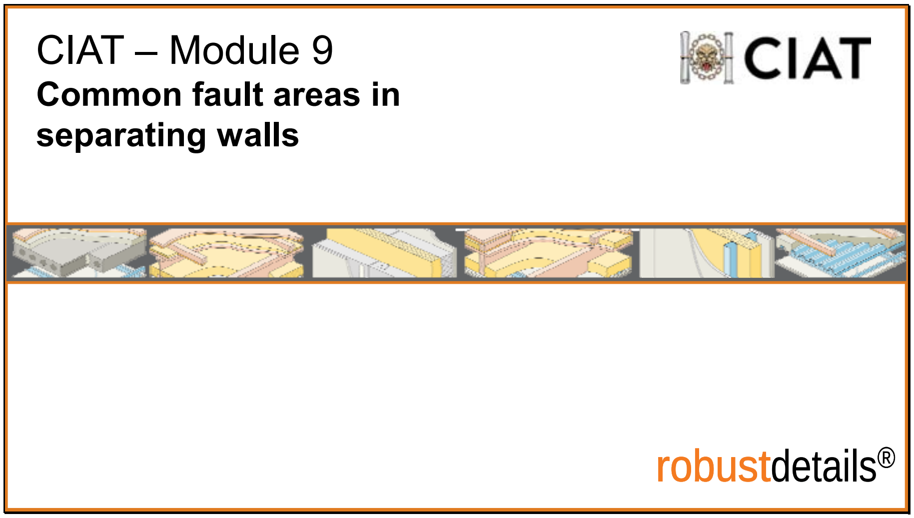
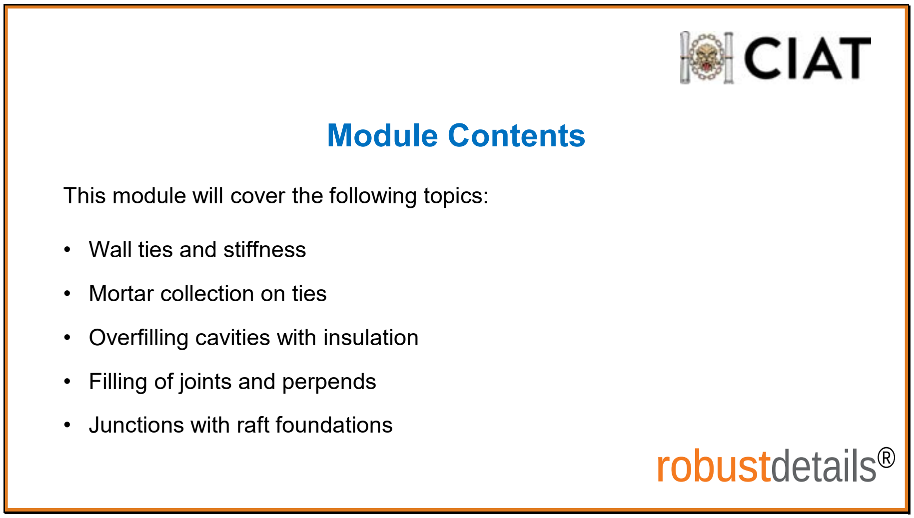
Slide 1



Welcome to Module 9 – Common fault areas in separating walls

Additional notes:

Slide 2

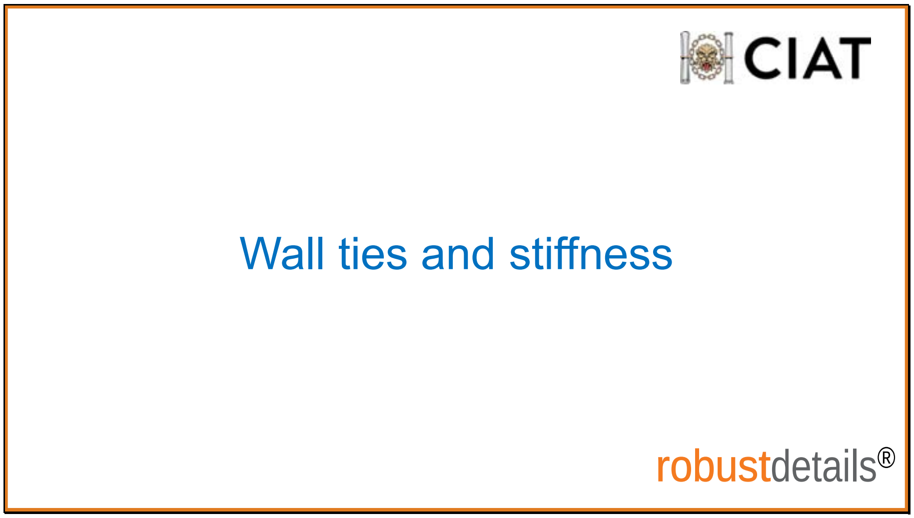


This Module will cover the following topics

Read slide

Additional notes:

