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Report E19136/IBF/R1-
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Project **47-49 High Street**
Ruislip, HA4

Title **Internal Building Fabric Assessment**
Sub Title

Client Parade View Limited
121 Ridgeway Road North
Osterley
TW7 5LX

Case No

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CONTENTS

1. INTRODUCTION	1
2. LOCAL AUTHORITY CRITERIA	2
3. REGULATION E1 - SEPARATING WALLS AND FLOORS	3
4. REGULATION E2 - INTERNAL WALLS AND FLOORS	5
5. REGULATION E3 - REVERBERATION IN COMMON AREAS	6
6. CONCLUSION	7

List of Tables

Table E19136/T1 - Predicted Absorption Requirements for Common Areas	6
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List of Attachments

APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

APPENDIX B: REQUIREMENTS OF APPROVED DOCUMENT E

APPENDIX C: DESIGN DATA SHEETS

1. INTRODUCTION

- 1.1 Adnitt Acoustics have been commissioned by Parade View Limited to undertake an acoustic assessment of the proposed residential development at 47-49 High Street, Ruislip, HA4.
- 1.2 This assessment is required to discharge a planning condition (Condition 4) of the appeal decision APP/R5510/W/17/3181601 and required the developer to assess the acoustic performance of the development against the requirements of Approved Document E of the Building Regulations 2010.
- 1.3 The condition requires that the assessment be undertaken by an organisation with the appropriate third-party accreditation for undertaking sound insulation tests to the requirements of Approved Document E. Adnitt Acoustics is a member of the ANC registration scheme and satisfies this requirement.
- 1.4 As this is a technical report it will be necessary to make use of some technical terms. To assist the reader, a glossary has been included in Appendix A.

Consultants Experience

- 1.5 This assessment has been undertaken by Chris Turner BSc(Hons) MSc MIOA MInstP for and on behalf of Adnitt Acoustic Services Limited.
- 1.6 Chris holds an undergraduate degree in Physics and Computer Science from the University of Wales (Swansea) and a postgraduate degree in Applied Acoustics and Noise Control from the University of Surrey.
- 1.7 Chris has over fifteen years post-graduate experience working as an Acoustics Consultant and joined Adnitt Acoustics in February 2012 following time with Acoustic Logic Consultancy (UK) Ltd and Capita Symonds now Capita Property and Infrastructure Ltd.
- 1.8 Chris is a corporate member of the Institute of Acoustics (MIOA) and the Institute of Physics (MInstP).

2. LOCAL AUTHORITY CRITERIA

2.1 The local authority, Hillingdon Council, have provided the following requirements in the planning permission for this project.

Condition 4:

"No development shall commence until details of a sound proofing scheme, certified or to the certifiable standards of the Association of Noise Consultants (ANC) or UK Accreditation Services (UKAS), between each floor has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented in accordance with the approved details prior to the first occupation of the flats hereby permitted and thereafter permanently retained."

Interpretation of Requirements

2.2 Neither the Association of Noise Consultants nor the United Kingdom Accreditation Services define "certifiable standards" instead these organisations provide third-party accreditation to organisations carrying out sound insulation testing to the requirements of Approved Document E¹.

2.3 Therefore, this assessment will be undertaken against the performance requirements found in Section 0 of Approved Document E. These requirements are reproduced in Appendix B.

¹ The Building Regulations 2010 Approved Document E 'Resistance to the passage of sound' 2003 Edition incorporating 2004, 2010, 2013 ad 2015 amendments.

3. REGULATION E1 - SEPARATING WALLS AND FLOORS

New Build Separating Walls

3.1 The construction of the new-build separating walls is understood to be as follows:

- 2 layers of 15mm Fireline either side;
- Two rows of 75x50mm timber studs at 400mm centres with a minimum 50mm gap between the studs and no bracing but ties between the frames at 1200mm centres;
- Minimum 60mm mineral wool (density 10-60kg/m³) on both sides;

3.2 The predicted laboratory performance of this wall construction is approximately 68dB (-3; -9) R_w (C;C_{tr}). The site measured airborne sound insulation for this construction is predicted to be $\geq 45\text{dB } D_{nT,w}+C_{tr}$. Therefore, this construction is predicted to comply with the minimum requirements of Approved Document E Table 0.1a.

3.3 This construction is understood to apply for the walls between the apartments and the common entrance halls and stairs, thus complying with the requirements of Regulation E1.

Separating Walls formed from former external wall

3.4 Where a separating wall between apartments has been formed from a former external wall (e.g. wall between Flat 1 Bedroom 2 and Flat 2 bedroom 2) an independent wall lining is recommended to one side with a parge coat to the other. This is due to the unknown construction of the former external wall.

3.5 The independent wall lining shall be formed from the following construction:

- 100x50mm timber stud spaced at least 10mm from the face of the external and party walls;
- Mineral wool density 30-45 kg/m³ and thickness 50mm, friction-fitted between the studs;
- Lining of two layers of plasterboard with total minimum mass per unit area of 20kg/m² with staggered and sealed joints.

3.6 Further details may be found on design data sheet WL1 - Wall Lining 1 which is included in Appendix C.

3.7 Following installation of the independent wall lining the predicted site measured airborne sound insulation is expected to be $\geq 45\text{dB } D_{nT,w}+C_{tr}$ thus complying with the with the minimum requirements of Approved Document E Table 0.1a.

