SCOPE

NZ METAL ROOFING MANUFACTURERS INC.

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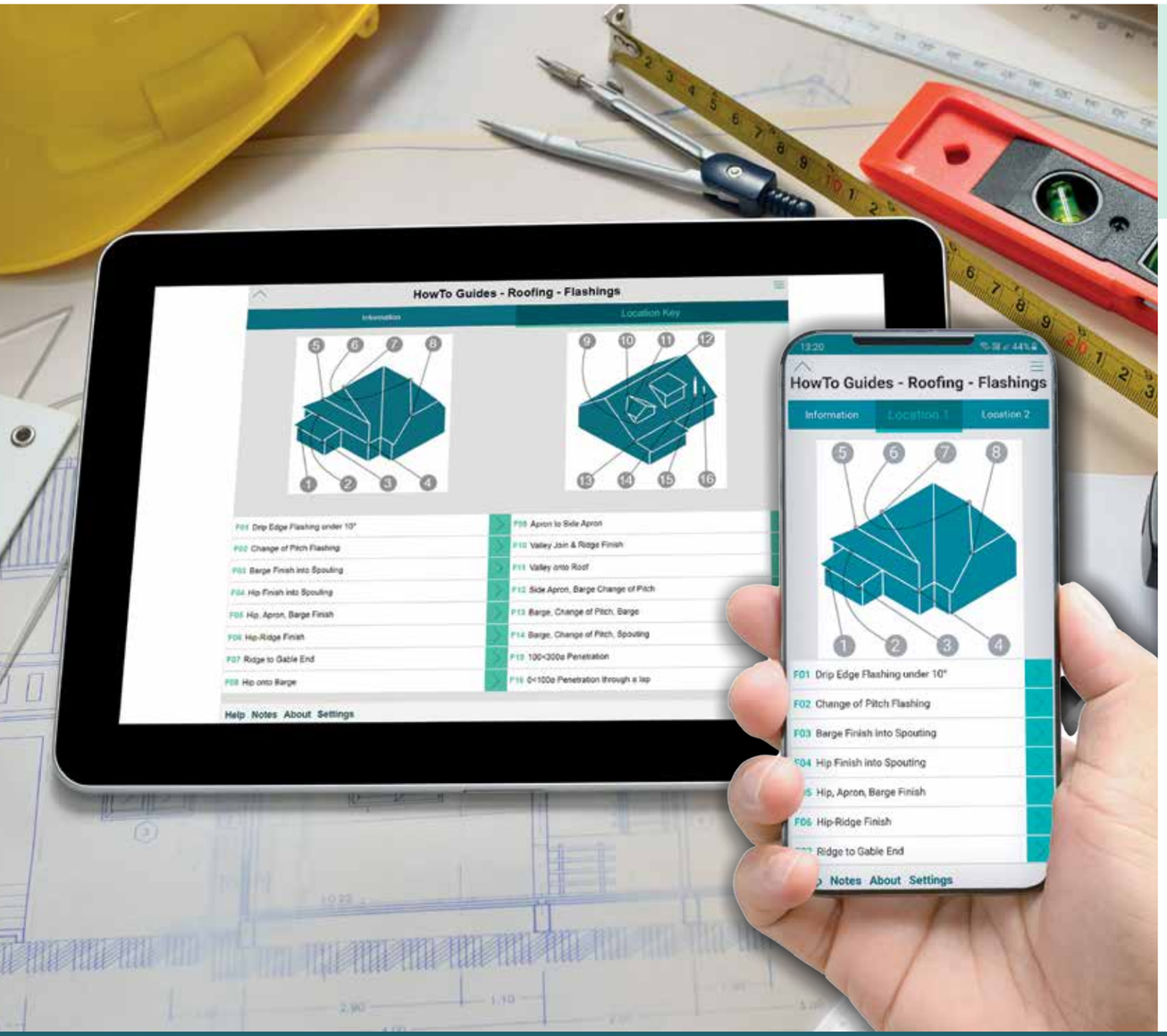

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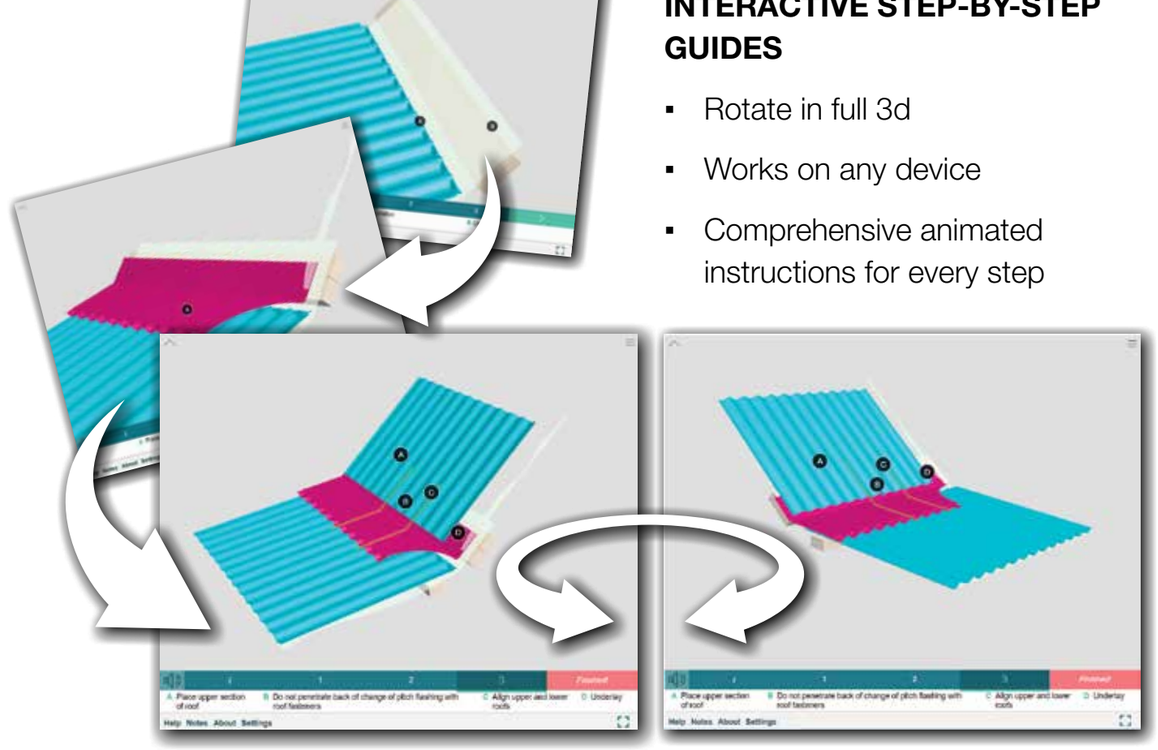

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With up to a 50-year warranty, the increased durability of COLORSTEEL MAXAM® means longer-lasting roofs and cladding for a buildings design life – the premise of one roof replacement in 100 years, working to reduce waste and supporting more sustainable building practices. Looking to the future, COLORSTEEL® , proudly made by New Zealand Steel will soon be made through an Electric Arc Furnace, New Zealand's largest decarbonisation effort through set to be operational by 2026.

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With up to a 50-year warranty, the increased durability of COLORSTEEL® MAXAM™ means longer-lasting roofs and cladding

CARDINAL LOGISTICS

Cardinal Logistics recently constructed a brand-new automated logistics facility in Drury, South Auckland. Located on a 9.8ha site, the warehouse is 240m long, 90m wide and ten storeys high — reaching 28m at its highest point. Strength and reliability were key when it came to selecting the roofing and cladding — with Roofing Industries' Maxispan roofing and Multirib cladding specified for the immense project.

The building was designed by Woodhams Meikle Zhan Architects (WMZA) and built by contractors Haydn & Rollet with the aim of creating a functional, long-lasting and aesthetically-pleasing space.
"Our goal was to ensure the building delivers long term performance with minimal maintenance while providing a modern and professional appearance for Cardinal Logistics," explains Kevin Lin, Architect, WMZA. "For the roofing and cladding we focussed on durability, weather resistance and visual appeal."

