

34 Townsend Road, Southall. UB1 1EX

ACOUSTIC DESIGN REVIEW

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Introduction

The Acoustic review report and its recommendations has been prepared for an enhanced sound insulation value of at least 5dB above the maximum Building Regulations value, for the floor/ceiling/wall structures separating different types of rooms/uses in adjoining dwellings/areas of a bedrooms below kitchen/living/dining/bathroom of separate dwelling to comply with required standards of the Council's SPG10 and noise limits specified in BS8233:2014.

The acoustic recommendations within this report are compliance with Approved Document E (ADE) 2003 of the 2015 Building Regulations.

Design Objectives

Planning Condition requires that the sound insulation between the consented flats be uprated by 5 dB above the requirements of the Approved Document E.

The adopted standard for 'Approved Document E (ADE) Resistance to the Passage of Sound' of the Building Regulations (England and Wales) came into force in 1st July 2003, incorporating 2004, 2010, 2013 and 2015 amendments. This document stipulates minimum requirements for the sound insulation levels within residential dwellings. Approved Document E states:

"In the Secretary of State's view the normal way of satisfying Requirements E1 will be to build separating walls, separating floors and stairs that have a separating function, together with associated flanking construction, in such a way that they achieve the sound insulation values for dwelling-houses and flats set out in Table 1a, and the values for residential purposes set out in Table 1b."

Table 0.1a of ADE 2015 provides the performance standards for purpose built dwelling houses and flats, which is reproduced below.

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 $D_{nT,w} + C_{tr}$ 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

To meet the above standards, all party wall and floor constructions (i.e., dividing elements between various residential residences) should meet the minimum sound insulation performance limits, as listed in Table above.

The proposal is to convert the existing property in to separate self-contained flats. the report will recommend the required.

sound insulation criterion as per table above for separating floors and separating wall to self-contained dwelling.

As the development is a change of use, the minimum airborne sound insulation requirement of the Approved Document E is $D_{nT,w} + C_{tr}$ 43 dB, and the maximum impact sound insulation requirement in $L'_{nT,w}$ 64 dB. As such, Planning Condition requires that the minimum airborne sound insulation performance between the flats in $D_{nT,w} + C_{tr}$ 48 dB, and the maximum impact sound insulation performance between the flats is $L'_{nT,w}$ 59 dB.

The ADE performance standards, specified as $D_{nT,w} + C_{tr}$ relate to the on-site sound insulation values. For design purposes however, the $D_{nT,w} + C_{tr}$ must be translated into known sound insulation properties of the various components making up partition walls and floors so that appropriate constructions can be determined. The sound insulation of various construction elements is usually measured and rated in acoustic test laboratories and quoted in terms of the Sound Reduction Index, $R_w + C_{tr}$.

The ADE performance standard for impact sound insulation is specified as $L'nT, w$ and relates to the on-site impact sound pressure value. For the purposes of design the $L'nT, w$ value has been converted into a $L_{n,w}$ value to allow for the floor construction to be accurately assessed. The minimum performance requirements for separating elements within this development in terms of R_w+C_{tr} and $L_{n,w}$ are in Table below.

AIRBORNE SOUND INSULATION REQUIREMENTS

Criteria	Type	ADE+5dB Requirement
Change of Use	Floors	$\geq 55 \text{ dB } R_w + C_{tr}$
Change of Use	Walls	$\geq 55 \text{ dB } R_w + C_{tr}$

IMPACT SOUND INSULATION REQUIREMENTS

Criteria	Type	ADE+5dB Requirement
Change of Use	Floor	$\leq 52 \text{ dB } L_{n,w}$

Sound Insulation for Separating Floor Constructions

Separating Element Description	Floor Construction	R _w +C _{tr} dB	L _{n,w}
Party Floor	<ul style="list-style-type: none"> • Collecta ScreedBoard 28 laid on top of existing floor boards (made good) or replacement floor boards; • 100mm Isover Spacesaver in cavity; • Collecta HP30 resilient bars; and • Two layers of gypsum-based board, composed of 15 mm (nominal 12.5 kg/m²) fixed with 25 mm screws and a second layer of 15 mm (nominal 12.5 kg/m²) fixed with 42 mm screws, with all joints staggered. 	55	52

Upgrade of existing floor with a platform floor

(As detailed in Approved Document E1)

Existing floor construction to be surveyed and any required remedial works to be undertaken before the floor treatment is provided. If the floor boards are considered unsuitable for upgrade the floor boards are to be replaced with boarding of a minimum thickness of 12mm. Gaps in the timber boarding should be sealed by overlaying with hardboard or filled with sealant.

Upgrade the existing ceiling by:

- Providing 100mm thick mineral wool with a minimum density 10kg/m³ between the joists in the floor cavity of the existing floor and
- Installing 2 layers of plasterboard minimum total mass per unit area 20kg/m², under existing ceiling laid with staggered joints.

Perimeter of ceiling to be sealed with tape or sealant.

A platform floor to be created by providing a 25mm thick resilient layer of mineral wool with a density of 60 to 100kg/m³ (e.g. Knauf Acoustic Floor Slabs) over the existing floor and carried up the edges of the room to isolate the floating layer from the wall surface. Over this provide 2 layers of board

material: 18mm chipboard spot bonded to 19mm Knauf Drywall Plank, glued together with staggered joints.

Refix the floor deck and fix Floorfoam Easy Edge Strip to the perimeter wall with the integral self adhesive strip.

Install timber battens on resilient strips at the floor perimeter and thresholds.

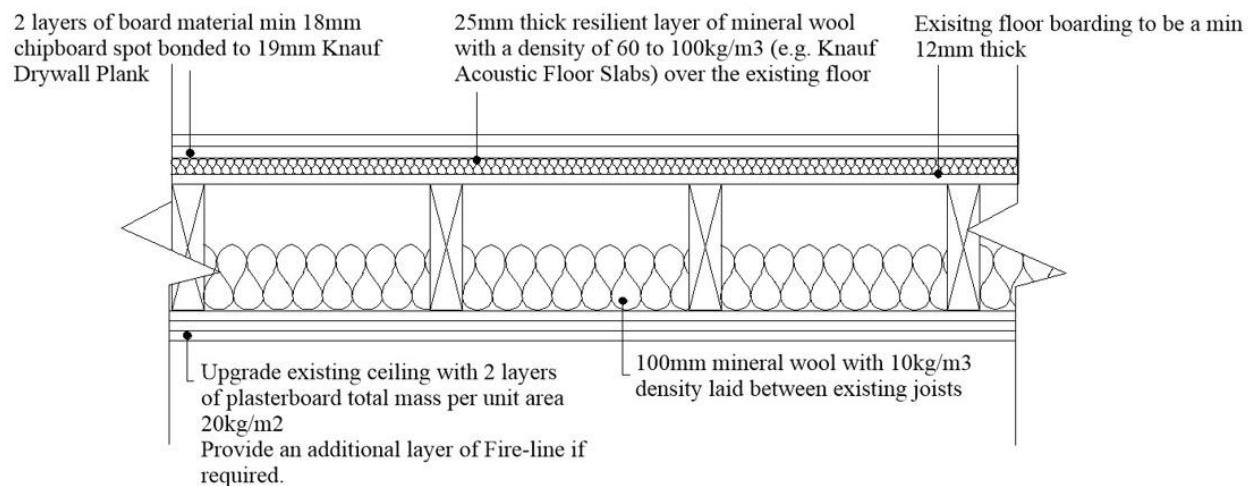
A 5mm gap to be provided between the skirting and floating layer, gap to be filled with flexible sealant.

Do not bridge the floating layer and the base or surrounding walls e.g. with services or fixings that penetrate the resilient layer.

All construction to be in accordance with Knauf 4.3 Separating Floors.

TIMBER FLOOR UPGRADE WITH PLATFORM FLOOR

(as detailed in Approved Document E1 and Knauf Separating floors 4.3 - manufacturers details to be followed)
Sound resistance performance to be checked and confirmed by acoustic Engineer



Pre completion sound testing to be carried out by a suitably qualified person with appropriate third party accreditation (either UKAS accreditation or be a member of the Association of Noise Consultants Registration Scheme).

This construction has the potential to comply with the requirements of the building regulations when forming a separating floor from an existing floor by material change of use.

Regarding airborne and impact sound insulation, the above construction method is presumed to satisfy the standard requirements of Approved Document E (ADE) 2003 of the 2014 Building Regulations. We would suggest the following in order to attain the necessary additional 5dB for both impact and airborne performance.

