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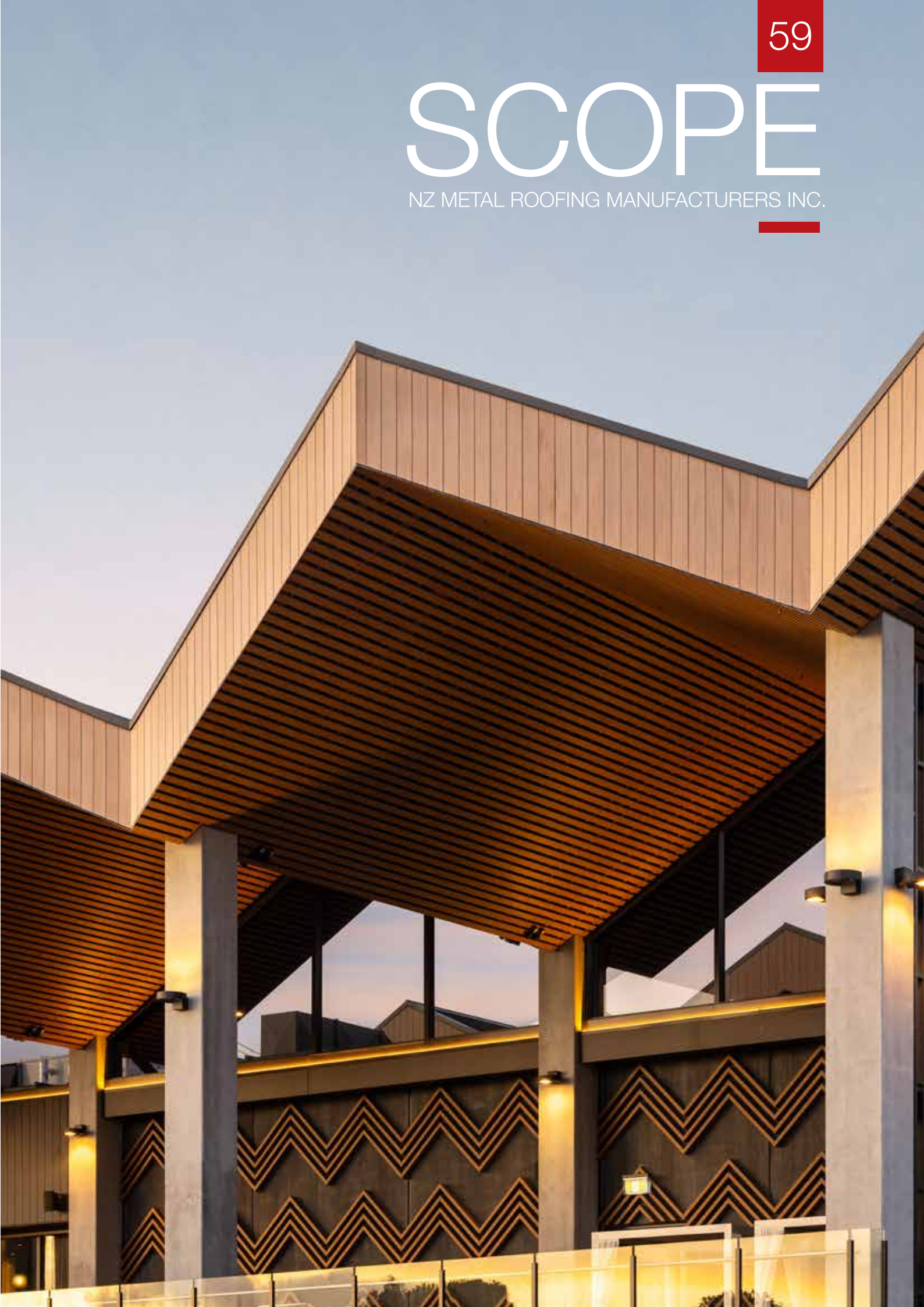
SCOPE

NZ METAL ROOFING MANUFACTURERS INC.



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NZ METAL ROOFING MANUFACTURERS INC.

February 2024

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Below is a brief introduction to the executive of The Metal Roofing Manufacturers Inc. It is intended that Scope be representative of the Metal Roofing and Cladding Industry in both commercial and residential sectors. Your submission of material you consider is of interest is welcomed be it design, research, manufacture or construction.