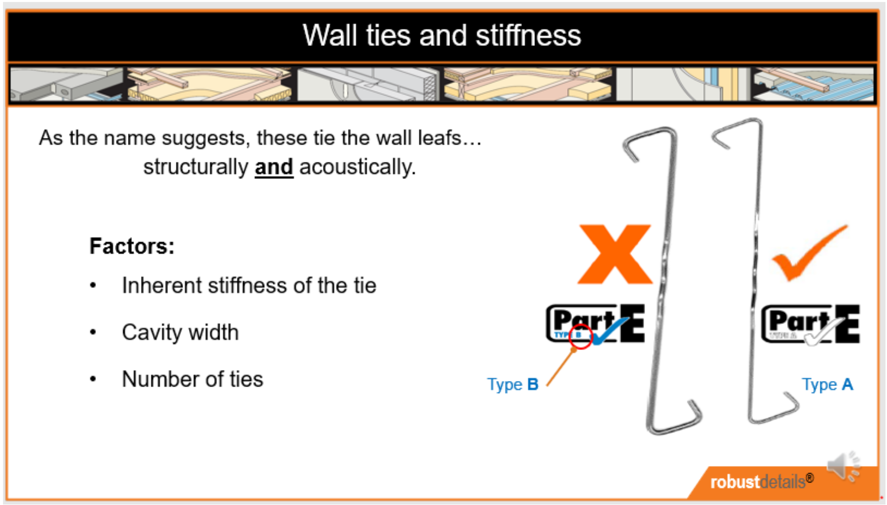
Slide 3



Read slide

Additional notes:

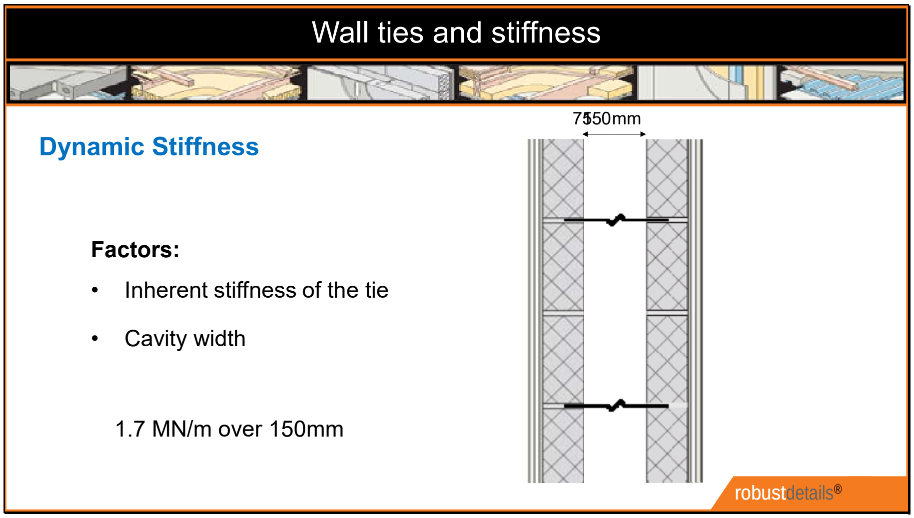
Slide 4



As the name suggests, these tie the wall leafs
How rigidly they tie them together is dependent on 3 factors…
Inherent stiffness – as we can see here, these two-look identical, but put side-by-side, we can clearly see one is thicker and hence, stiffer than the other

Additional notes:

Slide 5

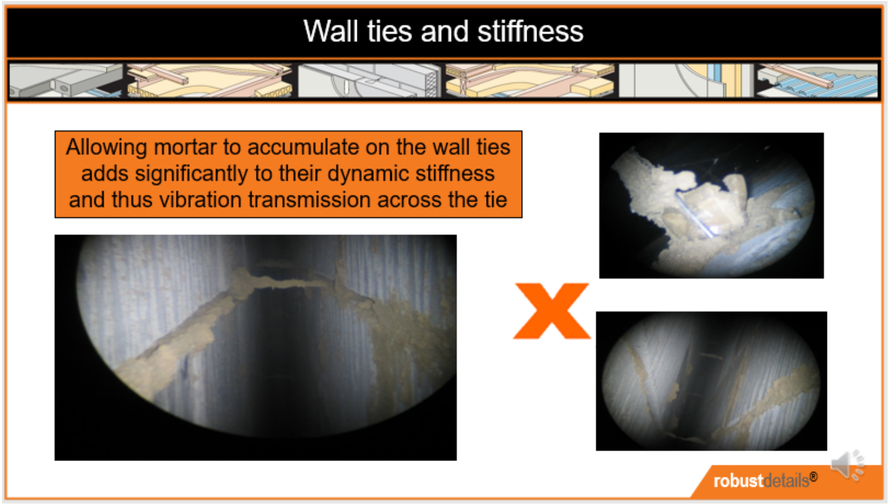


A term often banded about is Dynamic Stiffness.
In simple terms, this is a laboratory measure of how much vibration is transferred from one end to the other.
It is dependent on:
The inherent stiffness of the tie; and the cavity width.
So the dynamic stiffness value is always quoted with a specified cavity width.

