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BUILDING REGULATIONS 2000

APPROVED DOCUMENT E 2003

SOUND INSULATION TEST REPORT

Report 6060.SI.01

Prepared on 22 February 2012

For:

R E Wiltshire (Builders) Ltd

Meadow View

Hoe Street

Hambledon

Waterlooville

Hants

PO7 4RD

Site Address	Type of Property	Test Date	Tested by
30-32 East Street Havant PO9 1AQ	Material Change of Use	20/02/2012	Max Foster TechIOA

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Figures 6060.AB1-2 Airborne Sound Insulation Test Results

1.0 INTRODUCTION

Practical Acoustics Ltd, 202 Uxbridge Road, London W12 7JP has been commissioned by R E Wiltshire (Builders) Ltd, Meadow View, Hoe Street, Hambledon, Waterlooville, Hants, PO7 4RD to undertake pre-completion tests at 30-32 East Street, Havant, Hants, PO9 1AQ under the provisions of Building Regulations Approved Document E (2003 Edition).

This report records the results of the sound insulation tests and details the procedures used throughout the measurement and post-processing phases.

The sound insulation tests detailed in this report were undertaken by Max Foster TechIOA in full accordance with BS EN ISO 140-4: 1998 *"Field measurements of airborne sound insulation between rooms"* and the procedures described in Annex B of the Approved Document.

Please note that, although the sound insulation performance of the floor tested is assessed against Approved Document E (2003 Edition) of the Building Regulations 2000, the results are for indicative purposes only and for the purpose of providing advice on improvement works as deemed necessary.

2.0 METHODOLOGY

2.1 Airborne Tests

High volume "white" noise was generated from two loudspeakers in the source room, positioned to obtain a diffuse sound field. A spatial average of the resulting one-third octave band noise levels between 100 Hz and 3150 Hz was obtained by using a moving microphone technique over a minimum period of 15 seconds at each of two positions.

The same measurement procedure was used in the receiver room.

The results of the tests were rated in accordance with BS EN ISO 717-1: 1997 "Rating of sound insulation in buildings and of building elements. Part 1 Airborne sound insulation".

2.2 Reverberation Time

Reverberation time measurements were taken following the procedure described below in order to correct the receiver levels for room characteristics.

The source was moved to the receiver room and "white noise" was generated and stopped instantaneously in order to measure the reverberation time in each of the one-third octave bands between 100 Hz and 3150 Hz. The internal programme of the meter was used to measure the decay time of the sound in the room. This was repeated nine times in each room in order to obtain an average result.

2.3 Background Noise

The background noise levels in the receiver rooms were measured during the tests and the receiving room levels corrected in accordance with BS EN ISO 140 Part 4.

The dominant source of background noise observed during the tests was road traffic noise from East Street.

3.0 INSTRUMENTATION

The instrumentation used during testing is shown in Table 3.1 below.

Instrument	Manufacturer and Type	Serial Number
Precision integrating sound level meter & analyser	01dB-Sell Grey Solo Calibration Certificate AC/08/209/05	10045
Active Loudspeaker	RCF ART 310A	HAX20870
Active Loudspeaker	RCF ART 310A	HAX20864
White Noise Source	Acoustic Solutions – 513/4043	N/A
White Noise Source	Acoustic Solutions – 513/4043	N/A
Calibrator	Norsonic Type 1251 Calibration Certificate AC/08/209/01	31716
Specialist Software	01dB-Metravib dBBati	V5.050

Table 3.1 - Instrumentation used during testing

4.0 REQUIREMENTS

The sound insulation requirements for this development, as prescribed by Approved Document E (2003 Edition) of the Building Regulations 2000, are shown in Table 6.1 where they are compared to the test results.

5.0 TEST ROOMS

Details of the rooms tested are shown in Table 5.1 below. All the rooms tested were in a finished state, with doors fitted, walls painted and all sockets installed.

Test Element	Room 1	Room 2	Construction
Floor	Ground Floor Studio Area	First Floor Space	Not known at time of test
Floor	Ground Floor Bar Area	First Floor Space	

Table 5.1 - Room details

All the procedures described in Annex B of Approved Document E 2003 of the Building Regulations 2000 have been followed with the exceptions described in Table 5.2.

6.0 RESULTS

The results of testing are summarised in the tables below. For airborne tests, the higher the value, the better the performance.

6.1 Airborne Tests

The summarised results of the airborne tests are shown in Table 6.1. Full third octave band results are shown in Figures 6060.AB1-2 attached.

Test Element	Source	Receiver	Criterion	Test Result	Pass/Fail
Floor	Ground Floor Studio Area	First Floor Space	$D_{nT,w} + C_{tr} \geq 43\text{dB}$	$D_{nT,w} + C_{tr} 44\text{dB}$	Pass
Floor	Ground Floor Bar Area	First Floor Space	$D_{nT,w} + C_{tr} \geq 43\text{dB}$	$D_{nT,w} + C_{tr} 47\text{dB}$	Pass

Table 6.1 - Airborne Test Results

7.0 DISCUSSION

As can be seen from Table 6.1 above, the airborne results constitute a 'pass' with respect to current Building Regulations. Additional measures are specified below in order to improve upon the current sound insulation performance following the refurbishment works.

It can be seen that the Ground Floor Studio Area offers a lower result, mainly due to the weak floor area caused by the removed section of concrete slab.

It is understood that, where an escalator once was, plywood and timber joists have been installed in its place. In order to improve upon the measured levels and ensure a higher level of sound insulation in this area, we would recommend the installation of 1 x 15mm layer of SoundBloc plasterboard to the underside of the plywood within the ceiling void.

We would also recommend the removal of the top layer of plywood and in-filling the floor void with 100mm mineral wool slab (of density 45 kg/m^3) such as Rockwool RWA 45. Finally, we would recommend that a layer of 22mm chipboard or similar is installed to accommodate the floor finish.

In addition to the above, it is understood that improvements will be made to the access stairwell that separates the bar and the first floor flat. Where there is currently a hole blocked up with a chalk board, this should be fully bricked up.

Additionally, it is understood that the stairwell wall will be dry-lined. For this, we would recommend that 1 x layer of 15mm SoundBloc plasterboard is used installed on dot and dab with a continuous dab around the perimeter.

8.0 CONCLUSIONS

Sound Insulation tests were undertaken at 30-32 East Street, Havant, Hants, PO9 1AQ under the requirement of Building Regulations 2000 Approved Document E (2003 Edition).

Ratings of the airborne sound insulation of the floors tested have been calculated in accordance with the measurement and rating procedures defined in BS EN ISO 140 Part 4 and BS EN ISO 717 Part 1, respectively.

The airborne performance of the floors between Ground Floor and First Floor meets the requirements of Approved Document E (2003 Edition) of the Building Regulations 2000.

Outline mitigation measures have been proposed which would be expected to improve upon the current sound insulation performance following the refurbishment works.

Report by
Max Foster TechIOA

Checked by
Florian Clement MIOA

Standardised Sound Insulation According to BS EN ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Site Address: 30-32 East Street, Havant, Hants PO9 1AQ

Client: R E Wiltshire (Builders) Ltd

Test Date: 20/02/12

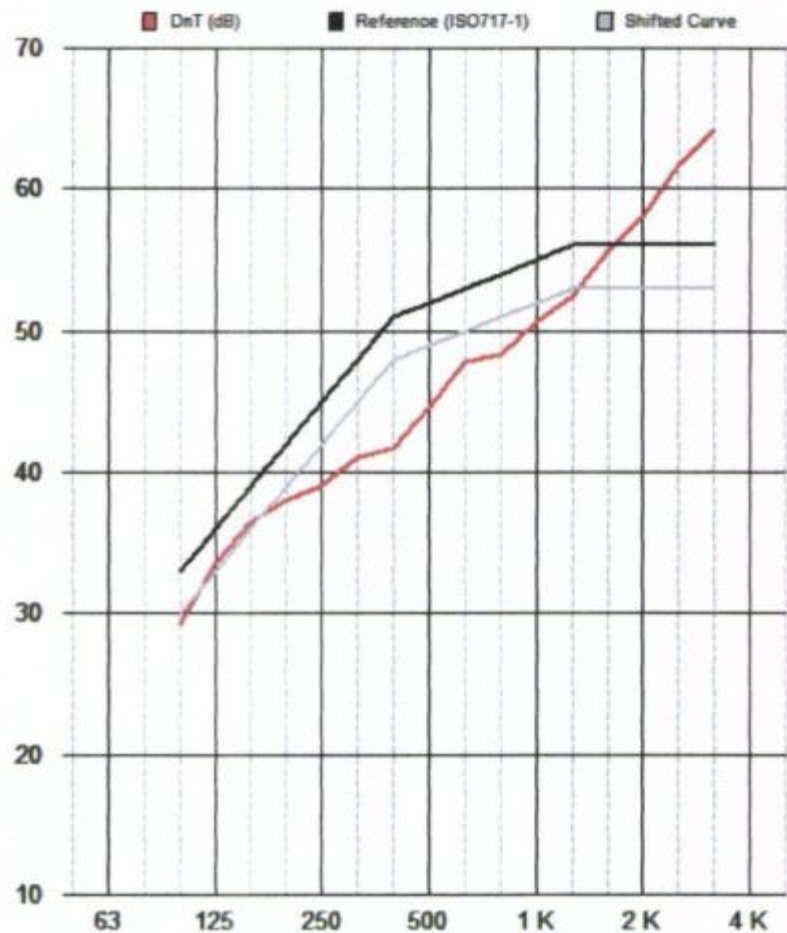
FIGURE 6060.AB1

Test Rooms:

Ground Floor Studio Area - First Floor Space

Frequency (Hz)	Dn,T (dB)
50	
63	
80	
100	29.2
125	33.6
160	36.4
200	38.0
250	39.1
315	41.0
400	41.7
500	44.7
630	47.8
800	48.4
1000	50.6
1250	52.5
1600	55.7
2000	58.0
2500	61.6
3150	64.1
4000	
5000	

Standardised Level Difference, Dnt, dB



">=" Shows limit of measurement due to background noise

$D_{n,T,w} (C; C_{tr}) (dB) : (C; C_{tr}) = 49 (-1; -5)$

Frequency (Hz)

$D_{n,T,w} + C_{tr} (dB) = 44$ according to ISO 717-1

Estimation based on field measurement results obtained using procedure described in Report 6060.

Tested by: M. Foster TechIOA

Standardised Sound Insulation According to BS EN ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms

Site Address: 30-32 East Street, Havant, Hants PO9 1AQ

Client: R E Wiltshire (Builders) Ltd

Test Date: 20/02/12

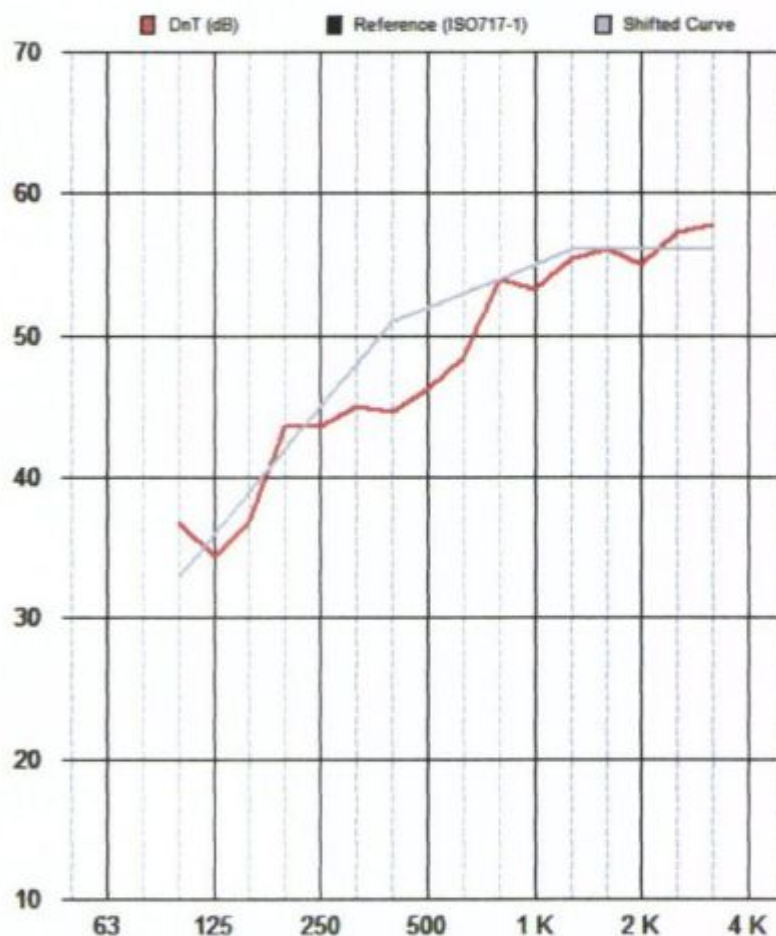
FIGURE 6060.AB2

Test Rooms:

Ground Floor Bar Area - First Floor Space

Frequency (Hz)	Dn,T (dB)
50	
63	
80	
100	36.8
125	34.4
160	36.8
200	43.6
250	43.6
315	45.0
400	44.7
500	46.2
630	48.5
800	53.9
1000	53.3
1250	55.4
1600	56.0
2000	55.0
2500	57.3
3150	57.8
4000	
5000	

Standardised Level Difference, Dnt, dB



">=" Shows limit of measurement
due to background noise

$D_{n,T,w} (C; C_{tr}) (dB) : (C; C_{tr}) = 52 (-2; -5)$

$D_{n,T,w} + C_{tr} (dB) = 47$ according to ISO 717-1

Frequency (Hz)

Estimation based on field measurement results obtained using procedure described in Report 6060.

Tested by: M. Foster TechIOA