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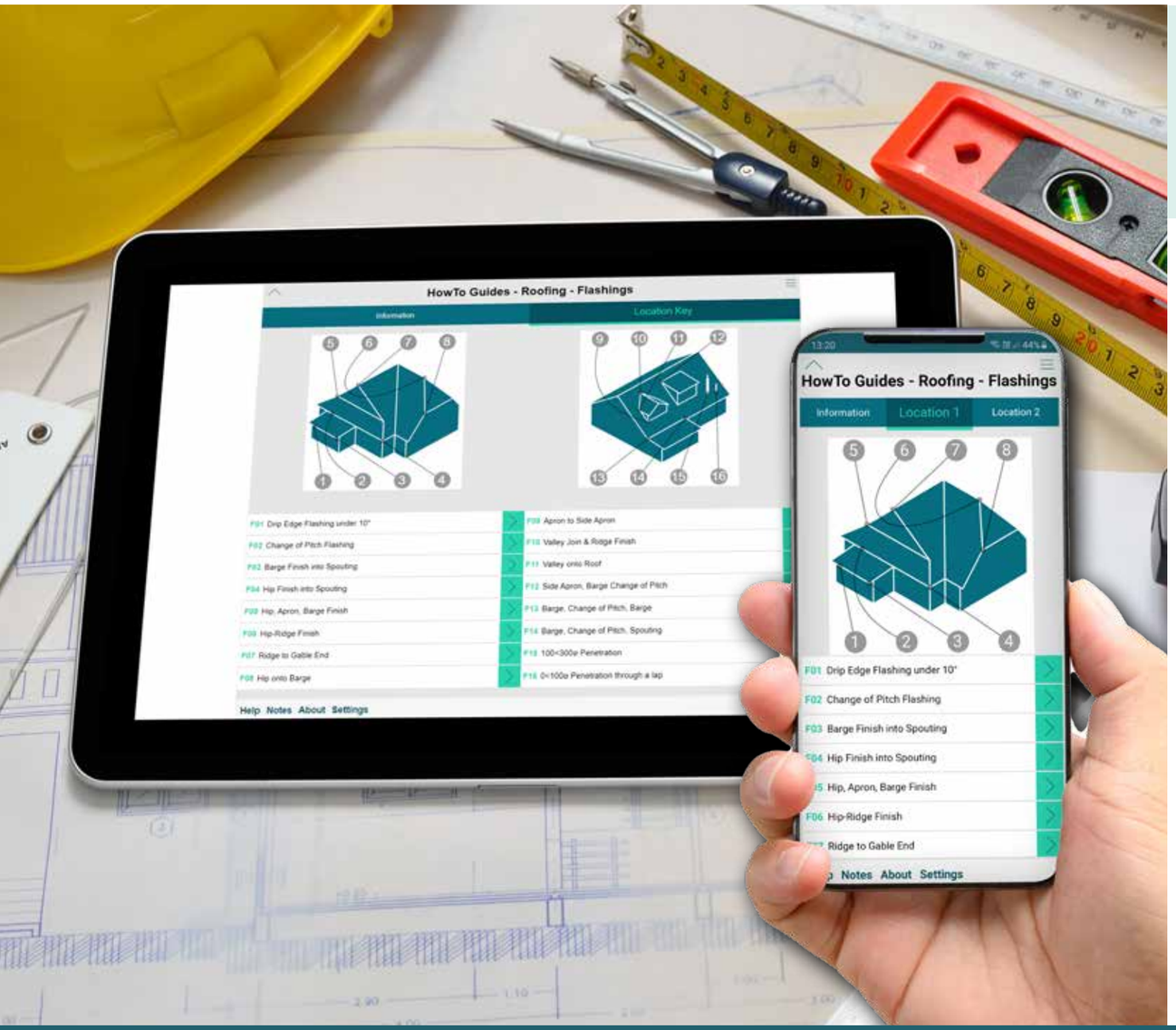

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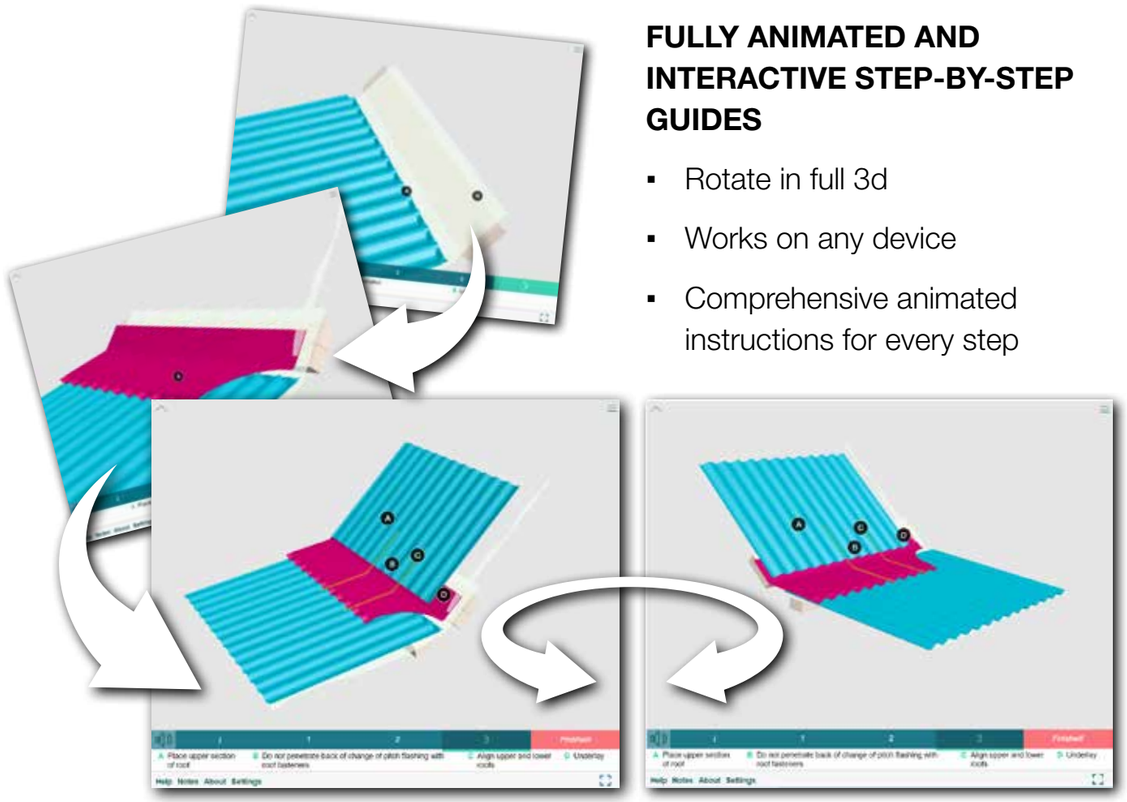

