

Hickie & Hickie Ltd

UNIT 3 & 4 WESLEY GATE, READING

Approved Document E Design Review

Report No. 17-0090-0 R01

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Report No.: 17-0090-0 R01

Date: 14 September 2017

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1 INTRODUCTION

It is proposed to convert a three storey former office building into residential apartments under 'Permitted Development Rights' and develop a roof extension at the third floor, which will require a separate planning application. The conversion and roof extension will be subject to the requirements of the Building Regulations 2010.

Approved Document E of the Building Regulations contains the relevant acoustic requirements for the conversion and roof extension design to comply with. A review has been conducted of the proposed design to consider whether any enhancement is necessary to achieve compliance. Where the design is not sufficient, advice has been provided for design consideration.

This report summarises the review undertaken and advice provided. The purpose of the report is to support the 'Plans Approval' process.

1.1 Existing Construction Assumptions

The existing office building is of three storeys in height with a pitched roof. It is assumed to have cavity external walls with masonry outer and blockwork inner leaf. The density of the blockwork is not known. Walls are lined with plasterboard (assumed to be plasterboard on dabs).

The existing separating wall between the two units is assumed to be single leaf blockwork with plasterboard lining on either side (assumed to be on plasterboard on dabs). The construction of the party wall to the second floor is not known.

The floors are pre-cast concrete slabs, except at the roof level, which comprises timber joists. On top of this is a raised access computer flooring and below is a suspended ceiling grid of mineral fibre tiles. It is not known if there is mineral wool in the void above the ceiling.

1.2 Proposed Development

The proposed arrangement is to form 18 one or two bedroom apartments with 4 apartments on each floor, except the 2nd floor with 5 apartments (see Appendix A attached), with the common stairwell not spanning over any apartment space. Apartments will be accessed off a lobby and not directly off the stairwell. Walls separating each demise are either existing blockwork or new studwork partitions. Internal partitions will be formed of lightweight studwork.

Existing ceilings will be removed and new plasterboard ceilings will be incorporated. The floor finish will be applied to a new raised floating flooring system.



2 APPROVED DOCUMENT E

The Building Regulations 2010 require all new build residential and conversion to residential developments to achieve minimum performance requirements for sound insulation. Approved Document E 'Resistance to the passage of sound (2003 edition incorporating amendments 2004, 2010, 2013 and 2015 amendments)' provides the technical guidance. The requirements of which are:

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 sound from other parts of the same building and from adjoining buildings.

Protection against sound within a dwelling-house etc.

- E2. Dwelling-houses, 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.

Requirement E2 does not apply to:

- (a) an internal wall which contains a door;
- (b) an internal wall which separates an en suite toilet from the 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

- 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.

It is expected that the proposed development scheme at Unit 3 and 4 Wesley Gate will be treated by the Building Control Officer or Approved Inspector as a 'material change of use' (conversion). Therefore, requiring compliance of the design with the above and the final in-situ construction with Requirement E1 demonstrated by pre-completion sound insulation testing.

The applicable performance design criteria are as given in the table below:



Design Component	Airborne Sound Insulation	Impact Sound Insulation
Party Walls	$D_{nT,w} + C_{tr} \geq 43$ dB	
Internal Walls	$R_w \geq 40$ dB	
Separating Floors	$D_{nT,w} + C_{tr} \geq 43$ dB	
Separating Floors		$L'_{nT,w} \leq 64$ dB
Entrance Doors	$R_w \geq 29$ dB	

3 SOUND INSULATION TESTING OF EXISTING STRUCTURE

Sample indicative sound insulation testing has been undertaken of the existing wall and floor construction. Floor tests were undertaken around the ground floor of unit 3 as all doors had been removed to other areas. All rooms tested were empty except the ground floor kitchen in unit 4, which contained fitted kitchen units. The ceiling had been removed in most areas tested except to a ground floor office in unit 3. The floor finish had been removed in all areas. The tests are considered indicative of the performance of the underlying structure.

3.1 Test procedure

In so far as was practicable, airborne sound insulation tests were undertaken in accordance with the procedure specified in the British Standard BS EN ISO 140-4: 1998, *Acoustics – Measurement of sound insulation in buildings and of building elements, Part 4: Field measurements of airborne sound insulation* and Impact sound insulation tests in accordance with the procedure specified in the British Standard BS EN ISO 140-7: 1998, *Acoustics – Measurement of sound insulation in buildings and of building elements, Part 7: Field measurements of impact sound insulation of floors*.

The single figure weighted standardised level difference $D_{nT,w}$ was determined in accordance with the definitions given in the British Standard BS EN ISO 717-1: 1997, *Acoustics – Rating of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation*. The single figure weighted standardised impact sound pressure level $L'_{nT,w}$ was determined in accordance with the definitions given in the British Standard BS EN ISO 717-2: 1997, *Acoustics – Rating of sound insulation in buildings and of building elements, Part 2: Impact sound insulation*.

3.2 Instrumentation

The following instrumentation was used:



Equipment	Type	Serial Number	Calibration	
			Date	Certificate no
Measurement equipment				
Rion Class 1 sound level meter	NA-28	00170246	06/04/17	U18435
Preamplifier	NH-23	60254	06/04/17	U18435
Microphone	UC-59	00299	06/04/17	18433
Rion Calibrator	NC-74	34773049	06/04/17	U18434
Rion Building Acoustics Card	NX-28BA	00670019	-	-
Airborne Sound source				
TECP white noise source	-	nsn	-	-
Alesis digital ⅓-octave equaliser	DEQ230	00692	-	-
Alto power amplifier	D1	9070007842	-	-
ANV dodecahedron loudspeaker	-	nsn	-	-
Impact Sound Source				
Sound Solutions Tapping Machine	-	TP02036	22/08/16	TP02036/08/16

3.3 Results

The Table below provides the indicative sound insulation results obtained. Full results are provided at Appendix 3.

#	Space 1	Space 2	Airborne, dB D _{nT,w} + C _{tr}	Impact, dB L' _{nT,w}
1	U3, 1 st floor office (front large)	U3, ground floor office (front large)	48†	57
2	U3, 1 st floor office (rear)	U3, ground floor office (rear corner)	52‡	52
3	U3, G nd floor office (front large)	U4, kitchen area	46	n/a
4	U3, G nd floor office (front large)	U3, 1 st floor office (front small)	43	-

† Partial overlap between rooms, full overlay will result in a lower test result (estimated at ~45dB).

‡ Existing suspended ceiling tiles still in place.

All airborne sound insulation results meet the minimum requirements in the Building Regulations, by either small or no margins, therefore some upgrade would be recommended to avoid failures following the conversion.