Separating Floor between apartments

3.8 The construction of the separating floor between the apartments is understood to be as follows:

- Final floor finish to client's requirements;
- 28mm Collecta Screedboard 28;
- 18mm WBP plywood on timber frame to structural engineers' specification;
- Minimum 150mm mineral wool insulation;
- 16mm resilient bars;
- Two layers of 15mm plasterboard (minimum 12.5kg/m²);

3.9 The predicted airborne acoustic performance for this construction is predicted to given an onsite measurement in the order of 35dB D_{nT,w}+C_{tr} which is not compliant with the requirements of Approved Document E.

3.10 The impact sound insulation performance is predicted to be less than 64dB $L'_{nT,w}$ which is compliant with the requirements of Approved Document E.

3.11 To improve the sound insulation performance, it is recommended that the plywood layer be replaced with a heavier material (e.g. flooring grade chipboard). Further details are found on datasheets AF1 - Floating Platform Floor and AC2 - Acoustic Ceiling (Resilient Bar) in Appendix C.

Separating Floor between retail unit at residential apartments above

3.12 An enhanced acoustic performance is recommended for the separating floor between the retail unit (ground floor) and the residential apartments in accordance with Paragraph 0.8 of Approved Document E.

3.13 The permitted uses of the retail unit are unknown. Therefore, an enhanced airborne sound insulation performance of between 5dB and 10dB above the minimum performance requirements of Approved Document E is recommended.

3.14 Therefore, the separating floor should have the following enhancements;

- Floor finish to client's specification;
- 18mm flooring grade chipboard (min: 14kg/m²)
- 50mm Cradle and Batten flooring system with 25mm mineral wool (>40kg/m³);
- Two layers of 18mm flooring grade chipboard on resilient fixings to existing timber joists;
- 200mm mineral wool insulation between existing joists (>40kg/m³);
- Existing ceiling;

3.15 The predicted on-site performance of this construction is in the order of 48dB to 50dB $D_{nT,w}+C_{tr}$ which is within the target range proposed. It has been assumed that it will not be possible to access the separating floor from the retail unit and all construction works will be undertaken from above.

Flanking Transmission

3.16 The inner leaf of the external walls is understood to be 100mm light-weight concrete block. No details of the junction between the external walls and party walls nor between the external walls and separating floors have been provided.

3.17 Therefore, it is recommended that the external walls within apartments are lined with an independent wall lining. This lining shall be formed from the following construction:

- 100x50mm timber stud spaced at least 10mm from the face of the external and party walls;
- Mineral wool density 30-45 kg/m³ and thickness 50mm, friction-fitted between the studs;
- Lining of two layers of plasterboard with total minimum mass per unit area of 20kg/m² with staggered and sealed joints.

3.18 Further details may be found on design data sheet WL1 - Wall Lining 1.

Doors

3.19 Entrance doors to the apartments shall comply with the requirements of paragraph 4.29 of Approved Document E. Namely the door shall have good perimeter seals including a threshold seal where practical and either:

- A minimum mass per unit area of 25kg/m², or,
- A minimum sound reduction index of 29dB R_w .

4. REGULATION E2 - INTERNAL WALLS AND FLOORS

Internal Walls

4.1 The proposed construction of the internal walls within the apartments is understood to be as follows:

- Two layers of 15mm fire line OR two layers of 15mm moisture shield to both sides;
- 75x50mm timber studs;
- 75mm mineral wool insulation within the cavity;

4.2 The predicted laboratory performance of these constructions is in excess of 40dB R_w which is compliant with the requirements of Table 0.2 of Approved Document E.

Internal Floors

4.3 There are no internal floors within the apartments within this development.

5. REGULATION E3 - REVERBERATION IN COMMON AREAS

5.1

There are two common areas which provide direct access onto the apartments which are indicated in the figures below.

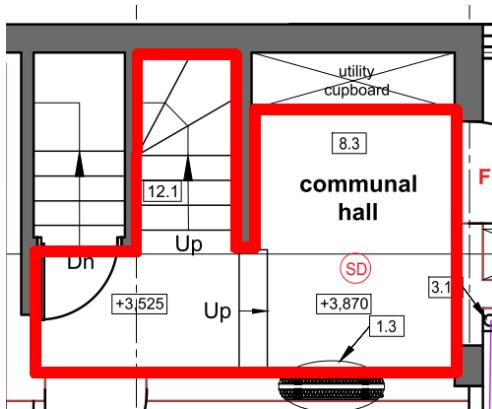


Figure E19136/D1 - Common Area First Floor

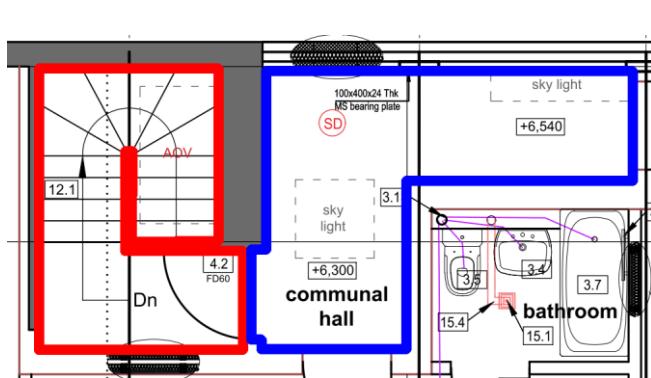


Figure E19136/D2 - Common Area Second Floor

5.2

To comply with the requirements of Regulation E3 an area of acoustic absorption should be installed in the common areas providing direct access to the flats. The predicted quantity of absorption required is indicated in the table below.

