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11 June 2024

18237-SI-01

UKAS Accredited Sound Insulation Test Report

Building Regulations,
Approved Document E

Project Number
18237

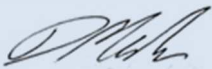
Issued For
Tops Pizza

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LIST OF ATTACHMENTS

18237-SI-01-AF1 to AF2	Airborne Floor Sound Insulation Test Results
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Issue	Date of Issue	Author	Reviewed	Authorised
0	11/06/2024			
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Issue	Comment
0	First Issue

1.0 INTRODUCTION

Clement Acoustics Ltd, 1B(c) Yukon Road, London SW12 9PZ has been commissioned by Tops Pizza to undertake pre-completion tests at Tops Pizza, 7 Queen Street, Gravesend in order to determine whether the level of sound insulation between commercial and residential spaces complies with requirements imposed by Gravesham Borough Council.

The development is a material change of use property consisting of one residential unit located above a take-away restaurant.

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 Daniel Hagan MIOA on 27 March 2023 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.

2.0 METHODOLOGY

2.1 Airborne Tests

High volume "white" noise was generated from a single loudspeaker in the source room, positioned in order 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 one position.

The same measurement procedure was followed in the receiver room.

The entire procedure was then repeated, with the loudspeaker located in a different position.

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.

High volume "white noise" was generated in the receiver rooms 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 sound level meter was used to measure the decay time of sound in the room.

This was repeated nine times in each room in order to obtain an average result.

2.3 Background Noise

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 the surrounding area.

3.0 INSTRUMENTATION

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

Instrument	Manufacturer and Type	Serial Number
Sound level meter	Norsonic Nor 145	14529094
Active Loudspeaker	RCF ART 310A	LKXN31648
Calibrator	Svantek SV33B	83120
Tapping machine	Sound Solutions Series 2	TP02109

Table 3.1 Instrumentation used during testing

4.0 REQUIREMENTS

The following planning condition has been set by Gravesham Borough Council:

Prior to the first use of the development hereby permitted, a sound insulation assessment shall be carried out and submitted to and approved in writing by the Local Planning Authority. The Assessment shall include details of the substantially enhanced sound insulation performance of the construction that separates the residential and commercial unit, which shall aim to resist the transmission of airborne sound such that the weighted standardised difference ($D_{nT, W} + C_{tr}$) is not be less than 53 decibels (i.e. an enhancement of the minimum levels stated in the Building Regulations of 10dB).

The airborne sound insulation requirement for this development, as prescribed by Gravesham Borough Council and ADE is therefore set at $D_{ntw} + C_{tr}$ 53 dB

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	Approx. Test Area	Construction
Floor	Ground Floor Commercial Unit (76 m ³)	First Floor Living Room (42 m ³)	15 m ²	Not Known at Time of Testing
Floor	Ground Floor Commercial Unit (76 m ³)	First Floor Bedroom (42 m ³)	15 m ²	

Table 5.1 Room details

6.0 RESULTS

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

Each result stated in this report and our test certificates applies only to the element tested and as the samples were presented.

6.1 Airborne Floor Tests

The summarised results of the airborne floor tests are shown in Table 6.1.

For this development, the requirement for separating floors as dictated by Gravesham Borough Council is to achieve an airborne sound insulation performance of $D_{nT,w} + C_{tr} \geq 53$ dB.

Certificate Reference	Source	Receiver	Test Result	Pass/Fail
18237-SI-01-AF1	Ground Floor Commercial Unit	First Floor Living Room	$D_{nT,w} + C_{tr}$ 35 dB	Fail
18237-SI-01-AF2	Ground Floor Commercial Unit	First Floor Bedroom	$D_{nT,w} + C_{tr}$ 34 dB	Fail

Table 6.1 Airborne floor test results

7.0 CONCLUSION

Sound insulation tests were undertaken at Tops Pizza, 7 Queen Street, Gravesend under the requirement of ADE.

Ratings of the airborne sound insulation performance of the floor 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 tested as listed in Table 6.1 fails to meet the requirements of the planning condition set by Gravesham Borough Council.

