

Snell Street Manchester

Sound Insulation Test Report

28744/SIT1

17/08/2023

For:
Artal
The XYZ Building
Spinningfields
Manchester
M3 3AQ



Hann Tucker Associates

Consultants in Acoustics Noise & Vibration

Head Office: Duke House, 1-2 Duke Street, Woking, Surrey, GU21 5BA (t) +44 (0) 1483 770 595

Manchester Office: First Floor, 346 Deansgate, Manchester, M3 4LY (t) +44 (0) 161 832 7041

(w) hanntucker.co.uk (e) enquiries@hanntucker.co.uk



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Sound Insulation Test Report 28744/SIT1

Document Control

Rev	Date	Comment	Prepared by	Authorised by
0	17/08/2023	-		
			James Hardacre Consultant BEng(Hons), AMIOA	Joseph Sinker Associate MSc(Res), BEng(Hons) MIOA



1.0 Introduction

Hann Tucker Associates visited new development at Snell Street on 11 August 2023 to undertake airborne and impact sound insulation tests on selected separating wall constructions between residential dwellings.

The properties under test are new build town houses.

This report presents the results of the tests and compares them with recommended sound insulation standards described in the Building Regulations Approved Document E: 2003 Edition.

2.0 Objectives

To undertake airborne sound insulation tests on separating wall constructions between selected residential houses at Snell Street.

To compare the results of the tests with recommended sound insulation standards described in the Building Regulations Approved Document E: 2003 Edition

These objectives are as set out in Part 4.0 of our Outline Brief dated 30 March 2023 and written instructions received on 30 March 2023.

3.0 Requirements Of Approved Document E

To satisfy Requirement E1 of Approved Document E: 2003 Edition, the following sound insulation values should be achieved:-

Table 1a: Dwellings – 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)
Purpose built dwellings Walls	45

Therefore the minimum value of weighted standardised level difference ($D_{nT,w}$) plus the spectrum adaptation curve (C_{tr}) as defined in BS EN ISO 717-1: 1997 specified in Approved Document E: 2003 Edition: Sound Insulation Standards for airborne sound tests is 45 dB for purpose built dwellings.



4.0 Test Procedure

The testing was carried out by James Hardacre Tester No.76.

4.1 Equipment

The equipment used during the testing is as follows:

Description	Manufacturer	Type	Serial Number	Calibration
Type 1 Precision Sound Level Meter	Brüel and Kjær	2250	2600445	Last Calibrated 05/12/2022
Calibrator	Brüel and Kjær	4231	2115545	Last Calibrated 05/12/2022

4.2 Airborne Sound Insulation Test Method (Separating Walls)

Hann Tucker Associates attended site on 11 August 2023, to undertake airborne sound insulation tests to selected separating wall constructions. The tests were undertaken in full accordance with BS EN ISO 140-4:1998 Acoustics – Measurement of airborne sound insulation in buildings and of building elements – Part 4: Field measurement of airborne sound insulation between rooms.

The sound level differences were determined by generating a broad band, random diffuse sound field within the source room. A spatial average of the resulting $1/3$ octave band noise levels was obtained within the source room from measurements undertaken over a time period of a least 30 seconds. The measurement procedure was repeated in the receive room. A second speaker position was then selected in the source room and the measurement procedure was repeated.

The receive levels were corrected for background noise where necessary as follows:

Where the measured background noise level in each $1/3^{\text{rd}}$ octave band was more than 6 dB but less than 10dB below the receive level, the following formula was applied:

$$L = 10 \log \left(10^{\frac{L_{SB}}{10}} - 10^{\frac{L_B}{10}} \right) \text{ dB}$$



where

L is the adjusted signal level in decibels;

L_{SB} is the level of the signal and background noise levels combined, in decibels;

L_B is the background level in decibels.

Where the measured background noise level was less than 6 dB below the receive level, a correction of 1.3 dB was applied (corresponding to a level difference of 6 dB) and the $\geq$ symbol was added to the results to show that the reported values are the limit of measurement.

The corrected receive levels are subtracted from the source levels to determine the level differences over the frequency range 100-3150 Hz from each source position. The level differences for each source position are arithmetically averaged at each frequency band to give the level difference, D .

