

# HARNESSING THE FUTURE

The University of Newcastle has invested \$37.5 million in an impressive new BioResearch Building that will support world-class biomedical and biological research giving researchers access to modern, fit-for-purpose facilities that will help Australia keep pace with emerging technologies, methodologies and fields of research.



CLIENT : University of Newcastle  
MAIN CONSTRUCTION COMPANY : Richard Crookes Constructions  
ARCHITECT : Denton Corker Marshall  
STRUCTURAL ENGINEER : Northrop  
PROJECT MANAGER : APP Corporation Pty Ltd  
CONSTRUCTION VALUE : \$37.5 million

**Main contractor Richard Crookes Constructions (RCC) completed the 2-storey, 3,820m<sup>2</sup> building under a design and construct contract with the finished facility to be operational in 2021.**

The project has a Physical Containment Level 2 rating and provides different zones to cater for low, intermediate, and high-barrier procedures. The building has been designed so internal spaces can be modified to fit the needs of individual research projects over time. The overall space includes flexible laboratory configurations which can respond to changing needs and future technologies, administration and meeting spaces, secure loading dock and storage areas, as well as the capacity for genomic editing technologies, germ-free facilities and sample freezers.

The structure of the facility was based on post-tensioned in situ concrete slabs for the ground floor to Level 2, with Level 2 walls and roof structure being structural steel.

The most striking feature of the building is the façade. Constructed from a combination of Monument powder coated Speedpanel and bespoke glazed curtain walls consisting of curved glass in association with a ceramic frit pattern on flat glass, the illusion of an undulating, flowing façade has been created.

To meet medical research requirements, specialist mechanical, medical gas, electrical and hydraulics services packages were required, with specific equipment for the operation of the facility including three autoclaves and rack washer.

Bear Melvey, Senior Project Manager for Richard Crookes Constructions, said that the large vessels for the autoclaves had to be installed early in the programme with other parts of the facility built around them.

“These were specialist items purpose-made for the facility by an overseas supplier and were not available when required. We successfully managed the issue by leaving unbuilt corridors along the path of travel. These were built in following the delivery of the vessels with the finalisation of the corridor works coinciding with the completion of the autoclave installation.”

More than 5,000 tonnes of earth were removed during pre-construction and approximately 250 concrete trucks were

on hand to pour concrete flooring. “The construction team put in nearly 100,000 working hours from commencement in May 2019,” Bear added. “The project supported 720 construction jobs and we conducted 894 inductions.”

Julie Rich, Director of Infrastructure and Facilities Services at the University, said the new BioResearch Building will ensure the University continues delivering research that improves the way disease is detected, diagnosed and treated.

“The facility will increase the University’s ability to attract and retain top research talent and support greater collaboration across the University’s various STEM disciplines. It will also provide researchers with access to new and emerging technologies in a modern, flexible, multipurpose, facility,” said Julie.

The University created a project board which included senior researchers to oversee the project. A senior users group made up of researchers and operational managers provided input on specific aspects of the design and user needs. In addition, a technical advisory group ensured the technical integrity of the project by providing input into research methodologies, workflows and equipment. Regular updates were provided to its internal research community.

Bear Melvey said Richard Crookes Constructions was proud to be associated with the University on this important project which is classified as a State Significant Development. “RCC has had an involvement including design finalisation over a period of 56 weeks. We had an excellent working relationship with the University team and the contractors and specialists who worked on the project.”

Richard Crookes Constructions has a specialist education division and has completed many significant projects in the sector.

*For more information contact Richard Crookes Constructions, Level 3/4 Broadcast Way, Artarmon NSW 2064, phone 02 9902 4700, fax 02 9439 1114, email reception@richardcrookes.com.au, website www.richardcrookes.com.au*

*For more information contact University of Newcastle, website www.newcastle.edu.au/research*

Below Northrop Consulting Engineers consulted on all structural, civil and façade engineering design.