A typical value would be 1.7 MN/m over a 150mm cavity
But if these ties were used in a smaller cavity, the stiffness increases significantly

Additional notes:

Slide 6



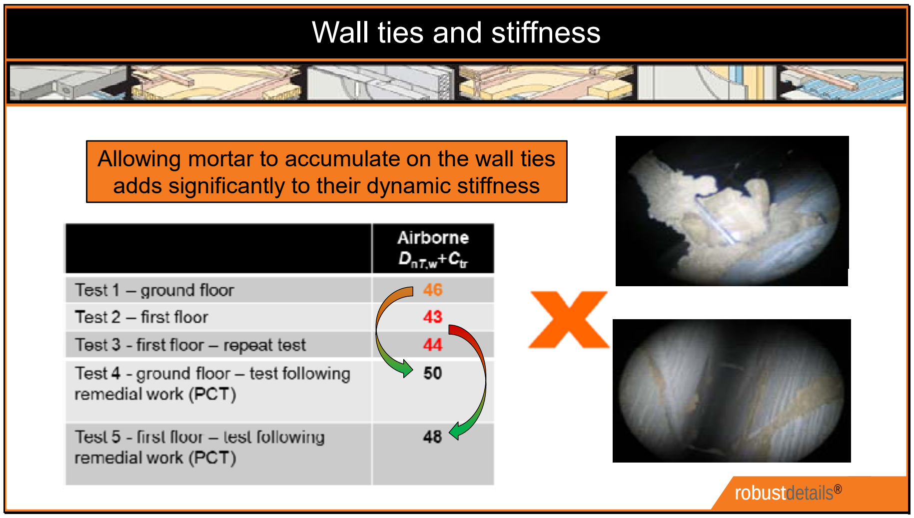
Also, the wall ties need to kept clear of mortar droppings.

If mortar is allowed to accumulate, this will significantly stiffen the wall tie, and so increases the amount of sound transmitted.

This is particularly prevalent where blown cavity fill is used (injected after the full height cavity is formed), as mortar droppings during the wall construction from the whole height of the wall can collect on the lower ties.

Additional notes:

Slide 7

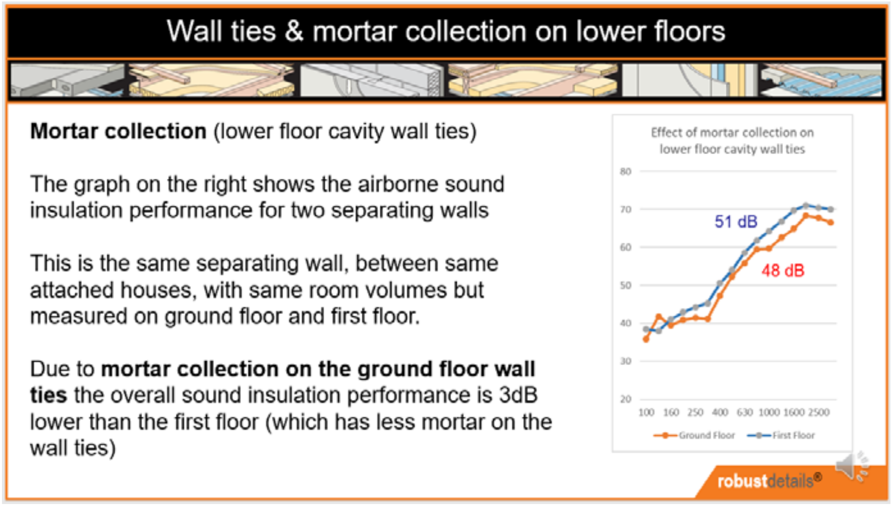


Tidiness matters
In performance terms: this is a typical measurement on a cavity separating wall with mortar which has collected on ties

After a lot of costly work removing the mortar droppings and thus reducing the overall tie stiffness, the same wall was tested
And this shows the difference it made - improving airborne sound insulation performance by 4-5dB

Additional notes:

Slide 8

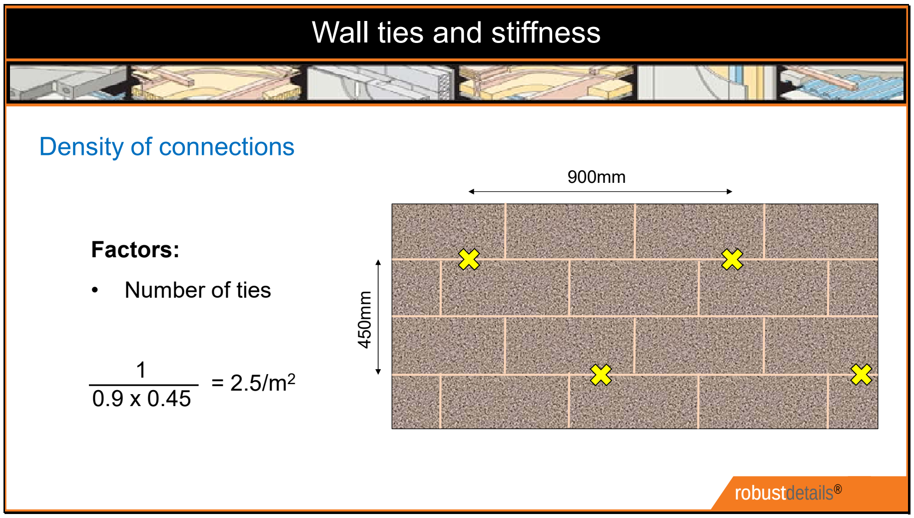


Lets now look at how mortar impacts stiffness using the standard Graphs

Read Slide

Additional notes:

Slide 9

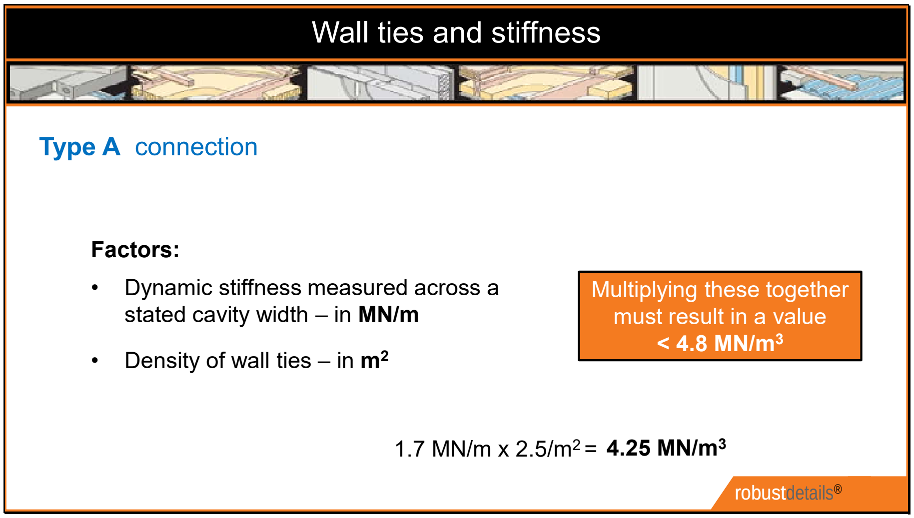


The final part of the equation is the number of connections – or number of ties. As we all know, the standard spacing for the ties is 900mm horizontally, and 450 vertically

Doing the calculation, this results in a density of 2.5/m^2

Additional notes:

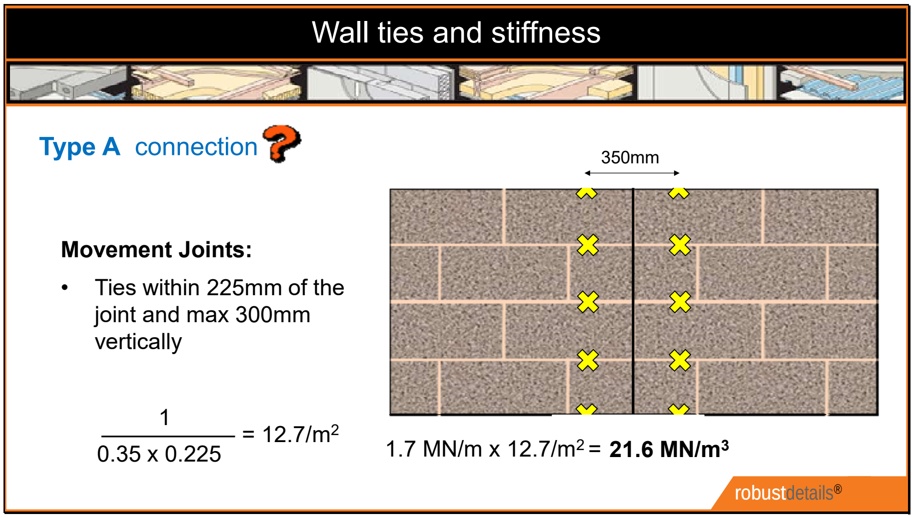
Slide 10



So this brings us back to the question of how rigidly are the 2 leafs connected?
And more importantly, is it Type A ?
In ADE, it states that when we multiply the dynamic stiffness by the density, it must give a connection value less than 4.8
so the typical Dynamic stiffness of 1.7 MN/m – multiplied by 2.5 gives 4.25
So what could go wrong??

