

Tom Jackson
83, Berry Lane,
Longridge,
Preston
PR3 3WH

4th December 2018

Dear Tom,

Ref: Noise insulation assessment for the proposed change of use of a shop premises at 83, Berry Lane, Longridge

Thank you for the information regarding this site and about the requirement for a Noise Insulation Assessment. As I understand it, you are intending to change the use of the premises, formerly a fruit and vegetable shop known as Applejack's, into a micro pub whilst retaining the same name. The intended hours of operation will therefore be extended from the existing 5:30pm closing to an 11pm closing time. There is an existing dwelling unit above the shop premises and it is considered by the Local Authority that the level of noise created by the new development may be detrimental to the current resident.

You have indicated that you intend to improve the amount of noise insulation in the ceiling area throughout the building. Hence, it is important to be aware of the current level of noise protection in order to determine how much extra noise insulation will be needed.

Technical Background:

The Building Regulations 2000 Approved Document E - Resistance to the passage of sound is the relevant standard. In this document there are levels of noise insulation stated that should give adequate protection between dwellings in a domestic situation. The parameter DnTw + Ctr is used for domestic properties. For the case of a commercial to domestic situation the Approved Document has no guidance except to state that "expert guidance should be sought". This is because the nature of the commercial enterprise could be different and therefore the noise creation possibilities would be different. The required level of noise insulation to achieve an acceptable environment for residents would therefore also vary.

The target for acceptable noise levels in the daytime (before 11pm) in living rooms is often taken as 35dB(A). However, BS8233 suggests that for "good" conditions a level of 30dB(A) is better. This could also be seen to be a better target for the evening. Therefore, a level of 30dB(A) will be used in this assessment as the specification target. The DnTw + Ctr parameter is not used in BS8233. Only DnTw is referred to.

A standard Airborne noise test was carried out according to the protocol of BS EN ISO 140 between the existing shop area and the flat above. The results, copied directly from the Bruel & Kjaer Building Acoustics program BZ7204, are shown below.

Measured Results:

Job: Applejack's

Date of measurement: 04/12/2018

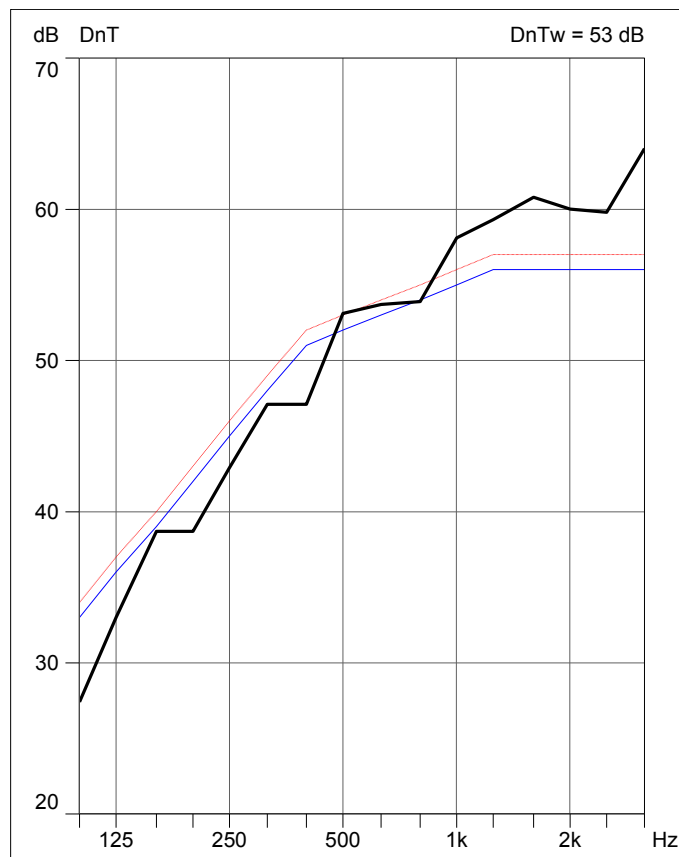
Airborne sound insulation

Calculations according to: BREW

Partition: A 'Shop to Flat'

Floor/Ceiling:

Overall Result(s): DnTw = 53 dB DnTw+C = 51 dB DnTw+Ctr = 45 dB



Part. A 'Shop to Flat' Results

Part. A 'Shop to Flat' Results:

[Hz]	L1A[dB]	L2A[dB]	B2A[dB]	T2A[s]	DnT[dB]	
100	86.8	56.6	38.6	0.26	27.4	
125	86.0	50.9	27.3	0.31	33.0	
160	88.0	47.3	24.7	0.31	38.7	
200	85.7	43.5	24.5	0.22	38.7	
250	87.2	43.0	19.8	0.37	42.9	
315	90.0	41.1	16.6	0.33	47.1	
400	85.7	35.2	15.3	0.23	47.1	
500	84.5	29.8	12.1	0.34	53.1	
630	83.3	25.6	12.8	0.20	53.7	
800	83.5	25.6	12.2	0.20	53.9	
1 k	86.2	24.2	11.9	0.20	58.1	
1.25 k	89.2	25.6	11.0	0.19	59.3	
1.6 k	86.8	22.0	12.5	0.20	60.8	b
2 k	85.8	22.2	11.4	0.22	60.0	
2.5 k	84.6	20.8	10.7	0.20	59.8	
3.15 k	87.0	19.2	10.2	0.21	64.0	b

Noise Insulation Assessment:

The overall average apparent insulation level is currently **53dB DnTw**. This is a very reasonable result and is, no doubt, due to the fact that an isolated ceiling has already been installed when the upper floor was originally converted to a dwelling. The subjective impression was that most of the middle to higher frequency energy was significantly reduced. Only the lowest bass frequencies from the test source could be heard.

It would be anticipated that the micro pub noise levels would be almost entirely due to conversation between customers. There is no intention to have high levels of music with significant bass frequency content. The business model for the operation is as a “drinkers” pub. Based on previous measurement experience and a typical maximum of around 30 people, Sound Advice suggests that the average noise level is unlikely to exceed 85dB(A). This is actually the level at which people **must** wear hearing protection in industry.

Thus, with a target noise level of 30 dB(A) in the flat, then the required insulation protection would be about **55dB**. The current value is already 53dB. An improvement of 2dB is not very difficult to achieve and the basic recommendation for domestic improvement in the Approved Document E guidance would be very suitable. **The relevant extract from the guidance is shown below in Appendix 1.**

Recommendations:

It is understood that it is already your intention is to install an isolated ceiling under the existing structure in order to contain all the relevant wiring etc. for the new proposed micro pub. This would certainly achieve the required effect. It would be sensible to create the isolated ceiling below with two layers of overlapping plasterboard. At least one of the boards should be Fireline board or similar.

If done correctly, this configuration would easily meet the required performance. The expected overall result should be in well excess of 60dB and significantly above the target requirement. There is therefore also some tolerance for occasional high levels.

The notes in the guidance with respect to independent joists fixed only to the surrounding walls and additional support by resilient hangers should be followed very carefully.

I trust that this clarifies the position and helps you to progress the conversion. Please call me if you think that I can assist further or if a test needs to be carried out after the work.

Regards,

John Houldsworth

John M Houldsworth. BSc. MIOA

APPENDIX 1

E DWELLING-HOUSES AND FLATS FORMED BY MATERIAL CHANGE OF USE

Floor treatment 1: Independent ceiling with absorbent material

4.26 The resistance to airborne and impact sound depends on the combined mass of the existing floor and the independent ceiling, the absorbent material, the isolation of the independent ceiling and the airtightness of the whole construction.

4.27 Independent ceiling with absorbent material (see Diagram 4-3)

- at least 2 layers of plasterboard with staggered joints, minimum total mass per unit area 20 kg/m²
- an absorbent layer of mineral wool laid on the ceiling, minimum thickness 100 mm, minimum density 10 kg/m³.

The ceiling should be supported by one of the following methods:

- independent joists fixed only to the surrounding walls. A clearance of at least 25 mm should be left between the top of the independent ceiling joists and the underside of the existing floor construction, or
- independent joists fixed to the surrounding walls with additional support provided by resilient hangers attached directly to the existing floor base.

Note: This construction involves a separation of at least 125 mm between the upper surface of the independent ceiling and the underside of the existing floor construction. However, structural considerations determining the size of ceiling joists will often result in greater separation. Care should be taken at the design stage to ensure that adequate ceiling height is available in all rooms to be treated.

4.28 Where a window head is near to the existing ceiling, the new independent ceiling may be raised to form a pelmet recess. See Diagram 4-4.

4.29 For the junction detail between floor treatment 1 and wall treatment 1, see Diagram 4-5.

4.30 Points to watch

Do

- Do remember to apply appropriate remedial work to the existing construction.
- Do seal the perimeter of the independent ceiling with tape or sealant.

Do not

- Do not create a rigid or direct connection between the independent ceiling and the floor base.
- Do not tightly compress the absorbent material as this may bridge the cavity.

Diagram 4-3: Floor treatment 1

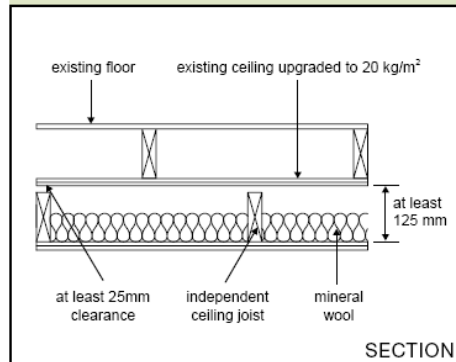


Diagram 4-4: Floor treatment 1 - high window head detail