Below De Martin & Gasparini supplied, placed and finished 4,200m<sup>2</sup> of concrete for the building and 500m<sup>2</sup> for the project's landscaping.



Northrop was engaged by renowned architectural firm DCM as structural, civil and façade engineers on the University of Newcastle's BioResearch Building. "A key consideration for Northrop's design was the vibration response of floor plates subject to footfall, plant and impact loading. The project brief required maximum floor vibrations of 25µm/s due to the extremely sensitive research equipment and procedures within the facility, which includes optical microscopes to 1,000X magnification. It's unusual for vibration to be such a key design consideration," said Neil Petherbridge, Northern NSW Business Manager for Northrop.

Northrop undertook detailed computer simulation using Oasys software resulting in an optimised slab design with thicknesses varying from 300-350mm with spans varying from 3.5m to 7.5m in the less sensitive areas. Large penetrations in the floor slabs for services added significantly to the complexity of the analysis. This compares with a typical office building where slab thicknesses would have been more like 150-200mm for these spans.

For more information contact Northrop Consulting Engineers (Newcastle), phone 02 4943 1777, email [newcastle@northrop.com.au](mailto:newcastle@northrop.com.au), website [www.northrop.com.au](http://www.northrop.com.au)



The De Martin & Gasparini (DMG) name is synonymous with excellence in concrete supply, pumping and placement. A subsidiary of ASX-listed Boral, DMG specialise in large, often challenging projects in commercial, industrial and high rise developments across Sydney, the Central Coast, Newcastle and the Hunter region.

Working with Richard Crookes Constructions, DMG supplied, placed and finished all the concrete required for the University of Newcastle's BioResearch Building. This involved 1,400m<sup>2</sup> of concrete on each of 3-levels, a total of 4,200m<sup>2</sup> for the building structure. Externally, DMG supplied and placed 500m<sup>2</sup> for the landscape areas with an exposed red riverstone finish.

DMG's Construction Manager of the northern region, Adam Campbell, said that the project was very much in line with the company's core business. "We have the expertise in our local teams, supported by an extensive range of the latest equipment, so even the most technically difficult job is within DMG's scope and capability."

DMG is based in Sydney but has had a full time presence in Newcastle to service the areas north of the Greater Sydney region. "We have 30

full time employees on the team at Newcastle, supplemented by up to 50 full time contractors," Adam said. "We have grown the business substantially in recent years because of our commitment to quality, safety and reliability."

Many of the latest and most iconic buildings in Newcastle and the Central Coast have been completed by DMG, including Newcastle beach front apartment buildings Arena, The Royal and Arvia Apartments and, in the CBD, The Herald, East End and the NUspace building for the University of Newcastle. Health infrastructure projects include Wyong, Maitland and Gosford Hospitals Stages 1, 2 and 3.

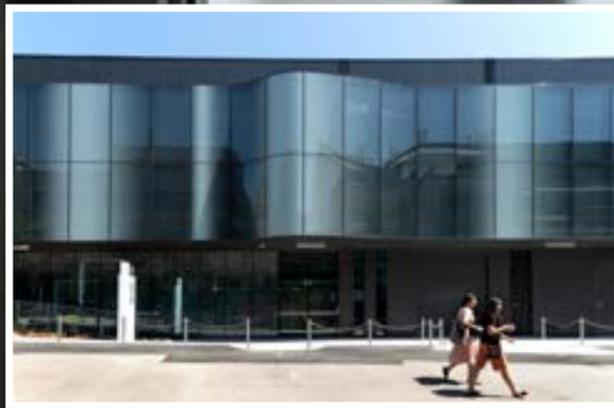
DMG services all construction industry sectors, offering a total concrete structure package from supply and placement of concrete through to total structures and also super-flat industrial floors – for example their most recent super-flat industrial floors project Bunnings Homemaker Centre Bennet's Green.

For more information contact De Martin & Gasparini, 32 Groves Road, Bennetts Green NSW 2290, phone 0466 153 255, email [adam.campbell@boral.com.au](mailto:adam.campbell@boral.com.au), website [www.demartinandgasparini.com.au](http://www.demartinandgasparini.com.au)

Below Engineering Fabrications Newcastle used 3D modeling to optimise the integration of the mechanical services into the structure.



Below I Can Dig It Excavations completed detailed excavation within the small working area at the BioResearch Building.



Contracted by Richard Crookes Constructions for the University of Newcastle BioResearch Building project, Engineering Fabricators Newcastle (EFN) completed the detailed shop drawings, supplied the manufactured structural steel from their Carrington workshop, and undertook the installation.

The new 2-storey, 3,820m<sup>2</sup> building has the capacity for up to 16 sample freezers, quarantine facilities, research laboratories and offices, requiring an impressive level of detail and coordination in relation to the cooler plant.

“Our vertically integrated operation gives us greater control of any project we undertake, so in the case of the BioResearch Building, we had the capacity and design skills supported by 3D modelling to find the optimal solution for integrating the mechanical services into the structure,” said Managing Director, Andrew Dewar.

The company’s team of 70 has an extensive skill base, including project managers, estimators, detail drafters, boilermakers, crane drivers and riggers. Around 25 of the team were engaged on the BioResearch Building for a 4-month period. “The EFN team is dedicated to offering a complete and personalised service with an earned reputation

for quality and service. We aim to meet time and budget objectives on every job,” Andrew said. “We work across all sectors including commercial, industrial, retail and residential, undertaking projects from Sydney to the Central Coast, Hunter Valley, Mid North Coast and beyond.”

Engineering Fabricators Newcastle offer a comprehensive project management package, from initial concept through to engineering design, detailed shop drawings, advanced bill of materials, workshop fabrication, site fabrication, surface treatment and installation.

Since establishment in 2011, EFN has developed an impressive client list ranging from Tier 1 builders through to medium sized construction companies and are currently engaged on the construction of Maitland Hospital, 388 George Street Sydney and the East End Newcastle redevelopment.

*For more information contact Engineering Fabricators Newcastle, 56 Forbes Street, Carrington NSW 2294, phone 02 4023 4578, email info@efnewcastle.com.au, website www.efnewcastle.com.au*

I Can Dig It Excavations undertakes all excavation services ranging from small backyard jobs through to major contracts. I Can Dig It delivers a precise excavation every time, meeting all client requirements.

Contracted to perform excavation services at the construction of the University of Newcastle’s new BioResearch Building, I Can Dig It performed a very detailed excavation within the confined working area. “We have a great deal of experience with the type of excavation required at the BioResearch Building site,” said Managing Director, Paris Corless. “Our team of nine skilfully navigated the logistical difficulties posed by the site and the need to work around other trades on a daily basis.”

I Can Dig It has a wide range of earthmoving equipment to suit any excavation assignment, with a comprehensive fleet including Posi-Track equipment, excavators ranging from 36 tonne down to 1.8 tonne machines. These are supported by 8 tonne tipper trucks and a 12 tonne bogie truck.

“The work at the BioResearch Building demonstrated our capacity to undertake complex excavations in full cooperation with the principal

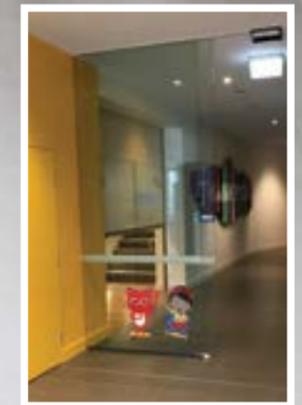
contractor and other trades,” Paris said. “It was a pleasure to work with Richard Crookes Constructions on this job.”

I Can Dig It Excavations is proud to be a local Newcastle based company supporting local employment and businesses. “We are constantly busy meeting the demand for our services on civil works. We are currently engaged on the Bunnings store site at Bennetts Green, a new subdivision at Glenning Valley, the Coles site at Mayfield and a subdivision at Boolaroo,” said Paris.

