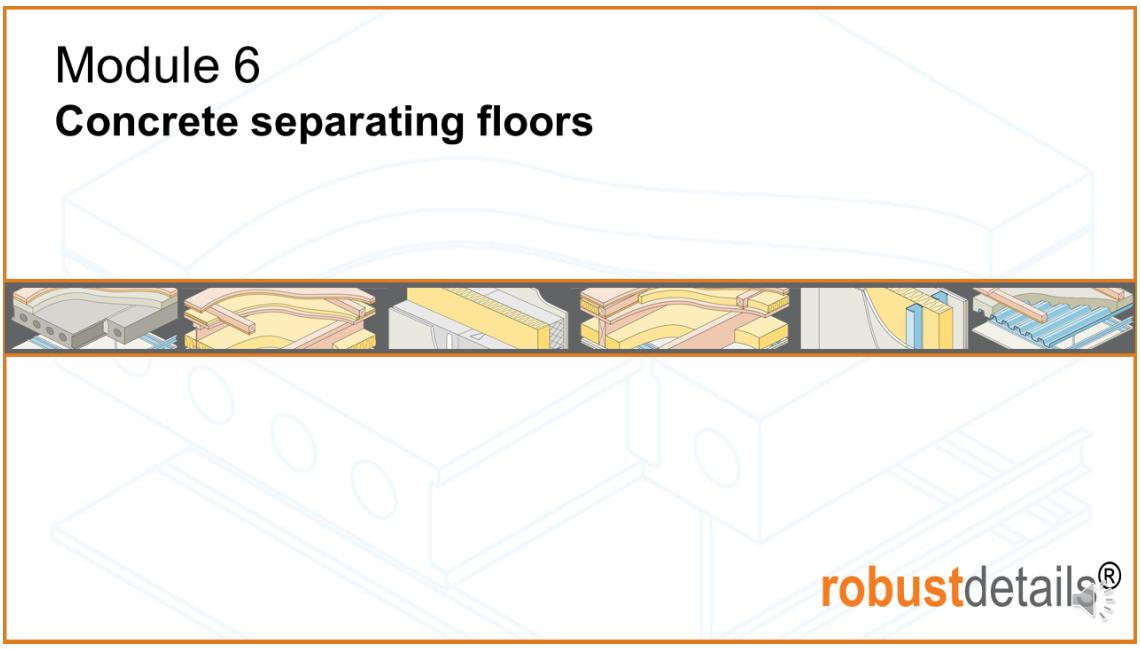
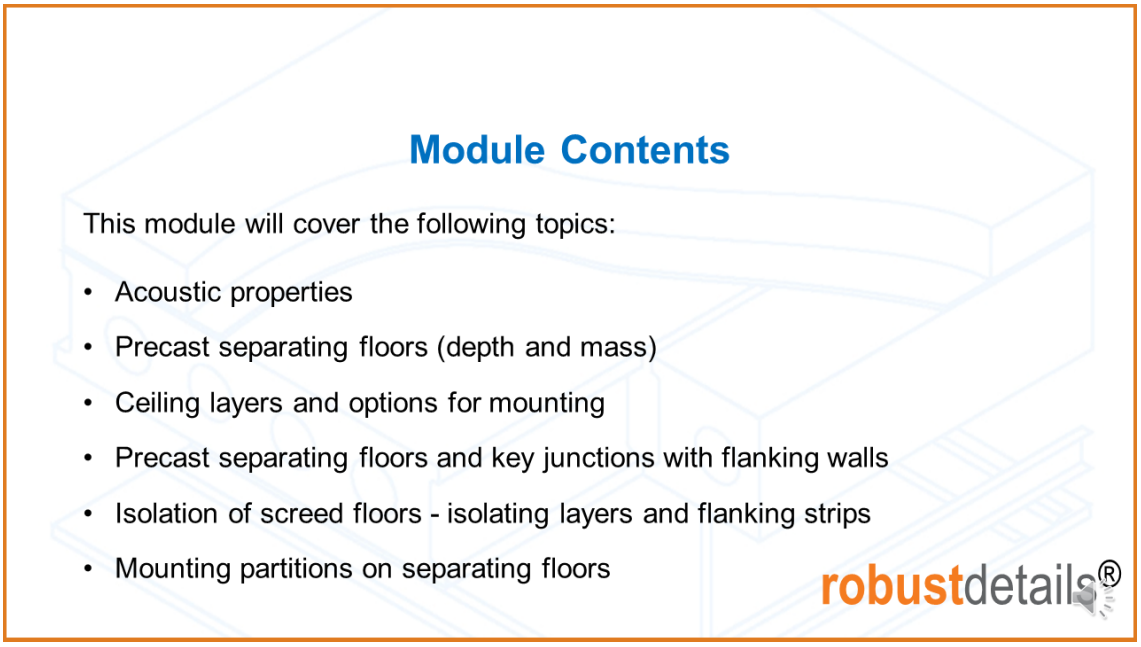
Slide 1



Welcome to Module 1 – Concrete separating floors

Additional notes:

Slide 2

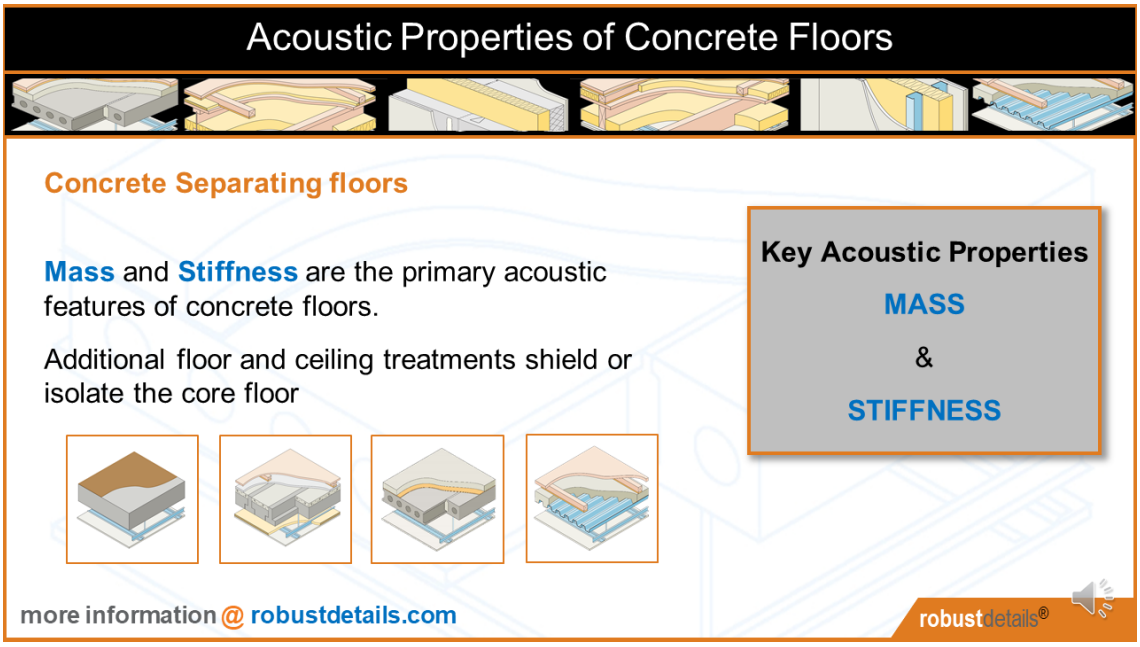


This Module will cover the following topics:

- Acoustic properties
- Precast separating floors (depth and mass)
- Ceiling layers and options for mounting
- Precast separating floors and key junctions with flanking walls
- Isolation of screed floors - isolating layers and flanking strips
- Mounting partitions on separating floors

Additional notes:

Slide 3



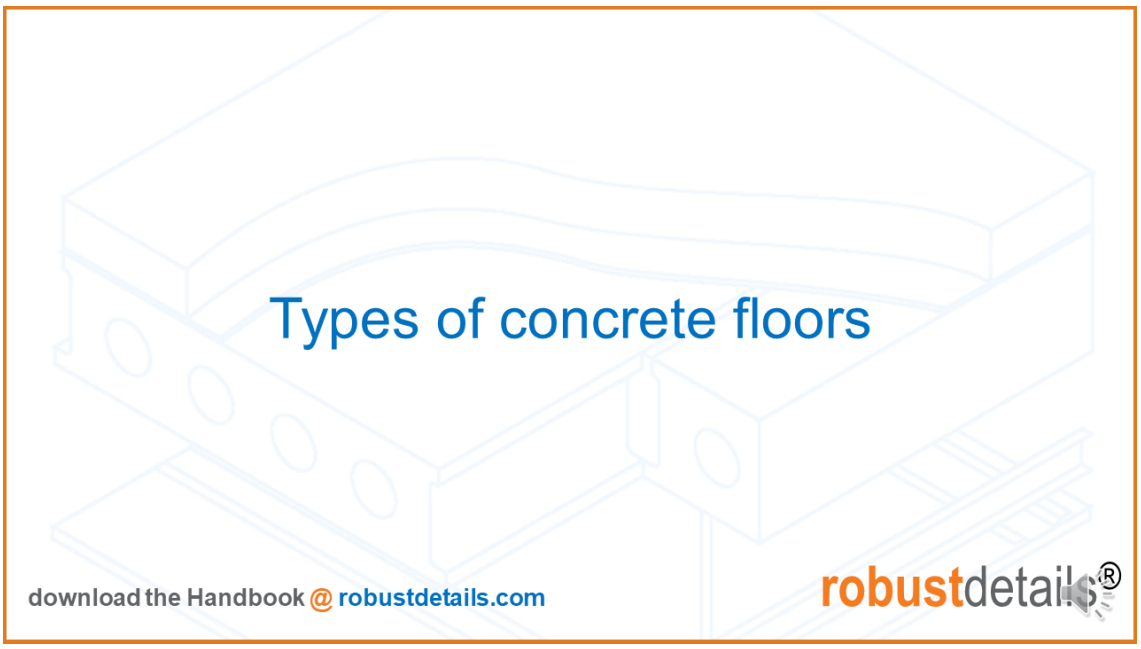
MASS and STIFFNESS are the primary acoustic features of concrete floors.

