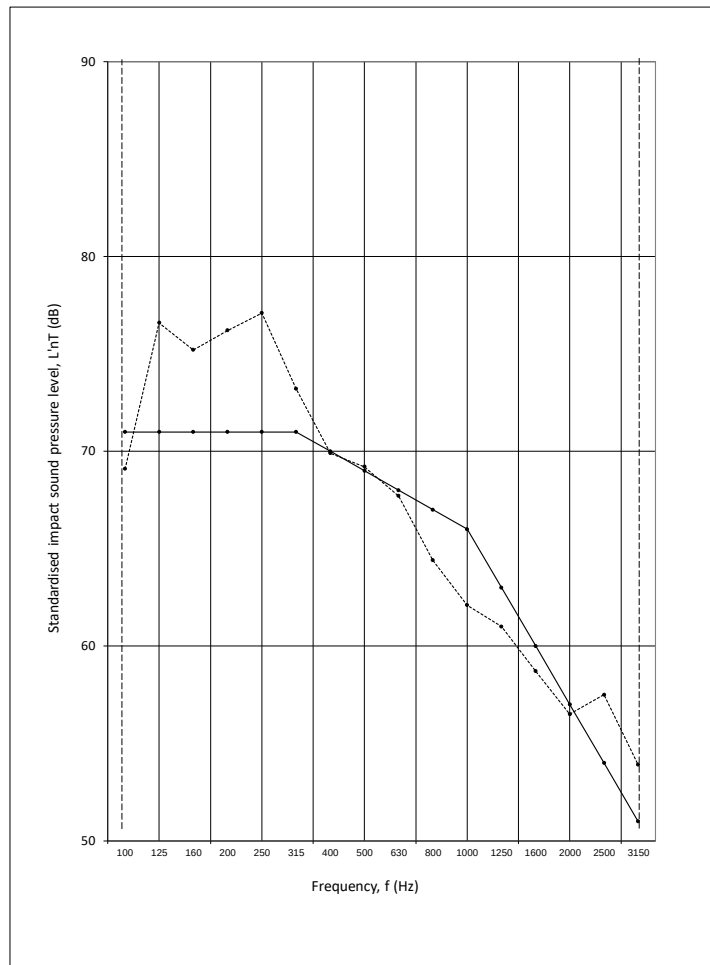
≤ = A correction of 1.3dB has been applied in this frequency band as the difference between the background noise level and the receive level is less than or equal to 6dB.

* = The receive level has been logarithmically adjusted for background noise in this frequency band as the difference between the background noise level and the receive level is between 6 and 10dB.

----- *L'*_{nT,w}
 ——— Reference Value Curve (ISO 717-2)

Rating in accordance with ISO 717-2
<i>L'</i> _{nT,w} 69 dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method.



Test Report No.

JA0509/3

Date of Report 09.05.24.

Name of Test Institute

Jigsaw Acoustics

Signature

A Regan

Standardized level difference measured in accordance with BS EN ISO 140-7 Field Measurements of Impact Sound Insulation of Floors			
Site:	9 Wern Road, Ystalyfera, Swansea	Date of Test:	07.05.24.
Test Type:	Impact Floor	Client:	Ean & Sue White
Source Room:	Living Room, 1st Floor Flat	Receive Room:	Chinese Takeaway - Waiting area
Source Room Volume (m ³):	25	Receive Room Volume (m ³):	40
Area of separating element (m ²):	10		
Separating Element Construction:	Timber joists and floorboards, original ceiling		

Frequency <i>f</i> Hz	<i>L'</i> _{nT} dB
50	
63	
80	
100	78.5
125	83.4
160	84.0
200	81.5
250	81.4
315	79.7
400	76.1
500	75.0
630	73.0
800	69.3
1000	67.5
1250	65.7
1600	65.3
2000	64.6
2500	64.2
3150	58.3
4000	
5000	

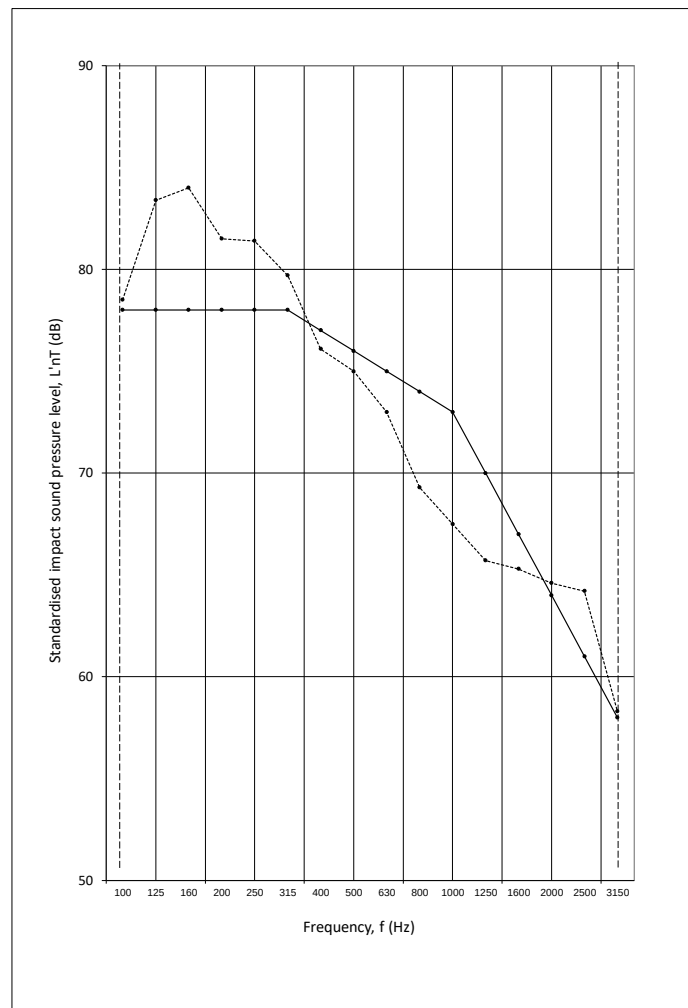
≤ = A correction of 1.3dB has been applied in this frequency band as the difference between the background noise level and the receive level is less than or equal to 6dB.

* = The receive level has been logarithmically adjusted for background noise in this frequency band as the difference between the background noise level and the receive level is between 6 and 10dB.

----- *L'*_{nT,w}
 ——— Reference Value Curve (ISO 717-2)

Rating in accordance with ISO 717-2
<i>L'</i> _{nT,w} 76 dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method.



Test Report No. JA0509/5

Date of Report 09.05.24.

Name of Test Institute Jigsaw Acoustics

Signature A Regan