Reverberant decays were then recorded in the receive room to determine the reverberation times over the same frequency range using a broadband noise source. For each receiver room 6No. measurements were made, comprising of 2No. source positions and 3No. microphone positions per source position. The reverberation time, T , used in subsequent calculations is an average of the 2No. source positions.

Having established $\frac{1}{3}$ octave band level differences and reverberation times over the frequency range 100-3150 Hz, the Standardised Level Difference, D_{nT} , is calculated for each $\frac{1}{3}$ octave band by applying the following formula:

$$D_{nT} = D + 10 \log_{10} \left(\frac{T}{T_0} \right)$$

where $T_0=0.5$ seconds

The $\frac{1}{3}$ octave band results are then compared with a standard curve using the method described in BS EN ISO 717-1: 1997 to determine the single figure descriptor of airborne sound insulation, the Weighted Standardised Level Difference, or $D_{nT,w}$.

The $\frac{1}{3}$ octave band results are also weighted using spectrum adaptation term No.2, C_{tr} , as detailed in BS EN ISO 717-1: 1997, to allow a more rigorous assessment of sound insulation performance with respect to low frequency noise.



The Weighted Standardised Level Difference and spectrum adaptation term are then added to give $D_{nT,w} + C_{tr}$, allowing comparison with the minimum airborne sound insulation requirements of Approved Document E.

4.3 Background Noise

The background noise levels were measured in each receive room in order to correct the received noise measurements for the effect of the prevailing noise climate.

The prevailing background noise comprised nearby construction noise.

4.4 Test Locations

All rooms tested had all doors and windows fitted and closed. The rooms were unfurnished.

The following airborne wall tests were undertaken:

Test	Source Room		Receive Room		Tested Construction Details
	Location	Approximate Volume	Location	Approximate Volume	
AW1	Unit 1 – Living Room	40 m ³	Unit 2 – Living Room	26 m ³	Double Skin 100mm Concrete Blockwork with 150mm Party wall insulation, finished with dot and dab plasterboard to both sides
AW2	Unit 1 – Bedroom 1	40 m ³	Unit 2 – Bedroom 1	26 m ³	

There were no cupboards present except where stated above. There were no step/staggers in the walls except where indicated above *.

5.0 Results

The results of the tests and analysis are given in the attached Certificates 28744/C1 to 28744/C2.



The following tables summarise our findings:

Airborne Tests Across Separating Walls	D _{nT,w} + C _{tr} (dB)		Approved Document E Compliance
	Test Result*	Required	
AW1	≥ 51	≥ 45	Pass
AW2	53	≥ 45	Pass

*Tests results including the ≥ symbol are background limited

6.0 Discussion

6.1 Airborne Tests

With reference to Section 4.0 and Section 5.0 the results for the walls tested are equal to or greater than the minimum value for airborne sound insulation as stated in Approved Document E: 2003 Edition.

7.0 Conclusion

Hann Tucker Associates have undertaken airborne sound insulation tests across separating wall constructions between selected residential houses at Snell Street.

The results apply to the sample as provided or presented.

The airborne sound insulation performance (D_{nT,w} + C_{tr}) of the separating wall constructions tested are greater than the minimum value stated in Approved Document E: 2003 Edition.

The results relate only to the floors tested. All data contained in this report (plot numbers, drawings etc.) has been provided by the client.

END OF REPORT



Appendix A

(Including 2No. Graphs)

28744/C1 to 28744/C2

Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

Project Details

Development: Snell Street

Client: Artal

Report Ref: 28744/SIT1

Airborne Wall Sound Insulation Test: AW1

Date of test: 11/08/2023

Source Room: 1 - Living Room

Approximate Source Room Volume: 40m³

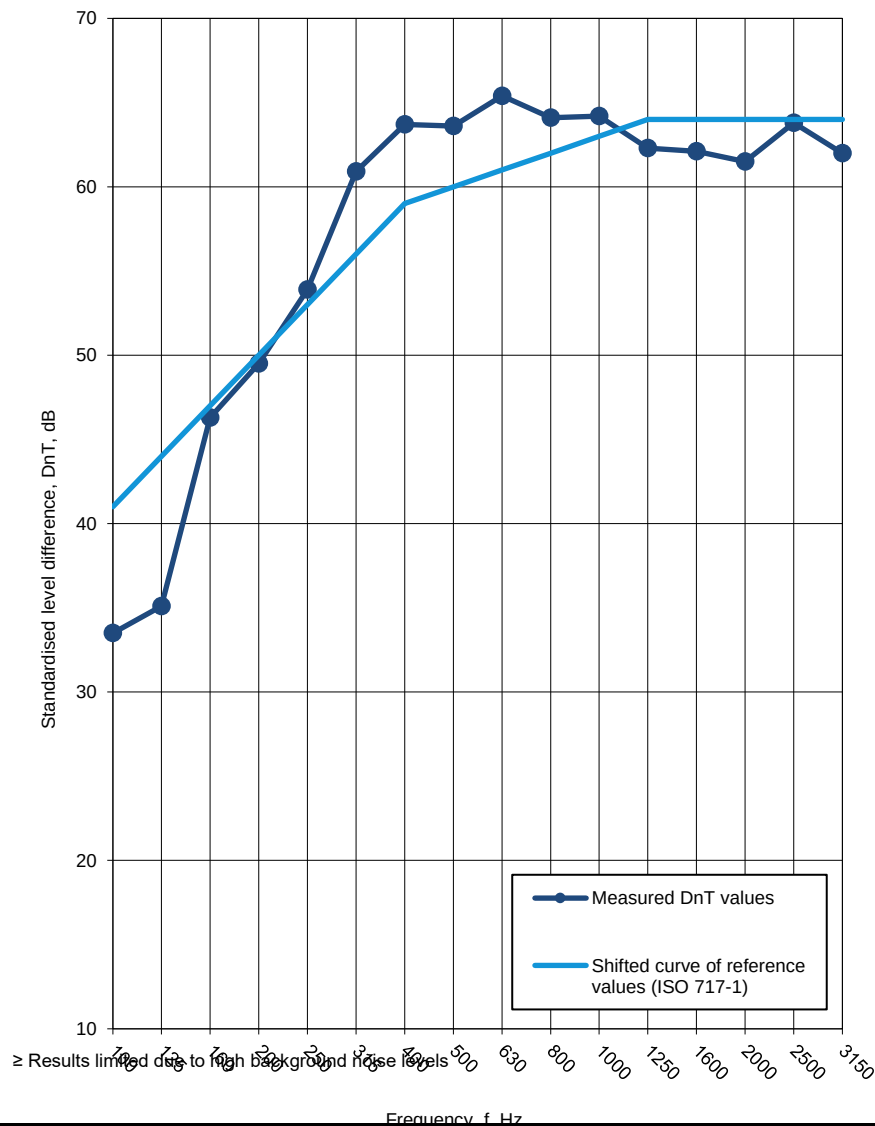
Receive Room: 2 - Living Room

Approximate Receive Room Volume: 40m³



4083

Frequency f Hz	DnT dB
100	33.5
125	35.1
160	46.3
200	≥ 49.5
250	53.9
315	≥ 60.9
400	≥ 63.7
500	≥ 63.6
630	≥ 65.4
800	≥ 64.1
1000	≥ 64.2
1250	≥ 62.3
1600	≥ 62.1
2000	≥ 61.5
2500	≥ 63.8
3150	≥ 62.0



Test Result

$D_{nT,w} + C_{tr} = \geq 51 \text{ dB}$

Rating according to ISO 717-1:

$D_{nT,w} (C; C_{tr}) = \geq 60 (-3; -9) \text{ dB};$

$C_{(100-3150)} = -3 \text{ dB}$

$D_{nT,w} = \geq 60 \text{ dB}$

$C_{tr (100-3150)} = -9 \text{ dB}$

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

Certificate Ref: 28744/SIT1/C1

Test organisation: Hann Tucker Associates

Date of issue: 17/08/2023

Test Engineer: James Hardacre

Test Engineer No: 76

Test Engineer Signature:



Hann Tucker Associates

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chester Office: First Floor, 346 Deansgate, Manchester M3 4LY (t) +44 (0) 161 832 7041

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Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

