



**SOUND INSULATION DETAILING**  
Report No. 11303

for the site at

**528 - 532 HYDE RD, GORTON**

PREPARED FOR : KSP RENTALS LTD

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## 1 INTRODUCTION

Braiden Acoustics has been commissioned by KSP Rentals Ltd to undertake a Sound Insulation Detailing survey for the site at 528 - 532 Hyde Rd, Gorton.

Planning application 138129/FO/2023 which proposes “Elevational alterations in connection with sub-division of ground floor to create 3 retail units (Class E) together with change of use of first and second floor to create 4 x 1 bedroom flats and 1 x 3 bedroom flat (Class C3)” was approved with conditions on the 19 December 2023.

The formation of the apartments will generate separating walls and floors that will be subject to Building Regulations Part E: Resistance to Passage of Sound.

As part of Building Regulations Part E, separating floors and walls must be tested<sup>1</sup> for sound insulation when the building works have been completed.

This report shall outline the design of the party floors and walls in order to meet Building Regulations, as well as construction methods to minimise compromising the design.

### 1.1 SCOPE

This report will review the current proposed designs of the party floors and walls so that they may achieve sufficient sound insulation for Building Regulations Part E.

## 2 DESCRIPTION OF SITE

The site comprises of three terraced three-storey buildings with retail at ground floor and residential above.



Figure 1  
Proposed site street view

### 2.1 EXISTING CONSTRUCTION

The party floor is of timber construction with 8” x 3” joists.

The party walls are double skin brick wall with dot and dab plasterboard on each side.

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<sup>1</sup> unless conforming to Robust Details

## 2.2 PROPOSED USE

### 2.2.1 Proposed party walls

The floor layouts of the apartments are shown in Figure 2, with red lines denoting the party walls.



Figure 2  
Proposed Floor Layouts

The party walls are existing and are constructed as follows:

*Double skin brick wall with dot and dab plasterboard*

The section to be infilled, on the first floor, should be the exact same build up of the rest of the party wall

### 2.2.2 Proposed Party Floors

The party floors are timber floors.

532 Hyde Road has had it's separating floors upgraded as follows:

- 1no 12.5mm fire board on
- 1no. 15mm acoustic board on
- Resilient bars attached to
- 8" x 3" joists 100mm acoustic mineral wool insulation in between the joists
- Floorboards with
- Foil backed underlay with 10mm laminate flooring

## 3 ACOUSTIC STANDARDS AND GUIDANCE

The acoustic assessment of the new development is predominantly based upon achieving the necessary sound insulation values given in Building Regulations Part e "Resistance to Passage of Sound" [1] also known as Approved Document E (ADE).

### 3.1 NOISE INDICES

Several different acoustic parameters are used to describe noise limits so a brief overview of the pertinent indices will be given here.

For sound insulation measurements, for following indices are commonly used.

**R**      *sound reduction index* – this is a laboratory result of the difference in average sound pressure levels  $L_1$  and  $L_2$ , between two rooms. Flanking transmission is controlled and minimised by constructing solid and massive walls so that the weakest element is the partition under test [2]. Therefore, **the R value gives a laboratory performance of the partition only** whereas in-situ  $D$  measurements account for other flanking transmission paths so usually give a lower result, depending on quality of construction.

$$R = L_1 - L_2 + 10 \log_{10} \frac{S}{A} \text{ dB} \quad (1)$$

where       $L_1$  = average sound pressure level in the source room  
               $L_2$  = average sound pressure level in the receiver room  
               $S$  = area of test partition  
               $A$  = equivalent sound absorption area in the receiver room

**$D_{nT}$**       *standardized level difference* – level difference between source and receiver rooms that is normalised to a ‘standard’ room with a reverberation time of 0.5s. This can differ from the laboratory values from approximately between 5 to 9 dB usually due to the influence of flanking transmission sound paths [3].

$$D_{nT} = L_1 - L_2 + 10 \log_{10} \frac{T}{T_0} \text{ dB} \quad (2)$$

where       $T$  = is the reverberation time in the receiving room  
               $T_0$  = is the reference reverberation time; for dwellings,  $T_0 = 0.5 \text{ s}$

**$C_{tr}$**       an additional weighting to account for low frequency sounds including urban road traffic – see Appendix for a table of typical noise sources – taken from [5].

The above calculations are done for each frequency band of interest. The ‘w’ subscript is the ‘weighted’ value denoting the single figure value.

