Network Architectural

Sustainability Awards

Sustainability eBook 2024

Network Architectural

Structures serve as potent instruments that can either exacerbate or alleviate environmental impacts.

Society's grasp of sustainability has expanded significantly, an expansion that has ushered in innovative design strategies, and prompted many fundamental shifts in behaviour. Central to this evolution is the role of building design in shaping the sustainability of our urban landscapes.

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The orientation and layout of a building play critical roles in its energy consumption. Thoughtfully aligning structures with the sun's trajectory allows for natural light and warmth, thus diminishing the reliance on artificial lighting and climate control systems. Equally important is the choice of materials. Selecting locally sourced, recycled, or renewable materials not only cuts transportation emissions but also reduces the environmental toll of extraction and production processes. Additionally, high-quality insulation and windows can enhance a building's energy efficiency, resulting in lower energy demands and reduced emissions.

Today, architects, engineers and even developers are increasingly embedding renewable energy systems into their designs. Solar panels, wind turbines, and geothermal systems can convert buildings into net energy producers, supplying excess energy back to the grid. This transition not only curtails dependence on fossil fuels but also fosters a more decentralized and resilient energy infrastructure.

Then there is water conservation, a subject close to many in this, the world's driest, inhabited continent. Implementing systems for rainwater harvesting and greywater reuse alleviates pressure on municipal water supplies and reduces the energy required for treatment. Moreover, green roofs and permeable pavements help manage stormwater runoff, easing the load on drainage systems.

At the end of the day, it is not an understatement to say that building design is integral to the quest for sustainability. By carefully considering orientation, material choices, energy systems, and water management, architects and engineers wield the ability to create structures that work in harmony with the environment rather than depleting it.

Prioritizing sustainability in design paves the way for a future that is not only ecologically balanced, but also resilient.

BRANKO MILETIC, EDITOR

The Awards Jury

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DICK CLARKE
Founding Director, Envirotecture Australia

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Architect & Passivhaus Designer, DJRD Architects Australia

JEREMY SPENCER
Director, Builder & Energy Rater, Positive Footprints Sustainable Design & Construction

MAHALATH HALPERIN
Architect & Director, Mahalath Halperin Architects

SIMONE SCHENKEL
Co-Founder & Director, Gruen Architecture Australia

Weathering the storm: ALPOLIC's role in creating resilient architecture for changing climate

Remember when weather was merely a topic of casual conversation? Now, amidst the escalating emergency of the climate crisis, it's a subject fraught with anxiety and uncertainty – especially because Australia is experiencing some of the most pronounced effects of global warming. From scorching heat waves and devastating bushfires to intense rainfall and torrential floods, we have endured a rapid surge in extreme weather events. This fundamental development is radically reshaping the built environment, presenting architects and designers with an urgent challenge: to create buildings that not only withstand these volatile and largely unpredictable conditions, but also contribute to a more sustainable, resilient and – hopefully – more stable future.

As a result, now, more than ever, the choices architects and designers make regarding materials, construction techniques, and overall design strategies are critical, and selecting products that can endure harsh weather conditions, resist corrosion, and offer long-term durability is paramount to ensuring the safety and longevity of the built environment in Australia.

TRIED AND TESTED SOLUTIONS PROVIDE CONFIDENCE FOR UNCERTAIN FUTURE

Assessing weatherability during the planning and design phases is crucial to ensure optimal performance and sustainable outcomes throughout a building's lifecycle, and early collaborative engagement with suppliers who provide comprehensive testing data is absolutely essential.

This includes simulations of various environmental conditions and, ideally, independent certifications demonstrating compliance with relevant standards. As many industry professionals are aware, AS4284 is a crucial Australian standard for evaluating a building facade's ability to resist water penetration under simulated weather conditions. Additionally, AAMA2605 is a widely recognised North American standard that outlines rigorous testing procedures for assessing the performance of organic coatings on architectural aluminium extrusions and panels, providing valuable insights into their resistance to fading, chalking, and corrosion.

