

# PLANTING THE SEEDS OF INNOVATION

**CLIENT :** The University of Queensland (UQ)  
**MAIN CONSTRUCTION COMPANY :** Hansen Yuncken  
**ARCHITECT :** m3 Architecture  
**CERTIFIER / DDA :** Certis  
**ENGINEER :** Bligh Tanner

The University of Queensland's Plant Futures Facility is a cutting-edge innovation in plant science and the development of sustainable ecosystems with global impact. Located on the St Lucia Campus, this state-of-the-art facility is set to position UQ as a leader in plant research in the Southern Hemisphere and establish it among the most sophisticated controlled environment facilities in Australia.

**Hansen Yuncken, a leading construction company renowned for its expertise in delivering highly technical projects, has played an instrumental role in bringing this ambitious vision to reality.**

The scope of the project included the demolition of existing buildings, constructing two floors of Controlled Environment Growth Rooms, support spaces, and a basement. Additionally, the project involved intricate landscaping and a rooftop deck housing building services equipment and glasshouses.

"The University of Queensland's Plant Futures Facility is exclusively a research-intensive building designed to simulate precise environmental conditions such as temperature, humidity, lighting, and CO<sub>2</sub>," said Krystal Lawrence, Senior Contract Administrator at Hansen Yuncken.

"Our team has integrated highly controlled, flexible interior grow rooms and laboratory spaces to cater to a wide range of plant science research, particularly focusing on high-temperature research."

What sets the Plant Futures Facility apart is its commitment to sustainability and advanced architectural detail. The building adheres to Physical Containment Level 2 Laboratory (PC2) requirements under the Office of the Gene Technology Regulator (OGTR) and Approved Arrangements (AA) for a 5.2 Biosecurity Containment Level 2 (BC2) bio-containment facility, underscoring its role in addressing global food, fibre, fuel, and sustainable production systems.

From a construction perspective, the project presented multiple challenges. One notable complexity was the intricate detailed façade made of face brick, which took over 12 months to complete.

"The glasshouses, located on the rooftop, provided unique challenges in terms of their erection methodology," Krystal said. "Service Coordination and reticulation through congested plant rooms required meticulous planning and the significant use of BIM (Building Information Modeling) to coordinate and resolve these challenges, ensuring adequate maintenance access for the future."



Image © Christopher Frederick Jones

Image © Christopher Frederick Jones



Hansen Yuncken commenced work on the Plant Futures Facility site in late November 2021, with make-safe and demolition operations starting in December 2021.

The first slab was successfully poured on May 4, 2022. At the peak of construction, the project team comprised 14 key members, with over 65 subcontractors engaged. On any given day, up to 130 workers were diligently working on-site to meet project milestones and deliver high-quality results.

Hansen Yuncken Queensland Manager, Michael Vicenzino reflected on the overall project; “The University of Queensland Plant Futures Facility has been one of the most complex research projects we’ve undertaken. The interface between numerous specialist contractors, some from the northern hemisphere and services contractors to deliver the specialist controlled environments with programming that enables multiple variants of atmospheric growing conditions in the grow rooms and glasshouses has been both a challenging and interesting learning experience. The exceptional quality of this building is a testament to our team’s ability to handle highly technical and serviced facilities, furthering our expertise in the education and research sectors.”

Hansen Yuncken’s precision engineering and commitment to excellence will leave a lasting impact on UQ’s research capabilities and global contributions to sustainable ecosystems.