*The difference between the R (laboratory) and D (on-site) can differ due to flanking issues. To account for the poorer on-site performance it is prudent to estimate the D value to be 8 dB less than the R value.*

### 3.2      BRITISH / INTERNATIONAL STANDARDS

#### 3.2.1      BS ISO EN 140 / 717

The 140 series of standards “Acoustics — Measurement of sound insulation in buildings and of building elements” describes the various methods of measuring the sound insulation of a multitude of building element types. The 717 series then describes the calculations to determine many different types of acoustic descriptors, especially the single number ‘weighted’ value.

#### 3.3      BUILDING REGULATIONS – APPROVED DOCUMENT E

The currently methodology for the assessment of sound insulation within a building is taken from The Building Regulations Part E: Resistance to the Passage of Sound, otherwise known as Approved Document E (ADE). The testing procedure is described in Annex B with reference to ISO 140-4 [3], ISO 140-7 [4], ISO 717-1 [5] and ISO 717-2 [6] which describe the testing methodology for airborne and structure borne noise as well as descriptions of the various relevant parameters and nomenclature.

The dwellings within the proposed site are classed as flats and so fall under the directions of part E1 of the Building Regulations document [1].

*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.*

According to Building Regulations Approved Document E (ADE) the proposed developed comes under the category material change of use, in other words the development is a conversion.

| Performance standard for separating walls and floors              | Sound Insulation Requirement |                  |
|-------------------------------------------------------------------|------------------------------|------------------|
|                                                                   | $D_{nT,w} + C_{tr}$ (dB)     | $L'_{nT,w}$ (dB) |
| <b>Dwelling-houses and flats formed by material change of use</b> |                              |                  |
| Walls                                                             | $\geq 43$                    | -                |
| Floors                                                            | $\geq 43$                    | $\leq 64$        |
| <b>Purpose built dwelling-houses and flats</b>                    |                              |                  |
| Walls                                                             | $\geq 45$                    | -                |
| Floors                                                            | $\geq 45$                    | $\leq 62$        |

Table 1  
Tables 0.1a from Approved Document E

Separating walls and floors must meet the requirements given in Building Regulation Part E. The testing requirements between separating partitions are shown in Figure 3.

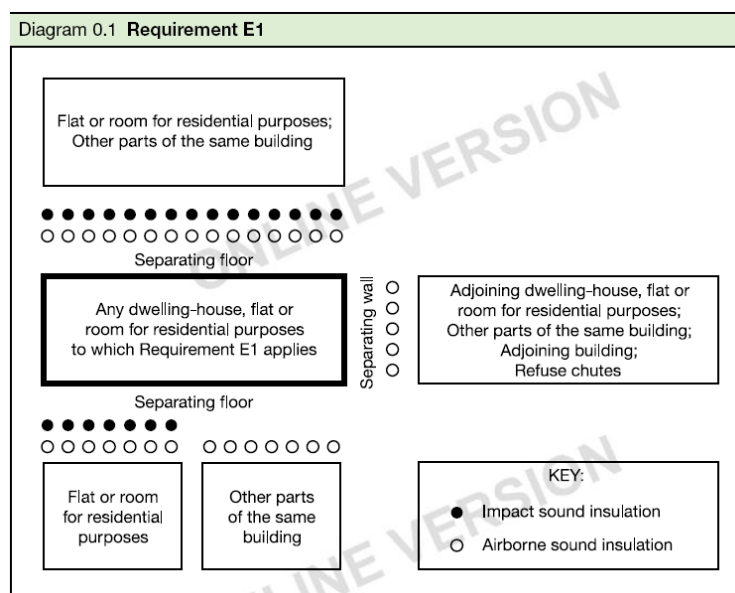


Figure 3  
Diagram 0.1 from Approved Document E

Figure 3 shows that there should be both airborne and impact sound insulation tests of the separating floors and airborne for the separating walls.

## 4 DESIGN PROPOSAL

### 4.1 SEPARATING WALLS

#### 4.1.1 Masonry wall

The masonry party wall has been measured for Sound Insulation using guidance in Approved Document E and the result is:

$$45 \text{ dB } D_{nT,w} + C_{tr}$$

This is only +2dB above the 45dB limit. The full result is in the Appendix.

When the theoretical and actual Sound Reduction Index charts are compared, it can be seen that the -in-situ measurement broadly follows the theoretical curve, although there could be some improvement in the mid / high frequency range.