Prioritising materials with proven weather resistance, backed by compliance with standards like AS4284 and AAMA2605, can significantly mitigate the risks associated with extreme weather events. By making informed decisions based on robust testing data and recognised industry standards, architects and builders can create more resilient structures.

ALPOLIC™: A PROVEN SOLUTION FOR A CHANGING CLIMATE

Manufactured in Japan by Mitsubishi Chemical Infratec Co., Ltd, ALPOLIC™ exemplifies a superior choice for architects seeking to safeguard buildings against the escalating challenges of Australia's climate. The panels have been rigorously tested to meet or exceed international standards – including AS4284 for water resistance and AAMA2605 for coating performance, ensuring resilience against corrosion and UV degradation. Plus, the panels have also undergone cyclone testing. Here, we look at specific aspects of ALPOLIC design that ensure its outstanding quality, reliability and weather performance.

First of all, the panels are engineered with high-quality aluminium, which equips them with outstanding structural integrity, and enables them to resist the forces exerted by high winds, heavy rain, or even hail. This endurance in the face of even the most trying conditions is further reinforced by corrosion resistance, UV stability and thermal expansion control. ALPOLIC™'s advanced Lumiflon FEVE paint coating technology ensures that the panels maintain their aesthetic appeal even when exposed to prolonged moisture, salt spray, or acidic pollutants and its high resistance to UV degradation ensures colours don't fade away. The panels' one-of-a-kind, mineral-filled core protects the exterior from damage over time, such as denting or oil canning, brought on by Australia's increasingly severe weather conditions. These characteristics contribute to the panels' distinctive flat profile and their capacity to retain their shine and lustre for about 50 years.

The iconic Q1 Tower in Queensland stands out as a testament to ALPOLIC™'s incredible weatherability, as the building has been withstanding the harsh conditions of its seaside locale since completion in 2005. Positioned only a couple of hundred metres away from breaking surf and exposed to salt air and Queensland's unforgiving sun for over 20 years, the building still maintains its structural integrity and aesthetic appeal, with the ALPOLIC™ panels installed across its exterior still looking as good as they did when first installed.

Designed by Conrad Gargett and Lyons, the Queensland Children's Hospital is another example of ALPOLIC™'s resilience. Completed exactly a decade ago, the hospital's exterior remains vibrant despite Brisbane's unrelenting tropical heat, humidity and intense sun exposure. Here, 55,000m² of the ALPOLIC™ product in various custom colours including vivid green, turquoise and purple were used on the building's exterior louvres and protruding components to achieve the architects' engaging and immersive vision – and thanks to ALPOLIC's Lumiflon FEVE resin technology, the panels still look like they did on the day of installation.

These pristine facades highlight the panels' exceptional resistance to heat. ALPOLIC™ products are engineered to minimise thermal expansion and contraction, preventing warping, buckling, or cracking – an essential consideration when specifying materials in areas set to experience extreme temperature variations.

Reliable fire performance is another quality making ALPOLIC™ NC/A1 particularly suited for an increasingly volatile, harsh climate. The mineral core of ALPOLIC™ NC/A1 is non-combustible, preventing it from catching fire even when exposed to high temperatures – a quality particularly relevant in bushfire-prone areas. In fact, it has been tested and certified to meet the Euroclass A1 standard, the highest possible rating for non-combustibility. That means the panel has passed rigorous tests simulating real-life fire scenarios and has shown no propagation nor spread of flame.

ALPOLIC™'s exceptional durability and weather resistance ensure reliability and longevity in the face of escalating extreme weather events. In that, they also offer additional benefits that reinforce ALPOLIC™ as a particularly sustainable choice for an uncertain future. Durability and structural integrity minimise maintenance and replacement requirements, which minimises costs, need for additional resources and labour, associated transportation and logistics, construction waste, and – as a result – the building's environmental impact is vastly reduced. In addition, in contrast to other products which might require cleaning up to four times a year, ALPOLIC™ panels do not require cleaning to maintain their warranty at all – which only reduces their environmental impact further. Plus, the availability of an Environmental Product Declaration (EPD) for the panels provides clarity about their environmental impact throughout their life cycle, fostering transparency and informed decision-making for sustainable building design.