The impact sound insulation results met the minimum requirements in the Building Regulations and no further upgrade is necessary.

A degree of flanking sound transmission was observed where there blockwork walls common to source and receiver rooms; it is therefore likely that these are of a medium to light-weight density.



4 LAYOUT REVIEW

A review of the proposed Flat layouts has been undertaken and the main points for design consideration are listed below. This are an aspect covered by The Building Regulations 2010 specifically, but is a Client issue for consideration of occupant comfort and saleability:

- The kitchen of Flat 16 is partially over a bedroom in Flat 10; kitchens tend to have a higher risk of activities which generate impulsive and sudden sounds e (i.e. closing cupboard doors, chopping, turning on switches / sockets and moving pots / pans) causing adverse effect to people sleeping.
- The living room of Flat 11 is adjacent to a bedroom in Flat 10 and the living room of flat 12 is adjacent to a bedroom in flat 14; living rooms tend to have higher levels of airborne noise from conversation, listening to music and televisions at times when others may be resting or sleeping. It may be worth considering an improvement to the sound insulation in these areas.
- The toilet and shower room in flat 17 is adjacent to a bedroom in flat 16, with fixings onto a new studwork wall. There is a risk of water running noise and re-radiated noise due to impacts (i.e. closing cupboard doors, drainage noise, toilet flushing and water hitting the shower trays) being audible in the adjacent Flat.
- It is not clear where the SVPs associated with Flats 9, 11 and 13 drop through in the flats below as the layout is not shown, however they would appear to be close to bedrooms. It is strongly recommended that SVPs do not pass through habitable rooms as they are a frequent source of complaint of noise from flushing water and waste.

None of the above directly affect compliance with Approved Document E, however, if any complaint is made, the demonstration of best practice design layout / mitigating constructions may be necessary as a defence.

5 COMPLIANCE WITH REQUIREMENT E1

The main separating constructions between the proposed demises and to the existing adjoining neighbours are required to be designed (and pre-completion tested where indicated by the Building Control Officer or Approved Inspector) to demonstrate the performance requirements.

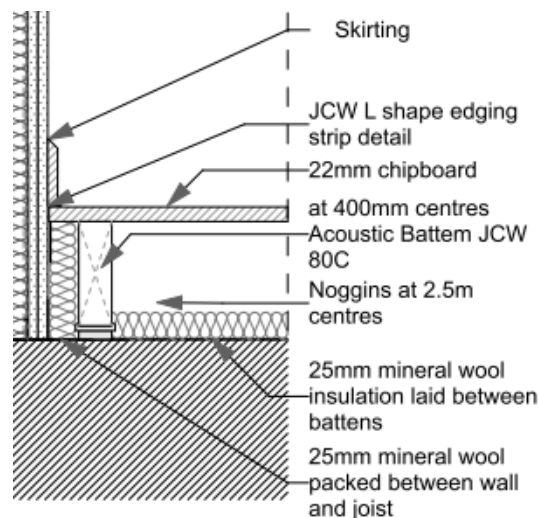
5.1 Separating Floors (Concrete – first and second floor)

The existing separating floor construction at the first and second floor is comprised as listed below:

- 30mm thick chipboard raised floor computer floor panels with metal wrap, with approximately 130mm void.
- Pre-cast concrete plank floor (assumed hollow core, unknown mass / thickness)
- Suspended lay-in-grid tile ceiling system

Sample sound insulation testing found the airborne sound insulation was marginally above the ADE criterion without a ceiling but adequate with the ceiling in place. The impact sound insulation was adequate

The current proposal presented on the Hives Architects' drawings (drawing no. 2684 018 P1) is to remove the raised floor (as it would normally be partially destroyed whilst breaking out areas to form the new demises' separating walls in any case), and replace with the following:



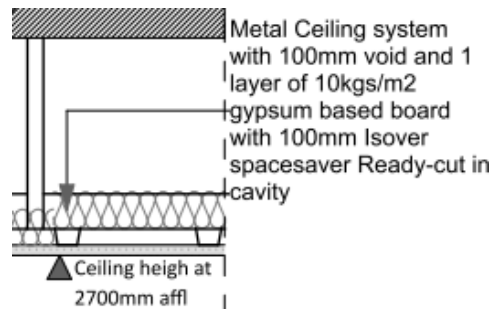
This would be expected to provide a similar level of airborne sound insulation and an improved level of impact sound reduction and would therefore be a reasonable proposal.

It is essential that the “Noggins at 2.5mm centres” donot bridge between floor slab and chipboard, with a gap below or formed from acoustic battens. It is also essential that the resilient edging strips are used and manufacturer’s instructions followed.

However, it has been requested that the existing raised access computer flooring be retained if possible. As tested, the airborne and impact sound insulation through the floor was adequate,

however, it is necessary to consider the horizontal airborne and impact sound transition at the floor junction with separating walls. This is discussed in section 5.8.

The construction works will remove the existing false ceiling system and it is proposed to replace with the following:



This is considered reasonable, however it is recommended the ceiling void should be at least 100mm and avoid having a similar depth to the floor void (i.e. if the raised access floor is 130mm, the ceiling void should be at least 150mm). The deeper the void the better the performance tends to be at lower frequencies.

If the above advised raised floor and ceiling systems are incorporated into the design, the airborne sound insulation is predicted to be greater than $D_{nT,w} + C_{tr}$ 43 dB and the impact isolation lower than $L'_{nT,w}$ 64 dB (subject to sufficient control of flanking sound).

5.2 Separating Floor (Timber - third floor)

The plans for the proposed appear to show the following construction (Hives Architects' Drawing 2684-019 P1):

- 50x250mm solid timber joists (or 253mm metal-web joists*)
- Presumably a T&G deck above joists (min 15mm recommended)
- Raised acoustic floor (22mm chipboard, JCW 80C resilient battens**, 25mm mineral wool between)
- Ceiling as above (1 layer of plasterboard on MF ceiling with 100mm in void)

This is broadly similar to Robust Detail E-FT-2/8 or Approved Document E, floor type 3, however the ceiling has insufficient mass. **It is recommended that the ceiling below comprises two layers of plasterboard with a total mass of at least 20 kg/m².**

As shown on the plans, it is essential that separating walls are constructed prior to the fitting of the raised acoustic floor to mitigate potential horizontal flanking path through the lightweight surface of the raised acoustic floor.