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THE BIG COTTAGE WITH A SMALL FOOTPRINT

Vickie and John had a vision for their new home. Taking aesthetic inspiration from the historic Californian bungalow on Fendalton Road known as the Los Angeles house and mixing in the clean Japanese/Scandinavian style known as Japandi, all while having a high performing home in terms of energy efficiency. All they needed was the right architect to bring their dream to life.

Bob Burnett Architecture, comprised of husband and wife team Bob Burnett and Shizuka Yasui, enjoys a reputation for being innovators in high performing energy efficient homes. Shizuka's architectural training in Japan lends a strong Japanese influence over their designs, focussing on Japanese elements of flow and efficiency.

Their passion for sustainability and energy led them to develop the Superhome Movement, which aims to share knowledge about sustainable practices and create a better standard for kiwi homes. During one of the Superhomes tours of sustainable homes, Bob met Vickie and John and bonded instantly over the concept for the Big Cottage.

Starting with the exterior, the team leaned heavily into the Los Angeles house aesthetic. Sloping walls were incorporated and grounded in a heavy stone base to create a rugged atmosphere. Contrasting the heaviness on the exterior, the interior draws in natural light and warmth via large triple glazed windows and utilises warm toned wood interior materials to reflect the light. A complex warm skillion roof adds an air of spaciousness, while completing the thermal envelope to ensure the home is warm and efficient.

The warm roof was constructed of a 140mm thick layer of Cross Laminated Timber (CLT) whose raw face was used as the interior surface of the ceiling. The warm, bright timber brought a lightness to the living space inside while the thickness provided a structurally sound base for the roof to be constructed upon. Next a 90mm layer of PIR board was applied and covered by a waterproof membrane underlay, battens, and an exterior layer of steel roof tiles. Using a system of battens and counter-battens to create Above Sheathing Ventilation (ASV) which allows airflow between the underlay and the exterior tiles. This design permits the passage of air between the exterior tiles and underlay, which dries any natural moisture accumulation and equalises the temperature and humidity between the exterior of the house and the inner roof. This holistic warm roof design allows the roof to be incredibly efficient in keeping warmth inside the building while allowing for a heightened ceiling which adds to the overall visual effect of the interior.

The roof design was heavily influenced by aesthetics. “From an architectural point of view, the roof is the 5th wall. It’s just as important as the walls and it heavily influences the look and feel of the project.” Bob explains. This is why Gerard’s Senator pressed steel tile was chosen as the roofing material. Its irregular pattern and gentle mottled colouring added to the organic feel of the exterior while leaning into the inspiration of the Los Angeles house with its cedar shingle roof. A nod to Japan was incorporated with a small upturn at the edges of the roof, reminiscent of Japanese temple architecture.

Once a material was proposed for this build, the team had to ensure it held its own in terms of sustainability. Like many metals, steel is able to be recycled time and again without any degradation to its properties. Gerard’s roof tiles have a core of 0.39mm thick steel, meaning any offcuts made during the installation process and the entire roof at the end of its lifespan can be melted down and remade into new products. Gerard also enjoys ISO 14001 accreditation, giving peace of mind that an effective environmental management system is in place for the manufacture of their tiles.

The Christchurch earthquake saw a shift to lightweight roof designs. “The earthquakes changed our choices as we’d never do a heavy roof now.” Bob explains of his decision-making process, “A light roof was always going to be the way to go, in terms of earthquakes, mass is your enemy.”. The interlocking design of Gerard’s roof tile creates a strong single structural unit intrinsically safer and sturdier than loose concrete tiles of the past. The benefit of going with a steel tile roof is the reduction in building materials required to support the roof “If you’ve got a heavy roof, you’re inherently going to have to have a heavier wall structure and bracing to support the roof.” Bob says.

The overall roof design is a key element in ensuring energy efficiency and liveability in the home. The design of the Big Cottage utilises a clever roofing feature to minimise overheating in the warmer months. An engawa, a roofed verandah-like structure that wraps around the building was designed, leaning on Japanese architectural practises. “The engawa really is fundamental. It’s crucial in preventing overheating.” Bob explains “It’s actually quite easy to do a warm home, but it’s more difficult to make it so that it’s not going to be too hot in summer, and the engawa is essential in preventing that overheating by blocking the midsummer midday sun on the north side, and allowing enough sun to come in during the winter when the sun is at a lower angle.” Nestled into the engawa roof is a large skylight, positioned to allow light into the kitchen and dining area where more natural light is needed, further reducing the power demand on the home.

