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SOUND INSULATION TESTS AND ADVICE

MARTEC ENVIRONMENTAL CONSULTANTS LTD

ANC REGISTERED TESTERS NO.134

Report Date	04-Aug-22
Site Address	55 Barlow Moor Road, Chorlton
Property Type	Flats
Tested Construction -	Conversion
Client	Carnarvon Street Properties Ltd
Client Address	15 Carnarvon Street, Manchester
Leq No	9201
Software Version	2.49

Prepared by: M A Kenyon MSc BSc MIOA



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1.0 INTRODUCTION

Martec Environmental Consultants Ltd were instructed to carry out sound insulation tests on separating structures as detailed on the title page of this report; the purpose of the tests was to determine whether the tested constructions met the performance standards of The Building Regulations [See Appendix 1] and to recommend remedial works as appropriate.

This report describes the rooms tested by Mel Kenyon on 14th July 2022, the equipment used, the results obtained, and draws conclusions as to the performance of the structure in comparison with the standards required in the current Building Regulations and makes recommendations as appropriate. The detailed result graphs appear at the rear of the report.

2.0 CONSTRUCTION

2.1 Between Ground and First Floor

It is understood that the separating floor between ground and first floors has been constructed as follows:

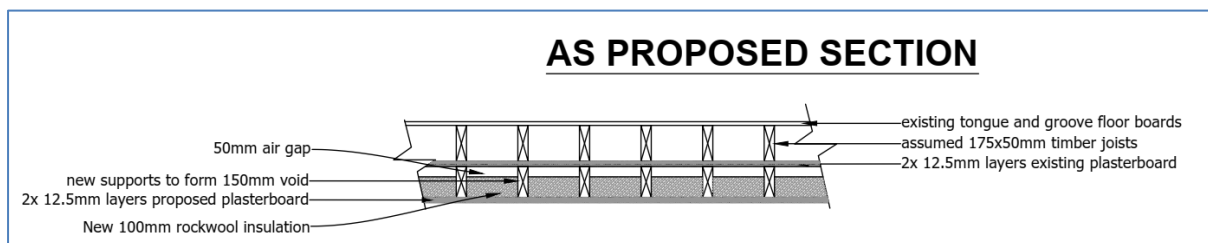


Figure 1: Ground Floor Ceiling Construction

From observations on site during the tests, the ceiling would appear to be two layers of Soundbloc plasterboard with 'staggered joints' but which had not been skimmed. There were significant sections of the floor above, that were missing. Given the fact that the original and additional ceilings were intact it was considered appropriate to conduct airborne sound insulation testing of this structure to the commercial space below; under such circumstances there are no requirements within the Building Regulations for impact testing.

Previously it had been recommended that the proposed construction should be modified to conform to 'Floor Treatment 1' from Approved Document E of The Building Regulation; however, this does not appear to have occurred.

2.2 Between First and Second floor

Figure 2 is a photograph taken on the first floor looking up at the ceiling. In addition, access was available to the second floor flat to walk around on the floor. The construction appeared to be timber floorboards above with lath and plaster ceilings below. Given the large sections of the missing ceiling with only the original floorboards above, it was not considered appropriate to conduct either airborne or impact testing.



Figure 2: Ceiling on First floor

3.0 CRITERIA

For airborne sound insulation, Part E of The Building Regulations relies on a single number value for assessment of sound insulation; this term is known as $D_{nT,w}+C_{tr}$; $D_{nT,w}$ was the previous single figure term and C_{tr} is a spectrum adaptation term designed to give more weight to the performance of separating structures at low frequencies. For dwellings and rooms for residential purposes formed by a material change of use, the airborne sound insulation of both separating walls and floors should

achieve a value of 43 dB $D_{nT,w+Ctr}$ or higher. The larger the $D_{nT,w+Ctr}$ the better the airborne sound insulation.

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For impact sound and separating floors, the required value is an $L'_{nT,w}$ of 64 dB or less for constructions subject to a material change of use. The smaller the $L'_{nT,w}$ the better the impact sound insulation.

4.0 MEASUREMENTS

Approximate room dimensions were measured on site. Where cupboards were located on walls, they were opened during the measurements. In addition, all the procedures described in Annex B of Approved Document E of the Building Regulations have been followed except when stated otherwise.

4.1 For Airborne Sound Insulation Tests

The airborne sound insulation of the separating structures was tested in full accordance with the methodology of ISO 140:1998 Part 4 and single number values for $D_{nT,w}$ & $D_{nT,w+Ctr}$ were calculated using the methodology of ISO 717: 1997 part 1.

Two sweep measurements were made over the course of at least 30 seconds and during the first measurement any differences between adjacent 1/3 octaves, greater than 6 dB, were eliminated by a combination of adjusting the source settings, moving the loudspeakers or by moving diffusers (or furniture). Subsequently two 30 second sweep measurements were made for both the received levels and background noise measurements.