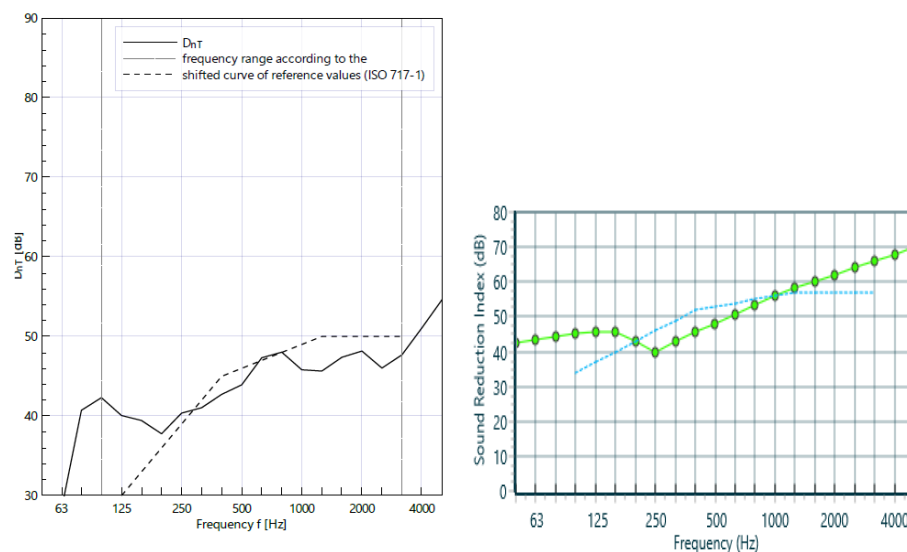


Figure 4  
Actual and theoretical Sound Reduction Index curves

##### 4.1.1.1 Plasterboard linings

For party walls, the following is advised:

- Plasterboard adhesive should be continuous across the whole wall and not 'dot n dab'. Therefore there should be NO pockets of air between the plasterboard and the masonry wall

##### 4.1.1.2 Electrical sockets

Ideally, there should be no penetrations in party walls, including electrical sockets, switches etc. However, if this is not possible then special care needs to be taken when inserting an electrical socket into the plasterboard of a party wall. The socket should be cladded behind the box, as shown in Figure 5 or Putty Pads can be used to line the socket box internally or externally to the rear as shown in Figure 6.

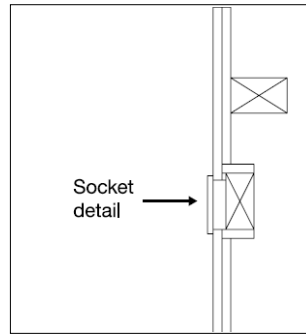


Figure 5  
Electrical socket detail in plasterboard

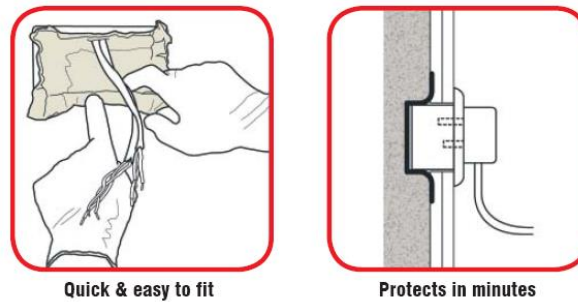


Figure 6  
Installation of Putty Pad

For party walls, the following guidelines should be adhered to:

- stagger the position of electrical sockets on either side of party wall
- do not use deep sockets and chases in the party wall
- use a similar thickness of cladding behind the socket box.

#### 4.2 SEPARATING FLOORS

The current separating floor is described in Section 2.2.2. and has also been measured for Sound Insulation with the following result:

$$44 \text{ dB } D_{nT,w} + C_{tr}$$

This is only +4dB above the 45dB limit. The full result is in the Appendix.

##### 4.2.1 Proposed flooring solution

For the, as yet, untreated separating floor, the follow design should be adhered to, as shown in Figure 7 below.