Additional features are peppered throughout this project such as rainwater harvesting off the roof. From a Superhome perspective, this is a must-have. “It’s so easy to do and doesn’t cost a lot, so you might as well make use of the water.” Bob says of rainwater harvesting “We’re using it as irrigation for the garden as a minimum. Then the next step is to plumb it in to flush the toilets because in the average home half the water is flushed down the toilet.” Gerard’s steel tiles are an ideal fit for this feature, as both smooth and textured finishes are safe for rainwater harvesting. Additionally, all Superhomes are outfitted with solar panels to ensure energy is being captured and utilised within the home. Gerard has an innovative bracketing system which allows solar panels to be mounted with brackets hooked under roofing panels to eliminate the need for roof penetrations which may cause degradation of the roof over time.

The project now stands completed with Vickie and John enjoying their new home. And showing their passion in furthering the education around sustainability and a better way of building, they’ve since had the annual Superhome Tour feature their home as a stop – the same tour they took before building the Big Cottage. Bob reflects on the project “It was a privilege to work on it and work with John and Vickie. They loved their house and at the end of the day that’s the ultimate reward for us.”.

THE PCC OVEN UPGRADE

Within the construction sector, steel stands out as one of the most sustainable options available. Not only is it a key component in building design and construction, it's recyclable and reusable nature allows it to be used multiple times that help reduce its environmental impact.

Steel's metallurgic properties means that when recycled, no degradation occurs allowing it to be melted down and reused an infinite number of times without compromising its structural integrity whilst using significantly less energy than producing steel from raw materials.

The challenge for a business such as Pacific Coilcoaters, the manufacturer of the ColorCote® range of pre-painted metal coiled product used in roofing, cladding and rainwater goods, is how to efficiently process the raw steel (and aluminium) coils in the painting process and to minimise the impact on the environment via the energy used and any greenhouse gases that may be emitted.

Since the inception of Pacific Coilcoaters, the paint curing process, which is effectively the same world-wide, has been conducted via the use of gas fired ovens with the business being one of the larger commercial users of gas in the Auckland region.

In 2021 with the existing paint line ovens nearing their end of life the business decided to challenge the "status quo" and embark on an ambitious program that was focussed on a more innovative approach to their replacement which would be better for the environment, meet changing customer expectations around the environment and to contribute to Fletcher Building's goal reducing carbon emissions by 30% by 2030.

Simply put, the strategy was to significantly decarbonise the business as much as possible. Following extensive research looking on global best practise, the final decision was made to replace the existing and outdated technology with a total of three electrically powered Near Infrared (NIR) ovens at a total project cost of circa $10 million.

Whilst seen as a common curing technology of paint in the aerospace and automotive industries, the use of NIR ovens in coil coating is rare. But the decision to install NIR ovens was seen by the wider business as a significant innovative move and to signal a firm commitment by Pacific Coilcoaters to help decarbonise the sector.

Coupled with this position was the added benefits of greater temperature control across multiple oven stages, less overall energy wastage, and improved quality control.

Traditional gas fired ovens are effectively giant hot boxes that require a lot of energy and time to reach their operating temperature, whilst NIR ovens operate in a similar way to a domestic bread toaster that is laying on its side. When the ColorCote® paint line is turned on, the NIR oven elements are activated and reach their required temperature almost immediately. When the paint line stops, the NIR ovens turn off immediately until they are needed again, unlike a gas oven that may have to be left running and consuming gas to help maintain its internal core temperature thus generating CO2 emissions even when the paint line is not running.

Following a lengthy period of planning that included the pre installation of two large power transformers and 3.7 km of 44mm power cables weighing more than 7.5 T, the old gas ovens were decommissioned in early April 2023, and the new NIR oven installation finishing some 6 weeks later.

The NIR oven installation was also complimented by the commissioning of a state-of-the-art Regenerative Thermal Oxidiser (RTO) that incinerates all of the emitted volatile organic compounds (VOC) at a temp in excess of 750degs Celsius.

During the installation and commissioning period the business continued to support and supply it's customers with all key product requirements as a result of working closely with them prior to the project commencement and through the use of its various product stocking models.

Following a successful installation program, the NIR ovens showed an immediate and expected dramatic reduction in CO2 produced per Tonne of product painted, with this reduction sitting at an average of 59% from its peak.

Coupling this new paint curing technology together with ColorCote®'s strategy of utilising water based paints combined with MagnaFlow™'s position of having the one of the lowest embodied carbon footprints within the pre-painted steel industry, means that customers can use ColorCote® products confident in the knowledge that they are working alongside a company that is focussed on delivering product that is not only "fit for purpose" but also doing what it can to minimise the impact on our fragile environment.

For further information on either ColorCote® products or this exciting project please contact us via enquiries@colorcote.co.nz

THE ROOF HELPING TO BRING A VISION OF LIFESTYLE AND COMMUNITY AT PAERATA RISE

In the artful design of the Schist Showstopper at Paerata Rise, Precision Homes has not only created a stunning residence but also a canvas for potential homeowners to envision the lifestyle that awaits them. The architectural brilliance of the show home, accentuated by the impeccable roofing solution provided by Dimond Roofing's Solar-Rib®, extends beyond aesthetics to foster a sense of belonging and community.