	Method A	Method B
Area 1 - Red Boundary	<p>>6m² Class C absorber on First Floor; AND</p> <p>either >5m² with Class D absorber or >2.5m² with Class C absorber on stairs and second floor landing</p>	Not applicable to stairs
Area 2 - Blue Boundary	>6m ² with Class C absorber	>2.1m ² of Class B absorber applied evenly over one or more of the surfaces.

Table E19136/T1 - Predicted Absorption Requirements for Common Areas

6. CONCLUSION

6.1 Adnitt Acoustics have been commissioned by Parade View Limited to undertake an acoustic assessment of the proposed residential development at 47-49 High Street, Ruislip, HA4.

6.2 This assessment is required to discharge a planning condition (Condition 4) of the appeal decision APP/R5510/W/17/3181601 and required the developer to assess the acoustic performance of the development against the requirements of Approved Document E of the Building Regulations 2010.

Regulation E1 - Protection against sound from other parts of the building and adjoining buildings

6.3 An assessment of the proposed constructions for the party walls and floors has been undertaken against the requirements of Table 0.1a of Approved Document E.

6.4 The predicted acoustic performance of the separating walls between the apartments should comply with the requirements of Approved Document E.

6.5 The predicted impact sound insulation performance of the separating floor should comply with the requirements of Approved Document E.

6.6 The predicted airborne acoustic performance of the separating floors is predicted not to comply with the requirements of Approved Document E and recommendations for enhancing the constructions have been provided.

6.7 Recommendations for the following elements have been provided:

- 6.7.1 Improving the airborne acoustic performance of the separating floor between the new apartments and the retail unit on the ground floor;
- 6.7.2 Controlling flanking sound horizontally and vertically between the apartments;
- 6.7.3 The acoustic performance of the entrance doors to the apartments.

Regulation E2 - Protection against sound within a dwelling-house etc.

6.8 An assessment of the proposed construction of the internal walls has been undertaken against the requirements of Table 0.2 of Approved Document E.

6.9 The predicted acoustic performance of the internal walls within the apartments complies with the requirements of Approved Document E.

Regulation E3 - Reverberation in the common internal parts of buildings containing flats or rooms for residential purposes

- 6.10 An assessment of the common areas has been undertaken in accordance with the methodology detailed in Section 7 of Approved Document E.
- 6.11 Recommendations for the quantities and performance of the additional absorption requirements have been provided for both methodologies described in the Approved Document.

Chris Turner BSc(Hons) MSc MIOA MInstP

for ADNITT ACOUSTICS

APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Ambient Noise	The noise climate heard over a period of time due to all normal sources, in the absence of extraneous or atypical sounds. Used to describe noise in the absence of the introduced sound, generally.
Ambient Noise Level	Describes the average noise level of the ambient noise over a stated period of time, e.g. hourly noise
	Parameter: A-weighted Continuous Equivalent Sound Pressure Level determined over the time period T. Expressed in decibels / A-weighted decibels
	$L_{eq,T}$ or $L_{Aeq,T}$ dB(A) or dB
Decibel scale dB	A linear numbering scale used to define a logarithmic amplitude scale, thereby compressing a wide range of amplitude values to a small set of numbers
dB(A)	An electronic filter in a sound level meter, which approximates under defined conditions the frequency response of the human ear.
$L_{Aeq,T}$	The equivalent continuous sound level. The steady dB(A) level which would produce the same A-weighted sound energy over a stated period of time as the measured sound pressure level.
L_{Amax}	The maximum dB(A) level measured during a survey period.
L_{A10}	The dB(A) level exceeded for 10% of the survey period, often used as a quantifier of traffic noise level.
L_{A90}	The dB(A) level exceeded for 90% of the survey period. Used in BS 4142:1997/2014 as being representative of the background noise level.
Acoustic screening	Physical barrier to sound formed by fence, wall, building or other structure, which has the effect of reducing the sound transmitted.
Individual Event Noise	The noise of a distinctive event with the varying noise climate, usually a transient activity, such as a vehicle pass-by, aircraft flyover or similar, rather than an isolated impulsive noise.
Individual Event Noise Level	Describes the highest noise level during the event as measured under particular conditions of time-weighting
	Parameter: A-weighted Maximum Sound Pressure Level with FAST or SLOW time weighting
	$L_{Amax,FAST}$ or $L_{Amax,F}$ $L_{Amax,SLOW}$ or $L_{Amax,S}$
	Expressed in decibels / A-weighted decibels
	dB(A) or dB
Sound Reduction Index R_w	Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997.
Weighted element-normalized level difference $D_{n,e,w}$	Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997.

APPENDIX B: REQUIREMENTS OF APPROVED DOCUMENT E

B.1 Schedule E

Requirement	Limits on application
Protection against sound from other parts of the building and adjoining buildings	
E1. Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to the sound from parts of the same building and from adjoining buildings.	
Protect against sound within a dwelling-house etc	Requirement E2 does not apply to -
E2. Dwellings-house, flats and rooms for residential purposes shall be designed and constructed in such a way that - (a) internal walls between a bedroom or a room containing a water closet, and other rooms; and (b) internal floors, provide reasonable resistance to sound.	(a) an internal wall which contains a door; (b) an internal wall which separates an en suite toilet from associated bedroom; (c) existing walls and floors in a building which is subject to a material change of use.
Reverberation in the common internal parts of buildings containing flats or rooms for residential purposes	Requirement E3 only applies to corridors, stairwells, hallways and entrance halls which give access to the flat or room for residential purposes.
E3. The common internal parts of buildings which contain flats or rooms for residential purposes shall be designed and constructed in such a way as to prevent more reverberation around the common parts than is reasonable.	

B.2 Requirement E1

“0.1 ...the normal way of satisfying Requirement E1 will be to build separating walls, separating floors, and stairs that have a separating function, together with the associated flanking construction, in such a way that they achieve the sound insulation values...set out in Table 1a...”

Table 1a: Dwelling-house and flats - performance standards for separating walls, separating floors, and stairs that have a separating function.		
	Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum values)	Impact Sound Insulation $L_{nT,wr}$ dB (Maximum values)
Purpose build dwelling-house and flats		
Walls	45	-
Floors and stairs	45	62
Dwellings-houses and flats formed by material change of use		
Walls	43	-
Floors and stairs	43	64

An acoustic testing programme is required at or just prior to full completion to demonstrate that the requirements for the separating elements (walls and/or floors) have been met. Only new buildings incorporating Robust Details may avoid this requirement.

Pre-Completion Testing must be undertaken by either a member of the Association of Noise Consultants Registered Scheme, which maintains a central record of all tests completed, or by UKAS-registered testing organisation, where individual organisations maintain records.

B.3 Requirement E2

“0.9 ...the normal way of satisfying Requirement E2 will be to use constructions for new walls and floors within a dwelling-house, flat or room for residential purposes, that provide the laboratory

sound insulation values set out in Table 2.... It is not intended that performance should be verified by testing on site."

Table 2: Laboratory values for new internal walls and floors within: dwelling-house, flats and rooms for residential purpose, whether purpose built or formed by material change of use.

	Airborne Sound Insulation R_w dB (Minimum values)
Walls	40
Floors	40

B.4 Requirement E3

The control of reverberation in common areas applies to corridors, stairwells, hallways and entrance halls which give access to the flat or room for residential purpose.

Section 7 of ADE describes how to determine the amount of additional absorption to be used in corridors, hallways, stairwells and entrance halls that give access to flats and rooms for residential purposes.

Control of Reverberation in Common Parts - Extracts from ADE Section 7	
Ref	
7.7	Method A: Cover a specified area with an absorber of an appropriate class that has been rated according to BS EN ISO 11654:1997 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption.
7.8	Method B: Determine the minimum amount of absorptive material using a calculation procedure in octave bands. Method B is intended only for corridors, hallways and entrance halls as it is not well suited to stairwells.
	Method A:
7.10	For entrance halls, corridors or hallways, cover an area equal to or greater than the floor area, with a Class C absorber or better. It will normally be convenient to cover the ceiling area with the additional absorption.
7.11	For stairwells or a stair enclosure, calculate the combined area of the stair treads, the upper surface of the intermediate landings, the upper surface of the landings (excluding ground floor) and the ceiling area on the top floor. Either, cover at least an area equal to this calculated area with a Class D absorber, or cover an area equal to at least 50 % of this calculated area with a Class C absorber or better. The absorptive material should be equally distributed between all floor levels. It will normally be convenient to cover the underside of intermediate landings, the underside of the other landings, and the ceiling area on the top floor.
7.12	Method A can generally be satisfied by the use of proprietary acoustic ceilings. However, the absorptive material can be applied to any surface that faces into the space.
	Method B:
7.13	In comparison with Method A, Method B takes account of the existing absorption provided by all surfaces. In some cases, Method B should allow greater flexibility in meeting Requirement E3 and require less additional absorption than Method A
7.14	For an absorptive material of surface area, S in m^2 , and sound absorption coefficient, α , the absorption area A is equal to the product of S and α .
7.15	The total absorption area, A_T , in square metres is defined as the hypothetical area of a totally absorbing surface, which if it were the only absorbing element in the space would give the same reverberation time as the space under consideration.
7.16	For n surfaces in a space, the total absorption area, A_T , can be found using the following equation. $A_T = \alpha_1 S_1 + \alpha_2 S_2 + \dots + \alpha_n S_n$
7.17	For entrance halls, provide a minimum of $0.20 m^2$ total absorption area per cubic metre of the volume. The additional absorptive material should be distributed over the available surfaces.
7.18	For corridors or hallways, provide a minimum of $0.25 m^2$ total absorption area per cubic metre of the volume. The additional absorptive material should be distributed over one or more of the surfaces.
7.19	Absorption areas should be calculated for each octave band. Requirement E3 will be satisfied when the appropriate amount of absorption area is provided for each octave band between 250 Hz and 4000 Hz inclusively.
7.20	Absorption coefficient data (to two decimal places) should be taken from the following: For specific products, use laboratory measurements of absorption coefficient data determined using BS EN 20354:1993 Acoustics - Measurement of sound absorption in a reverberation room. The measured third octave band data should be converted to practical sound absorption coefficient data, α_p in octave bands, according to BS EN ISO 11654:1997 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption....

B.5 Enhancement of Requirement E1

Where houses, flats or rooms for residential purpose adjoin non-domestic spaces, such as commercial, food & drink or industrial buildings, ADE advises increases sound insulation may be required for the building elements between spaces, including flanking construction.

