A Presentation to the IBCI Building Control Conference, 2016

Sound and the Building Regulations

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BUILDING REGULATIONS 2014

From Part E of the Second Schedule to the Building Regulations (1997 to 2014):

"E1 Each wall and floor separating a dwelling from –

(a) another dwelling or dwellings,

(b) other parts of the same building,

(c) adjoining buildings,

shall be designed and constructed in such a way so as to provide reasonable resistance to sound.

E2 The common internal part of a building which provides direct access to a dwelling shall be design and constructed so as to limit reverberation in the common part to a reasonable level."

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Application of Part E

- Amended Part E was published in December 2014.
- “Guidance set out in TGD E *Sound* (2014) applies to works, or buildings in which a material change of use takes place, where the works or the change of use commence or takes place, as the case may be on or after 1 July 2015.”
- Design assessment and testing in accordance with the new Regulations is already under way.

Sound Performance Levels

"In general for dwellings, the performance required by Regulation E1 should be satisfied by achieving the sound insulation performance levels as specified in Table 1..."

NEW GUIDANCE

Table 1	**Sound performance levels** *(Par. 1.1.1)*	
Separating construction	**Airborne sound insulation $D_{nT,w}$ dB**	**Impact sound insulation $L'_{nT,w}$ dB**
Walls	53 (min)	-
Floors (including stairs with a separating function)	53 (min)	58 (max)
NOTE: For works to protected structures, refer to paragraph 1.1.3		

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Acceptable Constructions

- Section 3: Separating walls and associated flanking construction details
- Section 4: Separating floors and associated flanking construction details

Where the relevant walls and floors are designed and constructed using acceptable constructions, and performance is demonstrated through testing, this will indicate *prima facie* compliance with Regulation E1.

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Example

3.4 Wall Type 2 (WT 2) - Solid masonry with dry lining

3.4.1 General

3.4.1.1 The resistance to airborne sound depends mainly on the mass of the core mass (dense block), the absorption of the mineral wool and the isolation (de-coupling) of the dry lining.

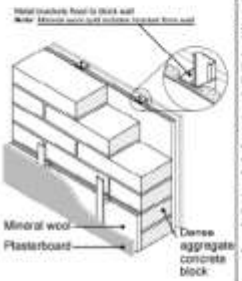
3.4.2 Wall specification

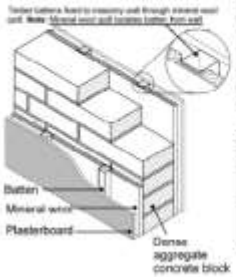
3.4.2.1 Wall Type 2 construction (with different lining options) is described in Diagram 8.

3.4.3 Key junctions and flanking details

3.4.3.1 Details of key junctions in the construction of WT 2 and details to limit flanking transmission are described in Diagrams 9 to 11.

Diagram 8 WT 2 Solid masonry with dry lining – Specification
(Par 3.4.2)





WT 2 - Solid masonry with drylining

Specification
The minimum mass of the wall (including linings) should be 415 kg/m²
Use blocks that are laid full wall width i.e. 215 mm wide blocks laid on flat using single course stretcher bond only (No double coursing)

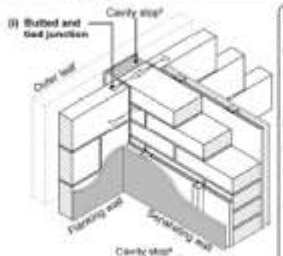
Wall lining options
The block wall faces should be lined with a mineral wool quilt or either:
- 13 mm mineral wool roll with a density of 30 kg/m³ (min), or
- 25 mm mineral wool quilt with a density of 10 kg/m³ (min).

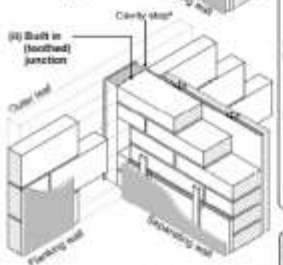
The wall linings should consist of a gypsum based board with a mass per unit area of 10 kg/m² fixed to either:
- 45 mm x 45 mm timber battens spaced at 400 mm centres (max), or
- 45 mm (min) wide metal frame spaced at 400 mm centres (max) and secured to wall by brackets.

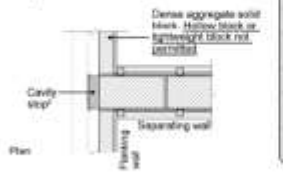
Example
215 mm solid dense block laid on flat (density 1900 kg/m³)
112.5 mm coursing (single course stretcher bond)
25 mm mineral wool quilt (min. density 10 kg/m³) both sides
45 mm x 45 mm timber battens at 400 mm centres both sides (affixed to wall through quilt - such that the quilt is compressed and isolates timber batten from core wall)
1 layer of gypsum based board mass per unit area 10 kg/m² (min) both sides

Key Points to Watch
- **DO NOT** use double coursing.
- The mineral wool must be located over the whole wall face and be sandwiched between the "battens or bracket" and the masonry wall.
- On NO account must the timber batten or metal bracket make direct contact with the masonry wall. Any contact should ONLY be possible via the fixing mechanism for the bracket or batten.

Diagram 9 WT 2 Solid masonry with dry lining – Flanking requirements at an external (flanking) wall
(Par 3.4.3)







Flanking wall requirements
The flanking wall must be 100 mm (min) thick dense aggregate block with a density of 1800 kg/m³ (min).

NOTE: This detail does not support the use of hollow block or light weight block flanking walls

The continuity of the flanking wall must be broken by the separating wall and should be joined to the separating wall using one of the two following methods:

(i) butted and tied and secured with integral wall ties at no more than 300mm vertical centres, or
(ii) built-in (toothed) every second course of the inner leaf.

NOTE: Using method (i) of butted and tied typically improves overall insulation performance by 2 - 3 dB above method (ii) of built-in (toothed).

Linings to the flanking may be gypsum based board, insulated plasterboard or plaster.

Where the external flanking wall is a cavity wall:
a) the outer leaf may be of any construction.
b) the cavity should be stopped with a flexible closer to minimise sound transmission along the cavity unless the cavity is fully filled with mineral wool or expanded polystyrene beads (seek manufacturers advice for other suitable materials).
c) the cavity stop should be protected from moisture transfer across the cavity.

Key Points to Watch
- **DO NOT** use double course, use single coursing only.
- Fill all the joints between the blocks with mortar.
- **ENSURE** there is a good seal between the flanking wall and the separating wall with full depth mortar joints.
- **ENSURE** the separating wall linings are taken up to the brickwork face of the flanking wall.
- **DO NOT** chase the masonry wall for sockets as the drylining void may be used for this purpose.
- Lining to the flanking wall (inner leaf) may be gypsum based board or insulation backed gypsum based board on slabs.

NOTES:
1. Thermal insulation omitted for clarity.
2. Cavity stops are specified for the purposes of minimising flanking sound transmission along the cavity. A cavity stop may also be required to act as a cavity barrier for the purposes of compliance with Part B - Fire Safety, see TGD B.

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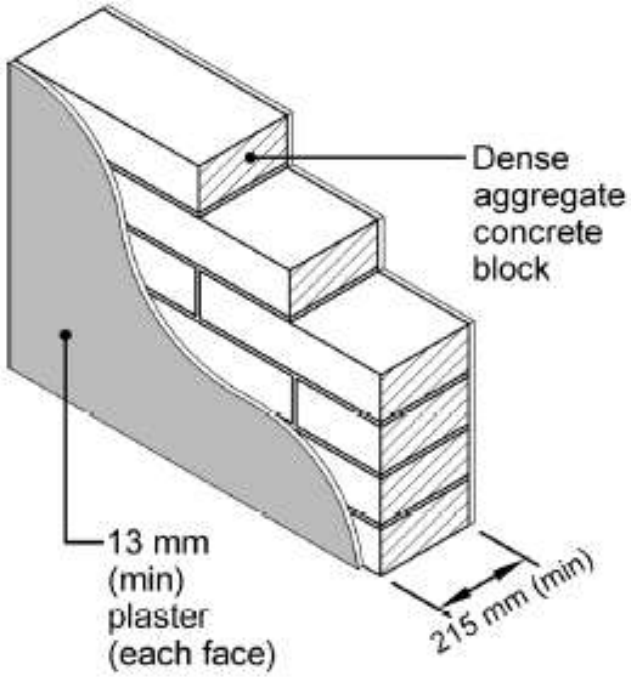
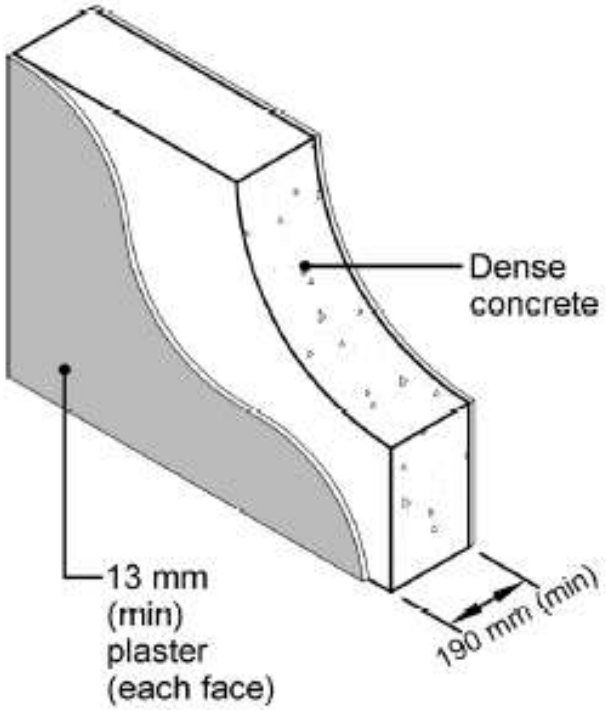
Wall Type 1 - Solid masonry/ concrete with plaster finish





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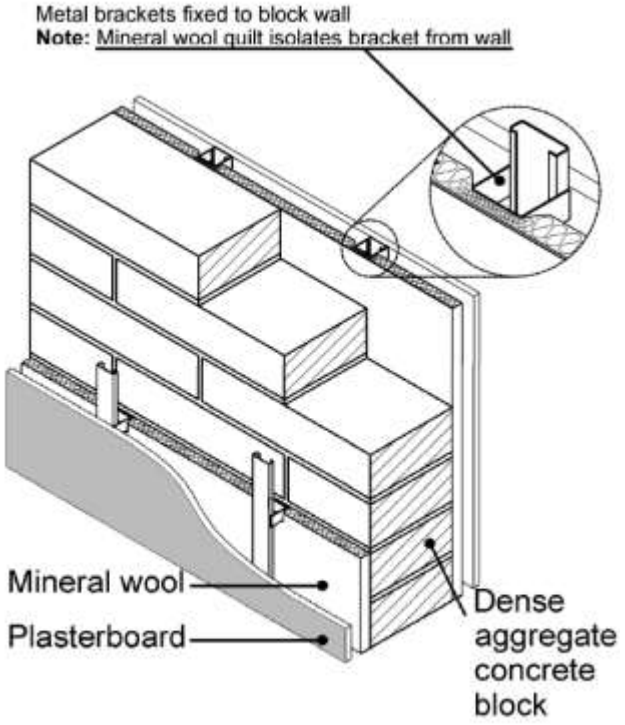
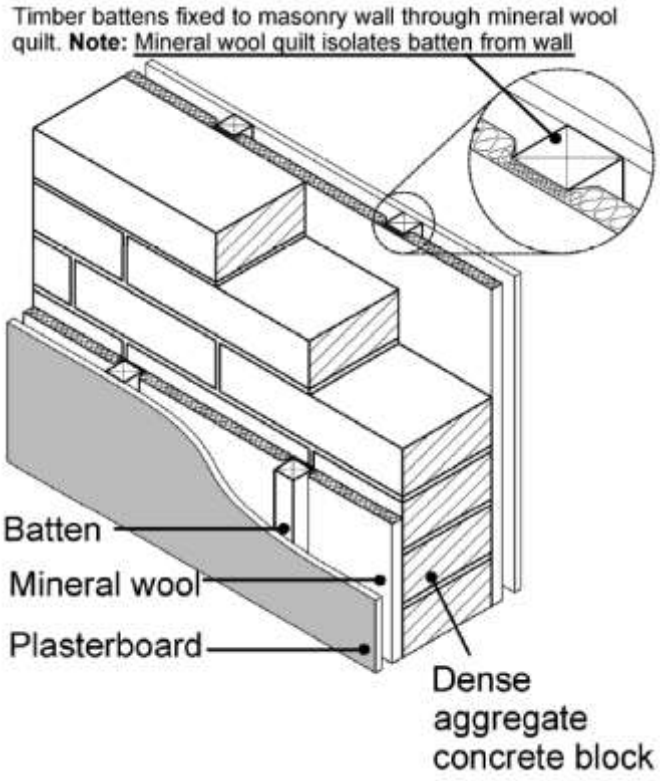
Wall Type 2 - Solid masonry with dry lining





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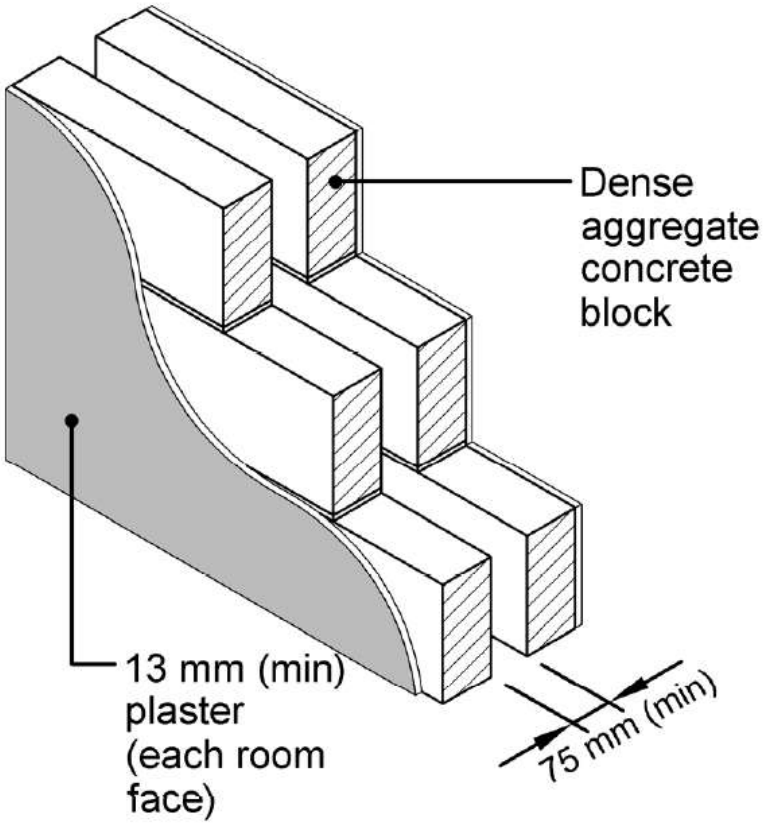
Wall Type 3 - Cavity masonry wall with plaster finish



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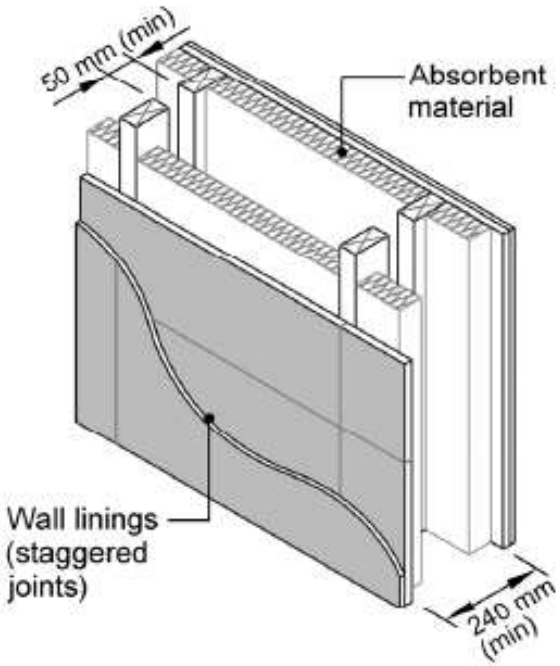
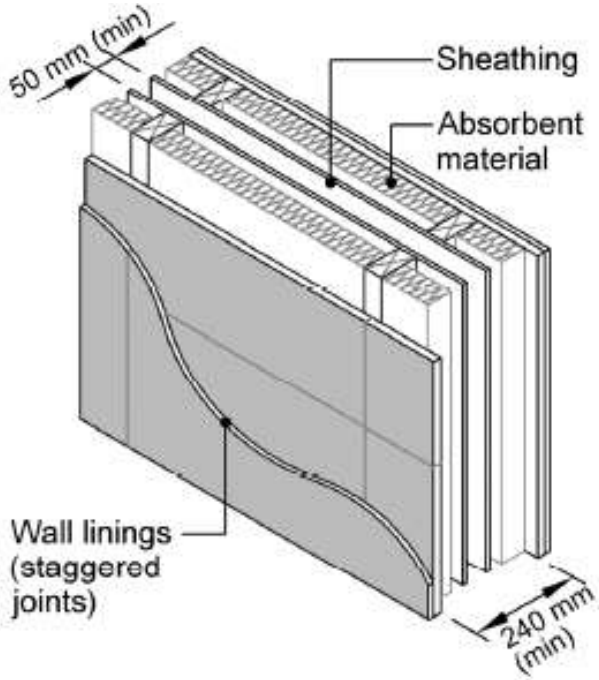
Wall Type 4 - Timber framed wall with absorbent material