As visitors step into the Schist Showstopper, they are greeted by an atmosphere of tranquillity and sophistication. The Solar-Rib® roofing, with its attractive linear profile, adds a touch of modern elegance to the exterior, setting the tone for the refined living experience within. The inviting timber battening of the exterior beckon's exploration, creating a warm and welcoming first impression.

Precision Homes has carefully curated every detail of the home to help potential buyers see themselves living there. The interior spaces, bathed in natural light thanks to the strategically placed windows and glass doors featuring the Solar-Rib® roofing, invite exploration.

The open and airy living area, adorned with blonde-wood floors, creates a versatile backdrop for a myriad of lifestyle possibilities.

The Schist Showstopper is not merely a display of architectural prowess; it is a vision of a life well-lived. The designer kitchen, equipped with top-of-the-line appliances, becomes the hub for culinary creativity and family gatherings. The sunken second lounge/media room offers a retreat for relaxation, while the separate study and charming reading nook provide spaces for productivity and reflection.

In the main suite, the towering timber wall, Velux skylights, and spacious walk-in wardrobe create a sanctuary within the home. The ensuite, featuring a large double shower overlooking a private garden, invites a sense of luxury and serenity. The main bathroom, with a skylight above the bathtub, provides an intimate space to unwind and gaze at the stars.

Beyond the individual spaces, the Schist Showstopper is designed to seamlessly integrate with the community spirit of Paerata Rise. The secluded courtyard, accessible through large windows and glass doors, becomes a private oasis for social gatherings and moments of quiet contemplation. The character-filled powder room and separate laundry add practicality to daily living, enhancing the functionality of the home.

The interior spaces, bathed in natural light thanks to the strategically placed windows and glass doors featuring the Solar-Rib® roofing, invite exploration.

The show home not only showcases the features of the Schist Showstopper but also invites viewers to envision their lives within its walls. It is a carefully crafted narrative that extends beyond the physical structure, painting a picture of a vibrant and connected community. The Solar-Rib® roofing from Dimond Roofing, with its aesthetic appeal and functional excellence, becomes an integral part of this storytelling, contributing to the overall ambiance of the home.

As potential homeowners walk through the Schist Showstopper, they are not just viewing a house; they are glimpsing a future—a life filled with warmth, comfort, and a sense of community. Precision Homes, KPA Construction, and Dimond Roofing have collaborated to create more than a show home; they have crafted a vision of living that resonates with those seeking not just a house, but a home and a community to belong to.

Main Contractor:
Precision Homes
Email: andrew@precisionhomesnz.co.nz

Roofing/Cladding Manufacturer:
Dimond Roofing

Roofing/Cladding Profile:
Solar Rib

Roofing Installer:
KPA Construction

WAI ARIKI HOT SPRINGS & SPA

Nestled on the tranquil shores of Lake Rotorua, the Wai Ariki Hot Springs & Spa stands as a beacon of architectural brilliance and cultural significance. As the proud recipient of the Harkness Henry Judges' Choice Award at the Central Property People Awards 2023, this sprawling 4,500m2 world-class spa and wellness resort is a testament to the power of visionary thinking and collaborative effort.

The Wai Ariki Hot Springs & Spa is not merely a building; it is an architectural masterpiece that seamlessly melds with its urban surroundings. The six-year journey from concept to grand opening reflects a remarkable collaboration between Ngati Whakaue, expert minds in design and construction, and a community united by the vision of making this landmark project a reality.