For the extensive roof of the facility, Roofing Industries' Maxispan profile in Colorcote Gull Grey was specified to provide the spanning capability, water carrying capacity and low maintenance required. "Maxispan offers exceptional long

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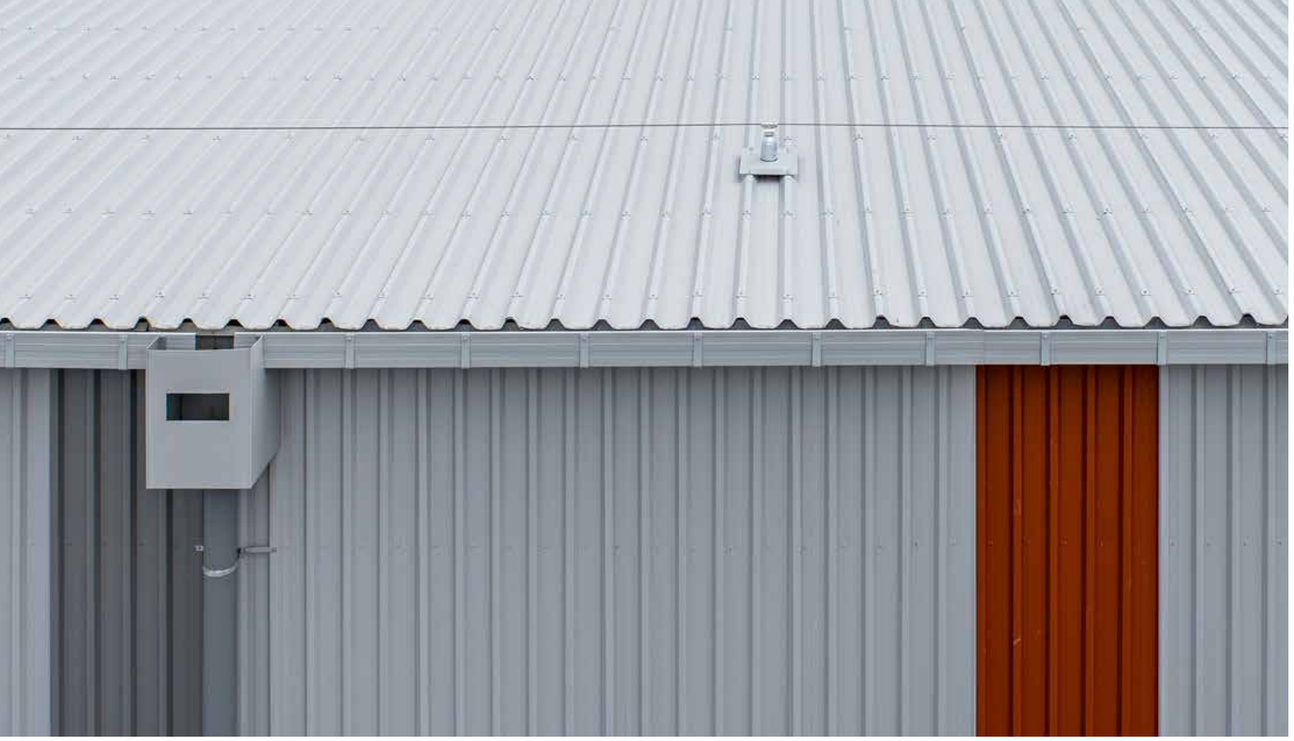
“Cardinal Logistics is probably one of the highest warehouses that's being built in Auckland at the moment — 28m at the highest point,”

spanning capability and high strength ideal for covering large warehouses,” says Kevin. “This reduces complexity in the design, making it a cost-effective solution.”

For the facade, which features vertical stripes in light grey, dark grey and red, Roofing Industries’ Multirib was chosen to bring the strength, look and weather resistance needed. “Multirib provides a sleek and contemporary appearance that complements the overall building. It’s a go-to profile we use for the majority of our projects, especially for commercial and industrial buildings,” says Kevin. “It is highly durable, and offers superior protection against weather elements which is crucial for maintaining building integrity over time.”

Collaboration was key to the success of the build, with roofers Steel Roofing brought in early in the project to ensure smooth installation later down the track. This helped them prepare for a challenging extra-height install.

“Cardinal Logistics is probably one of the highest warehouses that's being built in Auckland at the moment — 28m at the highest point,” says Brent Botha, Director, Steel Roofing Ltd. “We work at height a lot but not generally at that height, so all the machinery we used is extra height access machinery. It also poses challenges for the teams to get used to working at that height. The extra five to ten metres makes a difference — wind-wise it throws up a lot of issues for us.”



The significant height of the building also made cladding design and install more challenging, with two sheets of cladding needed to cover the full height of the walls. “You couldn’t have a single wall cladding sheet in that length, so they had to split the cladding at a certain point,” explains Brent. “We had sheets going up halfway, then a second sheet with a flashing joint going up to the top, so it was a two-step process.”

Extra care was taken to detail this more complex design. “One of the primary challenges was managing details at those tricky junctions and corners, and getting the flashings and sealings right to prevent potential ingress,” says Kevin. “Through close collaboration we effectively addressed those challenges to ensure correct installation.”

Painstaking attention to detail was needed when lining up the two sheets of Multirib cladding to create the clean lines of the striped facade. “Running colour from bottom to top and lining the sheets up as we went was quite challenging. We were using lasers at some points to keep it all straight and that bit more precise,” says Brent. “Multirib is a really strong, rigid profile that maintains its clean lines, which made it easier for us to line everything up. That profile probably has more strength than most, so was ideal for what we were trying to achieve.”

The meticulous level of care taken throughout design and install is reflected in the end result — a striking new facility for Cardinal Logistics featuring clean vertical stripes that add interest and a touch of Cardinal’s branding to the facade. And the building owners can have peace of mind knowing the Roofing Industries Maxispan roofing and Multirib cladding will offer the high performance, durability and low maintenance they need to keep the warehouse running smoothly.

“The design and install process went smoothly overall thanks to thorough planning and collaboration with Roofing Industries and Steel Roofing,” adds Kevin. “We’re extremely pleased with the final result. It meets all our expectations in terms of functionality, durability and appearance, and Steel Roofing did a great job, especially with the finishings of flashings and how it's terminated and sealed so everything looks great.”

Architects:
Woodhams Meikle Zhan Architects

Contractor:
Haydn & Rollett

Roofing and cladding installer:
Steel Roofing Ltd

Roofing and cladding substrate:
Zinacore

Roofing profile:
Roofing Industries Maxispan in Colorcote Grey

Cladding profile:
Roofing Industries Multirib in Colorcote Gull Grey, Sandstone Grey and Pioneer Red

POHUEHUE HOUSE

Set within an outstanding natural landscape zone in Mahurangi, north of Auckland, Pohuehue House takes long-run roofing to its limits. Architect Felicity Brenchley selected Kāhu® by Metalcraft Roofing for the highly visible roof of her family home – the contemporary alternative to corrugate.

When designing her rural family home, Auckland architect Felicity Brenchley chose simple lines and natural colours to embed the home and studio within its remarkable rural landscape. The expansive views come with a steep site, so the house has been dug into the hillside, its asymmetrical roof mimicking the local topography.

Approached from the ridgeline above, the first feature of the house that comes into view is the main roof. To achieve both the desired low pitch and a profile with a bold, contemporary aesthetic, the architect selected Kāhu® by Metalcraft Roofing. With its deep ribs, shadow lines and symmetrical profile, Kāhu® provides an excellent alternative to corrugate, bringing longer spans and a strong architectural character.

“I was interested in creating a monolithic form using simple geometries, forming the house as a solid block, with windows and doors punched out,” says Felicity. “To bring light down into the sheltered outdoor spaces, we installed two large ocular skylights, which carry the circular motif from the swimming pool into the architecture of the house. Welded aluminium flashings, powder-coated to match the COLORSTEEL® roof, make the circular skylights an elegant feature from above and below.”

Materials selected for low maintenance

Built by City of Sails Construction, the three-bedroom main house is complemented by a separate studio created with two shipping containers – a practical way to conceal a retaining wall as well as create a low-cost sleepout and workshop.

To bring the language of the house across to the studio, Felicity wrapped the containers in the Kāhu® profile, installed vertically. Its bold shadow lines and angular form add depth and definition to the 40m2 studio and link all the elements in both material and colour.

With its unique design solution to a challenging site, Pohuehue House was featured in an episode of Grand Designs New Zealand and covered the build from the very beginning. The studio, which was built at the start of the project, became home to the family (alongside their caravan for sleeping) while work on the main house continued.

“For the main house cladding, I chose brick for its monolithic feel and low maintenance. Having lived in a high-maintenance house, I wanted something that required less upkeep. A COLORSTEEL® finish in FlaxPod® for roofing and studio cladding also minimises ongoing maintenance. Lastly, I incorporated a few areas of timber cladding in protected areas to bring in warmer colour tones."

