



27 LLYS WALSH,
RHYL, LL18 4FR

www.redfansolutions.co.uk
info@redfansolutions.co.uk

15th November 2023

Dear Sir

Re: 5-7 Church Street, Wrexham

Enclosed are the results from testing of floor partitions at 7 Rodney Road in support of planning conditions, tested on 31st October 2023.

Airborne Tests

Testing Methodology

Airborne Sound Insulation Tests

Measurements of standardised level difference (DnT) were carried out in accordance with BS EN ISO 140-4:1998. Level measurements in the source and receiving rooms (L1 & L2). The noise was generated in the source room by placing an active loudspeaker, producing a steady spectrum of pink noise, in an external corner of the room but at least 0.5m away from any reflective surfaces.

The noise level was measured in both the source room and receiving room, sampling as much of the room as possible. The sound level meter was always kept 0.7m away from any reflective surface as to not artificially increase or decrease noise levels into the microphone. The measurements were taken at one-third octave band intervals from 100 to 3150 Hertz using an average time of 30 seconds. The speaker was then moved to a corner junction on two internal walls and the measurements were repeated. The measurements in each room were arithmetically averaged. For separating walls, the speaker should be in a corner opposite the test wall, however, due to the size of the source room the speaker was placed 4 metres from each partition wall.

Background Measurements in Receive Room (Lb)

Where noise levels were measured in the receiving room, the background noise level was also recorded with the source room speaker turned off to ensure the background noise level did not influence the result. The background noise level is measured over a time period that accurately reflects the background noise measurement at the time of the test. This is normally between 6 and 30 seconds and can vary between the first and second background measurements.

Calculation Methodology

Airborne Sound Insulation Tests

Background Noise Correction ('Corrected L2')

Any receiving room noise measurements that are within 6dB of the background measurements are corrected by logarithmically averaging the difference. The correction is applied up to 10dB, where a maximum correction of 1.6dB is applied. Any background noise level greater than 10dB over the L2 measurement will appear to reduce the sound insulation at that frequency.

Level Difference ('D')

The difference between the source and 'corrected' receiving room measurement is calculated for each speaker position and 2 differences averaged to obtain 'D' for each frequency measured. These are calculated separately for Speaker Position 1 and Speaker Position 2

Standardised Level Difference ('DnT')

The result is standardised by adding 10 times the logarithm of half the reverberation time at each frequency to give the standardized level difference (DnT) at each frequency. These are calculated separately for Speaker Position 1 and Speaker Position 2 and are arithmetically averaged to produce final DnT,S.

Weighted Standardized Level Difference ('DnT,w')

The DnT,S are then compared to the standard.

Sampling Regime

Testing was conducted using a sampling regime in accordance with Approved Document E 2003 [as amended] (ADE), ensuring each construction type was tested on the project, not necessarily each plot.

It is assumed that each construction type is constructed consistently. If this is not the case, and deviations of the construction type occur; further testing will be required to comply with the requirements of Approved Document E 2003 [as amended] to the Building Regulations. ADE requires that sets of tests are carried out on one in ten of each construction type or sub-group. Each set of tests on houses is made up of two airborne sound insulation tests (Two Tests). Each set of tests on flats is made up of two airborne tests on walls and two airborne and two impact tests on floors (Six Tests).

The location of the sets of tests are selected at random by the tester except where specifically requested the Approved Inspector or specialist input from Robust Details.

Rooms were tested furnished unless testing is specifically requested in an unfurnished room. Testing is conducted using the larger room as the source room, with a tolerance of 10% of volume being acceptable either way. Doors, windows, and trickle vents must be closed and kitchen units, cupboard doors, wardrobes etc shall be open for the duration of the test when they have been installed against the separating wall under test.

Deviations

Background Noise Levels

Background noise levels are often an unavoidable part of testing as this must take place on a live building site. Though a correction is applied within the calculation, high background noise levels may result in the wall/floor under test not achieving its full potential. Situations can occur where background noise levels are not high, but the sound insulation performance of the separating floor or wall is so good that the measured levels are close to the prevailing background levels. The equipment used cannot distinguish between background noise levels and the noise from the speaker.

Deviations Related to the Test

If any deviation from the testing method was necessary, details of the deviation are indicated on each individual test certificate (appended to this report). Where deviations were avoidable, or tests have been conducted on a 'trial' basis, these will be highlighted at the bottom of each certificate.

Below is the summary table of results.

Airborne Insulation	Partition type	Source Room	Receiving Room	Measured level DnTw +Ctr
	Floor	Upstairs front restaurant space	Restaurant (no 5)	49dB
	Floor	Upstairs rear restaurant space	Restaurant (no 6)	48dB

Item	Make/Model	Serial no	Calibration Cert no
Calibrator	Norsonic 1255	125525488	U45621
Sound Level Meter	Norsonic 145	14529308	U42077

The noise monitoring equipment used was calibrated before and after the noise survey period. No significant drift was recorded. Equipment calibration certificates can be provided upon request.

Conclusion

The results from the tests indicate the floor meets the requirements set out in ADE and there is no need for any further sound insulation. Any flooring materials removed should be replaced with acoustically like for like or better products.

If you have any further questions, then please do not hesitate to contact me.

Yours sincerely



Andrew Hunt
Acoustic Sound Engineer

Appendices

A. These are the main noise indices in use in the UK.

- dB(A): The human ear does not hear all frequencies with the same intensity. It is most sensitive to sounds in the 500Hz-8kHz range. Above and below this range the ear becomes progressively less sensitive. To compensate for this, sound level meters incorporate electronic filtering to correspond with the varying sensitivity of the ear. This filtering is called A-weighting and Sound Pressure Levels obtained with this weighting are referred to as A-weighted and signified as dB(A).
- LA90: The sound level (in dBA) exceeded for 90% of the time. This unit gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the “background noise level” of an area.
- LAeq,T: The equivalent continuous sound pressure level over a period of time, T; (in dBA) This unit may be described as “the notional steady noise level that would provide, over a period, the same energy as the varying noise in question”. In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as road traffic, aircraft and trains.
- LA1: The sound pressure level (in dBA) exceeded for 1% of the time. This unit can give an indication of a regular maximum noise level from such activities as dance music.
- LAe: The sound exposure level, (previously denoted SEL) is the noise level of an event, such as a train or aircraft event, normally expressed in a 1 second time period.
- LAmin: The minimum sound pressure level (in dBA) measured over the time period.
- LAmax: The maximum level of sound (in dBA), i.e. the peak level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.
- LArT : sound rating level, the a-weighted, leq sound level of an industrial noise during a specified time period, adjusted for tonal character and impulsiveness

B. Approved Document E requirements.

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 $D_{nT,w} + C_v$ 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