Additional notes:

Slide 111



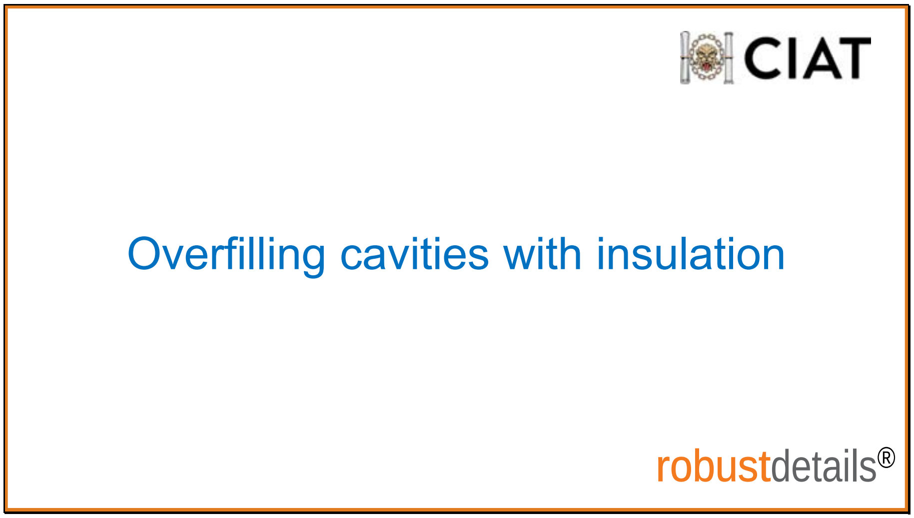
Structural standards say if a wall straight and unbroken and over 6m long, a movement joint is required
And the tie spacing should be… as slide.

225mm from the joint will hit a perp, so we'll say a spacing of 350mm x 225 to give a density of… 12.7 ties/m^2
Using our average Type A tie gives a connection of… 21.6 – over 4 times the 4.8 target
Then a metre down the wall, this repeats for the joint in the other leaf.

Using bed joint reinforcement and slip ties can mitigate the need for, and the effect of having movement joints.

Additional notes:

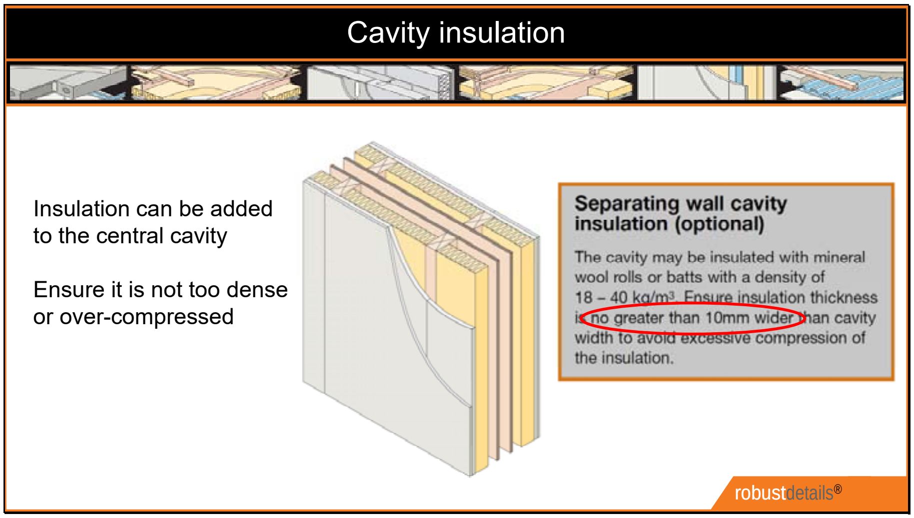
Slide 12



Read slide

Additional notes:

Slide 13



If needed for Part L, to reduce heat loss through "cavity bypass pathways" insulation can be added to fully-fill the wall. This will only make a minor change to the overall acoustic performance, as the work is already done by the insulation within the frames.

However, if the insulation is too dense or if it's over-compressed, it can form an acoustic bridge (rather like a strong tie) across the cavity, which can then reduce the acoustic performance.

