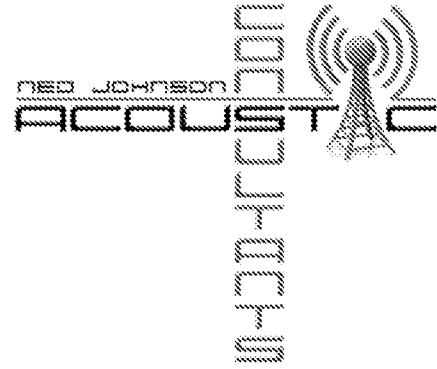
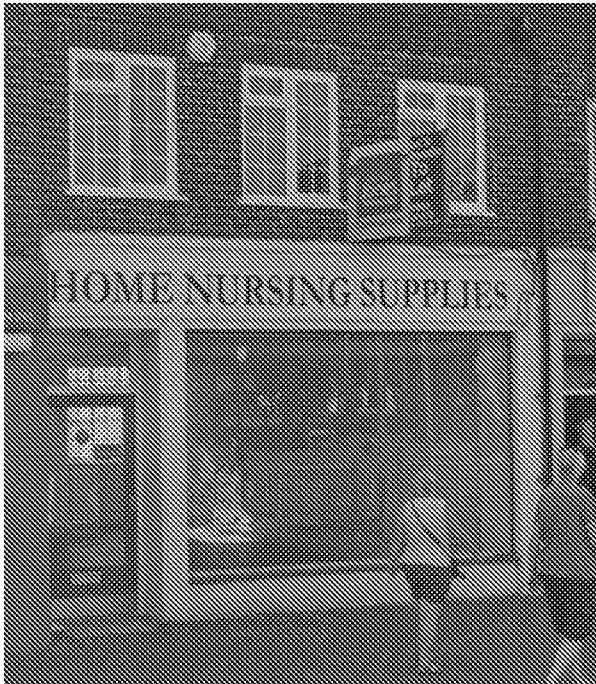




Acoustic Assessment at



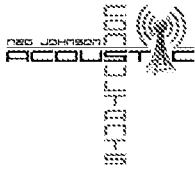
4 Broadmark Parade

Rustington

Document Ref: 361920

Date: 16/12/2019

Author: N Johnson MSc. MIOA

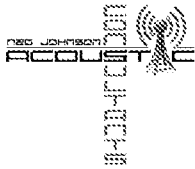


Executive Summary

Ned Johnson Acoustic Consultants Limited has been appointed by K&Z Newhaven Ltd to undertake an acoustic assessment of the sound insulation of the separating floor between KFC, 4 Broadmark Parade, Rustington and the first floor flat directly above.

The assessment was undertaken using a standard airborne sound insulation test to determine the sound attenuation of the separating floor between the ground floor and first floor.

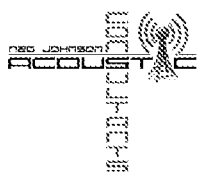
The results of the assessment show that the separating floor has a sound insulation performance of 55 - 56 DnT,w.



Contents

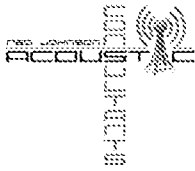
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1. Introduction

- 1.1 Ned Johnson Acoustic Consultants Limited has been appointed by K&Z Newhaven Ltd to undertake an acoustic assessment of the sound insulation of the separating floor between KFC, 4 Broadmark Parade, Rustington and the first floor flat directly above.
- 1.2 The property is a former ground floor A1 commercial unit converted to form an A3/A5 restaurant. The property has been extended to the rear and has an existing flat (Flat 1) at first floor level. The kitchen area of the restaurant is to the rear of the property with a flat roof above. The lobby and seating area of the restaurant is directly beneath the existing flat. Airborne sound insulation tests have been carried out and the results compared to the current building regulations and planning condition requirement.
- 1.3 Condition 5 of planning permission R/141/19/PL requires that the sound insulation between the ground and first floor achieves a minimum airborne sound insulation performance of $50D_{nT,w}+C_{tr}$.