Ref	
0.8	The performance standards set out in Tables 1a and 1b are appropriate for walls, floors and stairs that separate spaces used for normal domestic purposes. A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space. Specialist advice may be needed to establish if a higher standard of sound insulation is required, and if so, to determine the appropriate level.

There are several critical issues which need to be considered in deciding whether enhanced sound insulation is required or not including:

- Noise level of commercial or other use
- Planning conditions and use restrictions
- Potential annoyance of residents
- Public or private nuisance
- Statutory nuisance
- Managing or limiting disputes between occupants
- Managing risk of legal action under the Environmental Protection Act 1990 against the noise-producing occupant and the landlord
- Increasing viability and value of property by enabling as wide a range of potential commercial tenants as possible

APPENDIX C: DESIGN DATA SHEETS

WL1 - WALL LINING 1

To be read together with any comments and qualifying statements in the attached report.

General Description

Independent Wall Lining (IWL) formed of an independent frame with plasterboard lining and mineral wool in void.

Construction

The independent wall lining should be constructed as follows:

- Timber or metal frame independent from the face of the wall;
- Mineral wool in void;
- Lining of two layers of plasterboard.

Installation

The IWL wall treatment shall be installed as follows:

- 100x50mm timber stud spaced at least 10mm from the face of the external and party walls;
- Mineral wool density 30-45 kg/m³ and thickness 50mm, friction-fitted between the studs;
- Lining of two layers of plasterboard with total minimum mass per unit area of 20kg/m² with staggered and sealed joints.

The following points shall be observed:

- Do ensure that the independent panel and its supporting frame are not in contact with the existing wall;
- Do seal the perimeter of the independent panel with tape or sealant;
- Do not tightly compress the absorbent material as this may bridge the cavity.

Drawings

Refer to drawing/sketches WL1 and WFJ1

Performance

To meet the minimum Approved Document E performance requirement of $D_{nt,w}+C_{tr}$ of 43dB when used as part of a party wall system.

Coordination

Separating Floor Junctions

The independent lining should be built off the sub-deck. It must not be built off the floating floor.

Maintain clearances and resilient edging strip at floating floor junction.

Ceiling Junction

The ceiling should be taken through to the masonry.

The junction between the ceiling and the wall linings should be sealed with tape or caulked with sealant.

Wall Lining Junctions

Wall lining must not be continuous through party walls.

Internal Partition Junctions

See IW1 regarding the installation of internal partition.

Services Penetrations

See SP1 regarding the service penetration details.

Access Doors to Flats

See AD1 regarding the doorset requirements and details.

Products

The following products are approved for use in this application. Alternative products shall have equal or better performances and physical properties and be approved by the acoustic consultant.

Metal Frame Wall Lining System

- British Gypsum GypLyner IWL metal frame system, if in accordance with the construction above.

Plasterboard

- Gyproc Wallboard TEN (10kg/m²)
- 12.5mm Gyproc SoundBloc (10.6kg/m²)
- 15mm Gyproc Fireline (11.7kg/m²)

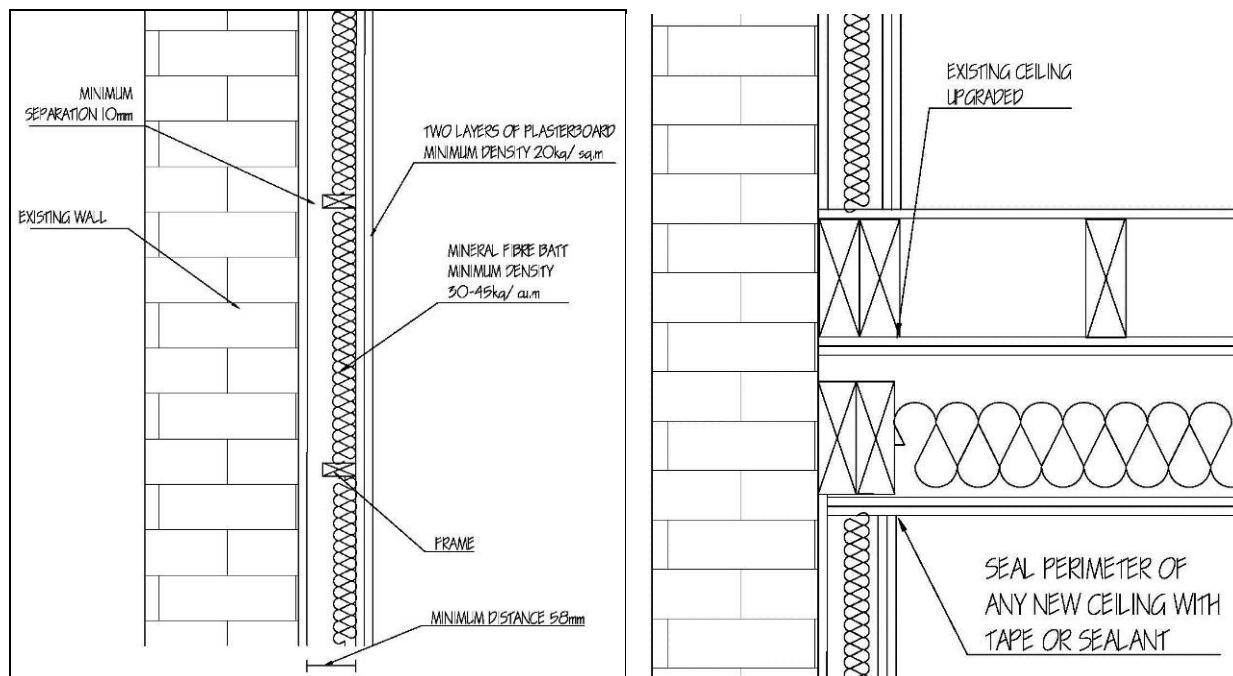
Mineral wool batts or quilt

- Rockwool Flexi (33kg/m³)
- Rockwool RWA45 (45kg/m³)

General Notes

It will be necessary to confirm with a structural engineer that the existing structure has the ability to support the proposed construction.

