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Test Date: 22nd July 2009
Report No: 4791

ANC Accreditation No: 139
ANC Test Reference: 23902

**FIELD TESTS FOR COMPLIANCE WITH
SOUND INSULATION REQUIREMENTS
FOR
WALLS & FLOORS
AT
ATLANTIC COURT
NORTHFIELD ROAD
ILFRACOMBE
EX34 8AL**

27th July 2009

Report by:

John Hammond TechIOA

Checked by:

Peter Ashford BSc, MIOA

Client: Atlantic Developments
No.2 Northfield Road
Ilfracombe
North Devon
EX34 8AL



ANC sound test *verification* for ADE

Notice to Building Control Officer

Certification of Test Results.

From the 31st December 2009 the ANC intend to cease to issue paper certificates and will go over to an online, entirely secure, paperless certification system for sound insulation tests.

Prior to the proposed cut-off date, the online verification (certification) system is available now. Building Control Bodies should follow the following steps to access the Test Results:

1. Go to the ANC secure server at

<http://cmms.lesander.co.uk/bco/promptscreen.php>

2. Enter the following in the spaces provided:

Task Number **23902** **Task Password** **FM1NR5**

A summary list of the results for all of the Tests undertaken to date for this project (Task) will be available for viewing and printing

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1 SUMMARY

1. The tests detailed in this report were carried out on 22nd July 2009; to check the acoustic performance of the party walls & floors between new Flat's at Atlantic Court, Northfield Road, Ilfracombe, North Devon, EX34 8AL.
2. The tests detailed in this report have been carried out in full accordance with ISO 140-4 and ISO 140-7^{1,2}.
3. The report also compares the results achieved with the levels prescribed in Approved Document E of The 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.
4. Approved Document E states that the individual values of airborne sound insulation ($D_{nT,w} + C_{tr}$) should be not less than 45 dB for walls and floors in new properties. The values achieved for impact sound insulation ($L_{nT,w}$) should not be more than 62 dB.
5. The following test types were carried out:

Test Type:	No. of Room-pair Tests	Required performance	Measured Performance	Pass Or fail
Horizontal, Airborne (Walls)	1	≥ 45 dB $D_{nT,w} + C_{tr}$	61 dB $D_{nT,w} + C_{tr}$	Pass
Vertical Airborne (Floors)	2	≥ 45 dB $D_{nT,w} + C_{tr}$	50, 52 dB $D_{nT,w} + C_{tr}$	Pass
Vertical Impact (Floors)	2	≤ 62 dB $L_{nT,w}$	48, 49 dB $L_{nT,w}$	Pass

6. **The results show that the airborne and impact sound insulation performance of the party walls & floors tested meets and exceeds the minimum requirements of the Building Regulations, Document E 2003.**

Building control specified testing regime.

2. TEST REPORT

2.1 General

Client: Atlantic Developments
No.2 Northfield Road
Ilfracombe
North Devon
EX34 8AL

Site: Atlantic Court, Northfield Road, Ilfracombe, EX34 8AL.

Background Noise: Dominant noise local traffic.

Type of Property: New Build block of 12 Flats
Non Historical Building

Test conducted by: John Hammond TechIOA
Ian Sharland Limited
Bampfylde House
Poltimore
Devon
EX4 0AF

Date of tests: 22nd July 2009

2.2 Element Construction

Party Walls: Plaster Skim – 12.5mm P/B – Durisol Composite Block– 12.5mm
P/B – Plaster Skim.

Party Floors: 22mm T&G – 19mm P/B – 72mm Resilient Baton – 10mm OSB –
Timber Joists – 100mm Mineral wool – Resilient Bars – 2 x
12.5mm S/B – Plaster Skim.

2.3 Test Method

The survey was conducted between pairs of rooms, following the guidance set out in BS EN ISO 140 1998, part 4, “Measurement of sound insulation in building and of building elements - field measurements of airborne sound insulation between rooms”, and BS EN ISO 140 1998, part 7, “Measurement of sound insulation in building and of building elements - field measurements of impact sound insulation between rooms”. For clarification, the test procedure also followed clarification issued by BRE, namely method 3, as described below.

For the airborne sound insulation tests, two loudspeakers were set up, facing into the corners of the source room on one side of the partition under test. A separate white noise signal was then played through each PA. Attended source and receiver room measurements were taken using six static microphone positions; measured over 6 seconds (as defined in ISO 140:4 Section 6.3.2). The tester remained still during each measurement and within the room throughout the measurements.

For the impact noise tests, a standard tapping machine was positioned in the source room. The hammer produces a steady impact noise by repeatedly dropping a number of cam-driven weights onto the floor from a fixed height - the tapping machine is equipped with a ‘spacer’ and adjustable feet so that the drop-height can be checked before each test. Attended receiver room measurements were taken using six static microphone positions; measured over 6 seconds (as defined in ISO 140:4 Section 6.3.2). The tester remained still during each measurement and within the room throughout the measurements. The tapping hammer was then moved to a minimum of three further positions with a total of six noise levels recorded for each test set.

A minimum of six measurements of the Reverberation Time in each receiving room were made using the impulse method (starting pistol), the values then being used to normalise the measured airborne sound level differences, in accordance with the recommendations of the British Standards. Also, background noise levels were recorded in each receiving room, to ensure that the measured levels from the loudspeaker or tapping hammer were sufficiently above extraneous noise sources, such as traffic. Where necessary, an adjustment was made to account for high background levels, as prescribed in the Standards.

Data was subsequently analysed using Norsonic NORBUILD software (v2.1), which meets the requirements of BS EN ISO 140 and 717, and Annex B of ADE.

Equipment:

Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Calibration	Calibration Cert No.
SLM	118	Norsonic	31591	17.04.2008	3813
Microphone	1225	Norsonic	68831	18.04.2008	3814
Calibrator	GA 607	Castle	036821	16.04.2008	3815
2 x PA	ART310A	RCF		N/A	N/A
2 x Source	MR1	Minirator		N/A	N/A
Tapping Hammer	TP2	Sound Solutions	TP02024	30.05.2008	134/02024/05/08

2.4 Exceptions to the requirements of Annex B of the Building Regulations

Section of Annex B	Requirement	Areas of non compliance	Procedure Carried Out
B2.11	Test rooms to have a volume of 25m ³ if possible	None	N/A
B2.12	Test rooms to be unfurnished	None	N/A
B2.13/2.14	Impact tests to be conducted on floor without soft covering unless it is an integral part of the approved specification	None	N/A
B2.15	In unequal rooms, the larger room should be used as the source room	None	N/A
B2.16	Doors/windows should be closed	None	N/A
B2.17	Kitchen units, cupboards etc should have their doors open and be unfilled	None	N/A

3. 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 $D_{nT,w} + C_{tr}$ (for airborne sound) as required by BS EN ISO 140-4¹ and Weighted Standardised Impact Sound Pressure Levels $L_{nT,w}$ (for impact sound) as required by BS EN ISO 140-7². They are also defined in ISO 717-1&2^{3,4}, 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 of 8 dB are also recorded 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 new dwellings:

Requirements of Document E 2003	Party Floors - Airborne Insulation $D'_{nT,w} + C_{tr}$	Party Floors - Impact Insulation $L'_{nT,w}$	Party Walls - Airborne Insulation $D'_{nT,w} + C_{tr}$
New Builds	Min 45 dB $D'_{nT,w}$	Max 62 dB $L'_{nT,w}$	Min 45 dB $D'_{nT,w}$
Conversions	Min 43 dB $D'_{nT,w}$	Max 64 dB $L'_{nT,w}$	Min 43 dB $D'_{nT,w}$

It is noted that airborne sound insulation is measured as a difference in sound levels across a partition. Therefore, a larger difference represents a better level of insulation, and the Regulations state the requirements as a minimum acceptable difference. In contrast, impact sound insulation is measured as an absolute level in the receiving room, due to the standard tapping hammer on the floor above. In this situation, a lower noise level represents a better level of insulation and the Regulations therefore specify a maximum allowable level.

3.2 Separating Walls (airborne sound):

Ref. No.	Source Room		Receiving Room		D _{nT_w} + C _{tr} (dB)		Pass/ Fail
	Description	Vol m ³	Description	Vol m ³	Required Value	Measured Value	
4791/1.01	Flat No.8 Living room / Kitchen	50	Flat No.7 Living room / Kitchen	40	≥45	61	Pass

3.3 Separating Floors (airborne sound):

Ref. No.	Source Room		Receiving Room		D _{nT_w} + C _{tr} (dB)		Pass/ Fail
	Description	Vol m ³	Description	Vol m ³	Required Value	Measured Value	
4791/2.01	Flat No.8 Living room / Kitchen	50	Flat No.10 Living room / Kitchen	50	≥45	50	Pass
4791/2.02	Flat No.8 Living room / Kitchen	50	Flat No.6 Living room / Kitchen	50	≥45	52	Pass

3.4 Separating Floors (impact sound):

Ref. No.	Source Room		Receiving Room		L _{nT_w} (dB)		Pass/ Fail
	Description	Vol m ³	Description	Vol m ³	Required Value	Measured Value	
4791/3.01	Flat No.10 Living room / Kitchen	50	Flat No.8 Living room / Kitchen	50	≤62	48	Pass
4791/3.02	Flat No.8 Living room / Kitchen	50	Flat No.6 Living room / Kitchen	50	≤62	49	Pass

4. 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. 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 717-2, based on the D_{nT} values at different frequencies (100-3150 Hz).

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: L₁ is the energy-averaged sound pressure level due to the white noise source measured in the source room using fixed point technique.
L₂ is the energy-averaged sound pressure level measured in the receiving room using fixed point technique.
T is the mean receiving room reverberation time (derived from T₃₀, secs).
T₀ is the reference reverberation time (= 0.5s for dwellings).

C_{tr} **Spectrum Adaptation Term** calculated in accordance with BS EN ISO 717-2, 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 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).

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: L₁ is the mean sound pressure level due to the tapping machine measured in the receiving room using fixed point technique.
T is the mean receiving room reverberation time (derived from T₃₀, secs).
T₀ is the reference reverberation time (= 0.5s for dwelling)