

robustdetails

Where RD's can't be used!




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Where RD's can't be used

A brief overview of those situations where RD constructions can't be used, a few suggestions on how to deal with this and where engaging an acoustic consultant can help.

A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, adding a decorative element to the background.

Approved Document E

ADE stipulates minimum levels of sound insulation for the following:

- ◆ New build houses and flats (E1)
- ◆ Refurbished houses and flats (E1)
- ◆ New build RRP's (E1)
- ◆ Refurbished RRP's (E1)
- ◆ Schools (E4)

Approved Document E

- ◆ ADE stipulates minimum levels of sound insulation for the following:
- ◆ New build houses and flats (E1) **PCT/RDL**
- ◆ Refurbished houses and flats (E1) **PCT**
- ◆ New build RRP's (E1) **PCT**
- ◆ Refurbished RRP's (E1) **PCT**
- ◆ Schools (E4) **PCT – not yet mandatory**

Robust Details

- ◆ Introduced in July 2004 as an alternative to pre-completion testing at the same time as testing for new build houses and flats became a mandatory requirement.

For new build houses and flats only.

- ◆ All other building types must be tested to demonstrate compliance with Approved Document E.

Pre-completion testing (PCT)


- ◆ Separating walls tested for airborne sound insulation.
- ◆ Separating floors tested for airborne sound insulation and impact sound resistance.
- ◆ 1 set of tests for every 10 dwellings (10% rule)



Test Organisations

- ◆ Must be members of the ANC Scheme or UKAS Accredited
- ◆ All RD inspectors are qualified testers with their respective organisations and hold either ANC or UKAS accreditation.
- ◆ RDL 'performance monitoring' uses the same test procedures etc as for PCT.

The ANC Registration Scheme

- ◆ Rigorous quality control
 - ◆ All test results recorded on central database for detailed analysis.
 - ◆ Current throughput is about 2000 tests per month (normally about 4000). ¼ million tests so far!
 - ◆ New-build 98% pass rate!
 - ◆ Conversions over 90% pass rate!
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- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, adding a decorative element to the presentation.

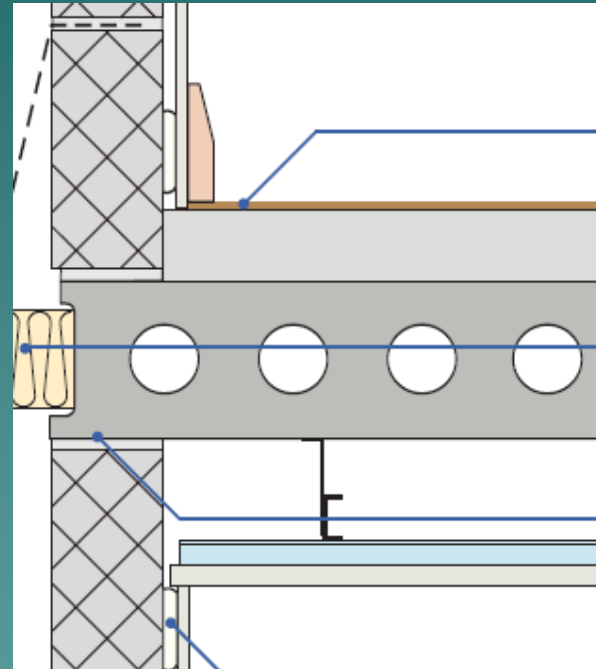
Where RD's can't be used to satisfy ADE.

◆ **Novel or hybrid construction methods**

- ◆ Rooms for Residential Purposes.
 - ◆ Refurbished houses and flats.
 - ◆ Schools.
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Novel and Hybrid Construction

- ◆ A 'novel' construction is a floor or wall design which does not appear in the RD handbook.
- ◆ If these are 'good' designs they could eventually appear in the RD Handbook.
- ◆ One example of this is the recent inclusion in the handbook of Type 1 concrete floors, EFC-9 and EFC-10, which use a 'bonded soft covering' instead of a floating screed.



Novel and Hybrid Construction

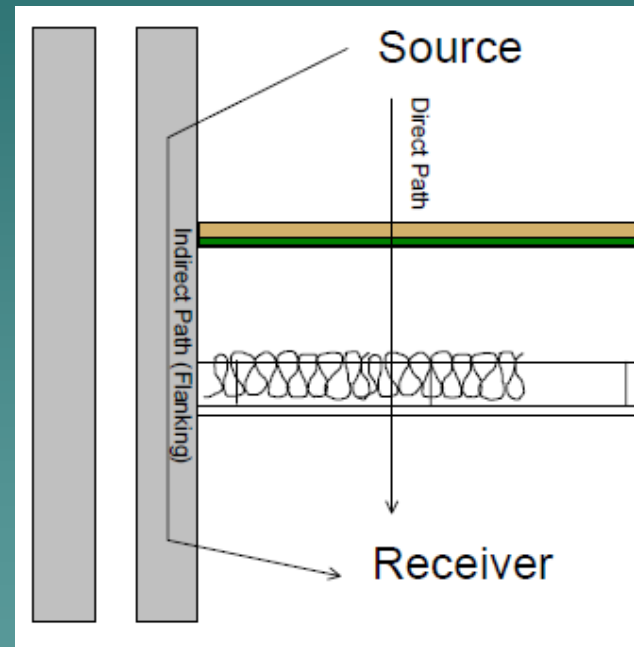
- ◆ Novel floors and walls can often be combined with RD floors and walls to create a 'hybrid' construction provided the 'novel' construction does not compromise the performance of the RD construction.
- ◆ For example, Table 4 in the RD handbook lists RD walls which can be used with non-RD floors provided the floor does not bridge the wall cavity (but see later comment about timber floors).

Novel and Hybrid Construction

- ◆ Similarly, RD floors which can be used with non-RD walls are listed in Table 5, provided the supporting blockwork is strong enough.
- ◆ In summary, the RD wall or floor can be registered but the non-RD element must be tested.