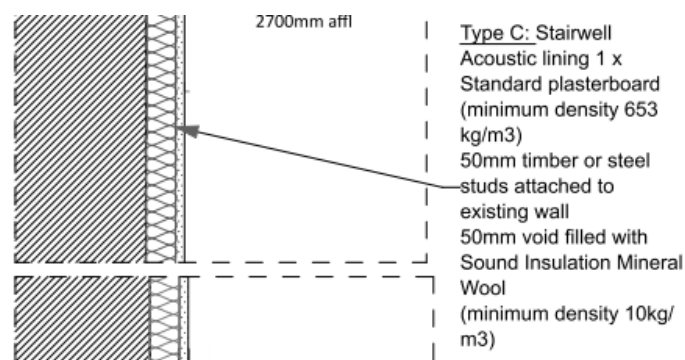
5.3 Existing Separating Walls

It is understood that the existing separating walls between units and to the stairwells, behind the existing plasterboard lining, comprises solid blockwork. The density is not known, however the

sound insulation testing undertaken across an example separating wall indicates it may be a medium density block.

The airborne sound insulation test result across the separating wall met the criterion in Part E, but by a relatively small margin. It is not known if blockwork is Stretcher Bond or Collar Tied construction, however no resonance at lower frequency is apparent in the test result, which can be associated with the Collar Tied method. The existing system used to support the plasterboard lining is not known. **It is recommended that the existing plasterboard lining to separating walls is replaced on at least one side with an improved system, particularly if it is plasterboard on dabs.**

It is understood that the following lining is proposed to the stairwells (Wall Type C):



Whilst this is reasonably likely to provide sufficient sound insulation, **the following is preferred as it provides better isolation between blockwork and lining:**

- British Gypsum GypLiner Universal (or similar equivalent) to form minimum 50mm cavity (and not less than the existing lining cavity if previously greater) with 50mm mineral wool in the cavity and a minimum 12.5mm plasterboard (minimum 10kg/m²) to the development side of the wall surface.
- or
- As above but using timber or steel studs/battens with resilient bars fixed horizontally instead of GypLiner Universal (or similar equivalent).

If the blockwork to the stairwells is the same as the separating walls the above linings would be sufficient, if however, the blockwork has a lower surface mass (e.g. thinner), then the following is recommended:

- Minimum 20mm set-off from existing wall surface
- Minimum 48mm metal 'I' studwork frame or equivalent timber frame
- 50mm mineral wool in the cavity (between studs)
- 2 x 12.5mm plasterboard (minimum 8 kg/m²) with joints staggered (Overall depth 93mm plus finishes)

Note, all linings should be full height, structure to structure.

Where any existing openings are to be infilled, this must be with masonry or blockwork of the same density as the existing wall. If in doubt it is recommended a density of at least 1600kg/m³ is used.



5.4 Existing Party Wall at Second Floor

It is not known whether the existing party wall at the second floor is solid or cavity block. If solid the advice given in Section 5.3 for an existing separating wall should be followed.

If the Party Walls are of a cavity blockwork form, then the existing performance may be slightly under that required depending on the density of the block and type of wall ties used. Assuming medium density blockwork, the risk is considered to be low. The following minimal lining works are suggested as an option to reduce this small risk:

- British Gypsum 52mm TriLine (or similar equivalent) bonded and mechanically fixed to the development side of the wall surface. (Overall depth 52mm plus finishes)

or

- British Gypsum GypLiner Universal (or similar equivalent) to form minimum 35mm cavity with 25mm mineral wool in the cavity and a minimum 12.5mm plasterboard (minimum 10.5 kg/m²) to the development side of the wall surface. (Overall depth 48mm plus finishes)

Note, all linings should be full height, structure to structure.

5.5 New Separating Walls

It is proposed to incorporate in the design a twin studwork wall as listed below, which has a laboratory test result of $R_w + C_{tr}$ 56 dB. Typically for lightweight systems, an 8 dB reduction should be allowed for between manufacturer's laboratory tested data and likely on-site performance, implying that the proposed studwork system should achieve an estimated $D_{nT,w} + C_{tr}$ 48 dB on-site (assuming good workmanship and flanking sound is controlled sufficiently). This proposal is therefore considered to be satisfactory for compliance.

- 2 x 15mm plasterboard (minimum 12.5 kg/m² per layer) with joints staggered
- 48mm metal 'C' stud frame
- 137mm cavity with 50mm mineral wool in the cavity
- 48mm metal 'C' stud frame
- 2 x 15mm plasterboard (minimum 12.5 kg/m² per layer) with joints staggered

The new separating wall is advised to be constructed from structure to structure (i.e. from concrete slab to soffit prior to floor and ceilings, and through any existing wall linings to the masonry structure) with appropriate acoustic deflection head details as advised by the product system supplier. However, it is understood that it is preferable to retain the existing raised access flooring, which presents a potential horizontal flanking path – see section 5.8. Also see Section 7 regarding electrical sockets / switches.

5.6 Flanking Conditions – existing external walls

There is a specific flanking path that requires consideration for control purposes. The internal lining to the external wall will be important as it will serve two functions, control of sound flanking both horizontally and vertical between the new demises and to adjoining buildings, plus reduction of external noise break-in through the façade. In order to sufficiently control flanking sound, it is advised that an internal lining be applied to the external walls, post construction of the separating walls and



internal partitions. . It is essential that new separating walls are taken through any existing linings being retained. The lining advised is as listed below:

- 12.5mm plasterboard (minimum 8 kg/m²), on dabs or a metal / timber lining system

Note, all linings should be full height, structure to structure.

5.7 Flanking Conditions - new external walls

Where new external walls are constructed directly on top of the existing external walls at the proposed roof extension, they will not be separated by the relatively dense concrete floor slab, as is the case between existing floors. There is a high risk of vertical flanking noise, particularly if light-weight aircrete blocks are used. The risk is lower if the inner leaf of the external wall is timber frame.

If the inner leaf of new external walls is to be blockwork the following linings are recommended:

- British Gypsum 52mm TriLine (or similar equivalent) bonded and mechanically fixed to the development side of the wall surface. (Overall depth 52mm plus finishes)

or

- British Gypsum GypLiner Universal (or similar equivalent) to form minimum 35mm cavity with 25mm mineral wool in the cavity and a minimum 12.5mm plasterboard (minimum 10.5 kg/m²) to the development side of the wall surface. (Overall depth 48mm plus finishes)

5.8 Flanking Conditions – retain raised access computer flooring

It is understood that it is preferred to retain the raised access computer floor. If the separating partitions are built of this, it presents a horizontal flanking path for both airborne and impact sound through the existing floor deck under new separating walls. **There are two options for retaining the floor:**

1. Remove raised access floor sections locally to build separating walls and make good floor either side with new support from the floor slab below (must not be supported from wall), e.g. with cradle and batten system.

Or

2. Insert mineral 100mm mineral slab, with a density of >33kg/m³ (e.g. Rockwool Flexi) under raised access floor to a width of 1m either side of separating partition, and install an additional (proprietary) resilient floating floor deck either side of the partition

Option 1 presents less risk of flanking, but it will need to be confirmed if the works to make good and support the replacement floor sections are viable.

Option 2 will raise the floor height, which may have implications at the top of stair treads or require a step threshold, and has less predictable sound insulation. **If option 2 is selected, it is suggested that a sound insulation test could be undertaken at an early stage between a room pair, prior to completing throughout the remaining flats.** It may then also be possible to confirm if a less costly floating floor will be acceptable. The options for floating floor are:



- a. 22mm T&G chipboard deck on resilient composite battens or resilient cradle and batten system, with a minimum height of 45mm and 25 mm mineral quilt void formed (lowest risk, increased height)
- b. High mass composite resilient deck, with a mass of at least 24kg/m² and pre-bonded resilient layer such as Celecta Screedboard 28 or JCW SoundBoard 28 Plus (relatively low risk)
- c. Basic composite resilient deck, with a mass of at least 12kg/m² and pre-bonded resilient layer such as Celecta Deckfon 26/30T or JCW Acoustic Dec 28/32 (moderate risk)

6 COMPLIANCE WITH REQUIREMENT E2

Internal Partitions in a demise: The proposed construction is (wall type C):

- 15mm plasterboard (minimum 12.5 kg/m² per layer) either side of
- 48mm metal 'C' stud frame
- 50mm mineral wool in the cavity

This has a laboratory test result of R_w 44 dB, which meets the requirement to achieve at least R_w 40 dB.

7 COMPLIANCE WITH REQUIREMENT E3

Reverberation Control: The common circulation parts of the development are required to comply with Requirement E3. This affects the common corridor lobbies and the stairwell*. There are two methods in Approved Document E that could be utilised.

Applying Method A

For the stairwell, this would mean covering the ceiling areas indicated in Appendix B with a Class D acoustic absorber product. An example is listed below which achieves Class D performance:

- British Gypsum Rigitone 8/18 (or similar equivalent) with a minimum 50mm void above

Alternatively, 50% of the area shown could be covered with a Class C acoustic absorber as per the example produce for the lobbies given below.

For the lobbies, they would be considered 'entrance halls' and would require a Class C acoustic absorber to the entire ceiling area. An example is listed below which achieves Class C performance:

- British Gypsum Rigitone 8/18Q (or similar equivalent) with a minimum 200mm void above

It should be noted that there may need to be a fire barrier ceiling above the acoustic ceiling depending on the fire requirements.

Applying Method B

Method B is only applicable to the lobbies (treated as 'entrance halls') and should not be applied to stairwells.



For the lobbies, if a carpet or vinyl flooring will be used, the ceiling could be reduced from a Class C to a Class D acoustic absorber covering the entire ceiling area.

*It is noted that flats are not directly connected to stairwells as there is a lobbied door between the communal entrance corridors. It is also noted that the sound insulation of separating walls to the stairwell is to be improved. The primary purpose of requirement E3 is to reduce noise from communal areas disturbing occupants of dwellings. It could be argued that the use of lobbied doors and improvement to sound insulation is an alternative way of mitigating potential disturbance from the stairwell (to be confirmed as an approach with Building Control). Notwithstanding, if this argument is to be made, it would be recommended that stairwells are carpeted and/or at least the ceilings above the landing areas treated to provide a more pleasant aesthetic to the entrance stairwells. The common corridor lobbies must still be treated.

8 OTHER ASPECTS OF DESIGN

There are a number of other aspects to the design for which Approved Document E provides best practice guidance advice. It is advised that these aspects are also incorporated into the design.

Entrance Doors

Approved Document E guidance states:

Ensure that any door has good perimeter sealing (including the threshold where practical) and a minimum mass per unit area of 25 kg/m² or a minimum sound reduction index of 29 dB R_w

This should be applied to the selection of all apartment and studio apartment entrance doors.

SVPs and Common Piped Services

Approved Document E guidance states:

Pipes and ducts that penetrate a floor separating habitable rooms in different flats should be enclosed for their full height in each flat. The enclosure should be constructed of material having a mass per unit area of at least 15 kg/m². Either line the enclosure or wrap the duct or pipe within the enclosure with 25mm unfaced mineral fibre.

The proposed design is for a double layer of 15mm plasterboard of approximately a combined mass per unit area 25 kg/m², with 50mm mineral wool insulation lining to the enclosure. This is satisfactory compare to the guidance.

Best practice to avoid complaints would be not to locate SVP in habitable rooms wherever possible. Therefore, if the SVP through the one bedroom studio apartments could be relocated into the bathrooms, this would be preferable.

Electrical Sockets / Switches

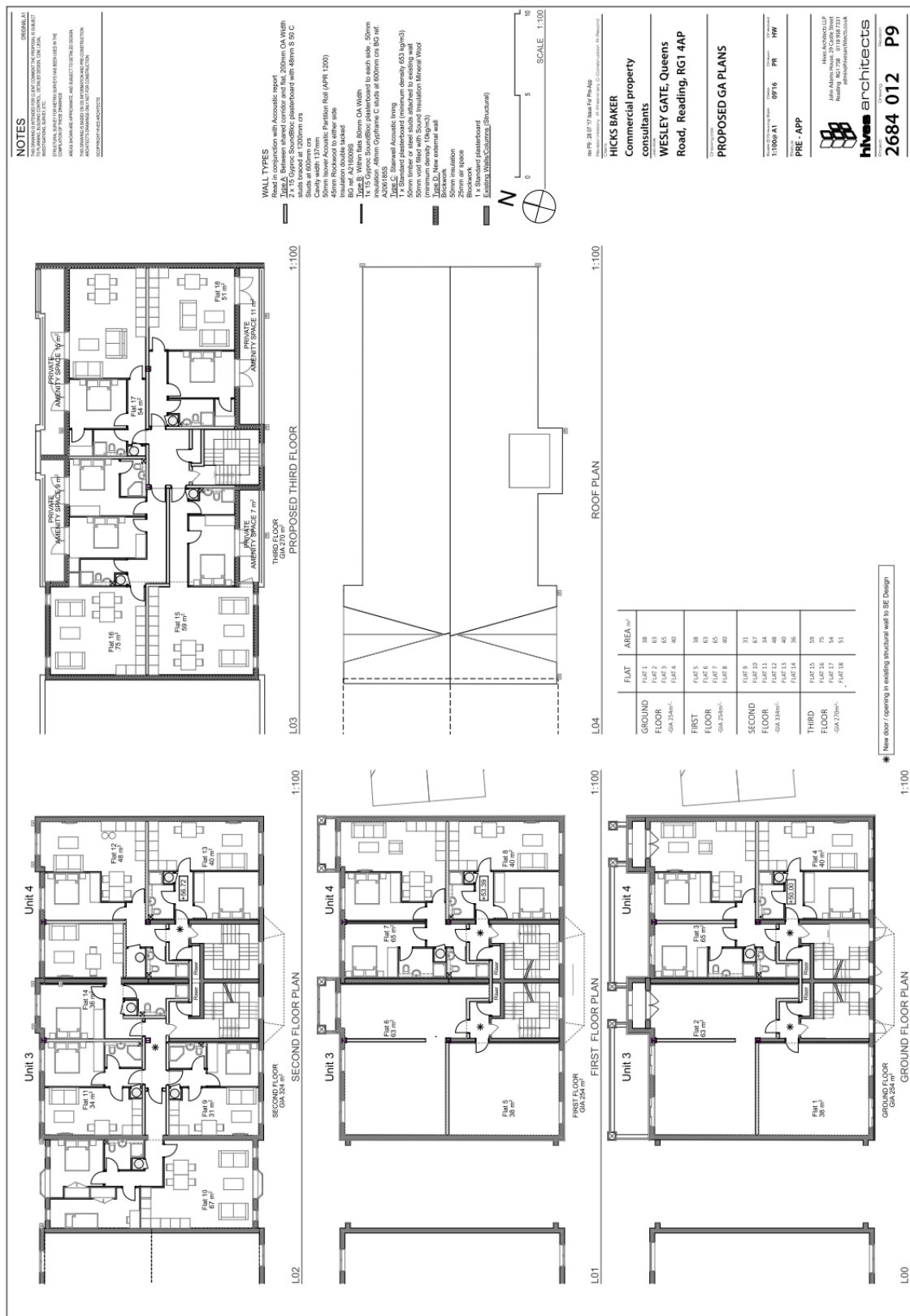
In lightweight drylined walls, especially when used to form separating walls between demises, inclusion of electrical sockets / switches can reduce the airborne sound insulation performance.