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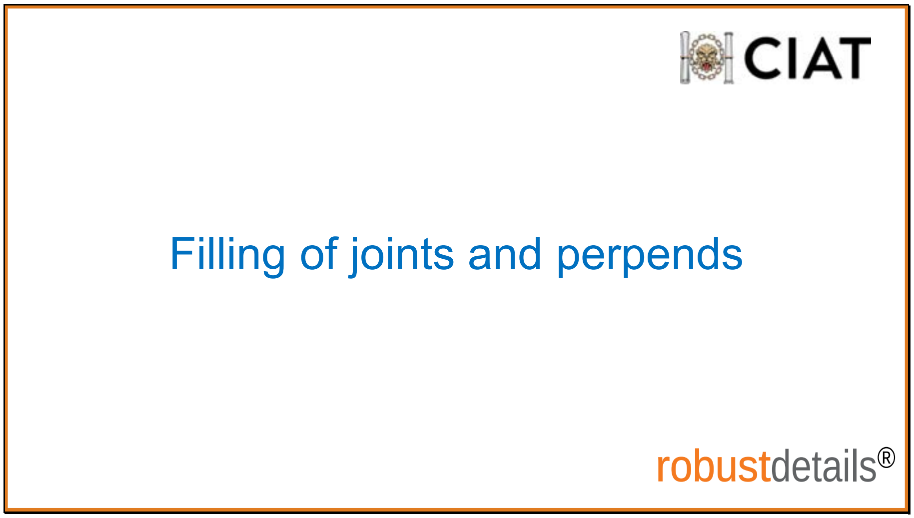
Additional notes:

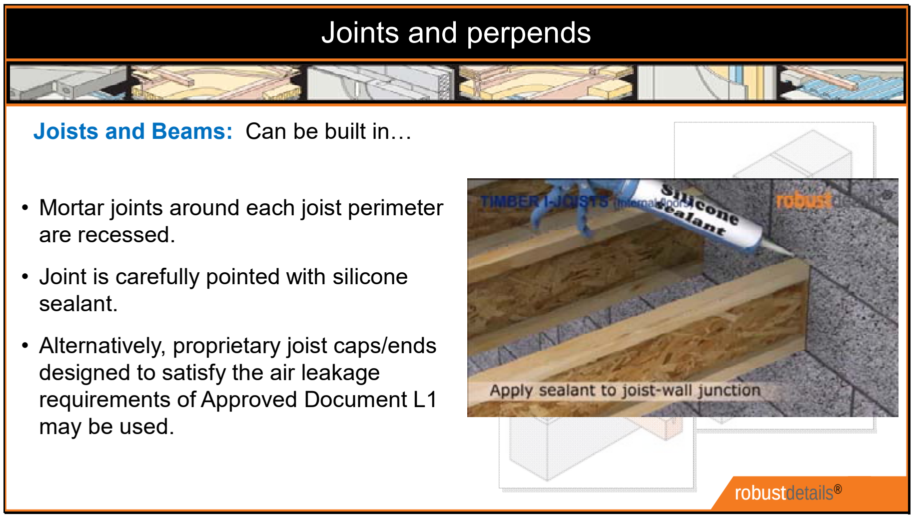
Slide 14



Read slide

Additional notes:

Slide 15

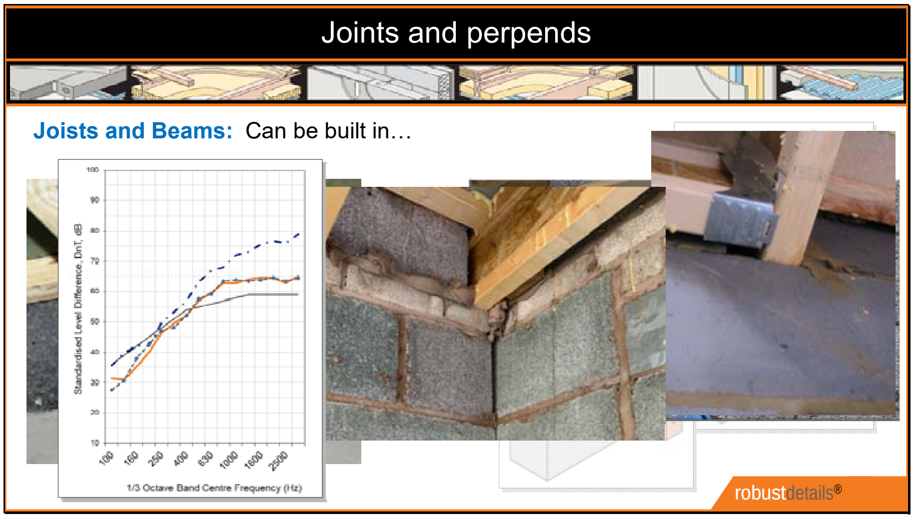


As shown in Appendix A1, it is possible to build joists into **cavity** masonry walls – but to ensure they don't create a flanking path through the wall… as slide
There is a really good animation on our website that shows the process.
This shows I-Joists, but it also applies to solid joists; and Metal web joists, provided they have blocked ends.