The high density of concrete also provides ‘high acoustic damping’ (this is when vibration energy within the structure dissipates within the material – known as a material’s Internal Loss Factor)

Concrete floors can have a variety of acoustic floor treatments and ceiling treatments which helps shield or isolate the core floor and can give additional damping and resilience.

Additional notes:

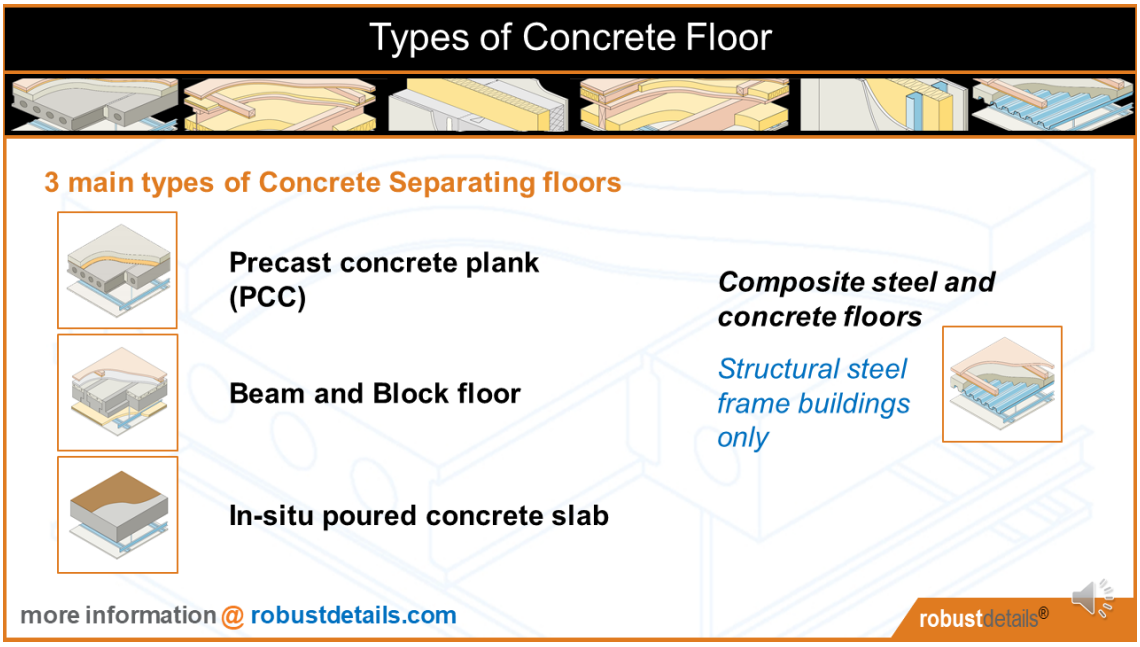
Slide 4



Read slide

Additional notes:

Slide 5



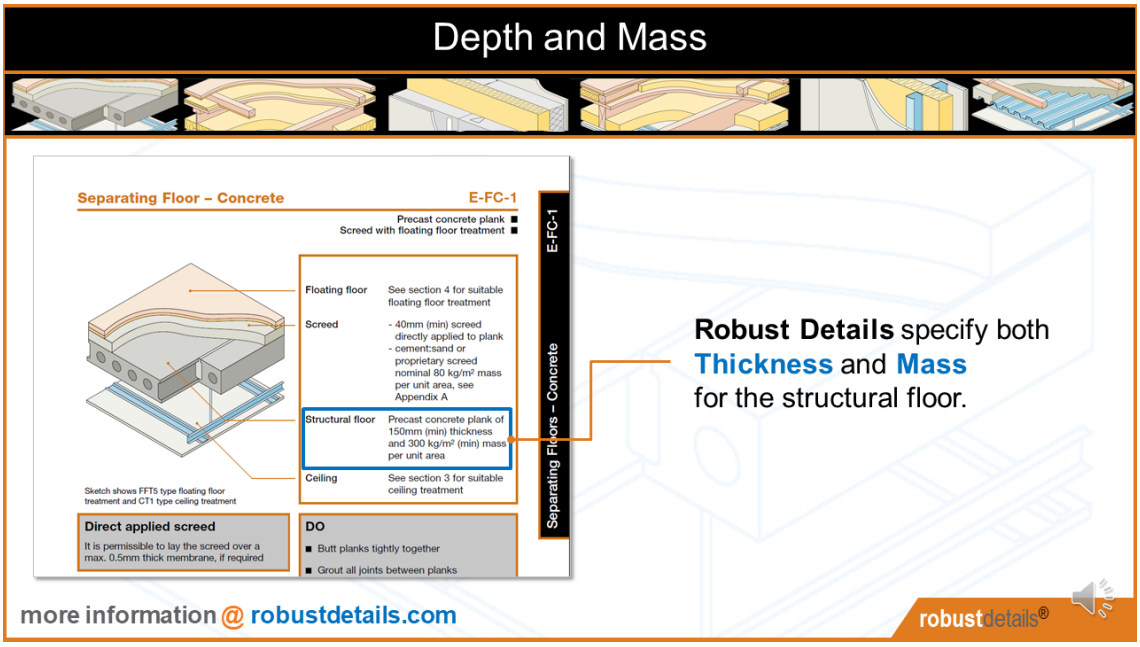
There are 3 types of concrete floor that are in general use in Robust Details. These are: <as slide>

There's also the steel-concrete composite floor. This is for structural steel frame buildings only, and is relatively low-use.

This module will concentrate on the precast floors – so that's the plank; and beam & block floors.

Additional notes:

Slide 6



Robust Details specify both Depth & Mass in order to give the required sound insulation performance.

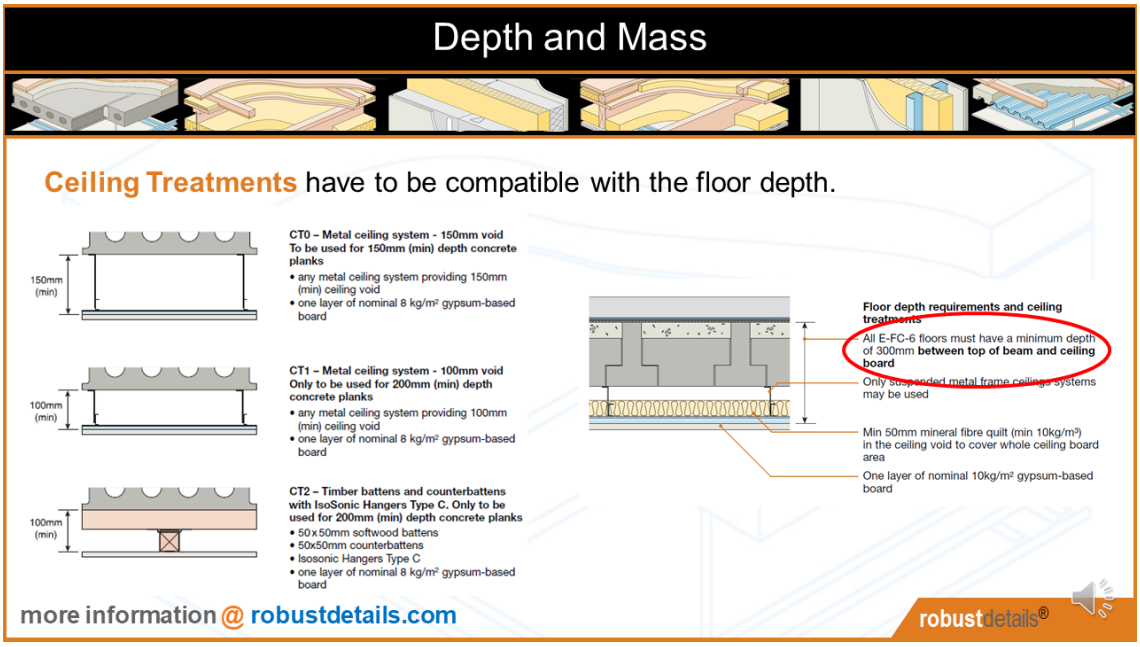
Increasing the depth OR thickness results in increased acoustic stiffness and rigidity;

Increasing mass improves low frequencies sound insulation performance; reduces the ability for the floor structure to flex; and increases acoustic damping in the floor.