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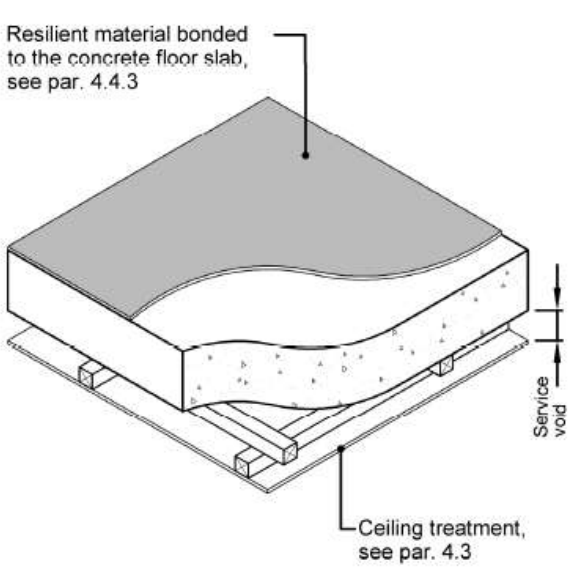
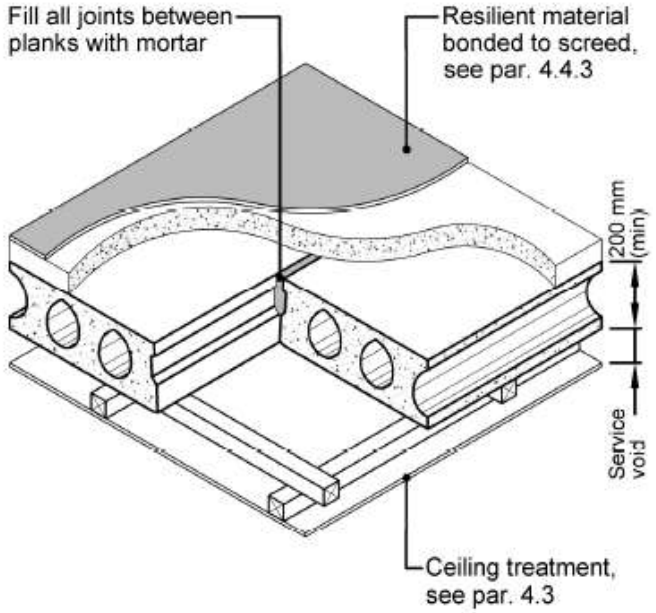
Floor Type 1 - Resilient material bonded to concrete

- Includes a suspended ceiling below the concrete base.





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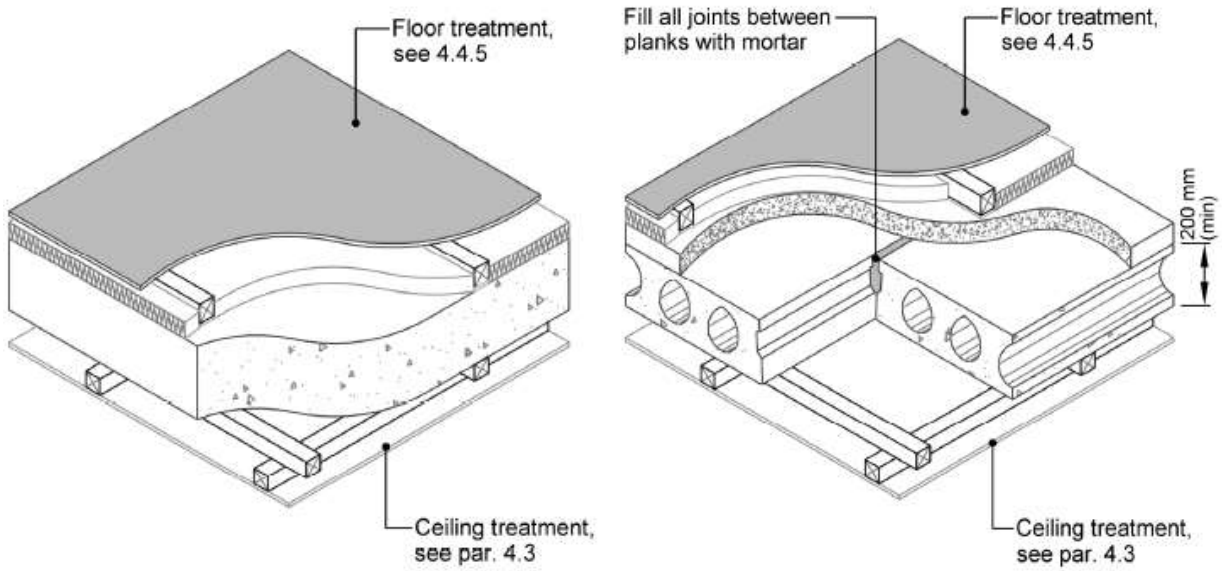
Floor Type 2 - Floating layer on concrete base

- Includes a suspended ceiling below the concrete base.



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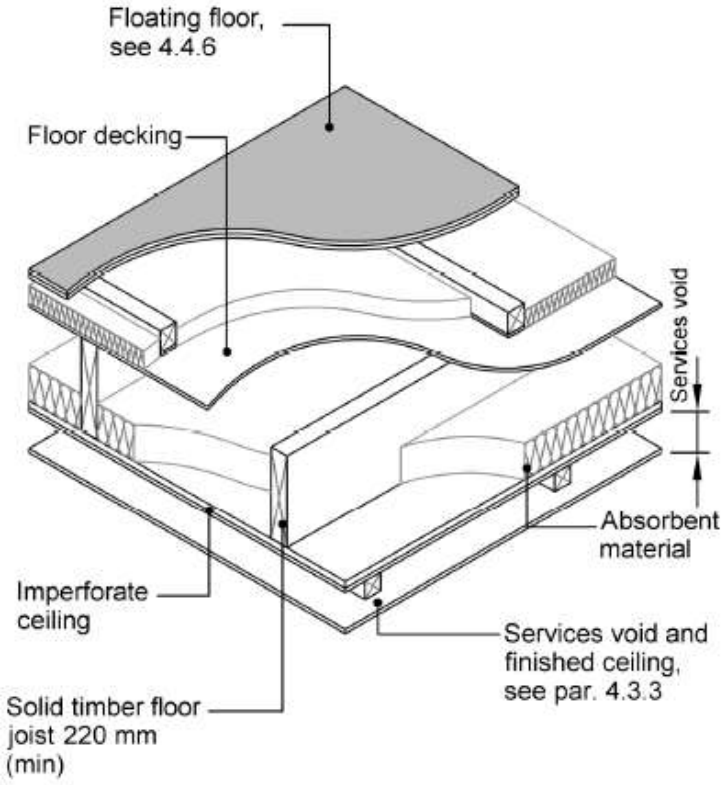
Floor Type 3 - Floating layer on timber base

- Includes a suspended ceiling below the timber base.



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Testing

- Mandatory pre-completion testing by a competent person.
- Tests to be performed on a representative sample of dwellings, total number dictated by the total number of units and the construction type.
- “Other” construction types require more tests, unless they are Assessed Sound Details.

NEW GUIDANCE

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“Sets of Tests”

- Each “set of tests” comprises a given number airborne and, in the case of floors, impact tests.

Table 2 Number of individual tests in a 'set of tests' (Par. 2.1.5.1)

Type of test	Dwelling Group Types	
	Dwelling houses (including bungalows)	Apartments and duplex dwellings[5]
Airborne test of separating walls[1]	Yes	Yes
Airborne test of separating walls[2]	Yes	Yes
Airborne test of separating floors[3]	N/A	Yes
Airborne test of separating floors[4]	N/A	Yes
Impact test of separating floors[3]	N/A	Yes
Impact test of separating floors[4]	N/A	Yes
Total No. of individual tests in a 'set of tests'[6]	2 No.	6 No.

- In houses, bungalows: 2 no. airborne tests on walls.
- In apartments, duplexes: 2 no. airborne tests on walls, 2 no. airborne tests on floors, 2 no. impact tests on floors.

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Frequency of Testing

TGD Constructions

Table 3A Minimum frequency of testing per group or sub-group type *(Par. 2.2.3)*	
Number of attached dwellings	**'Sets of tests' required**
4 or less	At least 1
Greater than 4 but less than or equal to 20	At least 2
Greater than 20 but less than or equal to 40	At least 2 + 10% x No. of attached dwellings greater than 20
Greater than 40 but less than or equal to 100	At least 4 + 5% x No. of attached dwellings greater than 40
More than 100	At least 7 + 5% x No. of attached dwellings greater than 100

Other Constructions

Table 3B Other constructions - minimum frequency of testing per group or sub-group type *(Par. 2.4.1.3)*	
Number of attached dwellings	**'Sets of tests' required**
Up to 8	At least 1 for each sep. element (up to 4)
Greater than 8 but less than or equal to 20	At least 6
Greater than 20 but less than or equal to 40	At least 6 + 10% x No. of attached dwellings greater than 20
Greater than 40 but less than or equal to 100	At least 8 + 5% x No. of attached dwellings greater than 40
More than 100	At least 11 + 5% x No. of attached dwellings greater than 100

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Assessed Sound Details (ASD's)

- An assessment/certification process for constructions not listed in TGD E.
- Calls for 30 no. individual *in-situ* tests, maximum 16 no. per site, conducted by at least two different test bodies.
- Competency of tester stressed again.
- Report to be assessed by an independent approved body, e.g. NSAI.
- Advantage: reduced testing frequency per Table 3A.

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Procedure for Testing and Reporting

- "*Sound insulation testing should be conducted by a competent person…*"
- Testing to be conducted in accordance with I.S. EN ISO 16283-1, 3382-2 & 140-7, and rated per the I.S. EN ISO 717 series.
- Restrict tests to living rooms and bedrooms, where possible (use kitchens and dining room only where necessary).
- Rooms should have a volume of at least 25m^3.

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Procedure for Testing and Reporting (cont.)