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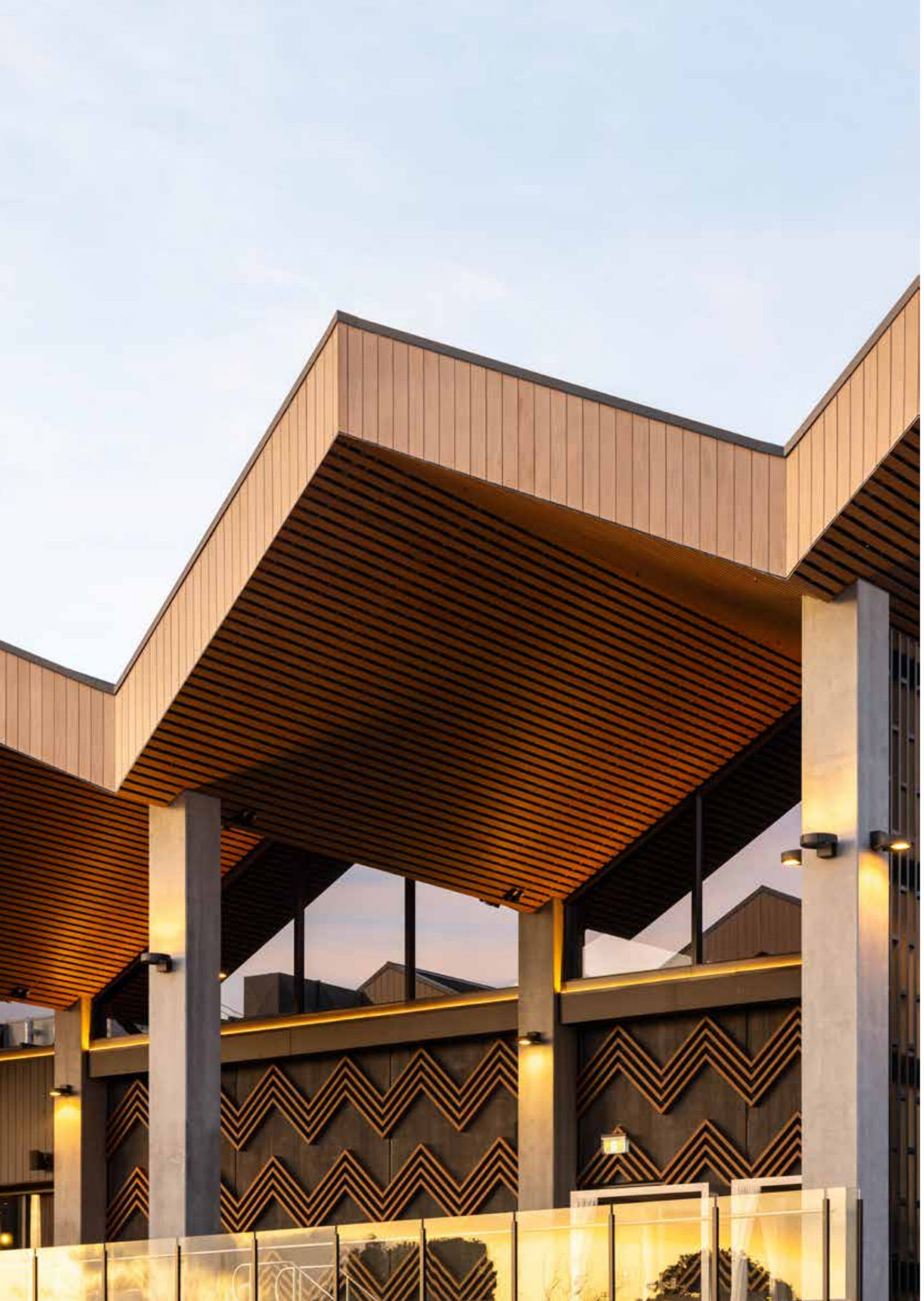

The architectural design of Wai Ariki Hot Springs & Spa is a thoughtful blend of tradition and modernity, paying homage to the cherished values of Te Arawa and Ngati Whakaue.

The architectural design of Wai Ariki Hot Springs & Spa is a thoughtful blend of tradition and modernity, paying homage to the cherished values of Te Arawa and Ngati Whakaue.

The result is a building that stands tall, making a profound architectural statement while remaining respectful to its cultural roots. It is monumental yet harmonious, a facility that not only rivals the best across the globe but also encapsulates the essence of intergenerational prosperity and employment.

At the crown of this architectural marvel is Dimond Roofings' DD400 profile in Colorcote.9 Alumiguard Plus – a roofing solution that goes beyond mere functionality. The DD400 profile adds a touch of modern styling with its broad angular ribs and wide pans, contributing to the overall aesthetic appeal of the Wai Ariki Hot Springs & Spa. Its concealed fix system ensures a clean finish, free from visible fixings, elevating the roof to a design element that complements the grandeur of the structure.

Paired with the DD400 profile, Colorcote.9 Alumiguard Plus provides not just protection but a shield against the harshest environmental conditions. Its use in 'very severe' marine environments and resistance to chemical exposure make it a reliable choice for a project situated on the serene shores of Lake Rotorua.

The Alumiguard Plus, with its durable baked-on paint system, reflects the commitment to quality and longevity, mirroring the values upheld by the Wai Ariki Hot Springs & Spa project.

As the DD400 profile and Colorcote.9 Alumiguard Plus become an integral part of the Wai Ariki Hot Springs & Spa, Dimond Roofings takes pride in contributing to a development that has permanently enhanced the urban tapestry of Rotorua and New Zealand. The roof is not just a protective covering; it's a symbol of excellence that crowns a facility destined to leave an indelible mark on the cultural and architectural landscape.

In celebrating the success of the Wai Ariki Hot Springs & Spa, we acknowledge the role played by Dimond Roofings in providing a roofing solution that is not just a functional necessity but an integral part of the visual narrative. The DD400 profile in Colorcote.9 Alumiguard Plus stands as a testament to the collaborative spirit that has shaped this remarkable project, contributing to a legacy that will endure for generations to come.

Main Contractor:
T H Commercial

Roofing/Cladding Manufacturer:
Dimond Roofing

Roofing/Cladding Profile:
Dimondek 400 / DD400

Material:
Colorcote .9 Alumiguard Plus

Roofing Installer:
T H Commercial

TIMELESS LEGACY PROFILE — A FEATURE AT WOOLLEN MILLS

Transforming the Woollen Mills site in Onehunga into a modern industrial campus was the work of JWA Architects. Lining the signature saw-tooth roof and exterior walls, Steel & Tube's Legacy™ profile brings a sophisticated accent to this award-winning 15,000 sqm build.

