

**JUNE 2004**

# **Approved Document E: Robust Details and PCT**

## **what does it mean for you?**

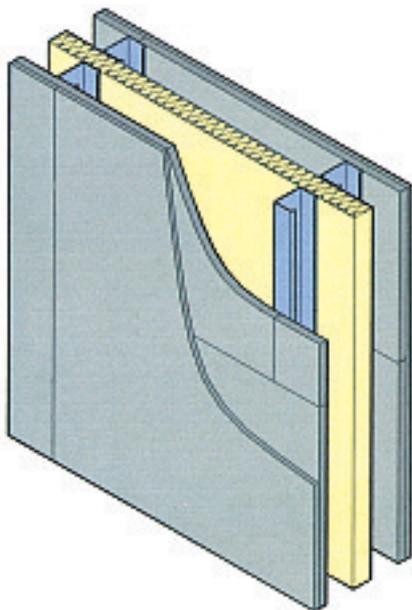
This document is produced primarily for housebuilders, but is important for all those involved in the design and construction of new and converted dwellings. It sets out the background to the changes in Approved Document E of the Building Regulations (England and Wales) in relation to pre-completion testing (PCT) acoustic performance and the response of the House Builders' Federation in producing an alternative means of compliance – Robust Details (RDs) – in order to reduce the burden of testing on the industry.

## Pre-Completion Testing (PCT)

Previous site testing and research has shown that separating walls and floors which should be capable of providing satisfactory levels of sound insulation did not do so in practice. The new Approved Document E introduced the concept of PCT to ensure that designed performance is achieved in practice. PCT is a sampling approach and so does not require that all separating walls and floors be tested. Building Control authorities have the power to require pre-completion testing of separating walls and floors as a means of demonstrating compliance with the performance criteria for sound insulation. Building Control should request tests be carried out on a sample size of 10% of dwellings on a development or rooms on a residential or hotel project to check compliance in addition to their normal inspections. Test work is normally carried out at the developer's expense but where and what to test is to be as directed by Building Control. It remains the developer's responsibility to meet the requirements of Approved Document E for the entire site, not just the ones that are tested.

PCT should be carried out on dwellings created by a material change of use and rooms for residential purpose – whether purpose built or formed by material change of use as from 1 July 2003. PCT on new build houses and flats will be required as from 1 July 2004. This is unless the Robust Detail (RD) approach is used. Tests should be carried out when rooms either side of the separating element are completed prior to decoration but without the inclusion of any soft furnishings. Tests are not required on internal walls and floors or between living spaces and corridors.

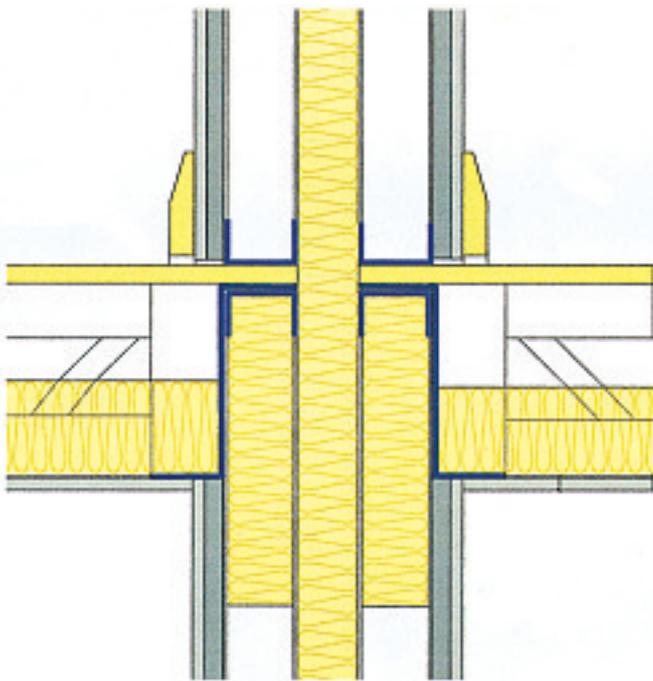
## The development of the Robust Details (RDs)



The House Builders Federation recognised that PCT would be both a costly burden on housebuilders and unnecessary where a proven acoustic solution guaranteed performance. Working with ODPM and building material producers, they have developed a set of practical RDs which have been rigorously tested to ensure that they significantly exceed the new Part E requirements and can be granted dispensation to avoid the need for PCT.

The public consultation phase of the project, which ended in November 2003, indicated widespread support for the principle of using RDs and the ODPM subsequently approved this approach as a way forward.

58 separate house-building companies provided sites for field-testing, which consisted of sound testing a total of 1,300 dwelling units in just 6 months. So far 14 constructions have been fully tested and meet the performance targets.



These constructions will form the first pattern book of solutions that is due for publication by RD Limited on the 4 May 2004. The pattern book includes site checklists for each construction and detailed flanking junction details that are integral to the correct installation of these forms of construction.

In order to use RDs the developer must register their site with RD Limited and must pay a plot registration fee. Details regarding plot registration can be found on the website [robustdetails.com](http://robustdetails.com). The plot registration fee will be used to conduct audit testing on the various forms of RD constructions to ensure that the necessary performance is being achieved failing RDs will be removed from the pattern book.

## In conclusion

There is no obligation to use the RD in preference to the PCT approach, however the following factors should be considered.

RDs are designed to have higher performance targets than the constructions described in Approved Document E.

The RD designs are engineered in part to provide a degree of workmanship tolerance. This may mean more materials are used than would be strictly necessary to provide the required performance with good workmanship. Although this may be regarded as being counter to the principles of sustainable development the benefits in terms of living standards are considered worthwhile.

RD performance can be enhanced with the use of high performance acoustic gypsum boards.

The RD designs are generally more expensive than the constructions described in Approved Document E but the objective of the RD scheme is to remove the uncertainty, delays and costs introduced by Pre-completion Testing. When this factor is taken into account it is anticipated that the RD scheme will prove to be cheaper overall.

It is hoped that designers and housebuilders will use the RDs as they exceed the minimum regulatory standard by a comfortable margin and should ensure that the ultimate benefits of the RD project are passed on to the new homes customer.

The effects of noisy neighbours can be one of the main problems experienced by occupants of attached homes. New planning guidelines (PPG3) requires a greater density of build on housing sites driving the industry towards a higher proportion of attached homes (link attached and apartments) in order to meet the more stringent guidelines. Therefore more homes will be affected by the needs for better standards of sound insulation between one home and another.

It has been estimated that about 4 million people in Britain are having their lives disturbed by noisy neighbours, sometimes with tragic consequences. The Chartered Institute of Environmental Health reports that the number of complaints about domestic noise has now reached over 5,000 per million of population and that the total number of such complaints has trebled. The 1996 English House Condition Survey indicates that nearly one quarter of households was bothered by noise either from traffic, industry or neighbours. A BRE study indicates that about 25% of occupants living in dwellings that attained the previous standards for sound insulation rated the insulation as 'poor' or 'very poor'. It is estimated that in new dwellings, as many as 40% of separating floors and up to 25% of separating walls may fail to meet the current standards.

The best defence against noise must be to ensure that proper precautions are taken at the design stage and during construction of the building. Remedial measures can be expensive and inconvenient particularly after the building has been occupied.