The required mass and thickness of the floors, along with any floor or ceiling treatments, is clearly identified on Page 1 of all of the concrete floor types

Additional notes:

Slide 7

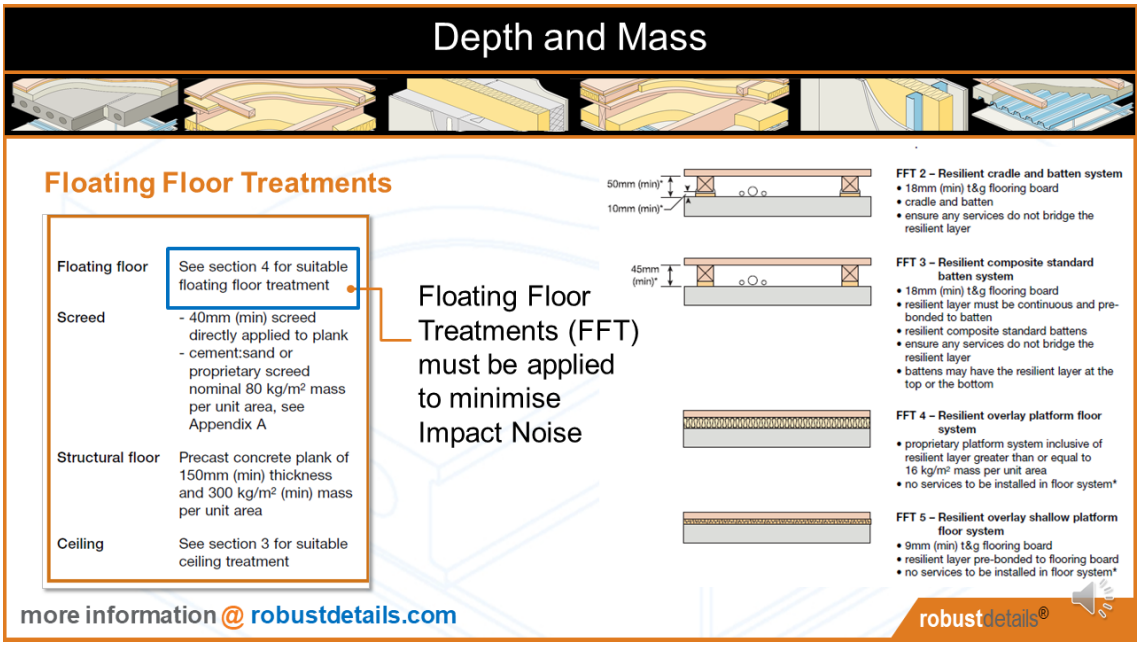


Also a Ceiling treatment has to be considered to give isolation and shield airborne and impact sound transmission. So any noise energy in the structural floor is not directly transmitted into the flat below
The general rule that Robust Details use, is that there has to be a minimum 300mm separation between where noise energy enters the structural floor – i.e. the top surface – and the ceiling lining
So a 150 plank needs a 150 void; and a 200 plank needs a 100 void.
Adding mineral wool insulation increases the acoustic absorption within the ceiling cavity.

The Beam and block floors just specify the 300mm dimension.
Most floors will specify a metal frame, or MF ceiling, but on certain floors, specialist propriety products are also available. Also be aware that the ceiling board thickness and weight can vary, so make sure this matches the chosen specification.

Additional notes:

Slide 8



Impact noise, from people walking in the apartment or flat above, needs to be addressed by using a floating floor treatment, or FFT.

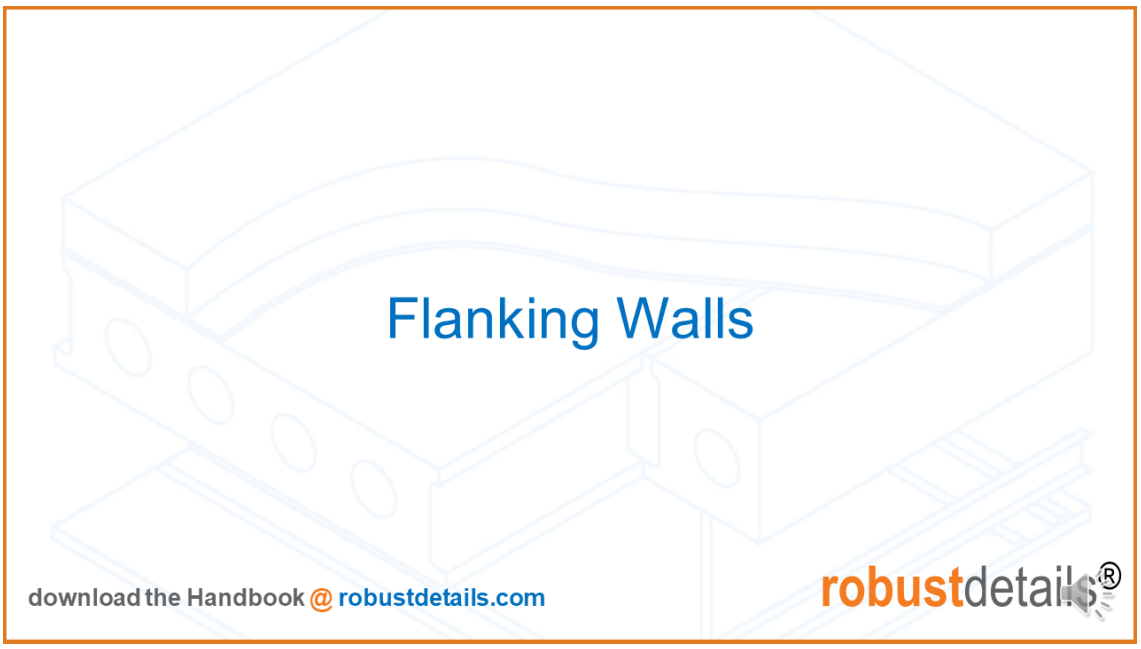
Any impact noise energy needs to be contained within the FFT – and resilient material underneath and around the FFT stops the impact noise transfer into the floor and surrounding structures.

Every RD construction has its tested floor treatments compatible with the floor

Underfloor heating is allowed in most of the FFTs, and there will be description in the Robust Detail where this applies.

Additional notes:

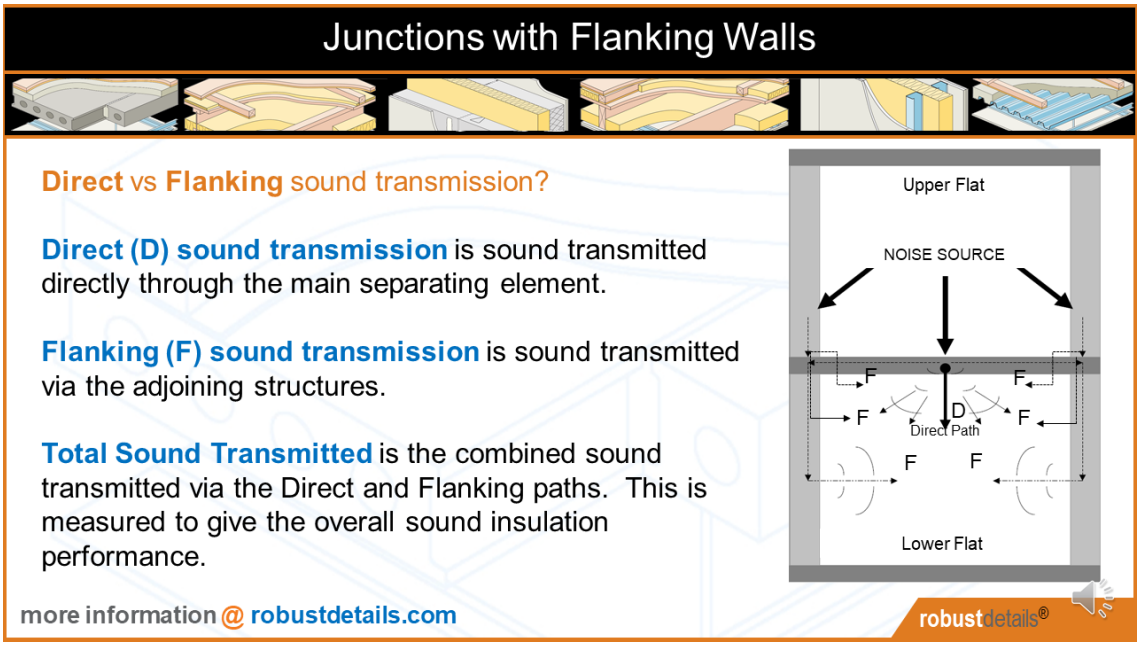
Slide 9



Read slide

Additional notes:

Slide 10



What is the difference between Direct and Flanking sound transmission?