Paying homage to an historical part of Auckland, JWA Architects has repurposed and expanded the original 19th-century Woollen Mills building, once famous for its Princess wool blankets. New materials include pre-cast concrete, glass and aluminium curtain walling, and our Legacy tray profile for wall and roof cladding.

Retaining the original brick building as the anchor for the site, the architects introduced the unmistakable 18th-century standing seam style of Legacy, in COLORSTEEL Flaxpod®, to create a design connection between old and new.

'We wanted to ensure a strong presence on Neilson Street that responded positively to the historic Woollen Mills site,' said JWA Architects founder Jonathan Walker. 'The new saw-tooth roof reflects the original Victorian factory roofline, giving the site a strong identity in South Auckland.'

Product selection criteria included: durability and performance; efficient installation and low maintenance; environmental compliance; and cost-effectiveness. As an architectural cladding system and roofing choice, the Legacy profile provides a vintage character, with sleek, modern lines to blend old and new.

Oil-canning is a frequent phenomenon in products featuring standing seams or wider profile patterns, like Legacy. It is not deemed a defect and tends to become less noticeable over time with weathering.

Using Legacy for an architectural finish

The Woollen Mills development is a clear and distinct destination and industrial business hub, proudly winning in the commercial category at the 2023 Auckland Architecture Awards.

The awards judges noted, ‘The saw-tooth roof form facing a busy road is commanding alongside its neighbours and establishes an engaging new presence in the surrounding context.’

‘The use of Steel & Tube’s Legacy profile was quite deliberate,’ says Jonathan Walker. ‘It’s a standard roll-form profile; however, it has the wide trough, giving a bit of a flat pan roof appearance, so it looks quite architectural.’ This means that a cost-effective, easily accessible and low-maintenance product also delivers on design quality and impact.

Cost-effective with a beautiful end result

Legacy has a competitive price point compared to the traditional standing seam profiles. ‘It comes with a wide pan and high rib and doesn’t require a plywood substrate,’ says Steel & Tube’s Specification Manager, Roofing, Sylvan Cheng. ‘That makes it immediately more cost-efficient, but with a beautiful end result.’

Legacy supports Green Star and Home Star requirements, with all Steel & Tube profiles in COLORSTEEL® accredited with Eco Choice Aotearoa. As a clip-fix system, Legacy also does not show a single screw, making it simple and time-efficient, helping projects keep within and ahead of deadlines.

‘It’s a great product to use,’ says Jonathan. ‘Detailed well, it withstands even harsh conditions.’ Legacy’s robustness and low upkeep requirements make the profile a popular choice for many projects.

A signature, stand-out look

‘The Legacy profile doesn’t have a swage, which means you get more of that architectural look to it,’ says Jonathan. ‘You also get that slight oil-canning effect that gives buildings a more crafted, bespoke finish. Flaxpod®, which is one of the darkest shade in the COLORSTEEL® colour palette, helped emphasise this feature. It’s nice that we can use some of the profiles in a more architectural way.’

Oil-canning is a frequent phenomenon in products featuring standing seams or wider profile patterns, like Legacy. It is not deemed a defect and tends to become less noticeable over time with weathering. ‘Some of our customers really like that undulation,’ says Sylvan. ‘It’s almost like the building is breathing. It’s a feature you can achieve if you pick the right colour and finish – and we are always happy to advise on how to achieve your preferred finish.’

The old Woollen Mills site has a new lease of life, once again a hub of local industry amid a trendy and bustling commercial area. This pioneering rejuvenation has won praise from both the architectural industry and local community, the development bringing energy and identity to Onehunga.

Product:
Legacy™

Architect:
JWA Architects

Installer:
Reel Roofing

Photographer:
Colleen Tunnicliff

Writer:
Folio

RECYCLING AND RECYCLABILITY

Recent initiatives by New Zealand Steel and by Pacific Coil Coaters, our primary suppliers of metallic coated and painted steel, will improve the sustainability of their operations, as reported in Scope 58 and in this issue 59, and we thought it worth revisiting an article published originally in 2008 and again in February 2015 and updating the content.

New Zealand Metal Roofing Manufacturers Inc (NZMRM), as does every industry that wants to survive, is continuously looking at the sustainability of their products and member companies. We have been operating a Sustainability Subcommittee since 2006, which looks at issues affecting the sustainability of our products and industry. It has been proactive in promoting the sustainability benefits of MRM to various external bodies, including Metals NZ and the NZ Green Building Council. We are founder members of the Sustainable Steel Council Inc.

RECYCLING and RECYCLABILITY

New Zealand Steel, in the last issue of Scope, discussed the proposed electric arc furnace (EAF) project, co-funded by the NZ Government, which will reduce their “carbon footprint” and at the same time use locally a significant percentage of the steel scrap which is currently exported. Pacific Coil Coaters, in this issue, will talk about their new electric ovens which as well as offering a more flexible manufacturing process, are already reducing markedly their own carbon emissions.

Both projects use and will use more of sustainably produced NZ electricity instead of fossil fuels and so contribute to New Zealand’s efforts to reduce our overall carbon emissions (minute though they may be by world standards).

These projects are both at the front end of the very long life of steel.

