

16 High Street, Northwood London

**Acoustic Design Review
Report 22739.ADR.01**

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DWG.1 Proposed floor construction

1.0 INTRODUCTION

The aim of this report is to define the acoustic requirements for the proposed development at 16 High Street, Northwood, London. Performance specifications will be established, reflecting a pragmatic approach without compromising on the building's intended use.

The following sections describe the acoustic recommendations for the different areas and the advantages that may be attained through implementation. The basis for all design recommendations within this report is Approved Document E (ADE) 2003 of the 2010 Building Regulations.

2.0 INTERNAL BUILDING FABRIC

2.1 Design Aspirations

The client has expressed a preference to provide sound insulation levels that would comfortably meet the Building Regulations requirements, and would provide compliance with the local authority condition, as follows:

"Sound Insulation

In order to prevent noise disturbance between the upstairs and downstairs units details of a noise insulation method statement should be provided to the local planning authority as part of any future planning application and implemented thereafter."

The main parameter that is used throughout this document to express airborne sound insulation of separating constructions is $D_{nT,w} + C_{tr}$. All specifications in this report will, therefore, be given with respect to this descriptor.

In order to satisfy the requirements of the Building Regulations, the minimum sound insulation performance criteria, as shown in Table 2.1, should be met by all wall constructions (i.e. separating elements between different residential dwellings).

Element	Design Criteria – Dwelling-houses and Flats	
	Airborne	Impact
Wall	New Build $D_{nT,w} + C_{tr} \geq 45$ dB Conversion $D_{nT,w} + C_{tr} \geq 43$ dB	N/A
Floor	New Build $D_{nT,w} + C_{tr} \geq 45$ dB Conversion $D_{nT,w} + C_{tr} \geq 43$ dB	New Build $L'_{nT,w} \leq 62$ dB Conversion $L'_{nT,w} \leq 64$ dB

Table 2.1 Building regulations requirements for new-build party elements

The proposed scheme is understood to be a change of use development with new build extension. This report will therefore make reference to the new build sound insulation criterion as displayed in Table 2.1.

In order to provide compliance with the planning condition and ensure that noise levels from the ground floor shop can be controlled sufficiently, it would be recommended that a target uplift of 10dB over standard ADE:2003 requirements is established, providing the target performances shown in Table 2.2. Note, impact performance from residential units to commercial units below has no greater requirement than standard ADE:2003 requirements.

Element	Design Criteria – Dwelling-houses and Flats	
	Airborne	Impact
Wall	$D_{nT,w} + C_{tr} \geq 55 \text{ dB}$	N/A
Floor	$D_{nT,w} + C_{tr} \geq 55 \text{ dB}$	$L'_{nT,w} \leq 62 \text{ dB}$

Table 2.2 Requirements for commercial to residential party elements

2.2 Separating Wall Constructions

It is understood that there are no separating walls associated with the proposed development.

2.3 Separating Floor Constructions

It is understood that the proposed floor will be a timber joist construction, however current proposals are limited to base build construction methods. In order to provide a party floor which can provide the appropriate sound insulation performance, we would recommend the following construction, in order of walking surface to ceiling soffit below:

- Floor finish
- Nominal resilient layer – Regupol 3912 6mm, or similar.
- 22mm T&G chipboard
- 200 x 50mm timber joists with 100mm thick 45kg/m³ mineral wool insulation
- 2 x 15mm SoundBloc plasterboard affixed to timber joists
- 100mm void provided by MF-type ceiling suspension using GAH1 resilient hangers
- 2 x 12.5mm SoundBloc plasterboard on MF frame
- Plaster skim finish

The above construction would be expected to meet the requirements of Approved Document E (ADE) 2003 of the 2010 Building Regulations, including the 10dB required uplift for airborne performance.

2.4 Junctions and Penetration Details to Maintain Performance

Interfaces between ceilings and all other adjacent elements should be built to ensure that the sound insulation performance of the wall is not compromised. All gaps should be tightly packed with mineral wool and all joints should be sealed with a flexible sealant, such as silicone caulk.

Please note that at this stage of the project no junction detail drawings have been provided. All junction details whereby the acoustic integrity of the project could be affected should be provided to KP Acoustics Ltd. for review.

2.5 Pipes and Penetrations

Where any ducts, pipes, conduits or other services penetrate the floor, provide an air-tight seal between the service and partition using a flexible sealant. All gaps should be tightly packed with mineral wool and sealed with plasterboard pattress and mastic seal.

2.6 Door Requirements

Where a degree of sound insulation is deemed necessary, doors with rated acoustic performance would be required. Recommendations with regards to the necessary sound insulation performance of the door units to be installed in the most sensitive spaces are shown in Table 2.3.

R _w (dB)	Typical Door Construction
30 for all apartment entrance doors	Solid core timber door, with drop seals and gaskets, or high quality acoustic perimeter and threshold seals
25-27 for all internal doors	Solid core timber door, no seals around the perimeter Solid core timber door, foam tape seals around the perimeter

Table 2.3 Acoustic specification of door systems

Some general points that should be followed regarding the acoustic performance of doors are as follows.

- Non-hardening caulk should be used to seal joints airtight
- If hollow metal frames are used, they should be fibre- or grout-filled
- Doors should be gasketed around the entire perimeter to be airtight when closed
- Seals should be adjustable to compensate for wear, thermal movement, settlement of building structure and other factors that cause misalignment of the doors

- Good quality hydraulic closers should be fitted on all doors likely to be subjected to heavy use

3.0 BUILDING SERVICES

3.1 Lighting and Electrical Services

Downlighters or recessed lighting may be installed at no more than one unit per 2m² of ceiling area, at centres not less than 0.75m and into openings not exceeding 100mm diameter.

3.2 Hydraulic Systems

Hydraulic systems shall be designed and installed to minimise audibility of water/waste noise within the residential areas of the apartments.

The following controls shall be adopted to minimise noise emissions from hydraulic systems.

- Avoid hard grouting and chasing of water pipes in walls, particularly where walls are common with noise sensitive areas
- In noise sensitive areas, support pipes with clamps having a soft neoprene sleeve.
- Route all rainwater down pipes outside the building or, alternatively, via service cupboards or risers boxed-in by means of 2x12.5mm layers of FireLine. Avoid bends and T-junctions in ceiling spaces above noise sensitive areas
- Do not support pipework from lightweight constructions

Where it is unavoidable that hydraulic systems pass through residential spaces, they must be concealed. As a minimum, bulkheads shall consist of minimum two layers of 12.5mm plasterboard with staggered and sealed joints. When concealing waste systems, the bulkhead shall also be lined internally with 50 mm mineral fibre insulation (30 – 40 kg/m³)

Where pipework passes through floors, penetrations shall ensure effective acoustic sealing around the pipes. This would be achieved by initially providing all pipework with a resilient sleeve detail. Large floor openings can be in-filled using a proprietary cementitious fire-stopping compound to the depth of the slab, whilst smaller openings can be loosely packed with mineral fibre insulation and closed-off with plasterboard pattresses above and below the slab. If using fire-stopping compound, it must be ensured that pipework holes in the formwork are cut oversize to prevent contact with the pipes. Any gaps remaining around pipework penetrations must be sealed with a continuous bead of non-hardening mastic.

General principles with regards to waste systems behind lightweight constructions within apartments are shown in Table 3.1.

Pipework Construction	Typical Door Construction
Cast iron pipework	No treatment necessary
Copper pipework	Wrapped in minimum 25mm thick acoustic insulation/foam and lag with 5kg/m ² loaded vinyl sound barrier material, or similar
Plastic pipework	Wrapped in minimum 50mm thick acoustic insulation/foam and lag with 5kg/m ² loaded vinyl sound barrier material, or similar
Plastic pipework to taps	No treatment necessary
Drainage systems	Wrapped in minimum 25mm thick acoustic insulation where concealed by lightweight constructions within residential areas

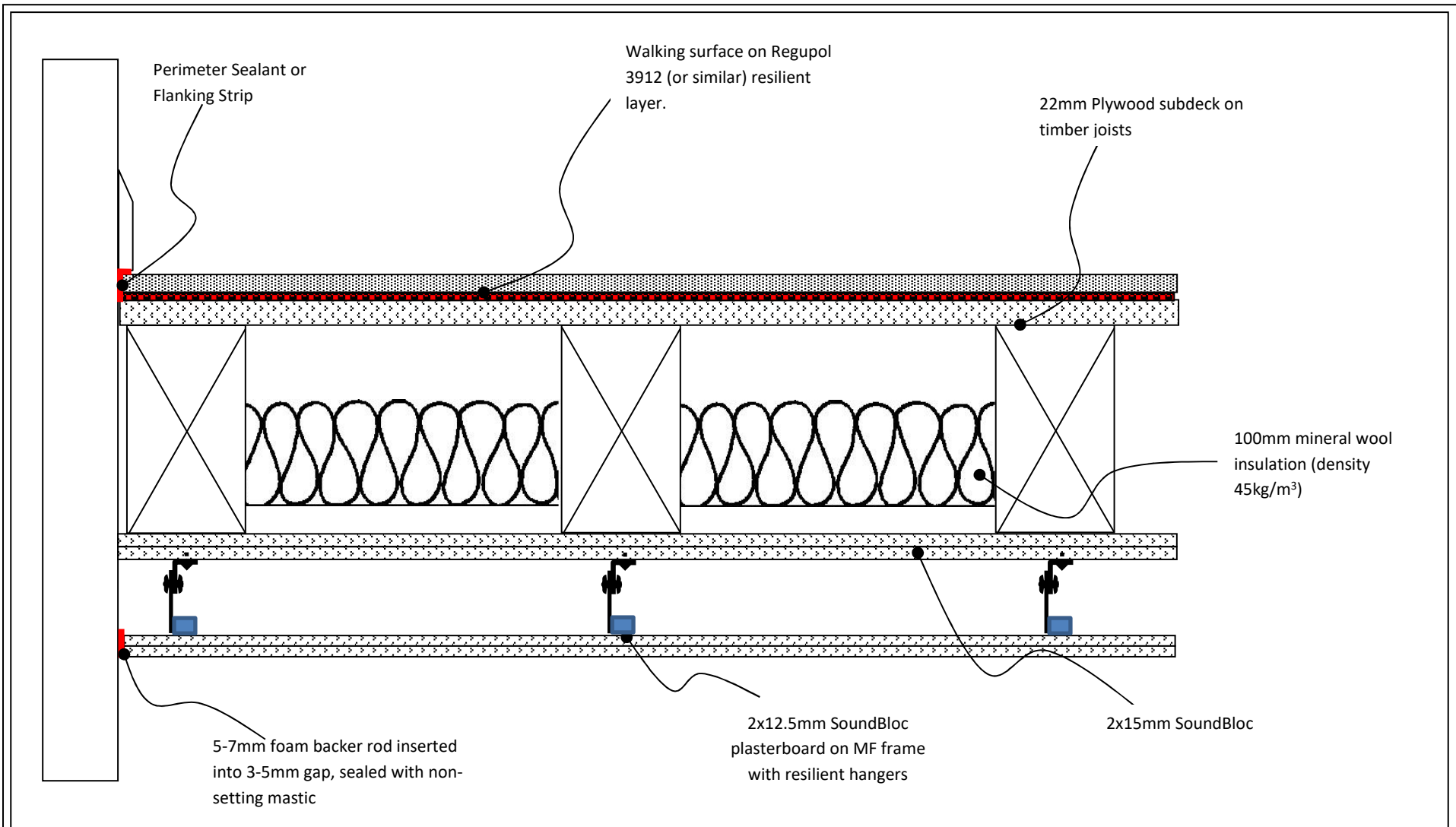
Table 3.1 Acoustic specification of SVP

4.0 CONCLUSION

The drawings for the proposed development at 16 High Street, Northwood, London, have been reviewed and suitable acoustic specifications have been determined to ensure that noise from the ground floor shop use does not negatively impact on the proposed first floor residence.

In order to achieve this, a +10dB uplift over ADE:2003 requirements has been recommended. A robust floor construction has been proposed which would be comfortably capable of achieving the required performance.

Additional advice for general good practice and optimisation of detailing has also been provided, which if followed would provide an improvement in future residential amenity.



Title:

Proposed Floor Construction (NTS)

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FIGURE 22739.DWG1

