



Ref: P4380/L02/RDC (email attachment)

27 October 2021

To:	J O'Hare	of:	The Egerton (Property) Partnership
Cc:	Distribution List	of:	

Dear John,

23a Crimsworth Avenue – Acoustic Design Review

Further to your email, it is understood that you require an acoustic design review of the proposed internal and external wall, floor and roof constructions at the above development.

This acoustic design review will be based on achieving the sound insulation performance requirements presented below.

Details of the requirements for the building envelope (including glazing and ventilation) are presented in AEC's noise assessment that was prepared for the development in August 2021 (AEC ref: P4380/R1/RDC). However, this information is also included and reviewed in this letter for completeness.

Sound Insulation Performance Requirements

The required sound insulation performance to be achieved by separating walls and floors, between adjacent dwellings and between dwellings and other parts of the same building are presented in Table 0.1a of Approved Document E of the Building Regulations 2010 (ADE).

As there are no separating walls and floors to neighbouring residents in this development, the only sound insulation requirements of ADE relate to internal walls.

For internal walls (except for an internal wall containing a door or to an en-suite toilet from an associated bedroom), ADE states that these partitions need to achieve a laboratory sound insulation performance of at least 40dB_{Rw}. This is based on evidence of manufacturer's laboratory test data, or robust acoustic calculation, and does not require to be tested on site.

The sound insulation performance requirements for the external envelope (external walls and roof) are based on ensuring that these elements do not downgrade the performance of the proposed glazing and ventilation strategy for the development. As per AEC's noise assessment, secondary glazing with a sound insulation performance of 46dB_{Rw} (37dB_{Rw}+C_{tr}) has been proposed.

Therefore, the external wall and roof should be constructed such that the on-site sound insulation performance (dB_{R'w}) is approximately 50 to 55dB_{R'w}.

Acoustic Design Review – Internal Structures (Walls & Floors)

Based on the provided drawings, there are two internal wall constructions (one timber and one loadbearing masonry wall), and a single internal floor construction proposed within the scheme. An acoustic design review of these constructions is discussed separately, below.

Internal Timber Wall Construction (non-loadbearing)

The proposed wall construction is understood to be as follows:

- Single layer of 12.5mm dense plasterboard (minimum mass per unit area 10kg/m²);
- 100 x 55mm timber studs @ 600mm centres;
- 25mm thick mineral wool installed within cavity;
- Single layer of 12.5mm dense plasterboard (minimum mass per unit area 10kg/m²);

Calculations indicate that this wall construction would be marginally below the requirements. In order to meet the requirements, AEC would suggest that BG system A026009 is installed. This is comprised of a single layer of 12.5mm thick Gyproc SoundBloc installed on each side of the timber studs. Within the cavity formed by the studs, 25mm Isover Acoustic Partition Roll (APR 1200) insulation should be installed.

Internal Masonry Wall Construction (loadbearing)

The proposed wall construction is understood to be as follows:

- Single layer of 12.5mm dense plasterboard (minimum mass per unit area 10kg/m²) dot and dabbed;
- 100mm (approximately) thick block/brick layer with a minimum density of 1750kg/m³;
- Single layer of 12.5mm dense plasterboard (minimum mass per unit area 10kg/m²) dot and dabbed;

Calculations indicate that this wall construction would achieve in excess of 40dBR_w and would, therefore, meet the requirements of ADE.

Internal Floor Constructions

The floor construction proposed throughout is understood to be as follows (floor base to ceiling):

- 22mm thick Caberfloor chipboard T&G floorboards;
- ~200mm deep timber joists;
- 100mm thick rockwool mineral layer (min. density 10kg/m³);
- Ceiling formed from one layer of 12.5mm SoundBloc.

Calculations indicate that this floor construction would achieve approximately 43dBR_w and would, therefore, meet the requirements of ADE. For internal floors, we would recommend that the mineral wool is always retained so as to ensure there is an adequate level of privacy between the spaces.

Acoustic Design Review – External Envelope (Walls & Roof)

An acoustic design review of the proposed constructions for the external wall and roof(s) is discussed separately, below.

Based on the drawings, there is a single external wall construction and two different roof constructions that have been proposed.

External Wall Construction

It is understood that the proposed external wall construction is as follows (outer face to inner):

- 103mm thick clay facing brickwork;
- 130mm cavity;
- 75mm Kingspan Kooltherm K108 partial filled cavity insulation;
- 100mm standard block internal skin;
- 12.5mm thick BG Plasterboard with skim.

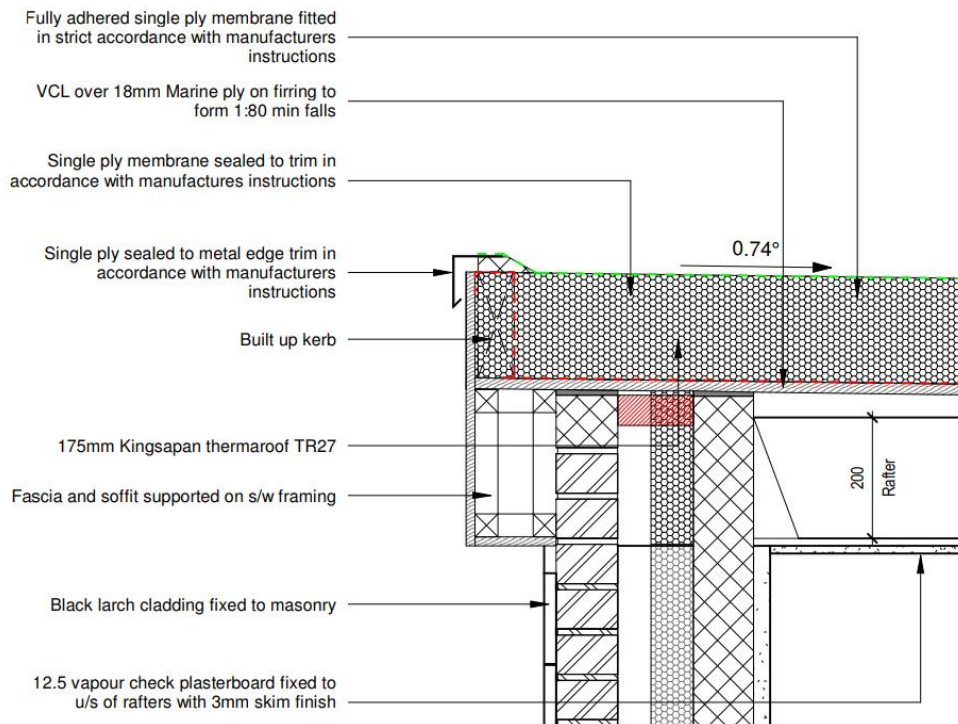
This wall construction would be expected to achieve a sound insulation performance of approximately 55dBR_w. Therefore, meeting the requirement of approximately 50 to 55dBR_w on-site.

Roof Constructions

Due to the layout of the development, in addition to a standard pitched roof, there are also provisions for a flat roof in some locations. The proposed construction details for each of these are discussed separately, below.

Flat Roof

The proposed flat roof construction is understood to be as follows:

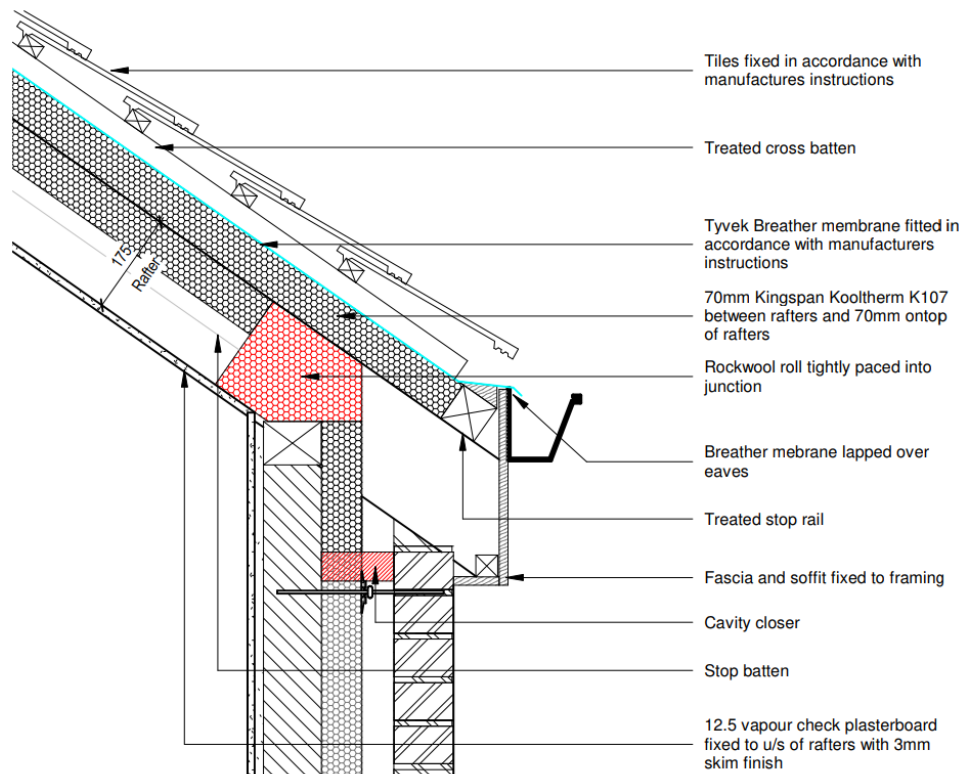


Calculations indicate that this roof construction would achieve a sound insulation performance that is below the suggested requirements.

Calculations indicate that installing mineral wool with a density of 22kg/m^3 would significantly increase the sound insulation performance of the roof. In addition, a ceiling should be comprised of two layers of 12.5mm thick Gyproc SoundBloc.

Pitched Roof

The proposed pitched roof construction is understood to be as follows:



Calculations indicate that this roof construction would achieve a sound insulation performance that does not meet the requirements. We would recommend installing mineral wool with a density of 22kg/m^3 and a ceiling should be comprised of two layers of 12.5mm thick Gyproc SoundBloc.

In order to achieve the requirements, the proposed ceiling must be removed and two layers of 12.5mm thick BG SoundBloc installed via resilient bars to the timber rafters. Within the cavity formed by the rafters, 50-100mm thick mineral wool should be installed.

Acoustic Design Review – Glazing & Ventilation Strategy

As per AEC's preliminary noise assessment, a glazing and ventilation strategy was determined for the development. This has been reproduced in Table 1, below.

Table 1 – Outline Requirements of Glazing and Ventilation to Achieve Internal Noise Levels in Habitable Rooms

Sound Insulation Performance			
Daytime (living rooms and diner)		Night-Time (bedrooms)	
Glazing	Ventilator	Glazing	Ventilator
$32\text{dBR}_w / 28\text{dBR}_w + C_{tr}$	$33\text{dBD}_{ne,w}$	$46\text{dBR}_w / 37\text{dBR}_w + C_{tr}$	$46\text{dBD}_{ne,w}$

Example glazing build-ups to achieve the required sound insulation performances are presented in Table 2, below. As the night-time sound insulation requirements are higher, this will only be achievable with a secondary glazed unit.

Table 2 – Example Glazing Constructions

Sound Insulation Performance	Glazing Type	Example Construction
$46\text{dBR}_w / 37\text{dBR}_w + C_{tr}$	Secondary	6mm Glass / 100mm Cavity / 4mm Glass
$32\text{dBR}_w / 28\text{dBR}_w + C_{tr}$	Double	6mm Glass / 6 – 16mm Cavity / 4mm Glass

Prior to any glazing being installed, octave band sound insulation performance data of the glazing build-ups and ventilators selected must be verified by AEC or others.

It is understood that there are provisions for a double sliding door on the upper floor that leads into a bedroom. As this cannot be a secondary glazed unit, this will require further development and review of available high sound insulation performing double-glazed units.

I trust the above is clear and of assistance.

Yours sincerely



Ross Chamberlain

Checked by:

