Chartered Building Consultancy

Acoustic South East

Design Review

Client:	**Renny Poore**
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Issue 1	
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CQMS Safety Scheme
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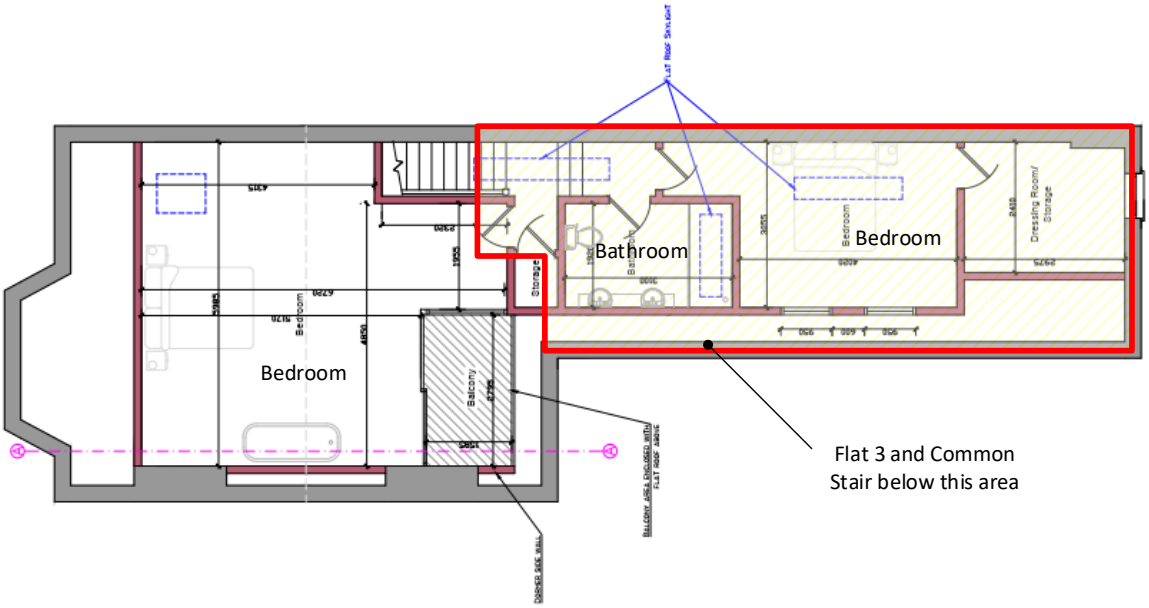
Report by: George Orton BEng(Hons) MIOA

Issue 1	29/07/2024

1 Introduction and Conclusion

Acoustic Southeast has been instructed to assess the acoustic design relating to the proposed development. The development will extend the existing flat 2 by creating a loft conversion. Parts of the loft conversion will be above another existing flat (Flat 3). The development layout can be seen below:



The acoustic design review will consider the following areas:

- Building Regulation and Planning Condition sound insulation levels
- Separating floors/walls within the proposed development

If recommendations in this report are followed to a good standard of workmanship the separating walls/floors should achieve the sound insulation criteria for conversion property. This should be sufficient to satisfy the planning condition given that all areas are dwellings (as opposed to higher noise creating uses such as bars/gyms etc.)

As the works will constitute a change of use (dwelling area in an area of building that was not previously a dwelling area) the requirements of Approved Document E will have to be satisfied. To achieve requirement E1 pre-completion (prior to spaces being occupied) will have to be completed.

It should be noted that if the products are not installed to the manufacturer's specification it can not be certain that the designs for the party floor/wall constructions will meet with the current building regulations regarding the passage of sound. The advice has been provided in good faith to help with the development's sound insulation but no responsibility can be taken for the structural integrity, fire safety etc of the design or for any specific levels of sound insulation achieved.

2 Planning Conditions and Criteria

2.1 Planning Condition

The development has gained planning approval Condition 5 relates to sound insulation

> 05. The development hereby permitted shall not commence unless and until a sound insulation scheme for protecting the residential properties below (Flat 3) and adjoining flat/s (No.5 and No.9 St Georges Road) from noise has been submitted to and approved in writing by the Local Planning Authority. The scheme shall be carried out in accordance with the approved details and retained as such thereafter.

