

# Site Acoustic Testing



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Non-refereed

## Background

There is no mandatory requirement to test on site and the building consent process does not require on site acoustic testing. Few Territorial Authorities have the expertise 'in-house' to assess acoustics and the associated alternative solutions.

Consequently, building consents issued on so called 'reasonable grounds' can include dubious and untested alternative solutions. Yet it is the on site performance that matters to your customers, not an acoustic opinion or a laboratory test.

Just as a reminder, the New Zealand Building Code Clause G6.3 requires a laboratory performance of STC 55 for walls and floors and IIC 55 for floors. The verification method allows a 5dB drop for site performance down to FSTC 50 and FIIC 50.

There are lots of overseas products being brought on the market, especially for floor impact insulation. Most of them are tested on in-situ concrete floors, however

most floors in New Zealand are either light timber frame or some form of pre-cast concrete. Hence the overseas test data may not be valid on your job and you must verify the performance on site.



***"...the only way you can find out if the building complies is to test on site..."***

Many of the floor and wall systems used in New Zealand buildings have never been tested in a laboratory and those that have been laboratory tested have rarely been tested on site. So it is anyone's guess whether they perform or not. One sure fire way to cause failure is to make number eight wire 'improvements' on the

published systems. Tampering with what you do not understand is prone to mistakes and basic errors.

Another favourite is substitution of other products and systems instead of what was on the building consent drawings. It seems to be a birthright of all Kiwi builders and designers to substitute anything for everything without approval from the Territorial Authority or proper testing. It is not surprising that failure to meet the performance specification or building code performance is common place.

Unless you have deep pockets do not fiddle with published, tested systems or the building consent details.

## So why would you test on site?

All buildings are different from each other, so what works in one may not work in another. Existing buildings being refurbished are particularly difficult to make sure they perform properly. You test on site so that you know that what the product suppliers are telling you,

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does actually work on your building. It is best to carry out acoustic testing early so that you get a feel for what is important and what is not. It allows you to put in place a quality assurance programme so that the team focuses on the important things to get right first time.

## Common examples of what fails

If you have built these systems in the past, you should count yourself lucky that you have not been called back to fix them up yet! Here are a few common culprits;

### For airborne sound insulation;

- Strapped and lined blockwork without batts in the cavity.
- 25mm polystyrene and plasterboard adhesive fixed on to 150mm concrete.
- Plasterboard lining put down the centre between the gap in the frames of a double timber

stud wall.

- Resilient rail wall systems without a strict Quality Assurance process in place, especially when plumbing services are on the wall.
- Rigid ceiling suspension systems under concrete and timber floors.
- Single entry doors without a lobby from a common corridor into a habitable space.

### For impact insulation;

- Adhesive based resilient layers under tiles.
- Tiled stairs and landings without a resilient layer.
- External access ways with bare concrete floors.
- Tiled floors on infill/pre-cast concrete slab floors.

## When would you test?

You should test at the very start of a job to make absolutely sure that the systems specified actually

perform in-situ on your job. It also focuses on the workmanship required to deliver the necessary performance.

Towards the end of a job when apartments are nearing completion about 5% of the apartments in a complex should be tested for airborne and impact sound to verify that they comply with the performance specification and the mandatory performance requirements of the building code.

## How would you test?

Basically, very early in the job you need to get a pair of rooms ready with doors in place and all second fix items completed. What happens in the acoustic site test is that one room is a source room and the other is the receive room.

If it is an impact sound test a special tapping machine is put in the source room and an acoustician measures the sound level in the



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receive room. If it is an airborne sound test a loudspeaker and amplifier are put in the source room and an acoustician measures the sound level in both the source and receive room.

The area of the wall or floor, the reverberation time and volume in the receive room are also measured and from this data the acoustician works out the field impact insulation class (FIIC) and field sound transmission class (FSTC).

You should insist on a graph of the results so you can see for yourself and ask the acoustician to interpret what has happened and why, especially if it fails.

### What happens if you do not test on site?

On site testing invariably identifies several points of failure to meet the building code performance requirements. This failure is not picked up by the Territorial

Authority because they do not do site testing. The only way you can find out if the building complies is to test on site.

The main way that builders and designers are found out is that awkward customers complain about the noise. The saving grace for most builders and designers is that building acoustics is a complicated area, almost a black art, and an occupier would need to be already in the know or have a lot of fire in their belly for them to succeed in getting it put right.

If a builder is eventually found out, it is very disruptive and expensive to put right, because part of the basic fabric of the building has to be dismantled and built right.

If one part of a set of apartments are built wrongly then the others will no doubt be the same. The occupiers and all the finishes are in place, it is a nightmare scenario for any builder to have to rebuild even a small part of several occupied

apartments in a complex.

### What are the benefits?

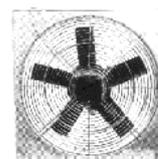
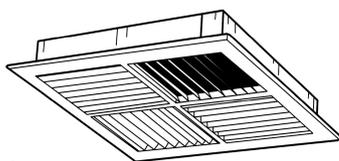
Site testing at the start of a job as part of your quality assurance process gives clear direction to all staff on site that this 'sound' facet, which you cannot see, is a very important part of the building compliance and must be given proper attention to detail.

It focuses subcontractor responsibility and liability from the outset and whilst the work is being done. It gets the work done right first time and keeps your customers happy.

Last but not least, successful site testing also means that there are no expensive and nightmarish call backs to put right floor and wall systems, which have failed and upset your customers. □

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