"I wanted something that required less upkeep. A COLORSTEEL® finish in FlaxPod® for roofing and studio cladding also minimises ongoing maintenance"

Sheltered outdoor spaces

“An important architectural move was creating a sheltered outdoor space, cut into the plan of the main building. The living, dining, kitchen and family room areas wrap around this central carved-out space, with a round skylight above to bring in light.

We replicated this idea in the studio, with a slightly smaller outdoor space and utilising a skylight of reduced diameter (1.8m for the main house and 1.4m for the studio). This design element reinforces the relationship between the two structures, and the Metalcraft roofers did a great job integrating the round skylights into the roof.”

Kāhu® – the modern alternative to corrugate

“I like the symmetrical appearance of corrugate roofing, which has an undeniable place in the Kiwi vernacular. However, corrugate roofing can only go down to an 8° pitch. By using Metalcraft Roofing’s Kāhu® profile, we have achieved the simple, symmetrical appearance you get with corrugate, but installed on a low-pitch roof."

“Utilising Kāhu® for roofing and studio cladding also minimised the number of materials in the project and created a monolithic, cohesive appearance to keep the building simple and subtle in the rural landscape."

Paul Hooper, branch manager at Metalcraft Roofing’s Hobsonville branch, notes that the Kāhu® profile is inherently stronger than corrugate

“The Metalcraft Roofing installation team had to carry the sheets down by hand,” recalls Felicity. “We have a video of nine people carrying each 18.5m-long roof sheet down the 40m driveway.

The house makes its statement through subtlety and detail, both blending in with and enhancing its glorious natural surroundings.

and can span longer distances. Within the group of Metalcraft trapezoidal profiles, architects can choose the performance they need for a project based on the characteristics of the rib spacing, depth and tray widths. We designed Kāhu® for cladding and roofing applications where clean design and depth of shadow were important to the design outcome.”

Challenges accessing a steep site

The remote, rural site came with challenges, the first of which was getting the large sheets of roofing steel to site. The supply truck managed the winding gravel roads, but the driveway was too steep and narrow to back down safely. This was overcome by the oldest and most basic of methods – people power.

“The Metalcraft Roofing installation team had to carry the sheets down by hand,” recalls Felicity. “We have a video of nine people carrying each 18.5m-long roof sheet down the 40m driveway. The wind whipped up just as they started, making the task even more difficult!”

Installing Kāhu® with skylights

Another challenge was building the two large, round skylights. “We found these amazing New Zealand-made skylights that fitted perfectly with our vision, and we were fortunate that the installers at Metalcraft Roofing had the specialised skills needed to make and install the required custom flashings – the end result was seamless.”

Paul explains the process for creating custom skylight and flue flashings: “We made templates of the round openings then laser-cut and tack-welded the 1.6mm-thick aluminium. We cut in the profile of the roofing pans, which required time and precision due to the circular shape. Once the fit was sorted, each flashing was fully welded as one piece. Finally, we took the flashings off-site for powder coating before returning to do the installation.”

COLORSTEEL® in FlaxPod® meets zoning colour requirements

The architect selected FlaxPod®, a 'soft' black that helps the roof recede into the setting and complements both the surroundings and the charcoal-coloured brick cladding. "With the zoning rules for colours, we had to use dark, recessive shades," notes Felicity. "We found a company in Christchurch that custom-makes bricks in any colour, allowing us to get a slightly lighter grey brick. This provided a nice contrast with the dark roof, so the house doesn't look too monotone."

Folded COLORSTEEL® barge flashings and custom guttering were used by the Metalcraft Roofing team to create a continuous metal element around the perimeter of the roof, which Felicity acknowledges was a great success.

“They did an excellent job. The barge detail and custom gutters were complicated – the angled soffits and linear skylights near the roof edge required custom flashings to integrate everything seamlessly. They tested profiles and adjusted them to ensure everything fitted perfectly.”

The result truly is a grand design. But rather than being ostentatious, the house makes its statement through subtlety and detail, both blending in with and enhancing its glorious natural surroundings.

The Kāhu® profile by Metalcraft Roofing provides a symmetrical and contemporary aesthetic based on its angular form and deep ribs, which define strong shadow lines and a bold architectural character. Kāhu® is suitable for roofs down to 3° pitch, and as a horizontal and vertical wall cladding, it provides a striking aesthetic for both modern and traditional architecture. The profile is designed for both residential and commercial applications.

Felicity Brenchley

Felicity Brenchley is an award-winning Registered Architect with over 20 years of professional experience in New Zealand, Melbourne and London. In 2013, Felicity established her own architecture practice, which focuses on providing quality design services to residential clients. Since then, Felicity has worked with over 60 clients on projects ranging from residential interiors, alterations and extensions to new houses and multi-residential developments.

Designer/architect:
Felicity Brenchley Architects

Main contractor:
City of Sails Construction

Roofing/cladding manufacturer:
Metalcraft Roofing, Hamilton

Roofing/cladding installer:
Metalcraft Roofing, Hobsonville

Roofing/cladding profile:
Kāhu® by Metalcraft Roofing

Colour:
COLORSTEEL® FlaxPod®

Photographer:
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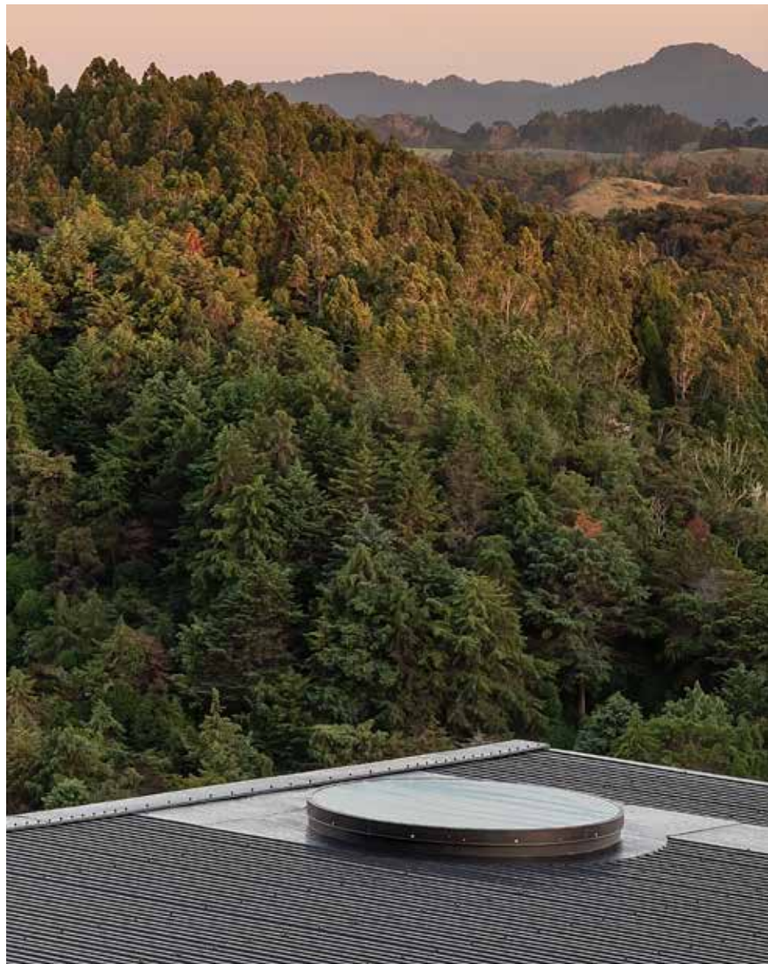