Direct (D) sound transmission is when sound is transmitted directly room to room through the main separating floor.

Flanking (F) sound transmission is when sound is transmitted via the adjoining structures, for example the inner leaf and separating wall leafs.

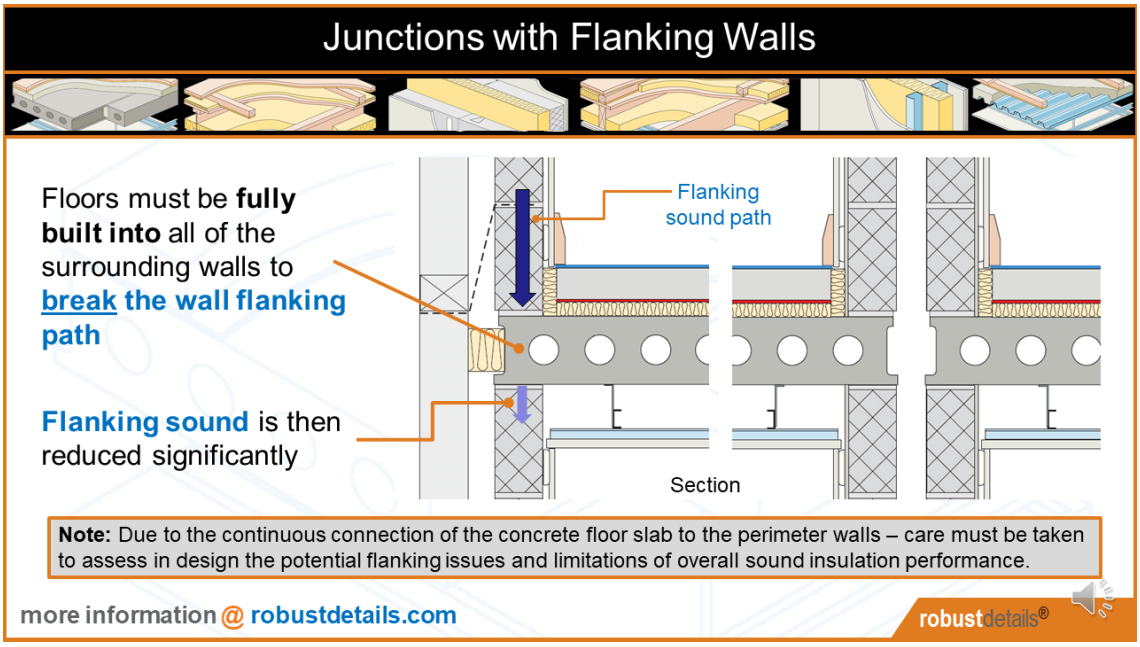
Total Sound Transmitted is the combination of Direct + Flanking sound

For separating floors there is typically ‘1’ direct path and ’12’ flanking paths (3 per wall/floor junction x min 4 room perimeter walls) and these 13 primary sound pathways combine to give the overall sound insulation performance.

Therefore, flanking sound is just as important as the separating element itself.

Additional notes:

Slide 11



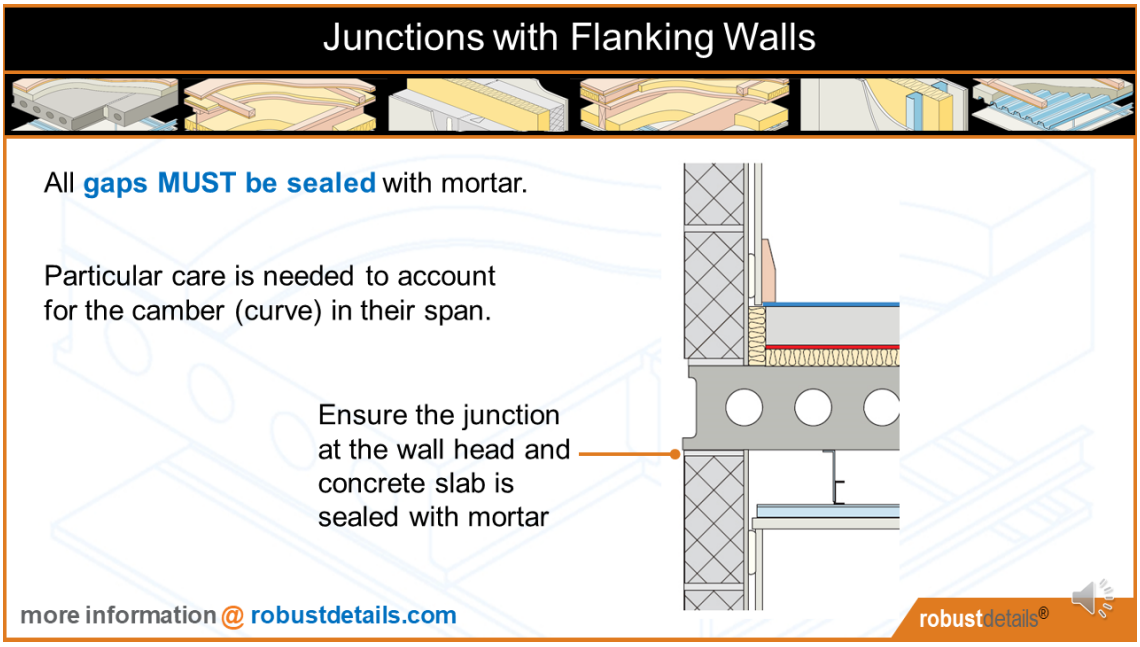
Sound energy can get into the structure, and flank around the edge of the floor.

To minimise this, the separation MUST be built into the perimeter walls. This gives a complete break vertically in the wall leaf, which interrupts the vertical transmission flanking path.

This is one of the reasons why timber separating floors cannot be used in masonry walls. The joists can be on hangers, but even when built into the wall, they don't fully break or divide the wall leaf and sound is able to easily transmit down the wall and past the joists.

Additional notes:

Slide 12



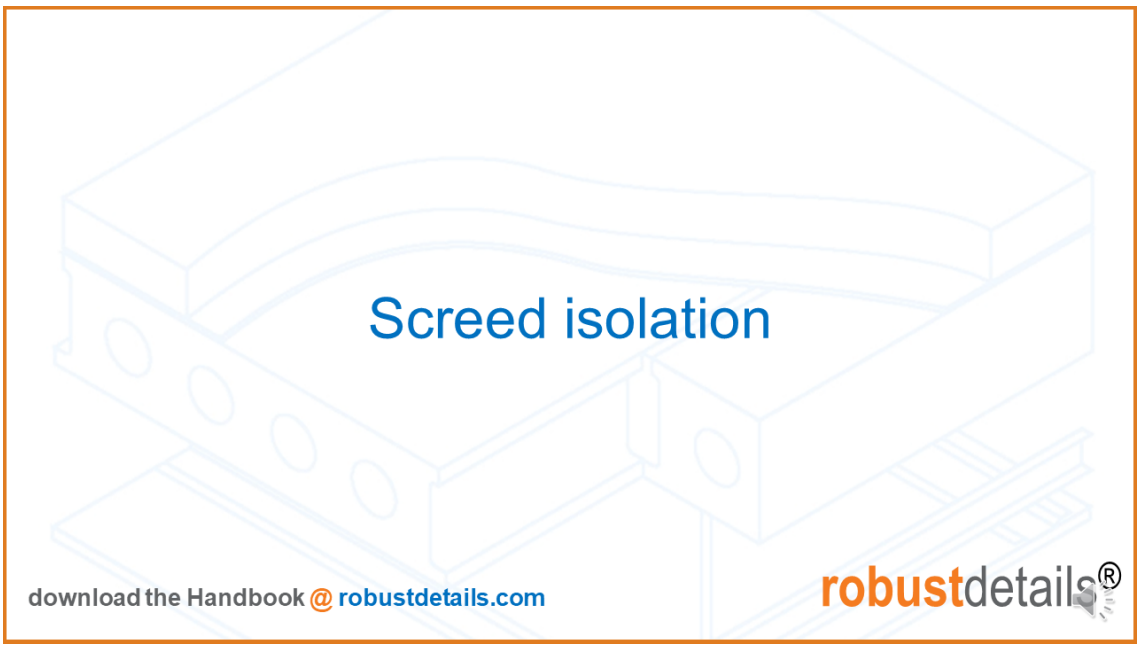
Where concrete floor slabs are built and rest on the wall head no gaps should remain and the joint MUST be sealed with mortar.

Precast concrete floor slabs often have a camber (curve) in their design. This can leave a gap between the wall head and the underside of the floor, particularly at the mid span of the slab.

This gap MUST be sealed with mortar to prevent sound leakage.