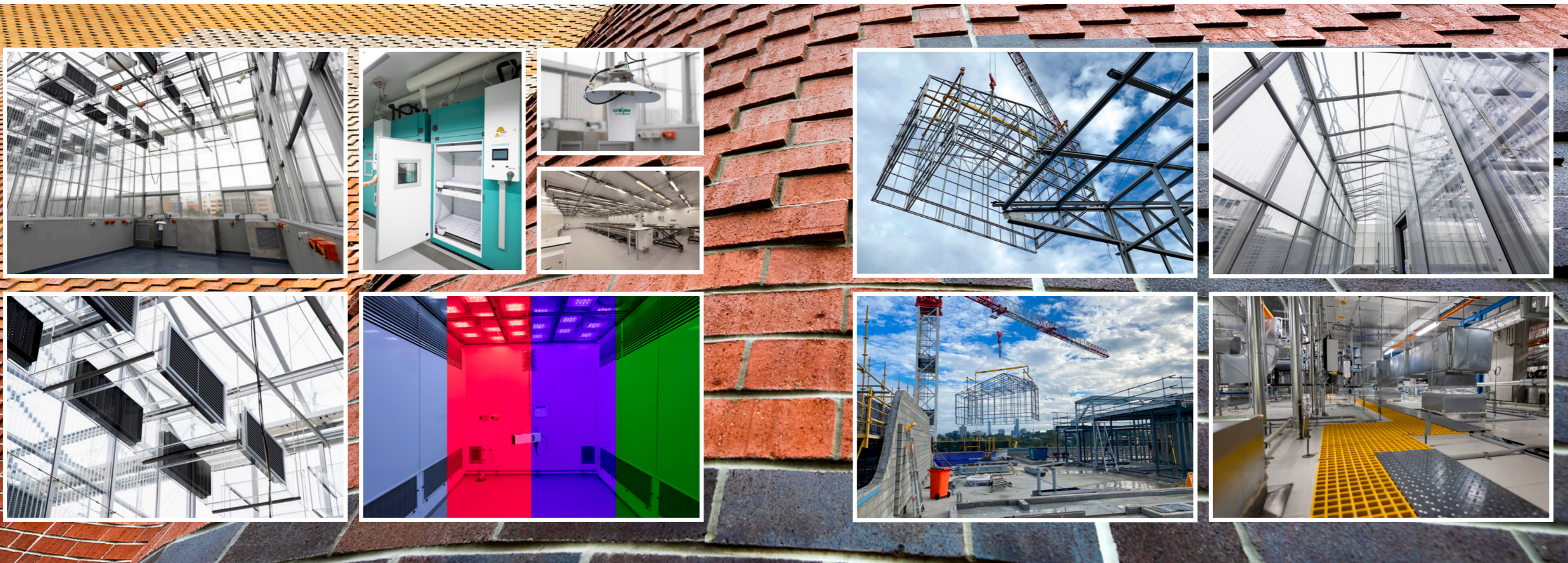
Proudly Australian, privately owned and controlled, Hansen Yuncken’s enduring success is shaped by experience and thirst for innovation. They are one of the nation’s largest commercial building contractors, employing over 600 team members across New South Wales, Northern Territory, Queensland, South Australia, Tasmania, and Victoria.

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Below Kerslake & Associates leveraged decades of expertise, to translate scientific needs into infrastructure requirements



Below KUSCH designed and certified UQ's Plant Futures Facility, ensuring structural integrity for cool rooms, glasshouses, and façades.



**Kerslake & Associates have played a pivotal role in the development of the University of Queensland's (UQ) Plant Futures Facility.** Spearheaded by Director, Rob Kerslake, an internationally recognised specialist in research laboratories, glasshouses, and controlled environment facilities, the firm brings over three decades of expertise to this ambitious project.

Kerslake's extensive experience, gained primarily through his work with the CSIRO in Brisbane, has positioned him as a vital contributor to the UQ project. His unique ability to translate scientific needs into infrastructure requirements was key to the successful development of the Plant Futures Facility. "My detailed knowledge of plant physiology and environmental requirements relating to plant growth within glasshouse and artificial environments, particularly in the tropics and sub-tropics, was crucial for this project," said Rob.

"I provide a unique service to both the scientific community and infrastructure consultants. I can translate scientific needs into infrastructure requirements using an understanding of the different cultures of science and construction, thereby providing an interface between the scientific community and consultant teams for infrastructure development."

There were a significant number of teams conducting research into a wide variety of crops that required a large range of experimental environmental conditions. The temperatures varied from a low of 8°C to 45°C in artificially lit cabinets and walk-in rooms and naturally lit rooftop greenhouses. "The facility will provide University of Queensland researchers with a world-class facility now and well into the future," said Rob.