- Test in completed but unfurnished rooms.
- Doors and windows should be closed.
- Fitted units, cupboards etc. should be open and empty.
- Place the sound source in the larger room in a pair.
- Up to two individual tests may be conducted on any given separating wall or floor.

Testing - Demonstration

Sound insulation tests are performed between adjacent rooms in order to establish the sound insulation performance of the separating construction.

There are three key components to each test:

- Generation and measurement of source level;
- Measurement of receiver level; and
- Reverberation time measurement.

Testing - Instrumentation

The following are required:

- Sound level meter & calibrator;
- Sound source;
- Amplifier;
- Transmitter; and
- Tapping machine (impact tests only).

Testing - Airborne

Outline test procedure:

1. Place the sound source in the larger room;
2. Measure the source noise level;
3. Measure the receiver noise level;
4. Measure the background noise level in the room;
5. Move the sound source and repeat steps 2/3/4; and
6. Measure the reverberation time in the receiving room.

Testing - Impact

Outline test procedure:

1. Place the tapping machine on the floor to be tested;
2. Measure the receiver noise level;
3. Repeat steps 1/2 three times;
4. Measure the background noise level in the room; and
5. Measure the reverberation time in the receiving room.

SOUND INSULATION TEST COVER SHEET

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CLIENT: _____

PROJECT: _____

CONTRACT NO: _____

SITRI SITE REF: _____

SITE ADDRESS: _____

_____

DATE: _____ **TIME:** _____

ENGINEER(S): _____

TEST TYPES: Airborne (Wall) ☐ Airborne (Floor) ☐ Impact ☐

SI KIT: Kit A ☐ Kit B ☐ KIT C ☐

CHANGES TO STANDARD KIT: _____

_____

CALIBRATOR:

Type	S/N	In Calibration?
		Yes ☐ No ☐

FIELD CALIBRATION:

	Before	After
Date		
Time		
Drift		
Accepted?	Yes ☐ No ☐	

DATA FILE PATH: _____

CHECK LISTS:

Airborne Tests

SLM ☐ Amplifier ☐ Cables ☐ Transmitter ☐
Speaker ☐ Tripod ☐ Calibrator ☐

Impact Tests

SLM ☐ Tapping Machine ☐ Power Source ☐
Calibration Pegs ☐ Hardwood Base ☐

Other Items

Extension Cable ☐ Safety Signs ☐ Spare Batteries ☐
PPE ☐ Site Drawings ☐ Transformer ☐
Measuring Tape/Laser ☐ Standards ☐

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SOUND INSULATION TEST PROCEDURE NOTES

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Airborne Sound Insulation Measurements

Sound Source

- Erect warning signs.
- Check all drivers operational.
- Place in larger room.
- Minimum of two sound source positions.
- If rooms staggered and source room >50m², both positions should be in the part of the source room closest to the common partition.
- Each position should be:
  - At least 1.4m apart on separate room planes at least 0.7m apart;
  - At least 1m from the partition under test; and
  - At least 0.5m from any other room boundary.
- No more than 6dB decay from 1m in front of sound source to 0.5m in front of common partition, otherwise move source closer.
- The measured L_1 spectrum should satisfy the "8dB rule" or take corrective action.

Measurements (Source & Receiver)

- 5 mic positions with 6s measurement at each per source location (both L_1 & L_2).
- If the room >50m², increase to 10 mic positions with 6s measurement at each.
- Each position should be:
  - At least 0.7m apart on different room planes;
  - At least 0.5m from any room boundary; and
  - At least 1m from the sound source.
- In receiving room, exclude those parts where the sound pressure level is 6dB or more below the level in the part of the room closest to the common partition.

Background

- 5 mic positions with 6s measurement at each after each L_2 measurement.
- Background noise levels should be at least 6dB (preferably more than 10dB) below the measured level in each band.

Impact Sound Insulation Measurements

- Tapping machine: check drop height and level on flat surface.
- If carpeted floors, remove carpet if possible.
- If required place hardboard on carpet and test (note this procedure if performed).
- If floor finishes are different, divide tests into subgroups.
- Minimum of 4 tapping machine positions, each at 45° to supports.
- 2 mic positions with 6s measurement at each per tapping machine position.
- 0.7m between measurement positions and at least 0.5m from room boundaries.
- Measure background as above after all receiver measurements complete.

Reverberation Time Measurements

- Minimum of 2 loudspeaker locations in room corners, at least 2m apart.
- 3 measurement positions per loudspeaker location with 1 decay at each position (i.e. 6 decays in total).
- Measurement positions at least 2m apart and at least 1m from any room boundary.

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SOUND INSULATION TEST RECORD SHEET

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CONTRACT NO: _____

SITRI SITE REF: _____

PAGE: _____ of _____

MEASUREMENT PROCEDURE:
I.S. EN ISO 16283 – 1 2014 ☐ I.S. EN ISO 140 – 7 1998 ☐
I.S. EN ISO 3382 – 2 2008 ☐ Other (details below) ☐

SOURCE ROOM:	Name:			
	Length (m):		Height (m):	
	Width (m):		Volume (m^3):	
RECEIVER ROOM:	Name:			
	Length (m):		Height (m):	
	Width (m):		Volume (m^3):	
AIRBORNE (WALL):	File Name:		Result:	
	L_1 Source Spectrum Check ("8dB Rule")?			Yes ☐ No ☐
	L_2 Background Level 10dB Below?			Yes ☐ No ☐
	No. of L_1	No. of L_2	No. of B_2	No. of T_2
AIRBORNE (FLOOR):	File Name:		Result:	
	L_1 Source Spectrum Check ("8dB Rule")?			Yes ☐ No ☐
	L_2 Background Level 10dB Below?			Yes ☐ No ☐
	No. of L_1	No. of L_2	No. of B_2	No. of T_2
IMPACT (FLOOR):	File Name:		Result:	
	L_2 Background Level 10dB Below?			Yes ☐ No ☐
	No. of L_2		No. of B_2	No. of T_2

NOTES:

CALIBRATION CHECK: Time: Drift: **(discard if >0.5dB)**

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CONTRACT NO: _____

SITRI SITE REF: _____

DESCRIPTION OF SEPARATING WALL: _____

DESCRIPTION OF SEPARATING FLOOR: _____

NOTES: _____

SKETCH: _____

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Testing - Analysis

- May be performed by the sound level meter itself (can be unreliable).
- Can undertake post-measurement analysis on a pc using proprietary software.
- Alternatively, use bespoke spreadsheets (probably the most robust approach).

Enter the raw 1/3 octave band data for ONE AIRBORNE TEST in the shaded cells below

Tester:
Signature:
Client:
Description:

Construction:
Task/Test No.:
Source Room: Volume
Receiving Room:
Common Area of Separating Element:

Test Date:
Report Date:

Chart Y Axis auto minimum: #N/A
Manual override

Auto Axis

FOR EASY INSERTION INTO WORD DOCUMENTS, REMEMBER TO SELECT THE "DnT Report" SHEET BEFORE SAVING

		50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 k	1.25 k	1.6 k	2.0 k	2.5 k	3.15 k	4.0 k	5.0 k
Source room 1 (1st source position)	S1																					
	S2																					
	S3																					
	S4																					
	S5																					
	S6																					
	S7																					
	S8																					
	S9																					
	S10																					
	S11																					
	S12																					
Source Room 2 (2nd source position)	2S1																					
	2S2																					
	2S3																					
	2S4																					
	2S5																					
	2S6																					
	2S7																					
	2S8																					
	2S9																					
	2S10																					
	2S11																					
	2S12																					
Receiving room 1 (1st source position)	R1																					
	R2																					
	R3																					
	R4																					
	R5																					
	R6																					
	R7																					
	R8																					
	R9																					
	R10																					
	R11																					
	R12																					
Receiving room 2 (2nd source position)	2R1																					
	2R2																					
	2R3																					
	2R4																					
	2R5																					
	2R6																					
	2R7																					
	2R8																					
	2R9																					
	2R10																					
	2R11																					
	2R12																					
Background 1	B1																					
	B2																					
	B3																					
	B4																					
	B5																					
	B6																					
	B7																					
	B8																					
	B9																					
	B10																					
	B11																					
	B12																					
Background 2 (Optional: only if you have recorded separate background data corresponding to each source position)	2B1																					
	2B2																					
	2B3																					
	2B4																					
	2B5																					
	2B6																					
	2B7																					
	2B8																					
	2B9																					
	2B10																					
	2B11																					
	2B12																					
Reverberation	T1																					
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	T17																					
	T18																					
D_{nT}		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
$D_{nT,w}$		#N/A																				
C_{tr}		#N/A																				

Standardized level difference according to I.S. EN ISO 16283-1*

Field measurements of airborne sound insulation between rooms in accordance with TGD E in Ireland

