



Kia ora

Things are speeding up here at the NBL with practical completion approaching in 2019.

The site is busier than ever, with numerous trade teams moving through the building in quick succession to maintain the installation momentum.

The final stages of construction are the most challenging; plant, ducting, pipes, trunking and cabling are all being installed concurrently, so space is at a premium.



Room air leakage testing has been going extremely well so far, showing a high level of airtightness. This is primarily down to the quality of the Arcoplast walling system and the expert sealant application.

Doorways are temporarily sealed using a blocking plate which is attached to an air pump. Air is then drawn out of the room, with operatives testing the pressure decay over time to ascertain leakage rates.



Power is on! The mains electricity supply to the laboratory was turned on 12 November - a huge milestone. This means that the distribution boards feeding the various mechanical equipment are now live and the installed lighting systems can be used to support site works.

As you can see on the left - good lighting equals quality workmanship.



To minimise penetrations in the Arcoplast surface (and therefore manage air leakage) service cabling will run along wall and ceiling mounted trunking within the laboratory spaces.

The trunking is glued to the wall with a specialist adhesive, forming a molecular bond which is incredibly strong and difficult to remove once in place. To minimise the risk of installation errors, a rigorous methodology and quality assurance process was developed at the outset.

MMA Flooring System

One of the most visible changes to the site is the ongoing installation of the specialist, methyl methacrylate (MMA) flooring system.

This is a multi-stage but relatively fast process given the expert operatives we have on site. Firstly, rounded epoxy coving is built up at the wall/floor boundary. This can be particularly challenging where services enter from the floor, as you can see in the left hand photo below. The entire concrete floor is then ground and shot-blasted to prime the surface ready for the MMA application. As it dries, cracks can appear in the concrete so a specialist product is applied to fill these.



Following this the first MMA membrane is poured out on the level floor - this is a self-levelling liquid product, approximately 1.5mm thick. Next, a wearing layer is poured, this is slightly thicker at 2mm and now things have to move quickly as the multi-coloured fleck finish must be applied before it dries. Workers hand cast the fleck, so applying a consistent spread requires a practised technique. After curing, any excess fleck is collected up to be used again.

MPI has opted for a sealed and textured finish so two 0.5mm roller-applied sealing coats are applied before the final 'orange peel' topcoat. This textured finish provides extra friction, particularly for wet areas.

Quality assurance is provided through pull-tests. A hydraulic device is used for this, applying a uniform suction pressure to an area of floor. As the pressure builds, eventually something has to give. It could be a layer of the flooring, or even the concrete underneath! These tests provide confidence that the flooring system is properly adhered to the substrate and will not delaminate through normal use. Voila! We have ourselves a hardy, impervious, easily cleanable and aesthetically pleasing floor, capable of withstanding the stresses and strains of a high biocontainment laboratory.



Profile – Daryll Dalzell

Building Services Manager

Daryll is a Manager with Fletcher Construction and has been part of the National Biocontainment Laboratory Project right from the start. With over 32 years' experience in the construction industry, he is the ideal candidate to work on the NBL. Daryll has been involved on some of the most complex building service arrangements in New Zealand, including three hospital projects and the delivery of Wellington's first NZGBC five star Greenstar building, Kumutoto.



What differentiates working on a biocontainment laboratory compared to other complex buildings such as hospitals?

Attention to detail. The QA [Quality Assurance] procedures on this project are more rigorous than I've ever seen and there is no room for error. We have numerous subcontractors working on site at any one time, if the construction of a particular element goes awry and we fail to pick this up the facility could fail validation and certification. This means that the levels of testing and witnessing are much higher than normal, even higher than when building a hospital. Every room is at the same standard as an operating theatre, particularly the HVAC [Heating, Ventilation and Air Conditioning] systems.

The finishing to the rooms is also very exacting as the cleaning regimes are so stringent. To ensure that pathogens cannot remain present in the laboratories, every surface has to be easily cleanable and this throws up a lot of challenges. No sharp edges and every surface has to be accessible and smooth.

The mock-up [a research and development facility built at Wallaceville which will eventually be dismantled] has paid dividends with both these challenges as we have been able to test out different installation methodologies with our subcontractors to see what works best. It also really helped in imparting the attitude we need – everyone needs to be bringing their A-game.

If you knew at the start of the project what you know now, what advice (in 100 words) would you give you former self?

Hire more staff! The number of skilled, conscientious staff that we need has been hard to find. We're in a good position now as we approach the end of the project, but the sheer quantity of work has been daunting at times. Given the level of detail no-one can be across every issue, we all need to be able to trust each other to resolve our respective problems, so taking ownership is key. We now have a great team on site, both within Fletchers and the wider subcontractor team.

To date, what has been the highpoint for you on the project?

Right now the highpoint is seeing the first finished rooms, you can really see the amount of work that's gone in across the board. Personally I'm expecting the next few months of commissioning to be the highpoint of the project overall, all of us working in services will really be able to see our hard work paying off as the various systems throughout the building come online for the first time.

What do you do when you're not constructing some of the most complex buildings in NZ?

I love cycling, both road bikes and mountain biking. Earlier this year I was fortunate enough to travel to France and follow the Tour de France over 14 days where we completed nine of the most iconic climbs of the Tour. It was incredibly hard, but incredibly enjoyable. My motto is never stop and never give up - I always want to be there at the finish.