Additional notes:

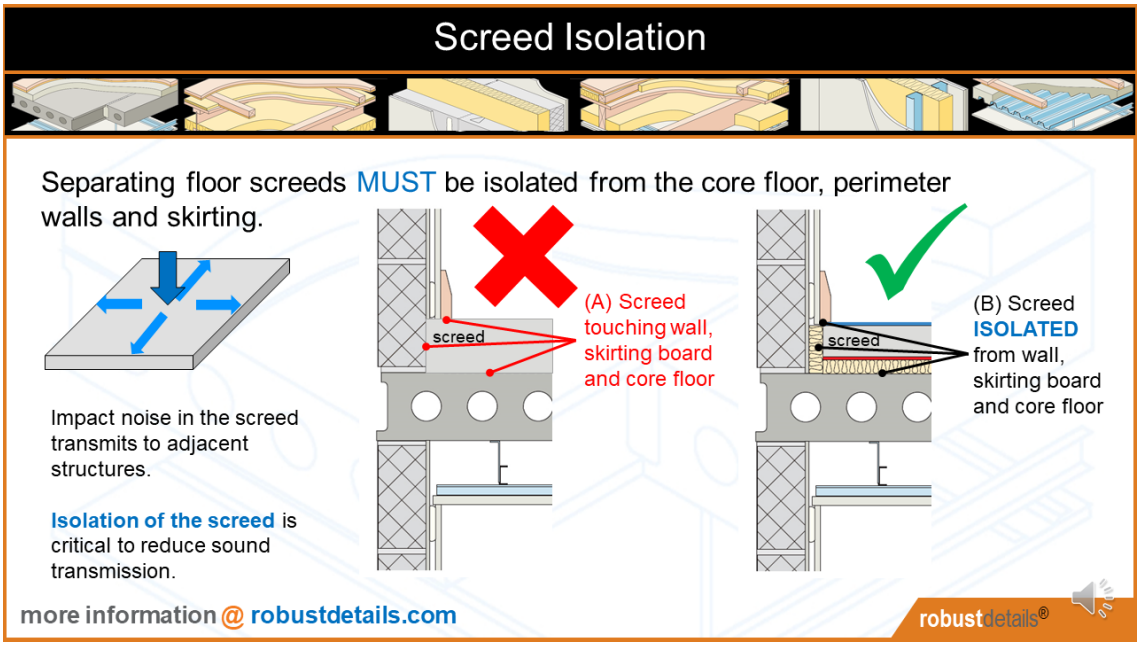
Slide 13



Read slide

Additional notes:

Slide 14



Separating floor screeds MUST be isolated from core floor and perimeter walls and skirting

Impact noise from footfall entering the screed rapidly transmits to adjacent structures. Hence isolation to reduce sound transmission and flanking noise from the screed into adjoining walls and core floors is VERY important.

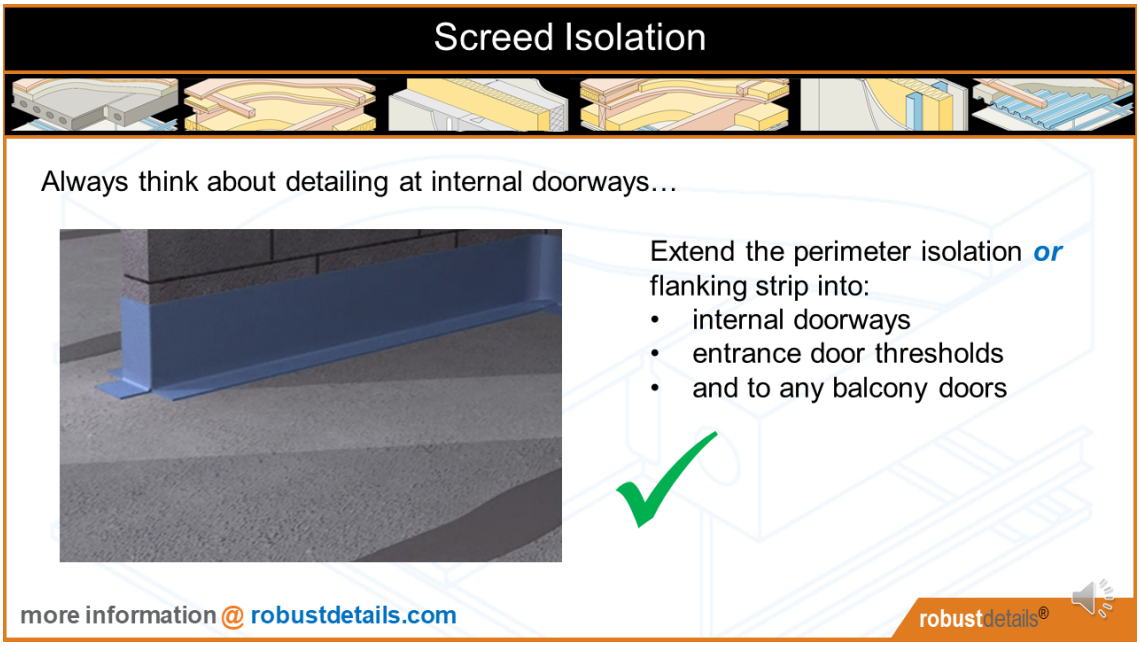
Figure (A) shows the screed **incorrectly installed** on a separating floor. There is NO isolation and the screed touches the core floor slab, perimeter walls and the skirting board.

Figure (B) shows the **correct installation** with all edges of the screed isolated so it does NOT come into contact with perimeter wall, core floor or skirting.

Good design detailing and specification is paramount – to reduce errors on sites.

Additional notes:

Slide 15



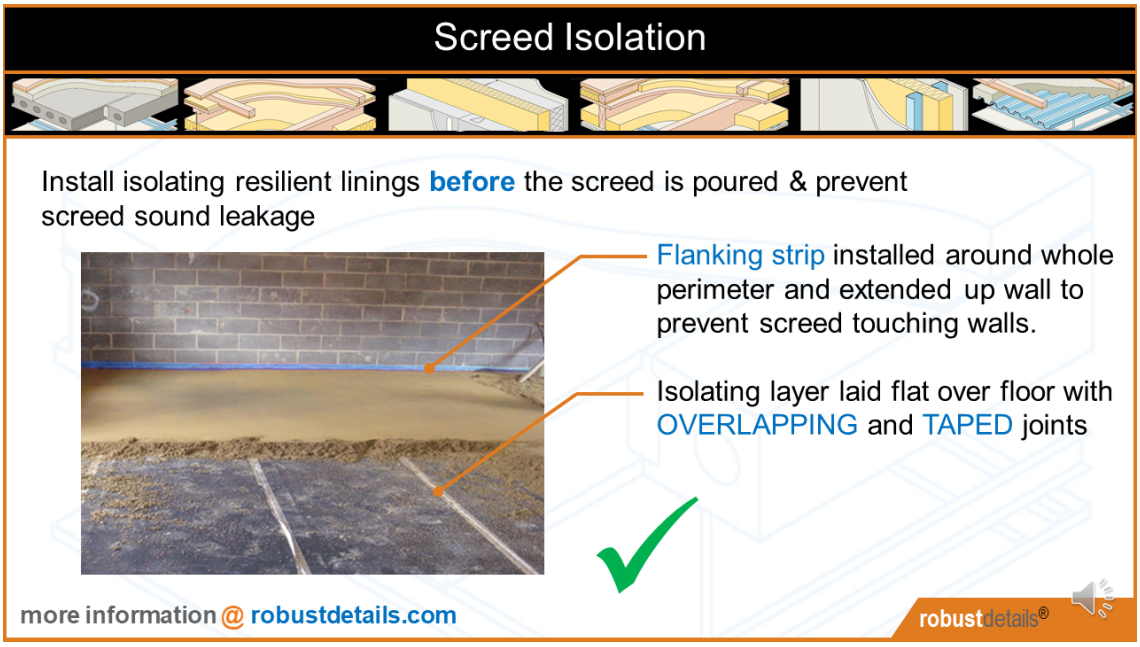
As mentioned earlier, impact noise energy must be contained within the FFT.

In order to achieve this with floating screeds, the edge isolation must be provided, and be continuous for the whole perimeter of the floating screed – including around doorways.

The animations found on our website that deal with these floors show the extent of the flanking strip.

Additional notes:

Slide 16

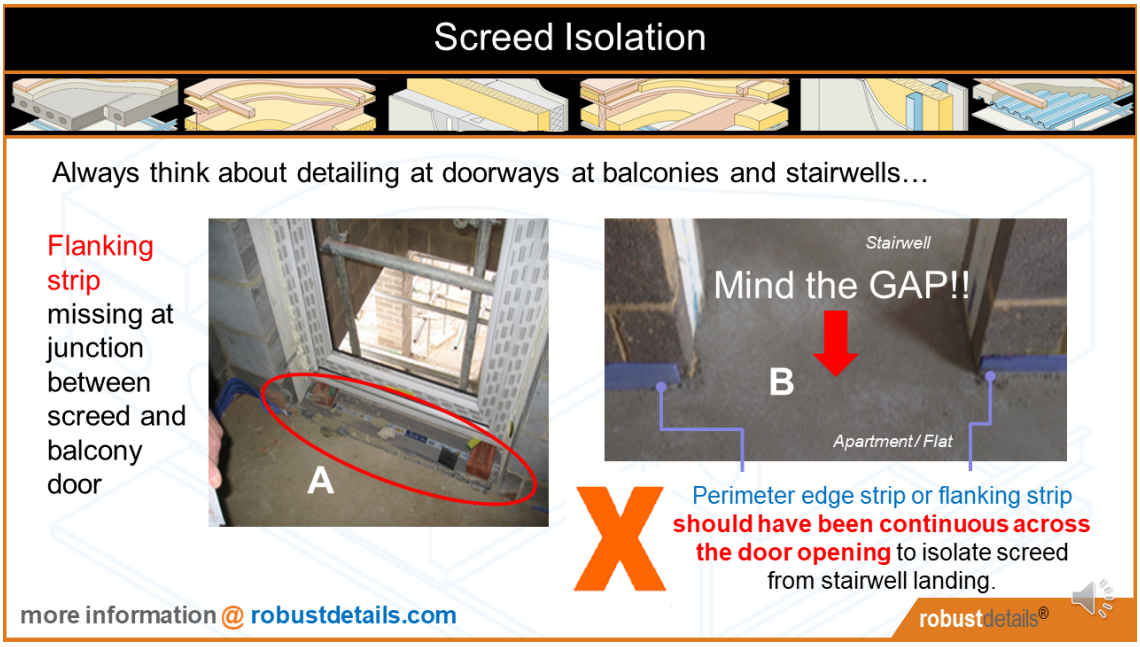


The resilient system, comprising of the resilient layer and flanking edge strips, must be fully installed and secured before the screed goes down

Overlapping and taping the joints guards against the material moving during the screeding process. If it does move, the screed can get into any gaps that are formed, and will create a flanking path.

Additional notes:

Slide 17



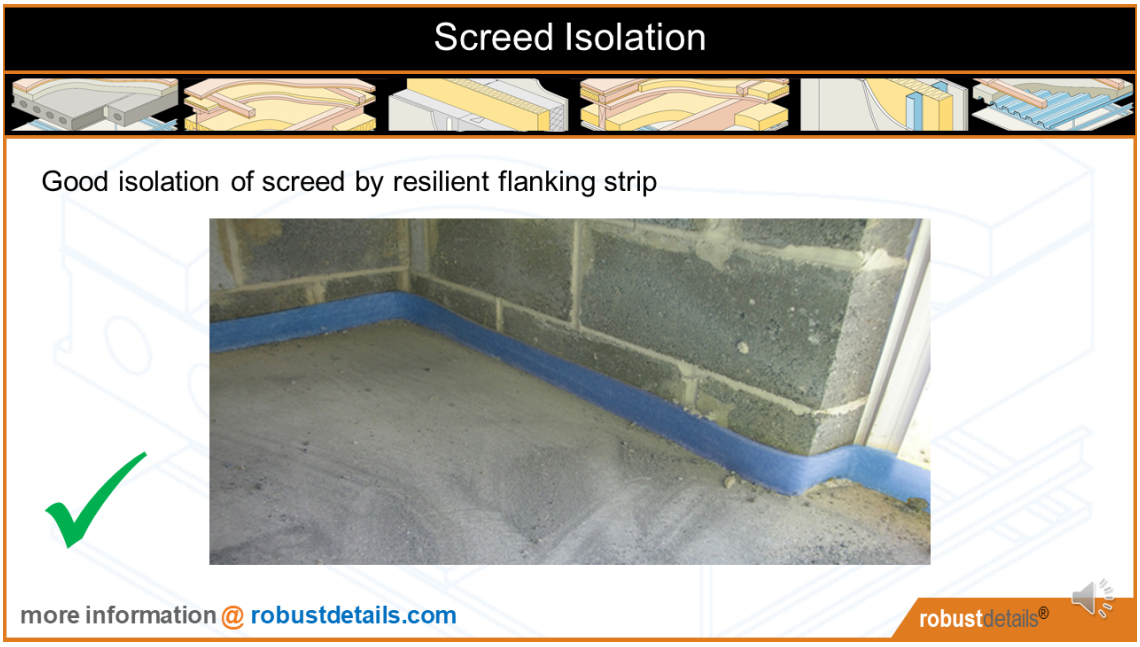
Unfortunately, these major errors can still happen on some sites.

In picture (A) the flanking strip is missing at junction between screed and balcony door. Sound and vibration will now be able to transmit into the block walls and door cill.

In picture (B) the screed has been allowed to connect and touch directly through to the common stairwell landing of the flats and also comes into contact with the block walls.
The purple perimeter edge strip or flanking strip should have been continuous across the door opening to isolate the screed from the stairwell landing.

Additional notes:

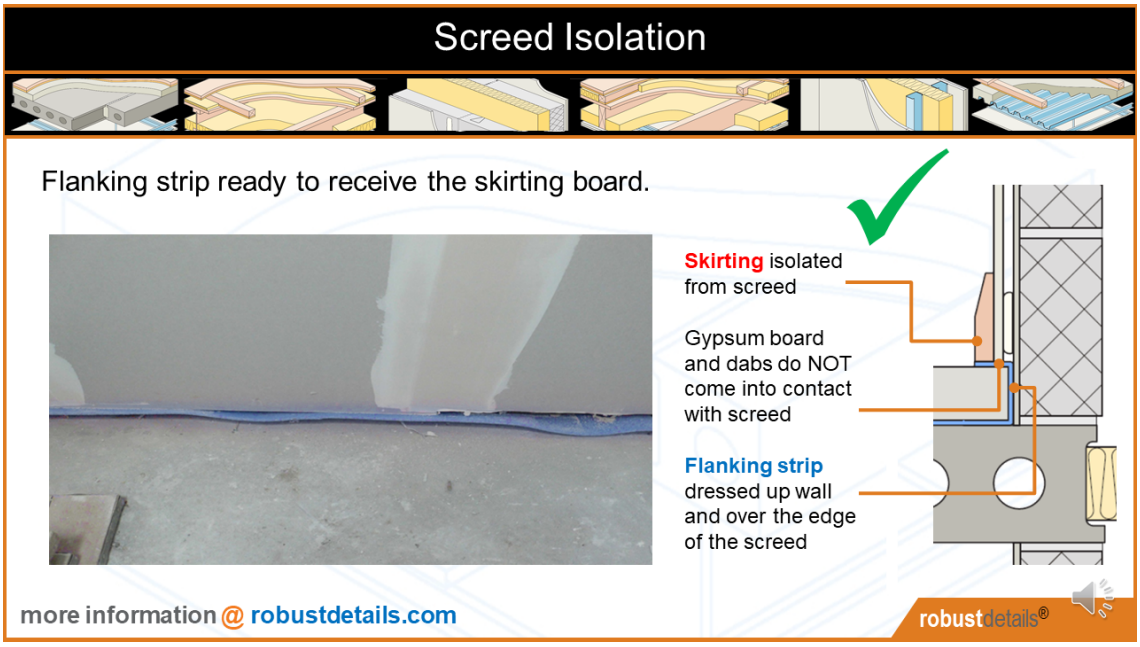
Slide 18



Flanking strip properly installed around the perimeter – just remember to fold it down before applying the wall finishes.

Additional notes:

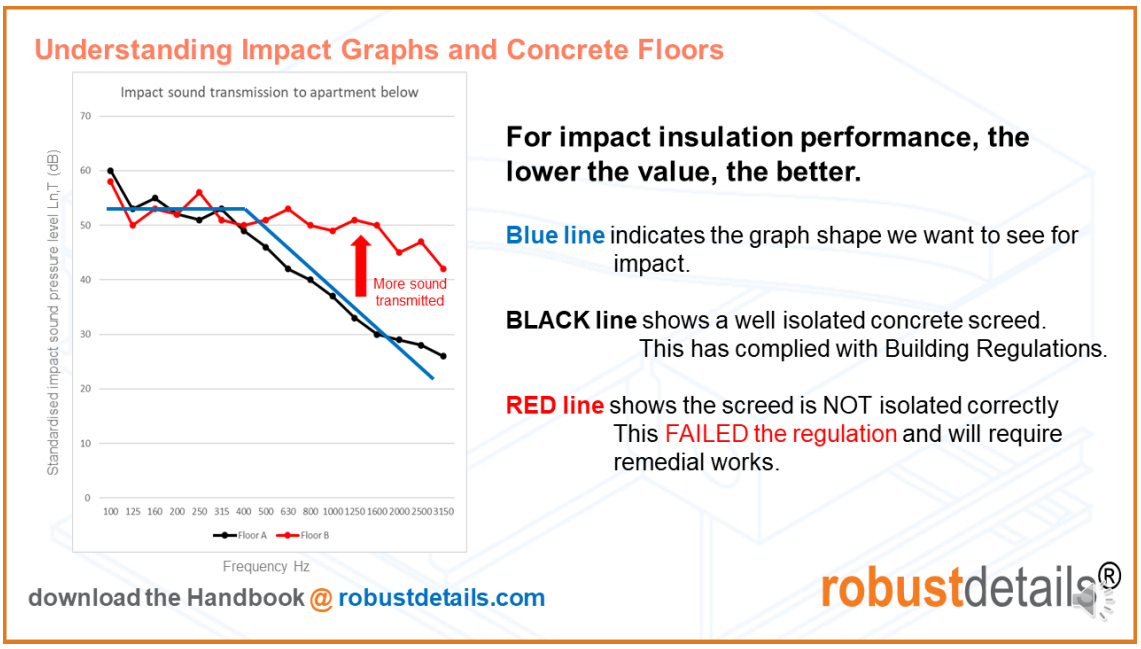
Slide 19



Resilient flanking strip must be dressed up the edge and over top of floating screed. This will isolate the screed from wall linings; and when the skirting board is affixed to the wall, it will sit above the flanking strip – and not on the screed.

Additional notes:

Slide 20



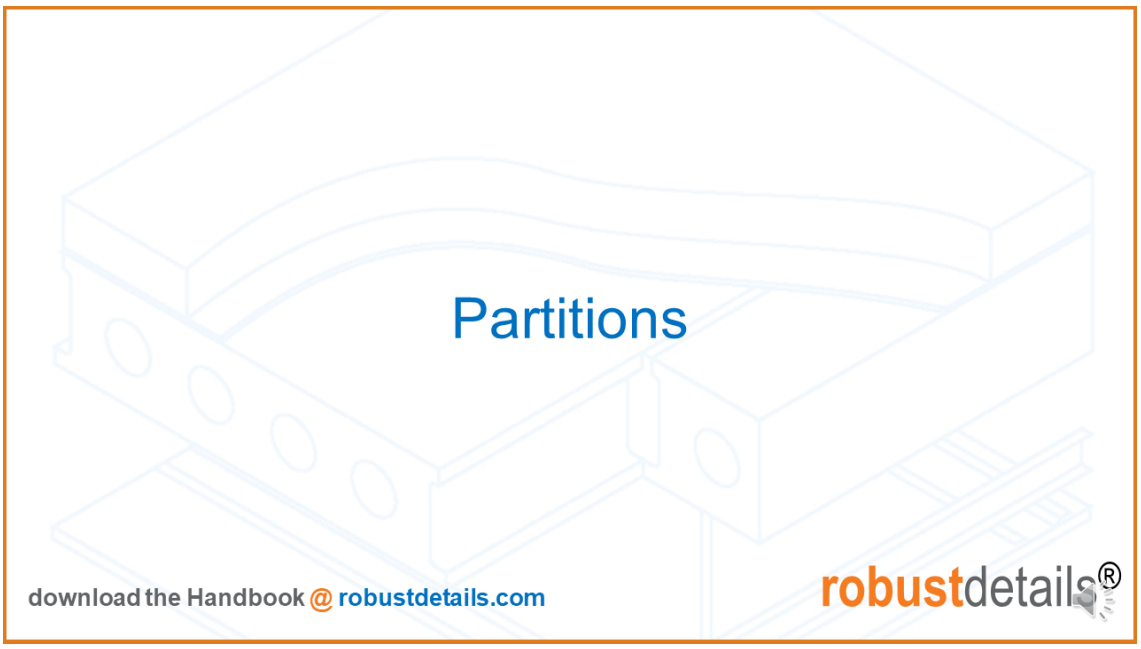
As mentioned in previous modules - for impact sound insulation – we measure the amount of impact noise transmitted from a standard tapping machine (Y-axis) for a range of frequencies 100Hz to 3150Hz (X-axis). The lower the value the better the impact insulation performance. The Blue line gives an indication of the type of shape we want to see for an impact graph.

The BLACK line shows a well isolated concrete screed and as frequency rises from 250 Hz onwards the graph tapers down and the amount of sound (in decibels) being transmitted is reducing. This has complied with regs.

The RED line shows where the screed is NOT isolated correctly and has come into contact with the concrete core floor and perimeter block walls. Lots of impact noise is able to transmit across many frequencies. This has FAILED the regulation and will require remedial works before plot completion.

Additional notes:

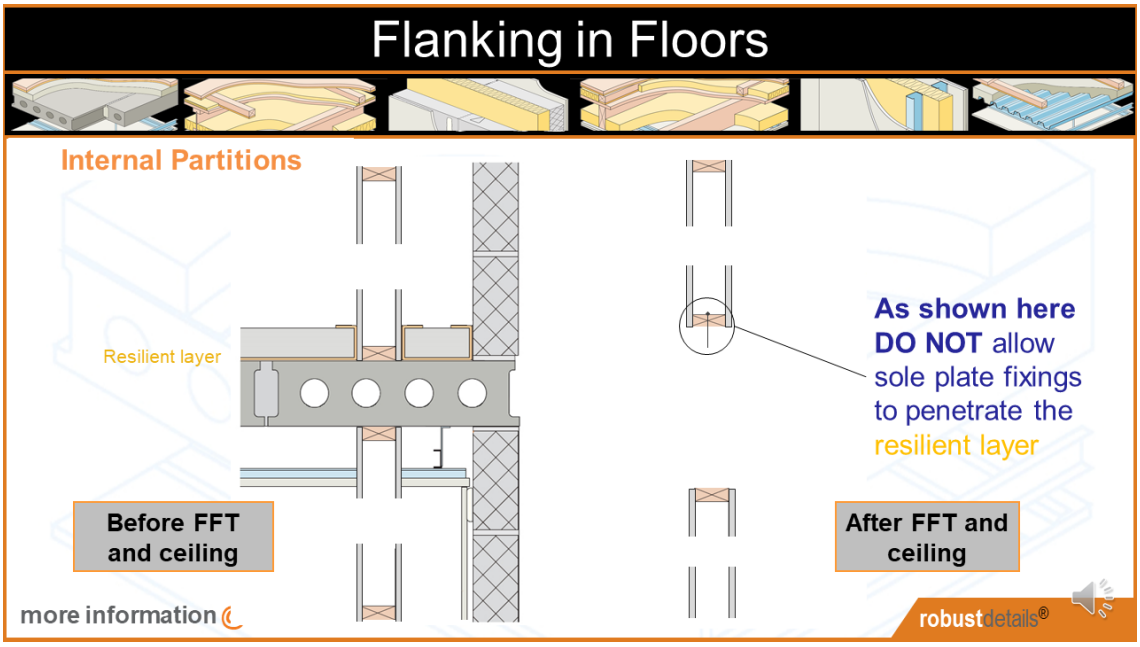
Slide 21



Read slide

Additional notes:

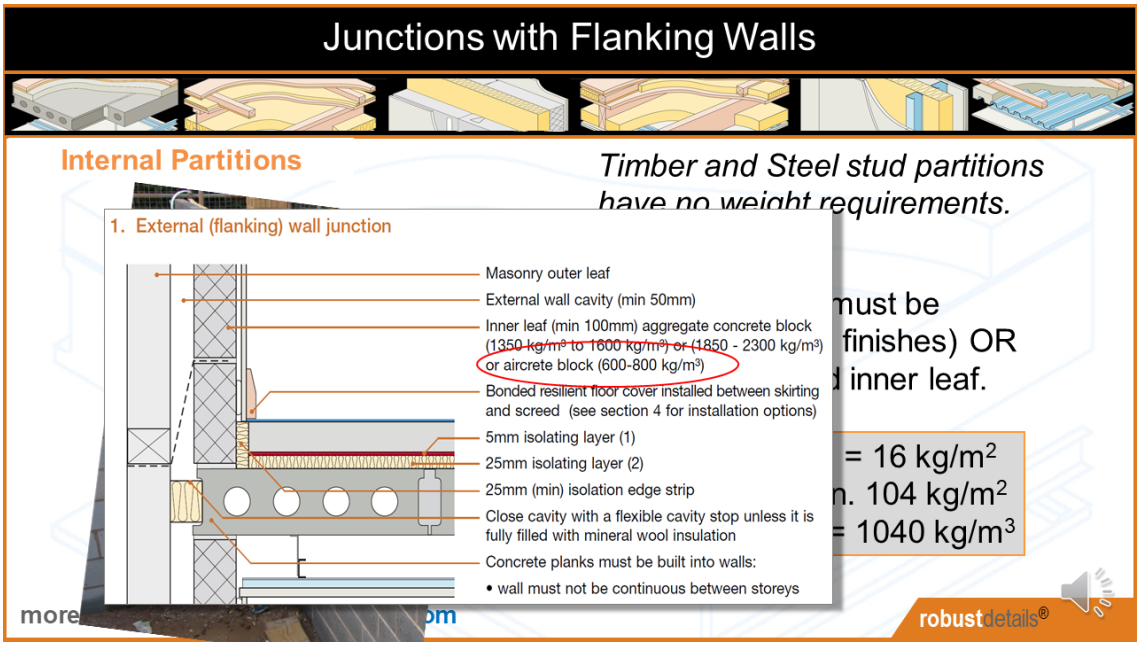
Slide 22



Partitions can be fitted direct to the structural floor, so no resilient strips necessary – and then the FFT and ceiling can be installed. So that impact noise doesn't flank through, ensure the screed is fully isolated from the partition, the same as it would be from any other wall. Same for the ceiling – ensure there are no air-paths up into the ceiling void.
Alternatively, they can be installed after the FFT and ceiling. When securing the sole plate, it's critical that that the fixings don't penetrate the resilient layer. As the ceiling is not broken, this is perhaps the most robust method for sound.
The same principles can be applied to timber frame structures. If mounted on top of the FFT the batten manufacturer may recommend doubling up the battens to prevent over-compression of the resilient material. The other important point is that when securing the head of the partition, fixings don't bridge the resilient bars.

Additional notes:

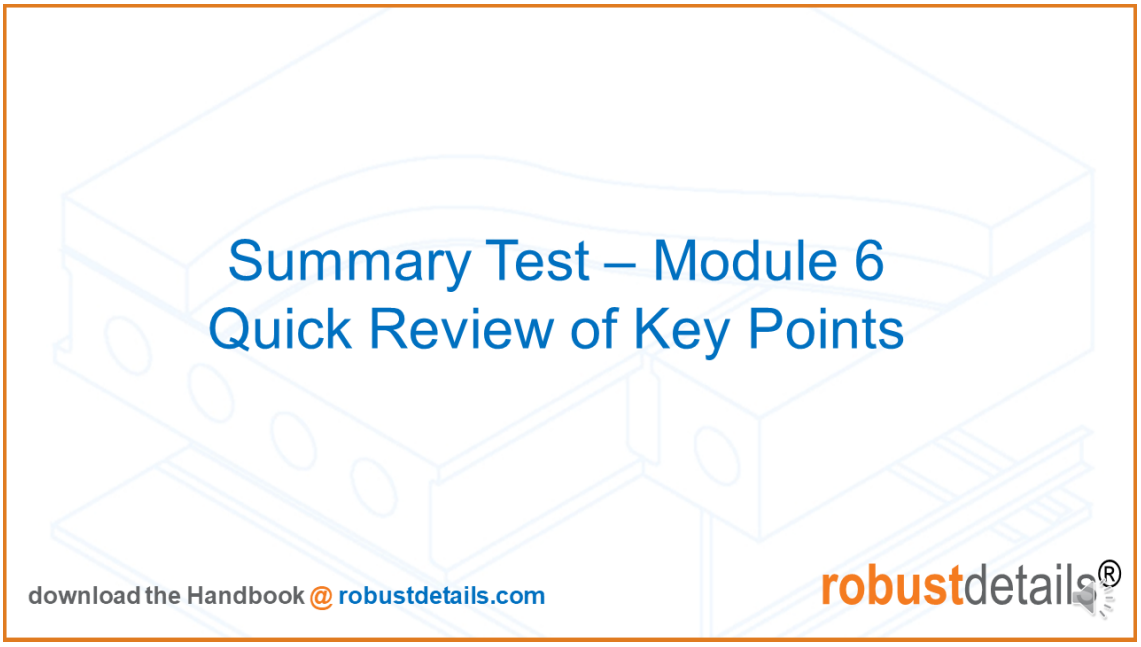
Slide 23



Lightweight structures don't have any minimum mass requirements, but when we start combining masonry partitions with concrete floors – or indeed masonry separating walls, the partitions can start transmitting noise into the structures.
So Appendix A1 says the partition has to be a min.120 kg/m^2 (incl. finishes) OR that of the approved inner leaf.
so as an example… and of course assuming 100mm thick, this would be 1040kg/m3 block.
However some floors allow 450kg blocks in the inner leaf (e.g. not E-FC-6), so if they are proven to protect against flanking there, they can protect against flanking via partitions.

Additional notes:

Slide 24



Now for a quick TEST to recap on Module 6

Additional notes:

Slide 25

Summary Test – Module 6

No.	Question
1	Mass and what else are the primary acoustic features of concrete floors?
2	What is the main purpose of including a floating floor treatment (FFT)?
3	If the precast concrete plank in a floating screed floor is 150mm thick, what is the minimum size of the ceiling void?
4	Total sound transmitted between attached dwelling is made up of Direct sound transmission and which other type?
5	Why should concrete floors be fully built into the surrounding walls?
6	Why must impact noise energy be fully contained within the floating screed?
7	Resilient systems on floating screed floors typically comprise which two components?
8	For measurement of impact noise, is a higher number better or worse?
9	What is the main consideration when fixing a partition on top of a floating screed?
10	When using masonry partitions with separating floors, what should the laid-weight of the partition be?

download the Handbook @ robustdetails.com

robustdetails®

Here are 10 questions – you may wish to PAUSE the recording and test yourself against these questions.

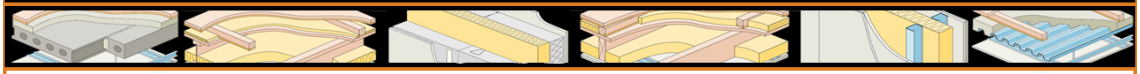
Once you have answered all of them – the next slide provides the answers.
In 10 seconds the slide will change so press pause now if you want to test yourself first.

Thank you for following Module 6.

Additional notes:

Slide 26

Summary Test – Answers



No.	Answer
1	Stiffness
2	To minimise impact noise coming from the flat above
3	min.150mm
4	Flanking sound transmission
5	To break the wall flanking path
6	If impact noise energy gets into the surrounding structures it will flank round into the apartment below.
7	Resilient Layer and Flanking Edge Strip
8	Worse, as more impact noise is being transmitted
9	The fixings must stay in the depth of the screed, and not penetrate the resilient layer.
10	Masonry partitions must be min.120 kg/m2 (incl. finishes) OR that of the approved inner leaf.

more information @ robustdetails.com

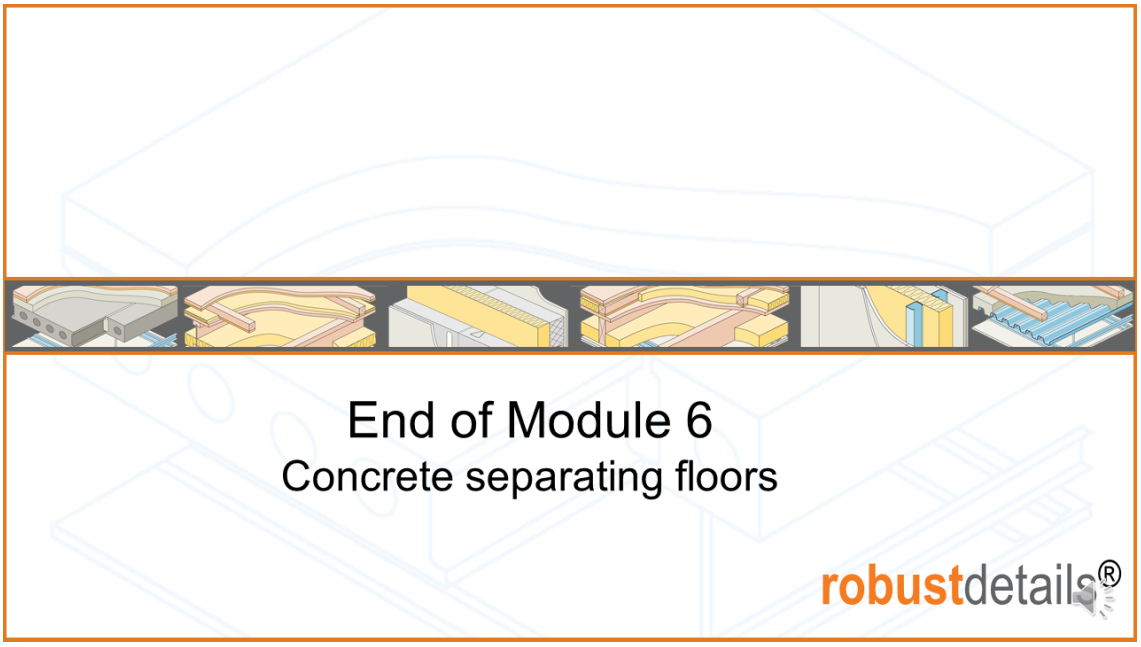
robustdetails®

Here are the answer to Module 6's quick test.
How did you do?

Thank you for following Module 1

Additional notes:

Slide 27



End of Module 6 - Concrete separating floors

Additional notes:

Slide 28

Download your free copy of the Handbook by signing up @

www.robustdetails.com

Contact us:

Technical @

email: technical@robustdetails.com

call: 03300 882 140

Customer Service @

email: customerservice@robustdetails.com

call: 03300 882 141

Additional notes: