



Slide 1

CIAT – Module 3
Compliance pathways for sound insulation in new attached housing



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Welcome to Module 3 – Compliance pathways for sound insulation in new attached housing


Additional notes:

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Module 3 Contents



This module will cover the following topics:

- A brief history of sound insulation
- Sound insulation testing for attached housing (pre-completion testing)
- Robust Details for attached houses and flats

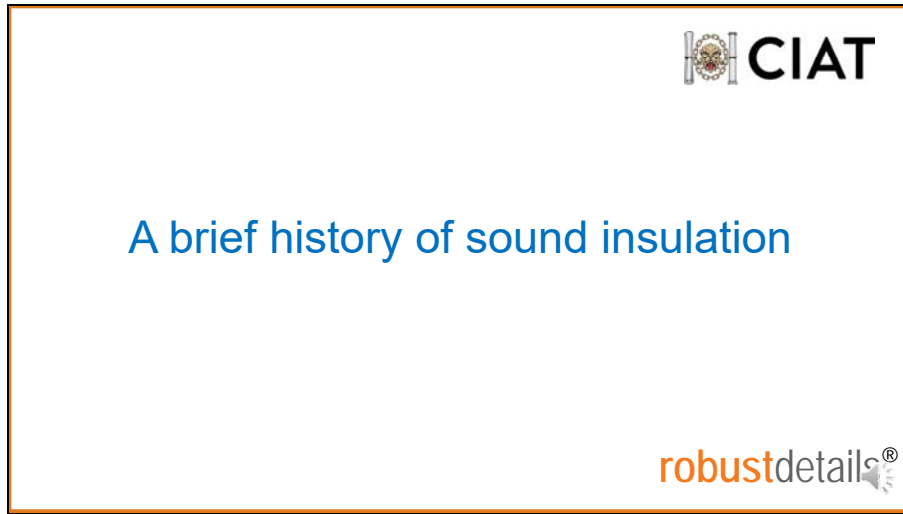
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This Module will cover the following topics:
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Slide 3




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Sound Insulation – A Brief History (1)




First mention of sound insulation Year 1189

The earliest attempt at building control within the nations of the United Kingdom was the requirement, recorded in the **Fitz Alwynne Assize of 1189**, for party walls to be built of stone at least three feet (3') thick,

Whilst this was essentially for reasons of structural stability, it is recorded that one of the reasons for the requirements in the Assize was:

“for appeasing contention between neighbours”

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Sound Insulation – A Brief History (2)



Building Control measures:

King David I introduced powers to set up Dean of Guild Courts to **control matters including building**. Year 1292

The London Building Act called for a solid nine-inch masonry wall **between dwellings**. Primarily to fire give resistance, it would also help sound insulation. Year 1668

Sound deafening using “ash blinding” was often incorporated within joisted floors. Years 1800-1919

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In Scotland in 1292, King David the 1st introduced powers to set up Dean of Guild Courts to control matters including building, although it took a further 400 years before this became regulated into building control as it is known today.


Following the Great Fire in 1666, the London Building Act called for a solid masonry wall between dwellings of nine inches (9”) minimum thickness. Which in addition to fire resistance would also help reduce sound transmission.

During 1800-1919 sound deafening using ‘ash blinding” was often incorporated within joist floor cavities.

Additional notes:

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Sound Insulation – A Brief History (3)



Building Control measures:

Edinburgh Corporation Building Rules provided details on **heavy construction requirements** including, under Article 15, the requirement of **floor deafening**. Year 1926

The publication of Technical Memorandum 3 '*Sound Insulation in Houses*' gave guidelines for sound insulation. Year 1957
Interestingly, this Technical Memorandum was published by the Department of Health.

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In 1926 under the Edinburgh Corporation Building Rules builders were provided with quite clear details on the heavy construction requirements for walls and floors including, under Article 15, the requirement of floor deafening.


Model byelaws included some requirements for sound insulation, and in 1957 the publication of Technical Memorandum 3 'Sound Insulation in Houses' full guidelines for sound insulation were made available. Interestingly, this Technical Memorandum was published by the Department of Health.

Additional notes:

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Sound Insulation – A Brief History (4)



1960-70s:
Various documents outlining sound insulation requirements published across the UK.