*For more information contact I Can Dig It Excavations, phone 0412 522 737, email office@icdi.com.au, website www.icdi.com.au*

**Below** Muller Acoustic Consulting completed several aspects pertaining to noise and vibration throughout the project.

**Below** Smoke Control Systems installed four Fyrehalt Vertical Fire Curtains® to provide separation between fire compartments and building occupants.



**Muller Acoustic Consulting completed several aspects pertaining to noise and vibration throughout the project.** Muller Acoustic Consulting (MAC) delivers technically robust, high quality acoustic consulting services for their clients across all industry sectors, including the measurement and management of noise and vibration emanating from construction, mining, industrial and commercial sites.

MAC was involved on the University of Newcastle's world class BioResearch Building from project pre-approval in 2017 to completion, delivering noise impact assessments for inclusion in the project's EIS, the noise and vibration management plan and real time compliance monitoring throughout construction.

MAC's team of eight specialists were involved in the work at the BioResearch Building at one stage or another.

The University of Newcastle project required several acoustic studies, including road noise intrusion, operational noise and management and monitoring of noise and vibration from construction. "This was completed by utilising real time noise and vibration monitoring systems that enabled the construction contractors to

receive trigger alarms and real time alerts if established noise or vibration triggers were reached," said Oliver Muller, Principal Acoustic Scientist.

During construction, managing noise and vibration emissions to minimise impacts on surrounding educational buildings was a key constraint. The success of MAC's management plan could be judged by the fact that the project was completed without complaints from University of Newcastle staff or students, or surrounding stakeholders.

Muller Acoustic Consulting has completed a number of major projects for several extractive industries, along with multiple projects for built environment developments and linear infrastructure projects. MAC have extensive experience liaising with regulators including the EPA, DPIE and councils delivering outcomes favourable to clients while maintaining good relationships with all stakeholders.

*For more information contact Muller Acoustic Consulting, PO Box 262, Newcastle NSW 2300, phone 02 4920 1833, email omuller@mulleracoustic.com, website www.mulleracoustic.com*

**The team at Smoke Control Systems Pty Ltd has a passionate belief that people deserve to work and live in safe and beautiful buildings.** Pursuing this passion, Smoke Control manufactures, supplies and installs curtains, shutters, glazing and smoke ventilation systems that satisfy changing fire and smoke control requirements for the Australian, New Zealand and International markets.

Smoke Control was therefore a logical choice to supply fire and smoke control systems at the University of Newcastle's BioResearch Building. The optimal solution for the building was to install four Fyrehalt Vertical Fire Curtains® which are Australian designed, engineered and manufactured.

"The Fyrehalt curtains provide fire separation between fire compartments in the building and also protect occupants as they egress the building in the event of a fire," explained David Grace, General Manager of Smoke Control.

Strobe warning lights alert occupants that the units are deploying, and integrated obstruction detection sensors ensure a clear deployment zone below the curtain system. The system is fully tested, and fire rated in accordance with AS1530.4 for up to 2 hours.

The challenge at the BioResearch Building was to integrate the fire protection system into the building to achieve the required level of fire safety whilst still achieving the intent of the unique architectural design. "Smoke Control's compact fire curtain system, which has the smallest headbox on the market, makes this goal easier to achieve for any building designer," said David.

Smoke Control partners with leading local and international organisations to deliver the latest fire and smoke management technology. "Continuous research and development enhances our offering of fire windows, fire shutters and fire curtains, so we can bring the most innovative technology to all projects," David said.

As well as their standard commercial and residential projects, Smoke Control is currently supplying fire rated glazing at the Crown Resort at Barangaroo and fire curtain systems at the Australia Museum.

*For more information contact Smoke Control Systems, 26C Ferndell Street, (Access Via Straits Avenue), South Granville NSW 2142, phone 1300 665 471, email info@smokecontrol.com.au, website www.smokecontrol.com.au*

