

Building Regulations

Approved Document E

The current Approved Document E, for England and Wales, came into effect on 1 July 2003 and was amended in 2004 and 2010. The guidance given in this document gives clear advice on the measures which may be taken to meet the requirement. Different requirements apply to Scotland.

INTRODUCTION

Awareness about noise transmission in the home is increasing. Noise is a modern paradox: people use more noise generating products than ever in the home and yet want increased levels of peace and quiet. The Building Regulations Part E: 2003 and the subsequent amendments in 2004 and 2010 give guidance to the requirements for the resistance to the passage of sound.

Requirement E1: Protection against sound from other parts of the building and adjoining buildings

“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.”

Requirement E2: Protection against sound within a dwelling-house, etc.

“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 E3: Reverberation in the common internal parts of buildings containing flats or rooms for residential purposes.

“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.”

SEPARATING FLOORS

England & Wales

The normal way of satisfying Requirement E1 is to build separating walls, separating floors, and stairs that have a separating function.

Separating floors are designed to limit or insulate against:

- airborne sound, such as that from a television or music system;
- impact sound, such as footsteps or chairs being dragged on the floor, and
- flanking sound - the indirect transfer of sound through the building fabric, usually through the walls separating dwellings.

In addition to considering the floor structure and floor covering, ceiling treatment in the room under the floor is also important. The separating elements should achieve the sound insulation values for dwelling-houses and flats in Table 1, and the values for rooms for residential purposes set out in Table 2.

Table 1 - Dwelling-houses and flats - performance standards for separating walls, separating floors and stairs that have a separating function

		Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum values)
Purpose built dwelling-houses and flats	Walls	45	-
	Floors and stairs	45	62
Dwelling-houses and flats formed by material change of use	Walls	43	-
	Floors and stairs	43	64

Table 2 - Rooms for residential purposes - performance standards for separating walls, separating floors and stairs that have a separating function

		Airborne sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum values)
Purpose built rooms for residential purposes	Walls	43	-
	Floors and stairs	45	62
Rooms for residential purposes formed by material change of use	Walls	43	-
	Floors and stairs	43	64

To achieve these performance standards for new build, developers can:

- use their own design and subject it to pre-completion testing (PCT), the onus being upon the builder to demonstrate that the required levels of sound insulation are achieved as detailed in the tables above, or
- use one or more of the design details from the set approved and published by Robust Details Limited provided that a valid notification is given to the building control body and the actual work complies with the detail or details specified in the notification. In order to use a robust detail, an application must be registered with Robust Details Limited and a fee paid. Further information can be found at www.robustdetails.com.

The pre-completion testing regime is as follows:

- tests to be conducted on completed units, except for decoration;
- one set of tests is required for every ten dwellings of the same construction type;
- a set of tests comprises two airborne tests and two impact tests;
- if any test fails by up to 2 dB, remedial work is required at the discretion of the Building Control, and
- if any test fails by 3 dB or more, remedial work and a re-test are required.

For England and Wales the Part E Robust Details Handbook outlines a series of solutions to satisfy the requirements of Part E of Schedule 1 to the Building Regulations. At the time of writing, the solutions for concrete separating floors are designated E-FC-1 to E-FC-17, noting that robust detail E-FC-3 has been withdrawn.

Out of the sixteen robust details, twelve utilise precast concrete planks (E-FC-1, E-FC-4, E-FC-5, E-FC-8, E-FC-9, E-FC-11, E-FC-12, E-FC-13, E-FC-14, E-FC-15, E-FC-16 and E-FC-17) and two utilise beam and block (E-FC-6 and E-FC-7).

In Appendix A1 - Additional Guidance of the Part E Robust Details Handbook there is information concerning what should be done in those situations where precast concrete plank separating floors require intermediate support by steel beams supported on masonry.

<http://www.robustdetails.com/the-handbook>

Northern Ireland

In Northern Ireland the Department of Finance and Personnel has accepted the robust details scheme as the alternative to pre-completion sound testing to demonstrate compliance with Part G of the Building Regulations (Northern Ireland) for new dwellings. Consequently builders wishing to register and construct plots in Northern Ireland can also use the Part E Robust Details Handbook and documentation. The reader should note that in the handbook's introduction there is a 'Special note for Robust Details constructed in Northern Ireland'.

Scotland

The requirements to comply with Section 5 of the Scottish Building Regulations are that separating elements should achieve the sound insulation values summarised below. Readers should note that the values in Table 3 for airborne sound insulation are more onerous than the values summarised in Tables 1 and 2 above.

Table 3 - Scottish design performance levels for separating elements

	Airborne sound insulation $D_{nT,w}$ dB (Minimum values)	Impact sound transmission $L'_{nT,w}$ dB (Maximum values)
New build and conversions not including traditional buildings	56	56
Conversions of traditional buildings	53	58

In Scotland the robust details scheme has also been accepted as the alternative to pre-completion sound testing to demonstrate compliance with Section 5 of the Building (Scotland) Act for new dwellings. Builders wishing to register and construct plots in Scotland can use the Section 5 Robust Details Handbook. Currently, the Scottish handbook does not contain robust details for concrete floors.

<http://www.robustdetails.com/other-services/robust-details-in-scotland>

INTERNAL FLOORS

England & Wales

The normal way of satisfying Requirement E2 is to build internal walls and floors that achieve the sound insulation values set out in Table 4.

Table 4 - Laboratory values for new internal walls and floors within dwelling-houses, flats and rooms for residential purposes, whether purpose built or formed by material change of use.

	Airborne sound insulation R_w dB (Minimum values)
Walls	40
Floors	40

Section 5 of Approved Document E gives examples of internal floor constructions that meet the sound insulation values set out in Table 4. Two of the example internal floor types are internal floor type A (described as concrete planks) and internal floor type B (described as concrete beams with infilling blocks, bonded screed and ceiling). Refer to Approved Document E for further information.

Northern Ireland

Part G of the Building Regulations (Northern Ireland) mirrors Approved Document E for England and Wales. Consequently internal floor types A and B can be used.

Scotland

The normal way of satisfying Section 5 of the Scottish Building Regulations is to build internal walls and intermediate floors that achieve the sound insulation values set out in Table 5.

Table 5 - Scottish design performance levels for internal / intermediate elements

	Airborne sound insulation R_w dB (Minimum values)
Internal walls	40
Intermediate floors	43

The design performance levels set out in Table 5 can be achieved by using the Generic Internal Constructions available on the BSD website:

<http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech/techexpleconstr/>

At present there are several intermediate floor details: Type 4A (concrete slab - precast hollowcore), Type 4B (concrete slab - solid precast) and Type 5 (concrete beam and block).

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