Chartered Building Consultancy

Acoustic South East

Sound Insulation Test Report

Client:	**Morton Brothers**
Site Address:	**1 Downlands Parade, Upper Brighton Road, Worthing, BN14 9JH**
Reported By:	**Martyn Chambers BA (Hons), MSc MIOA**
Checked By:	**Simon Barrett BSc(Hons) MSc MIOA**
Date Written:	**12 June 2023**
Test Date:	**12 June 2023**
Reference Number:	**J3358/11776639**
Report Number:	**76639**
ANC Registration No.:	**117**
Field Test Type:	**For Compliance with Airborne and Impact Sound Insulation Requirements for Floors & Walls.**

Constructionline Part of Capita plc

CQMS Safety Scheme

ANC THE ASSOCIATION OF NOISE CONSULTANTS

ATTMA

Table of Contents

1 Notice to Building Control Officer 3
2 Summary 4
2.1 Details of Sound Insulation Tests 4
2.2 Additional Notes and Deviations from Test Standards (if applicable) 4
3 Test Report 5
3.1 General 5
4 Results 6
4.1 General 6
4.2 Separating Floors (Airborne) 6
4.3 Separating Floors (Impact) ..... **Error! Bookmark not defined.**
4.4 Separating Walls (Airborne) 6
4.5 Element Construction Details 7
4.6 Test Method 8
5 References 9
6 Glossary of Terms 9
Appendices 10

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: 76639
- Enter Password HVCB8Y
- 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 12 June 2023 for Morton Brothers to check the acoustic performance of party floors and walls at 1 Downlands Parade, Upper Brighton Road, Worthing, BN14 9JH.

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
Vertical Impact (Floors):	0
Horizontal Airborne (Walls):	1

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. The results also satisfy the requirement of the properties decision notice of the results from the sound insulation tests achieving 50dB $D_{nTw} + C_{tr}$ dB.

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

- None

3 Test Report

3.1 General

Client Name:	Morton Brothers
Address:	49 Downview Road Worthing West Sussex BN11 4QH UK
Site:	1 Downlands Parade, Upper Brighton Road, Worthing, BN14 9JH
Type of Property:	Converted Flats
Test conducted by:	Martyn Chambers BA (Hons), MSc MIOA Acoustic South East 8 Highdown House Shoreham Airport Shoreham-by-Sea West Sussex BN43 5PB
Date of tests:	12 June 2023
Note:	Acoustic South East 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: 76639

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 [3], which deal with airborne and impact insulation respectively.

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 Lsb-Lb ≤ 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* [5] 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 J3358/76639/
Comerical Area	75	Living Room	42	17.5	60	52	43	Pass	2
Comerical Area	75	Front Bedroom	24	10	62	56	43	Pass	3

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 J3358/76639/
Comerical Area	75	Dining Area	30	10	58	52	43	Pass	1

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. With impact sound insulation it is the actual sound pressure level in the receiving room that is measured, and therefore the lower results, the better the insulation.

4.4 Element Construction Details

Party floor construction consisted of the following:

Floor type 3

Party wall construction consisted of the following:

Masonary - Full Construction Detail Held by Client

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 Noise

Equipment used:

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:

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

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:

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

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 ISO 140-4
Field measurements of airborne sound insulation between rooms

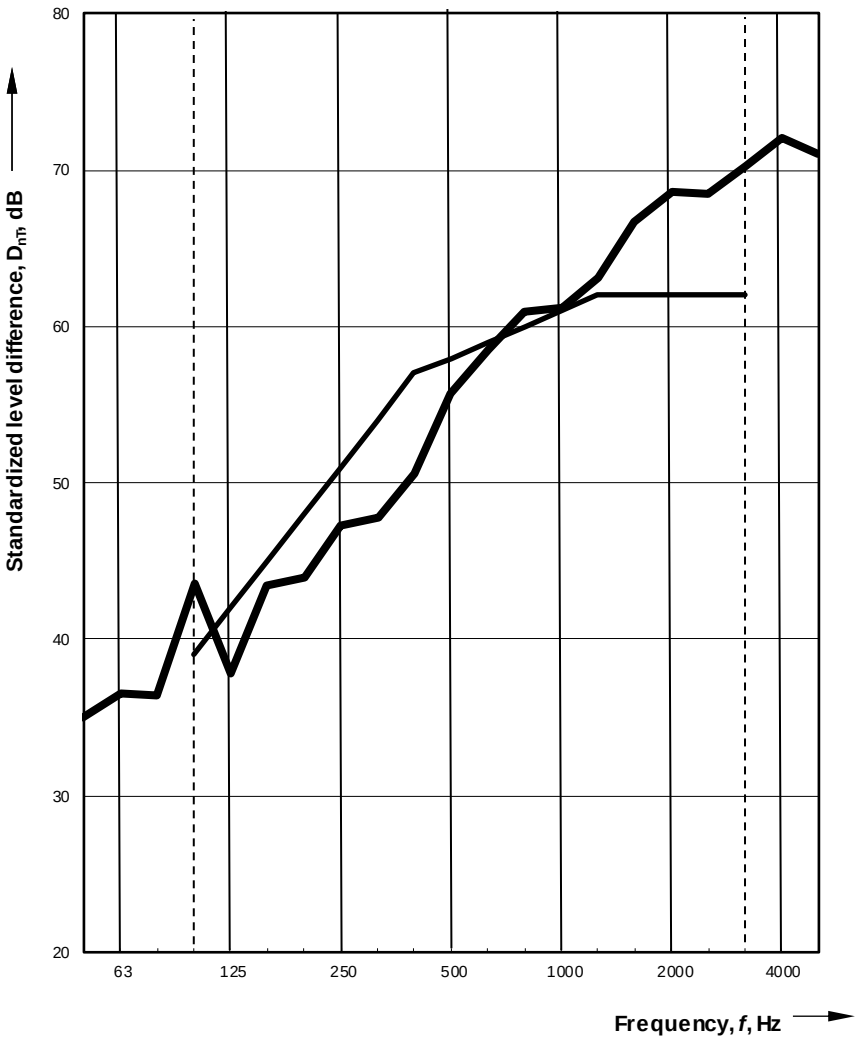
Client: Morton Brothers Date of test: 12/06/2023

Description and identification of the building construction and test arrangement, direction of measurement:
1 Dow nlands Parade, Upper Brighton Road, Worthing, BN14 9JH
Comerical Area to Dining Area (Horizontal)
Masonary - Full Construction Detail Held by Client
Shared Area: 10m. Sq.

Source room volume: 75 m³
Receiving room volume: 30 m³

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

Frequency *f* Hz	D_{nT} (one-third octave) dB
50	35.0
63	36.6
80	36.4
100	43.6
125	37.8
160	43.5
200	43.9
250	47.3
315	47.8
400	50.6
500	55.7
630	58.5
800	60.9
1000	61.2
1250	63.1
1600	66.7
2000	68.6
2500	68.5
3150	70.3
4000	72.0
5000	71.0



Rating according to ISO 717-1

$D_{nT,w}$ (C;C_{tr}) = 58 (; -6) dB; $D_{nT,w}+C_{tr}$ = 52 dB

Evaluation based on field measurement
results obtained by an engineering method

No. of test report: J3358/76639/1 Name of test institute: Acoustic South East
Date: 12/06/2023 Signature: Martyn Chambers

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

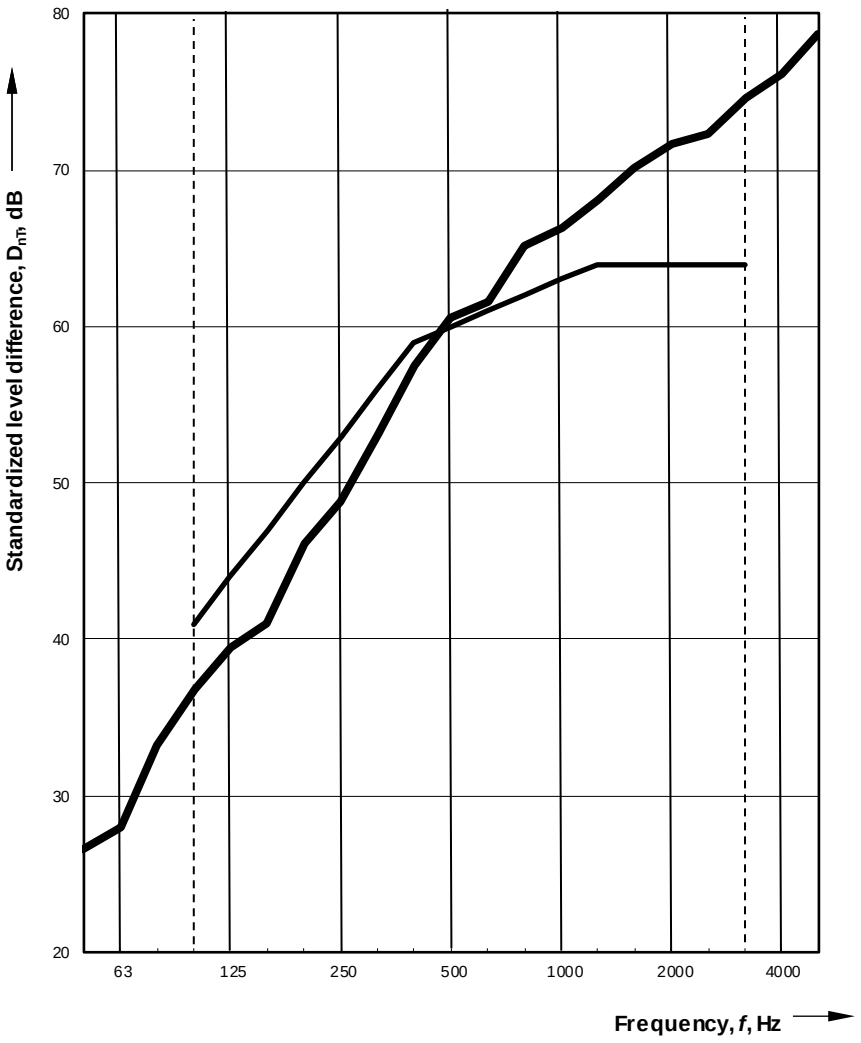
Client: Morton Brothers Date of test: 12/06/2023

Description and identification of the building construction and test arrangement, direction of measurement:
1 Dow nlands Parade, Upper Brighton Road, Worthing, BN14 9JH
Comerical Area to Living Room (Vertical)
Construction: Floor Type 3
Shared Area: 17.5m. Sq.

Source room volume: 75 m³
Receiving room volume: 42 m³

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

Frequency *f* Hz	D_{nT} (one-third octave) dB
50	26.6
63	28.0
80	33.2
100	36.8
125	39.5
160	41.0
200	46.1
250	48.8
315	53.1
400	57.5
500	60.5
630	61.6
800	65.2
1000	66.3
1250	68.1
1600	70.2
2000	71.7
2500	72.3
3150	74.6
4000	76.2
5000	78.7



Rating according to ISO 717-1

$D_{nT,w}$ $(C;C_{tr})$ = 60 (; -8) dB; $D_{nT,w}+C_{tr}$ = 52 dB

Evaluation based on field measurement
results obtained by an engineering method

No. of test report:	J3358/76639/2	Name of test institute:	Acoustic South East
Date:	12/06/2023	Signature:	Martyn Chambers

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

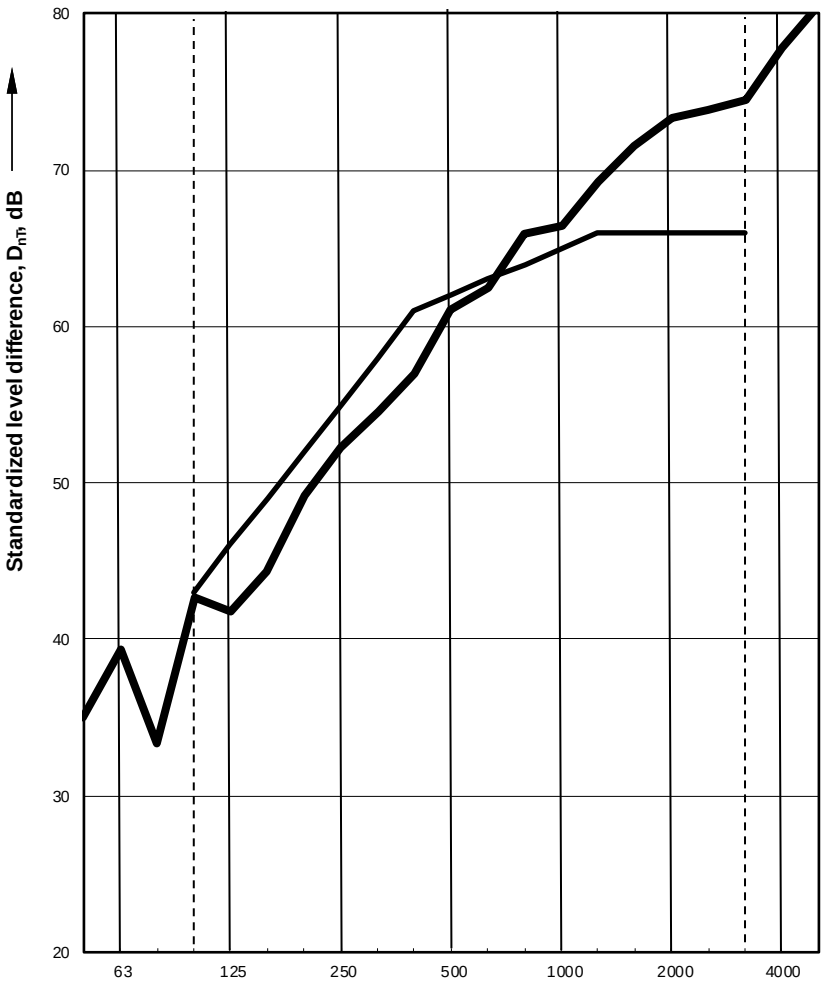
Client: Morton Brothers Date of test: 12/06/2023

Description and identification of the building construction and test arrangement, direction of measurement:
1 Dow nlands Parade, Upper Brighton Road, Worthing, BN14 9JH
Comerical Area to Front Bedroom(Vertical)
Construction: Floor Type 3
Shared Area: 10m. Sq.

Source room volume: 75 m³
Receiving room volume: 24 m³

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

Frequency *f* Hz	D_{nT} (one-third octave) dB
50	35.0
63	39.3
80	33.4
100	42.7
125	41.8
160	44.3
200	49.2
250	52.3
315	54.6
400	57.0
500	61.1
630	>= 62.5 *
800	>= 65.9 *
1000	>= 66.5 *
1250	>= 69.3 *
1600	>= 71.5 *
2000	73.4
2500	>= 73.9 *
3150	>= 74.5 *
4000	>= 77.8 *
5000	>= 80.5 *



* Result should be taken as limit of measurement due to low SNR in receiver room (<=6 dB)

Rating according to ISO 717-1

$D_{nT,w}$ $(C;C_{tr})$ = 62 (; -6) dB; $D_{nT,w}+C_{tr}$ = 56 dB

Evaluation based on field measurement
results obtained by an engineering method

No. of test report:	J3358/76639/3	Name of test institute:	Acoustic South East
Date:	12/06/2023	Signature:	Martyn Chambers