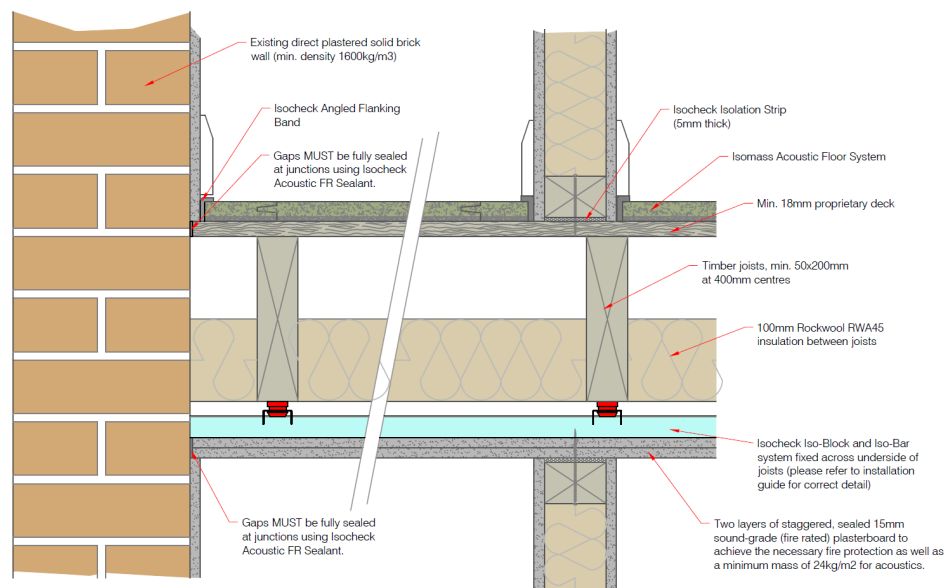


Figure 7  
Isomass acoustic floor

The main point to be followed are:

- All gaps between and around the existing floorboards should be filled with acoustic sealant
- Any of the Isomass acoustic flooring products can be installed, i.e. Isocheck 15T

#### 4.2.2 Junction with internal stud wall

Internal stud walls should **not** penetrate the upgraded acoustic flooring but rather abut up to it.

#### 4.2.3 Penetrations in the separating floor

Piped services (excluding gas pipes) and ducts that pass through separating floors should be surrounded with absorbent material for their full height and enclosed above and below the floor, as shown in Figure 8.

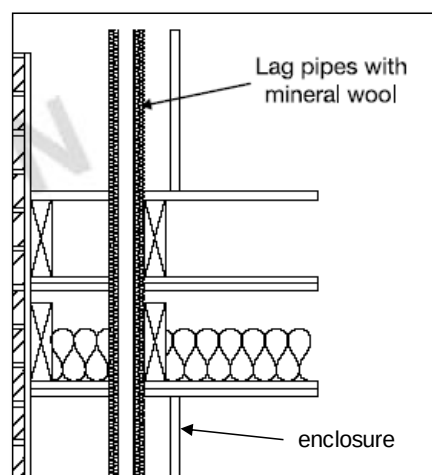


Figure 8  
Enclosed and lagged pipework the penetrates a separating floor

Penetrating pipework should be lagged with acoustic wrap (minimum 25mm unfaced mineral wool) and boxed in (enclosed) with at least 2no. 15mm Soundbloc.

Alternatively, it is suggested to use Rockwool Techwrap – see manufacturer for installing instructions - and then boxed in as above.

<http://www.rockwool.co.uk/products/u/2014.product/9884/building-insulation/rockwool%C2%AE-techwrap2-and-techtube->

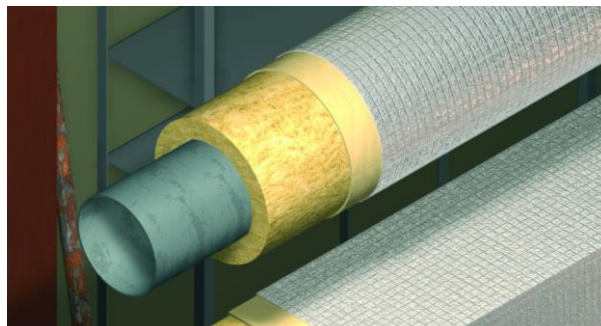


Figure 9  
Cutaway drawing of Rockwool Techwrap

## 5 CONCLUSION

An acoustic building detail survey has taken place at 528 - 532 Hyde Rd, Gorton so that the proposed property is constructed in line with Building Regulations Part E “Resistance to Passage of Sound”.

Informal sound Insulation tests have been conducted at 532 Hyde Road

- The sound insulation of the timber first floor at 532 Hyde Road has passed but only by 4 decibels
- The sound insulation of the double skin brick party wall has also passed but by only 2dB
- Improvements have been suggested for the party walls
- Improvements have been suggested for the party floors.