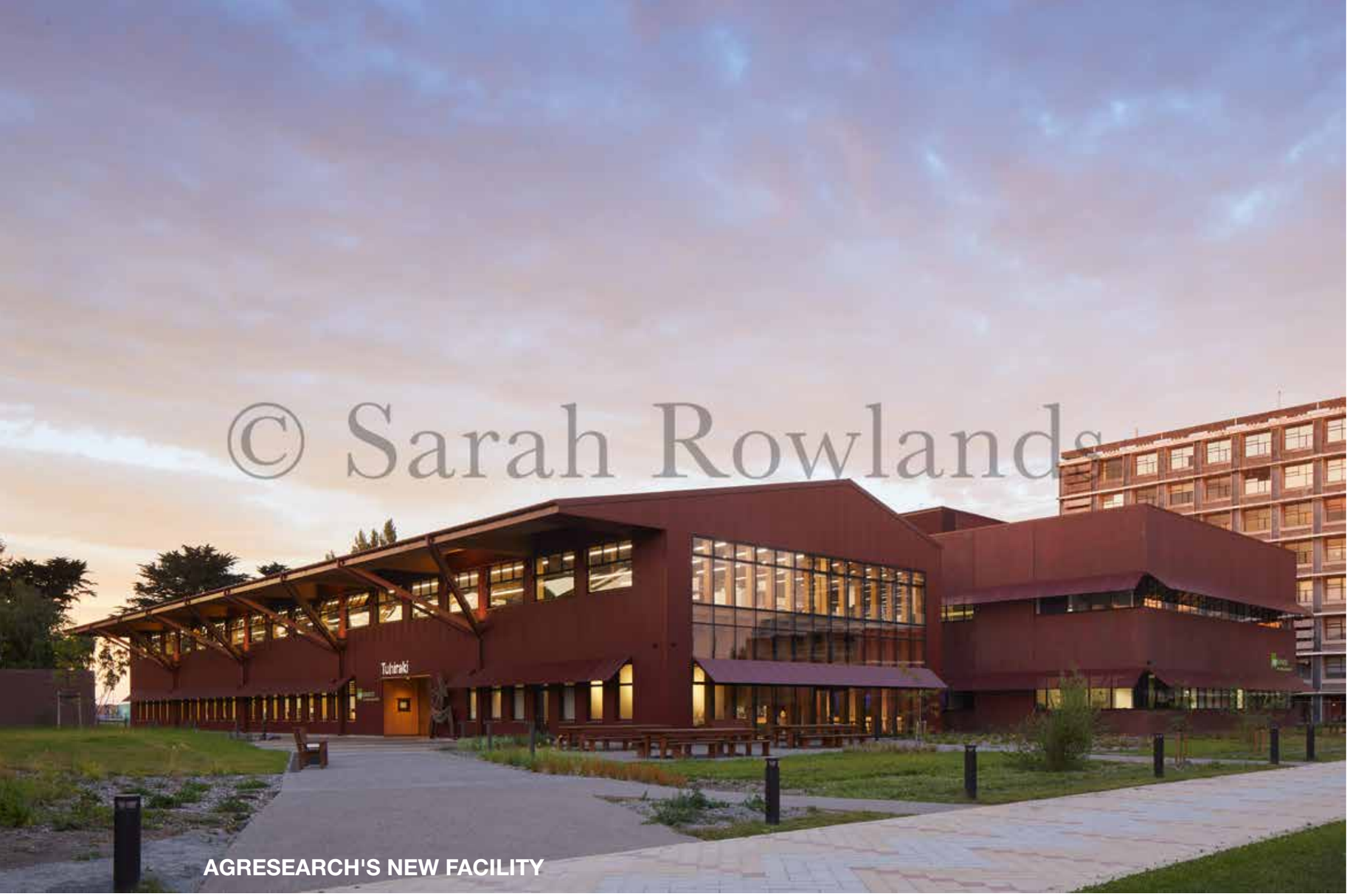

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Science North, now named Waimarie, and AgResearch, named Tuhiraki, were completed in 2023

Agricultural research, in today's world, has a large focus on environmental issues — searching for ways in which to improve agriculture and farming efficiently in an environmentally friendly manner. With the agricultural industry in the cross-hairs of the climate change movement, this work is particularly prescient.

The new building for AgResearch, completed in 2023 and designed by Architectus, is a case of 'walking the talk' and demonstrating, in the very place where they work, a commitment to doing the right thing for the environment. With a rational, straightforward functional layout, the two-storey building is split into two parallel wings, one housing the offices and the other the laboratories, connected by two central links. The two halves are treated very differently.

The laboratory wing, with the fit-out designed by Lab-works Architecture, is a traditional concrete and steel structure with a red concrete pre-cast panel façade.

The workplace wing is the complete opposite — a timber structure composed of CLT, LVL and glulam, and Potius timber cassettes, which is clad on the exterior in profiled red metal sheets. The justification

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AGRESEARCH'S NEW FACILITY

Jasper van der Lingen investigates the collaborative, innovative and sustainable credentials of Tuhiraki, AgResearch's new agri-science facility in Lincoln, designed by Architectus with Lab-works Architecture.

Post the 2011 Canterbury earthquakes, there was an ambitious plan to bring together various dispersed agricultural research facilities into a single building with the aim of integrating researchers from academia at Lincoln University with the Crown Research Institute, AgResearch. Through such a consolidation, it was hoped to supercharge progress and promote innovation and collaboration in this critical industry for the New Zealand economy. But, for various reasons, this was abandoned many years later as the subsequent government of the day rethought the role of Lincoln University and the project as a whole.

The hope of collaboration did not totally die, though. The larger project fragmented and became, instead of a single building, three separate buildings all placed close by — neighbours that can still visit and work together but not as a fully integrated group as was originally envisaged. The smaller of the three, Science South, was completed in 2021 and the larger two, Science North, now named Waimarie, and AgResearch, named Tuhiraki, were completed in 2023 on immediately adjacent sites on the front lawn of Lincoln University.

The timber structure is exposed wherever practical, and the soaring internal height gives an almost cathedral-like feel to the open-plan offices

Te Waihora is reflected in many ways throughout the building, from the sculpture of tuna (eels) in the main entry to the manifestations on the glazing, and from the wall treatments through to the landscaping and central courtyard space.

for this hybrid is pragmatic and reasonable and is expressed in a clear, straightforward and elegant manner, typical of the work of Architectus. The PC2 labs require containment after a seismic event and have low vibration standards, which are achieved without undue complexity with a standard steel and concrete structure. In addition, the heavy servicing needs of the laboratories, along with their weight and seismic restraint, are simply achieved with steel and concrete.

The workplace wing, though, with fewer constraints, was an opportunity for AgResearch to demonstrate its commitment to sustainability and provide a warm, handsome interior to attract and retain the very best staff. The timber structure is exposed wherever practical, and the soaring internal height gives an almost cathedral-like feel to the open-plan offices, providing a sense of occasion and dignity to the day-to-day tasks undertaken within. Natural cross-ventilation, using operable windows on actuators, has proven to be a success during its first typical Canterbury summer in use. Large overhangs and shade canopies over the west-facing windows mitigate heat gain from the most demanding part of the day and, to reinforce AgResearch's support and close links to the New Zealand farming community further, wool carpet and insulation are employed throughout. The building, and particularly the west wing, is a great exemplar of how to build in today's environmentally sensitive age and reflects the sustainability values of AgResearch in an authentic way in the very fabric of where they work. It is a place that is future-focused and committed to doing the right thing.

The building is located on a prominent site adjacent to the Lincoln University campus, situated on the corner of Ellesmere Junction Road and Springs Road. The patina of the red-oxide concrete panels speaks of the red brick prevalent throughout the campus as well as the traditional red barns that dot the countryside. This, plus the simple exposed timber structure inside, evokes the utilitarian shearing sheds and farm buildings of rural New Zealand. One could quibble about the placement of the large service yard facing the street corner; however, for a building in the round, with no obvious back, this location was the most pragmatic and is dealt with sensitively around some large existing trees.

The other key driver of the design was to promote transparency and collaboration. Architectus has enabled, in the design, the ability to see between the labs and offices and to be aware of the many activities going on. This promotes a sense of a larger community, working together towards a common goal. It was a conscious move away from the more traditional separate offices and hermetic labs to an open-plan environment with shared circulation and views throughout to become a place that promotes teamwork, interaction and innovation.

Beyond the building itself, the aspiration of facilitating collaboration extends to the neighbouring Waimarie building, housing the labs and offices of Lincoln University. Large, full-height walls of glass face across the courtyard and space between, giving great visibility to the activities in each building. Tuhiraki has no public café, whereas Waimarie has one. This was intentional, to encourage those informal interactions between inhabitants of the two buildings that can occur over lunch and coffees. Overall, this desire for integration goes back to the original vision for the project and, although the earlier single building is now fragmented into various separate buildings, the architects have cleverly retained this larger aim to work together through simple, clear architectural moves.

A deep recognition of the cultural importance of this significant building on a prominent site has been carefully worked through and is embodied in the very fabric displaying a respect and acknowledgment of the local iwi, the narratives of the region and its setting. A thorough process was followed and the partnership with the local iwi of Ngai Tahu has enriched the meaning and significance of the facility, grounding it in its place and history. Based on the stories of the nearby Te Waihora (Lake Ellesmere), the building name Tuhiraki refers to the mountain (Mount Bossu) where Rakaihautu rested his ko (digging tool) after creating much of the land. The huge significance of Te Waihora is reflected in many ways throughout the building, from the sculpture of tuna (eels) in the main entry to the manifestations on the glazing, and from the wall treatments through to the landscaping and central courtyard space.

