



Ian Sharland LIMITED

Noise & Vibration Control Specialists

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**Field tests for compliance with
AIRBORNE and IMPACT sound insulation requirements
for floors & walls**

at

9 Cliff Avenue
Swanage
Dorset

REPORT

Prepared by:

Peter Ashford BSc(Hons) MIOA

Date : 13 December 2006

Reference No : 3833/PJA

ANC Accreditation No : 139

Location: 4000 Ventura Swastika Drive
Test Date: 03/10/2014
Ref: 030214-A

REPORT

Report generated by
SIRASoft VBA version 1.0
on 03/10/2014

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Location: 9 Cliff Avenue, Swanage, Dorset

Test Date: 15/12/2015

Ref: 20150134

REPORT

Field Measurements
of Sound Insulation

for Ian Sharland Ltd

for Ian Sharland Ltd

1.0 Summary

Ian Sharland Ltd has been commissioned to check the actual sound insulation across the party walls & floors between the newly constructed flats at 9 Cliff Avenue, Swanage.

The tests detailed in this report have been carried out in full accordance with ISO 140-4 and ISO 140-71,2

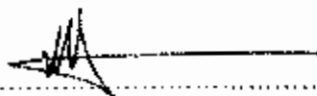
The report also compares the results achieved with the levels prescribed in Approved Document E of The UK Building Regulations 20035 in order to check for compliance. All the procedures in Annex B of Approved Document E of The Building Regulations have been followed.

Approved Document E states that the individual value of airborne insulation achieved should be not less than = 45 dB for walls, $D_{nTw} + C_{tr} = 45$ dB for floors. The values achieved for impact insulation should not be more than 62 dB.

The following test types were carried out:

Test Type:	No. of Room Pair Tests	Minimum Measured performance	Required performance	No. Passed or failed
Horizontal Airborne (Walls)	2	51	45 DnTw + Ctr	2 Pass
Vertical Airborne (floors)	2	56	45 DnTw + Ctr	2 Pass
Vertical impact (floors)	2	48	62 LnTw	2 Pass

The results show that the wall and floor structures tested meet and exceed the requirements of the Building Regulations.



Peter Ashford BSc MIOA

Location: 9 Cliff Avenue, Swanage, Dorset

Test Date: 05/12/2006

Ref: 7803 PJA

REPORT

For a full range of services

contact us on 01300

780300 or 01300

2.0 Test Report

2.1 General

Site: 9 Cliff Avenue
Swanage
Dorset

Type of Property: New Build

Test conducted by: Peter Ashford BSc MIOA
Ian Sharland Limited
Bampfylde House
Pollimore
Exeter
Devon
EX4 0AF

Date of tests: 05/12/2006

Client: John Massey
Swan Country Homes
3 Colway Rise
Colway lane
Lyme Regis
Dorset

Res.

Int. 1

2.2 Room Dimensions & Element Construction:

Test Reference	Source Room & Volume (m3) Apprx	Receiving room & Volume (m3) Apprx	Common Area
3833/1.1	Flat No.5 Bedroom 1 30	Flat No.6 Bedroom 1 40	10
3833/1.2	Flat No.6 Bedroom 2 24	Flat No.7 Bedroom 2 19	6

3833/2.1	Flat No.5 Bedroom 1 30	Flat No.10 Living room / Kitchen 87	12
3833/2.2	Flat No.6 Bedroom 2 24	Flat No.10 Bedroom 1 57	10

3833/3.1	Flat No.10 Living room / Kitchen 87	Flat No.5 Bedroom 1 30	12
3833/3.2	Flat No.10 Bedroom 1 57	Flat No.6 Bedroom 2 24	10

The following party floor & wall constructions were confirmed by to be;

Site Manager

Party walls;

Dry line
2 x 12.5mm Fermacell
100mm Stud
100mm Mineralwool
30mm Cavity
100mm Mineralwool
100mm Stud
2 x 12.5mm Fermacell
Dry line

Party floors;