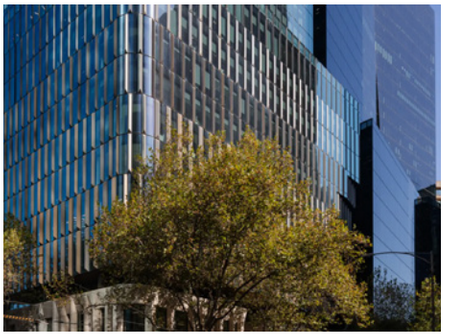
In a world grappling with the increasing urgency of climate change and more unpredictable, volatile weather patterns, the architectural community is bound to play a vital role in creating a resilient built environment that can endure and thrive. By prioritising weather-resilient design and specifying meticulously tested high-performance materials and products like ALPOLIC™, architects, designers and construction professionals can help create sustainable and resilient buildings – and a greener, more stable future for Australia.

Commercial Architecture (Large) Award Shortlist

proudly partnered by Network Architectural

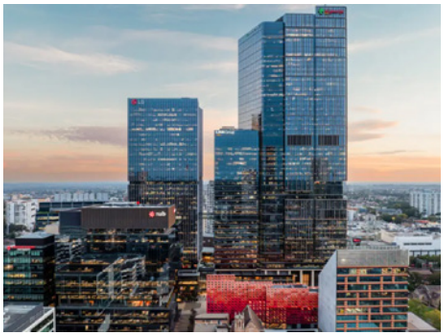
A Class 5, 6, 7 or 8 building used for professional and / or commercial \purposes of over 500sqm in floor size.

550 SPENCER ST – CATCHING THE SUN
STUDIO KENNON



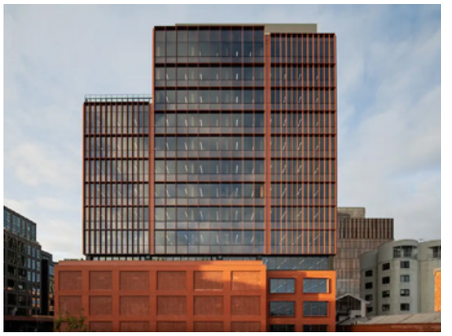
555 COLLINS STREET
COX ARCHITECTURE + GENSLER

83 PROPRIETARY STREET, TINGALPA
ELEVATION ARCHITECTURE

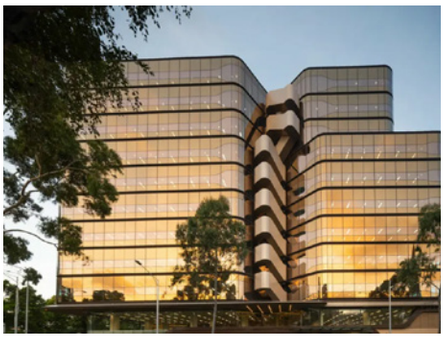


PARRAMATTA SQUARE
WALKER

SYDNEY SWANS HQ
POPULOUS



T3 COLLINGWOOD
JACKSON CLEMENTS BURROWS ARCHITECTS



VICTORIA PLACE
INTEGRATED GROUP SERVICES

Award Winner

WINNER

T3 COLLINGWOOD
JACKSON CLEMENTS BURROWS ARCHITECTS

Responding sensitively to its rich industrial context, T3 Collingwood aims to positively contribute to Collingwood's urban streetscape and sense of community. The high quality 15-level commercial building provides an activated ground plane on Wellington St with cafes, restaurants, and other public amenities.

