ENERGY RATING SERVICES

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9677: 61-65 CHARLOTTE STREET, LONDON

Further to your recent enquiry, we are pleased to present you with a summary of our recommendations for the acoustic treatment of the floors and walls within the proposed residential blocks at the above project.

A design that would exceed standard Building Regulation requirements by at least 5dB, thus complying with Condition 14 of the Decision Notice has been established as the main client requirement for residential parts of the development.

The following sections describe our review and any necessary amendments to the proposed constructions in order to meet the above criterion.

1.0 SOUND INSULATION DESIGN CRITERIA

1.1 Standard Building Regulations

In order to satisfy the requirements for Approved Document E of the building regulations, the minimum sound insulation performance criteria, as shown in Table 1, should be met by all floor and wall constructions (i.e. separating elements between different residential dwellings). For this development, the less stringent requirements for change of use developments apply.

	Design Criteria	
Element	Airborne	Impact
Floor	$D_{nT,w} + C_{tr} \geq 45$ dB for new build $D_{nT,w} + C_{tr} \geq 43$ dB for conversions	$L'_{nT,w} \leq 62$ dB for new build $L'_{nT,w} \leq 64$ dB conversions
Wall	$D_{nT,w} + C_{tr} \geq 45$ dB for new build $D_{nT,w} + C_{tr} \geq 43$ dB for conversions	-

Table 1 Approved Document E design criteria for party elements

1.2 Requirements for Residential Parts

In order to comply with Condition 14 of the Decision Notice, the criteria highlighted in Table 1 should be improved upon by at least 5dB.

This equates to an airborne sound insulation performance of at least $D_{nTw} + C_{tr}$ 48 dB and an impact sound insulation performance of less than L_{nTw} 59 dB.

2.0 PROPOSED FLOOR SYSTEMS

2.1 Floor Type: Residential - Residential

The proposed floor build-up between residential parts (first - second floor and higher) is based on a timber joist floor and has been proposed as follows, from walking surface to ceiling:

- 22mm engineered wood floor,
- 25mm timber battens,
- 35mm NuHeat underfloor heating,
    - Includes 20mm acoustic panel and 10mm bonded fibreboard,
- 22mm oriented strand board (OSB),
- 205mm timber joist with 100mm mineral wool infill,
- 2 layers of 12.5mm FireLine plasterboard,
- MF ceiling system on acoustic hangers forming 100mm void,
    - 25mm mineral wool within void,
- 2 layers of 12.5mm SoundBloc plasterboard.

The above construction would be considered an improvement on Robust Details construction E-FT-2, which comprises a similar above-joist construction, but only a resilient bar ceiling. The proposed acoustically suspended ceiling has significantly more mass and improved isolation, and would therefore be expected to outperform the Robust Details construction.

With E-FT-2 specified as achieving 1 Code for Sustainable Homes credit for new-build developments, it is expected to provide an airborne sound insulation performance of at least $D_{nTw} + C_{tr}$ 48dB and an impact sound insulation performance of less than L_{nTw} 59 dB.

Particularly as the proposed construction in this instance is considered an improvement on the Robust Details construction, we would expect a sound insulation performance compliant with the requirements of Condition 14 of the Decision Notice.

3.0 PROPOSED WALL SYSTEMS

3.1 Wall Construction 1

Wall Construction 1 is based on existing brick work, and is proposed as follows:

- Plaster skim coat,
- 1 layer of 12.5mm SoundBloc plasterboard,
- 9.5mm PIR insulation,
- Existing brickwork (275mm - 400mm),
- 9.5mm PIR Insulation,
- 1 layer of 12.5mm SoundBloc plasterboard,
- Plaster skim coat.

The above construction is an improvement on Robust Details construction E-WM-9, which comprises a 215mm concrete block wall, with plasterboard to each side on dabs.

The Robust Details construction is specified as providing an onsite performance of at least $D_{nTw} + C_{tr}$ 45 dB.

Based on the improvements in the proposed system, comprising significantly thicker masonry parts and insulation separating plasterboard from the masonry, we would expect an onsite performance in the region $D_{nTw} + C_{tr}$ 50-54 dB, therefore compliant with the requirements of Condition 14.

3.2 Wall Construction 2

Wall Construction 2 is based on a proposed blockwork cavity construction, and is proposed as follows:

- Plaster skim coat,
- 1 layer of 12.5mm SoundBloc plasterboard,
- 35mm lining studs, cavity filled with insulation,
- 75mm high density blockwork,
- 50mm cavity, fully filled with insulation,
- 75mm high density blockwork,
- 35mm lining studs, cavity filled with insulation,
- 1 layer of 12.5mm SoundBloc plasterboard,
- Plaster skim coat.

The above construction is comparable to Robust Details construction E-WM-3, which comprises a blockwork cavity wall, with plasterboard to each side on dabs.

The Robust Details construction is specified as providing an onsite performance of at least $D_{nTw} + C_{tr}$ 48 dB, as a 1 Credit Code for Sustainable Homes construction.

Although the proposed construction has a thinner cavity (50mm compared to 75mm) and thinner blockwork (75mm compared to 100mm), the proposed lining channels and insulation is expected to maintain the overall performance of at least $D_{nTw} + C_{tr}$ 48 dB, therefore compliant with the requirements of Condition 14.

4.0 DUCTS AND PIPEWORK

Where pipes and ducts pass through adjacent dwellings, there is a possibility for flanking noise through the pipework itself.

In order to minimise the effects of this, we would recommend following the below advice:

- Where pipework runs through stacked bathrooms, we would recommend first lagging the pipework in mineral wool (25mm thick, minimum density 25Kg/m^3), before boxing in with a single layer of SoundBloc plasterboard or similar,
- Where pipework will penetrate through living spaces (eg combined Lounge/Kitchen), we would recommend lagging as above, but boxing in with a double layer of SoundBloc plasterboard or similar.

Where pipework penetrates through a separating wall or floor, it should be ensured that there is no rigid contact, but an airtight seal should be achieved using non-hardening mastic. Any fire stopping should also allow for a flexible, rather than rigid contact.

For ductwork that is within a single flat (eg kitchen extract fan running to the rear elevation of the same flat), no acoustic criteria need to be met. However, we would recommend boxing in ductwork with a single layer of 12.5mm SoundBloc plasterboard in order to allow amenable operation.

5.0 COMMUNAL DOORS

For doorsets within communal areas (eg from stairwell to corridor), no particular acoustic performance is deemed necessary.

Where doors are specified between communal areas and residential rooms, the following guidance is given in Approved Document E of the Building Regulations:

> *Ensure that any door has good perimeter sealing (including the threshold where practical) and a minimum mass per unit area of 25 kg/m^2 or a minimum sound reduction index of 29 dB R_w*

6.0 REVERBERATION IN COMMON PARTS

The simplest way to treat common parts for reverberation is by following Method A, as defined in Approved Document E of the Building Regulations.

Method A recommends that surface area of ceilings in common parts should be treated with a Class C (or better) absorber. For stairwells, this applies to the underside of landings, rather than the underside of stairs

7.0 GENERAL

It should be noted that where junctions are sealed with mastic, the mastic does not need to be specifically 'acoustic'. Provided the mastic is silicone-based and remains flexible when set (i.e. does not crack) it is acceptable for use.

The sound insulation performance predictions and advice provided in this document are based on the assumption that there will be no major mistakes in workmanship regarding the acoustic detailing and finishing of the party elements proposed in this development.

We trust that the above information is sufficient to your requirements and remain available should you have any further questions.

Yours Sincerely,

Duncan Martin MIOA