In this way, the rich poetic narratives that tell how the local whenua has come to be are now an essential part of the design: a welcome process that is becoming more and more common, and important, in the architecture of Aotearoa. Maybe the age-old discussions about what characterises New Zealand architecture are starting to come more into focus with buildings like Tuhiraki.

Tuhiraki is a building that looks to the future while simultaneously recognising the past. It both acknowledges that we need to look after our planet and demonstrates that in the way it is made, as well as respecting the context, particularly the rich cultural history of a place.

This article was first published by Architecture NZ magazine (July 2024 edition)

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Main Contractor:
Naylor Love Construction

Roofing/Cladding Manufacturer:
Roofing Industries

Roofing Profile:
Eurostyle Eurolok Tray Roofing

Cladding Profile:
True Oak Corrugate

Color:
Scoria

Material:
Magnaflow (Colorcote)

Roofing Installer:
Graham Hill Roofing

Photography by: Rory Gardiner

Texture & Tone

Designing from the outside in. Drawing inspiration not only from its surroundings, but from the COLORSTEEL® roof itself.

Nestled at the foothills of the picturesque Wainuiomata hills in New Zealand's lower North Island, this Marine Parade residence artfully integrates texture and tone to create a tranquil haven for its owners. Constructed primarily from weathered timber and light, sandy-hued materials, the dwelling seamlessly fits in with its natural surroundings while paying homage to the local architectural vernacular.

The pine cladding complements the COLORSTEEL® Gull Grey roofing, resulting in a broad, low-profile silhouette that effortlessly harmonizes with neighbouring homes and the coastal landscape. This thoughtful blend of elements not only creates a cohesive visual aesthetic but also fosters a sense of belonging within the community and its environment.

Moreover, the exterior roofing design served as a muse for the interior design scheme. Drawing inspiration from the COLORSTEEL® roof, the interior layout was crafted with a deliberate focus on connecting the outside environment with the living spaces within. Stepping inside, one is greeted by the airy expanse of the vaulted macrocarpa-clad ceiling, adorned with exposed beams that mirror the tray profile of the COLORSTEEL® roof.

This intentional design approach not only enhances the visual continuity between the interior and exterior but also amplifies the sense of spaciousness and luminosity within the home, inviting the owners to relax and unwind in their private retreat.

Above: COLORSTEEL® Gull Grey

"The exterior roofing also helped provide inspiration for the interior of the home, with exposed beams of a vaulted macrocarpa-clad ceiling reflecting the COLORSTEEL® roof in a tray profile to create a sense of brightness, volume, and release when you step inside."

Thomas Seear-Budd

Skilfully detailed and concealed downpipes and flashings together with the elegant simplicity of the COLORSTEEL® Gull Grey expertly blending the macrocarpa and limestone exterior of this home, enhances the idea of a distilled piece of architecture.

Project	RK Residence
Designer	Seear-Budd Ross
Rollformer	Metalcraft Roofing
Roofer	RJC Building Limited
Builder	RJC Building Limited
COLORSTEEL® Colour	Gull Grey
Profile	Espan® 340

Photography by: Dennis Radermacher, Lightforge

A Place to Call Home

Award Winning Rangiora Housing Development

To seamlessly integrate a series of single-occupancy dwellings into an established low-density neighbourhood, Rohan Collett Architects designed clusters of units that blend harmoniously with existing homes. These units feature gabled forms clad in a variety of complementary COLORSTEEL® colours.

Single-occupancy social housing is scarce nationwide, and integrating these homes aesthetically into established low-density neighbourhoods can be challenging. This was the task at hand for the Rangiora development, which replaced nine 1950s state houses with 28 one-bedroom units.

To avoid the stigma sometimes associated with such developments, the architects grouped the units into clusters of two or three, giving them facades that resemble the surrounding stand-alone family houses. The units are clad in colours chosen not only for their ability to foster a sense of community but also to instil pride and individuality in the occupants.

Rohan Collett Architects highlights the importance of colour in the project's success: "A consistent colour palette was chosen to achieve a shared sense of identity among residents and was used with purposeful irregularity to avoid a visual result stigmatised by uniformity."

The selected colours—Desert Sand, Titania, Pioneer Red, and New Denim Blue—were chosen after researching the demographic of the proposed occupants and considering

"A consistent colour palette was chosen to achieve a shared sense of identity among residents and was used with purposeful irregularity to avoid a visual result stigmatised by uniformity."

the enduring appeal of these colours within Rangiora's natural environment and streetscape. To further blend the buildings with their neighbours, some units are clad in brick, while the clean lines of the Espan® profile provide a sympathetic yet contemporary look.

With landscaped communal spaces and built-in accessibility features, the development offers its occupants a sense of home and inclusion within the Rangiora neighbourhood.

Project	Rangiora Housing Development
Designer	Rohan Collett Architects
Rollformer	Metalcraft Roofing
COLORSTEEL® Colours	Titania, New Denim Blue, Pioneer Red, Desert Sand
Profile	Espan® 470

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T&G PACKHOUSE

The construction of T&G Global Limited's state-of-the-art apple packhouse in Whakatu, near Hastings, stands as a testament to the integral role of quality roofing and cladding solutions in modern industrial projects. This $100 million facility, one of the largest packhouses in the world, underscores the importance of high-quality materials and expert craftsmanship in achieving construction excellence.

Dimond Roofing, renowned for its high-quality roofing and cladding materials, was selected as the supplier of choice for the packhouse's construction. Their products ensured the structural integrity and aesthetic appeal of the facility. The installation of these materials was expertly handled by Turfrey Hastings, a leading installer in the region known for their precision and commitment to quality.

Turfrey has provided roofing solutions for more than four decades. As one of the region's largest and most well-respected roofing companies, they have installed some of the area's biggest and most technically complex roofs. Their team has the expertise to support the design, appraisal, and installation of all roofing projects using the latest roofing technology.

The facility's 16,000 square meter roof features the DP955 .55 ZinaCore™ profile. This profile is designed for superior strength and cost efficiency. It features stronger ribs to protect against buckling and a wide pan for safe foot placement, which enhances safety and speeds up installation. With a wider cover width of 955mm, fewer sheets

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This highly automated facility, with 1.7 hectares of roof space, will be able to pack more than 125 million kilograms of apples per season

are needed, reducing both installation time and costs. The DP955 profile not only provides robust protection but also contributes to the distinctive design of the building.

For the wall cladding, Dimond supplied 2,000 square meters of LT7 .40 ZinaCore™. This profile is engineered for applications requiring protection from severe climatic conditions and maximum structural economy. The strong section properties of LT7 allow for wider purlin and girt spacings, adding extra economy to the project. Additionally, LT7 offers excellent water shedding characteristics, making it ideal for low-pitch roofs and ensuring long-term durability and resilience.

The packhouse's roofing and cladding are critical not just for protection but also for sustainability. Designed with demanding sustainability standards, the packhouse has 1,200,000-litre water tanks to absorb large downpours and reduce the impact on the public stormwater system and local rivers. The advanced filtration system reduces water use from its own bore, with final discharges being of drinking quality standard.

Brad Turfrey, Managing Director of Turfrey's, reflected on their involvement in the project, stating, "It took about six months. The highlight was the scale and multi-trade offering we did on it. We did plumbing, roofing, drainage, and rainwater services - this was a lot to complete at the pace required, however, our team enjoy a good challenge, it's where we thrive."

The packhouse, designed by First Principles Constructors Ltd (FPC), integrates several leading innovations that streamline T&G Global's storage, sorting, and distribution processes, significantly improving turnaround times and overall efficiency. FPC's design proved resilient, with the site sustaining minimal damage from Cyclone Gabrielle, which hit the region in February 2023.

This highly automated facility, with 1.7 hectares of roof space, will be able to pack more than 125 million kilograms of apples per season once its two-phased construction is complete – twice the volume of apples currently packed. T&G Global Chief Executive, Gareth Edgecombe, says the world-class packhouse has been built to help meet future global consumer demand for premium apples from Aotearoa New Zealand. "This state-of-the-art post-harvest facility will be instrumental in enabling us to manage increased volume growth, lift productivity, and ensure our fruit arrives in market in excellent condition," says Gareth.

"The packhouse, which cost close to $100 million, is being commissioned in two phases and integrates leading automation and technology, from the wet infeed area and defect sorting, to soft fruit handling technology and robotic fruit packers and palletisers, enabling us to do more with less. The completion of the facility and the installation of the first 220-meter packing line is a real testament to the team. It's been a remarkable team effort to build the packhouse and deliver it on budget and on time, while dealing with labour and material constraints during COVID-19. The new facility will enable our Whakatu team to pack 90-100 bins per hour on the one line, lifting the productivity rate up to 1 bin per person per hour. When the second line is installed, we'll be able to pack up to 190 bins per hour, with a similar number of people.

"We see this packhouse playing a key role in helping create increased value from Aotearoa New Zealand's unique benefits and intellectual property. Over the last five years, T&G has redeveloped hundreds of hectares into modern 2D growing systems, with increased plantings of our premium Envy™ brand, which is on track to be a billion-dollar brand by 2027. Many of our independent grower partners have done the same. By building this packhouse we can accommodate this increased volume and help support the domestic and export growth of the region, sector, and nation."

The successful partnership between T&G Global, FPC, Turfrey Hastings, and Dimond Roofing demonstrates how high-quality materials and expert installation can lead to the creation of a facility that not only meets current demands but is also prepared for future growth, setting a new benchmark for the industry. As New Zealand continues to export millions of cartons of apples annually, this packhouse will play a crucial role in sustaining and expanding the country's agricultural success.

SUMMERSET BY THE DUNES

Summerset by the Dunes, Summerset's spectacular coastal retirement village, is a bustling community already with residents enjoying the close proximity to the Papamoa shoreline. Ground broke in 2019 and the project is progressing with a projected completion date of 2025.

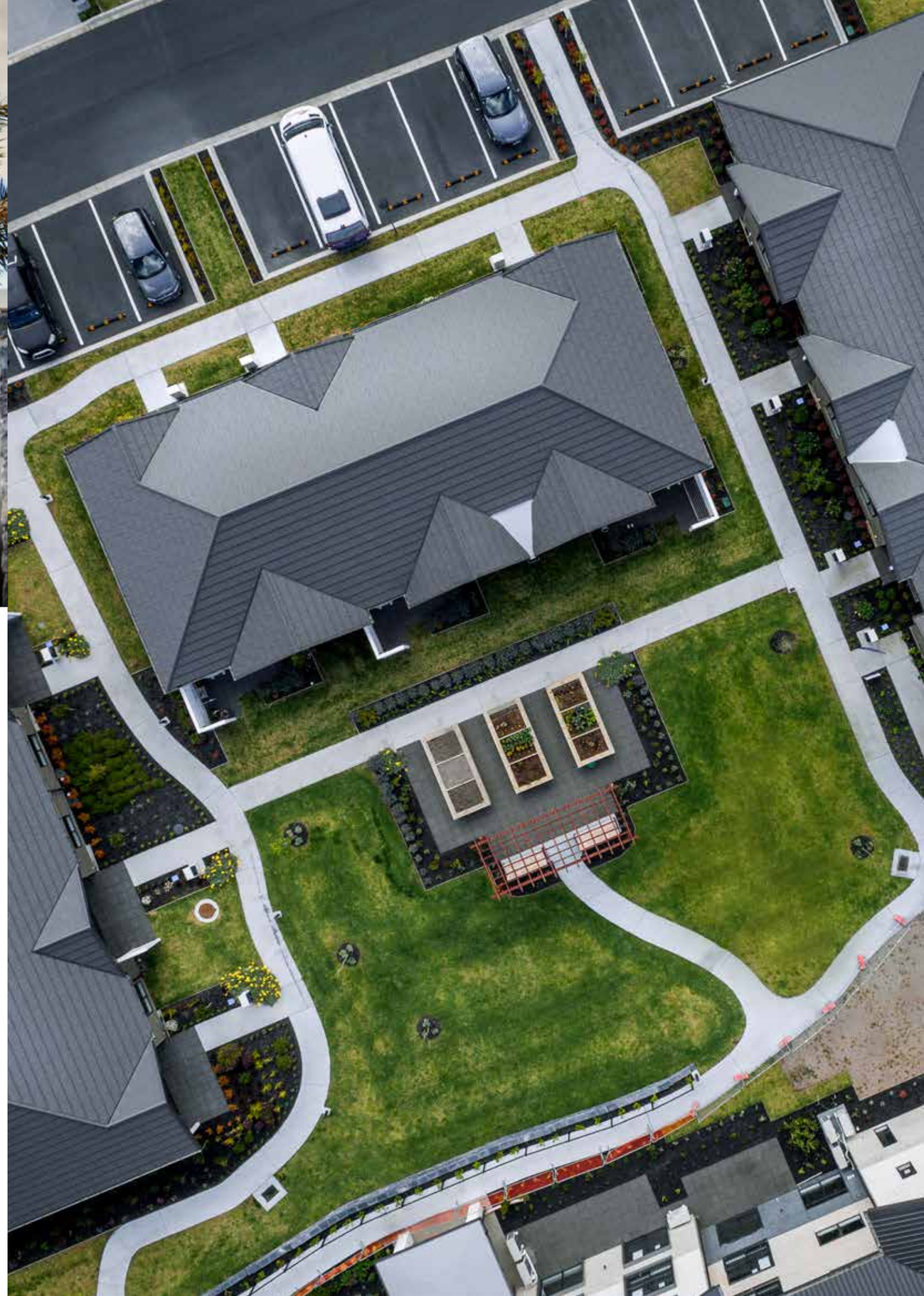
Interrupted by the onset of Covid-19 and the supply chain issues Covid brought with it, this development needed outstanding project management to ensure the project wouldn't suffer from delays. Working to get the project back on track after Covid restrictions were eased, each villa block's construction needed to flow smoothly with material choice and installation playing a large part in the project's success.

The development is immense, with 211 villas being constructed, along with a large central care centre and curated grounds. In projects like this, timely customer handover is a paramount consideration. With new residents excited to move into the next phase of their lives, the timing between selling current property and shifting into their new homes becomes a critical factor. As an additional dynamic, timely handover facilitates cashflow to help keep the entire development running smoothly.

Any delays in handover can cause issues at a later date. To mitigate any potential hold ups, each villa's construction is planned out meticulously and managed closely. Denver Wyatt, Site Supervisor at Summerset by the Dunes, is responsible for managing the process, planning out the work schedules and organising the subcontractors to ensure the villas are completed on time.

Summerset employs a tight sequential construction process to create efficiency throughout the building process. As the slab of a villa block is being poured, the next block of villas is having its frames and trusses erected, all while the next block has the expert team at AGS Roofing installing Gerard's steel roof tiles. As soon as the team finishes one villa block, they move onto the next block which has been prepared for them to move across. As a result, downtime between villas is minimised.

The roofing team is allocated 10 days to complete a three-villa block before they're scheduled to move to the next block. To meet this timeframe, Gerard's tile system is ideal. "You can lay the roof in a number of weather conditions" Denver elaborates "You're not tied down if its too windy, and the guys have been out laying roofs when there's a bit of rain. So, it's been quite beneficial to use Gerard". With each tile being under 1.4m long, the tiles are easily manoeuvred and managed by a single roofer, even in windy periods, as the smaller plane provides less resistance to the wind.



The roofing team is allocated 10 days to complete a three-villa block before they're scheduled to move to the next block.

Gerard's Stratos steel roof tile system was an easy choice for the Summerset team. "You get a great looking tile pattern, and all the benefits of a lightweight roof." Denver says, "It's durable, cost effective, and faster to go on." Compared to concrete tile, using Gerard's pressed steel tiles meant significant environmental savings as well, with fewer transportation emissions and less structural framing required to support the roofing material.

Making it easy for scheduling, all the roofing materials required for the build are ordered off the building plans, meaning entire villa-lots can be palletised and delivered to site in advanced of the roof install. Building sites can be busy, with materials dropped in inconvenient places and no means of shifting them easily. With Gerard's tiles delivered on standard pallet sizes, they are easily manoeuvred onsite for storage or installation regardless of the other construction work occurring onsite.

Summerset by the Dunes lies in an exposed location in close proximity to ocean winds, as a result performance must be carefully considered for all building materials. In Gerard's steel tile design, each panel interlocks with the next creating a solid matrix. The tiles have been tested by James Cook University in Townsville, Australia and have been proven to withstand wind loadings equivalent to wind speeds of 350kph. This is achieved by the interlocking design and installation method of fasteners being applied horizontally at right angles to the wind's lifting forces.

The layout of Summerset by the Dunes is idyllic, with gently winding roads and pathways meandering through the complex. The villas are available in three colour schemes, with Gerard's Stratos profile in three colourways chosen to complement the solid brick exteriors. The village is developed using modern engineering to ensure the residents have comfortable, warm and dry homes, with Gerard's roof tiles playing a part in that design.