4mm Veneer
18mm Ply
Fermacell Type2 E22 Flooring
Jupiter 30mm Eco Underfloor heating Tray
18mm OSB
225mm Timber Joists
100mm Mineralwool
Protektor TPS 25 Acoustic Hanger
2 x 12.5mm Fermacell

3.0 Results

3.1 General

Results of the measurements, in terms of single-figure ratings, are provided below. They are provided as Weighted Standardised Level Differences $D_{nTw} + C_{tr}$ (for airborne sound) as required by BS EN ISO 140-4 [1] and Weighted Standardised Impact Sound Pressure Levels L_{nTw} (for impact sound) as required by BS EN ISO 140-7 [2]. They are also defined in ISO 717-1&23,4, 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. Adverse deviations that occurred in excess are detailed in tabular results tables in accordance with BS EN ISO 140-4&7.

Approved Document E of The Building Regulations: *Resistance to the passage of sound*⁵ sets out the following requirements for dwellings formed by a material change of use:

Airborne Sound Insulation

The insulation values for airborne insulation for walls shall not be less than $D_{nTw} + C_{tr} = 45$ dB

The insulation values for airborne insulation for floors shall not be less than $D_{nTw} + C_{tr} = 45$ dB

Impact Sound Insulation

The insulation values for impact sound shall not be more than $L_{nTw} = 62$ dB

3.1 Separating walls (airborne sound):

Source Room	Receiving Room	D_{nTw} (db)	D_{nTw} + C_{tr} (db)	Minimum Pass Criterion	Pass / Fail	Ref No.
Flat No.5 Bedroom 1	Flat No.6 Bedroom 1	67	59	45	Pass	3833/1.1
Flat No.6 Bedroom 2	Flat No.7 Bedroom 2	55	51	45	Pass	3833/1.2

3.2 Separating Floors (airborne sound):

Source Room	Receiving Room	DnTw (db)	Dntw +Ctr (db)	Minimum Pass Criterion	Pass / Fail	Reff No.
Flat No.5 Bedroom 1	Flat No.10 Living room /	67	58	45	Pass	3833/2.1
Flat No.6 Bedroom 2	Flat No.10 Bedroom 1	64	56	45	Pass	3833/2.2

3.3 Separating Floors (impact sound):

Receiving Room	LnTw (dB)	Maximum Pass Criterion LnTw (dB)	Pass / Fail	Reff No.
Flat No.10 Living room /	42	62	Pass	3833/3.1
Flat No.10 Bedroom 1	48	62	Pass	3833/3.2

Graphical and Tabular Presentation of

On the following pages, the graphical results are presented from which the single-figure ratings are calculated as well as the equipment calibration certificates.

Peter Ashford BSc MIOA
Ian Sharland Limited

4.0 References

1. BS EN ISO 140-4:1998: *Field measurements of airborne sound insulation between rooms*
2. BS EN ISO 140-7: 1998: *Field measurements of impact insulation between rooms.*
3. BS EN ISO 717-1: 1997: *Rating of sound insulation in buildings and of building elements.* Part 1: Airborne Sound Insulation.
4. BS EN ISO 717-2: 1997: *Rating of sound insulation in buildings and of building elements.* Part 2: Impact Sound Insulation.
5. The Building Regulations 2000 (as amended 2003). *Approved Document E: Resistance to the Passage of Sound.*

5.0 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:

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

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:

$$L_{nT} = L_1 + 10 \log(T/T_0) \quad \text{dB}$$

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)