- Floor Finish i.e – Carpet, laminate floors, Timber floor, Tiles
- JCW Acoustic Deck 37 cement particle (floating installation)
- 18mm T&G Chipboard subfloor, or existing timber joists
- Existing timber joists, assumed 200mm
- 100mm 60kg/m³ mineral wool (RW3 or similar) between joists
- 16mm resilient bars
- 2 x 15mm SoundBloc plasterboard

It is crucial to install a proper flanking strip, such Yelofon ES5/100, around the walking surface's perimeter while installing party floors. Installing this will stop the finished walking surface from making contact with the surrounding walls.

The above constructions should be capable of achieving the 5dB over Building Regulations standards for both impact and airborne sound insulation performance however the following points should be considered to ensure the performance of the floors is not compromised:

- Ideally downlighters should be avoided. If they are required they should be no more than 1 downlight per 2m² of ceiling area;
- Skirting boards should be fixed so that they loosely sit on top of the flanking isolation strip;
- Ensure all air gaps are sealed with a non-hardening mastic;
- Ensure floor treatment is installed in accordance with the manufacturer's instructions;
- Install flanking strips around the perimeter of the flooring board to isolate floor from walls and skirtings
- Ensure that internal walls do not penetrate the sub floor or ceiling plasterboard and is built

up to the underside only.

- Electrical sockets should be installed in a staggered configuration at a minimum distance of 600mm from one another. Sockets should not be installed in a 'back-to-back' configuration.
- Wall cavities should remain clear of rubble and debris in order to maintain the acoustic separation of the leaves.

Separating Wall Constructions

It is understood that the proposed Wall construction to be used between apartments is as follows:

Separating Element Description	Wall Construction	$R_w + C_{tr}$ dB
Party Wall	<ul style="list-style-type: none"> Two layers of 2x15mm British Gypsum SoundBloc, resilient bar, 90mm stud with mineral wool between, resilient bar, two layers of plasterboard. 	56

- 3mm Plaster Skim
- 1no. of 12.5 Fireline plasterboard
- 1no. of 15mm Sound bloc plasterboard
- 100mm Masonry Wall/ 90mm timber stud with mineral wool
- 16mm resilient bars
- 1no. of 12.5 Fireline Plasterboard

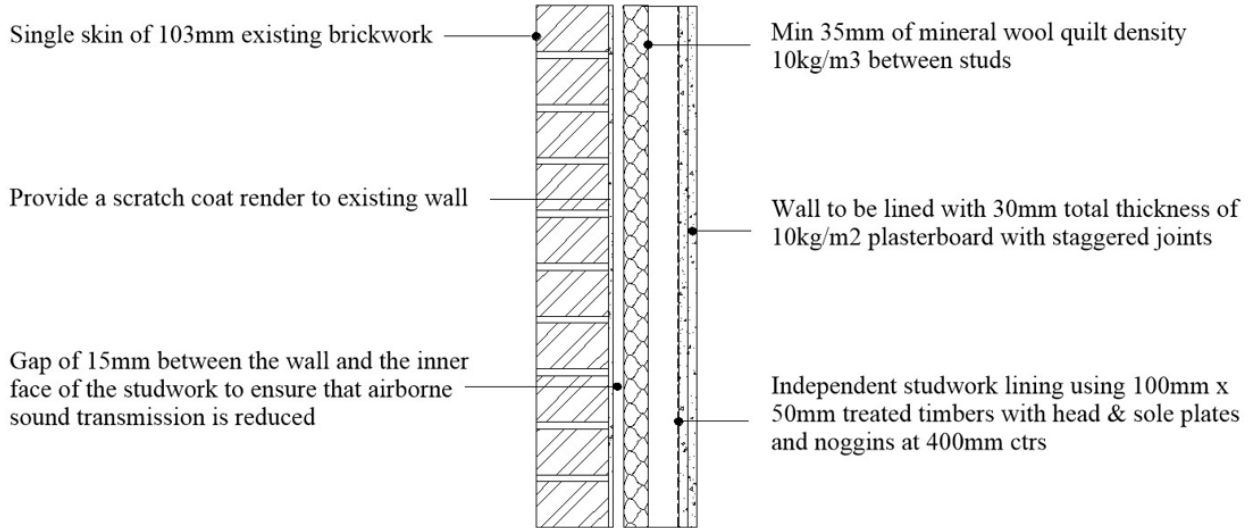
Regarding airborne and impact sound insulation, the above construction method is presumed to satisfy the standard requirements of Approved Document E (ADE) 2003 of the 2014 Building Regulations. We would suggest the following in order to attain the necessary additional 5dB for both impact and airborne performance.