The building work continues onsite at Summerset by the Dunes, while homes are filling with new residents. Denver concludes "The residents are happy, everyone's pretty chuffed with how it's all come out."

METAL ROOFING IN NEW ZEALAND: A HISTORY

With an estimated market share of around 70%, New Zealand has one of the highest percentages of prepainted and roll formed long run metal used in roofing in the world.

So how has our love affair with what is commonly called “tin roofs” developed? To help us try and understand, first we need to look back at a little history of how “tin roofs” first eveolved.

There are examples of iron sheeting being used for roofs in Europe and the US as far back as the early 1800’s with it being used as a cheaper alternative to copper and lead.

It does seem to be generally accepted that “corrugated iron” was first patented in 1829 in London, with the corrugations added to flat sheets of iron to provide added strength that allowed a greater span over a lighter framework thus helping reduce costs.

Tin roofs, which were seen as a lighter alternative to “iron” roofs weren’t widely accepted until after the US Civil War (circa 1865) when “tin” rolling mills were established and tin plate shingles were introduced.

Whilst the term “tin roof” is now a very generic term, originally tin roofs were in fact made from iron plated with tin, a naturally occurring silvery coloured soft metal. One of the first to use tin plate roofing on his now historic home, Monticello in Virginia USA

One of the early notable buildings to have a galvanised iron roof was the US Mint located in New Orleans whereby the zinc coating was applied to 20 gauge (0.8mm) corrugated iron

The next generation of metallic coated steel development will focus on more efficient methods of manufacturing and recycling steel

was Thomas Jefferson who as we know was one of the founding fathers and an author of the US Declaration of Independence.

Another reference to “tin roofs” was Terne plate, which is fact wasn’t tin, but iron that was coated in an alloy of lead (65%) and tin (35%), giving it a duller finish and claimed greater durability. It’s not known if Terne plate was ever used in New Zealand, but there is no doubt that the high lead content would today cause significant environmental concerns with water run off and water collection.

Zinc coated iron or steel (commonly referred to galvanised iron) was first introduced in the 1830’s in France and started to gain popularity due to its longevity as a result of the zinc providing a sacrificial coating that protected the iron underneath the coating.

One of the early notable buildings to have a galvanised iron roof was the US Mint located in New Orleans whereby the zinc coating was applied to 20 gauge (0.8mm) corrugated iron. By comparison, today’s typical base metal thickness for a roof is 0.55 mm thick.

As we moved further into the 19th century, technology of the day started to take over and there was a progression away from the naturally occurring iron, to melting it at high temperatures (1,700°C) in the presence of oxygen and coke to form steel which has significantly greater tensile strength, yield and is significantly tougher.

The early settlers to New Zealand saw “corrugated iron” as an easy to use, practical and versatile product that was used in the construction of early homes and buildings around the country, with it being seen by some as being right at the inception of our “do it yourself” Kiwi culture. Early examples of “corrugated iron” construction can be found in Central Otago dating back to the 1840’s.

Durability, longevity, recyclable and low maintenance coupled with a move in the 1960’s to local roll forming equipment manufacturers and specialised roll forming businesses started to open helped develop and grow what we now know as “long run metal roofing and cladding” industry.

With the opening of the NZ Steel mill in 1968 and then a further upgrade in 1987, the installation of a galvanising pot allowed for locally produced galvanised steel roofing materials to be supplied into the market. These came in a range of differing coating weights often defined by the preface “Z”, with common coating weights including 185 gsm and 275 gsm.

Established in 1917 and now part of the Fletcher Building stable of companies, Pacific Coilcoaters then became the first producers of continuous “coil coating” or painting of pre-painted long run metal roofing products in the mid 1980’s and the launch of the ColorCote® brand in 1989. Up until that point all long run metal roofing products were left unpainted to “weather” or were post painted after installation.

Further steel technology developments saw the introduction of what is commonly referred to as AZ or aluminium / zinc coatings in 1969, with global manufacture in the 1970’s.

These coatings provided better weathering protecting than the traditional pure zinc (Z) coatings at a lower cost and often lower overall weight. AZ metallic coatings are typically defined as having a composition of 50-60% aluminium, 1-2% silicon, and the remainder zinc. AZ coating weights were typically in the 150 - 200 gsm coating weight range and this technology quickly became the “bread and butter” metallic coating used across the industry with it being produced locally by NZ Steel from around 1993.

As we know, New Zealand has an extensive coastline with many of our towns and cities exposed to harsh environmental conditions from salt spray and the resulting corrosion. As a result, in the mid 2000’s the use of a new metallic coating called ZAM® was introduced by ColorCote®. Developed in Japan by Nippon Steel in 2000, ZAM® provided superior salt spray and scratch corrosion resistance than the tradition AZ and Z coated steel substrates through the addition of magnesium that allows any scratches or minor cut damage to “self heal”.

This new metallic coating was comprised of 6% aluminium, 3% magnesium and the balance (circa 91%) in zinc and was designated by the preface ZM or ZMa

ZAM® was marketed and sold under the brands ZM8® and more latterly MagnaFlow™ by ColorCote®.

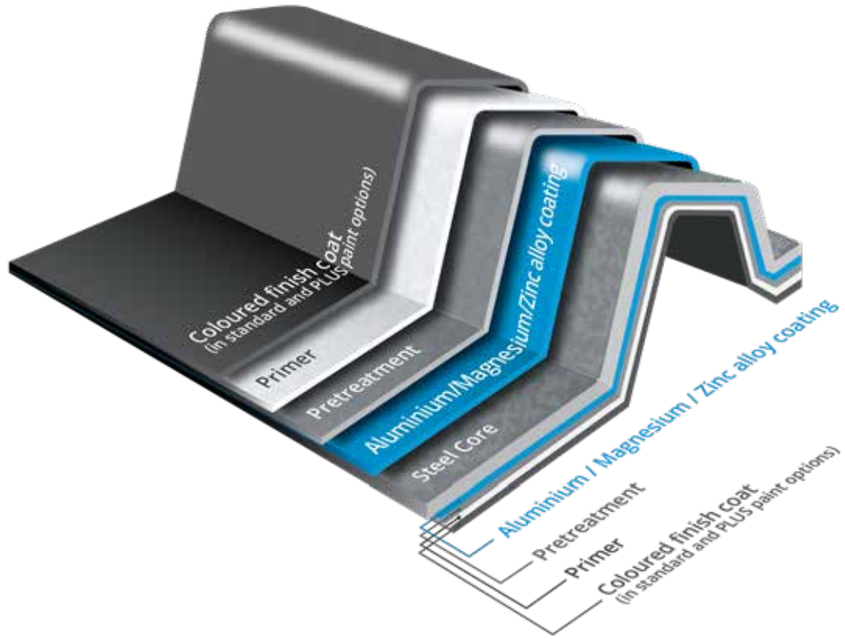
In the mid 2000’s there was yet another development to help enhance the durability of long run metal products with the advent of AM or aluminium / magnesium based metallic coatings. These coatings allowed for yet more improved durability whilst using lower coat weights.

Typically containing 47-57% aluminium, 1-3% magnesium, & 1-2% silicon with the balance comprising of zinc, AM coatings were first introduced into the New Zealand market as another performance improvement under its ColorCote® MagnaFlow™ brand in 2016.

As the focus continues to increase on sustainability and the environmental impact of all construction related products, so given that steel production emits approximately 7% of worlds total CO2 emissions, the manufacture of steel-based products including roofing and cladding falls under the spotlight.

Whilst steel is effectively 100% recyclable, the next generation of metallic coated steel development will not only focus on more efficient methods of manufacturing and recycling steel using electric arc furnaces, but also the choice of Hydrogen to replace the use of Coke to help decarbonise the steel.

This new chapter in steel manufacture alongside continuous future developments in metallic coating technology will ensure that roll formed prepainted long run metal roofing and cladding will continue to be seen as the most efficient, durable and economical choice in the construction industry for many more years to come.



EMBODIED CARBON & METAL ROOFING

Designers and architects can reduce impact by choosing lower emissions products, using products that last longer (durability), using a more efficient thermal envelope and designing for disassembly.

The discussion around carbon emissions buildings and building products has been growing and this article will detail some of the driving forces behind this, what is means for pre-painted long run steel, roofing and cladding products and relevant changes that could impact the roofing market.

Carbon Emissions: What's driving the discussion?