Standardized level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

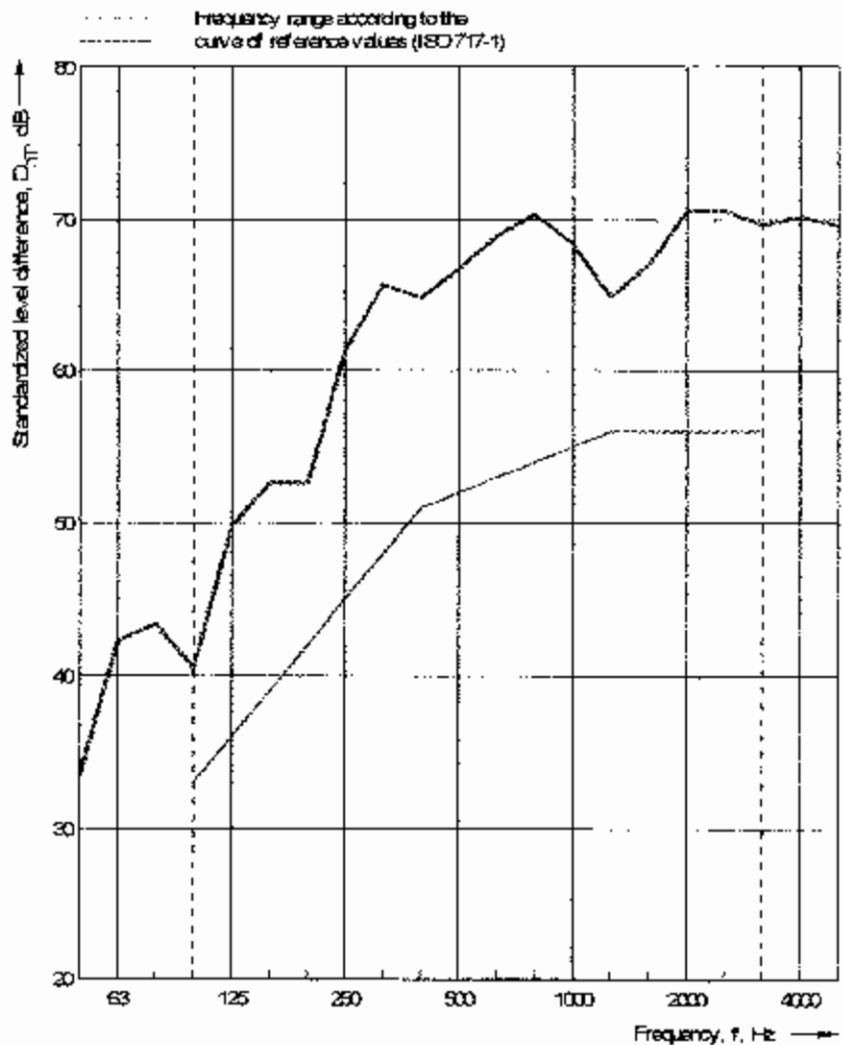
Client: Swan Country Homes
 Description: 9 Cliff Avenue, Swanage, Dorset

Date of test: 5/12/06

Object: Wall between Flat 5 Bedroom 1 and Flat 3 Bedroom 1

Receiving room volume: 40.0 m³

Frequency f [Hz]	D _{5T} 1/3 octave [dB]
50	33.4
63	42.3
80	43.4
100	40.5
125	49.8
160	52.6
200	52.6
250	61.3
315	65.7
400	64.8
500	66.8
630	69.0
800	70.4
1,000	68.4
1,250	64.9
1,600	87.1
2,000	70.8
2,500	70.6
3,150	69.7
4,000	70.2
5,000	69.6



Rating according to ISO 717-1

$$D_{nT,w}(C;C_p) = 67 (-3; -8) \text{ dB}$$

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

$$C_{50-3150} = -4 \text{ dB}$$

$$C_{0,50-3150} = -12 \text{ dB}$$

$$C_{50-5000} = -3 \text{ dB}$$

$$C_{0,50-5000} = -12 \text{ dB}$$

$$C_{100-5000} = 2 \text{ dB}$$

$$C_{0,100-5000} = -8 \text{ dB}$$

Company:

No. of test report: 3833/1.1

Date: 08/12/2006

Signature: 

