

## Good Building Guide

## Sound insulation in dwellings

## Part 1: An introduction

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**Gary Timmins and Ian West**


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This Good Building Guide provides practical guidance for designers, construction managers and operatives, and property developers on understanding the requirements of national building regulations concerning the provision of sound insulation in dwellings. Part 1 explains the importance of providing good sound insulation between and within homes. It describes:

- the problems associated with neighbour noise
- how to satisfy the current regulatory requirements in England and Wales
- methods of measuring sound transmission in dwellings.

**Considering the requirements relating to sound insulation at an early stage of any development reduces the likelihood of costly remediation measures and delays at completion.**

**Parts 2 and 3 give advice on providing the correct level of sound insulation when constructing new dwellings and converting a building into multiple dwellings.**

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**The noise problem**


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Unwelcome noise in homes, specifically sound transmission between homes, is a major problem in the UK which requires serious consideration from both architects and builders. Noise nuisance can be a serious cause of stress and, if not remedied, can affect health and wellbeing as well as influencing people's enjoyment of buildings. People have different attitudes to noise; building occupants may be unaware that the noise they are making can be heard by their neighbours and regarded as a nuisance.

These problems can be solved by encouraging neighbours to modify their behaviour or by improving the level of sound insulation. As the noise climate within our homes mirrors



**Figure 1:** Terraced houses are required to control sound transmission between adjacent properties and within each property

changes in the way we live, more stringently applied national building regulations<sup>(1-4)</sup> and enhanced specifications (eg the Code for Sustainable Homes (CSH)<sup>(5)</sup>) have been introduced to control the transfer of neighbour noise.

Incorrect design of walls and floors, use of the wrong materials and poor workmanship can result in increased sound transmission, non-compliance with national building regulations and increased complaints from occupants. Failure to comply with the regulatory requirements leads to increased costs due to remediation works, delays to handover, continued involvement after practical completion and potential increases in future building warranty premiums.

**Part 1** of this Good Building Guide, together with **Parts 2** and **3**, offers practical guidance on providing the correct level of sound insulation when constructing new dwellings or converting a building into multiple dwellings.

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## Sound insulation in dwellings

## Part 2: New-build

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**This three-part Good Building Guide provides practical guidance for designers, construction managers, construction operatives and property developers on understanding the requirements of national building regulations concerning the provision of sound insulation in dwellings.**

**Part 2 explains how to provide a reasonable level of sound insulation between new dwellings. New dwellings are subject to routine sample pre-completion testing to ensure that they comply with the minimum performance targets in the appropriate national building regulations and any site-specific requirements.**

**The regulatory requirements and more general information are provided in Part 1 of this publication<sup>[1]</sup>. Part 3 will give advice on providing the correct level of sound insulation for converted dwellings.**



**Figure 1:** Sound insulation must be considered throughout the building process for new homes

## The noise problem

Unwelcome noise in homes, specifically sound transmission between homes, is a major problem in the UK that requires serious consideration from both architects and builders. Noise nuisance can be a serious cause of stress and, if not remedied, can affect our health and wellbeing as well as influencing our enjoyment of buildings. People have different attitudes to noise; building occupants may be unaware that the noise they are making can be heard by their neighbours and regarded as a nuisance.

These problems can be solved by encouraging neighbours to modify their behaviour and/or by improving the level of sound insulation. As the noise climate within our homes is affected by changes in the way we live, more stringently applied national building regulations<sup>[2, 3, 4, 5]</sup> and enhanced specifications (such as The Code for Sustainable Homes<sup>[6]</sup>) have been introduced to control the transfer of neighbour noise.

When considering sound insulation, it is the construction of the walls and floors that separate dwellings (separating walls and

separating floors) and their junctions with surrounding elements that is most important. Consideration of the sound insulation of internal partitions was discussed in GG 83-1<sup>[1]</sup>. Incorrect design of walls and floors, use of the wrong materials and poor workmanship can result in poor sound transmission, non-compliance with building regulations and increased complaints from occupants. Failure to comply with the regulatory requirements leads to increased costs due to remediation works, delays to handover, continued involvement after practical completion and potential increases in future building warranty premiums.

This Good Building Guide considers the principal types of construction used in dwellings and divides construction into two types – heavyweight and lightweight:

- Heavyweight construction covers traditional materials and systems, including masonry or precast concrete walls, precast concrete floor units, and precast concrete beam and block floors.
- Lightweight construction typically uses framed construction of timber or metal.

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## Part 3: Material change of use (conversions)

Gary Timmins and Ian West

This three-part Good Building Guide provides practical guidance for designers, construction managers, construction operatives and property developers on understanding the requirements of national building regulations concerning the provision of sound insulation in dwellings.

The aim of Part 3 is to give practical advice and outline guidance on appropriate constructions that will provide a reasonable level of sound insulation between dwellings formed by a material change of use (conversions). Where new dwellings are formed in a building as a result of a material change of use, they are subject to routine pre-completion testing to ensure that they comply with the minimum performance targets in the appropriate national building regulations and any site-specific requirements.

The regulatory requirements and more general information are provided in Part 1 of this Good Building Guide<sup>[1]</sup>. Part 2 explains how to provide a reasonable level of sound insulation between new dwellings<sup>[2]</sup>.

### The noise problem

Unwelcome noise in homes, specifically sound transmission between homes, is a major problem in the UK which requires serious consideration from both architects and builders. Noise nuisance can be a serious cause of stress and, if not remedied, can affect our health and wellbeing as well as influencing our enjoyment of buildings. People have different attitudes to noise; they may not be aware that the noise they are making can be heard by their neighbour and is regarded as a nuisance.

These problems can be solved by encouraging neighbours to modify their behaviour or by improving the level of sound insulation. As the noise climate within our homes is affected by changes in the way we live, more stringently applied regulations have been introduced to control the transfer of neighbour noise:



Figure 1: Material change of use of a non-domestic building to a residential apartment block

- England Approved Document E (AD E), 2003 (amended 2004, 2010 and 2015)<sup>[3]</sup>
- Wales Approved Document E (AD E), 2003 (amended 2004 and 2010)<sup>[4]</sup>
- Scotland Technical Handbook, Section 5, 2013<sup>[5]</sup>
- Northern Ireland Technical Booklet G, 2012<sup>[6]</sup>

Enhanced specifications (such as BREEAM UK domestic refurbishment<sup>[7]</sup>) have also been introduced.

When considering sound insulation, it is the construction of the walls and floors that separate dwellings (separating walls and separating floors) that is most important. Consideration of the sound insulation of internal partitions was discussed in Part 1 of this *Good Building Guide*<sup>[1]</sup>. Incorrect design of walls and