



Kia ora

Welcome to issue three of *NBL News*. It is hard to believe that we are 12 months in to the construction phase of the new high-containment laboratory project. There has certainly been considerable progress on site since the Minister for Primary Industries, Nathan Guy, turned the first sod back in October 2015.

Since our last update, the four tonne base isolators have been installed as well as the stainless steel slider plates, concrete beam work is nearing completion and three quarters of the ground floor slab has been poured. The latest milestone in the construction phase has been the arrival of the first components of the steel structure on site. You can see pictures of this progress [here](#).



Concrete poured to Zones A and C. September 2016

From this point onwards progress will be increasingly visible from ground level up, building on the extensive foundation and basement level works completed over the last six months. The outline structure of the laboratory will really start to take shape once the 12 metre high steel columns are erected.



Steel structure columns erected, October 2016

Although the design for the building was completed in late 2014, there is still a continuous engagement process between the design, construction, services and MPI project teams to refine and specify exact requirements, ensuring effective biocontainment, safety and cost management. These decisions include the use of innovative wall and ceiling materials that are easy to clean and maintain, as well as the fine detail of services that must

penetrate through the containment barrier but remain air-tight. This can be extremely challenging, since a seemingly small change can often have a significant consequential impact on another aspect of the design, and all decisions have to be in accordance with international best practice for biocontainment, together with numerous building and operating standards and regulations.

The responsibility for tracking the project through this design refinement process sits with Gilles Tremblay, Director of Commissioning Services at Merrick & Company. Gilles has relocated to Wellington from Ottawa, Canada, to oversee construction and commissioning of the facility. This month we talk to Gilles about the complexities of working on the NBL Project, the commissioning process, and how the NBL project compares with other Merrick & Co. projects. You can read more [here](#).

An insight on commissioning

Q&A with Gilles Tremblay, Director of Commissioning Services, Merrick & Company

Commissioning is a term that we use a lot. Can you tell us what this means to you?

In the simplest sense, commissioning is a quality assurance process. In the laboratory environment it is about ensuring the user ends up with the facility they anticipated at the outset, taking into account their requirements, design intent and that the finished facility performs the intended functions. Often people assume that commissioning is just about getting the facility up and running but underpinning this is the safety and reliability perspective. The commissioning process has to build in redundancy and resilience to ensure the laboratory operates to and meets the required health, safety and environmental standards. Public perception also plays such a big role. People need to know that the containment facility on their doorstep poses no threat to them and their environment. We can't afford to get this wrong.



Gilles Tremblay, Director of Commissioning Services, Merrick & Company

How did you become a commissioning specialist?

It's hard to believe I've been in this line of work for 24 years now. My background is in control and instrumentation systems. I was working for a controls company back in Canada and was involved in the installation of the control systems for a containment facility in Winnipeg. I ended up staying on the project longer than originally planned, seeing it through the entire commissioning phase. Working in the containment space is pretty specialised, I learnt a lot from the Winnipeg project and then became a consultant on other PC3 and PC4 containment laboratory projects, taking an oversight of operational projects from start to finish, ensuring they are certifiable for their intended use.

You've worked on some large-scale projects, such as the containment facilities in Winnipeg, Canada, and the Pirbright Institute in the UK. How does the NBL project compare?

That's a good question. On specialist projects like this, attention to detail and due diligence all apply no matter how big or small the job is. Although the NBL project is a little smaller in physical size than my other projects, all projects are fast-evolving and present their own challenges. The pace of technological change alone means that no job is easier than the last. When you factor in the seismic and earthquake requirements you have here in New Zealand, this adds a whole different level of complexity that is new to me.

What are the challenges of working on a project overseas?

There are unique challenges involved in establishing yourself into another working environment and delivering a project with local resources and capabilities but this is what makes it exciting and interesting. Initially it takes a while to get used to the different culture and working practices, and of course getting to know the people you're working alongside. It can be difficult with the time difference to connect with the team back in Canada, especially if there is a time-critical issue to address. Technology is a big enabler – through email, teleconferencing and videoconferencing we can achieve a great deal.

What has been the highlight of your time on the NBL project to date?

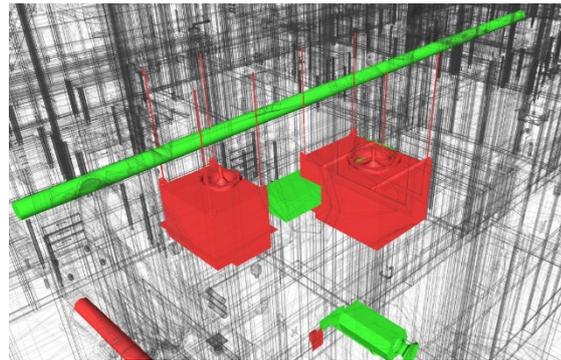
I'm really enjoying working with so many different people on the project, from stakeholder groups to tradespeople and the community in general. Since this facility is a national resource and attracts a lot of attention, there is real pride and ownership in the project and this is reflected in the quality of the work. I've been blown away by how the people I'm working with are embracing the project and the part they are playing in protecting New Zealand. This is an exciting project to be involved with – I could never go back to working on an office building or shopping mall!

CLOSE UP - Advanced technology modelling in six dimensions

Building Information Modelling (BIM) is a digital representation of the physical and functional characteristics of a building. It involves using software to create a model with real life attributes and sharing that information to optimise the design, construction and operation of the building. BIM covers more than just geometry though; the modelling extends beyond 3D, the three primary spatial dimensions (width, height and depth), to include time as the fourth dimension (4D) cost as the fifth (5D), and Construction Operations Building Information Exchange (COBie) as the sixth (6D).

Fletcher Construction is using BIM for the NBL project to provide comprehensive information on design, workflow and cost for the construction aspects of the build. We've included some examples of how BIM is being used at this stage in the process.

3D modelling clash detection allows the project team to upload models from other collaborators (such as electrical, plumbing, fire systems) to enable all aspects of the design to be viewed together in one place. This allows any design issues to be identified and resolved prior to the issue of shop drawings, and mitigate against these issues making it on to the site.



3D modelling clash detection results

The process of 4D BIM involves allocating the construction programme timeline data to the model. This enables identification of items which may have been misallocated or missed in the project programme and also simulates construction of the project to identify illogical construction sequences and to educate the project team regarding construction intent. The 4D BIM Workflow designed for the NBL encompasses not only new construction activities but also Temporary works, Demolition, Pre-commissioning, Commissioning and Certification activities.

BIM is an integral aspect of the NBL project to enable overall planning, tracking and quality assurance and it is great way to provide people who are not directly involved with the project with a visual representation of how the build will progress over time.

Timeline

ID	Name	Status	Planned Start	Planned End	June 2017							July 2017							
					W22	W24	W25	W26	W27	W28	W29	W30	W31						
38.36%	Systems Tests	=====	15/12/2016	12/06/2018															
27.84%	19. EMERGENCY POWER	=====	9/03/2017	31/05/2018															
27.67%	Systems Tests	=====	18/02/2017	31/05/2018															
26.36%	20. SERVICES: STEAM, CHILLED WATER, COOL...	=====	4/02/2017	18/05/2018															
53.66%	Component Verifications	=====	6/03/2017	30/10/2017															
54.96%	Component Verification (CV's)	=====	20/07/2016	30/04/2018															
52.95%	Mechanical	=====	22/06/2016	30/04/2018															

Properties

Property	Value
FCC_Task_ID_Construct	B-2013
FCC_IDE_Activity	925508
FCC_IDE_Description	Structural Steel
FCC_IDE_Cool Level	8

4D programme data integration and simulation

Keeping up with best practice



Chris Edwards, Fletcher's NBL Project Manager, and Hamish Mowat, Fletcher's Gateway Project Manager in the Gateway Building mock-up room.

As part of ensuring the new laboratory will meet international best practice in biocontainment and construction standards, the team continues to engage with other projects and laboratories. Recently members of the team visited the new Gateway Building, at Victoria University of Wellington Kelburn Campus, to get an update on their progress and understand the challenges they've encountered. Of particular interest was viewing their mock-up room and learning how valuable this has been in finding the best solutions to specific construction details, even those as seemingly minor as how bench splashbacks intersect at corners.

In November, members of the team from MPI, Merrick and Fletcher Construction will be attending the ABSANZ conference in Melbourne. The conference theme is 'Learning from each other' so we're looking forward to discussing the NBL project with others in the industry.

Forward planning to facilitate transition

Construction of the laboratory is only part of the National Biocontainment Laboratory Project. With the construction phase of the project well underway, a whole host of supplementary non-construction projects are also in progress to prepare the facility for commissioning and subsequent operational use by the target date of early 2019.

A number of working groups have been established involving representatives from the Animal Health Laboratory, Business Support and Facilities team, as well as subject matter experts. Examples of work in this area include scoping the requirements for a computerised maintenance management system, communicating commissioning requirements clearly to the main contractor so they know the performance specification that needs to be met prior to practical completion, and matching security system hardware selection to how laboratory staff actually work in the laboratory.

By getting ahead and engaging with the right people and information early, we can avoid hold ups as everything comes to completion in late 2018, identify potential issues and how to address them, benefit from lessons learnt and ensure that all aspects of the project are appropriately covered.

This project is a great example of people from different backgrounds connecting to use their wide range of specialist skills to deliver the best outcomes for the NLP Project and New Zealand's biosecurity management and response capability.

We'll keep you updated with our progress in these areas in future issues.

NBL non-construction projects

- Commissioning and certification planning
- Asset management and facility maintenance systems
- Equipment procurement
- Development of laboratory operating procedures
- Defining training requirements and developing plans
- Security and safety planning
- Transition planning for relocation from existing laboratory to the new building
- Planning for the eventual decommissioning the existing facility

What a difference a year makes

A selection of images showing construction progress since the first sod was turned back in October 2015.



October 2015: Hon. Nathan Guy, Primary Industries Minister, turns the first sod on site.



December 2015: Preparing the construction site.



April 2016: Foundation pad boxing in place. Tower crane is installed.



September 2016: Concrete floor poured to two zones.



October 2016: Steel structure erected on site.

Register now for Protecting to Grow New Zealand: Biosecurity Forum 2016

Whether you're a home gardener, a farmer, a fisherman, a grower, an avid internet bargain hunter or international globetrotter, protecting to grow New Zealand is everyone's business.

Join us at 'Protecting to Grow New Zealand: Biosecurity Forum 2016' to launch the Biosecurity 2025 Direction Statement and hear from national and international experts about the future of biosecurity in New Zealand.

At the two-day forum we'll focus on the important role of our global biosecurity system to protect and grow New Zealand's unique environment, economy and people.

The forum will be held in Auckland at the Pullman Hotel on Tuesday 22 (Forum) and Wednesday (Workshops) 23 November 2016.

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