Chartered Building Consultancy

Acoustic South East

Change of Use Planning Application

Report by: Scott Castle BSc (Hons) CEnvH, MCIEH PGDip: Acoustics MIOA

Date: 30/01/2024

Project: J3781

Issue 1

Site: **Unit 2, 28 Goring Street, Goring. BN12 4AD**

Client: **Little Green Apples Limited**

Constructionline Part of Capita plc

CQMS Safety Scheme

ANC THE ASSOCIATION OF NOISE CONSULTANTS

ATTMA

Acoustic South East is a Trading Name of Acoustic Associates Sussex Ltd, Company Registration No: 5646519

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Issue 1	30/01/2024	Original Issue

1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for a change of use. Specifically, it is proposed to change from a chip shop to a wine bar, a sui generis use. Suggested conditions have been seen from the Environmental Health consultee comments dated 25th October 2023 which indicate that given the commercial ground floor setting and residential demise above, the requirements for the separating floor/ceiling partition will be a minimum of 50dB $D_{nT,w}+C_{tr.}$

The proposed hours of use of the premises are daytime only and terminate at 23:00 hours.

The only proposed live music to be played is from an unamplified piano and this is an occasional use only.

The baseline sound insulation test carried out on 23rd January 2024 indicates that the ceiling achieves 44dB $D_{nT,w}+ C_{tr}$. There is therefore a requirement to enhance the sound insulation of the party floor by a minimum of 6dB to improve the sound insulation performance to protect existing residents in the HMO above.

A suspended metal furring ceiling is recommended with dense mineral wool placed into the void to improve the sound insulation between the two spaces. It is also necessary to review the wall linings either side of the premises to ensure that these do not act as a weak path and allow flanking transmission into the building structure.

The addition of a suspended acoustic ceiling will further enhance the soundproofing of the premises.

Recommendations have been provided to improve the sound insulation performance, which if followed and constructed according to manufacturers' instructions, will see an improvement at the site. Planning consent should not therefore be withheld on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

The client has made a planning application to Adur and Worthing Council for a change of use from E(b) (a former fish and chip shop) to a wine bar (sui generis) use. The application is registered under AWDM/1274/23 on the planning portal for Adur and Worthing Council.

As stated, the proposal is for a wine bar whereby there would be occasional unamplified music. The client has indicated the playing of piano, albeit not all of the time.

It is understood that a Premises Licence under the Licensing Act 2003 has already been granted and the client has requested that the local planning authority mirror the hours on the newly issued premises licence to ensure a joined-up approach.

2.2 Environmental Health – Technical Consultee Response

The local planning authority have received a technical consultation from Environmental Health dated 25th October 2023 which suggests recommendations as follows:

- Restrictions of the outside area being used (unaware that external area exists)
- Hours for construction/demolition (internal fitout only)
- Suitable system for extraction (the chip shop extract system remains)
- The party ceiling between the ground floor commercial use and the first-floor residential use will be required to achieve a minimum airborne sound insulation value of 50dB $D_{nTw}+C_{tr}$. (This is 7dB(A) above the requirement of Building Regulations Approved Document E).
- Only unobtrusive background music shall be provided in the premises within the approved hours and not to exceed 75dB $L_{Aeq,\ 15minues}$ measured anywhere on the premises.

2.3 Site Location

The premises are located on a commercial parade/terrace on Goring Road. These are two storey properties which overlook Goring Road, as seen below in Figure 1.



Figure 1. Site Location and Photograph

2.4 Current Use

The fish and chip shop use has a suspended ceiling with lay in grid tiles as seen in Figure 2 below. A void is apparent above the ceiling tiles and the measured ceiling height from floor to tile is 2.61m. It is anticipated that there remains sufficient room/head space in order to consider an acoustic ceiling if required.

The walls either side of the chip shop premises were not solid walls and will likely require further investigation in due course.



Figure 2. Inside the Ground Floor Commercial Premises (note the suspended ceiling)

2.5 Proposed Internal Layout

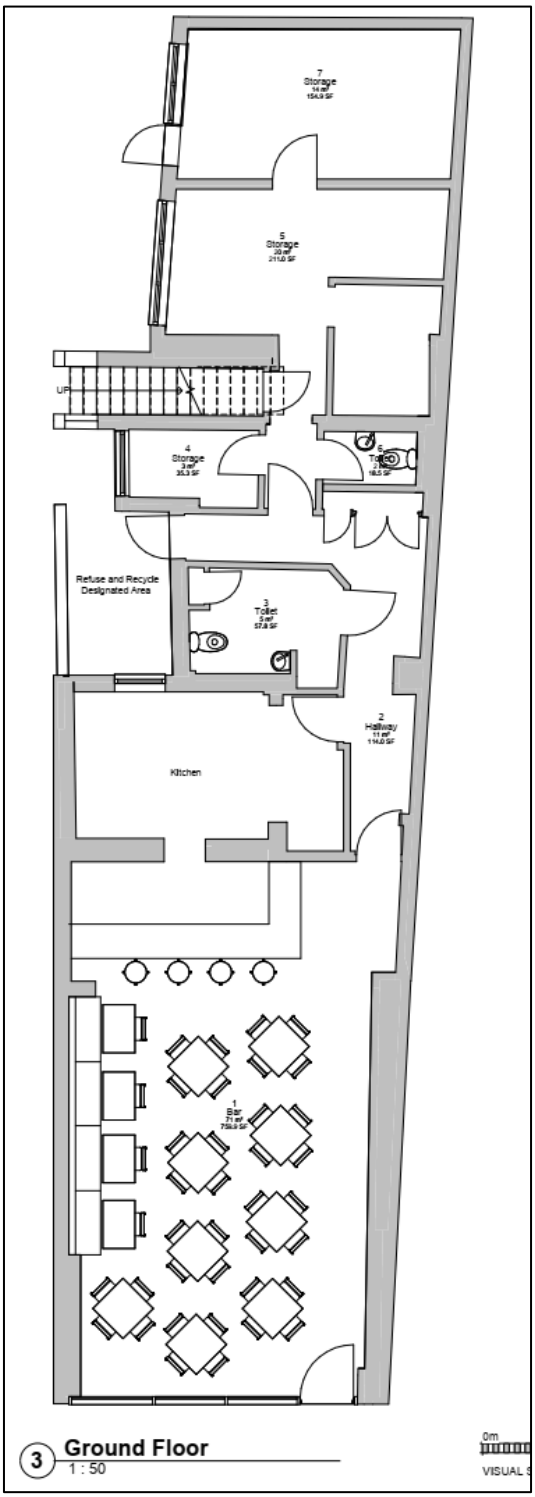


Figure 3. Proposed Internal Layout at Ground Floor

The client proposes a slightly higher sound pressure level inside the venue (85dB $L_{Aeq,T}$) and desires the occasional use of an unamplified piano.

2.6 Proposed Hours of Use

As stated, the proposed hours are requested to match the issued premises licence. For clarity the client reports the hours as being:

- Sunday to Tuesday – 22:30 hours finish
- Wed-Saturday – 23:00 hours finish.

The use is therefore considered to be daytime only.

2.7 Floor Build Up

The current composition of the separating floor is unknown at the time of the report being written.

2.8 Nearest Residential Receptor(s)

The nearest residential receptor is the flat above, which is a HMO with separate rooms and accessed from the rear. On visiting the rooms were not numbered.

A commercial estate agent is located to the West and it is understood that to the East of the application site is a stairwell leading to further accommodation, although the latter was not observed on site.

2.9 Methodology and Rationale

It is understood from both the Planning Noise Advice Document Sussex (2023) as well as Building Regulations Approved Document E and the technical consultation received from Environmental health that there is a requirement to protect first floor residents from the ground floor commercial use.

Accordingly, a baseline sound insulation test was carried out on 23rd January 2024 to identify how the ceiling partition performs and what, if any, additional works might be needed to improve the soundproofing.

At the time of the visit, a music track was also amplified through speakers to achieve 85dB $L_{Aeq,\ 30\ seconds}$ in the ground floor premises and measurements were made in the first-floor residential property to determine the received sound pressure level.

Given the results of the testing, recommendations will be made on how to improve the sound insulation performance of the party floor.

3 Sound Insulation Testing

Acoustic South East attended the site to carry out a vertical airborne sound insulation test on 23rd January 2024. This involved exciting the ground floor commercial premises with high levels of pink noise in order to test the performance of the party floor in a method approved in ISO 140-4:1998 for airborne testing. Measurements were made at source, in the first floor receive room and then the sound source (pink noise) was switched off with further readings taken in the receiving room in order to measure the background noise level.

Given that the receive room was furnished, it was not necessary to undertake reverberation time testing.

The results of the sound insulation test was 44dB $D_{nTw}+C_{tr}$. The graph is presented below.

It is therefore necessary to improve the sound insulation performance by at least 6dB in order to satisfy the suggested condition/requirements of Environmental Protection.

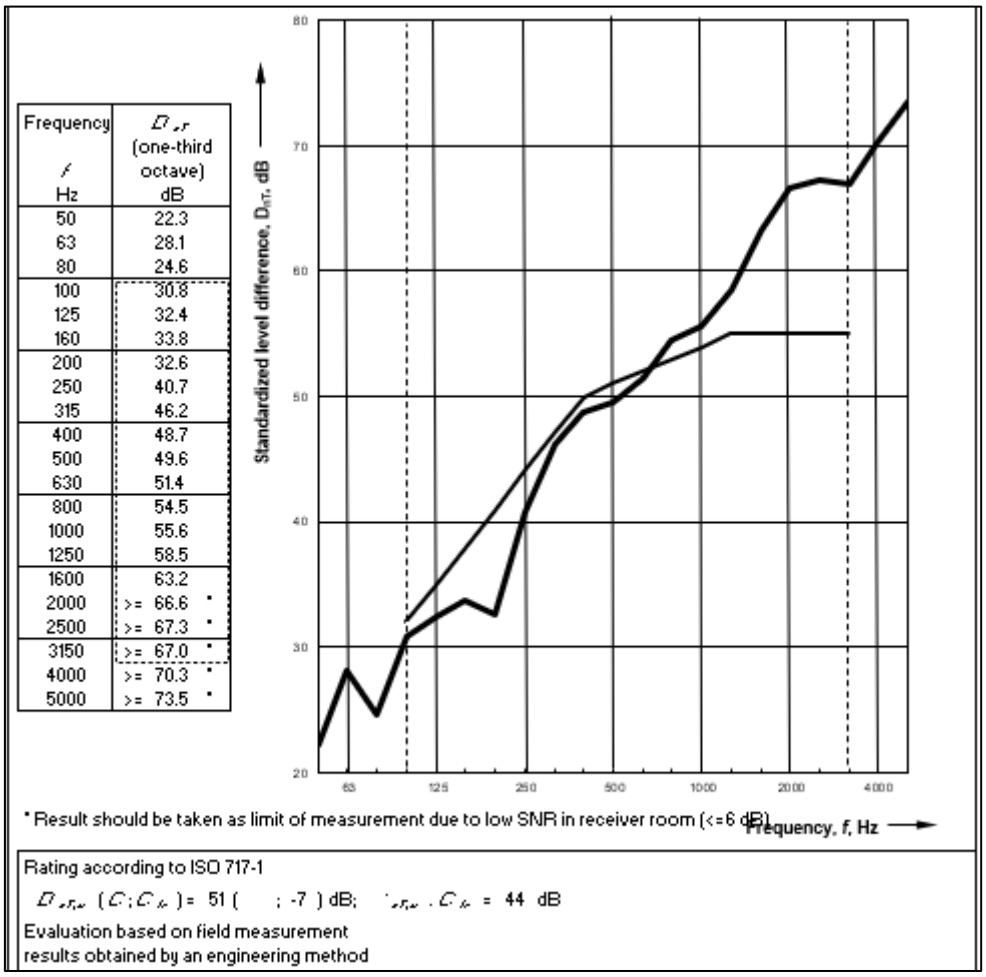


Figure 4. Results of the Vertical Airborne Sound Insulation Testing - Ground to First Floor

4 Amplified Music

To understand how the flooring partition attenuates sound, a musical track was played through a mixing desk to a sound pressure level which achieved 85dB $L_{Aeq,\ 30\ seconds}$ with a swept measurement inside the chip shop space.

With the volume and mixing desk controls set, the track was replayed and receive measurements made in the first-floor bedroom over a number of 30 seconds intervals, as it is appreciated than the song characteristics can change over time.

The level difference between the source downstairs sound pressure level in $L_{Aeq,30\ seconds}$ and the receive room upstairs was approximately 41dB(A). The resulting sound pressure level in the bedroom was approximately 44dB $L_{Aeq,\ 30\ seconds}$.

5 Findings of the Attended Testing

It is noted that there is a requirement to improve the airborne performance of the party floor/ceiling of the premises.

6 Recommendations

6.1 Suspended Ceiling

A suspended acoustic ceiling, which is accessed from the client's side is likely to yield the greatest improvements. The ceiling must be installed for the entirety of the premises in order to protect residents above.

The current lay in grid tile ceiling should be removed and the condition of the ceiling examined and any defects made good.

A Gyproc MF grid ceiling with acoustic hangers and 150mm void would work well. This would incorporate a minimum of 100mm of dense mineral wool and 2x 12.5mm Soundbloc board to the underside.

The sound bloc board layers would be staggered with the seams taped and sealed and also with perimeter edge around the channel may be required, but the manufacturer's instructions should be followed and caution exercised to avoid items being secured directly into the ceiling.

An example of the suspended MF ceiling is as follows - GypCeiling MF Ceiling Systems | British Gypsum (british-gypsum.com)

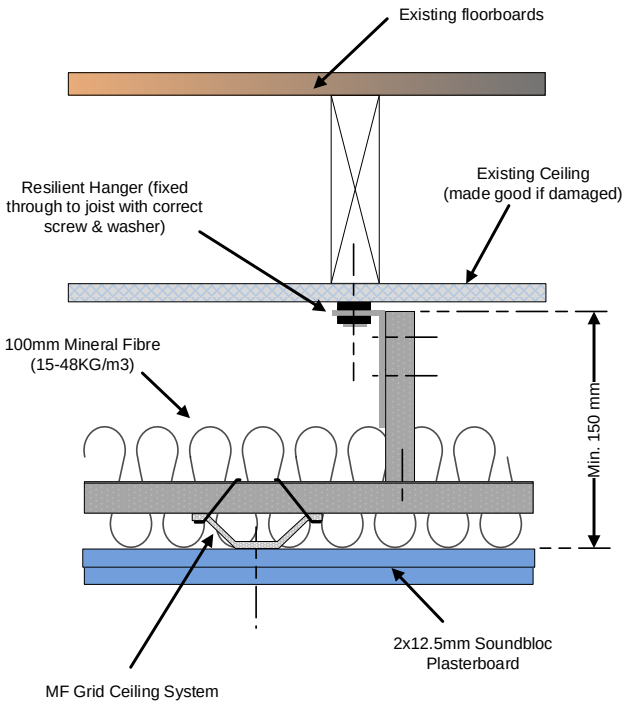


Figure 5. Example of MF Ceiling

An alternative to an MF grid (British Gypsum) is a genie clip approach which may allow for a shallower void.

An example of a genie clip is shown here - https://www.soundstop.co.uk/ZGENIECLIP.php

6.2 Flanking Conditions

The total sound insulation provided by the party floor relates to the construction of the flank walls as well as the separating floor itself. If not detailed correctly flanking sound transmission will cause a sound test fail no matter what the floor construction is:

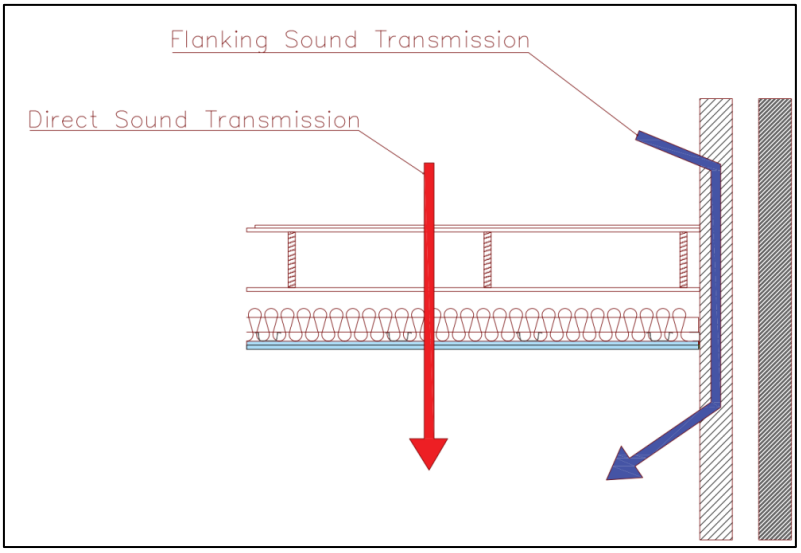


Figure 6: Flanking Sound and Direct Sound Transmission paths

Figure 6 above illustrates the possible 'flanking' path that sound can take, bypassing an otherwise excellent ceiling construction and compromising the degree of airborne (or impact) sound insulation achieved.

Approved Document E (ADE: 2015; section 4.44) advises that where the flanking wall is of less than 375kg/m^2 surface mass then wall linings should be considered to reduce the possibility of flanking sound becoming a problem.

Where wall linings are inserted (an illustration of a simple resilient bar system is shown below in Fig. 7 but see also below relating, it is recommended that suspended ceiling linings are installed first and wall linings brought up to the underside of the ceiling linings. This is to avoid a weakened sound path via a void, continuous past the perimeter edges of the ceiling (see Fig,8).

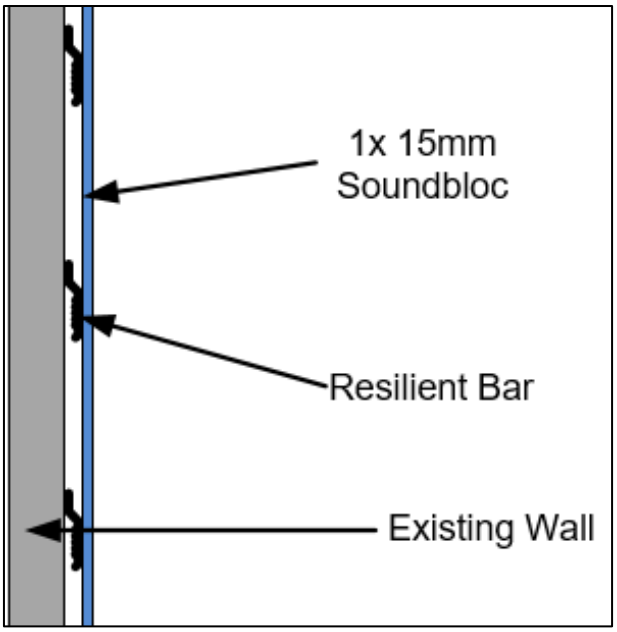


Figure 7: Proposed Wall Lining Detail

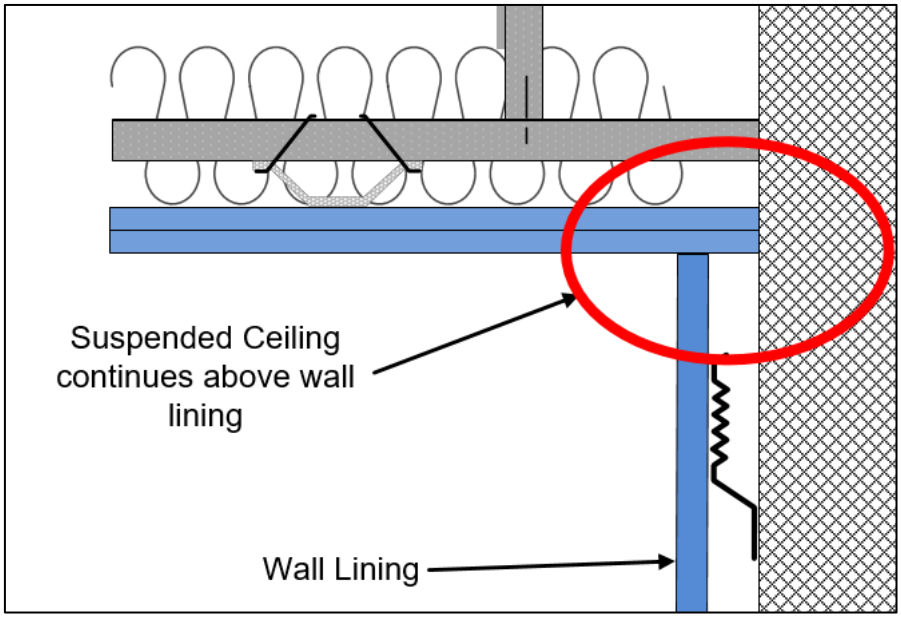


Figure 8: Wall Lining Suspended Ceiling Junction

7 Piano Installation

With the intention to install a piano, it is strongly recommended that the mounting conditions seek to isolate the mass and weight of the piano from the floor to avoid exciting the building structure.

It is strongly advised that the piano is not amplified via microphone or linked to any broadcast speakers.

It is understood by the client that the proposed extension from 75dB $L_{Aeq,T}$ to 85dB $L_{Aeq,T}$ relates to the operation of the piano.

It is strongly advised that the client exercises caution over the selection of music and indeed musician to ensure that the 85dB $L_{Aeq,T}$ level is not likely to be exceeded internally.

8 Workmanship

Plasterboard joints should be staggered and sealed with Gyproc sealant or a flexible decorator's caulk. A 3-5mm gap should be left at all perimeter edges, this too sealed as above.

Proprietary products (e.g. British Gypsum Gyplyner etc.) should be specified/installed correctly/carefully and in accordance with the manufacturer's instructions. It is confirmed that such products can be very effective for upgrading the airborne sound insulation provided by party walls or internal walls. They can also be very effective as wall linings to counter flanking sound transmission.

9 Services

The following applies to any services that pass from one floor to another or that pass through a separating floor or wall.

- Pipes and ducts that penetrate a floor separating habitable rooms in different flats should be enclosed for their full height in each flat.
- The enclosure should be constructed of two layers of board material having a combined mass per unit area of at least 16kg/m^2. (2x12.5mm plasterboard)
- Either line the enclosure, or wrap the duct or pipe within the enclosure, with 25 mm unfaced mineral wool.
- Penetrations through a separating floor by ducts and pipes should have fire protection to satisfy Building Regulation Part B - Fire safety. Fire stopping should be flexible and also prevent rigid contact between the pipe and floor. Note: There are requirements for ventilation of ducts at each floor where they contain gas pipes. Gas pipes may be contained in a separate ventilated duct or they can remain un-ducted. Where a gas service is installed, it shall comply with relevant codes and standards to ensure safe and satisfactory operation.
- Do seal the joint between casings and ceiling with tape & sealant.
- Do leave a nominal gap (approx. 5 mm) between the casing and any floating layer and fill with sealant.

If any services are to be installed within party walls it is recommended that they are not back-to-back and that chases into block-work are kept to a minimum.

10 Lighting

It is recommended that surface mounted lighting should be used in order to preserve the full sound resistance of the ceiling linings. If recessed lighting units MUST be used then the number and positioning should be limited such that no more than one unit is used per $2m^2$ of ceiling area, into openings no closer than 0.75m and using units approved for fire and acoustic performance.

11 Fire Safety

The report focuses solely on the acoustic performance of the separating floor and ceiling between ground and first floor. It remains the client's responsibility to pursue information and specifically specialist information in respect of fire safety and structural integrity.

12 Conclusion

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