Kerslake has also lent his expertise to the design of Level 3 Quarantine insect laboratories and glasshouses in Brisbane and Melbourne, demonstrating his ability to handle complex and high-stakes projects. His role as the controlled environment and glasshouse specialist consultant for the UQ Plant Futures Facility underscores his significance in the field.

With Kerslake & Associates' involvement, the UQ Plant Futures Facility is set to become a benchmark in research infrastructure, offering unparalleled support for scientific advancements in plant growth and physiology.

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**KUSCH provided the structural design and certification for the cool room panels, glasshouse frames, and the architectural masonry façade at the University of Queensland's new Plant Futures Facility.** Their design ensured these components could endure seismic loads, the weight of suspended services, and live loads from construction and maintenance personnel.

The cool rooms were designed to serve as trafficable platforms, supporting both construction and operational activities. The installation of mechanical and lighting services above and below the panel ceilings of the coolrooms created complex buildability challenges. KUSCH's structural modelling enabled the panel ceilings to be rated for both personnel and equipment loads. This simplification of the installation process ensured safe and efficient access for maintenance in these congested areas.

Detailed modelling and analysis of the panel system allowed KUSCH to eliminate additional seismic bracing typically installed with laboratory cool rooms. "By bracing FCUs to the cool room panels rather than the overhead structure, we resolved personnel access issues, reduced material and labour costs, and mitigated differential movement problems," said Jarrod.

"One of the significant challenges of the project was the construction of the glasshouses on the roof of the 6-storey building. The builders faced difficulties in determining a safe and economical method for this task," said Business Manager, Jarrod Vanderree.

KUSCH developed a methodology which saw the construction of the glasshouse frames at ground level, followed by lifting the completed frames onto the roof using the onsite tower crane. "This not only improved safety but also proved to be cost-effective. KUSCH's detailed structural analysis and certification ensured the success of this lift operation," explained Jarrod.

Additionally, KUSCH managed the structural design and certification of the architectural masonry façade. This included accommodating gravity, wind, and seismic loads, as well as building movement and brick expansion and contraction. Their detailed analysis and design certification addressed these complex factors, ensuring the durability and stability of the multi-storey masonry façade.

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## SUSTAINABLE WASTE MANAGEMENT DURING THE CONSTRUCTION OF UQ'S PLANT FUTURES FACILITY

Cleanaway's involvement in the construction of the University of Queensland Plant Futures Facility underscores the significance of effective waste management solutions in large-scale projects.

With a steadfast focus on sustainability, resource recovery, regulatory compliance, and environmental standards, Cleanaway is the leading waste management company in Australia.

"Our dedicated staff are extensively trained in both construction and demolition waste management. This expertise allows us to handle diverse waste streams with precision and efficiency, ensuring a seamless waste collection and processing," said Felicity Willmet, Cleanaway's National Operational Performance Manager.

"Over 60 staff members from our Brisbane office, including frontline driver operators and customer call centre specialists, collaborated seamlessly to ensure smooth waste collection, processing, and recycling for more than 150 services for this project. The team's dedication to customer service, exceptional work ethic, and commitment to the community was exemplary."



Throughout the project, Regional Manager Tiffany Paffey played a crucial role in overseeing the site and project, ensuring that waste management operations ran safely, smoothly and efficiently. Tiffany's leadership and strategic oversight were instrumental in coordinating logistics, optimising waste removal processes, and maintaining timely service delivery, contributing to the overall success of the project and ensuring the safety of both the Cleanaway and site teams.

"Our waste management services operate on an ad hoc basis, where clients can simply call us when the need arises. We pride ourselves on being highly responsive and agile, ensuring that we can promptly address construction site requirements," said Felicity.

"The waste bin plays a crucial role in site operations and must be serviced within the requested timeframe. We understand the intricacies of the industry, and work closely with our construction partners to navigate the challenges and complexities of project logistics, ensuring a seamless coordination of all the moving parts."

Cleanaway prioritise high resource recovery rates and implement eco-friendly practices to not only facilitate effective waste disposal but also contribute to environmental conservation efforts. Their goal is to ensure that every aspect of their waste management services aligns with the principles of sustainability and environmental responsibility.