Therefore, sockets in separating walls should not be back to back and it is advised to provide back-box enclosures (of similar combined mass to the separating wall linings) around all electrical sockets / switches in the demises separating walls. Alternatively, proprietary sound deadening putty pads could be used.



APPENDIX A: PROPOSED FLOOR PLANS



APPENDIX B: ABSORPTIVE CEILING COVERAGE





APPENDIX C: DETAILED SOUND INSULATION TEST RESULTS

FIELD MEASUREMENT OF AIRBORNE SOUND INSULATION BETWEEN ROOMS

Standardised level difference DnT, w according to ISO 140-4

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 1 Upstairs
Receiver room: Room 4 Downstairs

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: C. Heal

Test Partition: Raised access computer floor over pre-cast concrete floor slabs of unknown depth

Partition area, m²: 34.3

Source room volume, m³: 68.5

Receiving room volume, m³: 97.5

Frequency, Hz **DnT, dB**

100	33.9
125	33.9
160	39.5
200	42.8
250	45.0
315	48.1
400	48.9
500	50.4
630	53.2
800	>= 53.4*
1000	>= 51.1*
1250	>= 54.9*
1600	>= 59.8*
2000	61.4
2500	>= 63.0*
3150	>= 63.7*

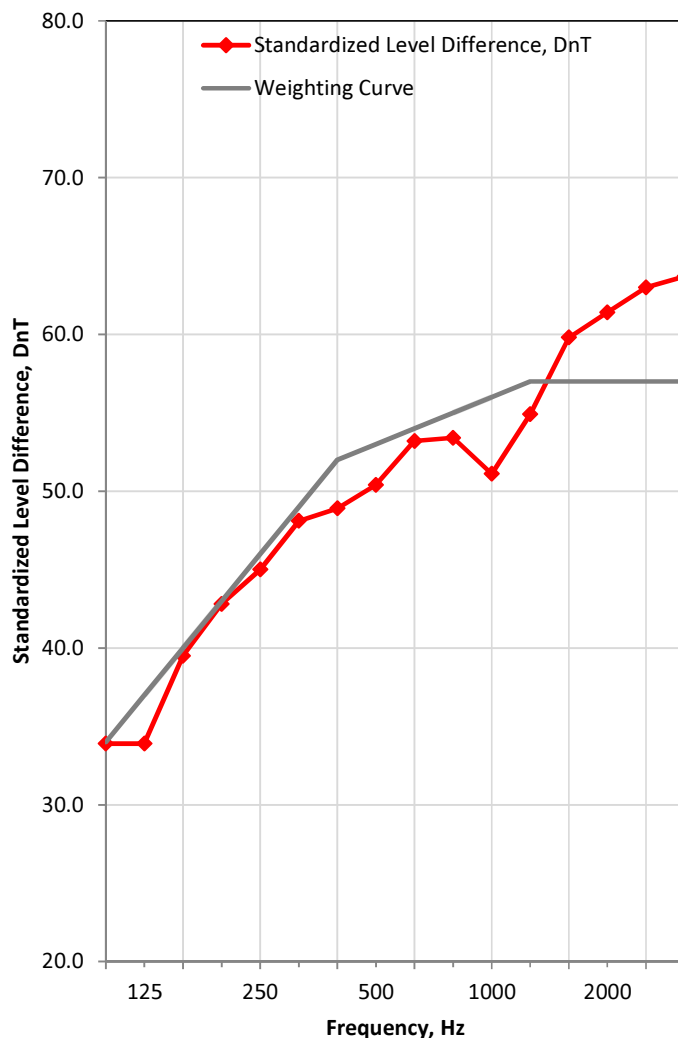
* approaching or at the limit for measurement

DnT,w (C;Ctr): 53 (-1, -5) dB

Measured, DnT,w + Ctr: 48 dB

Criterion, DnT,w + Ctr: 43 dB

Test result: Pass



Sustainable Acoustics Ltd
5 Charlecote Mews
Winchester
Hampshire
SO23 8SR

Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017

FIELD MEASUREMENT OF AIRBORNE SOUND INSULATION BETWEEN ROOMS

Standardised level difference D_{nT} , w according to ISO 140-4

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 2 Upstairs
Receiver room: Room 2 Downstairs

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: C. Heal

Test Partition: Raised access computer floor over pre-cast concrete floor slabs of unknown depth. Suspended ceiling grid below with mineral fibre tiles - possible mineral wool quilt in void