- 3mm Plaster Skim
- 1no. of 12.5 Fireline plasterboard
- 1no. of 15mm Sound bloc plasterboard
- 100mm Masonry Wall/ 90mm timber stud with mineral wool
- 15mm Gap
- independent studwork lining using 100mm x 50mm treated timbers with head & sole plates and noggins at 400mm centres
- Wall to be lined with 30mm total thickness of 10kg/m² plasterboard with staggered joints
- 35mm of mineral wool quilt density 10kg/m³ in the cavity between studs
- 3mm Plaster Skim

Upgrading existing single skin separating wall

The existing walls must be checked for stability and be free from defects as required by the Building Control Officer. Provide a scratch coat render to existing wall. Construct an independent studwork lining using 100mm x 50mm treated timbers with head & sole plates and noggins at 400mm centres, leaving a gap of 15mm between the wall and the inner face of the studwork to ensure that airborne sound transmission is reduced. Seal the perimeter with tape or sealant. Wall to be lined with 30mm total thickness of 10kg/m² plasterboard with staggered joints and with at least 35mm of mineral wool quilt density 10kg/m³ in the cavity between studs. Finish with 3mm plaster skim. The independent panel and its supporting frame must not be in contact with the existing wall.

UPGRADING SINGLE SKIN PARTY WALL (warm adjoining space)



Upgrading existing single skin separating wall (Timber)

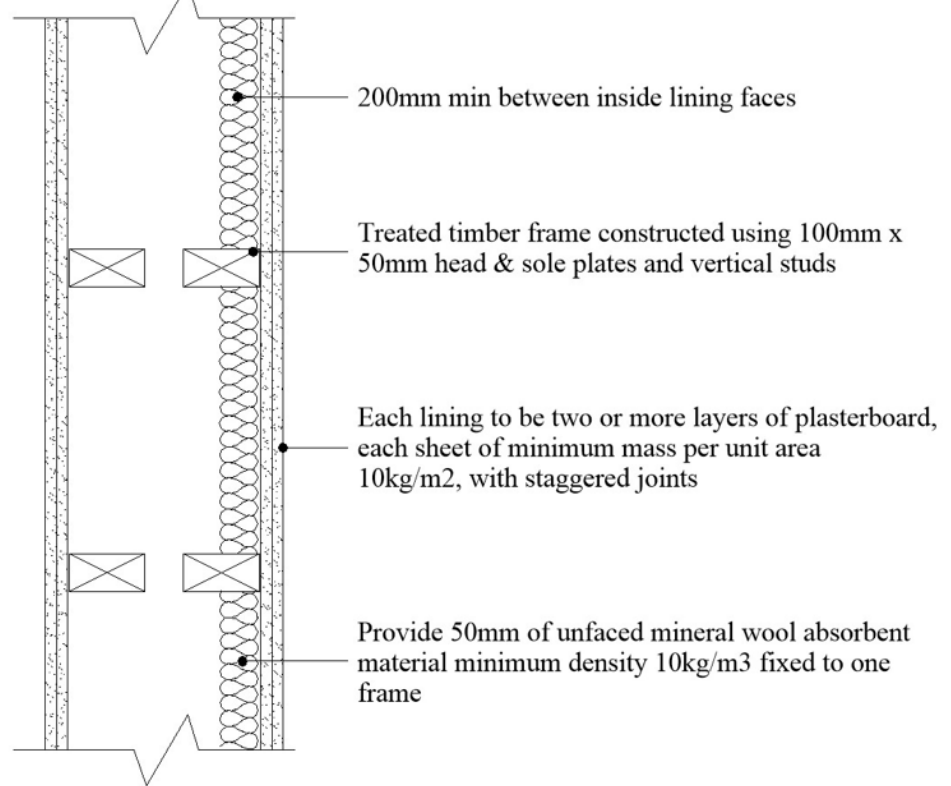
Approved Document E Wall Type 4.1

Construct two parallel timber frames using 100mm x 50mm head & sole plates and vertical studs (with