Through communication and collaboration, Cleanaway can get the best outcomes for customers.

For more information contact your local Cleanaway branch by calling 13 13 59, [www.cleanaway.com.au](http://www.cleanaway.com.au)



**Known for their innovation and customer satisfaction, Maintek Roofing were contracted to provide and install critical roofing components in the University of Queensland Plant Futures Facility.**

Maintek's scope of work included installing acoustic walls and ceilings, roof sheeting, and stainless cappings that met the stringent requirements of a high-tech research environment. To ensure maximum efficiency and aesthetic results for the project's façade, Maintek utilised a dual product system, combining Vulcan Acoustic Insulation and Aluminum Perforated Cladding.

Aluminium Perforated Cladding is designed to maximise airflow and enhance natural lighting while providing protection from harsh weather conditions. "These architectural products not only serve as a striking façade but also function as paneling and screening for both internal and external applications," said Ryan Rahurahu, Project Manager.

Vulcan Acoustic Insulation is a high-density, rigid insulation made from mineral rock fibre stonewool. "It's a non-combustible material suitable for both external and internal applications, known for its

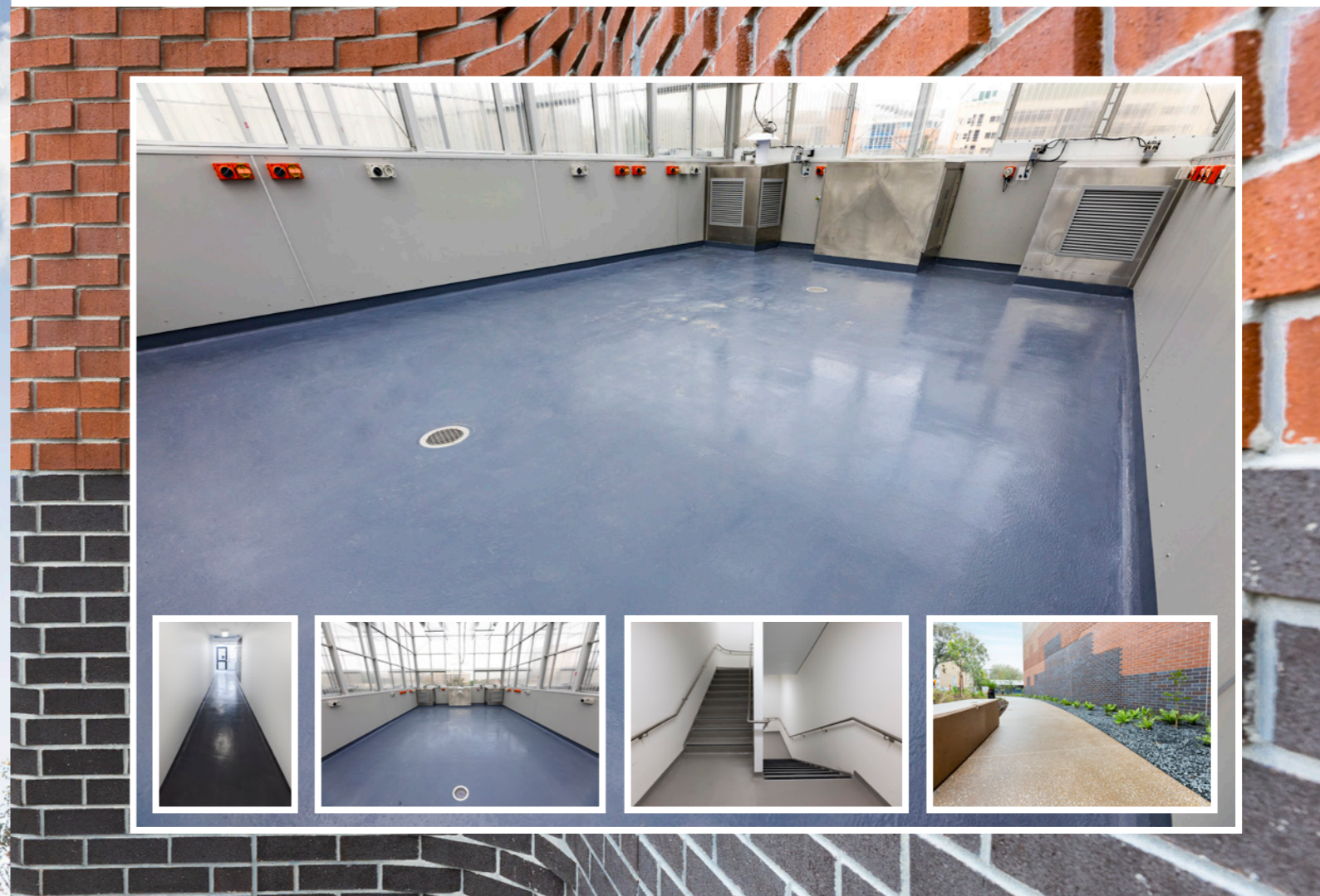
water-shedding characteristics. "This insulation is particularly effective in ventilated rainscreen façades and other thermal and acoustic wall, roof, floor, and ceiling applications." Ryan said.

