



## Kia ora

Welcome to issue two of *NBL News*. Since our last update, things have been busy at the Wallaceville site as construction of the new high-containment laboratory really gains momentum.

The pile drilling that started late last year is complete, and the concrete anchors have been poured. Each anchor has a steel cable embedded in 21 cubic metres of concrete. This cable is attached to the main structure of the building and holds the building down in the event of a vertical thrust during a large earthquake. Site excavation has finished, and the four tonne base isolators have arrived on site. The construction team is currently completing the concrete foundations and basement floor. You can see pictures of this progress [here](#).

One of the challenges of the project is maintaining all existing laboratory operations alongside the construction site. However, the proximity to the laboratory staff has provided many opportunities for discussion with the people who will be working in the completed facility. From a design perspective, this engagement has been critical to understanding the needs of our end users, and has informed design decisions along the way. This month Dr Richard Spence, Team Manager Immunology, gives us an insight into how the new facilities will improve the efficiency and capacity of the scientists at MPI's Animal Health Laboratory, and how collaboration with the design team will ensure a building that can achieve this. Read more [here](#).



*Foundations under construction, April 2016.*

## Construction from a Science Perspective

*Q&A with Dr Richard Spence, Team Manager Immunology, MPI Animal Health Laboratory (AHL)*

### ***From your point of view, how will having the new laboratory facilities benefit the AHL?***

Providing the diagnostic and routine surveillance testing that supports our biosecurity system into the future has been central to the government decision to upgrade MPI's high containment facilities. The new laboratory will provide state of the art facilities that will enable the highly trained scientists at the AHL to perform their wide range of diagnostic testing efficiently and effectively. The extra laboratory space in high containment (Enhanced Physical Containment Level 3) will provide increased capacity and capability to respond to exotic disease investigations and incursions. In addition to the extra space available, the way the facility's design allows for flexibility in lab use ensures that any new testing methods developed in the coming years will be able to be adopted by our scientists, and we will be able to tailor our work environment to meet the requirements of any new technology. A good example of this is the way the PC2 laboratories, which under normal circumstances are used for routine testing, will be able to be converted to additional high containment lab space in the event of a large scale animal disease outbreak. Like other members of the AHL staff I spend a lot of time thinking about how we would deal with the volume of testing that would be required in the unlikely event of a Foot-and-Mouth disease (FMD) outbreak in New Zealand. Knowing that our FMD testing capacity will be greatly increased in the new lab is particularly exciting.

### ***How have the end users been involved in the project?***

My team and other staff at AHL have been heavily involved in the design process from very early on in the project. This has ensured that the different requirements of each laboratory team (Immunology, Virology, Bacteriology and Aquatic Diseases) have been carefully considered and needs met as best as possible. Scientists from Environmental Science and Research (ESR) have also had input into the design of the human health laboratory suite within the high containment area. The engagement between our staff and the design team allowed open and



*Members of the AHL Immunology team. From left: Rick Clough, Rudi Bueno, Judy Jenner, Richard Swainsbury, Michaela Hannah, Richard Spence.*

honest discussions to ensure that we've got a design that will produce a fit-for-purpose building. For example, the new specimen receiving area and immunology laboratories are joined which will increase the team's workflow efficiency and provide additional space for receiving samples and equipment without cluttering up laboratory space. Members of AHL staff are currently working through the user requirements to inform the specific design of the Class III biosafety cabinet that will be in the High Biosafety Laboratory Suite. This is another example of AHL staff working together with the project team to ensure that both the facility and the equipment in it are exactly what we need to continue the work we do at AHL.

### ***Have you enjoyed being able to watch construction progress?***

Absolutely. It's been great to see the progress of the build so far. Since construction began in earnest last year, I have been watching progress on the new facility with great interest. Witnessing the process of the hold-down piles going into the ground has been fascinating, and it's great to see the rest of the foundations taking shape. Seeing the structural steel go up over the next few months will be particularly interesting as we will then begin to get a real appreciation of the size and layout of the new facilities we will be working in once construction is finished and the laboratories are certified in 2019.

## Tower Crane Installed on Site

Last month, a clearly visible sign that construction is progressing appeared on the Upper Hutt skyline. Over the weekend of 15-16 April 2016, contractors installed the tower crane that will lift materials in loads of up to 12 tonnes during construction of the new facility. The crane, which is 28 metres high will be on site for 12 months. [Watch a time lapse video of the crane going up here.](#)

### Key information

Manufacturer: Liebherr  
Height: 28m  
Boom radius: 43.3m  
Maximum load: 12 tonnes  
Power source: Electric



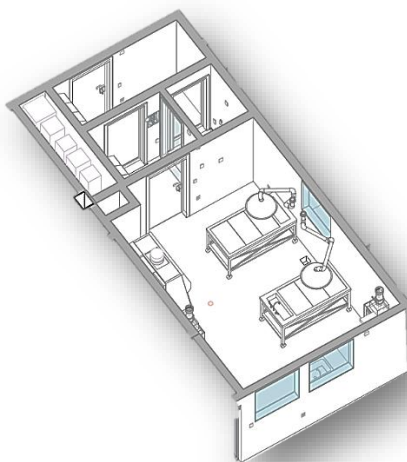
*Contractors work to assemble the crane on site.*



*Tower crane over the construction site May 2016.*

## Site Shed and Mock-up

In addition to the new laboratories, Fletcher Construction Company is also building a multi-purpose building adjacent to the construction site, which will contain offices and meeting space for construction staff, a secure and dry materials storage area, and a “mock-up” of one of the laboratory rooms. The purpose of the mock-up is to test and refine the construction methods for the more challenging aspects of the build and equipment installation. It will provide the opportunity to test different surface finishes and functional elements such as air leakage around wall penetrations (affecting how air-tight the room is), and set quality standards. The mock-up will also give end users and visitors a “sneak-peek” into what working in the new facility will be like once it is finished. Special components integral to the success of the facility as a whole will be incorporated, such as an air pressure resistant (APR) door. Fletchers will begin work on the mock-up from mid-2016 and we’ll be covering this in more detail in a later issue of this newsletter.



*Axonometric view of the room that will be built in the mock-up, including shower airlock and APR door.*



*Internal view of the site shed under construction. The mock-up will be built in this area.*

## Australian Animal Health Laboratory Operational Experience

In order to get the best laboratory possible, we have used our networks extensively so we can learn from others, both inside New Zealand and internationally. The extent of engagement with external parties sets the NBL project apart from most standard construction projects and reflects the complexity of the facility and its importance to New Zealand's biosecurity system. Visiting operational laboratories, labs currently under construction, and discussing issues and experiences with scientists and engineers has been an important part of shaping our design.



*The Australian Animal Health Laboratory.  
Image credit: CSIRO.*

With the design completed and the lab now under construction, work is beginning on establishing the operating procedures that will ensure the safe operation of the facility from 2019. The success of the benchmarking initiatives and strength of MPI's relationships with other similar facilities meant that in February 2016 our project engineer, Nathan Woods, was able to undertake a one month site visit at the Australian Animal Health Laboratory (AAHL) in Geelong, Victoria, to gain first-hand experience in how a large, world class animal health facility is operated and maintained.

Nathan's experience at AAHL included working within the three main areas of the Property Services team: Maintenance, Reliability, and Operations. The Operations team's primary role is to operate the facility's mechanical systems through the SCADA (computerised control) programme. The Maintenance Team look after the hands-on repairs on the facility, and the Reliability Team handles the strategic aspects of maintenance, focussing on ways to streamline site maintenance activities and reduce costs.

Nathan has come back from his experience at AAHL with a deeper knowledge of the day-to-day operation of a large animal health laboratory, and how these specific maintenance and operational matters can be integrated early on in construction for the overall benefit of the facility and its users. Some of the aspects of facility operation that Nathan covered while he was in Geelong were:

- Developing content for standard operating procedures (SOPs), which need to be in place before the facility is being commissioned
- Selection and use of computerised maintenance monitoring systems (CMMS)
- Developing and implementing a facilities maintenance strategy
- Reliability analysis and impacts on maintenance activities (including condition monitoring, breakdown maintenance, and preventative maintenance)
- Examples of typical long term degradation that occurs in these facilities. This has impacts on material selection and maintenance programmes.

Other members of the project team have also been involved in knowledge sharing initiatives to benefit the project, including attendance at the International Veterinary Biosafety Workgroup (IVBWG) and the Association of Biosafety for Australia and New Zealand (ABSANZ) conference in late 2015. The IVBWG conference comprises delegates from animal health facilities all over the world who meet every 18 months to share experiences and learn from one another. Joseph O'Keefe, NBL Project Director, sits on the working group and regularly attends their meetings. The ABSANZ conference is similar, however delegates are predominately based in Australia and New Zealand, with diverse interests including human health, animal health and containment regulations and operating procedures. Both these international groups provide a benchmark for design and operations to ensure we meet international best practice in the completed laboratory.

## Site Photos

A selection of images taken over the past few months showing construction activity on site.



A digger excavates the site before the foundations can be laid. The existing high-containment laboratory is visible in the background.



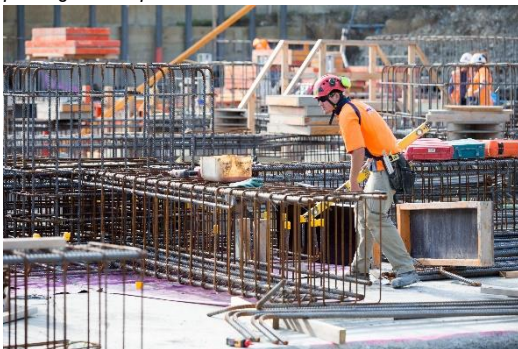
Veronica Herrera, Director IDC&R, MPI; and Fletcher Construction Project Manager Chris Edwards inspect the pipe casings before they are put into the ground.



Contractors test the consistency of the concrete before pouring anchor piles.



MPI engineers watch the first concrete anchor being poured.



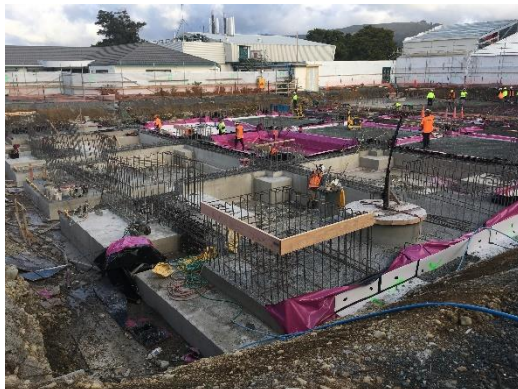
A contractor installs the reinforcing steel bars that form the beams and pads in the building's foundations.



Boxing up the steel in preparation for pouring concrete.



Contractors fill the concrete skip for the next load.



Foundations in progress.



*The concrete in the background of this image will form the basement floor. The next stages of construction include completing the concreting in this area, forming the base isolator plinths, and installing base isolators.*