Local Authority
BUILDING CONTROL

Sound Insulation

The Revised Building Regulations Part E

How will my project be affected by the Revised Approved Document E ?

The revised Approved Document E of the Building Regulations came into force on the 1st July 2003. The revised document aims to improve the standards of sound insulation both between and within buildings and this will no doubt have an affect on the way that buildings are designed and constructed. This brief guide aims to show how the changes will affect typical projects.

Example 1: Domestic Extensions: these usually only affect a single property and therefore sound separation between dwellings is not involved. These projects will however be affected by the new Regulation E2 which requires sound insulation within the internal walls and floors of buildings. The guidance relating to this part of the Regulations is contained in Section 5 of the Approved Document. In a typical domestic situation stud walls around bedrooms and bathrooms need 75mm studwork with either two layers of plasterboard on each side or 25mm of sound insulation incorporated within the wall. Internal timber floors will require 100mm of sound insulation to be placed between the joists within the cavity (see diagrams below).

Diagram 5-1: **Internal wall type A**

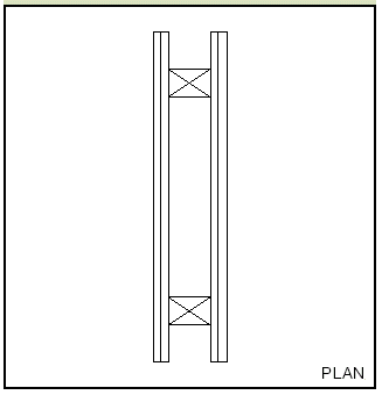


Diagram 5-2: **Internal wall type B**

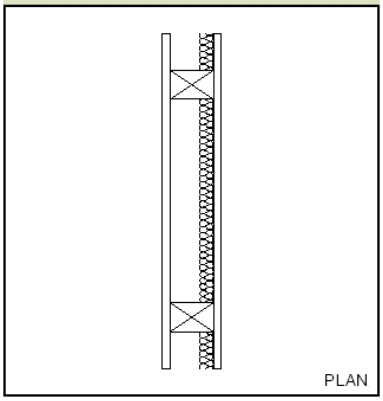
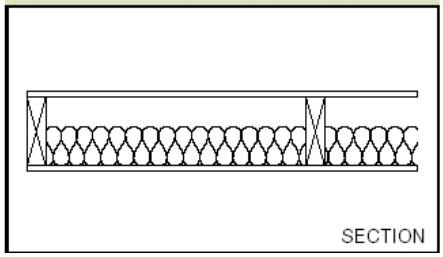


Diagram 5-7: **Internal floor type C**



For extensions where more than one property is involved the separating walls and floors should be built to the standards required for new dwellings (see later) although no sound testing will be required.

Example 2: Domestic Loft Conversions: any new internal walls around bedrooms and bathrooms and the new internal floor will require sound insulation as shown in Example 1 above. In attached properties the existing separating walls may also require upgrading. Whilst there is no requirement for these walls to be brought up to new build standards, reasonable provision should be made to improve their sound resisting properties.

Diagram 2-1: **Types of separating wall**

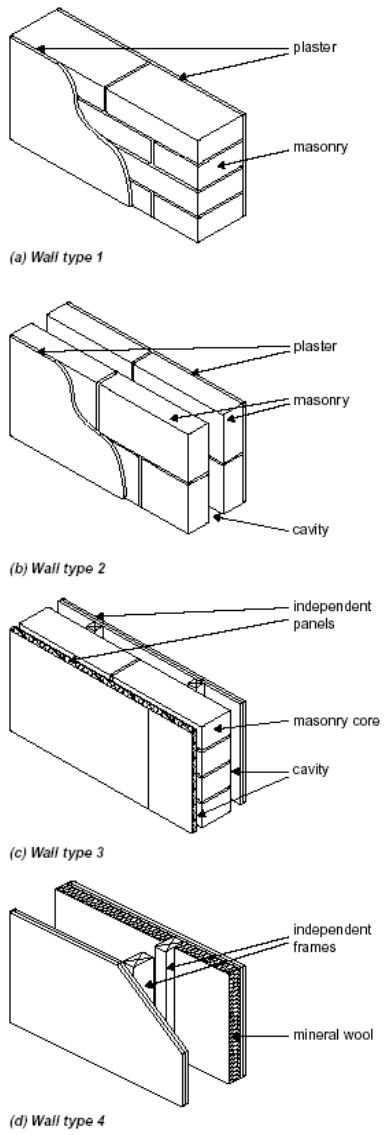
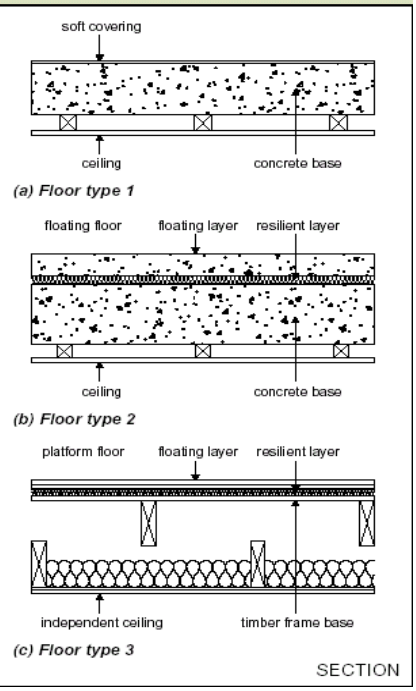


Diagram 3-1: **Types of separating floor**



Example 3: New Build Housing and Flats:

Detached Housing: as this type of housing does not involve Separating Walls compliance with the new regulations is relatively straightforward. Internal walls around bedrooms and bathrooms and the internal floors will require sound insulation as described in the guidance for Domestic Extensions, no other sound insulation measures will be required.