The complexity and importance of this project demanded the best, and Maintek Roofing delivered. Our role in ensuring the facility's roofing meets the highest standards of durability, insulation, and acoustics has been a significant achievement for our team," said Ryan.

Maintek's other notable projects include Brisbane Metro Bus Depot, Palm Beach Aquatic Centre, and Collingwood State School. Maintek's portfolio includes government projects, airport installations, and architectural commercial ventures, all of which speak to their capability and reliability.

*For more information contact Maintek Roofing Pty Ltd, 75 Waterway Drive, Coomera QLD 4209, phone 07 5580 4697, email [ryan@maintekroofing.com.au](mailto:ryan@maintekroofing.com.au), website [www.maintekroofing.com.au](http://www.maintekroofing.com.au)*

Below Epcon Contracting offers eco-friendly, non-toxic epoxy flooring solutions for commercial, residential, and industrial projects.



With years of experience in the flooring industry and a solid reputation among builders and construction companies across Australia, Epcon Contracting has proven itself as a leader in epoxy flooring solutions, and a clear choice for the University of Queensland (UQ) Plant Futures Facility project.

“At Epcon Contracting, we pride ourselves on being an independent, commercial, residential, and industrial floor contractor, specialising in epoxy flooring systems,” said Kirk Rome, Director of Epcon Contracting. “We promote and use only the most reliable components and materials, ensuring our services are non-toxic, safe, and environmentally friendly.”

Epcon Contracting’s involvement in the UQ Plant Futures Facility was comprehensive, encompassing a range of flooring solutions tailored to the facility’s unique requirements. The scope of work included applying epoxy resin to the staircase, using 2pac epoxy on Levels 2, 3 and 4 and concrete sealer on Levels 1-2 and Levels 4-6, maintaining slip resistant finish for compliant safety. Resin supplied by Sika Australia, with slip resistance verified by Slip Test Australia.

Additionally, they utilised epoxy resin mortar in the basement to

correct the concrete and applied Sika 263SL followed by Sika 264 Epoxy rollcoats incorporating aluminum oxide.

For the Level 6 greenhouses, Epcon’s team, installed the Tremco Alphaguard waterproof membrane, supplied by Tremco Australia, and for the external footpaths, a spray-applied Streetscape Concrete Sealer was utilised from Concrete Colour Systems.

“Our team had to coordinate closely with other trades to gain access to spaces, which extended our timeline to July,” Kirk explains. “Despite the challenges, we ensured that every aspect of our work met the highest standards of quality and performance.”

As a family-run business, Epcon Contracting operates with a personal touch and a commitment to excellence. “Our aim is to provide our clients with strong and great-looking floors at competitive prices and within budget,” Kirk said. “We install epoxy flooring that performs in harmony with the architecture of the building and the type of business carried out at the facility.”

For more information contact Epcon Contracting, phone 0431 083 575, website [www.epconcontracting.com.au](http://www.epconcontracting.com.au).