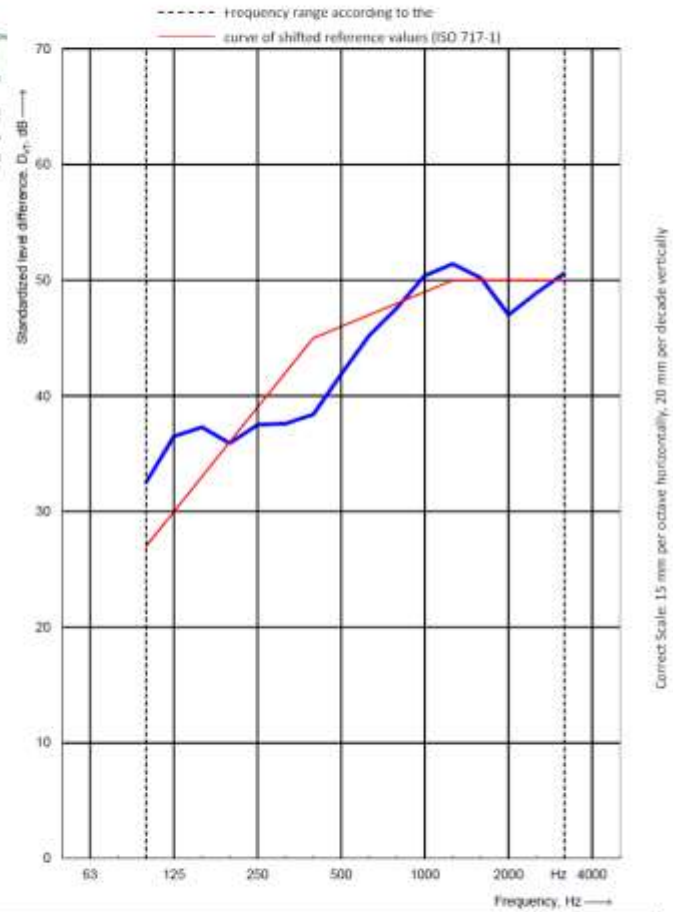
Client: SITRI
Source Room: Large Office
Receive Room: Small Office
Description: Party wall between offices at AWN

Date of test: 25/11/2015

Construction: 215mm masonry laid on flat

Source Room Volume: 172 m^3
Receive Room Volume: 69 m^3
Common Area: 16 m^2

Frequency [Hz]	D_{nT} 1/3 octave [dB]
50	
63	
80	
100	32.5
125	36.5
160	37.3
200	35.9
250	37.5
315	37.6
400	38.4
500	41.9
630	45.2
800	47.6
1000	50.4
1250	51.4
1600	50.2
2000	47.0
2500	48.9
3150	50.6
4000	
5000	



Rating according to ISO 717-1

$D_{nT,w}(C_{tr})$ = 46 (-3) dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method.

* Evaluation does not include the Low Frequency Measurement Procedure of I.S. EN ISO 16283-1

Tester: Chris Dilworth

No. of Test Report: xxx/1

Date: 04/02/2016

Signature:

In the Event of a Failure

- A set of tests has deemed to have failed if any individual value does not reach the stipulated levels of sound insulation performance.
- Action required:
  - Remediate the failed constructions until the performance is satisfactory;
  - Apply the same measures to (or test) other constructions completed prior to the failure, and;
  - Increase the frequency of testing.

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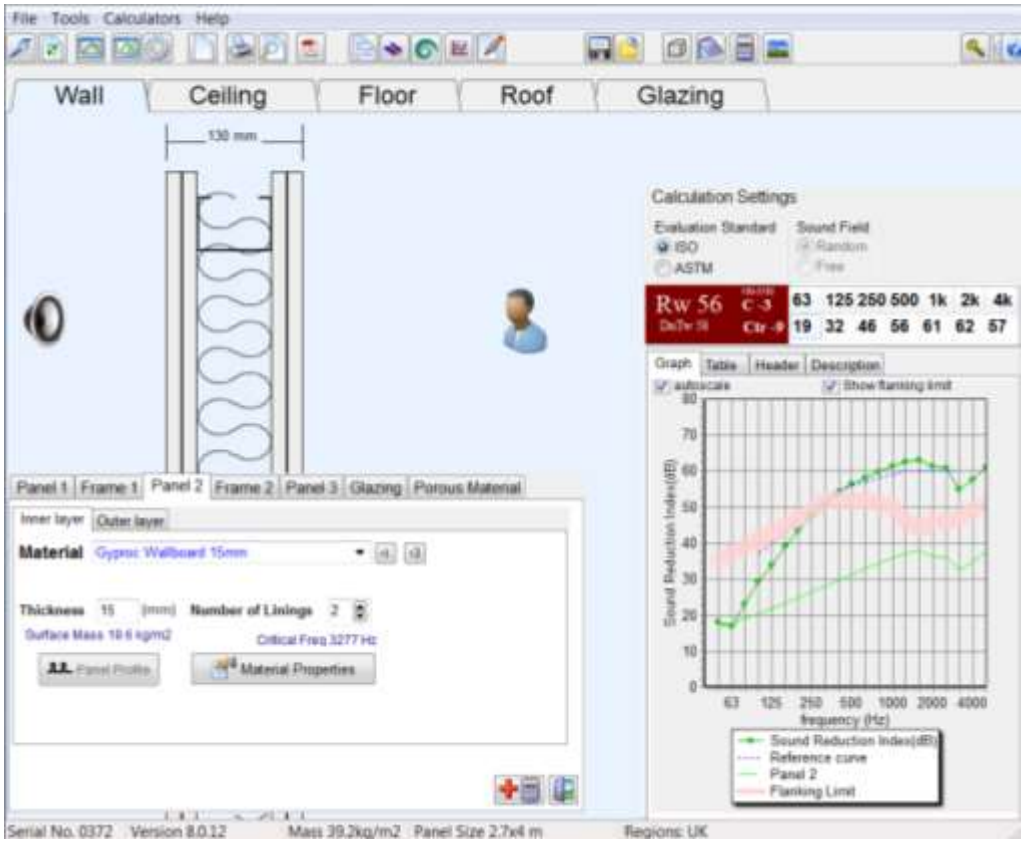
How can we ensure good sound insulation?

- Base the design on construction types that have been shown to work well. Alternatively, conduct a robust theoretical assessment of the proposed base construction.

Prediction of Sound Insulation using Insul



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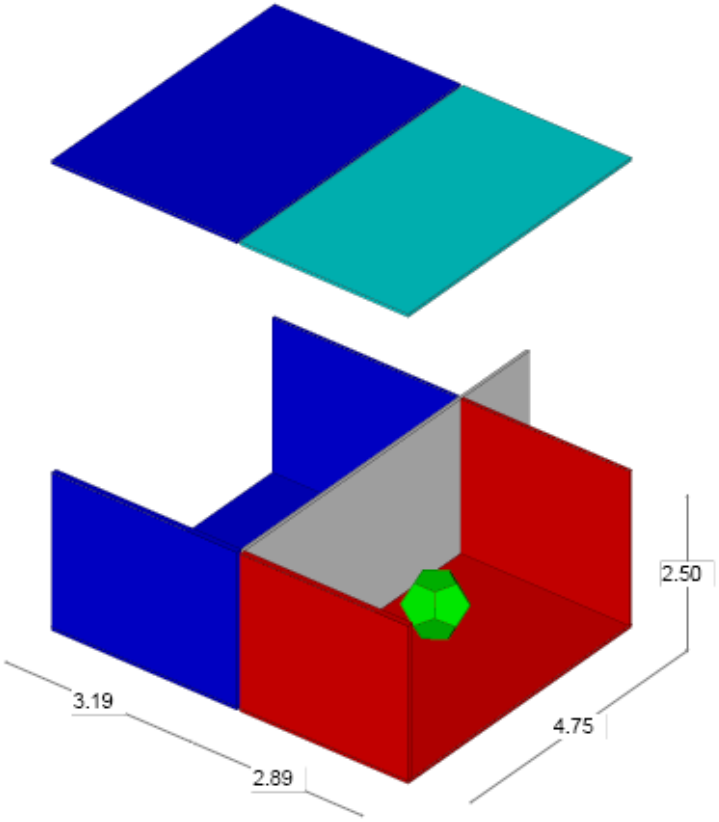
Prediction of Sound Insulation using Bastian



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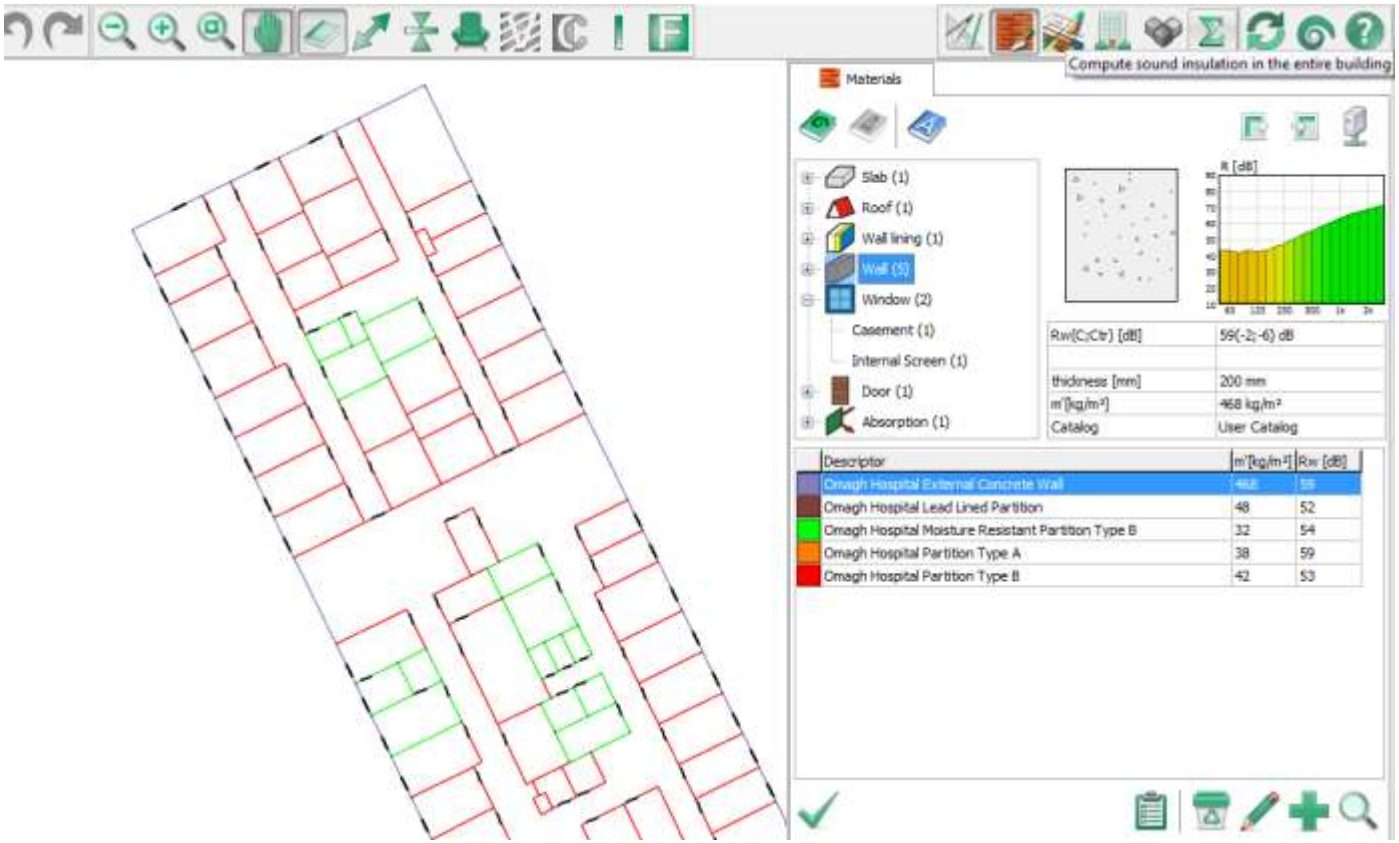
Prediction of Sound Insulation with SONarchitect



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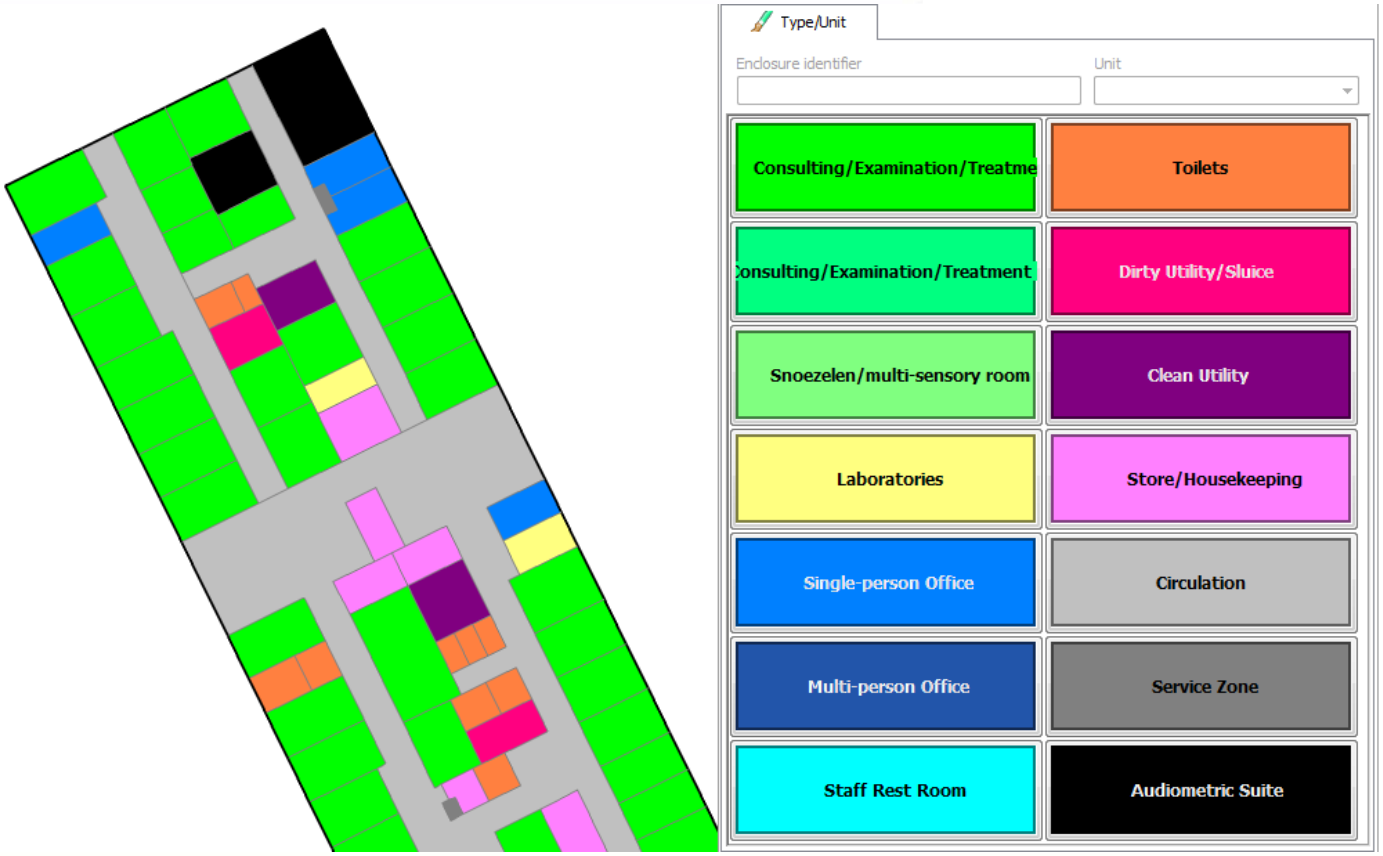
Prediction of Sound Insulation with SONarchitect



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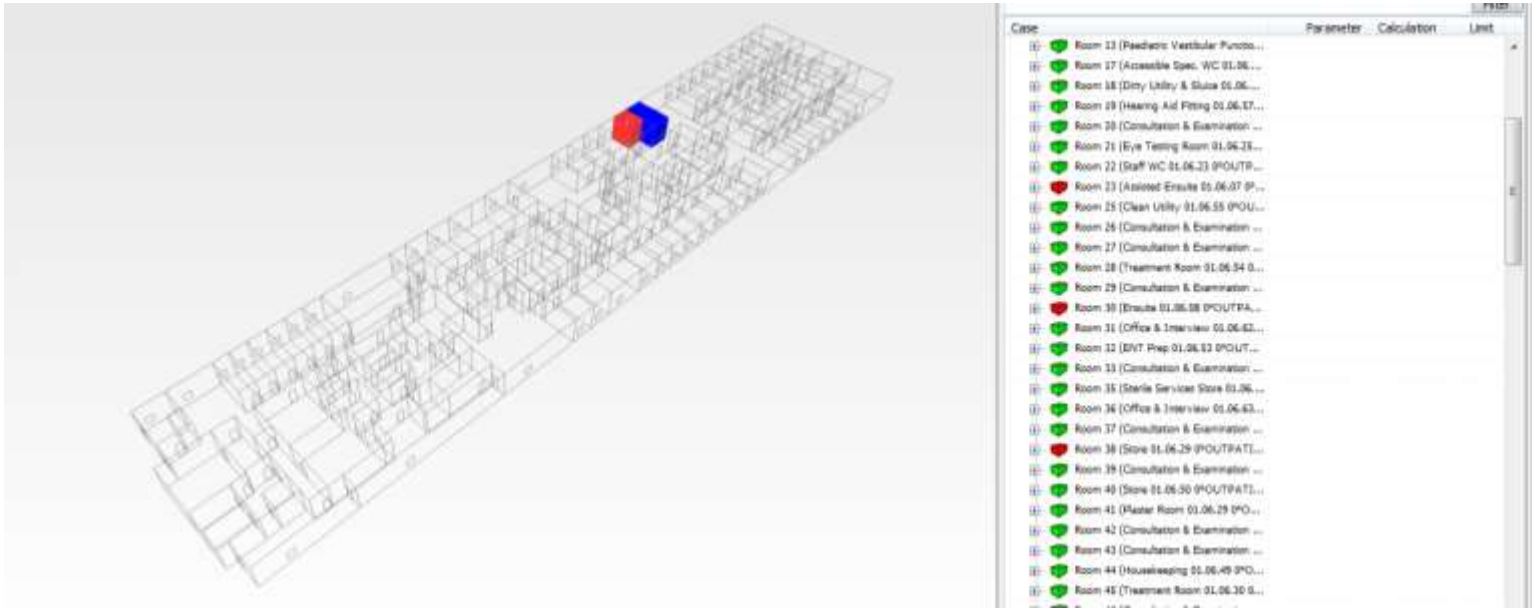
Prediction of Sound Insulation with SONarchitect