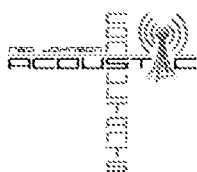


2. Site Description

- 2.1 The site is now a KFC restaurant and is due to begin trading. The nearest residential premises is flat 1, which is located above the proposed restaurant at first floor level.
- 2.2 Figure 1 below shows the location of the development, which is shaded in blue.

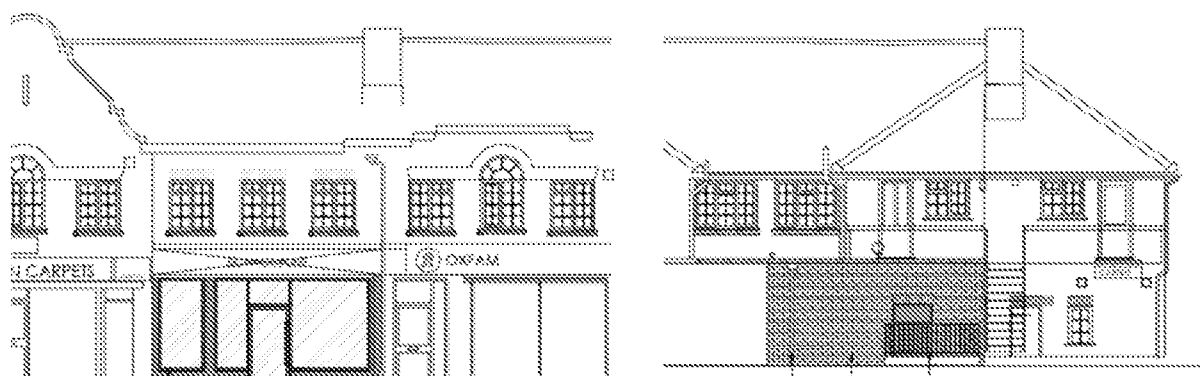
Figure 1.

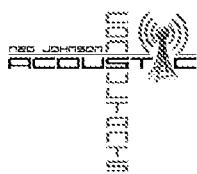




2.3 Figure 2 below shows the front and rear elevations.

Figure 2.





3. Reference Documents

National Planning Policy Framework

3.1 The Department of Housing, Communities and Local Government published the National Planning Policy Framework (NPPF) on 24th July 2018.

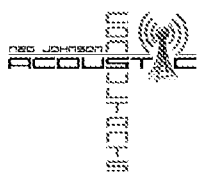
3.2 Paragraphs 170 e and 180a refer to noise in terms of policy approach:

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.



Noise Policy Statement for England

- 3.3 The Department for Environment, Food and Rural Affairs published the *Noise Policy Statement for England* (NPSE) in March 2010. The explanatory note of NPSE defines the terms used in the NPPF:

“2.20 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

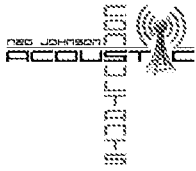
LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.”

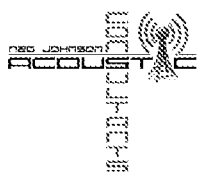
- 3.4 The NPSE does not define the SOAEL numerically, stating at paragraph 2.22:

“2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on



health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

- 3.5 There is no local or national guidance on how the three terms should be defined numerically.
- 3.6 There are three aims in the NPSE, which match, and expand upon, the first two bullet points in paragraph 123 of the NPPF and add a third aim that relates to a wider improvement in health and quality of life (the bold text is in the NPSE):
- 3.7 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.
- 3.8 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.
- 3.9 This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.



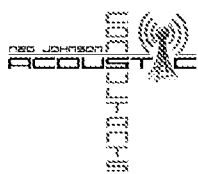
British Standard 8233

- 3.10 The scope of British Standard 8233: 2014 *Sound insulation and noise reduction for buildings – Code of practice* is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use.
- 3.11 The standard suggests suitable internal noise levels for residential dwellings, as shown in Table 1. Below.

Table 1.

