

Sound Insulation Test Report



Client: Redlynch Properties Ltd
Site Address: 11 Sea Lane, Ferring

Reported By: Simon Barrett BSc(Hons) MSc MIOA
Checked By: Martyn Chambers BA (Hons), MSc PGDip: Acoustics, AMIOA
Date Written: 31 March 2021

Test Date: 30 March 2021
Reference Number: J3030/11762403
Report Number: 62403
ANC Registration No.: 117

Field Test Type: For Compliance with Airborne and Impact Sound Insulation Requirements for Floors & Walls.

Providing Better Living, Working & Learning Environments

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1 Notice to Building Control Officer



Notice to Building Control Officer

Certification of Test Results

ANC operates an online, secure, paperless certification system for sound insulation tests. This is an ANC Registered Test.

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:

- Go to the ANC website: www.theanc.co.uk
- Follow links to Building Control "ADvANCE"
- Enter task number: 62403
- Enter Password TM7ZBY
- Select role "Building Control Officer" and press "Login", 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.

2 Summary

2.1 Details of Sound Insulation Tests

The tests detailed in this report were carried out on 30 March 2021 for Redlynch Properties Ltd to check the acoustic performance of party floors and walls at 11 Sea Lane, Ferring.

The tests detailed in this report have been carried out in full accordance with BS EN ISO 140-4 [1] unless otherwise specified in section 2.2, below.

The report also compares the results achieved with the levels prescribed in Approved Document E (2003 edition incorporating the 2015 amendments) [5] of the Building Regulations 2010 in order to check for compliance. All the procedures in Annex B of Approved Document E of The Building Regulations have been followed. The following test types were carried out:

Test Type:	No. of Room Pair Tests
Vertical Airborne (Floors):	2
Horizontal Airborne (Walls):	2

Approved Document E states that the individual value of airborne insulation achieved should be not less than $D_{nT,w} + C_{tr} = 43$ dB for party floors and walls in between converted dwellings.

The results show that the room pairs tested satisfy the requirements of Approved Document E.

2.2 Additional Notes and Deviations from Test Standards (if applicable)

- Tests Were completed in unfurnished and uncarpeted rooms
- For Tests 1 & 2, the source room covered both of the receiving rooms either fully or partially.

3 Test Report

3.1 General

Client Name: Redlynch Properties Ltd

Address: 15 Sea Lane
Ferring
Sussex BN12 5DP
UK

Site: 11 Sea Lane, Ferring

Type of Property: Converted Flats above a commercial space

Test conducted by: Simon Barrett BSc(Hons) MSc MIOA
Acoustic Associates Sussex Ltd
8 Highdown House
Shoreham Airport
Shoreham-by-Sea
West Sussex BN43 5PB

Date of tests: 30 March 2021

Note: Acoustic Associates Sussex Ltd is listed on the list of ANC Registered Members and was at the time of the testing. This is an ANC Registered report, with the unique registration number: 62403

4 Results

4.1 General

Results of the measurements, in terms of single-figure ratings, are provided below. They are provided as Weighted Standardised Level Differences $D_{nT,w} + C_{tr}$ (for airborne sound) as required by BS EN ISO 140-4 [1]. They are also defined in ISO 717-1 [2], which deals with airborne insulation.

On the following pages, the graphical results are presented, together with the underlying data from which the single-figure ratings are calculated.

Some 1/3 octave readings reached the limit of the measurement $L_{sb}-L_b \leq 6dB$. These are marked in the graphs which follow the main body of the report.

Approved Document E of The Building Regulations: *Resistance to the passage of sound* [3] sets out the following requirements for converted houses and flats:

Airborne Sound Insulation:

The insulation values for airborne insulation for converted floors & walls shall not be less than $D_{nT,w} + C_{tr} = 43$ dB.