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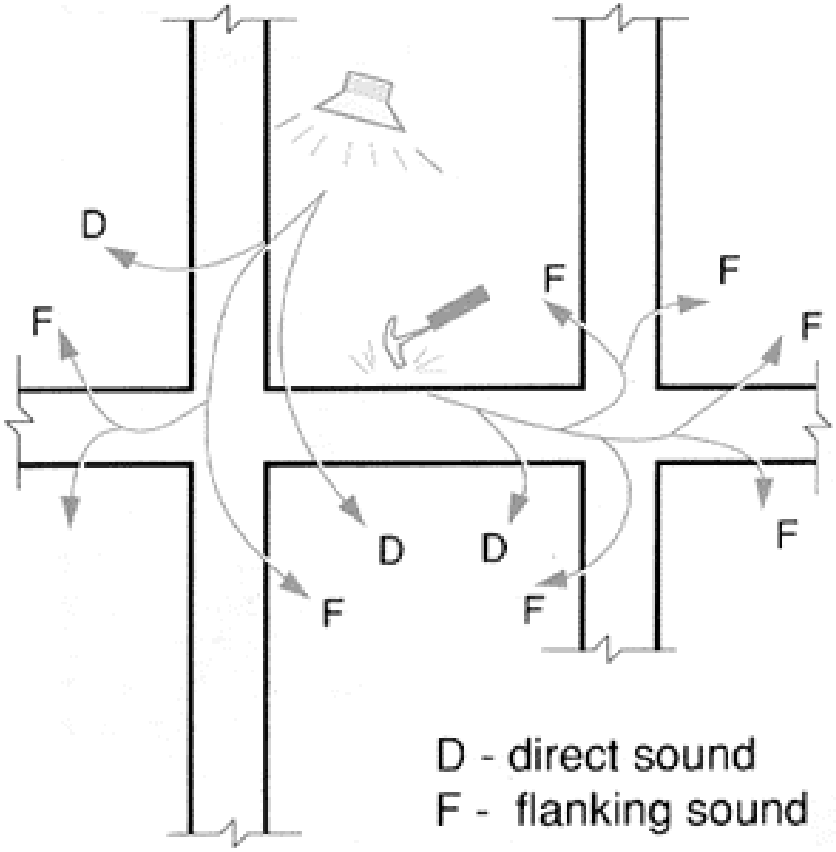
How can we ensure good sound insulation?

- Base the design on construction types that have been shown to work well. Alternatively, conduct a robust theoretical assessment of the proposed base construction.
- Detail junctions carefully.
- Consider the potential for noise transfer via flanking paths.

Flanking Noise Transfer



Source: National Research Council Canada

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How can we ensure good sound insulation?

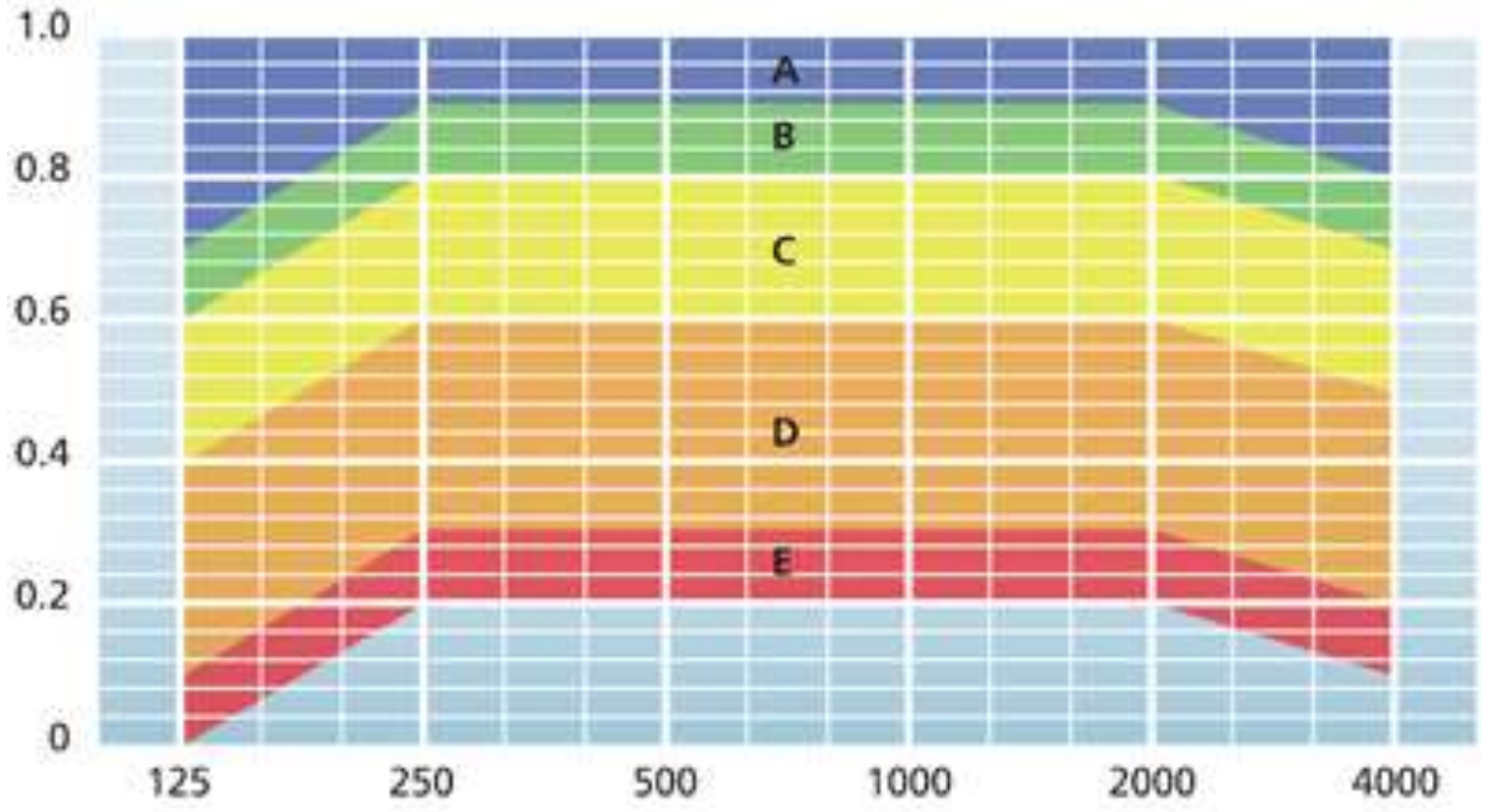
- Base the design on construction types that have been shown to work well. Alternatively, conduct a robust theoretical assessment of the proposed base construction.
- Detail junctions carefully.
- Consider the potential for noise transfer via flanking paths.
- Inspect during construction.
- Conduct pre-completion testing.
- If necessary, make recourse to a variety of remedial noise control measures.

Reverberation Control

- Method A: Apply an absorber of a specified class to an area that is a function of the area of the floor (in entrance halls, corridors or hallways) or the combined area of stair treads, landings and top floor ceiling (in stairwells or stair enclosures).
- Method B: Apply an absorber of the required Class to an area derived by calculation (only in entrance halls, corridors or hallways).

NEW GUIDANCE

Class of Absorption



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Method A

- Entrance halls, corridors or hallways: Apply an acoustically absorbent material to an area equal to or greater than the floor area. The material should be a Class C absorber or better, per I.S. EN ISO 11654:1997.
- Stairwells or a stair enclosure: Calculate the combined area of stair treads, landings and top floor ceiling area – cover an equivalent area with a Class D absorber or 50% of this area with a class C absorber or better.

Method B

- Takes into account the absorptive qualities of the basic schedule of finishes.
- Additional absorption is added as necessary.
- The requirement is based on the volume and usage of the space.
- Involves a relatively straightforward but potentially lengthy calculation.
- Advantage: typically results in a requirement for less absorption than Method A.

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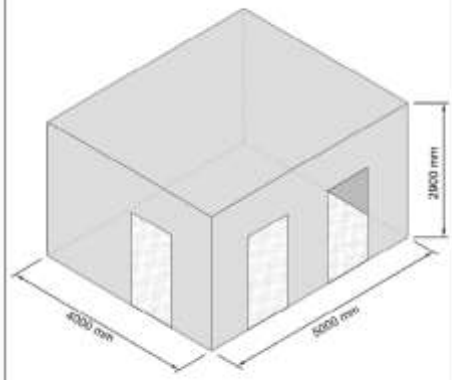
Method B Example

Diagram C.1 Worked example
(Par. C.5.1)



Criteria:

(a) Concrete floor covered with carpet;

(b) Painted concrete block walls;

(c) 3 No. timber doors (1.0 m x 2.4 m).

NOTE: All dimensions are internal dimensions.

Method B results in the use of a Class D absorber instead of Class C per Method A

Table C.2 Example calculation using Method B
(Par. C.5.2)

Step 1: Calculate the surface area related to each absorptive material (i.e. for the floor, walls, doors & ceiling).

Surface	Surface finish	Area (m^2)
Floor	Carpet covered	20
Doors	Timber	7.2
Walls (excluding door area)	Painted concrete block	45
Ceiling	*To be determined from the calculation*	20

Step 2 - Obtain the absorption coefficient for the carpet, painted concrete block walls and the timber doors. In this case the values are taken from Table C.1.