Standardized level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

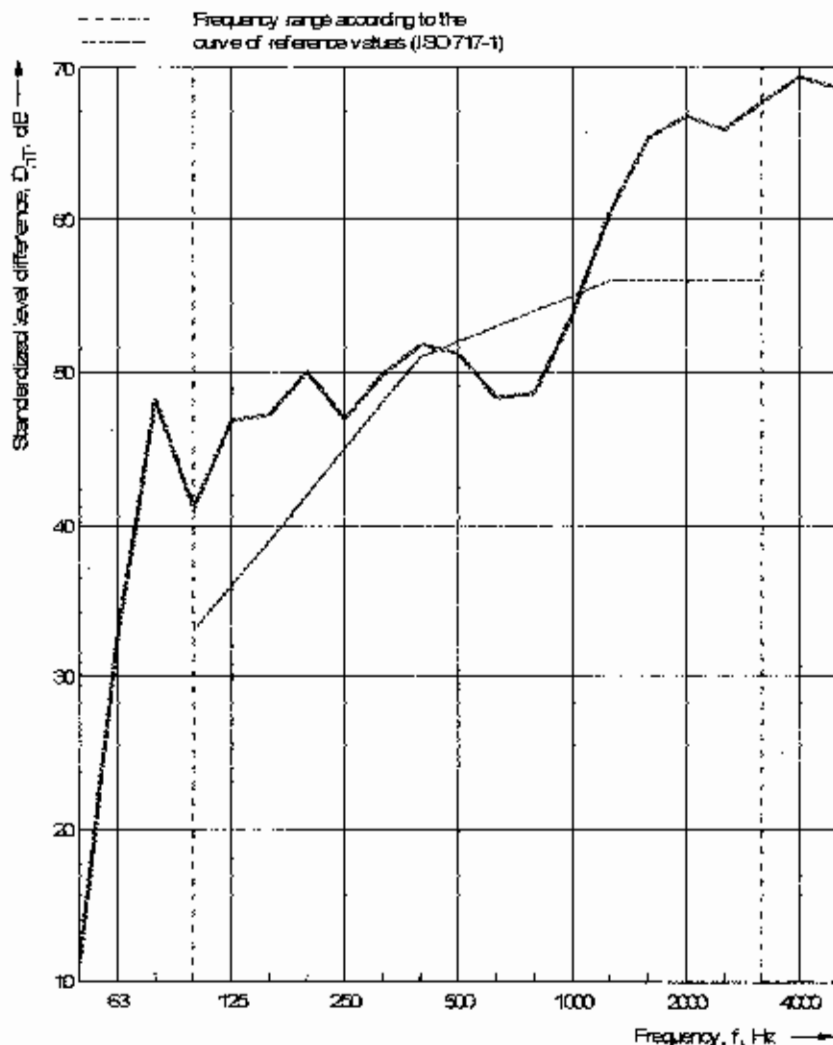
Client: Swan Country Homes
 Description: 9 Cliff Avenue, Swanage, Dorset

Date of test: 5/12/06

Object: Wall between Flat 6 Bedroom 2 and Flat 7 Bedroom 2

Receiving room volume: 19.0 m³

Frequency f [Hz]	D _{nT} 1/3 octave [dB]
50	11.2
63	32.7
80	48.2
100	41.1
125	46.8
160	47.2
200	50.0
250	46.9
315	49.8
400	51.8
500	51.2
630	48.3
800	48.6
1,000	53.8
1,250	60.5
1,600	65.4
2,000	66.8
2,500	65.9
3,150	67.7
4,000	69.4
5,000	68.6



Rating according to ISO 717-1

$$D_{nT,w}(C; C_T) = 55 (-1; -4) \text{ dB}$$

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

$$C_{50-3150} = -6 \text{ dB}$$

$$C_{T,50-3150} = -19 \text{ dB}$$

$$C_{50-5000} = -5 \text{ dB}$$

$$C_{T,50-5000} = -19 \text{ dB}$$

$$C_{100-5000} = 0 \text{ dB}$$

$$C_{T,100-5000} = -4 \text{ dB}$$

Company:
 No. of test report: 3833/1.2

Date: 09/12/2006

Signature:

Standardized level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

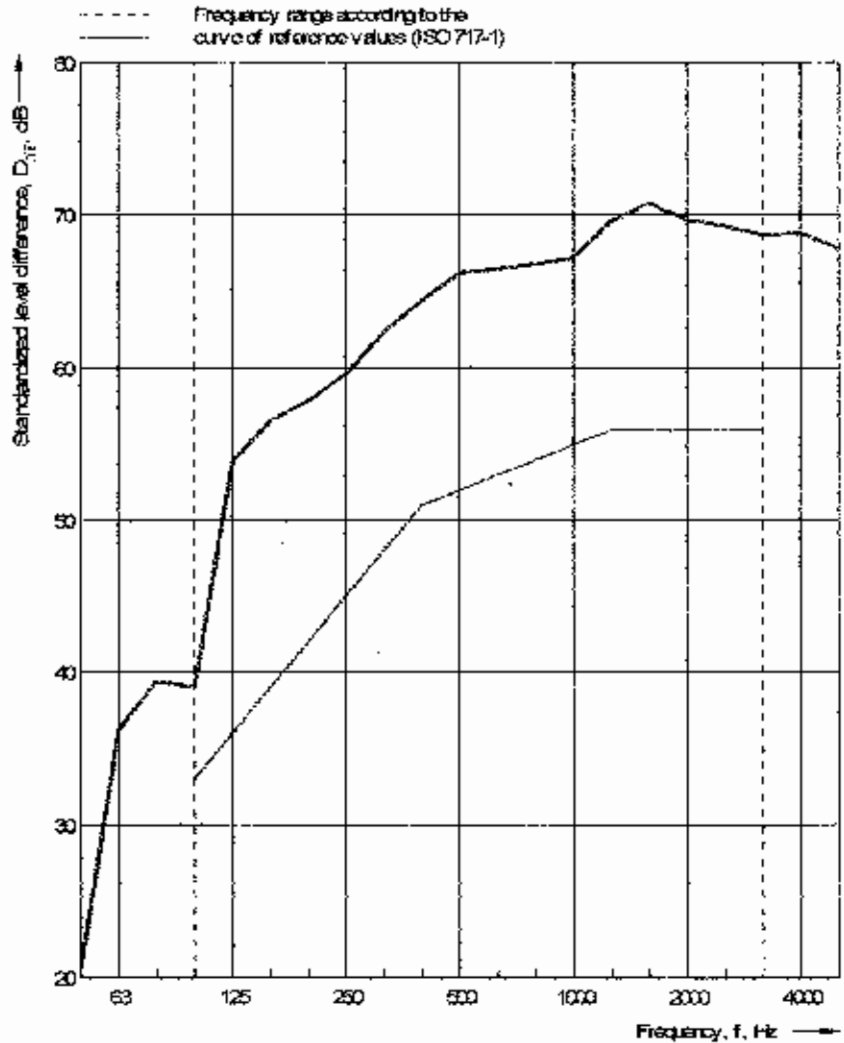
Client: Swan Country Homes
 Description: 9 Cliff Avenue, Swanage, Dorset

Date of test: 5/12/06

Object: Floor between Flat 5 Bedroom 1 and Flat 10 Living room / Kitchen

Receiving room volume: 87.0 m³

Frequency f [Hz]	D _{ST} 1/3 octave [dB]
50	20.7
63	36.2
80	39.4
100	39.0
125	53.9
160	58.6
200	57.9
250	59.6
315	62.3
400	64.4
500	68.2
630	68.5
800	66.8
1,000	67.2
1,250	69.6
1,600	70.8
2,000	69.7
2,500	69.3
3,150	66.7
4,000	68.8
5,000	67.8



Rating according to ISO 717-1

$$D_{f,T,R}(C;C_T) = 67 (-3; -9) \text{ dB}$$

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

$$C_{50-3150} = -8 \text{ dB}$$

$$C_{T,50-3150} = -22 \text{ dB}$$

$$C_{50-5000} = -7 \text{ dB}$$

$$C_{T,50-5000} = -22 \text{ dB}$$

$$C_{100-5000} = -2 \text{ dB}$$

$$C_{T,100-5000} = -9 \text{ dB}$$

Company:
 No. of test report: 3833/2.1

Date: 08/12/2006

Signature:

Standardized level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

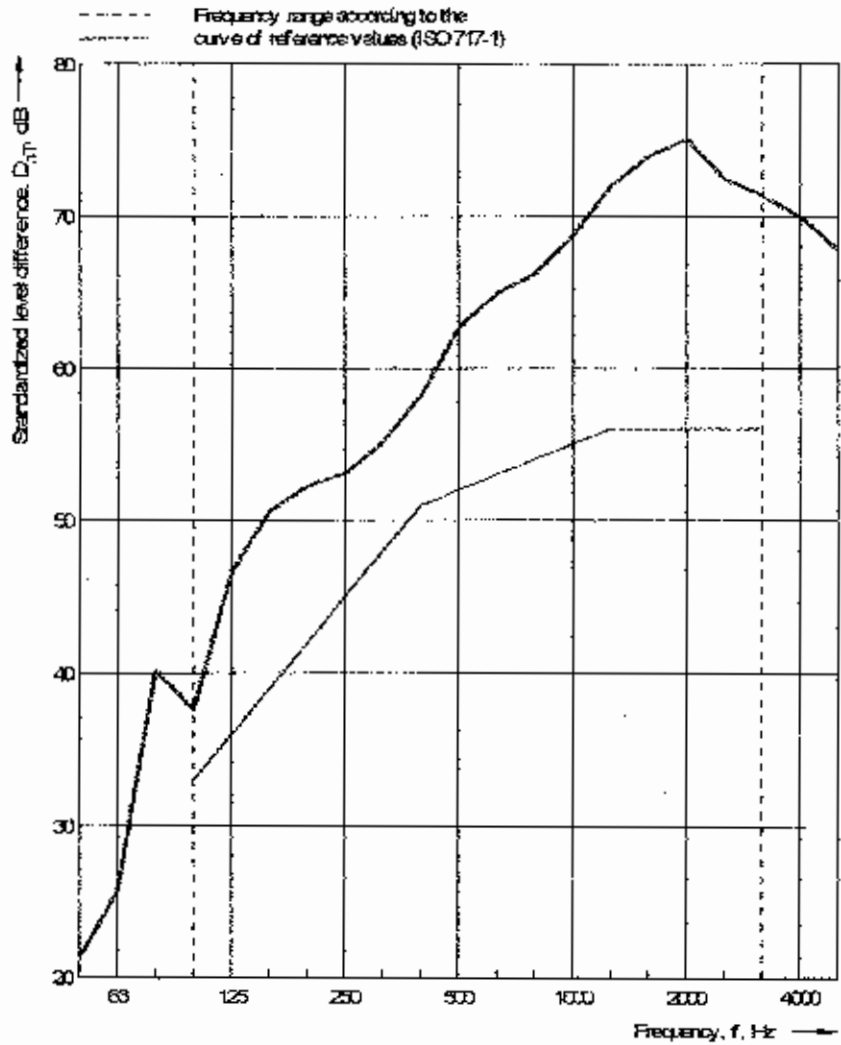
Client: Swan Country Homes
 Description: 9 Cliff Avenue, Swanage, Dorset

Date of test: 5/12/06

Object: Floor between Flat 6 Bedroom 2 and Flat 10 Bedroom 1

Receiving room volume: 57.0 m³

Frequency f [Hz]	D _{nT} 1/3 octave [dB]
50	21.3
63	25.7
80	40.2
100	37.6
125	46.6
160	50.6
200	52.2
250	53.0
315	55.1
400	58.2
500	62.7
630	65.0
800	66.3
1,000	68.8
1,250	72.0
1,600	74.0
2,000	75.1
2,500	72.5
3,150	71.4
4,000	70.0
5,000	67.8



Rating according to ISO 717-1

$$D_{nT,w}(C;C_T) = 64 (-2; -8) \text{ dB}$$

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

$$C_{50-3150} = -7 \text{ dB}$$

$$C_{T,50-3150} = -20 \text{ dB}$$

$$C_{50-5000} = -8 \text{ dB}$$

$$C_{T,50-5000} = -20 \text{ dB}$$

$$C_{100-5000} = -1 \text{ dB}$$

$$C_{T,100-5000} = -8 \text{ dB}$$

Company:

No. of test report: 3833/2.2

Date: 06/12/2006

Signature:

Standardized impact sound pressure levels according to ISO 140-7

Field measurements of impact sound insulation of floors

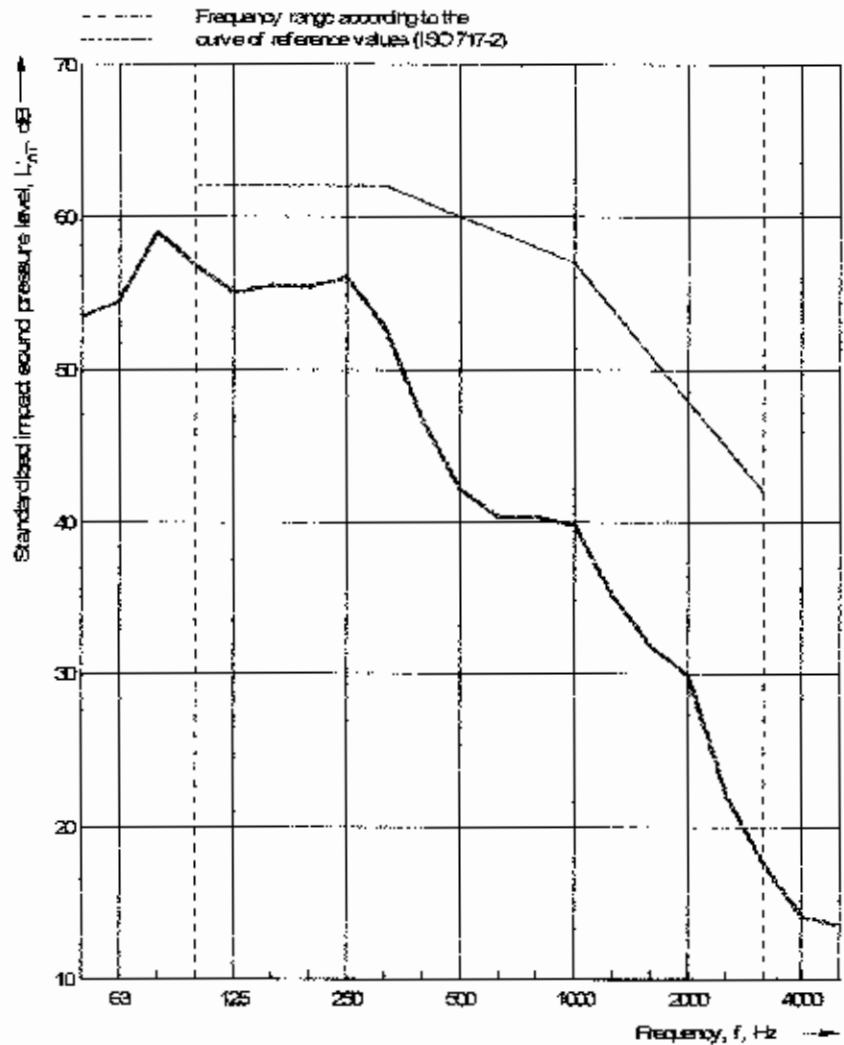
Client: Swan Country Homes
 Description: 9 Cliff Avenue, Swanage, Dorset

Date of test: 5/12/06

Object: Floor between Flat 10 Bedroom 1 and Flat 6 Bedroom 2

Receiving room volume: 24.0 m³

Frequency f [Hz]	L _{n1} 1/3 octave [dB]
50	53.5
63	54.5
80	59.0
100	56.8
125	55.0
160	55.5
200	55.4
250	56.0
315	52.6
400	46.7
500	42.2
630	40.4
800	40.4
1,000	39.8
1,250	35.2
1,600	31.8
2,000	29.9
2,500	22.1
3,150	17.6
4,000	14.2
5,000	13.6



Rating according to ISO 717-2

$$L_{nT,w}(C) = 48 (0) \text{ dB}$$

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

$$C_{150-2500} = 2 \text{ dB}$$

Company:
 No. of test report: 3833/3.2

Date: 08/12/2006

Signature: 

Standardized impact sound pressure levels according to ISO 140-7

Field measurements of impact sound insulation of floors

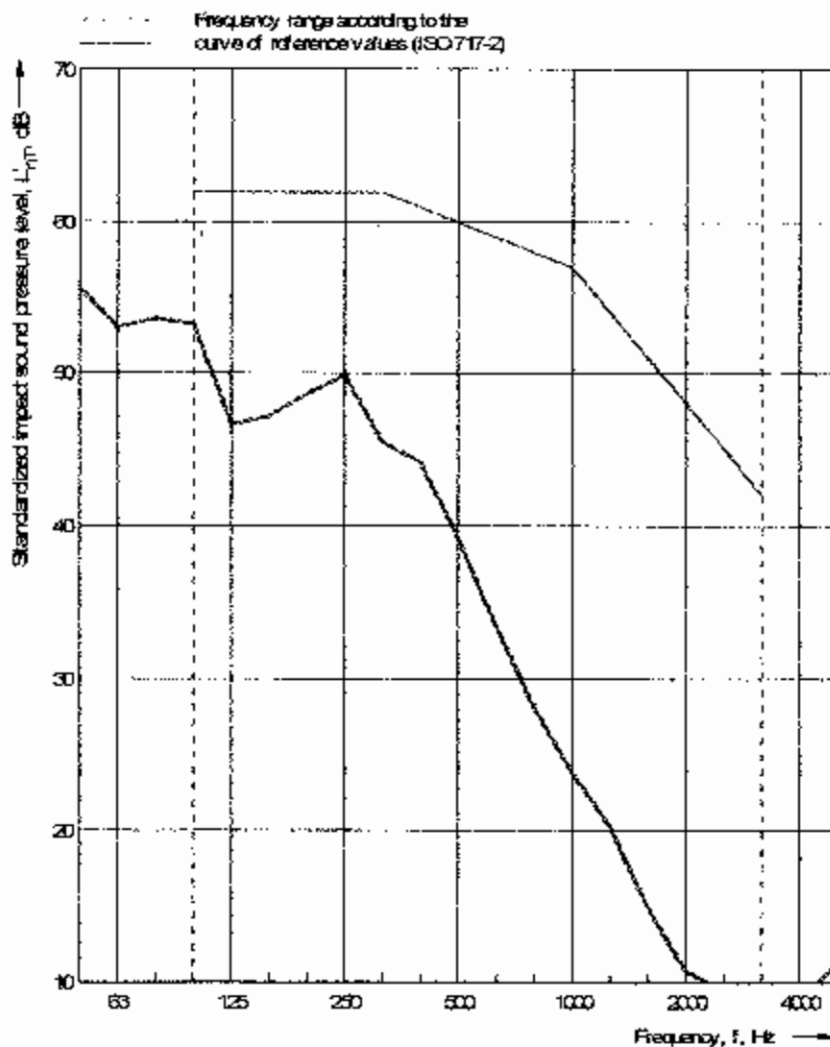
Client: Swan Country Homes
 Description: 9 Cliff Avenue, Swanage, Dorset

Date of test: 5/12/06

Object: Floor between Flat 10 Living room / Kitchen and Flat 5 Bedroom 1

Receiving room volume: 30.0 m³

Frequency f [Hz]	L _{nT} 1/3 octave [dB]
50	55.6
63	53.0
80	53.6
100	53.2
125	46.6
160	47.1
200	48.8
250	49.8
315	45.4
400	44.1
500	39.2
630	33.5
800	28.1
1,000	23.8
1,250	20.3
1,600	14.9
2,000	10.7
2,500	9.4
3,150	8.4
4,000	9.0
5,000	11.1



Rating according to ISO 717-2

$$L'_{nT,w}(C) = 42 (0) \text{ dB}$$

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

$$C_{1,50-2500} = 4 \text{ dB}$$

Company:
 No. of test report: 3833/3.1

Date: 08/12/2006

Signature: 