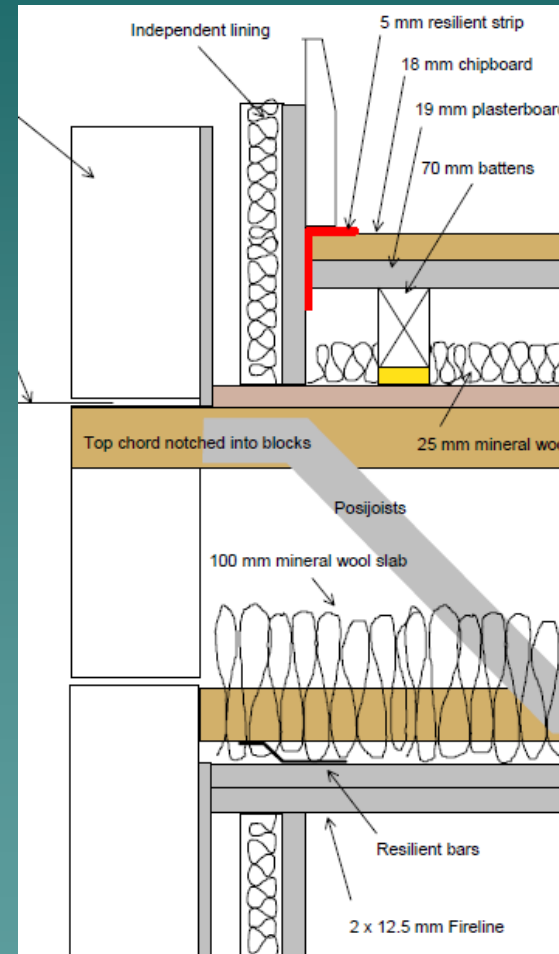
Some combinations don't work

- ◆ Some hybrid floor/wall combinations are fundamentally incompatible!
- ◆ Perhaps the most common example of this is the use of timber separating floors in a masonry cavity shell!
- ◆ This **DOES NOT** work unless acoustic wall linings are used!!



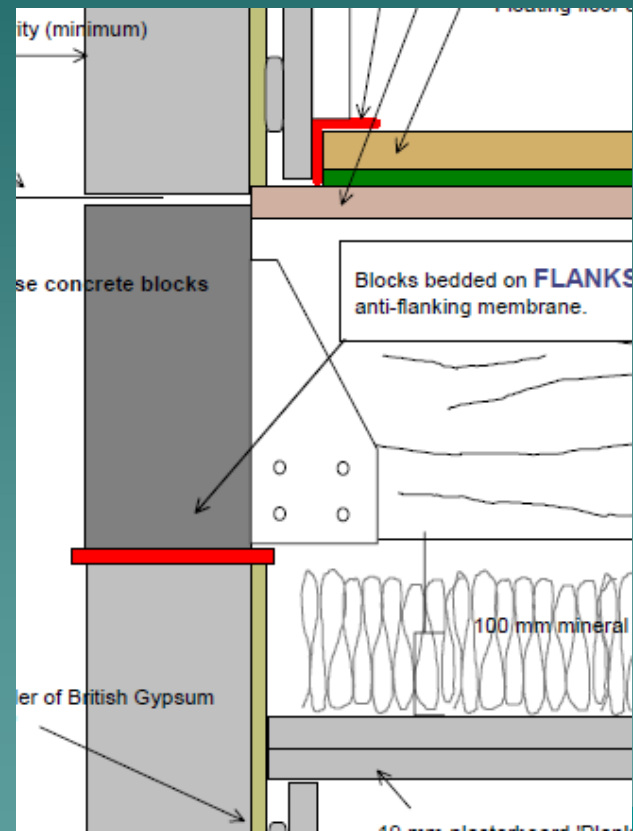
But can be modified!

- ◆ This is the 'standard' solution suggested in ADE and requires independent wall linings to the faces of all cavity walls to reduce flanking.
- ◆ BUT - wall construction is not RD!



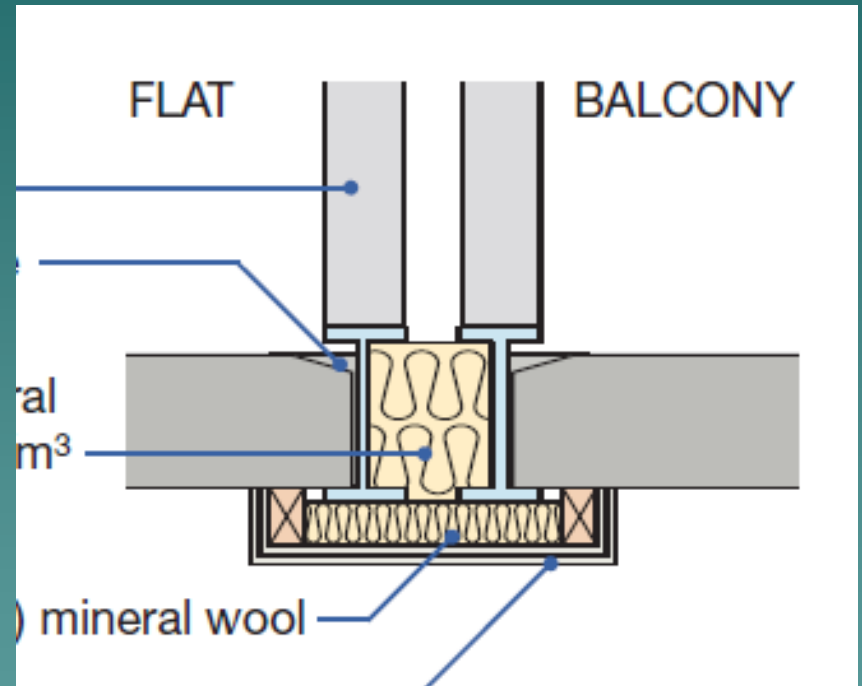
Caution required.

- ◆ To date, attempts to come up with a proprietary solution to this problem have been disappointing!
- ◆ But! There is a demand for this floor/wall combination, especially for sites with limited access.



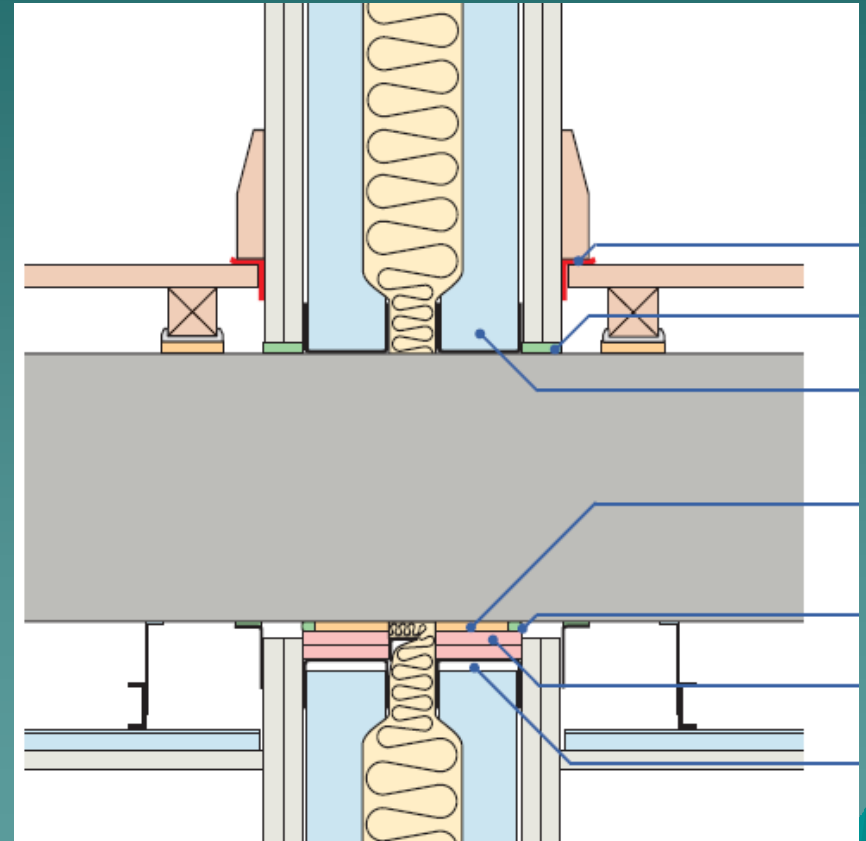
Drive-through.

- ◆ Other common problems occur where there is a large space required above or below a separating wall e.g. a drive-through situation.
- ◆ It is not permissible, for example, to support an RD separating wall off steel beams.
- ◆ This example shows a means of supporting an *external wall* only!
- ◆ This can be built as a separating wall, with care, but it is not an RD and will need to be tested!



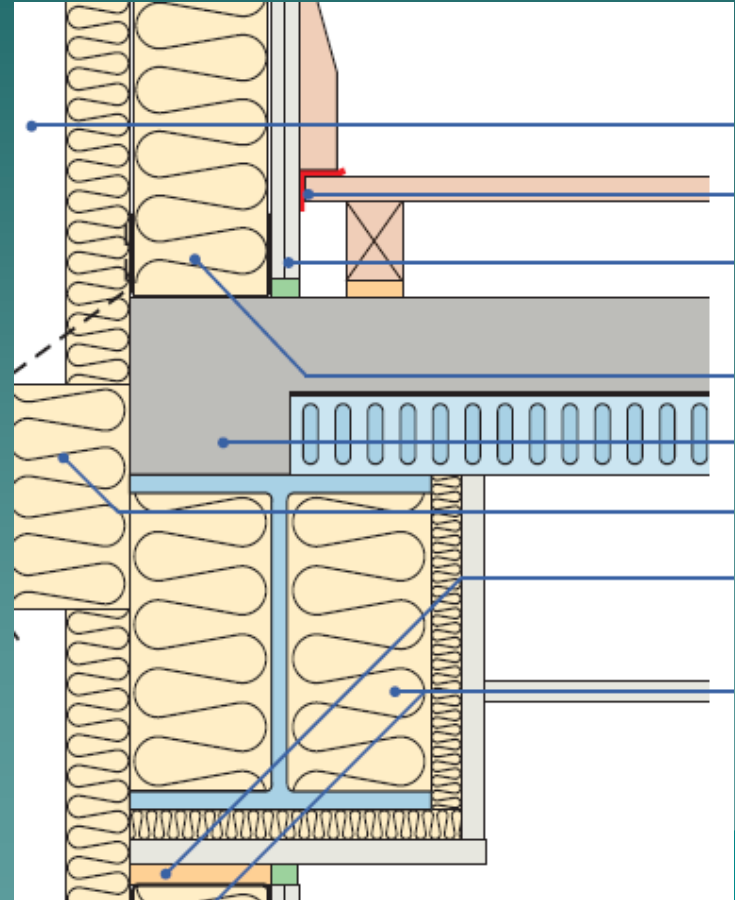
'RD' possible solution.

- ◆ Lightweight (e.g. timber or steel-frame) separating walls can be built off continuous raft suspended floors where the mass of the floor is at least 365 Kg/m².
- ◆ A floating floor must be used.
- ◆ Floor and wall are both RD.



Steel-frame hybrid


- ◆ Where the separating floor is in-situ concrete on profiled decking, there is no RD separating wall solution.
- ◆ Lightweight separating walls can be built but require *special detailing* at the soffit and at the external wall junction.
- ◆ Walls will require pre-completion sound testing.



Seek Expert Guidance!

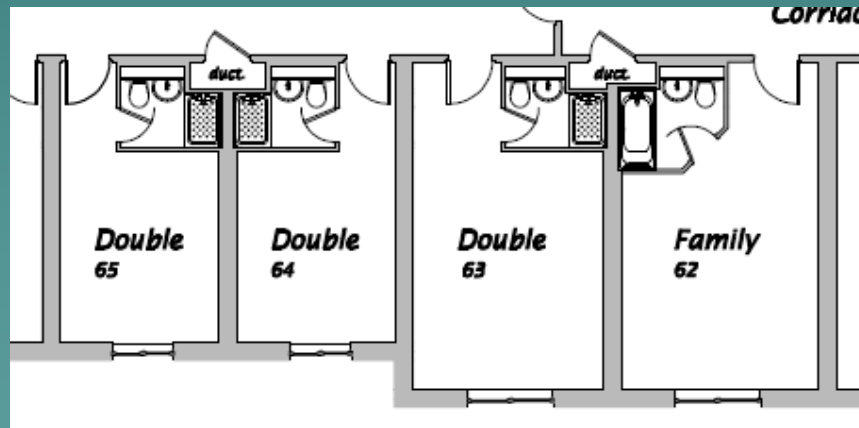
- ◆ Where novel or hybrid, non-RD constructions are used, or where there is doubt about compatibility between construction types, then it is important for the builder and/or architect to obtain professional and *independent* advice about acoustics at an early stage in the project.
- ◆ Acoustic consultants who are members of the Association of Noise Consultants (ANC), with 'Building Acoustics' in their statement of competence, have no interest in selling products and materials and can therefore offer independent design advice.
- ◆ Many ANC firms will also offer an inspection service and will be able to carry out sound insulation testing upon completion.

Where RD's can't be used to satisfy ADE.

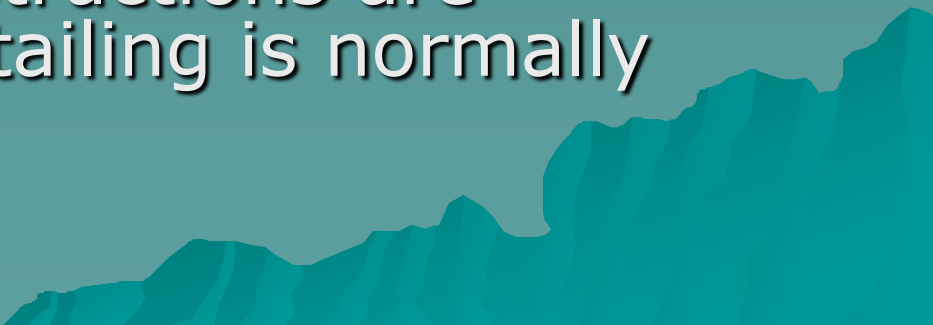
- ◆ Novel or hybrid construction methods
 - ◆ **Rooms for Residential Purposes.**
 - ◆ Refurbished houses and flats.
 - ◆ Schools.
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Rooms for residential purposes.

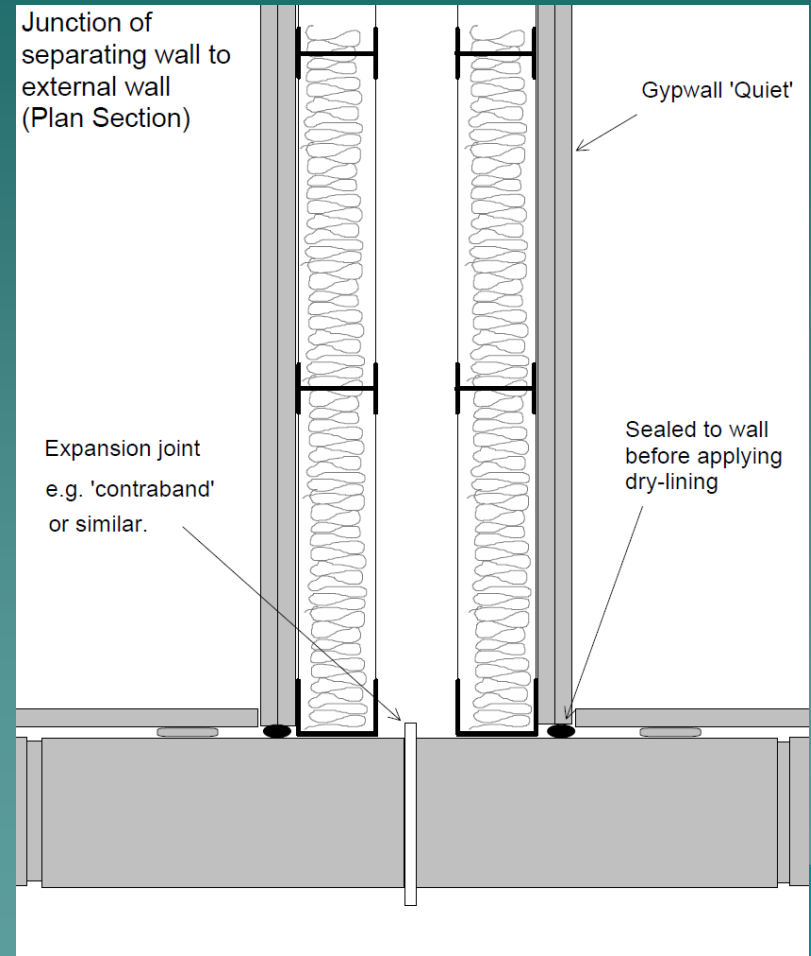
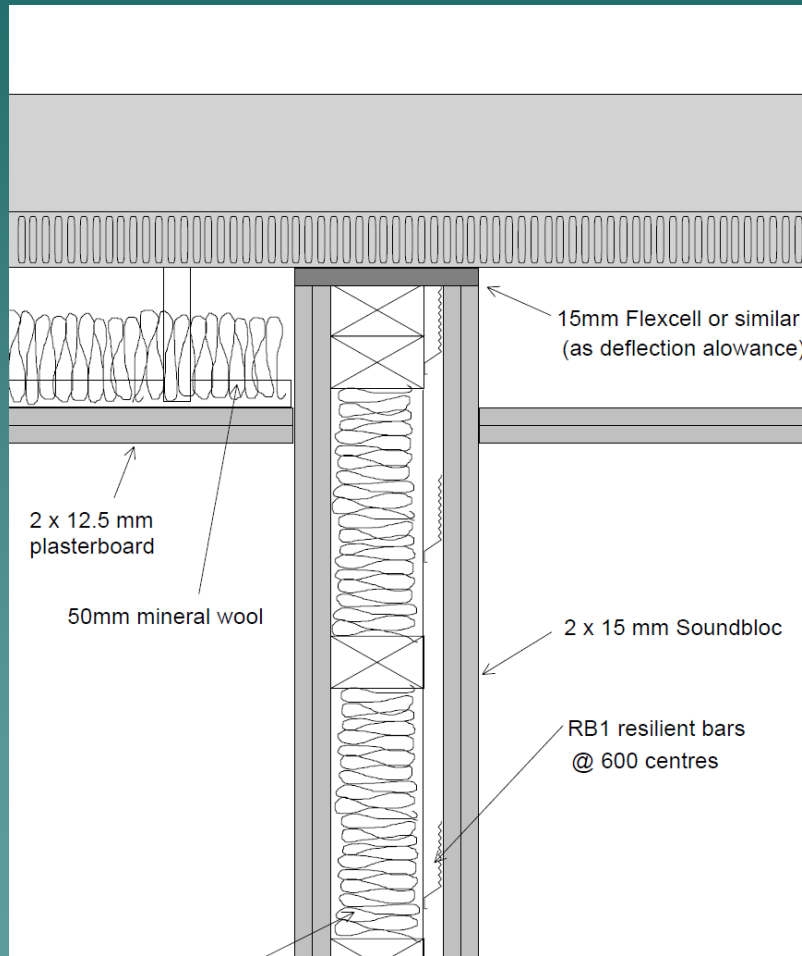
- ◆ Hotels
- ◆ Residential care homes
- ◆ Student accommodation



Rooms for residential purposes.

- ◆ Individual rooms are treated as 'dwellings' for the purpose of the building regulations (ADE) and require sound insulation tests on separating walls and floors.
 - ◆ Rooms have doors which open onto a common corridor or hallway.
 - ◆ Added complexity of service penetrations through walls and into corridors
 - ◆ RD's can't be used.
 - ◆ While 'standard' constructions are possible, bespoke detailing is normally required.
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- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, partially overlapping the text area.

Rooms for residential purposes



Rooms for residential purposes




Example of RD design (EFC-4) 'borrowed' for use in a RRP.

Without 'expert intervention', it can go horribly wrong!



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Refurbished houses and flats (conversions)

- ◆ Mills
- ◆ Warehouses
- ◆ Large houses
- ◆ Small houses
- ◆ Retail premises
- ◆ Pubs/Bars
- ◆ Churches/chapels



Buildings may be listed or
have conservation status!
RD's can't be used.

Refurbished houses and flats (conversions)

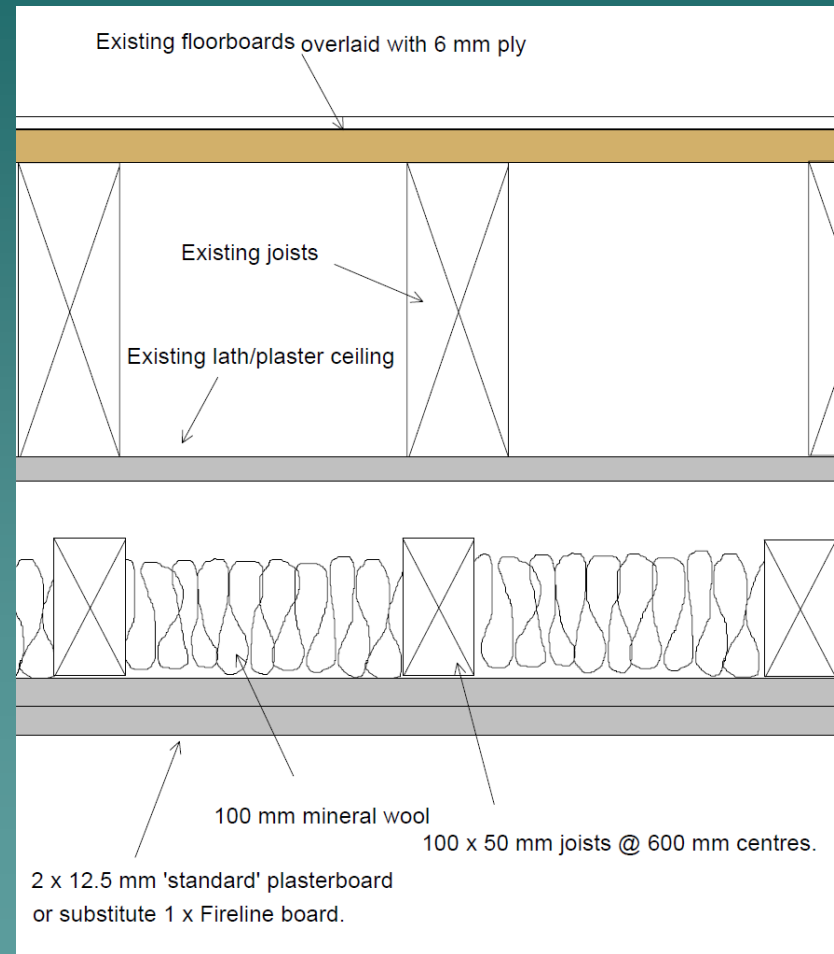
Most conversion projects have two things in common:

- a) Solid masonry external walls
- b) Timber joist floors.

- a) Is good as it means that flanking via external walls is not usually a problem.
- b) Is bad, as new separating walls may have to be constructed off these floors

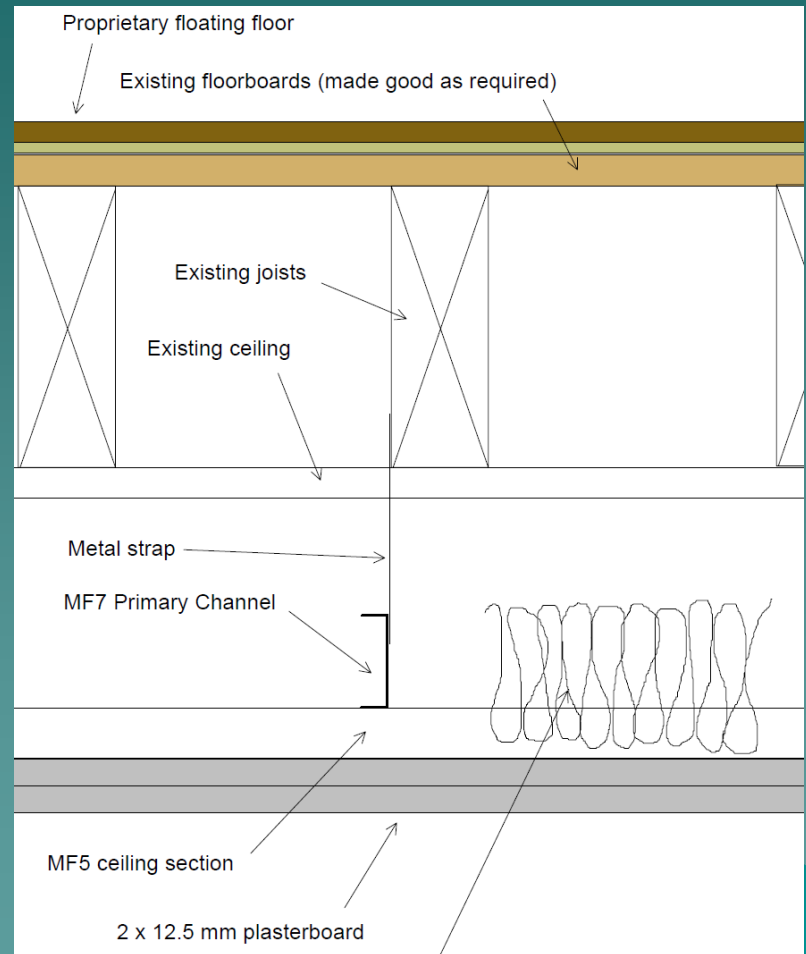
Refurbished houses and flats (conversions)

- ◆ Simplest project is splitting a two-storey single dwelling into 2 flats.
- ◆ Construct independent ceiling on timber joists.
- ◆ Make good floorboards and overlay with ply.

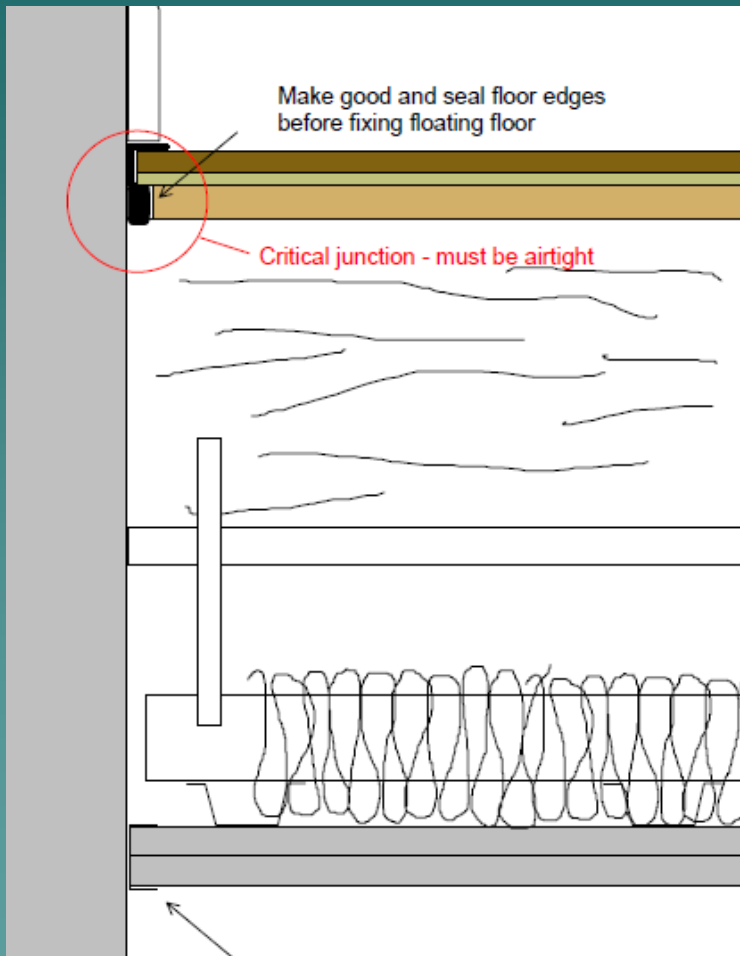


Refurbished houses and flats (conversions)

- ◆ Proprietary products and materials are sometimes helpful.
- ◆ This example uses a metal-framed suspended ceiling and a floating floor treatment.

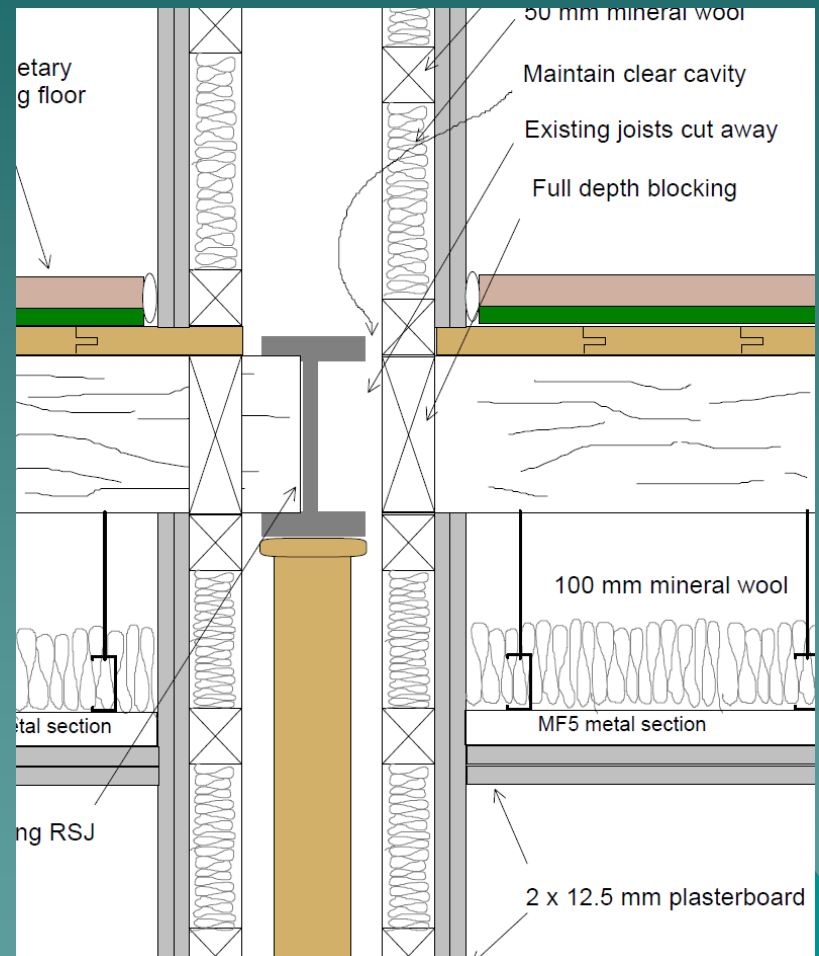
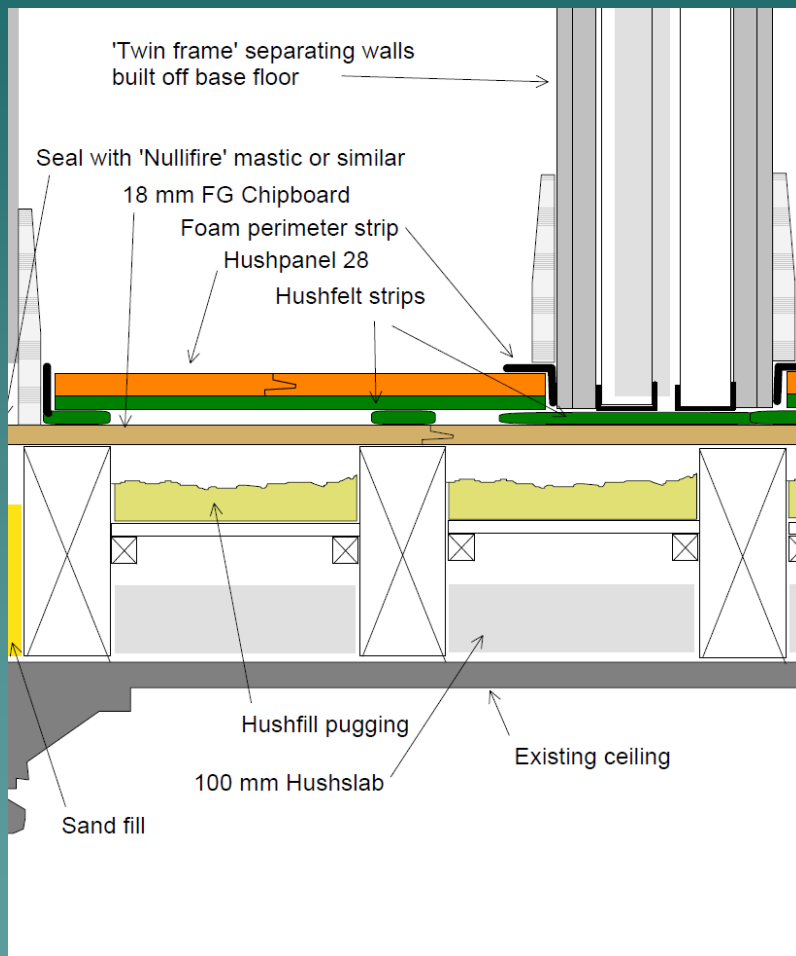


Refurbished houses and flats (conversions)



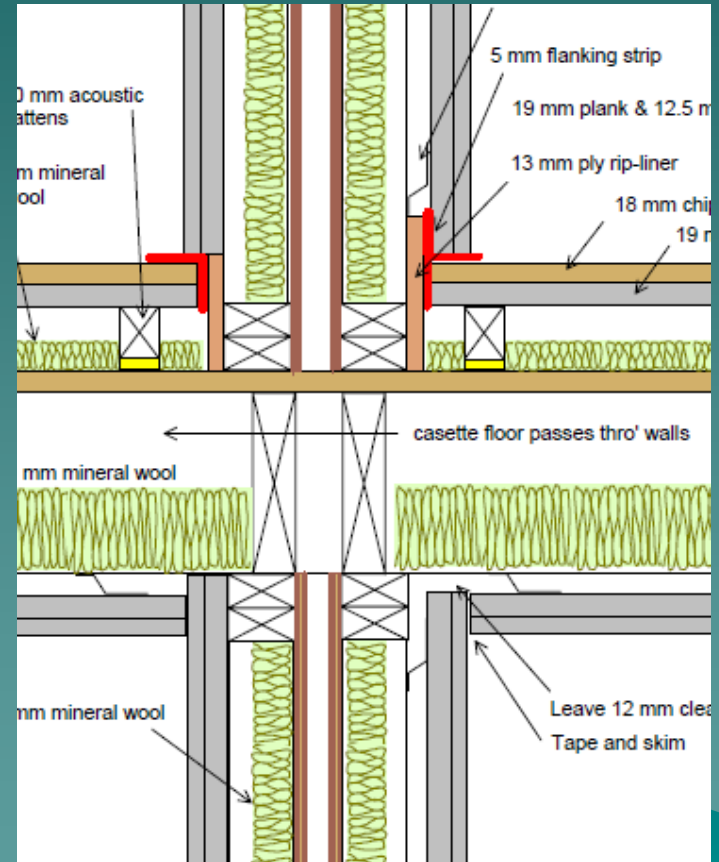
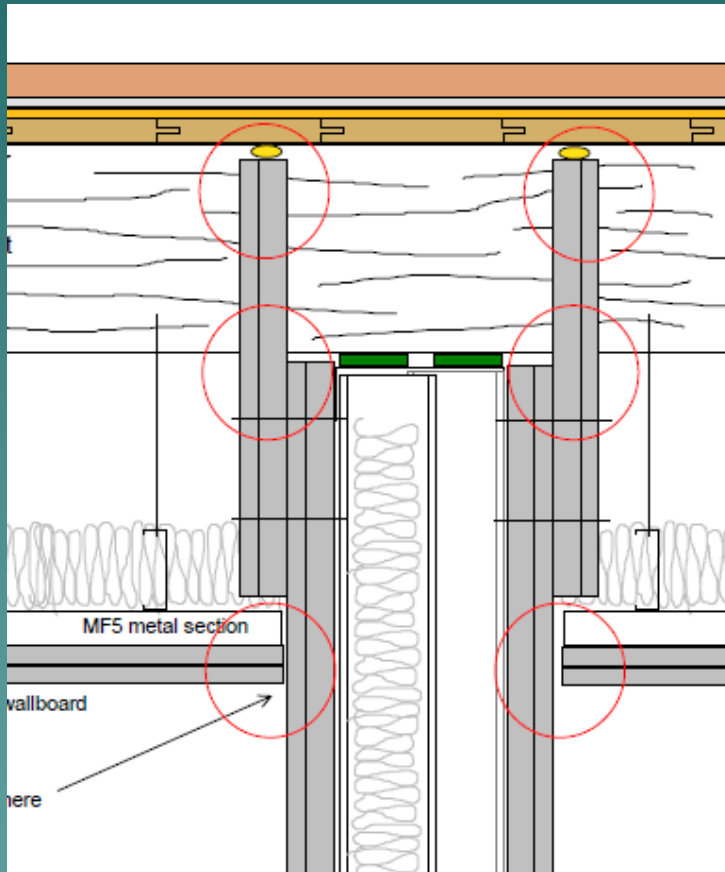
- ◆ Junction details are very important.
- ◆ Solid (e.g. 9" brick) walls are usually straightforward but cavity walls will require independent linings.

Refurbished houses and flats (conversions)



Some situations demand more complex solutions!

Refurbished houses and flats (conversions)

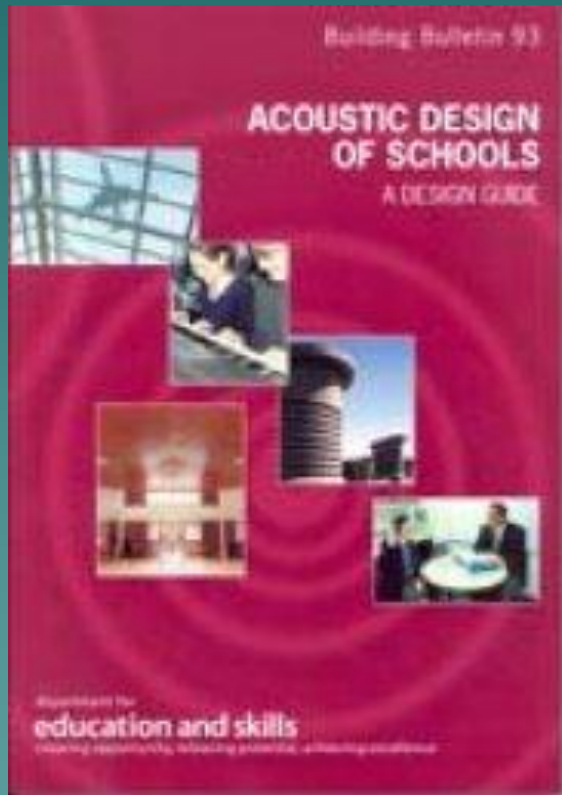


Some situations demand more complex solutions!

Where RD's can't be used to satisfy ADE.


- ◆ Novel or hybrid construction methods
- ◆ Rooms for Residential Purposes.
- ◆ Refurbished houses and flats.
- ◆ **Schools.**

Schools.

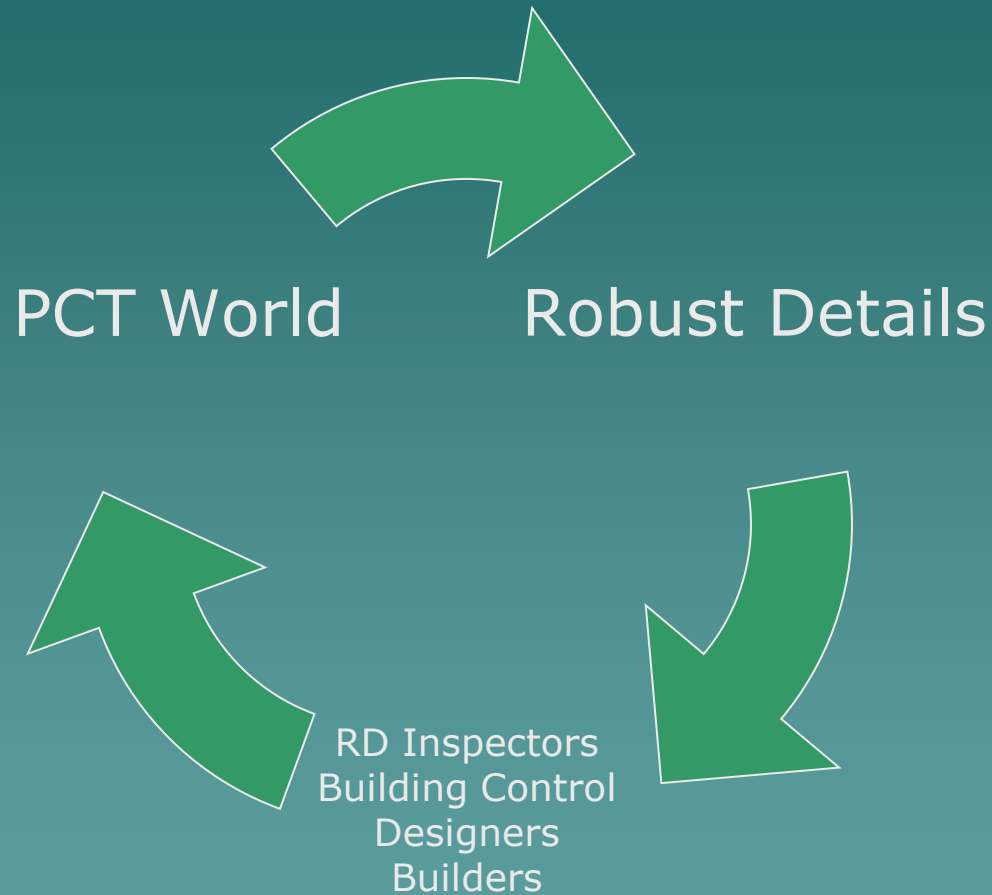


- ◆ Regulation E4 of Building Regulations.
- ◆ Performance requirements, which are mandatory, are specified in Building Bulletin 93, which also contains design guidance.
- ◆ BB93 is currently being amended but is 'on hold' until further notice.

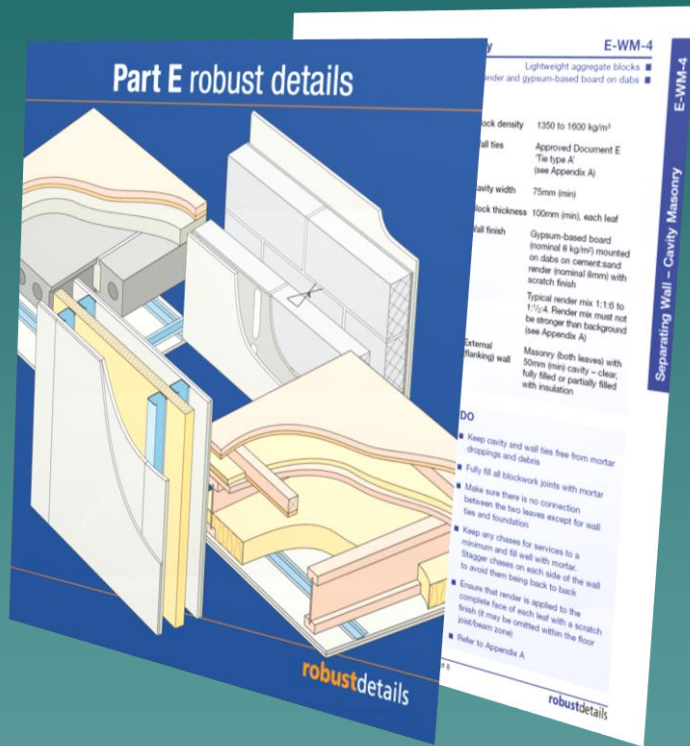
Summary so far

- ◆ RD constructions do not require sound testing.
 - ◆ Novel or hybrid constructions require careful design and sound testing of one or more elements (floor or wall).
 - ◆ RD's can't be registered for rooms for residential purposes, conversions and schools.
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Knowledge Transfer



In praise of the RD Handbook




- ◆ Probably the most important single document on domestic building acoustics, design and practice, this decade.

Role of Acoustic Consultant

- ◆ For any non-RD design, it is recommended to seek expert advice from a suitably qualified acoustic consultant who is experienced in building acoustics design.
- ◆ Most members of the Association of Noise Consultants (ANC) have experience and expertise in this field.
- ◆ Can also assist in other, related areas such as site surveys for planning and noise (and vibration) impact assessments.

Noise and vibration assessments for planning consent.

- ◆ PPG24 (eligibility for consent determined according to NEC's A, B, C and D)
 - ◆ BS 8233 (internal noise levels)
 - ◆ BS 6472 (vibration)
 - ◆ BS 4142 (noise from industry)
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- A stylized silhouette of a mountain range in a teal color, located in the bottom right corner of the slide.

Typical PPG 24 survey?



Typical PPG 24 survey (well almost typical!)



Sometimes vibration is an issue



Here's why!



It turned out that vibration was not an issue but a scheme of envelope insulation, secondary glazing and mechanical ventilation was included in the consultant's report

About the ANC (Benefits to clients)

All ANC members.....

- ◆ employ at least 50% of consulting staff who are qualified acousticians and members of the Institute of Acoustics at MIOA Grade, or higher.
- ◆ have demonstrated an appropriate standard of professional and technical competence through a rigorous application procedure and through annual audit.
- ◆ are required to abide by the Association's Rules and Bylaws which include a complaints procedure.
- ◆ carry an appropriate level of Professional Indemnity Insurance.
- ◆ have no significant financial interest in the manufacture or sale of acoustic products.



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