2.2 Building Regulations

Approved Document E of the Building Regulations (2003 Edition) specifies minimum performance values of Weighted Standardised Level Difference (DnT,w + Ctr) for airborne noise transmission through party floors and walls and Weighted Standardised Sound Pressure Level (L'nT,w) for impact sound transmission through a floor.

It should be noted that with airborne sound insulation it is the level difference that is being measured between rooms and the higher the result the better the insulation.

With impact sound insulation it is the actual sound pressure level in the receiving room that is measured, and therefore the lower results, the better the insulation.

As the development contains only dwellings and the condition does not state any specific criteria, it is assumed that the standard building regulations criteria will be acceptable

A summary of the acoustic requirements, for the conversion property, are as follows:

Requirements of:	Element	Airborne Sound Insulation (DnT,w + Ctr)	Impact Sound Insulation (LnT,w)
Bregs Dwelling/Dwelling	**Floor**	**≥43dB**	**≤64dB**
Bregs Dwelling/Dwelling	**Wall**	**≥43dB**	**N/A**

Table 1: Building Regulations Noise Criteria

3 Party floors

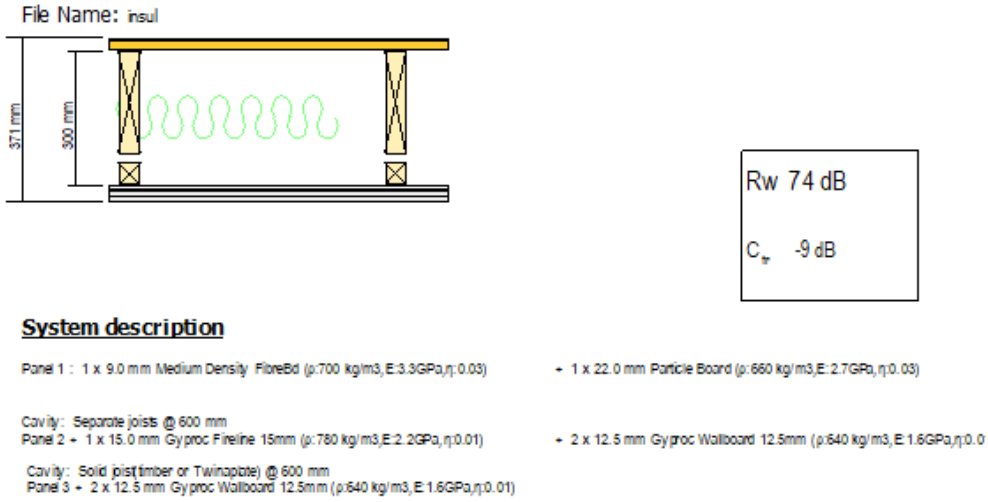
Recommendations for the proposed party floors are detailed below. The recommendations assume that the structural engineer will require that new joists are installed to support the new rooms in the existing roof (existing ceiling joists in the loft space are fairly slim)

3.1 Loft Conversion Floor Option 1

Option 1 is the preferred option in terms of acoustics, however it does require that works are completed in the existing 1st floor flat.

- Thin acoustic floor (as detailed in notes below)
- New 22mm Chipboard/Ply/OSB
- New timber floor joists (specified by structural engineer. New floor joists to be totally independent of existing ceiling joists)
- 100mm Rockwool or acoustic insulation roll between the new joists (or laid over the existing ceiling joists)
- Existing timber joists
- Existing Ceiling
- New 15mm Fireline or 2x12.5mm Soundbloc (fire consultant to review floor detail)

The floor has predicted to achieve a sound insulation level, in absence of flanking sound transmission paths, of Rw+Ctr =65dB



3.2 Loft Conversion Floor Option 2

For option 2 it is assumed no works are able to take place in the existing 1st floor flat:

- Thin acoustic floor (as detailed in notes below)
- New 22mm Chipboard/Ply/OSB
- New timber floor joists (specified by structural engineer. New floor joists to be totally independent of existing ceiling joists)
- 100mm Rockwool or acoustic insulation roll between the new joists (or laid over the new plasterboard that is fixed on top of the existing ceiling joists)
- New 15mm Fireline or 2x12.5mm Soundbloc fixed to top of existing ceiling joists (fire consultant to review floor detail)
- Existing timber joists
- Existing Ceiling

The floor has predicted to achieve a sound insulation level, in absence of flanking sound transmission paths, of Rw+Ctr =55dB

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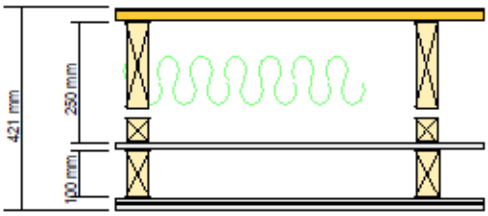

Rw 67 dB

C_{tr} -12 dB

System description

Panel 1 : 1 x 9.0 mm Medium Density FibreBd (ρ:700 kg/m3,E:3.3GPa,η:0.03) + 1 x 22.0 mm Particle Board (ρ:660 kg/m3,E:2.7GPa,η:0.03)

Cavity: Separate joists @ 600 mm
Panel 2 + 1 x 15.0 mm Gyproc Fireline 15mm (ρ:780 kg/m3,E:2.2GPa,η:0.01)

Cavity: Solid joist(timber or Twinaplate) @ 600 mm
Panel 3 + 2 x 12.5 mm Gyproc Wallboard 12.5mm (ρ:640 kg/m3,E:1.6GPa,η:0.01)

3.3 Acoustic Floor Options

Three suitable examples would be:

- Monarfloor's "Deck 9"
- Cellecta's "Deckfon17T"
- H&H Acoustic Technology's "Reduc Micro 17"

3.4 Loft Hatch

The existing loft hatch, in the ceiling of Flat 3, should be infilled as detailed below:

- Timber joists to match depth of existing ceiling joists
- 50mm Rockwool or acoustic insulation roll between the new joists
- 2x15mm Fireline Plasterboard

The area should be infilled prior to completing the floor detail (option 1 or 2) shown in the above sections

3.5 Final Test Results

The predictions above were for the floor detail alone. When the sound tests are completed, at the end of the project, flanking sound transmission paths will undermine the sound insulation performance of the party floor. It is assumed that the final test results should be no more than 6dB lower than the predicted results for the floor. Therefore the final results approximate predictions will be:

- Option 1 $D_{nT,w}+C_{tr}$ = 59dB
- Option 1 $D_{nT,w}+C_{tr}$ = 49dB

Both predictions achieve the Building Regulations sound insulation criteria for a material change of use project ($D_{nT,w}+C_{tr}$ ≥43dB)

4 Party Walls

The existing walls are solid brickwork without a plaster layer. The brick pattern shows bricks on end which demonstrates the wall will be around 215mm thick (two rows of brick courses tied together with end on bricks). The mortar joints look to be in good condition.

Acoustic Southeast have tested many similar wall constructions, in similar Victorian/Edwardian buildings. The tests will usually achieve the conversion property criteria. It is recommended that all mortar joints are checked and filled if required.

If thermal upgrades are required basic thermal plasterboard (fitted on dabs to the background wall) would further improve the sound insulation of the wall.

5 Services Generic Advice

In general it would be better to route soil pipes down through the floor to the existing areas of Flat 2 (I.E. not through party floor). The following applies to any services that have to pass from one floor to another through a separating floor.

- 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.
- Soil pipes should be fixed to the masonry wall with a resilient material between the pipe and collar support bracket.
- Do seal the joint between casings and ceiling with tape & sealant.

6 Final Testing

If recommendations in this report are followed to a good standard of workmanship the separating walls/floors should achieve the sound insulation criteria for conversion property.

As the works will constitute a change of use (dwelling area in an are of building that was not previously a dwelling area) the requirements of Approved Document E will have to be satisfied.

To achieve requirement E1 pre-completion (prior to spaces being occupied) will have to be completed.