Stud depth may need to increase to support high walls and maintain stability. The larger the separation the better acoustic performance should be achieved.



AF1 - ACOUSTIC FLOATING PLATFORM SYSTEM 1

General Description

A proprietary 'acoustic' floating platform floor on either chipboard or existing floorboards.

Construction

The floating platform floor treatment consists of the following:

- Proprietary floating platform floor [e.g. Monarfloor Deck 9 or equivalent];
- 18mm floor grade T&G chipboard or existing floorboards made good;

Installation

Manufacturer's advice and instructions shall be followed. The following summarises the main procedures:

- Install new chipboard sub-deck in broken bond pattern, applying adhesive to all tongue and groove panel joints or retain and make good existing floorboards;
- Fix acoustic flanking band at the floor perimeter between room edges and floating platform floor;
- Lay proprietary floating platform floor in broken bond pattern, applying adhesive to all tongue and groove panels;
- Install skirting and trim off excess acoustic flanking band.

The following points shall be observed:

- The floating platform floor should be isolated from the perimeter walls using acoustic flanking band;
- The floating 'acoustic' floor board must not be hard fixed to the sub-deck (e.g. screwed or nailed) and a clear gap should be maintained between the floating 'acoustic' floor board and surrounding walls, skirting boards and door architraves using a acoustic flanking band;
- Do not bridge between the floating layer and floor structure with services, wall linings or other elements.

Performance

To meet minimum performance requirements of Approved Document E in combination with the recommended AC1 ceiling treatment:

- Airborne sound insulation $\geq D_{nt,w} + C_{tr}$ 43dB;
- Impact sound insulation $\leq L_{nt,w}$ 64dB.

Any alternative floating floor treatment must achieve a Weighted Reduction in Impact Sound Pressure Level (ΔL_w) of not less than 17 dB when measured according to BS EN ISO 140-8:1998 and rated according to BS EN ISO 717-2:1997. The performance value ΔL_w should be achieved when the floating floor is both loaded and unloaded as described in BS EN ISO 140-8:1998 for category II systems.

The floating floor treatment must achieve the performance criteria as detailed above when tested in a UKAS-accredited laboratory and be approved by the acoustic consultant.

Drawings

Refer to drawing/sketches AF1 and WFJ1

Coordination

Party Walls

The party walls must not be built off the floating floor system.

The sub-deck must not be continuous under the party wall.

Ceilings

Floor Type AF1 must be used in conjunction with a resiliently mounted or independent ceiling, see AC1.

Flanking Walls

Independent Wall Linings as detailed in WL1 are required and must be built off the sub-deck not the floating floor system.

Products

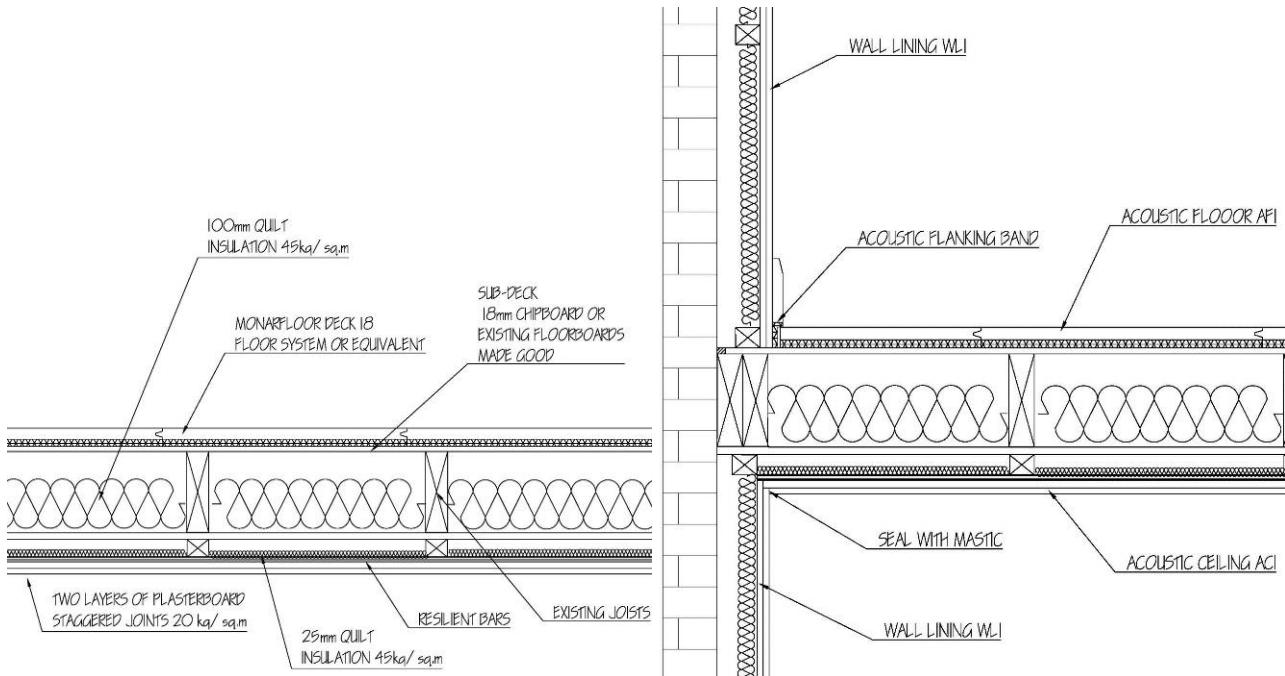
The following products are approved for use in this application. Alternative products shall have equal or better performances and physical properties and be approved by the acoustic consultant.