BELOW Winner from Jackson Clements Burrows Architects - Jimmy Walker with Anna Fischer from Network Architectural.

PROJECT PHOTOGRAPHY John Gollings, Tom Blachford.

The butterfly effect at Changi Airport Terminal 3:

INGENIOUS DESIGN TAKES FLIGHT WITH DURLUM'S DYNAMIC CEILING AND LIGHT MODULATION SYSTEM

Airports have long captivated our imaginations – and for good reason. An awe-inspiring testament to humanity's inventive spirit, airports are inspiring reminders of the transformative potential of bold design. Singapore's flagship Changi Airport is no exception. In fact, this iconic complex of buildings, designed through a collaboration between SOM – Skidmore, Owings & Merrill LLP and CPG Corporation Pty Ltd, is one of the most innovative global travel hubs.

A perennial high-ranker in the "World's Best Airport" awards by Skytrax, this busy airport is a pinnacle of ingenuity, and Terminal 3 stands out as a particularly fine example of architectural and engineering excellence. One of Terminal 3's most outstanding design features is its custom ceiling and light modulation system by durlum, a leading developer of metal ceilings and lighting systems for architectural applications. Unique on a global scale for its robustness, sophistication and seamless integration of design and technology, durlum's system enables the airport to capitalise on different light sources to create a comfortable environment for millions of travellers passing through the airport every year, while significantly reducing energy consumption.

The system's eye-catching design language is inspired by the effortless kinetics of butterfly wings, a concept beautifully brought to life through a series of panels gracing the terminal's roof. While their striking designs have certainly become a distinctive element of the building's envelope, these 919 anodised aluminium panels engineered by durlum, are not merely decorative – they are fundamental to regulating the amount of natural light flooding the interior.

Each perforated panel is strategically positioned above a light well, and their movements are orchestrated by a central computer that receives real-time data from roof sensors. This allows the panels to respond dynamically to the sun's angle and the prevailing weather conditions, ensuring optimal daylight while minimising unwanted heat gain.

Inside the terminal, durlum's ingenious light modulation system continues to stand out as one of the most distinct design features. Here, thousands of louvred ceiling panels work in seamless tandem with a network of overhead lights and light-deflecting reflective surfaces to capitalise on daylight, and use artificial lighting only when required. Spanning an expansive area of 60,000m2, this intricate, responsive system transforms the ceiling into a stunning, sculptural installation that emulates the very same dynamic movement of butterfly wings.

When natural light fades, 90 light projectors installed across the roof, along with direct and indirect lights throughout the terminal, seamlessly take over, ensuring a consistently well-lit and comfortable environment for travellers.

durlum's dur-TRONIC system expertly manages this intricate dance of light, dynamically transitioning between natural and artificial light sources so seamlessly that the shifts are practically imperceptible to the crowds rushing through the airport. This extraordinary solution, custom-designed specifically for this iconic location, ensures a bright, comfortable and evenly lit environment, while the spectacular design of louvred skylights enhances the stunning, futuristic character of the interiors.

At the same time, this ingenious system significantly reduces the terminal's energy consumption. Through a responsive and fully automated combination of daylight harvesting, reflective surfaces, and intelligent lighting control, the airport reports an estimated reduction of 2,400 tons of CO2 emissions annually. This reduction in carbon footprint – further underscored by the outstanding recyclability of durlum's aluminium panels – is a testament to the incredible potential ingenious design can have on environmental performance.

The success of Changi Airport Terminal 3 showcases the transformative power of uncompromising, cutting-edge design, and collaboration between architects, engineers, and manufacturers. An exquisite example of custom design, this project serves as an inspiration for the future of commercial developments, demonstrating that aesthetic excellence, environmental responsibility and technical ingenuity can soar to new heights – and with durlum's innovative ceiling and lighting solutions ambitious projects like this one can truly take flight.