1970- early 1980s
The method of determining sound insulation known as the Aggregate Adverse Deviation (AAD)

Mid 1980's onwards
A consolidated approach for determining sound insulation was introduced:

- $D_{nT,w}$ for airborne
- $L'_{nT,w}$ for impact

Legal Judgement – sound testing

In 1984 a legal judgement in Glasgow (SSHA v CGDC) stated that sound insulation tests could be used “as a means to determine whether the workmanship was satisfactory”.

This then allowed Scottish Building Control departments the potential to request a sound insulation test be undertaken on any attached new build dwelling or conversion.

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1960-70s:

Various short documents outlining sound insulation requirements were published across the UK.

1970- early 1980s

The method of determining sound insulation was known as the Aggregate Adverse Deviation (AAD)

Mid 1980's onwards


A consolidated approach for determining sound insulation was introduced using $D_{nT,w}$ for airborne and $L'_{nT,w}$ for impact.

A subsequent legal judgement stating that sound tests could be used to determine the quality of workmanship, allowed Scottish building control the ability to sound test any attached dwelling.

Additional notes:

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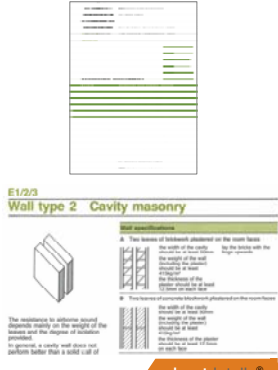
Sound Insulation – A Brief History (5)



Construction Specifications

From the mid-1980's regulations for sound insulation were published using "Deemed to Satisfy" specifications.

However, sound insulation testing was used as a means to determine the performance of new innovative separating walls and floors.



E12/3 Wall type 2 Cavity masonry

Key specifications

- 1. The cavity shall be filled with mineral wool insulation.
- 2. The cavity shall be filled with mineral wool insulation.
- 3. The cavity shall be filled with mineral wool insulation.
- 4. The cavity shall be filled with mineral wool insulation.
- 5. The cavity shall be filled with mineral wool insulation.
- 6. The cavity shall be filled with mineral wool insulation.
- 7. The cavity shall be filled with mineral wool insulation.
- 8. The cavity shall be filled with mineral wool insulation.
- 9. The cavity shall be filled with mineral wool insulation.
- 10. The cavity shall be filled with mineral wool insulation.

The resistance to airborne sound depends mainly on the weight of the leaves and the degree of isolation provided. A cavity wall does not perform better than a solid wall of the same weight.

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From the mid-1980's regulations for sound insulation were published using "Deemed to Satisfy" construction specifications (Approved Document E [ADE]). Generally if a **deemed to satisfy** was built it was rare to undertake a sound insulation test. Specification guidance was very limited within the ADE .

However, as new construction methods and products appeared in the market, sound insulation testing was used as a means to determine the performance of new innovative separating walls and floors.

Additional notes:

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Sound Insulation – A Brief History (6)




Development of Robust Details (RD)

The new housing industry sector established Robust Details for a number of key objectives:

- To have clear design & construction guidance for Part E;
- To reduce specification and construction errors;
- To support standardised approaches;
- To target a higher sound insulation standard;
- To address the insufficient sound testing capacity for the 150,000 new attached homes being built per year.

In 2002-2003 the industry built over 1,400 new homes utilising 'candidate Robust Retail constructions'. These were then assessed for the higher target RD sound insulation performance and the first RD Handbook went live in 2004.



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The new housing industry sector established Robust Details for a number of key objectives:


- To have clear design & construction guidance for the new Part E,
- To reduce errors in specifications and constructions
- To support standardised approaches based on site test evidence helping supply chains and skills,
- To target a higher sound insulation standard for the lifetime of the building, improving quality of life,
- There was (and is) insufficient sound testing capacity for the 150,000 new attached homes per year.

In 2002-2003 the industry built over 1,400 new homes utilising 'candidate Robust Retail constructions'. These were then assessed for the higher target RD sound insulation performance and the first RD Handbook went live in 2004.