Floating 'acoustic' floor systems:

- Monarfloor Deck18 and Monarfloor Acoustic Flanking Band [Monarfloor Acoustic Systems- 01727 830 116 or www.monarflex.icopal.co.uk]
- Isomass Isocheck 24T and Isocheck Perimeter Flanking Band [Isomass Ltd - 0845 838 33 99 or www.isomass.co.uk]; or
- Equal or approved floating 'acoustic' platform floor.

General Notes

It will be necessary to confirm with a structural engineer that the existing structure has the ability to support the proposed construction.



Internal Partitions

See IW1 regarding the installation of internal partitions.

Services and Service Penetrations

SP1 should be referred to for services passing through the separating floor.

AC2 - ACOUSTIC CEILING SYSTEM 2

General Description

Resilient bars fixed perpendicular to the joists with a plasterboard ceiling and mineral wool in the void.

Construction

The acoustic ceiling should be constructed as follows:

100mm mineral wool with a density of 45kg/m³ in ceiling void;

Gypframe RB1 resilient bars fix perpendicular to joists;

Ceiling of two layers of 10kg/m² plasterboard.

Installation

Follow Manufacturer's advice and instructions. The following summarises the main procedures:

Place 100mm mineral wool with a density of 45kg/m³ in ceiling void;

Fix resilient bars at 90° to the joists or ceiling battens at 450mm maximum centres;

Fix bars to the timber supports with 36mm Gyproc Drywall Screws;

The bars are joined by nesting them together directly over a support. The overlap shall be nominally the width of the joists or ceiling battens, but a maximum of 50mm. The corrugated webs shall be nested together and both base flanges tightly screwed to the joists or ceiling battens. The bars are fixed across the joists or ceiling battens;

The cut ends of boards must be supported on resilient bars. Gypframe RB1 resilient bar noggings must be located at corners, openings and abutments to provide additional support for the lining board;

Fix the Gyproc lining boards at 90° to the bars. Ends of boards or plank must be supported on resilient bar noggings at ceiling perimeters;

Fix boards to the resilient bars with Gyproc Drywall Screws as detailed at 230mm centres for ceilings in the field of the board and 150mm centres at board ends using the sizes given below:

British Gypsum Advised Screw Lengths

25mm screws for 12.5mm and 15mm wall board.

32mm screws for 19mm plank.

36mm screws for 12.5mm wall board fixed over 12.5mm wall board.

42mm screws for 12.5mm wall board fixed over 19mm plank and 15mm wall board fixed over 15mm wall board.

Do not use longer screws than recommended above or fix screws in line with the joists or ceiling battens. If a screw connects with the timber or upper flange of the resilient bar, it will undermine the sound insulation performance of the construction;

Plasterboard layers should be staggered with taped and sealed joints.

The following points shall be observed:

Do ensure the mineral wool is well packed horizontally between the joists;

Do install over the whole ceiling area;

Do seal the perimeter of the ceiling with the walls with elastic, non-hardening sealant;

Do stagger, tape and seal plasterboard joints;

Do install acoustically-rated downlighters in the ceiling (if applicable);

Do fix top flange of resilient bar to joist only, running bars perpendicular to joists;

Do fix boards to bottom flange of bars only using correct length screws for each board;

CRITICAL: DO NOT fix boards to the joists directly NOR allow fixing screws to bridge resilient zone and touch upper flange or joists

Drawings: Refer to drawing/sketches AF1 and WFJ1

Performance

To meet minimum performance requirements of Approved Document E in combination with the recommended floor treatment AF1 - Airborne sound insulation $\geq D_{nt,w} + C_{tr}$ 43dB; Impact sound insulation $\leq L_{nt,w}$ 64dB.

Coordination

Separating Floors

Ceiling Type AC2 must be used in conjunction with a floating platform floor, see AF1.

Party Walls

The ceiling treatment must not pass through the party walls.

Wall Linings

WL1 should be referred to for wall lining junction.

Products

The following products are approved for this application. Alternative products shall have equal or better performances and physical properties; and be approved by the acoustic consultant.

Resilient Bars

British Gypsum Gypframe RB1 Resilient Bar.

Any alternative resilient bars must achieve:

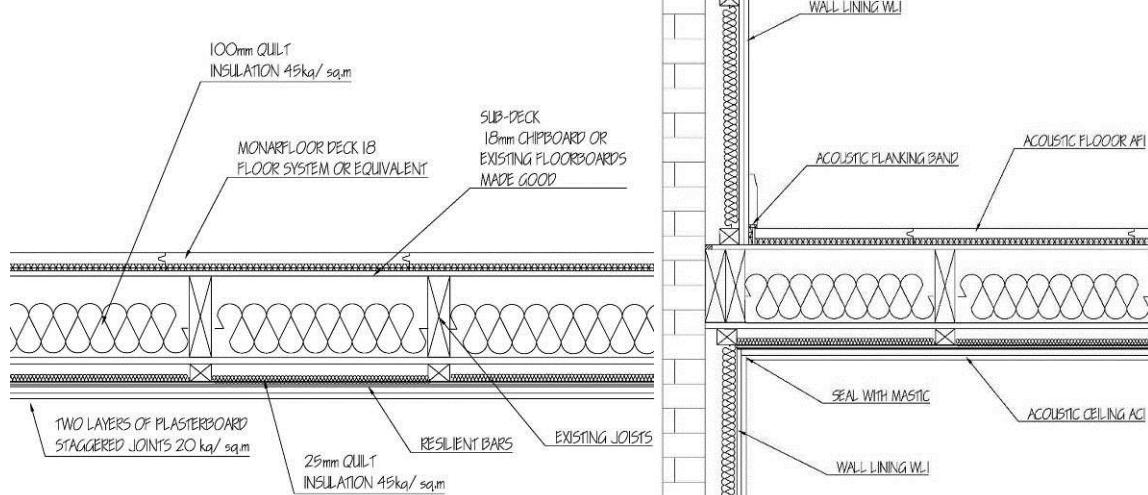
A Weighted Reduction in Airborne Sound Pressure Level ($\Delta R_w + C_{tr}$) of not less than 17 dB when measured according to BS EN ISO 140-3 and rated according to BS EN ISO 717-1;

and

A Weighted Reduction in Impact Sound Pressure Level (ΔL_w) of not less than 16 dB when measured according to BS EN ISO 140-6 and rated according to BS EN ISO 717-2.

General Notes

It will be necessary to confirm with a structural engineer that the existing structure has the ability to support the proposed construction.



Internal Walls

IW1 regarding the installation of internal partition.

Steel Encasement

See SE1 regarding the steel encasement details.

Services Penetrations

SP1 should be referred to for services passing through the party floor.

Plasterboard

Gyproc Wallboard TEN (10kg/m²)
12.5mm Gyproc SoundBloc (10.6kg/m²)
15mm Gyproc Fireline (11.7kg/m²)

Mineral wool batts or quilt:

Rockwool RWA45 (45kg/m³)
Rocksilk RSA45 (45kg/m³)

Acoustically Rated Downlighters

Snaplite (Snaplite 0870 443 7735
www.snaplite.co.uk)

JCC Fireguard (JCC-Lighting - 01243 838999 -
www.jcc-lighting.co.uk)

Other compliant with Robust Standards
Appendix F

SA1 - SOUND ABSORPTION TREATMENT 1

To be read together with any comments and qualifying statements in the attached report.

Allowance must be made within the design for sound absorptive finishes within those common parts giving access to flats to control reverberation of sound.

In the selection of materials it is important to note that the absorption can be applied as a single treatment (eg. acoustic false ceiling) or as a combination of treatments for walls and floors.

The materials must be distributed equally within the space and evenly across different floors.

Sound Absorption Class C/D absorbers can be a conventional lay-in grid acoustic ceiling or could be discrete panels. Panels could be foam or fabric wrapped mineral fibre batts or faced mineral fibre wall panels.

The use of bonded absorbent foam or low density mineral fibre panels is not recommended, due to potential short lifespan problems.

If materials of better performance than Absorption Class C (ie. Class A or B) are selected then these may be referred to Adnitt Acoustics for approval and advice regarding effective reductions in material area. You will require supporting calculation to demonstrate these will still comply with the objectives of the ADE at reduced areas.

Performance

Acoustic Ceiling Tiles/Wall Panel Sound Absorption Requirements

The acoustic tiles/panels shall provide the following minimum sound absorption performance when tested in accordance with BS EN ISO 20354:1993 Acoustics - Measurement of sound absorption in a reverberation room; and classified according to BS EN ISO 11654:1997 Acoustics - Sound absorbers for use in buildings, rating of sound absorption.

Absorption Class	Minimum Sound Absorption Coefficient at Octave Band Centre Frequency, Hz				
	250	500	1k	2k	4k
C	0.6	0.8	0.8	0.8	0.7
D	0.4	0.6	0.6	0.6	0.5

Products

Acoustic ceiling tiles and wall panels meeting the above performance can be provided by:

Armstrong	Armstrong World Industries Ltd, Building Products Division, Armstrong House, 38 Market Square, Uxbridge UB8 1NG Tel 0800 371849
Eckel	Half Moon Street, Bagshot, Surrey GU19 5AL Tel 01276 471199
Ecophon	Saint-Gobain Ecophon Ltd, Old Brick Kiln, Ramsdell, Tadley RG26 5PP Sales Office Main Sales Tel 01256 850977
Rockfon Ltd	Lakeside House, 1 Furzeground Way, Stockley Park East, Uxbridge Middlesex UB11 1BD Tel. 0208 622 3071
Sound Check	Studio Yard, 1a Merivale Road, London SW15 2NW Tel: 020 8789 4063

General Notes

Alternative and approved may be used subject to meeting the required minimum acoustic performance. This specification covers the minimum acoustic requirements only, it is the responsibility of the project team/developer to ensure that all products meet any other requirements for other disciplines including but not limited to fire, structure and robustness.