Alternatively, joist end caps that give a good air-tightness can also be used.

Additional notes:

Slide 16



Most builders are very able and willing to do this…
Others not so.

Where gaps are left, high frequency noise can creep through such gaps – as we can see when this scenario is tested… <Click> there is a marked drop off at the top of the frequency range compared to a wall that's finished correctly.

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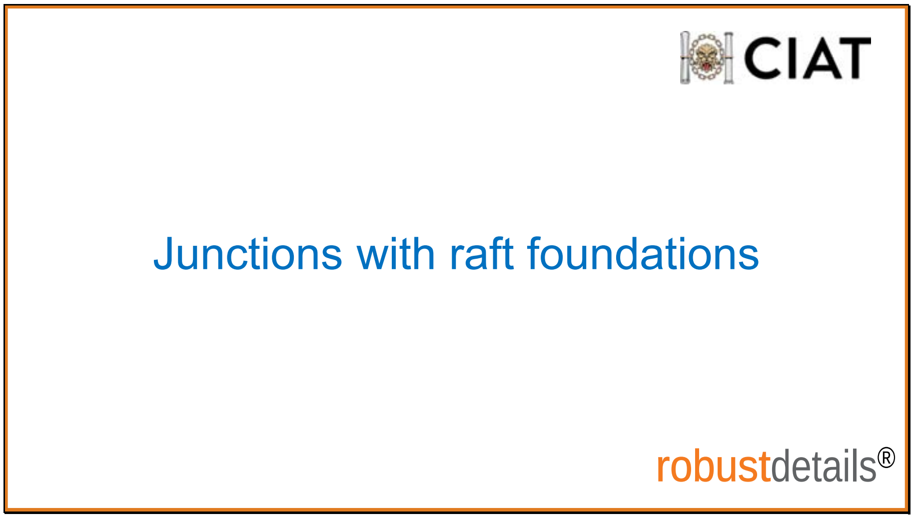
Additional notes:

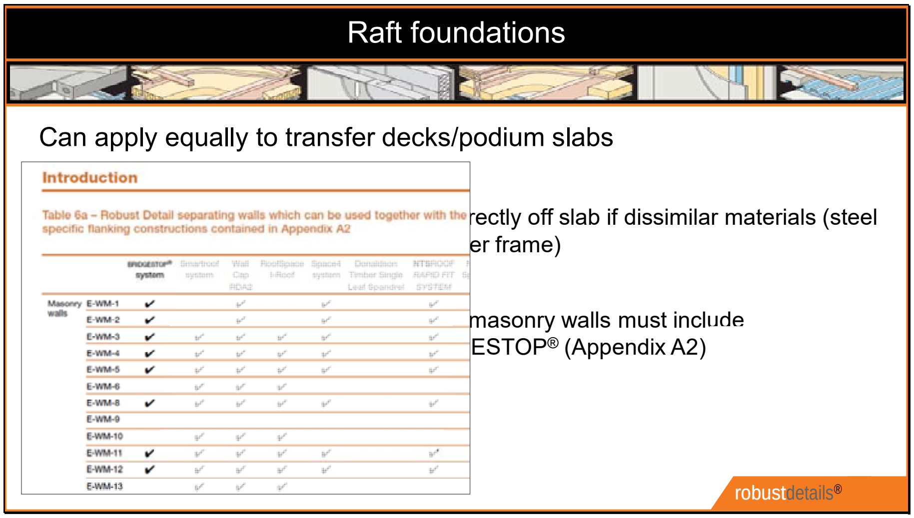
Slide 17



Lets move forward to junction with raft foundations

Additional notes:

Slide 18



The principles here apply just the same to transfer decks – the critical thing is that they are insitu poured at 365kg/m2, which is enough to dampen direct transmission.

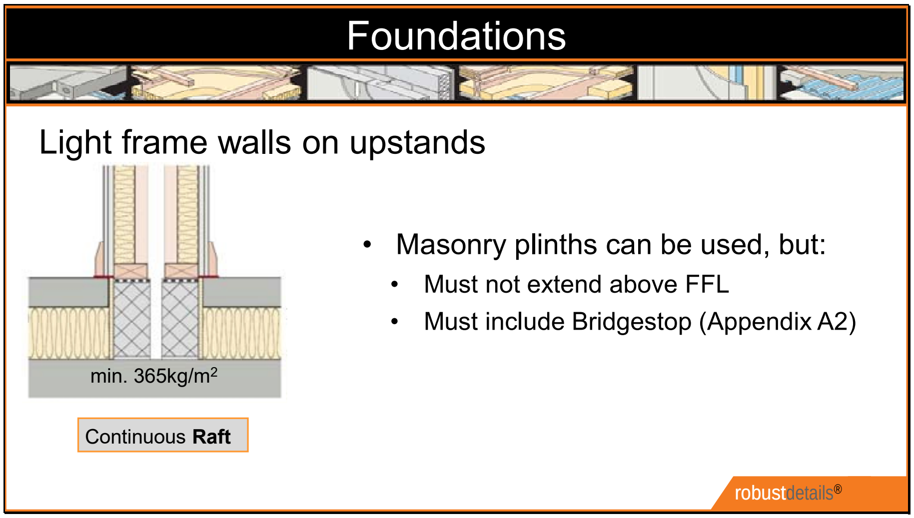
Timber and steel have a different frequency response to concrete, so these can be mounted directly on the slab

But concrete blocks have to be isolated using Bridgestop to prevent noise energy transferring from one block leaf to the other via the slab

Check this applies to your chosen wall type by referring to Table 6a in the Introduction, as not all walls have been approved to be used in this way..

Additional notes:

Slide 19



Sometimes there may be need to raise the walls on block plinths – and this is possible, provided:

The blocks do not extend above finished floor level, so the timber-to-block junction is shielded by the floor the Bridgestop system is used to isolate the blocks from the slab

Alternatively, upstands could be cast in as part of the slab – as long as they also stay below FFL

Additional notes:

Slide 20

Summary Test – Module 8

CIAT

No.	Question
1	Wall ties will acoustically connect the wall leafs, but what 3 factors determine the amount of connection? Inherent stiffness of the tie; the cavity width; and ...
2	Why should the wall ties be kept clear of mortar droppings?
3	What would be the normal spacings for wall ties within a cavity masonry wall?
4	What feature can lead to an increased number of wall ties over a small area?
5	If the central cavity of E-WT-2 is filled with insulation that is way too thick, the insulation will be compressed - but why would this be a problem?
6	When joists are built into a cavity masonry wall, they should be sealed to the blockwork with mortar and what else?
7	What type of sound leakage can occur if the joists are not properly sealed?
8	Where separating walls are built off continuous slabs, what is the minimum weight for the slab in kg/m^2?
9	Where cavity masonry separating walls are built off continuous slabs, what must be included at the base?
10	If masonry upstands are used to lift timber frame separating walls, where should the top of the upstand finish?

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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 8.

Additional notes:

Slide 21

Summary Test – Answers

No.	Answer
1	The number of ties.
2	Mortar droppings can significantly increase the stiffness of the tie, allowing more sound to transfer.
3	900mm horizontally by 450mm vertically (in a staggered pattern)
4	Movement joints can have wall ties at 12.7/m^2 instead of the normal 2.5/m^2.
5	If the insulation is too dense, it can actually form an acoustic bridge between the two leafs.
6	Silicone sealant. This is to protect against cracking as the mortar dries out.
7	High frequency sound can creep through.
8	365 kg/m^2.
9	Icopal Monarfloor BRIDGESTOP®
10	Below finished floor level, so the floor shield the potentially weak junction.

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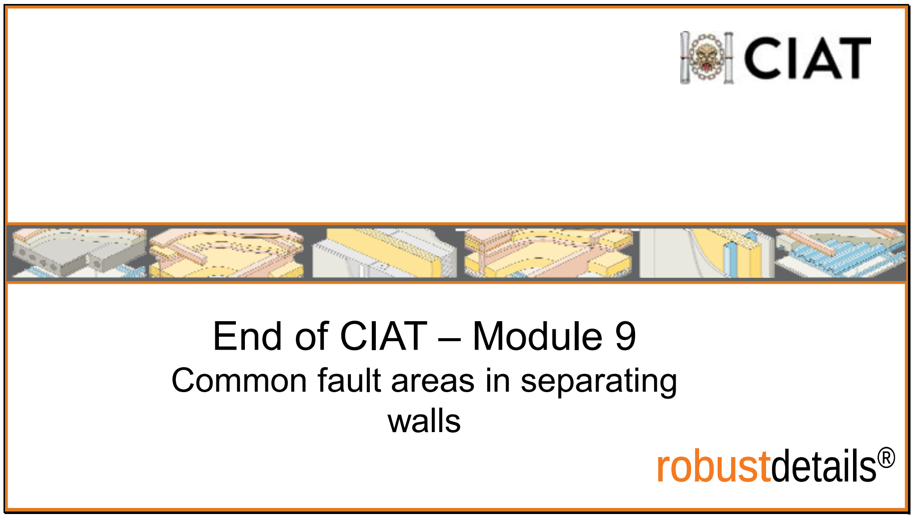
Here are the answer to Module 8’s quick test.
How did you do?

Thank you for following Module 8

Additional notes:

Slide 22



End of Module 9 – Common fault areas in separating walls

Additional notes: