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ACOUSTIC INSULATION ASSESSMENT AND SPECIFICATION

PROPOSED ALTERATIONS, 27-29 BAWDLANDS, CLITHEROE, LANCs., BB7 2LA

1. Introduction

This document provides an assessment of the acoustic insulation properties existing fabric of the building and the addresses the actions required to provide acoustic insulation to attain compliance with Building Regulations Approved Document, Part E1 & E2, 2015 – Resistance to Passage of Sound.

Any remedial specifications are designed to match or exceed the stipulated levels required by Building Regulations.

In preparing this assessment reference has been made to technical information contained within:

- “The British Gypsum White Book”
- “Robustdetails® Technical Handbook - September 2023”.

The robustdetails® scheme is an alternative to pre-completion sound testing to satisfy Approved Document E of The Building Regulations

2. The Existing Structure

Party & External Walls:

The measured and visual survey indicates that the external walls to the front, side and rear are 545mm thick and constructed of clay brickwork.

The worst case scenario is that the party wall is 440mm thick clay brick and this is used for assessing the acoustic properties of the existing building.

First Floor:

The first floor comprises 25mm thick softwood timber board over 175 x 50mm softwood timber joists at 400mm centres. The ceiling finish to the underside is 12.5mm thick plasterboard with a plaster skim finish.

3. Acoustic Assessment of the Existing Structure

Party walls:

One brick thick walls with an unplastered can achieve a sound reduction index of 50dB. The nominal density of clay brick being 1690kg/m³

First Floor:

Typically this type of timber floor construction would result in noise levels 78dB for Impact noise and 38dB for Airborne noise

4. Matters to address

The proposed alterations require that the works are to comply with Building Regulations Approved Document E.

Section 0: Performance, Table 0.1a details the minimum performance standards required for walls and floors to satisfy the requirements of Part E1 & E2.

Table 0.1a Dwelling-houses and flats – performance standards for separating walls, separating floors, and stairs that have a separating function		
	Airborne sound insulation sound insulation $D_{nT,w} + C_w$ dB (Minimum values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum values)
Purpose built dwelling-houses and flats		
Walls	45	-
Floors and stairs	45	62
Dwelling-houses and flats formed by material change of use		
Walls	43	-
Floors and stairs	43	64

Extract from Approved Document E

5. Action Required to Comply with Approved Documents

Party Wall:

The existing walls are a minimum of 440mm thick brick and this will provide an Airborne sound index of 55db > 43dB minimum requirement.

2.35 Wall type 1.3 Brick, plaster on both room faces (see Diagram 2.4)

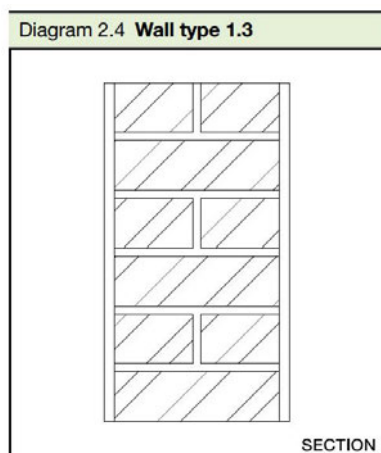
- minimum mass per unit area including plaster 375kg/m²;
- 13mm plaster on both room faces;
- bricks to be laid frog up, coursed with headers.

Example of wall type 1.3

The required mass per unit area would be achieved by using

- 215mm brick
- brick density 1610kg/m³
- 75mm coursing
- 13mm lightweight plaster (minimum mass per unit area 10kg/m²) on both room faces

This is an example only. See Annex A for a simplified method of calculating mass per unit area. Alternatively use manufacturer's actual figures where these are available.



Extract from Approved Document E

First Floor:

The Impact noise level needs reducing to at least 64dB, and the Airborne sound level needs increasing to a minimum of 43dB.

In addition to achieving compliance with Approved Document E, the first floor between the ground floor and the first floor needs to comply with Building Regulations Approved Document B: Fire Safety. The floor structure needs to be 60 minutes fire resistant, so the existing structure will need to be upgraded.

BS Table 2b - Indirect fix plasterboard to new or existing solid timber joist floors
Solutions to satisfy the requirements of BS 476: Part 21: 1987

1 22mm t&g (softwood or chipboard) floor boarding over minimum 195mm x 38mm timber joists at 600mm centres. Gyproc RB2 Surefix Bars fixed to underside of joists at 450mm centres, and at perimeter with ceiling linings as in table fixed into the bars only. 100mm Iover AFR 1200 in the cavity.

2 22mm t&g (softwood or chipboard) floor boarding over minimum 195mm x 38mm timber joists at 600mm centres. Gyproc RB1 Resilient Bars fixed to underside of joists at 450mm centres, and at perimeter with ceiling linings as in table fixed into the bars only.

3 22mm t&g (softwood or chipboard) floor boarding over minimum 195mm x 38mm timber joists at 600mm centres. Gyproc RB1 Resilient Bars fixed to underside of joists at 450mm centres, and at perimeter with ceiling linings as in table fixed into the bars only. 100mm Iover General Purpose Roll in the cavity.

4 Typical platform floor construction (comprising walking surface of 18mm t&g wood board flooring, spot bonded with Gyproc Sealant at 300mm centres to a substrate of Gyproc Plank laid on 25mm Iover Sound Deadening Floor Slab, laid on a minimum of 12mm wood based sheet sub-deck nailed to the joists) over minimum 195mm x 38mm timber joists at 600mm centres. Gyproc RB1 Resilient Bars fixed to underside of joists at 450mm centres, and at perimeter with ceiling linings as in table fixed into the bars only. 100mm Iover General Purpose Roll in the cavity.

Detail	Nominal floor depth mm	Board type	Ceiling lining thickness mm	Maximum loadbearing ratio	Sound insulation $R_w (R_w + Ctr)$ Airborne dB	$L_{w,imp}$ Impact dB	System reference
30 minutes fire resistance BS							
1	240	WallBoard	1 x 12.5	100%	41	76	C206006
60 minutes fire resistance BS							
2	258	FireLine	2 x 12.5	100%	45	72	C016031
3	263	SoundBloc	2 x 15	100%	54	60	C206009
4	315	SoundBloc	2 x 15	100%	64 (53)	54	C016040

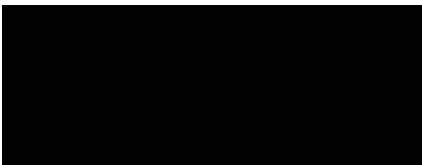
NB The fire resistance and sound insulation performances are for imperforate partitions, walls and ceilings incorporating boards with all joints taped and filled, or skinned according to British Gypsum's recommendations. The quoted performances are achieved only if British Gypsum components are used throughout, and the Company's fixing recommendations are strictly observed. Any variation in the specifications should be checked with British Gypsum.

NB Where boards are fixed direct to timber joists, Gyproc Drywall Timber Screws should be used as opposed to nail fixing to minimise the risk of fixing defects occurring.

Extract from British Gypsum White Book

Existing ceiling to be removed and replaced with 2no layers British Gypsum Soundblock fixed to RB1 resilient bars at 450mm centres. 100mm Iover General Purpose Roll between joist with minimum 22mm timber board finish over. This provides Impact noise reduction to 60dB < 64dB and Airborne sound reduction increase to 54dB > 43dB

Signed:



Paul Derbyshire Dip.Surv.

Dated: 10th May 2024