## 6 REFERENCES

- [1] The Building Regulations Part E  
*Resistance to the Passage of Sound*  
Office of the Deputy Prime Minister, 2003.
- [2] BS EN ISO 140-3:1998  
*Acoustics. Measurement of sound insulation in buildings and of building elements. Part 3: Laboratory measurement of airborne sound insulation of building elements*  
British Standards, 1998.
- [3] BS EN ISO 140-4:1998  
*Acoustics. Measurement of sound insulation in buildings and of building elements. Field measurements of airborne sound insulation between rooms*  
British Standards, 1998.
- [4] BS EN ISO 140-7:1998  
*Acoustics. Measurement of sound insulation in buildings and of building elements. Field measurements of*

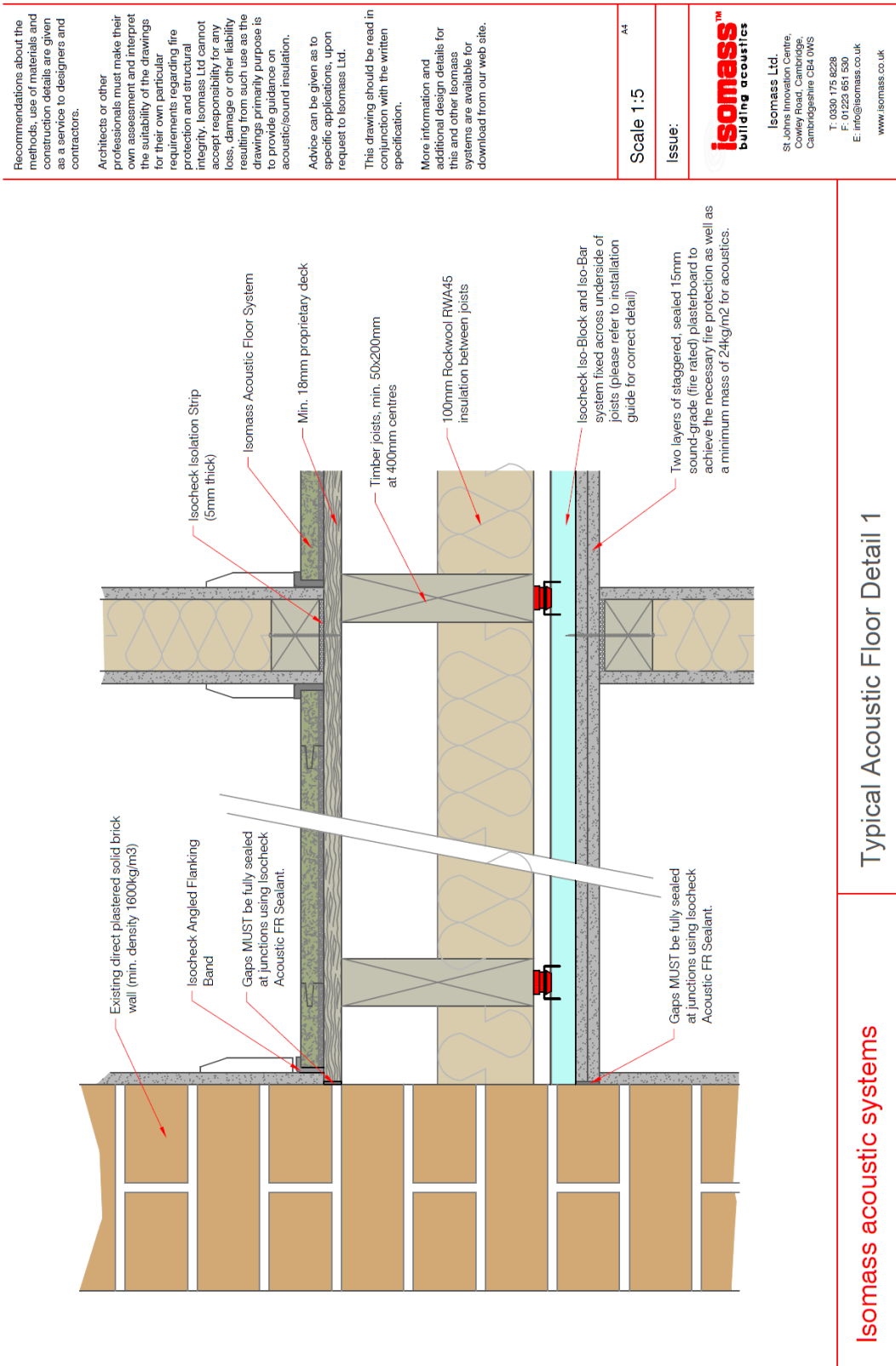
*impact sound insulation of floors*  
British Standards, 1998.