Q&A with Steven Fraser, Ceiling Systems Manager at Network Architectural

As the demand for sustainable building solutions intensifies, metal ceilings are becoming increasingly popular, especially for commercial architecture. With their remarkable recyclability and longevity, they are emerging as a smart choice for the forward-thinking and environmentally conscious. So, we sat down with Steven Fraser, Ceiling Systems Manager at Network Architectural, to unpack the environmental potential of metal ceilings, and talk about what makes durlum a real stand-out in this space.

A&D: Can you tell us about your background in sustainability and how it led you to your current role at Network Architectural?

STEVEN FRASER: I've always been passionate about how materials impact buildings and their occupants, and with over 15 years of experience in manufacturing composites and metals I have developed a deep understanding of their environmental impact.

Now, as Ceiling Systems Manager, I strive to help architects and subcontractors choose the best products for their needs while prioritising sustainability. I strongly believe that we are the custodians of our environment for the next generation, and I like to align my career trajectory to employers that share my values. Network Architectural certainly does.

A&D: From your perspective, how does sustainability factor into today's architecture and design landscape?

SF: Incorporating sustainable design principles from the outset is paramount to ensuring efficient use of resources, reducing waste, and improving overall building performance. And for me, creating durable ceilings that minimise ongoing maintenance and withstand the test of time to reduce waste and energy in the long term is absolutely crucial. In essence, it's all about using less resources and repurposing existing elements.

A&D: How important is sustainability to your organisation? Is it an important consideration when sourcing products to support?

SF: Sourcing sustainable products for our portfolio is essential for Network Architectural. It's a fundamental principle of the company's ambition to create positive environmental and social impact. And while financial success is important, it really is about fostering responsible business practices that benefit employees, the industry as well as global communities at large.

A&D: durlum is your leading metal ceiling solution. How does durlum's commitment to sustainability align with Network Architectural's environmental ethos?

SF: durlum is also committed to sustainability, which aligns perfectly with Network Architectural's environmental ethos. durlum has achieved an Environmental Product Declaration (EPD) for all of its steel, aluminium and chilled/heated ceilings, which means that they have independently verified the environmental impact of their products throughout their entire life cycle, from raw material extraction to manufacturing, use, and end-of-life disposal.

Plus, durlum is also certified according to the international environmental management standard ISO 14001 as well as energy management standard ISO 50001 – these certifications demonstrate durlum's commitment to reducing its environmental impact and improving its energy efficiency.

A&D: Speaking of certifications, last year you went through the process of obtaining Global GreenTag GreenRate certification for durlum. Can you talk through that process?

SF: We're very proud to have achieved Global GreenTag GreenRate Level A Certification last year. It was a rigorous process that involved evaluating our durlum Aluminium Panels across various factors, including health and ecotoxicity, life cycle analysis, and corporate social responsibility.

We had to provide detailed evidence demonstrating that our product ingredients and manufacturing processes aren't harmful to people or the environment. This was a challenging but rewarding undertaking that ultimately reinforced our commitment to sustainability.

We're confident that our Global GreenTag GreenRate Level A Certification proves that our durlum Aluminium Panels are a responsible choice for projects prioritising sustainability.

A&D: With all that in mind, would you consider metal ceilings to be a good sustainable solution and why?

SF: Absolutely. I think it's important to acknowledge that metal ceilings use a lot of energy to produce in the first instance, however their robustness, corrosion resistance and longevity of use offset this impact. And if incorporated with smart solutions can effectively help reduce the day-to-day energy consumption of the buildings' operational energy use, such as lighting and heating.

In addition, metal ceilings offer one of the best end-of-life opportunities. Not only do they offer an exceptional life span of over 50 years – they are infinitely recyclable and remain to be a high value item at the end of its long-life span. Plus, recycling metal ceilings uses 95% less energy than producing new metal. Consequently, metal building products rarely end up in landfills, contributing to a circular economy.

Phone: 13 71 75
info@networkarchitectural.com.au
www.networkarchitectural.com.au

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