



19th December 2023

Mr L Edwards
Optimum Architecture Ltd
Nags Corner
Nayland
CO6 4LT

Dear Les,

Reference: Park Street Stores, Stoke by Nayland (DC/23/03801)

I have been asked by yourself to assess and advise on the sound insulation at the above address which is a listed building. The site currently comprises of a house adjoining a shop and post office (part of the house is over the shop). It is proposed that the house will be split into 2 units with a flat above the shop and a house adjacent to the flat and shop (i.e. over 2 floors). There does not seem to be a change of use between the shop and the proposed dwellings although the entrance to the proposed flat will be separated from the shop store where currently it is connected.

Babergh District Council have given planning permission with the following condition relating to sound insulation:

10. ACTION REQUIRED IN ACCORDANCE WITH A SPECIFIC TIMETABLE: SOUND INSULATION

Prior to first occupation, a scheme of sound insulation works to the floor/ceiling and party wall structures between the separate residential units created by the development shall be implemented in accordance with details that have first been submitted to and approved in writing by the Local Planning Authority. Thereafter the approved scheme shall be retained in perpetuity.

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Reason - To enable the Local Planning Authority to retain control over the development in the interests of the residential amenity of the occupiers.

The condition mentions the floor/ceiling but does not specifically mention the shop where it does refer to the dwellings. This could be construed as meaning the sound insulation is to apply to the 2 dwellings as this is where there is a change of use (i.e. 1 dwelling to 2 dwellings).

Advice will be given for all areas and with a view to achieving the requirements of the Building Regulations Part E. It should be noted that as the building is listed there may be aspects that restrict the works that can be carried out (e.g. low ceilings, door frames etc). Failure to meet the criteria in Part E of Building Regulations is not necessarily failure to comply. My comments and advice are as follows:

Separating Constructions (Requirement E1)

Part E sets the required levels of sound insulation for different types of development. The criteria for flats and houses are shown below (the criteria for this site are shown in red):

		Sound Insulation Airborne Minimum $D_{nT,w} + C_{tr}$	Sound Insulation Impact Maximum $L'_{nT,w}$
<i>Dwelling-houses and Flats</i>			
Purpose Built	Walls	45	-
	Floors/Stairs	45	62
Material Change of Use	Walls	43	-
	Floors/Stairs	43	64

N.B. There is no impact requirement for residential above a shop.

Separating Walls

There will be separating walls between the shop and the house and between the flat and the house. The walls will be dealt with in order of rear to front and ground floor then 1st floor using drawing 1405-1-04C as reference.

Shop Store to House Kitchen

This wall is over 9" thick solid masonry and as such is equivalent to a Part E Type 1 wall recommended for new build. As such this wall is highly likely to be compliant and needs no further work for acoustics.

Store and Post Office to House Kitchen and Cupboard

This wall is understood to be a lightweight framed wall. This can be upgraded on the store side with an independent stud (typically 50mm) 10mm from the wall (fixed only to the ceiling, floor and perimeter walls) with 50mm lightweight mineral wool roll or rigid batts in between the studs but not between the frames and the existing wall (the gap must be kept clear). Fix two layers of 12.5mm plasterboard totalling 20 kg/m² (e.g. 2x SoundBloc) to the studs ensuring staggered joints. This construction is recommended in Part E for thin masonry walls (see Appendix A). In theory it should be capable of upgrading a stud wall to Part E standards. However this could be dependent on the existing wall. If this can first be upgraded with a layer of 12.5mm SoundBloc on the store side first (fixed direct to the wall) then this would add some useful mass to the existing construction.

This independent lining could be installed in the cupboard of the house to save space in the Post Office. The perpendicular wall between the store and cupboard should be lined if this section of wall is lightweight. If masonry it is likely that the wall would be acceptable without the additional lining as the space is a cupboard (this would need approval from Building Control).

Post Office to House Lounge

This wall appears to be over 9" thick solid masonry and as such is equivalent to a Part E Type 1 wall recommended for new build. As such this wall is highly likely to be compliant and needs no further work for acoustics.

Shop to House Lounge

It appears that the wall is largely compliant with thick masonry with a door opening that has been blocked up with a lightweight structure. Rather than line this whole section of wall the treatment could simply be carried out in the door opening thereby saving some space in the shop. The treatment would be a twin stud construction which is essentially 2 of the independent frames and linings described for the store and Post Office but back to back i.e.

two independent frames of 50 to 100mm timber stud (or 70mm metal C studs) with lightweight mineral wool roll or rigid batts in between the studs (not between the frames) and finished with 20 kg/m² plasterboard (e.g. two layers of 12.5mm SoundBloc plasterboard) each side with a void between the inside lining faces of around 200mm. The current lightweight structure could be removed or left in place if the recommendation can be built around it. It could be included as one of the linings if there is space and it can be upgraded to 20 kg/m² plasterboard.

Shop to House Sitting Room

The wall is lightweight with exposed timber frames on the sitting room side. This can be upgraded with an independent lining as per the store and Post Office. Masonry could also be an option here if desired (virtually any form of 4" brick or dense masonry would be acceptable for acoustics as the existing wall will act as the independent lining).

Flat Sitting/Dining Room to House Boiler Room, Bedroom 2 and Bedroom 1

The existing walls in these locations are lightweight framed walls. There are considerable irregularities on the flat side of the wall (on the other side of the house boiler room) and the house side has exposed timbers in the boiler room and bedroom 1. The wall is half height in Bedroom 2 due to the pitch of the house roof.

Again, the independent lining as described for the store and Post Office would be acceptable in these locations. It is understood that this would be carried out on the sitting/dining room side due to the timbers on the house side. Due to the wall with irregularities on the flat side the works should be carried out in Bedroom 2 and as the wall is half height the lining would be half height also saving on the amount of works. The lining could be carried out in the boiler room but as this is not habitable there would be no harm acoustically in leaving this as is. This would also allow an area of the roof timbers to be checked periodically. Clearly, fire control is also important and should be taken into account in deciding what to do with this section of wall and all our recommendations. The door in the landing area on the separating wall line would benefit from being overboarded with plasterboard in the void or at least be sealed with a mastic or foam to seal airgaps.

Shop Store to Flat Entrance Stairwell

This is a totally new wall and could be formed from any of the following:

New twin stud wall with two independent frames of 100mm timber stud (or 70mm metal C studs) with lightweight mineral wool roll or rigid batts in between the studs (not between the frames) and finished with 20 kg/m² plasterboard (e.g. two layers of 12.5mm SoundBloc plasterboard) each side.

Masonry (brick or dense block) around 9" thick and plastered each side.

100mm timber stud (or 70mm metal C stud) with 100mm lightweight mineral wool in between and finished with 20 kg/m² plasterboard (e.g. two layers of 12.5mm SoundBloc plasterboard) on resilient bars each side.

Separating Floors

The separating floor between the shop is understood to be floorboards on timber joists with a suspended ceiling. The exact construction is not known. It was not possible to measure the sound insulation due to the shop being fully stocked and open to the public at the time of the visit. In our experience testing in shops is highly inaccurate due to the absorption of sound via the shelves and stock. The standards require empty unfurnished spaces for accurate testing. Quite simply the results can not be relied upon to represent the actual sound insulation. During the time of my visit upstairs I did not once hear any activity from the shop despite there being frequent customers (I did hear shop activities from the house sitting room on the ground floor) and I believe that this area of the development could easily be left as is. There is no change of use and the shop closes at reasonable hours meaning there will be no activities during the night.

In any case, the normal floating floor build up would be difficult to achieve in the flat due to the low door frames. There is little headroom in the shop for an additional suspended ceiling.

The only construction that would seem viable at this site would be a system that is fitted within the existing construction with only a very small loss of height in the flat. This would be as follows:

Remove the existing floorboards and lay 50mm mineral wool ($\geq 10\text{kg/m}^3$) on to the existing ceiling. Fix two layers of 12.5mm SoundBloc horizontally between the joists at a height of 50 to 60mm from the existing ceiling. This can be done by fixing strips of plasterboard or mdf or timber battens etc to the sides of the joists to form a ledge. Seal all joints on the top

layer between the plasterboard and the joists and between adjacent sheets of plasterboard. Place 100mm mineral wool ($\geq 10\text{kg/m}^3$) in the remaining void. Install British Gypsum SI System joist channels (do not screw to joists) and place 19mm plasterboard Plank between the joists (resting on the ledges of the joist channels). Replace floorboards and fix only to the ledges of the channel (screws going through the centre into the joists will lead to a much lower performance). The SI system would normally be used with resilient bars and a 20kg/m^2 ceiling. The system described above is likely to be borderline and may not be capable of passing on site but is useful where there are height restrictions to achieve the best possible solution under the circumstances.

Internal Constructions (Requirement E2)

Part E requires new internal walls (i.e. those newly built within a dwelling) to be rated at R_w 40 dB (or higher) if they belong to a bedroom or a room containing a toilet (except where there is a door in that specific section of wall between the two areas it separates or if the wall separates an en-suite from the associated bedroom). Such a wall can be formed from either 75mm timber or 50mm metal stud with 20kg/m^2 plasterboard each side (e.g. two layers of 12.5mm SoundBloc plasterboard) which can be reduced to 10kg/m^2 plasterboard each side if there is 25mm lightweight mineral wool in the cavity ($\geq 10\text{kg/m}^3$). All other internal walls can be formed from standard plasterboard with no insulation required.

It appears that there are no internal walls that are required to meet the above standard; in the flat the new bedroom 2 wall has a door opening to the landing and the wall between bedroom 2 and the bathroom is existing as are all other internal walls in the flat and the house.

Conclusion

The above advice is given with the intention of meeting Part E requirements or as best as can be achieved under the circumstances of a listed building. It is considered that there would be little harm in not doing any works to the floor although a system has been described that could be installed if necessary. It is proposed that testing is carried out on the walls at completion (out of hours and with pets removed due to the high noise levels; 100 dB plus) and the floors could also be tested at the same time in their current condition. The shop could either be cleared or tested as is to give a less accurate idea of the sound insulation. This will help Building Control decide on the required action should the client wish to hold back on floor works until then.

Please let me know if you wish to discuss any of the recommendations or if you feel I have missed something that we discussed or if you have any alternative proposals you would like me to comment on.

Yours sincerely,

Keiron Durrant
Principal Consultant

Appendix A –Part E Wall Treatment

Wall treatment 1: Independent panel(s) with absorbent material

4.22 The resistance to airborne sound depends on the form of existing construction, the mass of independent panel(s), the isolation of the panel(s) and the absorbent material.

Construction

4.23 The independent panel may be used on one side of the existing wall only where the existing wall is masonry, and has a thickness of at least 100 mm and is plastered on both faces. With other types of existing wall the independent panels should be built on both sides.

4.24 Independent panel(s) with absorbent material (see Diagram 4-2)

- minimum mass per unit area of panel (excluding any supporting framework) 20 kg/m²
- each panel should consist of at least 2 layers of plasterboard with staggered joints
- if the panels are free-standing they should be at least 25 mm from masonry core
- if the panels are supported on a frame there should be a gap of at least 10 mm between the frame and the face of the existing wall
- mineral wool, minimum density 10 kg/m³ and minimum thickness 35 mm, in the cavity between the panel and the existing wall

4.25 Points to watch

Do

- Do ensure that the independent panel and its supporting frame are not in contact with the existing wall.
- Do seal the perimeter of the independent panel with tape or sealant.

Do not

Do not tightly compress the absorbent material as this may bridge the cavity.

Diagram 4-2: Wall treatment 1