Attached Housing and Flats: the walls separating houses and flats will need to be constructed as separating walls. Section 2 of the Approved Document provides guidance on four types of separating wall that should provide the sound reduction required (see diagram). The performance of these walls will be heavily influenced by flanking transmission and extensive guidance on how these walls should be detailed is contained within this section of the Approved Document. Whilst all of the constructions should satisfy the requirements of the regulations the constructions are ranked in order of performance with Type 1 being the most effective wall.

The floors within flats will also need to be constructed as separating floors. These must resist both airborne and impact sound. Section 3 of the Approved Document gives guidance on three floor types (see diagram), that should achieve the levels of sound reduction required together with guidance on how they should be detailed. No specific guidance is provided for block and beam floors, if you wish to use this type of floor guidance should be sought from the manufacturer.

Acoustic ceilings should be installed in the common areas of flats to reduce reverberation.

Separating walls and floors in new houses and flats which are either purpose built or formed by conversion will be subject to post completion testing (see later).

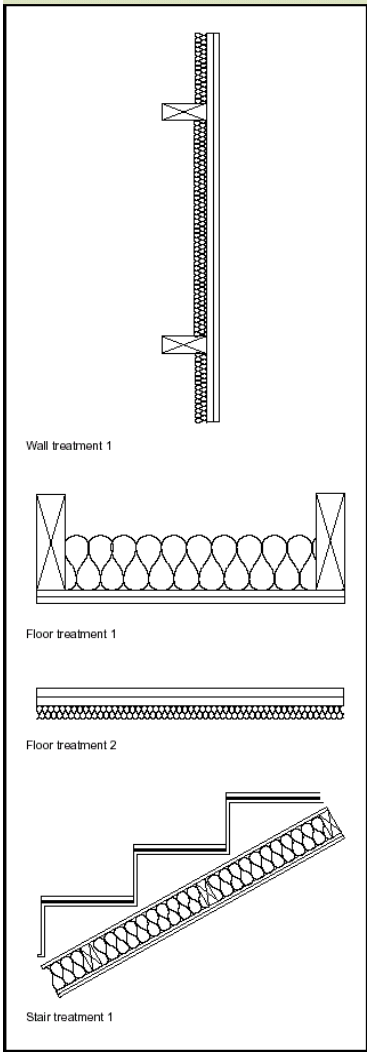
Example 4: A New Building or Extension containing Rooms for Residential Purposes: the Building Regulations have been expanded to cover sound transmission between Rooms for Residential Purposes. This section of the Regulations covers all rooms in non-domestic buildings where people can sleep, this would include, hotel bedrooms, rooms in residential care homes, student accommodation etc.

The walls and floors between the rooms should be constructed as separating elements in accordance with the guidance previously mentioned, the preferred solutions are wall types 1 or 3 with floor type 1 although alternative constructions can be used with careful detailing.

Walls between residential rooms and any corridors will also need to be constructed as separating walls and guidance relating to doors in these walls is given.

Separating walls and floors between residential rooms which are either purpose built or formed by conversion will be subject to post completion testing (see later).

Diagram 4-1: **Treatments for material change of use**



Example 5: A Conversion of a Building which forms a Dwelling House or Flat: the revised sound transmission regulations apply to attached houses and flats that are formed by conversion. The standards required are less onerous than those required in new build situations and Section 4 of the new Approved Document provides guidance on treatments that can be applied to existing walls and floors that should upgrade their sound resisting qualities (see diagram). All of the Separating walls and floors will require upgrading. Any new internal floors that are not separating floors and any internal walls around bedrooms and bathrooms will require sound insulation to the internal wall standards (see Example 1: Domestic Extension).

Acoustic ceilings should be installed in the common areas of flats to reduce reverberation.

The separating walls and floors in flats and houses formed by conversion will require post completion testing (see later).

Post Completion Testing: where new houses and flats are built or formed by conversion and where rooms for residential purposes are created or altered, the new regulations require that the separating walls and floors be sound tested to establish the effectiveness of the sound insulation installed. The tests should be carried out when the house or flat is finished prior to the installation of furniture. Walls must be tested to establish their resistance to airborne sound and floors must be tested to establish their resistance to airborne and impact sound. The testing procedure is set out in Section 1 of Approved Document E. Tests should be carried out by a UKAS accredited body and the results should be submitted to Building Control within 5 days of completion of work.

Remedial work will be required if the tests do not show that the construction provides the required level of sound reduction.

Reverberation: Section 7 of the new Approved Document provides guidance relating to reverberation sound in the common parts of buildings containing flats or rooms for residential purposes. Two methods of compliance are offered both of which should reduce the problems associated with this type of sound.

Schools: acoustic conditions in schools are now covered by the Building Regulations, the Approved Document refers designers to Building Bulletin 93 'The Acoustic Design of Schools' for detailed guidance. Building Bulletin 93 is currently available on the acoustics page of teachernet.gov.uk website.

Summary: with higher density developments and changing population demographics sound transmission between buildings is an increasing problem. The revised Sound Resistance Regulations have been designed to counter the rising level of complaints received about noise transmission and improve the welfare and convenience of building users.

This guide is intended to provide an overview of the new regulations and it should be read in conjunction with the Revised Approved Document which gives more complete details of the construction required. If you would like any further advice or if you would like to discuss alternative solutions please call Building Control on 01789 260626.