## Robust Details using gypsum products

RD Code	Title	Gypsum Products
<b>Separating Walls</b>		
E-WM-1	Cavity dense aggregate blocks plastered	13mm gypsum plaster
E-WM-2	Cavity lightweight aggregate blocks plastered	
E-WM-3	Cavity dense aggregate blocks render and drylining	12.5mm standard wallboard fixed with dabs of gypsum adhesive
E-WM-4	Cavity lightweight aggregate blocks render and drylining	
E-WM-5	Cavity Besblock Star Performer render and drylining	
E-WM-6	Cavity aircrete render and drylining	
E-WT-1	Twin timber frame (no sheathing)	Two layers of plasterboard weighting 22kg/m <sup>2</sup>
E-WT-2	Twin timber frame (with sheathing)	
E-WS-1	Loadbearing twin steel frame wall	
E-WS-2	British Gypsum Gypwall QUIET IWL	
<b>Separating Floors</b>		
E-FM-1	Precast concrete plank with floating floor	Ceiling Option 1 – metal suspended ceiling 100mm cavity depth lined with 12.5 mm standard wall board
E-FM-2	In-situ concrete with floating floor	Ceiling Option 2 – metal suspended ceiling 75mm cavity depth lined with plasterboard 10kg/m <sup>2</sup>
E-FT-1	Engineered I joist with floating floor and resilient bar ceiling	Floating floor incorporating plasterboard 13.5kg/m <sup>2</sup>  Ceiling – a benchmarked resilient bar lined with a double layer of plasterboard 23kg/m <sup>2</sup>
E-FS-1	In situ concrete on steel profiled deck	Ceiling – metal suspended ceiling lined with plasterboard 10kg/m <sup>2</sup>

## A brief history behind the changes to Part E of the Building Regulations

New Approved Document E of the Building Regulations (England and Wales) dealing with resistance to the passage of sound came into effect in July 2003 and introduced higher requirements for acoustic performance for residential building. The approved document is one of a series published by The Office of the Deputy Prime Minister (ODPM) to provide practical guidance on meeting the requirements of Schedule 1 and Regulation 7 of the Building Regulations.

Approved Document E gives guidance with suggested constructions on how to provide reasonable levels of sound insulation between and within dwellings and other residential buildings (e.g. hotels, hostels and buildings providing residential care). However these guidance constructions do not guarantee compliance and it was proposed that a sample of properties (1 in 10 on any site) would have to undergo Pre-Completion Testing prior to final completion and occupancy. This applied to all residential properties other than new homes from 1 July 2003.

For new homes and flats the same requirement will come into force on 1 July 2004 unless you take the Robust Details approach. Robust Details are forms of construction that have been site tested to demonstrate superior performance to that required by Approved Document E. Approved Document E allows the use of Robust details as an alternative to conducting pre-completion testing.

### The requirements under Approved Document E

Construction	RD Individual value		RD Mean value		PCT standard	
	Airborne (min)	Impact (max)	Airborne (min)	Impact (max)	Airborne (min)	Impact (max)
Separating Walls	47	–	50	–	45	–
Separating Floors	47	60	50	57	45	62

Note – Airborne performances are quoted in terms of  $D_{nT,w} + C_{tr}$  and Impact performances in terms of  $L'_{nT,w}$ .

SEPARATING WALL CHECKLIST				
Site Location: _____		Company: _____		
Location of Separating Wall – Block: _____		Plot No: _____		
CHECKLIST	Yes (✓)	No (✓)	Date (dd/mm/yy)	Name of Person Inspecting
1) Is the cavity width a minimum of 200mm?				
Notes: _____				
2) Are the batt materials (density 33-80 kg/m <sup>3</sup> ) a minimum of 50mm thickness?				
Notes: _____				
3) Are the insulation batts tightly abutted?				
Notes: _____				
4) Do the lining layers have staggered joints?				
Notes: _____				
5) List the type of gypsum based board used for the linings or its mass per unit area (kg/m <sup>2</sup> ).				
Notes: _____				
6) Are the lining board joints taped and filled?				
Notes: _____				
7) If kitchen units are mounted on the party walls is there an additional service void?				
Notes: _____				
8) Are the sockets back boxed with gypsum based board or equivalent?				
Notes: _____				
To be completed at end of inspection: Comments: _____			Site Manager/ Agent: _____ Signed: _____ Date: _____	

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## References

Amendment to the Building Regulations to allow Robust Standard Details to be used as an alternative to pre-completion testing. ODPM August 2003

Sound Separation: Acoustic Solutions using Gypsum Products, GPDA June 2000

You thought all Plasterboard was the same – GPDA CDROM 2003

<http://www.robustdetails.com>

<http://www.odpm.gov.uk/>

<http://rsd.napier.ac.uk/>