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Sound insulation testing for attached housing
(pre-completion testing)




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Sound Insulation Testing



England and Wales

1985 to 2003	2004 onwards
<ul style="list-style-type: none">• Deemed to satisfy construction specifications• Mean and minimum performance standards for airborne sound insulation• Mean and maximum performance standards for impact sound transmission• Sound testing was not required	<ul style="list-style-type: none">• Guidance construction specifications published• Minimum performance standards for airborne sound insulation• Maximum performance standards for impact sound transmission• Sound testing is required OR the site is registered with Robust Details and builds in accordance to RD specifications


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Additional notes:

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Sound Insulation Testing (PCT – England & Wales)




Sound insulation testing required for attached houses and flats

- Minimum 10% of attached houses;
- Minimum 10% of flats / apartments;
- Minimum 10% also to be tested if construction of the separating element differs;
- Minimum 10% also to be tested if construction of the flanking differs;
- Building control determine which plots are tested;
- Testing undertaken at the final stage before completion.

Airborne
Min 45 dB DnT,w+Ctr

Impact
Max 62dB L'nT,w

Sound insulation testing is termed Pre-Completion Testing (PCT)

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Sound insulation testing required for attached houses and flats on the same site (separating walls & Separating floors),
Minimum 10% of attached houses must be tested,
Minimum 10% of flats / apartments must be tested,
Minimum 10% also to be tested if there are changes (within the same site) if the construction details are different (e.g. blockwork homes and timber frame homes in same site),
Minimum 10% also to be tested (within the same site) if the flanking constructions are different (e.g. outer wall constructions are different),
Building control or equivalent should determine which plots are to be tested,
Testing undertaken at the final build stage “Pre-completion”
Then RED box
Then GREY box

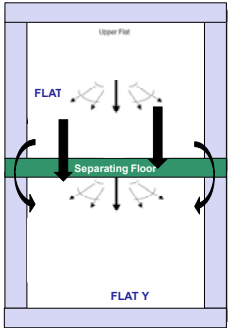
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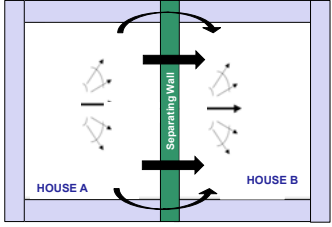
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New Attached Housing Sound Insulation Requirements





Separating Floor
Airborne Sound Insulation
Min 45dB DnT,w+Ctr
Impact Sound Transmission
Max 62dB L'nT,w



Separating Wall
Airborne Sound Insulation
Min 45dB DnT,w+Ctr

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Also note on the diagram the direct and indirect (flanking) transmission pathways shown by the arrows.

Additional notes:



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Additional notes:

A rectangular box with a black border containing ten horizontal lines for writing notes.

The handbook can be downloaded for free and all additional guidance at www.robustdetails.com


Now in its 4th edition, as new RDs are published, the FREE online handbook is updated and also industry briefing and CPD sessions are provided.

More information the RD route is outlined in Module 4.


Additional notes:

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Summary Test – Module 3
Quick Review of Key Points




Now for a quick TEST to recap on Module 3

Additional notes:

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Summary Test – Module 3 

No.	Question
1	In the mid-1980's, a consolidated approach for determining sound insulation was introduced with DnT,w for airborne sound; and L'nT,w for what other sound?
2	The Ctr weighting gives greater emphasis to: a) Low frequencies; or b) High frequencies
3	In which year did sound insulation testing become mandatory for new homes in England? a) 1985; or b) 2004
4	What does PCT stand for?
5	What is the normal percentage of each construction type that needs testing under PCT?
6	Under Part E, what are the target sound insulation values for airborne and impact noise? Include whether these are minimum or maximum values
7	To be published as Robust Detail, the construction has to be tested on site, with the 30 results being better the Building Regulations by a minimum and mean of what values?
8	For airborne insulation values, England uses DnT,w+Ctr - but what does Scotland use?



Here are test questions – you may wish to PAUSE the recording and test yourself against these questions.

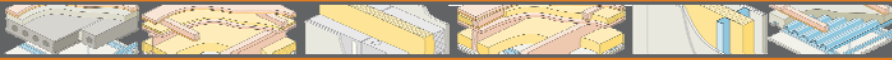

Once you have answered all of them – the next slide provides the answers.
In 10 seconds the slide will change so press pause now if you want to test yourself first.

Thank you for following Module 3.

Additional notes:

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End of CIAT – Module 3
Compliance pathways for sound insulation in new housing

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This is the end of module 3 – Compliance pathways for sound insulation in new housing

Additional notes:

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