Surface	Area (m^2)	Absorption coefficient (α) in octave frequency bands				
		250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Floor	20	0.03	0.06	0.15	0.30	0.40
Doors	7.2	0.10	0.08	0.08	0.08	0.08
Walls	45	0.05	0.06	0.07	0.09	0.08
Ceiling	20	To be determined from this calculation				

Step 3 - Calculate the absorption area (m^2) related to each absorptive surface (i.e. for the floor, walls and doors) in octave frequency bands.
(Absorption area = surface area x absorption coefficient).

Surface	Area (m^2)	Absorption area (m^2)				
		250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Floor	20	0.6 *(20x0.03)*	1.2	3.0	6.0	8.0
Doors	7.2	0.72 *(7.2x0.10)*	0.58	0.58	0.58	0.58
Walls	45	2.25 *(45x0.05)*	2.7	3.15	4.05	3.60

Step 4 - Calculate the sum of the absorption area (m^2) obtained in Step 3.

	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Existing absorption area (m^2)	3.57 *(0.6+0.72+2.25)*	4.48	6.73	10.63	12.18

Step 5 - Calculate the total absorption area (A_T) required for the entrance hall.
(See C.3.1: Provide a minimum of 0.2 m^2 absorption area per cubic metre of the volume).
Therefore $A_T = 0.2 \times 5 \times 4 \times 2.9 = 11.60$ m^2 of absorption area required.

Step 6 - Calculate the total absorption area (A) to be provided by ceiling (m^2). If any values of minimum absorption area are negative e.g. 4000 Hz, then, there is sufficient absorption from the existing surfaces to meet the requirement without any additional absorption in this octave band.
(Additional absorption = A_T – existing absorption area (from Step 5)).
N.B. negative values indicate that no additional absorption is necessary.

	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Additional absorption area (m^2)	8.03 *(11.6 - 3.57)*	7.12	4.87	0.97	-0.58

Step 7 - Calculate the required absorption coefficient α to be provided by ceiling. (Required absorption coefficient α = Additional absorption area/ area of ceiling).

	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Required absorption coefficient α	0.40 *(8.03 ÷ 20)*	0.36	0.24	0.05	Any Value

Step 8 - Identify a ceiling product from the manufacturer's laboratory measurement data that provides absorption coefficients that exceed the values in Step 7.

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The Need for a Certification Scheme

- Given the increased importance of sound insulation testing under the new Regulations, DECLG considered that a certification scheme should form part of the improved regime.
- This is referenced in TGD E: “Sound insulation tests carried out by a person certified by an independent third party to carry out this work offers a way of ensuring that such certification can be relied upon.”
- DECLG encouraged the industry to explore options that would support the availability of competent testers to meet the new regime requirements.
- This led to the current proposals for SITRI – the Sound Insulation Testing Register (Ireland).

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- A Certification Scheme developed by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA).
- A “not for profit” professional body in the form of a Company Limited by Guarantee, wholly owned by the ANC.
- Modelled on the existing ANC Certification Schemes operated in the UK.

- The Institute of Acoustics is the UK's professional body for those working in acoustics, noise and vibration. Formed in 1974, it has some 3000 members and an active Irish Branch.
- The Association of Noise Consultants is a trade association for acoustics, noise and vibration consultancy practices. The membership includes more than 115 companies representing nearly eight hundred consultants. The ANC operates a Registration Scheme for member companies undertaking sound insulation testing in the UK.

OFFICIAL SITRI LAUNCH
Minister Paudie Coffey, 27 January 2016

OVERVIEW

The aims of the Sound Insulation Testing Register (Ireland) are to:

- Ensure an adequate supply of suitably qualified and experienced sound insulation testers in order to meet the requirements of Technical Guidance Document E Sound;
- Maintain a database of competent testers in order that industry professionals (such as Assigned Certifiers and Building Control) can commission sound insulation tests with confidence; and
- Maintain a database of results from sound insulation tests conducted by its members.

THE APPLICATION PROCESS

- Stage 1 – Expression of Interest
- Stage 2 – Submit Application (with confirmation of proposed Route to Registration)
- Stage 3 – Evaluation (Training, Review of Experience or Existing Accreditation from another jurisdiction)
- Stage 4 – Registration Audit
- Stage 5 – Enrolment on the Sound Insulation Testing Register (Ireland)

SOUND INSULATION TESTING REGISTER (IRELAND)

On successful completion of the Registration Audit, the applicant will be deemed fully competent to carry out sound insulation testing as a Registered Tester on the SITRI Scheme and will be listed on the Scheme Register.

The Register is maintained on the Scheme website and will list all those persons deemed competent as Registered Testers for the purposes of sound insulation testing per TGD E.

It will be searchable by tester details, company name and location.

ONGOING SCHEME ACTIVITY

Members of the Scheme will be required to:

- Conduct sound insulation tests in accordance with the Scheme handbook and all applicable standards;
- Upload all sound insulation test results to the Scheme database, accessible via the website;
- Undergo an annual audit; and
- Undergo a witnessed test every three years.

VISIT
Verifying Irish Sound Insulation Tests

The Scheme will maintain a database of results for all sound insulation tests conducted by members of the Register.

This will be accessible from the website using a unique identifier and password for each tester.

Building Control, Assigned Certifiers, Clients, Architects, etc. will be able to access the results for specific developments using a site identifier and password.

It will be possible to download summary reports with a complete listing of results from each site.

SITRI SOUND INSULATION TESTING REGISTER (IRELAND)

CERTIFICATION OF PRE-COMPLETION SOUND INSULATION TESTING

ISIT verifying Irish sound insulation tests

DATE TASK ACCESSED
19 February 2016

Task number	11	**Password**	[redacted]	**Registered organisation number**	115
Task registration date	04/02/2016			**Registered organisation name**	AWN Consulting
Client	[redacted]			**Registered organisation address**	The Tecpro Building, IDA Business and Technology Park, Dublin, D17 NX50
Site address	[redacted]			**Registered organisation e-mail**	stephen.smyth@awnconsulting.com

Test ID	Test Date	Source Room	Receiving Room	Project Type	Wall / Floor	Type	Target	Descriptor	Result	Pass / Fail	Retest Comments
1	[redacted]	[redacted]	[redacted]	A	Wall	Airborne	≥ 53 dB	$D_{nT,w}$	64 dB	✔	New test
2	[redacted]	[redacted]	[redacted]	A	Wall	Airborne	≥ 53 dB	$D_{nT,w}$	63 dB	✔	New test
3	[redacted]	[redacted]	[redacted]	A	Wall	Airborne	≥ 53 dB	$D_{nT,w}$	63 dB	✔	New test
4	[redacted]	[redacted]	[redacted]	A	Wall	Airborne	≥ 53 dB	$D_{nT,w}$	60 dB	✔	New test

A - New Build
B - Material Change of Use
C - Protected Structure

✔ Performance is at or better than the performance citied in The Building Regulations (Ireland) 2014, Technical Guidance Document E Sound
✖ Performance is worse than the performance citied in The Building Regulations (Ireland) 2014, Technical Guidance Document E Sound
P Protected Structure - a dispensation or relaxation (or partial dispensation or relaxation) of the requirements has been granted by the local Building Control Authority

To check this certificate against the official online test log, please go to http://www.soundtestingireland.com, follow the link to the VISIT website and input **TASK NUMBER 11** and **PASSWORD** [redacted]

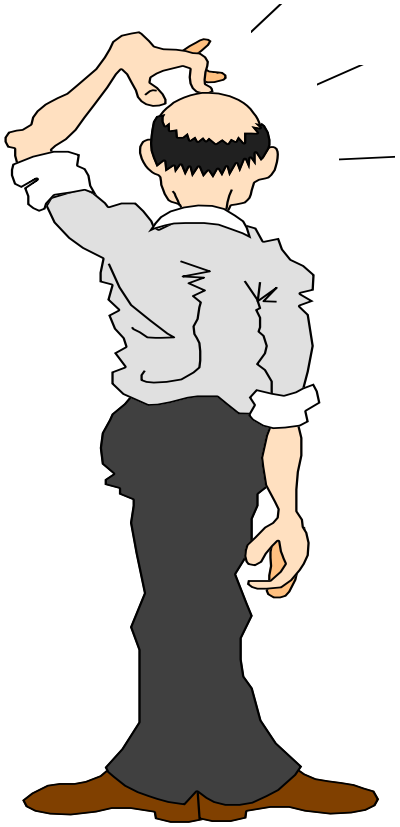
This Certificate confirms that the tests described in the list above gave the results stated and were carried out by the named SITRI registered test organisation, at the stated property, on the stated date and that the named test organisation was a member of the SITRI Scheme at the time of the tests.

Likely Benefits?

The experience from England & Wales, which have similar requirements and operate a testing certification scheme:

- Failure rate: fell from 25% for walls and 40% for floors to 3% overall between 2003 and 2011;
- Builders' concerns: were alleviated once it became clear that net costs had fallen;
- Knowledge transfer: increased consumer confidence;
- Improved quality: led to fewer complaints and improved health; and
- Database: more & better information for regulators.

Any Questions?



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Thank you for your attention

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