Project Details

Development: Snell Street

Client: Artal

Report Ref: 28744/SIT1

Airborne Wall Sound Insulation Test: AW2

Date of test: 11/08/2023

Source Room: 1 - Bedroom 1

Approximate Source Room Volume: 26m³

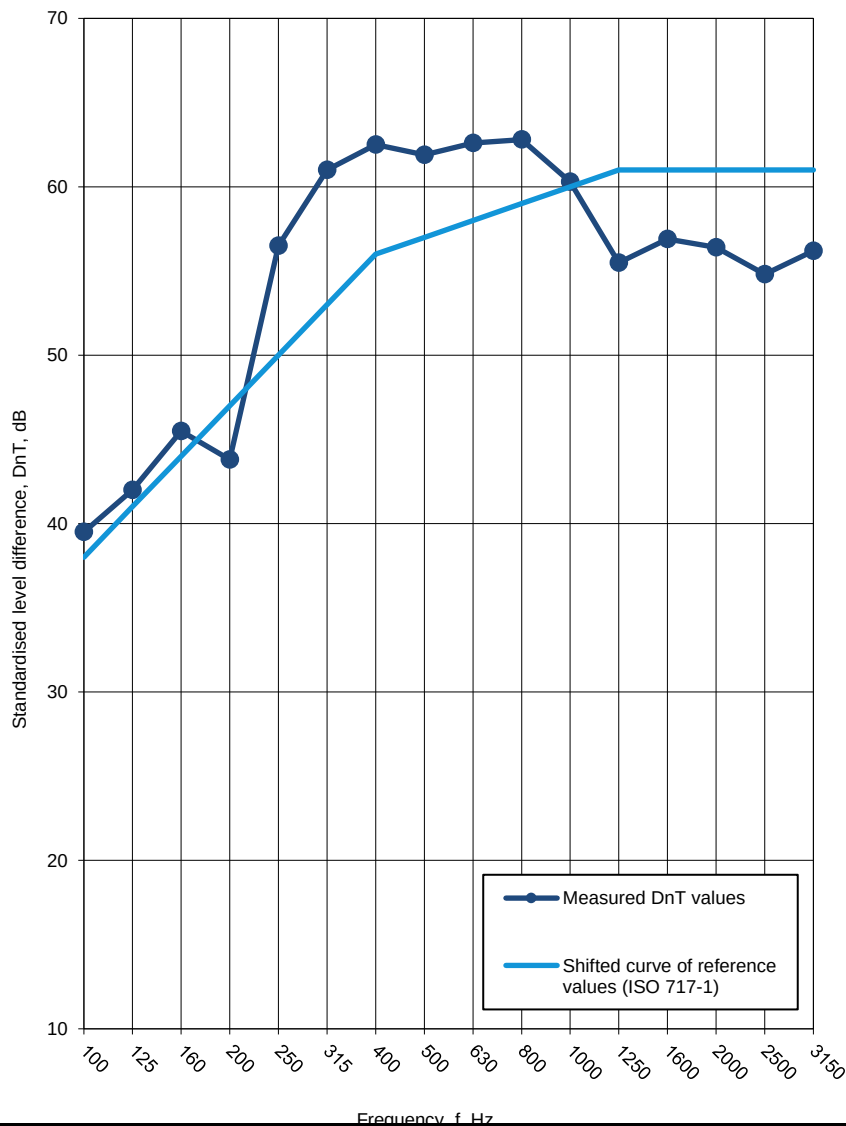
Receive Room: 2 - Bedroom 1

Approximate Receive Room Volume: 26m³



4083

Frequency f Hz	DnT dB
100	39.5
125	42.0
160	45.5
200	43.8
250	56.5
315	61.0
400	62.5
500	61.9
630	62.6
800	62.8
1000	60.3
1250	55.5
1600	56.9
2000	56.4
2500	54.8
3150	56.2



Test Result

$D_{nT,w} + C_{tr} = 53 \text{ dB}$

Rating according to ISO 717-1:

$D_{nT,w} (C; C_{tr}) = 57 (-1; -4) \text{ dB};$

$C_{(100-3150)} = -1 \text{ dB}$

$D_{nT,w} = 57 \text{ dB}$

$C_{tr (100-3150)} = -4 \text{ dB}$

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

Certificate Ref: 28744/SIT1/C2

Test organisation: Hann Tucker Associates

Date of issue: 17/08/2023

Test Engineer: James Hardacre

Test Engineer No: 76

Test Engineer Signature:



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