It is the scientific consensus that greenhouse gas (GHG) emissions produced by human activities (such as the burning of fossil fuels) are contributing to an excessive heating of the planet's atmosphere, leading to changes in weather patterns and effects known as climate change. The consequences of these changes pose long-term threats to human health, the global economy and the biosphere through excessive heat, changes in rainfall, catastrophic events such as storms and flooding, sea level rise and much more through this rapid change in our environment.

The Paris agreement was an international agreement, signed by 196 nations in 2015, which sought to limit the global average temperature to below 2C above pre-industrial levels, and pursue efforts to stay within 1.5C. As part of this agreement, emissions were tracked, recorded and reported, as well as efforts to reduce and offset them. Most of the signatories have net zero targets by 2050 (accounting for ~ 88% of global emissions) and interim 2030 targets.

New Zealand has both a net-zero by 2050 emissions target as well as interim 2030 targets, as outlined via the Climate Change Response (Zero Carbon) Amendment Act 2019. This set the framework for our emissions reduction budgets and emissions reduction plans, which are the plans for how we will achieve these targets as a nation.

Another piece of legislation, the Financial Sector (Climate-related Disclosures and Other Matters) Amendment Act 2021, now requires around 200 large financial institutions to make climate-related financial disclosures. These organisations will report on governance, strategy, risk management and metrics and targets relating to their exposure to climate risk. This change will help ensure the effects of climate change are routinely considered in business, investment, lending and insurance underwriting decisions. This has created drivers in financial markets for better sustainability and climate-related investment decisions.

Contributions from the built environment

A 2018 Thinkstep report found that the building sector is responsible for up to 20% of our total GHG emissions. These can be broken down into embodied carbon and operational carbon emissions, as measured in kg of CO2 equivalents. Embodied carbon emissions are those that are associated with a particular material or product; these are assessed by a life cycle assessment (LCA) and can include all emissions throughout the supply chain and lifetime). Operational emissions are those that are associated with the energy or resources used during the use-phase of the building.

The diagram (right) shows the emission of a building over its entire lifecycle; from the time the construction materials are made and the building is built. This is followed by the ongoing impact of the services provided such as water and electricity (operational carbon), and repairs and replacements required of parts of the building over time (embodied carbon). The final stages incurred at the end of life include the energy required to demolish the building. The final bar represents benefits and loads outside of the lifecycle; however, these are often not included in most LCA's, and may be separately assessed.

Designers and architects can reduce impact by choosing lower emissions products, using products that last longer (durability), using a more efficient thermal envelope and designing for disassembly. Re-purposing waste on construction and demolition sites can reduce the need for new materials. Manufacturers of building materials are also actively working on reducing the impact of their materials, such as the installation of the electric arc furnace at New Zealand Steel which will reduce the gross emissions of their site by 1,000,000t CO2 annually, and significantly reduce the embodied carbon of associated steel products.

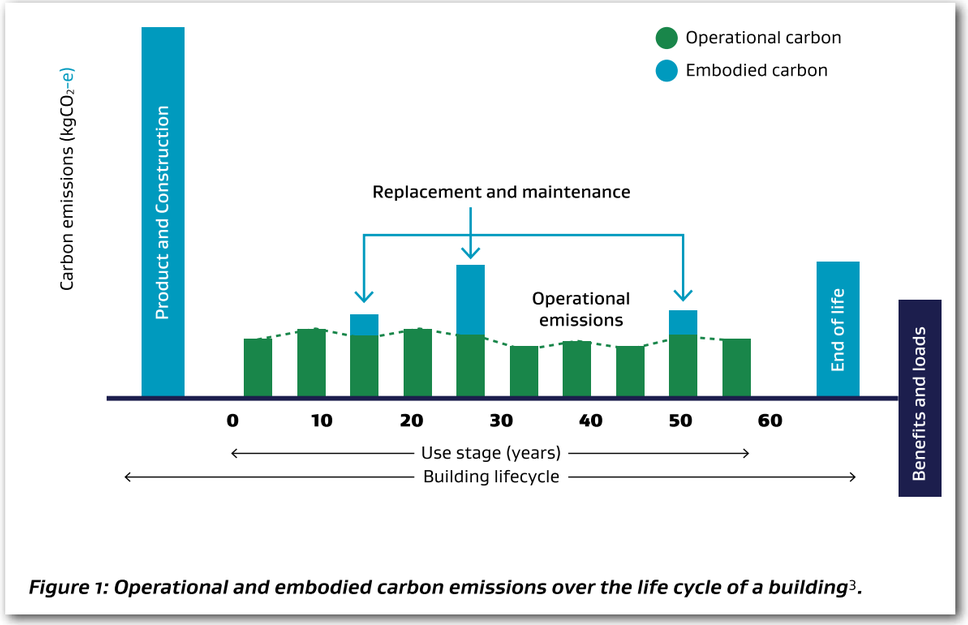


Figure 1: Operational and embodied carbon emissions over the life cycle of a building[3].

Demonstrating your impact

The Greenstar scheme, managed by the New Zealand Green Building Council (NZGBC) is a voluntary sustainability rating scheme for non-residential buildings, fit-outs and communities, assessing impacts on emission reductions, land-use, social impact, water, energy and many more criteria. The NZGBC also offer a sustainability certification program for residential housing called Homestar®.

In 2021 the government as part of its plan for a carbon neutral public sector, set new standards for non-residential government buildings, to require a Greenstar 5-star rating for all buildings of capital value over $9 million from 1 April 2023.

In the private sector, there has also been an increase in the uptake of Greenstar buildings. One of these drivers is a new wave of green financing, driven through tools such as sustainability linked loans (SSLs). A recent example of this was in late 2021 where ANZ provided a $1.25 SSL to Metlifecare, whereby they would pay back a lower interest rate if they kept to the targets set by ANZ. One of those targets included building six new aged care facilities which achieve a 6 Green Star rating from the NZGBC (the highest rating available).

The combination of drivers from both public and private sector is helping to create a demand for buildings and associated buildings materials that support the goals of frameworks such as those administered by the NZGBC.

Changes to Greenstar and the opportunity for roofing

In August 2024 the NZGBC launched their new program, Greenstar Buildings NZ, which is set to replace their Greenstar Design & As Built program. This update sets a new benchmark for sustainable

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The Green Star Responsible Products Framework recognises initiatives that a product or manufacturer can comply with to contribute towards a Green Star certification

buildings and includes credits that allow roofing and cladding products to directly contribute to the star rating of a building.

The new tool covers areas of sustainability under 8 categories, one of which focuses on decisions relating to the design, construction and procurement practices on a building project; the 'Responsible' category. The Green Star Responsible Products Framework recognises initiatives that a product or manufacturer can comply with to contribute towards a Green Star certification. A responsible product value (RPV) is given to a particular initiative as assessed against the Responsible Product Guidelines. This taps into an existing database operated by the Green Building Council of Australia (GBCA) with several initiatives and associated RPVs already created.

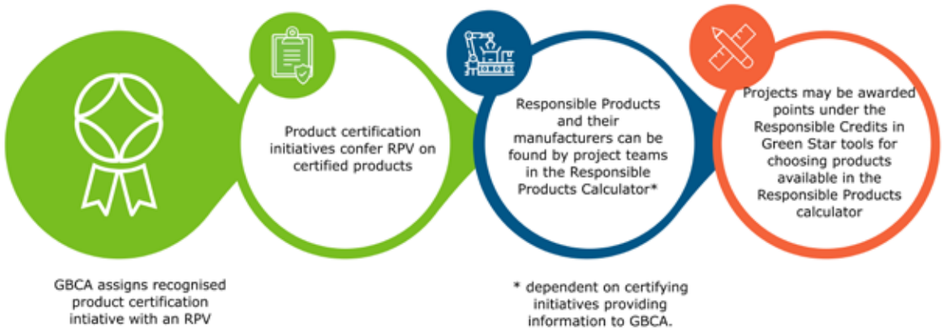
The Responsible Envelope credit details two criteria by which up to 4 points are available:

2 points if 30% of the building envelope components (by cost) meet an RPV of at least 10

An additional 2 points if 10% of the building envelope components (by cost) meet an RPV of at least 15, or 60% of all the building envelope components (by cost) meet an RPV of at least 10

COLORSTEEL® is an example of a product which holds a product specific EPD and an Eco-Choice Aotearoa certification (EC 57-23): the total RPV score of this is 16, which would then provide a total of 4 points if used for at least 30% of the building's envelope components (by cost).

It is critical that roofing manufacturers are aware of how their products can support these credits in the new Green Star Buildings NZ program. As the entire Building and Construction industry learns to use these new tools, suppliers have an opportunity to work alongside those pursuing a Green Star accreditation and demonstrate how their products can create a more sustainable built environment.



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