Partition area, m^2 : 39.8

Source room volume, m^3 : 60.8

Receiving room volume, m^3 : 39.8

Frequency, Hz **D_{nT} , dB**

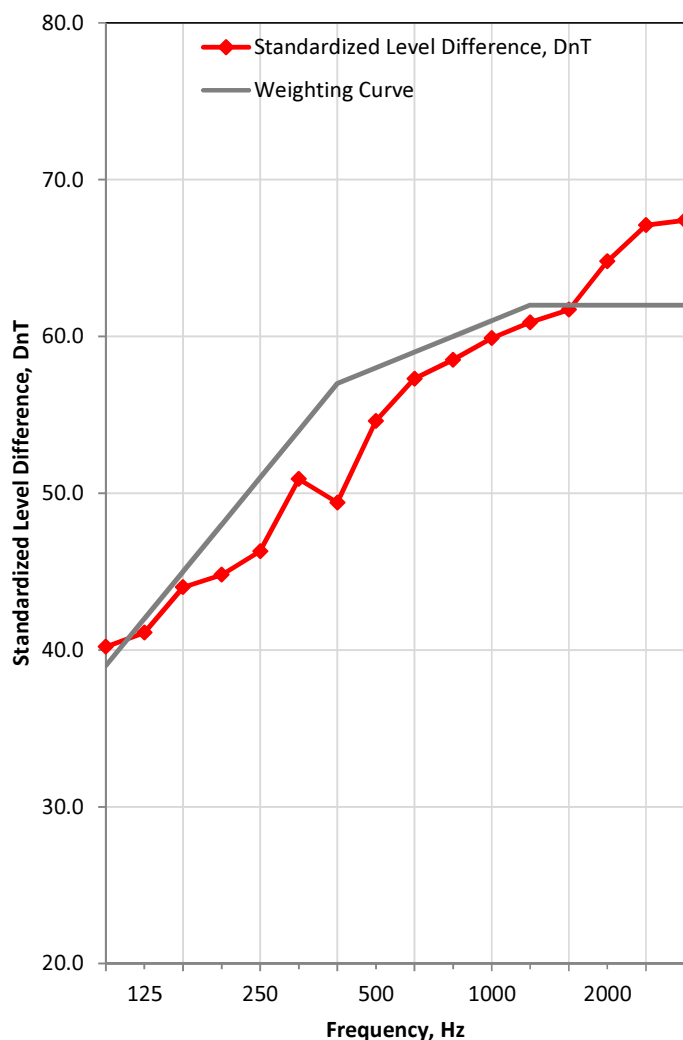
100	40.2
125	41.1
160	44.0
200	44.8
250	46.3
315	50.9
400	49.4
500	54.6
630	57.3
800	58.5
1000	59.9
1250	60.9
1600	61.7
2000	64.8
2500	67.1
3150	67.4

$D_{nT,w}$ (C;Ctr): 58 (-2, -6) dB

Measured, $D_{nT,w}$ + Ctr: 52 dB

Criterion, $D_{nT,w}$ + Ctr: 43 dB

Test result: Pass



Sustainable Acoustics Ltd
5 Charlecote Mews
Winchester
Hampshire
SO23 8SR

Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017

FIELD MEASUREMENT OF AIRBORNE SOUND INSULATION BETWEEN ROOMS

Standardised level difference $D_{nT, w}$ according to ISO 140-4

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 4 Downstairs
Receiver room: Room 3 (Kitchen)

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: C. Heal

Test Partition: Blockwork walls, plasterboard lining either side; kitchen cabinets and services cupboards open.

Partition area, m^2 : 24.6

Source room volume, m^3 : 97.5

Receiving room volume, m^3 : 16.9

Frequency, Hz **D_{nT} , dB**

100	34.9
125	42.0
160	37.3
200	35.9
250	40.1
315	42.3
400	44.3
500	46.4
630	47.5
800	50.0
1000	53.1
1250	$\geq 54.1^*$
1600	$\geq 54.1^*$
2000	55.4
2500	$\geq 57.7^*$
3150	$\geq 57.1^*$

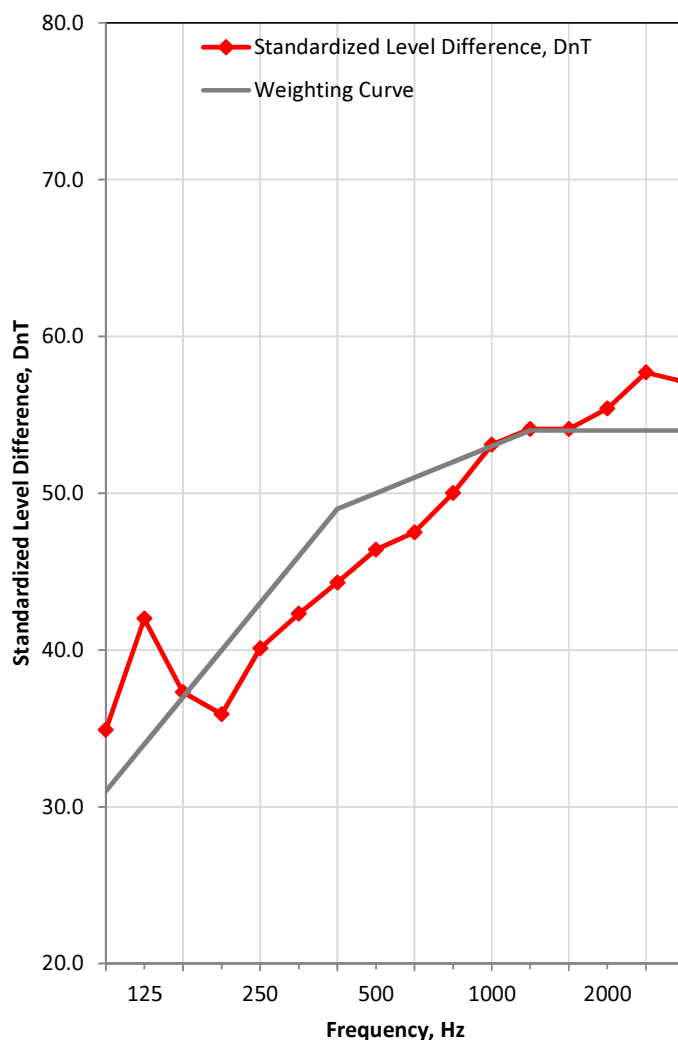
* approaching or at the limit for measurement

$D_{nT, w}$ (C;Ctr): 50 (-1, -4) dB

Measured, $D_{nT, w}$ + Ctr: 46 dB

Criterion, $D_{nT, w}$ + Ctr: 43 dB

Test result: Pass



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Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017

FIELD MEASUREMENT OF AIRBORNE SOUND INSULATION BETWEEN ROOMS

Standardised level difference D_{nT} , w according to ISO 140-4

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 4 Downstairs
Receiver room: Room 3 (Kitchen)

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: C. Heal

Test Partition: Blockwork walls, plasterboard lining either side; kitchen cabinets and services cupboards open.

Partition area, m^2 : 24.6
Source room volume, m^3 : 97.5
Receiving room volume, m^3 : 16.9

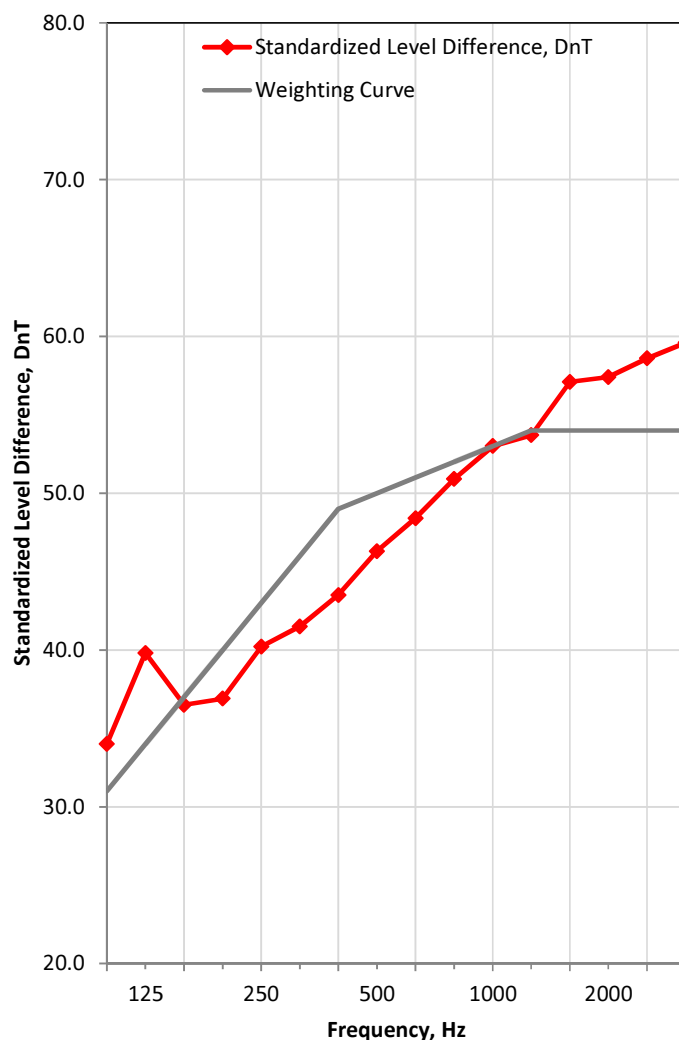
Frequency, Hz	D_{nT} , dB
100	34.0
125	39.8
160	36.5
200	36.9
250	40.2
315	41.5
400	43.5
500	46.3
630	48.4
800	50.9
1000	53.0
1250	53.7
1600	57.1
2000	57.4
2500	58.6
3150	59.6

$D_{nT,w}$ (C;Ctr): 50 (-1, -4) dB

Measured, $D_{nT,w}$ + Ctr: 46 dB

Criterion, $D_{nT,w}$ + Ctr: 43 dB

Test result: Pass



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Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017

FIELD MEASUREMENT OF AIRBORNE SOUND INSULATION BETWEEN ROOMS

Standardised level difference DnT, w according to ISO 140-4

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 4 Downstairs
Receiver room: Room 4 Upstairs

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: J. Whiddett

Test Partition: Raised access computer floor over pre-cast concrete floor slabs of unknown depth

Partition area, m²: 41.1
Source room volume, m³: 97.5
Receiving room volume, m³: 41.1

Frequency, Hz **DnT, dB**

100	29.5
125	30.2
160	33.2
200	36.7
250	42.2
315	43.6
400	44.5
500	45.4
630	48.6
800	51.0
1000	>= 52.5*
1250	>= 55.2*
1600	>= 57.5*
2000	>= 57.3*
2500	>= 58.0*
3150	>= 58.5*

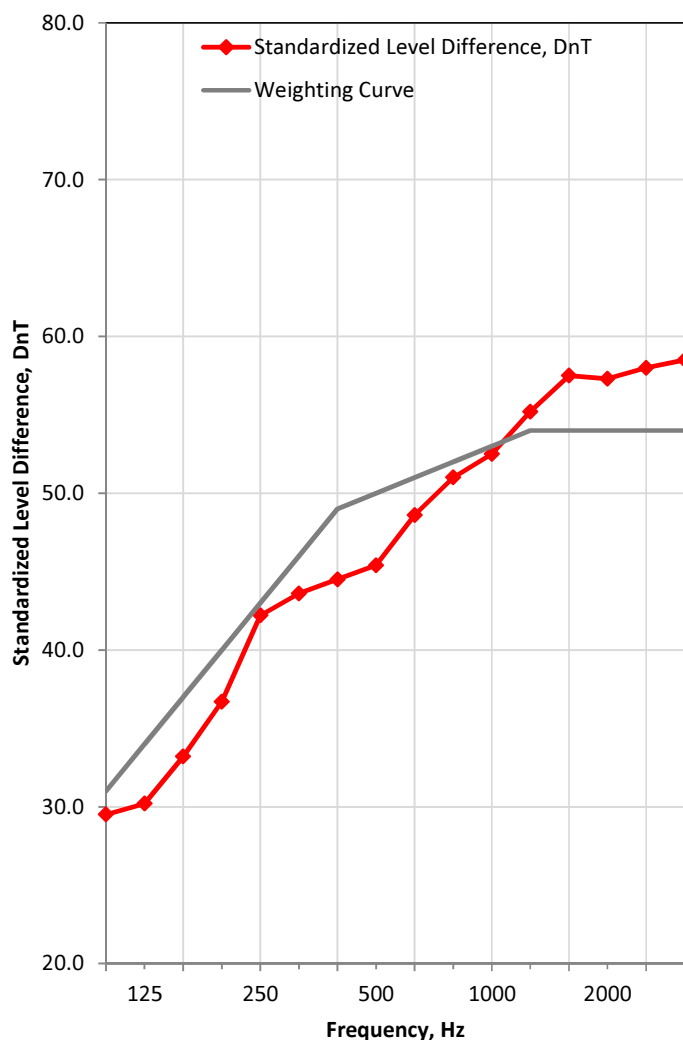
* approaching or at the limit for measurement

DnT,w (C;Ctr): 50 (-2, -7) dB

Measured, DnT,w + Ctr: 43 dB

Criterion, DnT,w + Ctr: 43 dB

Test result: Pass



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Winchester
Hampshire
SO23 8SR

Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017

FIELD MEASUREMENT OF IMPACT SOUND INSULATION OF FLOORS

Standardised impact sound pressure level according to ISO 140-7

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 1 Upstairs
Receiver room: Room 4 Downstairs

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: C. Heal

Test Partition: Raised access computer floor over pre-cast concrete floor slabs of unknown depth

Partition area, m²: 34.3

Receiving room volume, m³: 97.5

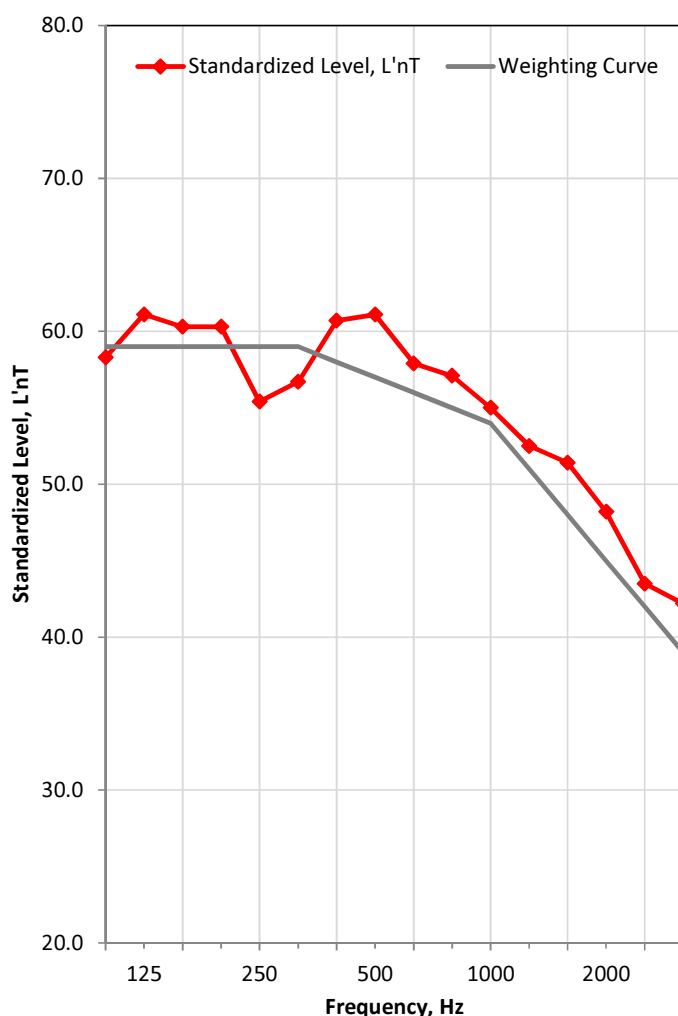
Frequency, Hz **L'nT, dB**

100	58.3
125	61.1
160	60.3
200	60.3
250	55.4
315	56.7
400	60.7
500	61.1
630	57.9
800	57.1
1000	55.0
1250	52.5
1600	51.4
2000	48.2
2500	43.5
3150	42.2

Measured, L'nT,w: 57 dB

Criterion, L'nT,w: 64 dB

Test result: Pass



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Winchester
Hampshire
SO23 8SR

Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017

FIELD MEASUREMENT OF IMPACT SOUND INSULATION OF FLOORS

Standardised impact sound pressure level according to ISO 140-7

Evaluation based on field measurement results obtained in 1/3-octave bands by an engineering method

Project: Wesley Gate
Source room: Room 2 Upstairs
Receiver room: Room 2 Downstairs

Project no: 17-0090-0
Test number: n/a
Test date: 31-Aug-2017
Analysis date: 05-Sep-2017
Tester: C. Heal

Test Partition: Raised access computer floor over pre-cast concrete floor slabs of unknown depth. Suspended ceiling grid below with mineral fibre tiles - possible mineral wool quilt in void

Partition area, m²: 39.8

Receiving room volume, m³: 39.8

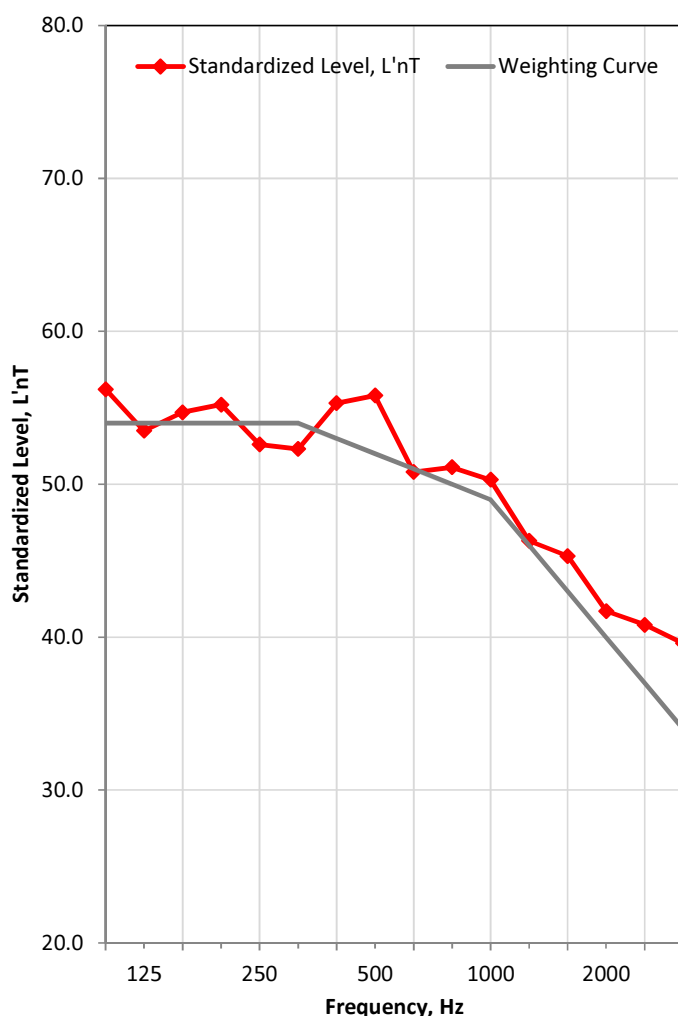
Frequency, Hz **L'nT, dB**

100	56.2
125	53.5
160	54.7
200	55.2
250	52.6
315	52.3
400	55.3
500	55.8
630	50.8
800	51.1
1000	50.3
1250	46.3
1600	45.3
2000	41.7
2500	40.8
3150	39.6

Measured, L'nT,w: 52 dB

Criterion, L'nT,w: 64 dB

Test result: Pass



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Tested by:



ANC Registration Number: 112

Date: 05-Sep-2017