noggins) at 400mm centres, or to Structural Engineer's details & calculations, ensuring a minimum distance of 200mm is provided between inside faces of the two frames. Provide two layers of plasterboard with staggered joints each side of frame, each sheet to have a minimum mass per unit area 10kg/m² (for example Gyproc Soundbloc). Provide 50mm of mineral wool batts, Crown Acoustic Partition Roll or Isowool APR 1200, with a minimum density 10kg/m³ between the studs of the frames. Stagger all sockets on opposite sides of the separating wall by a min of 150mm. Care to be taken at junctions to block air paths using timber blocking or joists as detailed in Approved Document E.

TIMBER FRAMED SEPARATING WALL

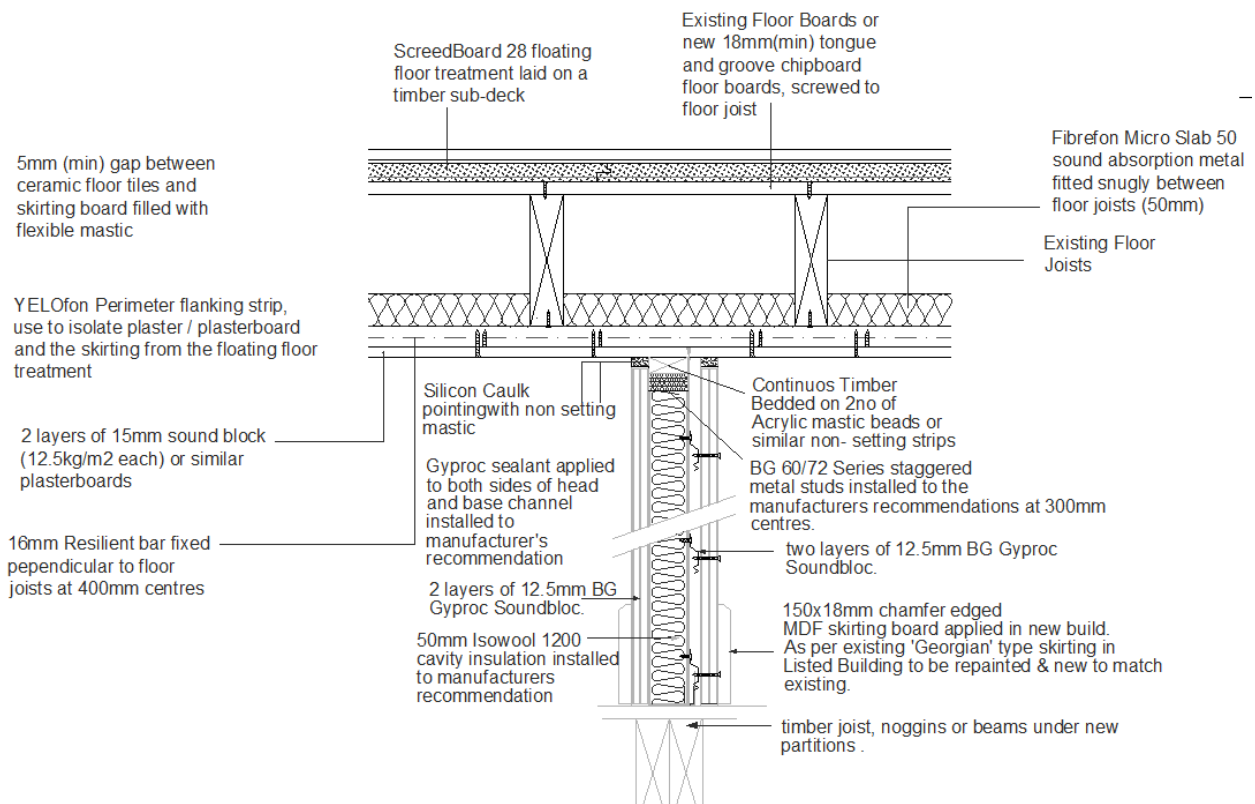
Acoustic Engineer to be consulted to ensure detail is suitable for proposed build



Junctions and Penetration Details

In order to guarantee that the wall's ability to insulate sound is not jeopardised, interfaces between walls and all other surrounding elements should be constructed. Mineral wool should be tightly packed into any gaps, and silicone caulk or another flexible sealant should be used to cover all connections.

A soft, non-hardening sealant should be used to seal the perimeter connections of all ceiling soffits. A 3 mm gap at the perimeter of the ceiling should be filled with a compressed foam "backer" rod for optimal performance. To make a seal around the perimeter of the ceiling, this should then be sealed with a single bead of flexible sealant.



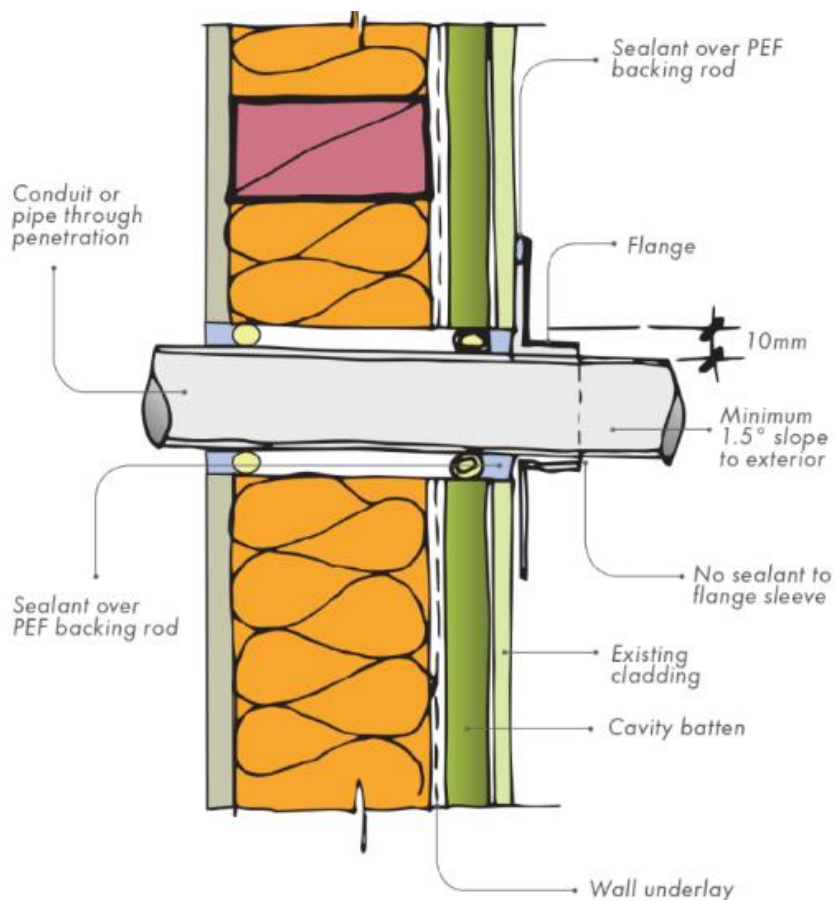
Pipes and Penetrations

Where any ducts, pipes, conduits or other services penetrate either walls or floors, 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.

Floor penetrations

Pipe services and ducts which pass through separating floors should be surrounded with 25mm sound absorbent mineral wool and enclosed in a duct of two layers of Gyproc FireLine board having a mass per unit area of at least 15kg/m² for their full height. Seal the joint between the casing and ceiling with tape.

Gas services may require ventilation and should be installed in accordance with The Gas Safety (Installation and Use) Regulations 1998.



Door Requirements

Doors having an acoustic performance rating would be necessary in cases where a certain level of sound insulation is thought to be necessary. Table displays recommendations for the required sound insulation performance of door units to be put in the most sensitive areas.

R_w (dB)	Typical Door Construction
29-30 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, foam tape seals around the perimeter

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.

Conclusion

The Layout and specifications for the proposed development at **34 Townsend Road, Southall. UB1 1EX**, have been reviewed and suitable acoustic specifications have been determined.

In order to ensure that the ADE:2003 +5dB requirement is met, it was determined that, despite taking a realistic approach to the actual needs of the various spaces, it was necessary to refine the acoustic provision of some elements, such as the acoustic detailing of Floor, Walls and junctions, beyond the currently proposed base build specification.