4.2 Separating Floors (Airborne)

Source Room	Vol (m ³)	Receiving Room	Vol (m ³)	Common Area (m ²)	DnT,w (dB)	DnT,w + Ctr (dB)	Minimum Pass Criterion (dB)	Pass/Fail	Test Reference J3030/62403/
Ground Floor Commercial	>100	Flat 4 Studio/Kitchen	60.1	10	62	57	43	Pass	1
Ground Floor Commercial	>100	Flat 3 Living Room	46.5	18	54	47	43	Pass	2

4.3 Separating Walls (Airborne)

Source Room	Vol (m ³)	Receiving Room	Vol (m ³)	Common Area (m ²)	DnT,w (dB)	DnT,w + Ctr (dB)	Minimum Pass Criterion (dB)	Pass/Fail	Test Reference J3030/62403/
Flat 4 Studio	60.1	Flat 3 Living Room	46.5	4.7	50	45	43	Pass	3
Flat 4 Studio	60.1	Flat 1 Studio	60	9.4	56	52	43	Pass	4

N.B. For the purposes of interpretation of the tabulated data above, with airborne sound insulation it is the level difference that is being measured between rooms and the higher the result the better the insulation.

4.4 Element Construction Details

Party floor construction consisted of the following:

Existing Beam & Block Concrete Floor, Suspended MF Grid Ceiling incorporating 150mm void, acoustic hangers and 100mm mineral fibre, 2 layers of acoustic plasterboard.

Party wall construction consisted of the following:

2x 15mm Soundbloc Plasterboard, Gypframe 48 S 50 C Stud at 600mm Centres, Minimum Cavity between studs 37mm (total between plasterboard surfaces 137mm) incorporating 50mm Mineral Fibre, Gypframe 48 S 50 C Stud at 600mm Centres, 2x 15mm Soundbloc Plasterboard

4.5 Test Method

Before any measurements were taken, the meter was calibrated. The calibration procedure was repeated at the end of the tests to check for any calibration 'drift'. No significant drift occurred.

Resistance to Airborne Sound

Two loudspeakers were placed facing into the corners, separated from each other, at different heights in the source room and angled across the room to create a diffuse sound field. An amplifier was used to broadcast pink noise through the loudspeakers using two individual noise generators. The spectrum shape of the reverberant noise was checked to ensure that each 1/3 octave band was within 6 dB of its neighbouring bands. The spectrum shape was adjusted, if necessary, to comply with this criterion (Firstly loudspeaker position/s are adjusted until the criterion is achieved. If this fails the spectrum shape is adjusted using a graphic equaliser).

Measurements were taken in the source room at each 1/3 octave band centre frequency between 100 Hz and 3.15 kHz using the "sweep" technique as described in ISO140 (30 secs.). Further measurements were then taken in the same way in the receiving room on the other side of the test element. The reverberation time was also obtained using the interrupt stationery method for each 1/3 octave centre frequency in the receiving room. This was spatially averaged over 6 positions in the room using 1 source position.

Ambient sound pressure levels (without the source operating) were also taken at each frequency in the receiving rooms using the "sweep" technique as described in ISO140 (30 secs) to check that ambient noise levels were at least 10 dB below the measured levels due to generated noise and thus did not contribute to the measured levels. These too were spatially-averaged. Type of noise radiated: Broadband pink noise. Dominant sources of background noise were as follows: Road Traffic

Equipment used:

Description	Type	Serial	Manufacturer	Calibration Expiry Date	Calibration Certificate No.
Type 1 SLM	NOR118(A)	31460	Norsonic	09/05/21	TCRT19/1376
Mic (118A)	1225	91973	Norsonic	09/05/21	TCRT19/1376
Pre-Amp (118A)	1206	30779	Norsonic	09/05/21	TCRT19/1376
SLM Calibrator	Norsonic 1251	30974	Norsonic	27/01/2022	AASX270120
Sound Source	2 Speaker (Mackie)	0024, 0133	Neutrik/Mackie (Thump)	-	-
Sound Source	Reverb 2	0024	Mackie (Thump)	-	-

N.B. for calibration certificates and details see appendix.

5 References

1. BS EN ISO 140-4:1998: *Field measurements of airborne sound insulation between rooms*
2. BS EN ISO 717-1: 1997: *Rating of sound insulation in buildings and of building elements. Part 1: Airborne Sound Insulation.*
3. *Approved Document E: Resistance to the Passage of Sound (2003 edition incorporating 2015 amendments).*

6 Glossary of Terms

$D_{nT,w}$ **Weighted Standardised Level Difference.** A single-figure value of airborne sound insulation performance, derived according to procedures in BS EN ISO 717-1, based on the D_{nT} values at different frequencies (100-3150 Hz third octave bands).

D_{nT} **Standardised Level Difference.** A frequency-dependent measurement of airborne sound insulation, calculated using the following formula:

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

Where:

L_1 is the energy-averaged sound pressure level due to the pink noise source measured in the source room using a sweep technique.

L_2 is the energy-averaged sound pressure level measured in the receiving room using a sweep technique.

T is the mean receiving room reverberation time (derived from T_{30} measured in seconds).

T_0 is the reference reverberation time (= 0.5s for dwellings).

C_{tr} **Spectrum Adaptation Term** calculated in accordance with BS EN ISO 717-1, to characterise airborne sound insulation with respect to typical outdoor noise sources (A-weighted urban traffic noise).

$L'_{nT,w}$ **Weighted Standardised Impact Sound Pressure Level.** A single-figure value (@ 500 Hz) of impact sound insulation, performance, derived according to BS EN ISO 717-2, based on the L_{nT} values at different frequencies (100Hz- 3150 Hz third octave bands).

L'_{nT} **Standardised Impact Sound Pressure Level.** A frequency dependent measurement of impact sound insulation, calculated using the following formula:

$$L'_{nT} = L_1 + 10\log(T/T_0) \text{ dB}$$

Where:

L_1 is the mean sound pressure level due to the tapping machine measured in the receiving room using a sweep technique.

T is the mean receiving room reverberation time (derived from T_{30} measured in seconds).

T_0 is the reference reverberation time (= 0.5s for dwellings).

L_{sb} The level of the signal (within the receiving room) and background noise combined, in deciBels (dB)

L_b The Background Noise Level, in deciBels (dB)

Appendices

Graphical & Tabular Presentation of Results

and

Equipment Calibration Certificate

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

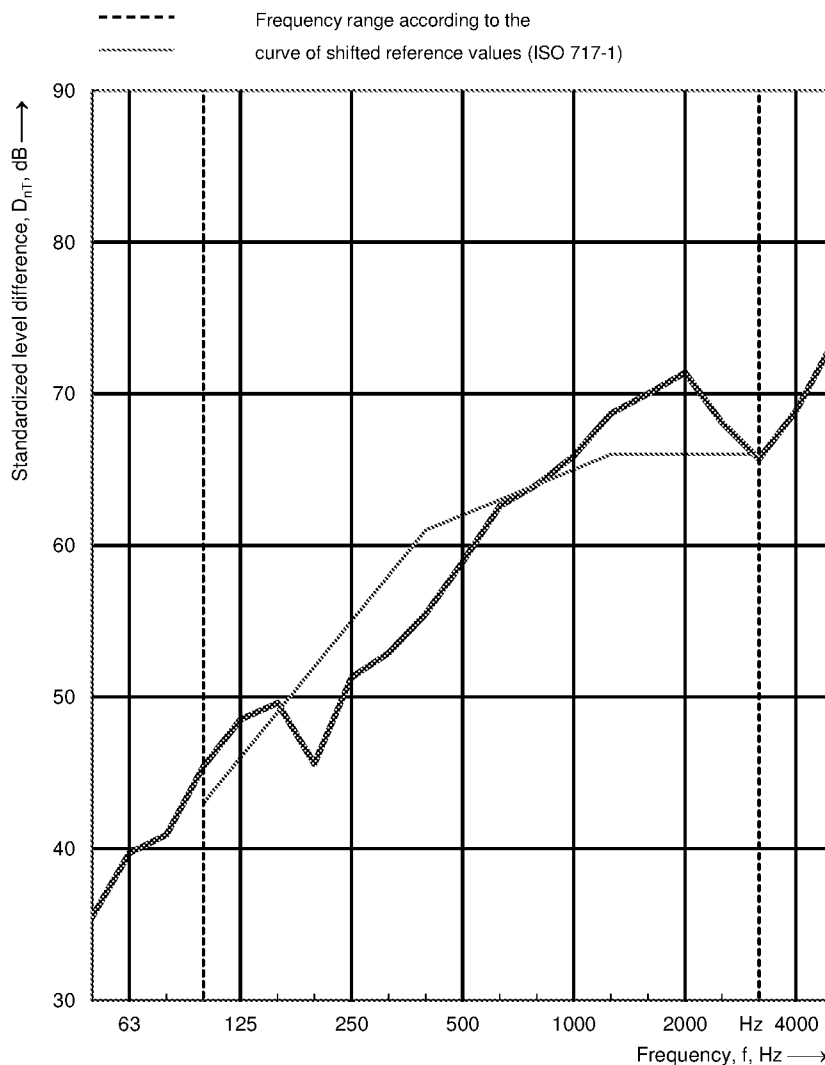
Client: Redlynch Properties Ltd
 Description: 11 Sea Lane, Ferring, BN12
 Ground Floor Commercial Unit - Flat 4, Studio (Vertical)
 Common Area: 10sq. m (Approx.)

Date of test: 30/03/2021

Construction: Existing Beam & Block Concrete Floor, New Suspended MF Grid ceiling incorporating acoustic hangers, 100mm Isover and 2x 15mm Soundbloc Plasterboard.

Source room volume: >100 m³
 Receiving room volume: 60.1 m³

Frequency f [Hz]	D _{nT} 1/3 octave [dB]
50	35.5 ¹
63	39.7
80	40.9
100	45.4
125	48.5
160	49.6
200	45.6
250	51.3
315	52.9
400	55.5
500	58.9
630	62.6
800	64.0
1000	65.9
1250	68.7
1600	70.0
2000	71.4 ¹
2500	68.1 ¹
3150	65.7
4000	68.9
5000	73.4 ¹



¹ Value at Limit of Measurement

Rating according to ISO 717-1

D_{nT,w}(C;C_{tr}) = 62 (-1 ; -5) dB

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

C₅₀₋₃₁₅₀ = -2 dB C₅₀₋₅₀₀₀ = -1 dB C₁₀₀₋₅₀₀₀ = -1 dB

C_{tr,50-3150} = -8 dB C_{tr,50-5000} = -8 dB C_{tr,100-5000} = -5 dB

Company: Acoustic Associates Sussex Ltd

No. of test report: J3030/62403/1

Date: 31/03/2021

Signature: Simon Barrett

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

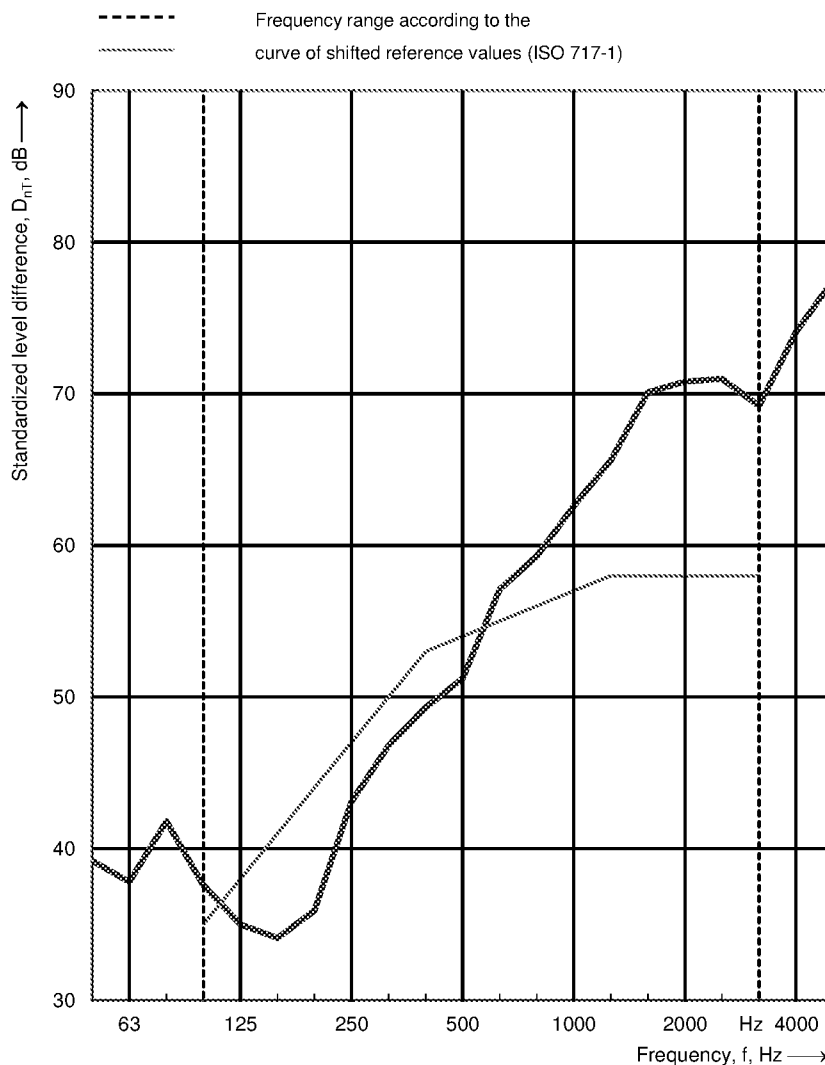
Client: Redlynch Properties Ltd
 Description: 11 Sea Lane, Ferring, BN12
 Ground Floor Commercial Unit - Flat 3, Living Room (Vertical)
 Common Area: 18sq. m (Approx.)

Date of test: 30/03/2021

Construction: Existing Beam & Block Concrete Floor, New Suspended MF Grid ceiling incorporating acoustic hangers, 100mm Isover and 2x 15mm Soundbloc Plasterboard.

Source room volume: >100 m³
 Receiving room volume: 46.5 m³

Frequency f [Hz]	D _{nT} 1/3 octave [dB]
50	39.2 ¹
63	37.8
80	41.8
100	37.6
125	35.0
160	34.1
200	35.9
250	43.1
315	46.8
400	49.3
500	51.2
630	57.1
800	59.3
1000	62.6
1250	65.6
1600	70.1 ¹
2000	70.8 ¹
2500	71.0 ¹
3150	69.2 ¹
4000	74.1 ¹
5000	77.5 ¹



¹ Value at Limit of Measurement

Rating according to ISO 717-1

$D_{nT,w}(C;C_{tr}) = 54$ (-3 ; -7) dB

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

$C_{50-3150} = -3$ dB $C_{50-5000} = -2$ dB $C_{100-5000} = -2$ dB

$C_{tr,50-3150} = -8$ dB $C_{tr,50-5000} = -8$ dB $C_{tr,100-5000} = -7$ dB

Company: Acoustic Associates Sussex Ltd

No. of test report: J3030/62403/2

Date: 31/03/2021

Signature: Simon Barrett

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

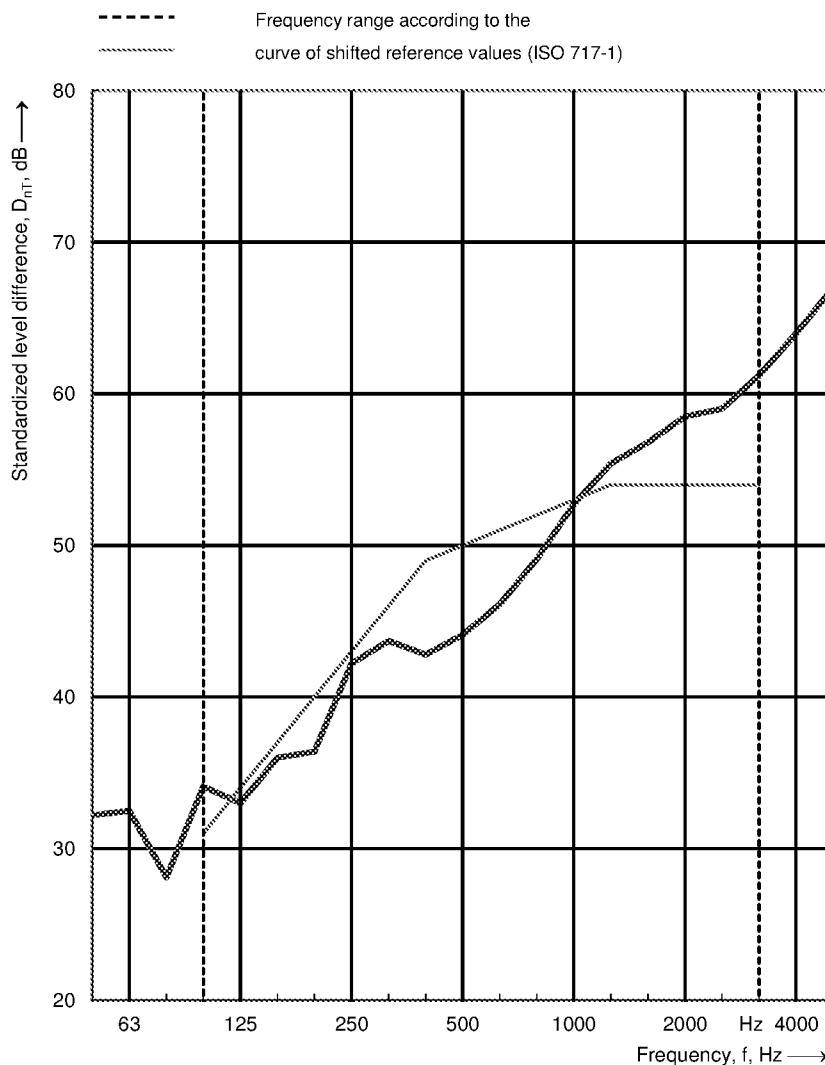
Client: Redlynch Properties Ltd
 Description: 11 Sea Lane, Ferring, BN12
 Flat 4, Studio - Flat 3, Living Room (Horizontal)
 Common Area: 4.7sq. m (Approx.)

Date of test: 30/03/2021

Construction: Double Stud incorporating mineral fibre and 2x15mm Soundbloc plasterboard either side.

Source room volume: 60.1 m³
 Receiving room volume: 46.5 m³

Frequency f [Hz]	D _{nT} 1/3 octave [dB]
50	32.2
63	32.5
80	28.1
100	34.1
125	33.0
160	36.0
200	36.4
250	42.2
315	43.7
400	42.8
500	44.1
630	46.1
800	49.1
1000	52.7
1250	55.4
1600	56.8
2000	58.5
2500	59.0
3150	61.2
4000	64.0
5000	67.0



Rating according to ISO 717-1

D_{nT,w}(C;C_{tr}) = 50 (-2 ; -5) dB

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

C₅₀₋₃₁₅₀ = -2 dB C₅₀₋₅₀₀₀ = -1 dB C₁₀₀₋₅₀₀₀ = -1 dB

C_{tr,50-3150} = -7 dB C_{tr,50-5000} = -7 dB C_{tr,100-5000} = -5 dB

Company: Acoustic Associates Sussex Ltd

No. of test report: J3030/62403/3

Date: 31/03/2021

Signature: Simon Barrett

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

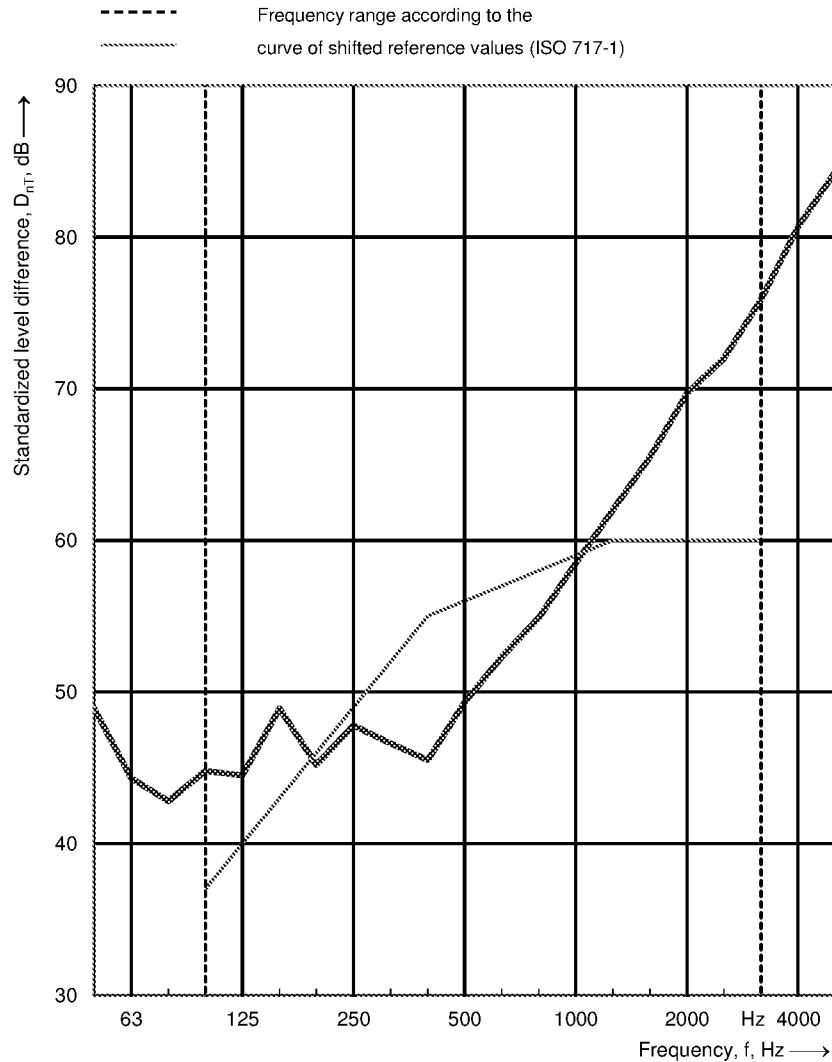
Client: Redlynch Properties Ltd
 Description: 11 Sea Lane, Ferring, BN12
 Flat 4, Studio - Flat 1, Studio (Horizontal)
 Common Area: 9.4sq. m (Approx.)

Date of test: 30/03/2021

Construction: Double Stud incorporating mineral fibre and 2x15mm Soundbloc plasterboard either side.

Source room volume: 60.1 m³
 Receiving room volume: 60.0 m³

Frequency f [Hz]	D _{nT} 1/3 octave [dB]
50	48.9
63	44.3
80	42.8
100	44.8
125	44.5
160	48.9
200	45.2
250	47.8
315	46.6
400	45.5
500	49.3
630	52.3
800	54.9
1000	58.5
1250	62.0
1600	65.5
2000	69.7 ¹
2500	72.0 ¹
3150	75.9 ¹
4000	80.7 ¹
5000	84.3 ¹



¹ Value at Limit of Measurement

Rating according to ISO 717-1

$D_{nT,w}(C;C_{tr}) = 56$ (-1 ; -4) dB

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

$C_{50-3150} = -1$ dB $C_{50-5000} = 0$ dB $C_{100-5000} = 0$ dB

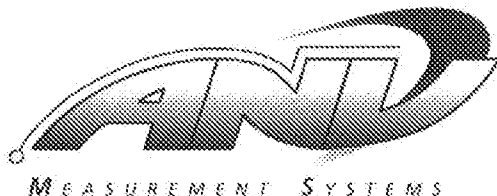
$C_{tr,50-3150} = -4$ dB $C_{tr,50-5000} = -4$ dB $C_{tr,100-5000} = -4$ dB

Company: Acoustic Associates Sussex Ltd

No. of test report: J3030/62403/4

Date: 31/03/2021

Signature: Simon Barrett



CERTIFICATE OF CALIBRATION

Date of Issue: 10 May 2019

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL

Certificate Number: TCRT19/1376

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Approved Signatory

K. Mistry

CUSTOMER

Acoustic Associates Sussex Ltd
8 High Down House
Cecil Pashley Way, Shoreham Airport
Shoreham-by-Sea
West Sussex
BN43 5PB

ORDER No

AASL/SAC/NOR118A/CAL

Job No

TRAC19/05198

DATE OF RECEIPT 08 May 2019

PROCEDURE

Calibration Engineer's Handbook section 3

IDENTIFICATION

Sound level meter Norsonic type 118 serial No 31460 connected via a preamplifier type 1206 serial No 30779 to a half-inch microphone type 1225 serial No 91973.

CALIBRATED ON

10 May 2019

**PREVIOUS
CALIBRATION**

Calibrated on 04 May 2017 Certificate No. 167351 issued by CMR

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT19/1376

Page 2 of 3 Pages

The sound level meter was set to frequency weighting A and adjusted to read correctly in response to a laboratory sound calibrator. This reading took into account manufacturers' information on the free-field response of the sound level meter.

The sound level meter was then tested, and its overall sensitivity adjusted as required.

An acoustic calibration at 1kHz was performed by application of a standard sound calibrator, whilst the tests at 125Hz and 8kHz were performed by the electrostatic actuator method.

The final sensitivity setting in calibration mode was -26.3 dB.

RESULTS

The sound level meter was found to conform to the type 1 requirements of BS EN 60651:1994* and BS EN 60804:1994* for those tests carried out.

The self-generated noise recorded was:

12.5 dB (A)

11.4 dB (C)

23.4 dB (Lin)

The expanded level uncertainty of the Laboratory's 1 kHz sound calibrator used during this verification is ± 0.10 dB.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with the *Guide to the Expression of Uncertainty in Measurement* published by the International Organisation for Standards (ISO).

All measurement data are held at ANV Measurement Systems for a period of at least six years.

Typical case reflection factors specified by the manufacturer have been used for this verification.

The linearity range and primary indicator range specified in the manufacturer's handbook (dated November 2001) have been used.

The Norsonic 118 sound level meter design has successfully undergone pattern evaluation at Physikalisch-Technische Bundesanstalt (PTB). It was found to meet the requirements of BS EN 60651* and BS EN 60804* and was granted pattern approval as a Type 1 sound level meter.

No component of uncertainty for manufacturer-specified corrections has been included in the uncertainty budget and, in accordance with amendments to the standards, the measured values obtained during the verification have not been extended by any measurement uncertainty when assessing conformance to each standard.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT19/1376

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NOTES

- *1 BS EN 60651:1994 and BS EN 60804:1994 were formerly numbered BS 5969:1981 and BS 6698:1986 respectively.
- 2 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method.
- 3 The instrument firmware version was 3.4.6190
- 4 All tests were carried out with the compensation filters set as follows; the verification is valid only for this case.

	Random	Windscreen	Preamp	Self-noise
Status	OFF	OFF	ON	N/A
Screen marker			G	

- 5 The frequency weighting Z provided has been taken as equivalent to the Lin response in BS EN 60651:1994 for the purposes of this verification.

END

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