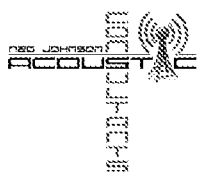
Activity	Location	07:00 - 23:00	23:00 - 07:00
		L _{Aeq} , 16 hour	L _{Aeq} , 8 hour
Resting	Living Rooms	35	-
Dining	Dining Area	40	-
Sleeping	Bedrooms	35	30

- 3.12 In terms of this development the internal noise levels have been compared to the internal noise levels in Table 1. It is suggested in this report that by meeting these noise levels the development would be classed as NOAEL.



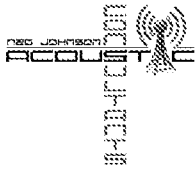
3.13 Condition 5 of planning permission R/141/19/PL states:

'The use hereby permitted shall include the sound insulation scheme, recommended by Ned Johnson Acoustic Consultants' Acoustic Assessment (ref. 451819 Rev. A, dated February 2019), for protecting the upper floor residential unit from noise. The scheme shall achieve a minimum airborne sound insulation value of 50dB (DnTw + Ctr dB). Following implementation of the insulation scheme, a test shall be undertaken to demonstrate that the attenuation measures carried out has achieved the minimum airborne sound insulation criteria. The use of the development shall not commence until test results, demonstrating the minimum sound insulation criteria has been achieved, has been submitted to and approved by the local planning authority.'

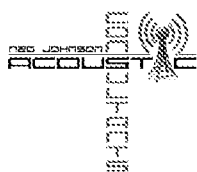


4. Survey Methodology

- 4.1 An airborne sound insulation test was conducted on December 16th 2019 following the completion of sound insulation works at 4 Broadmark Parade. A total of two floor samples (airborne only) were taken between the ground floor commercial unit and the first floor flat above.
- 4.2 The instrument used was a Norsonic 118 precision grade Sound Level Meter, which meets the requirements of BS EN 61672: 2003.
- 4.3 The sound level meter was calibrated immediately before and after use with a Rion NC74 Acoustic Calibrator and no drift was noted in calibration readings.
- 4.4 The tests were performed by mounting a RCF cabinet speaker on a stand, with a pink noise source attached, in the ground floor restaurant seating area. This room has 2 rooms directly above at first floor, which are a bedroom and a living room.
- 4.5 A pink noise source was played and measurements were then taken at two separate positions in $1/3$ octave frequency bands at ground floor level. With the source playing at the same volume, measurements were also taken at two separate positions in both of the receiving rooms at first floor level directly above the speaker. Again these measurements were in $1/3$ octave frequency bands.
- 4.6 The volume of both rooms was measured; the speaker was then turned off and a background noise measurement was taken in each of the first floor rooms.



- 4.7 The speaker was then placed in each of the first-floor rooms with the pink noise source attached. The speaker and noise source were turned on and the reverberation time was measured using a series of 10 decays.
- 4.8 Once all the measurements were complete the results were used to calculate the DnT,w of the separating floor.



5. Noise Survey Results

5.1 The tables below show the results of the measurements taken during the survey:

Table 2. Ground floor to 1st floor flat bedroom

Frequency Hz	Source Room Position 1	Source Room Position 2	Receiver Room Position 1	Receiver Room Position 2	Background	Reverberation Time (S)
100	97.9	96.9	57.3	55.7	28.1	0.52
125	99	97.2	56.7	55	32.2	0.62
160	95.8	100.2	53.8	52.3	33.0	0.72
200	97.7	101.3	52.8	48.5	23.4	0.71
250	97.8	99.3	47.4	49.7	24.2	0.86
315	96.7	97	43.7	41.9	21.4	0.96
400	98.3	96	39	40.9	21.9	0.95
500	95.9	96.5	36.8	39	22.3	1.11
630	98.4	96.8	36.7	37.4	19.1	1.09
800	97.4	96.3	33.6	35.1	18.4	1.21
1000	97.5	96.3	31	33.9	19.2	1.16
1250	95.9	95.5	28.3	31.8	21.7	1.08
1600	97.6	98.2	25.6	28.9	13.2	0.98
2000	96	96.6	24.1	27.6	11.8	0.95
2500	96.7	95.4	23.3	25.8	8.9	0.9
3150	95.4	94.1	21.8	23.7	7.7	0.88

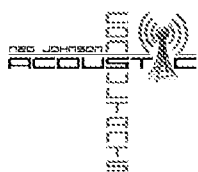
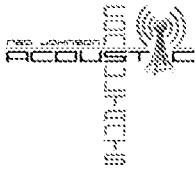
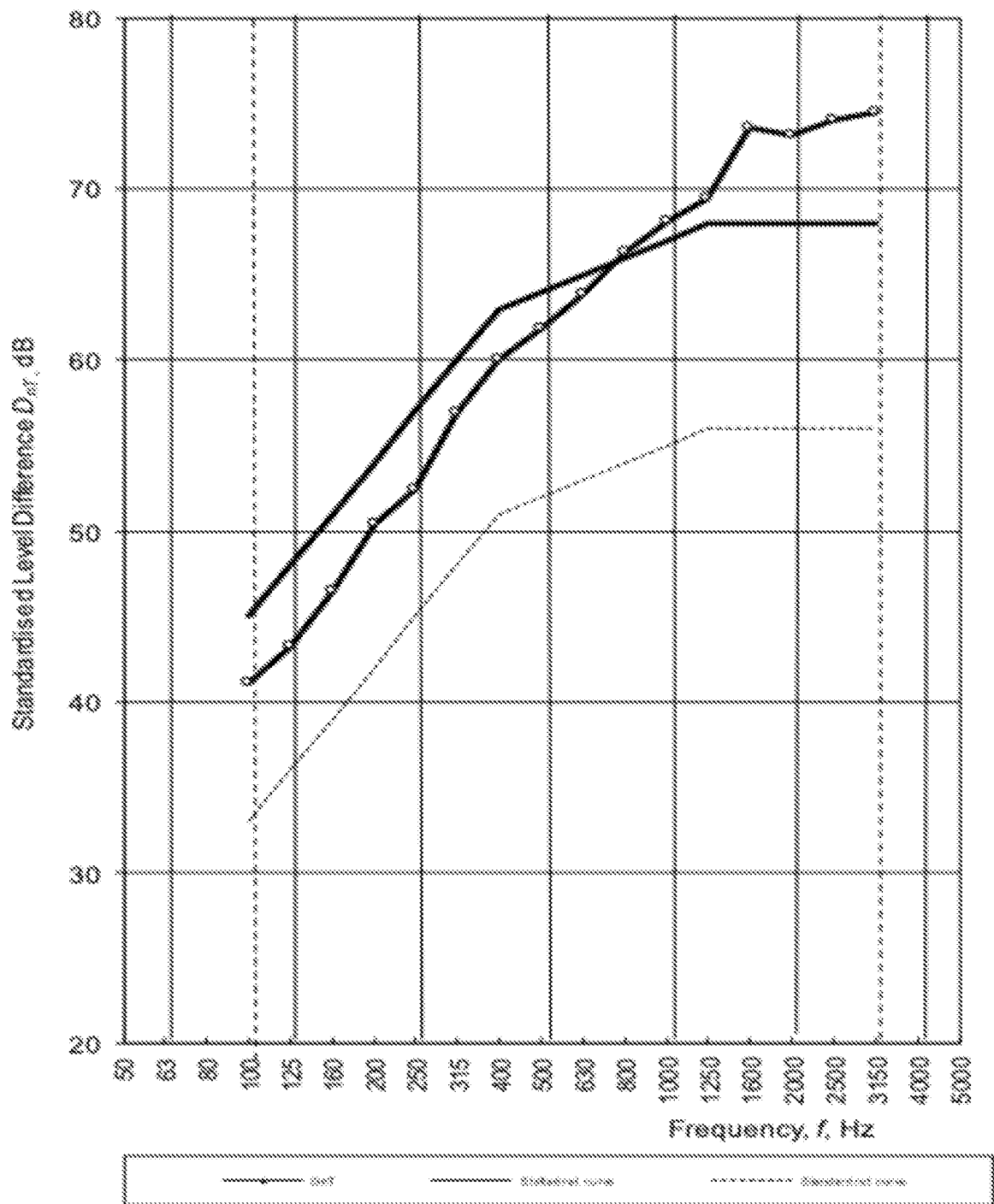


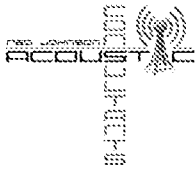
Table 3. Ground floor to 1st floor flat living room.

Frequency Hz	Source Room Position 1	Source Room Position 2	Receiver Room Position 1	Receiver Room Position 2	Background	Reverberation Time (S)
100	97.4	100.2	59.3	57.4	33.2	0.71
125	99.8	96.6	57.4	56.3	33.7	0.76
160	96.6	98.1	55.4	54	35.8	0.63
200	97.1	100.2	52.3	52.7	31.8	0.55
250	100.3	99.1	50.3	52	30.7	0.7
315	98.3	97.9	50	51.7	24.7	1.03
400	97.3	99.2	48.4	47.6	24.9	1.03
500	97.3	98.3	44.2	42.3	25.3	1.03
630	94.9	97.7	39.7	40.5	21.7	1.04
800	97.5	97.3	37.3	36.4	21.4	1.26
1000	97.4	98.4	35.4	34.9	21.2	1.2
1250	97.7	99.8	32.8	33.3	20.0	1.11
1600	96.7	98.1	27	29.8	17.9	1.04
2000	97	95.9	24.1	26.3	14.7	1.07
2500	97.4	96.3	20	23	13.6	0.95
3150	96.2	97	18.3	20.5	8.5	0.93

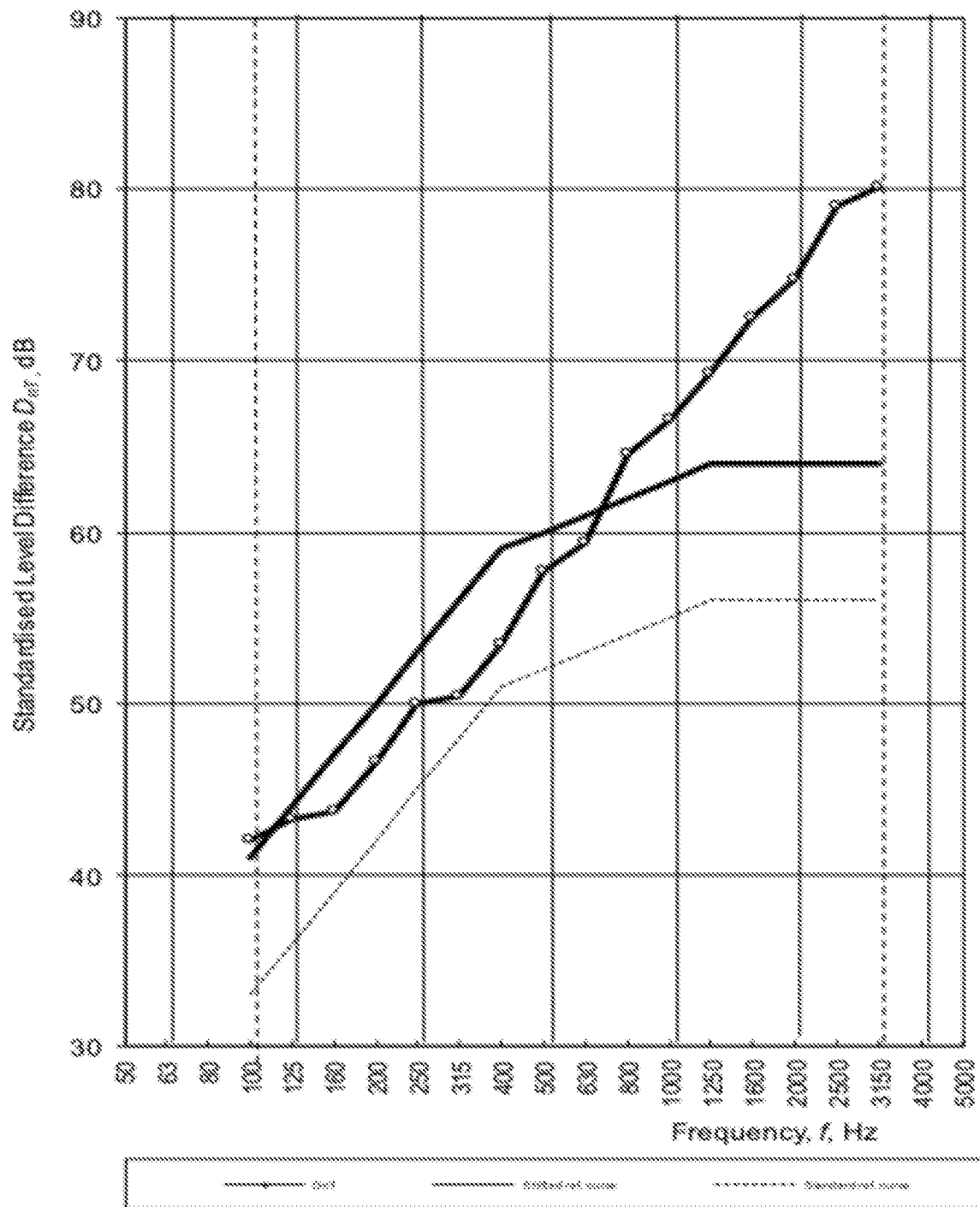


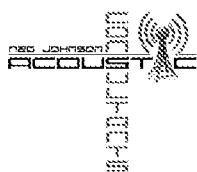
Graph showing results for ground floor to 1st floor bedroom:





Graph showing results for ground floor to 1st floor living room:





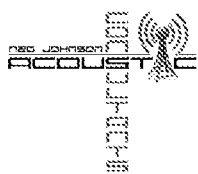
5.2 The $D_{nT,w}+C_{tr}$ was then calculated using the shifted reference curve. The following tables set out the results:

Table 4. Ground floor to 1st floor bedroom

Correction	Result (dB)
$D_{nT,w}+C_{tr}$	56

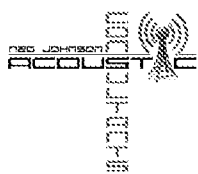
Table 5. round floor to 1st floor living room

Correction	Result (dB)
$D_{nT,w}+C_{tr}$	55



6 Evaluation of results

- 6.1 The acoustic performance of the floor has been determined by comparing the measured noise levels with the criteria set out in Section 3 of this report.
- 6.2 The measurements taken demonstrate that the sound insulation at 4 Broadmark Parade between the ground floor restaurant and the 1st floor flat is 55 - 56 $D_{nT,w}+C_{tr}$. This results show that the airborne sound insulation exceeds the 50 $D_{nT,w}+C_{tr}$ set in the planning requirements by 5dB between the restaurant and the living room and 6dB between the restaurant and the bedroom. The results therefore demonstrate that the requirements of condition 5 have been met.
- 6.3 As the requirements of condition 5 have been met no further sound insulation works are required.



Appendix 1: Glossary of Terms

Daytime Defined in BS8233 and BS4142 as the period 07:00-23:00 hours.

Night-time Defined in BS8233 and BS4142 as the period 23:00-07:00 hours.

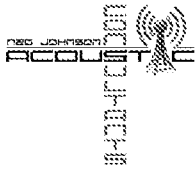
Decibel (dB): A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure levels the reference quantity is 20 uPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB_A : Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB_A broadly agree with people's assessment of loudness. A change of 3 dB is the minimum perceptible under normal conditions, and a change of 10 dB corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB_A ; normal conversation about 60 dB_A at 1 metre; heavy road traffic about 80 dB_A at 10 metres; the level near a pneumatic drill about 100 dB_A .

$L_{A10,T}$: The A weighted noise level exceeded for 10% of the measurement period, T. It gives an indication of the upper limit of fluctuating noise such as that from road traffic.

$L_{A90,T}$: The A weighted noise level exceeded for 90% of the measurement period, T. This is defined in BS 4142 as the background noise level.

L_{AE} : The sound exposure level – the level of a sound with a period of 1 second that has the same sound energy as the event considered.



$L_{Aeq,T}$: The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T).

$L_{A\ Max}$: The highest A weighted noise level recorded during a noise event. The time weighting (slow or fast) should be stated.