No microphone position was closer than 0.5m from the room boundaries.

4.2 Reverberation Time Measurements

The reverberation times were determined by using the sound level meter and its internal software or external PC software. The average value of T20 for six starting pistol impulses at six different source and receiver positions was used, except in smaller rooms where the average of three impulses at each of two positions was used. Reverberation time calculations were made using the “reverse-Schroeder integration method”.

4.3 Deviations from Methodology

Essentially the first floor was open plan with much of the dividing partitioning having been removed, which presumably accounts for the sections of missing floor and ceiling. Two tests were conducted with one at the front of the first floor [higher level] and the other using the middle area of the first floor. This procedure does not comply with the Building Regs requirements for tests between ‘completed but unfurnished’ dwellings but is considered appropriate for the purposes of this study.

5.0 RESULTS

A summary of the results appears below:

Table 1: Airborne Sound Insulation Results [dB] - 14/07/2022						Criterion	Results			Pass/
ANC Test	Source	Vol	Receiver	Vol	Element	$D_{nT,w}+C_{tr}$ (dB)	$D_{nT,w}$ (dB)	C_{tr} (dB)	$D_{nT,w}+C_{tr}$	Fail
		(m ³)		(m ³)						
N/A	GF Commercial	442	FF Front Area	110	Floor	≥43	46	-7	39	fail
N/A	GF Commercial	442	FF Mid Area	87	Floor	≥43	50	-5	45	pass

The full results appear at the rear of the report; where the airborne results are shown as “≥”, or the impact results as “≤” if conducted, this indicates the reported values should be taken as the limits of measurement, due to the on-site conditions.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Between Ground and First Floor

It can be seen that the construction met building regulations requirements in the mid-section of the first floor but failed [by 4dB] in the raised front section of the first floor. There were other sections of the floor which were not tested, i.e., it may be that they have the same performance as the mid-section [pass] or the front section [fail].

Clearly the construction is capable of meeting Building Regulations requirements [mid-section result] so the reasons for the failure in the front section are not clear.

Given the uncertainty over the performance it is recommended that for the whole of the the first-floor, the flooring should be made good and above the floor two layers of 19mm plasterboard should be installed and then E-cousti 28mm acoustic decking, as the top layer.

6.2 Between First and Second floor

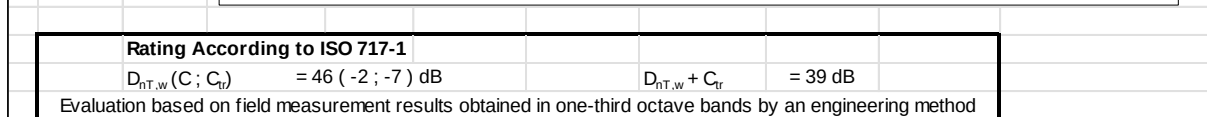
If the base construction is timber with boards and a lath and plaster ceiling, then Floor Treatment 1 [to be sent under separate cover] is normally a suitable method of ensuring compliance with the requirements of the Building Regulations.

Room vols [m3]		----- Frequency range according to the curve of reference values (ISO 717-1)
Source	442.0	
Rec	110.0	

Background noise

0

Background noise	Number of correct responses (Solid line, circles)	Number of correct responses (Dashed line, squares)	Number of correct responses (Dotted line, triangles)
0	10	8	6
2	15	12	10
4	20	16	14
6	25	20	18
8	30	24	22
10	35	28	26

[illegible]

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APPENDIX 1

COPY CORRESPONDENCE

Subject: 577 Barlow Moor Rd, Chorlton
Date: Wed, 26 Jan 2022 09:35:06 -0000
From: Rob Stuart <rob@c-bc.co.uk>
To: 'Mel Kenyon' <mak@martecenviro.co.uk>

Hi Mel

You did a survey for me a couple of years ago in Kendal. My client has a property in Chorlton which is being converted from a bank to a restaurant at ground floor to residential at 1st floor and is already currently residential at 2nd floor. As part of building regs we need a pre completion sound test to comply with the below table, the works haven't started and I'm keen to implement works to deal with the sound from below to ensure it passes the test.

The ground floor tenant is proposing to undertake the works in the attached drawing.

Is this something you can assist with?

Thanks

Table 0.1a Dwelling-houses and flats – performance standards for separating walls, separating floors, and stairs that have a separating function

	Airborne sound insulation sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum values)
Purpose built dwelling-houses and flats		
Walls	45	-
Floors and stairs	45	62
Dwelling-houses and flats formed by material change of use		
Walls	43	-
Floors and stairs	43	64

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