[5] BS EN ISO 717-1:1997  
*Acoustics. Rating of sound insulation in buildings and of building elements. Airborne sound insulation*  
British Standards, 1997.

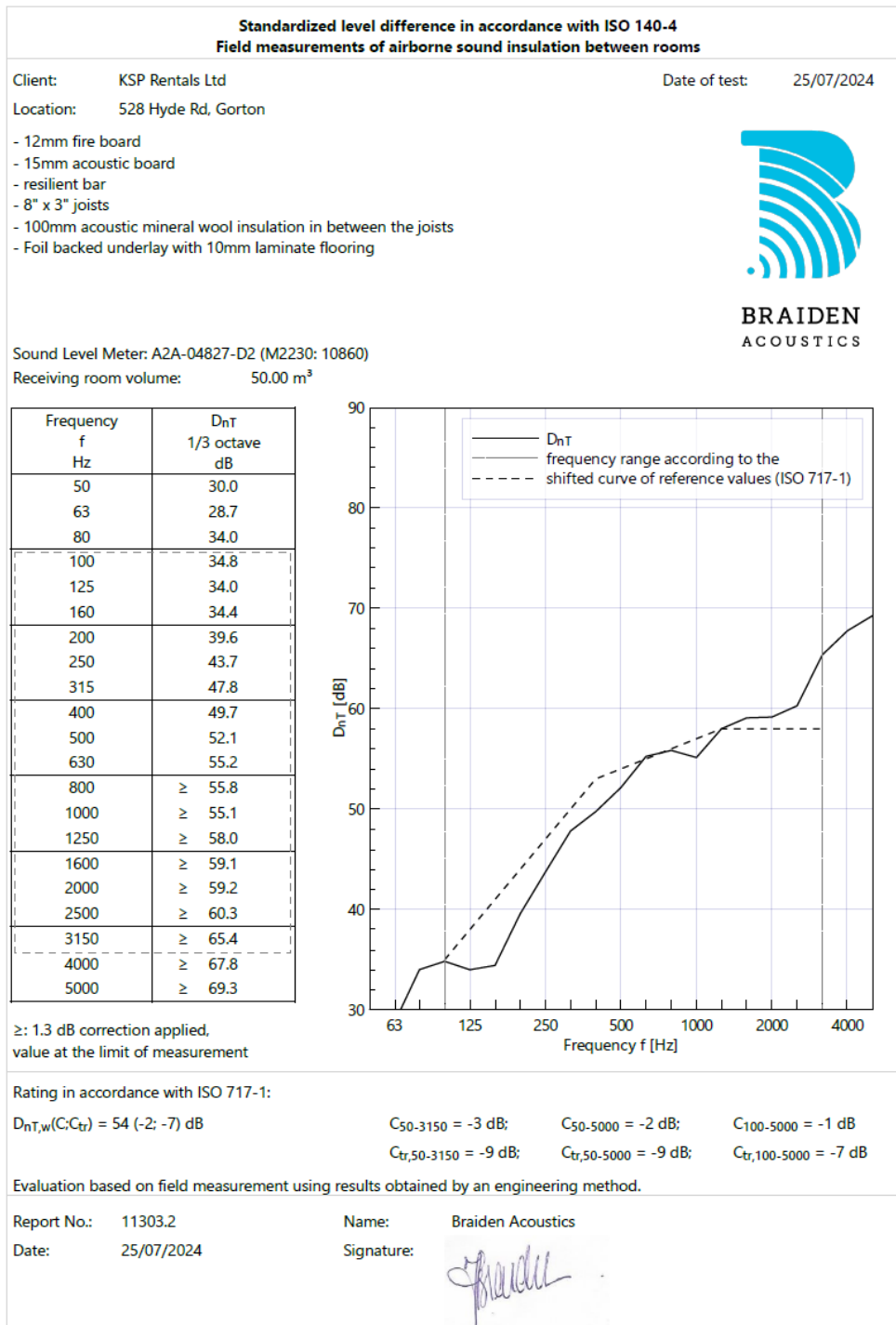
[6] BS EN ISO 717-2:1997  
*Acoustics. Rating of sound insulation in buildings and of building elements. Impact sound insulation*  
British Standards, 1997.

## Appendix

## A1 PROPOSED SEPARATING FLOOR



## A2 SOUND INSULATION TEST – FLOOR



### A3 SOUND INSULATION TEST – WALL