SOUND INSULATION PERFORMANCE CERTIFICATE

Standardised Airborne Sound Insulation Performance According to BS EN ISO 140-4

Field Measurements of Airborne Sound Insulation Between Rooms



Site Address: 7 Queen Street, Gravesend, Kent DA12 2EQ

Client: Tops Pizza

Test Date: 27/03/2023

Test Rooms: Ground Floor Commercial Unit - First Floor Living Room

Frequency (Hz)	D _{nT} (dB)
100	20.4
125	21.6
160	24.9
200	29.0
250	32.9
315	34.9
400	37.3
500	38.9
630	40.4
800	43.2
1000	47.9
1250	48.5
1600	50.1
2000	≥ 52.5
2500	53.8
3150	54.6

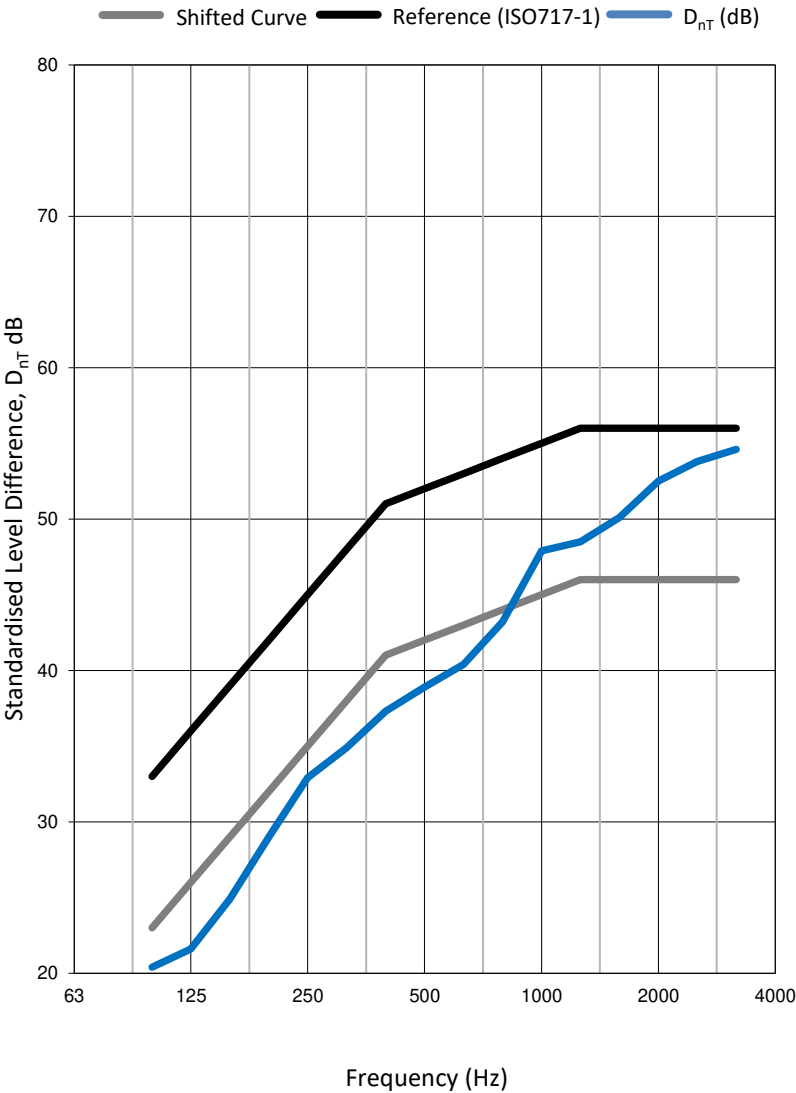
$D_{nT,w}(C_{tr}) \text{ (dB)} : (C_{tr}) = 42 \text{ (-7)}$

$D_{nT,w} + C_{tr} \text{ (dB)} = 35$

According to ISO 717-1. Evaluation based on field measurement results obtained using procedure described in Report 18237-SI-01

“≥” Shows limit of measurement due to background noise

Tested By: Daniel Hagan AMIOA



18237-SI-01-AF1

Site Address: 7 Queen Street, Gravesend, Kent DA12 2EQ
Client: Tops Pizza
Test Date: 27/03/2023
Test Rooms: Ground Floor Commercial Unit - First Floor Bedroom

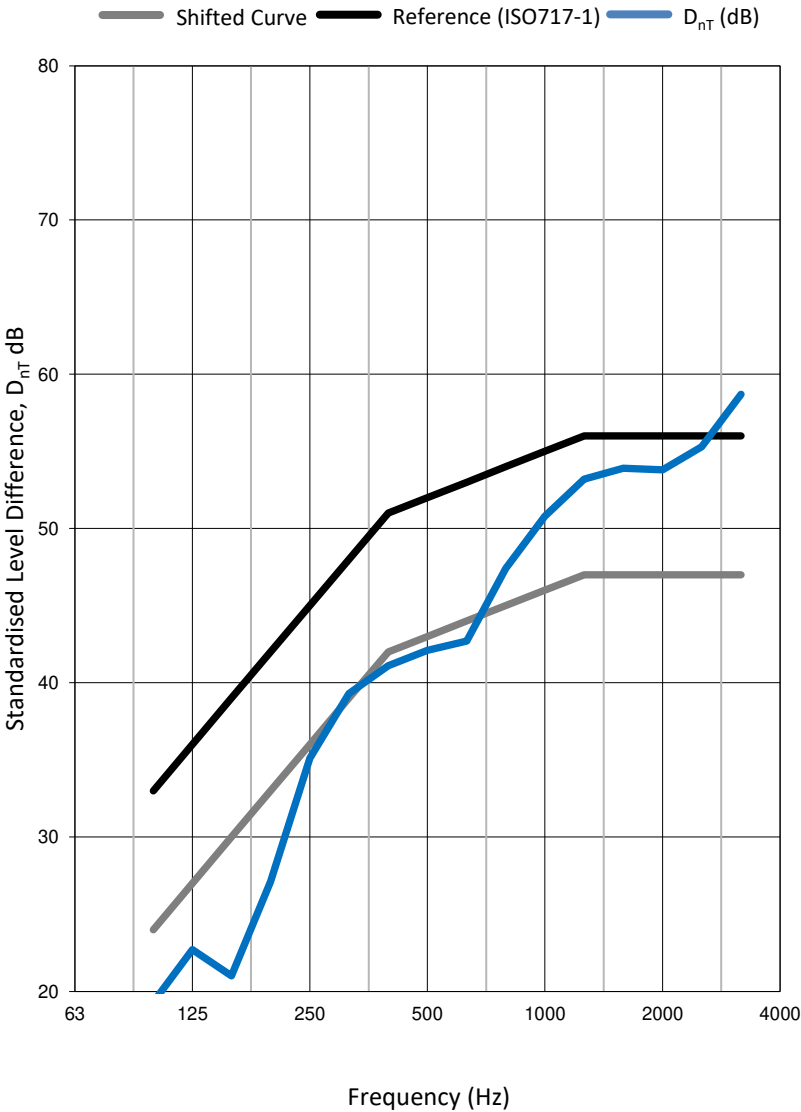
Frequency (Hz)	D _{nT} (dB)
100	19.3
125	22.7
160	21.0
200	27.1
250	35.1
315	39.3
400	≥ 41.1
500	≥ 42.1
630	≥ 42.7
800	≥ 47.4
1000	≥ 50.8
1250	≥ 53.2
1600	≥ 53.9
2000	≥ 53.8
2500	≥ 55.3
3150	≥ 58.7

$D_{nT,w}(C_{tr})\text{ (dB)} : (C_{tr}) = 43\text{ (-9)}$
 $D_{nT,w} + C_{tr}\text{ (dB)} = 34$

According to ISO 717-1. Evaluation based on field measurement results obtained using procedure described in Report 18237-SI-01

“≥” Shows limit of measurement due to background noise

Tested By: Daniel Hagan AMIOA



18237-SI-01-AF2