What is not always so well known about is the other end of the life of steel and indeed all metal – its ability to be recycled and its actual method and level of recycling. In fact metal used in cladding (and elsewhere of course) is able to be recycled indefinitely with no loss of quality (unlike any other material), and actually is recycled to a very high degree, not least because the processing energy cost of recycling is significantly less than that of making virgin metal. Steel scrap is worth money, not just something to be got rid of like most materials.

Steel is effectively immortal. Once made from iron ore, or in NZ, ironsand, it actually lasts forever, unchanged, and can be remade into any number of products, with its properties unchanged. While this is true of some other metals, (in the building sector of aluminium), no other material can legitimately claim this. In spite of “recycled” or “recyclable” plastic, glass, concrete and so on, all of these lose quality during the process and only exist as lower quality materials for one or two cycles before being uselessly degraded and turning into pollution.

At the end of its long life, used steel is eagerly sought after on the world market and then melted down, using much less energy than the original process, and emerges in whatever form required just like new. Since there is a world shortage of steel, as well as making new steel, the global industry consumes all the scrap it can get. Because of its long life, recycling can’t make enough to fill the demand. Such is the process that the majority of all steel ever made (since the 1820s) still exists somewhere, and will continue to live forever. Your imported steel knife may contain a very small fraction of steel made somewhere in 1850 (which of course may only have been scrapped recently).

In this article, we provide information from world sources and specifically New Zealand sources to discuss the generic recyclability and recycling of metal, in particular steel, and about the unique system and cycles operating in New Zealand. What follows has been taken from a number of sources and so is only as accurate as the sources. We deal here only with steel, which is by far the main material used for metal building cladding, but many of the comments about recycling apply equally to aluminium, certainly at world level, even though it has quite different processes. And indeed other metal cladding materials such as zinc and copper have such high value as to always be recycled.

Recycling, recyclability and reusability

It is important to separate these similar sounding operations.

As above, steel is the ultimate recyclable material. Its quality is unaffected by reprocessing and recycled steel is as good as new, but has much less embodied energy. All steel products have the ability to be recycled, but the degree to which they are recycled and the ease of doing so does depend on how much they are mixed with other materials and the difficulty

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Metal and specifically steel cladding can both often be reused in the original form, but more importantly it can be recycled into product indistinguishable from the original

of recovery from the other materials. Reuse of material similarly depends on its quality at the end of the life of whatever contains it. Structural steel is very reusable and can be recycled. Steel cladding can be reused depending on its condition (and may end up on a lower quality building) but is more easily recycled (and is much easier to melt than structural steel). Steel used as reinforcing in concrete is fairly easy to recycle although as this requires the destruction of the concrete it is difficult to recover. Steel used in motor car bodies is highly contaminated with other materials. In spite of this variability steel for recycling is a valuable resource and 85-90% of steel used in construction is recycled globally. Over 60% of all steel used globally is subsequently recycled. One source (The World Counts – very interesting) says over 1 billion tonnes of steel is recycled annually; even in NZ we are talking of up to 500,000 tonnes of scrap p.a.

The ability to be recycled

A number of common materials can be recycled in the sense of being taken in a form which is no longer needed or able to be used and then converted into something else. A number of products themselves are able to be reused once the item into which they are incorporated is no longer required.

Metals in various forms, glass, plastics, paper, timber, fabrics and others are able to be reused in some way, and we are all familiar with the recycling programmes of local councils – unheard of 20 years ago but now common – in which various materials are left outside to be “recycled”. We have the idea that they are reused in some way without being very aware of what this might be. For a number of materials collected in this way recycling is actually not possible currently. In fact, to varying degrees nearly all these – apart from metals – are either not actually reused in a recognisable way or are degraded during reprocessing from the original form or quality (often referred to as “down cycling”). Nearly all non-metals even if reused as part of a new or similar product are in a product of lower quality or value with reduced physical or aesthetic properties. The current term “Recyclable” often seen on plastic packaging is really a rather cynical marketing ploy to make you think that the product will actually be recycled as is. While much packaging could actually be reused the cost of cleaning it means this never happens. Remember glass milk bottles (maybe many of you can’t!) but these were a valued product, washed and put out daily in order to get a new one. These were then machine washed and refilled with milk. No longer. Much “recyclable” product ends up in land-fill or on a beach in Malaysia.

Metal and specifically steel cladding (which after all is what we (NZMRM) make and sell) can both often be reused in the original form but more importantly it can be recycled into product indistinguishable from the original, totally undegraded and capable of being recycled indefinitely. Steel cladding is generally unmixed with anything other than metal coating and paint and has thin sections and so is one of the most easy to recycle steel products, compared with e.g. reinforcing steel buried in concrete.

Throughout its history steel has always been recycled and all steel contains a proportion of recycled material from 10 – 100%, so that any steel currently in use actually has some content that may have been used a number of times.

Recycling levels

Because of the factors discussed above - and below – (no loss of quality, scrap required for efficient function of steel mills, much lower energy content), steel has a very high level of recycling – typically up to 90% of all steel embodied in buildings and in artefacts which have ended their useful life ends up being recycled into fresh steel ready to start as good as new, into a long new useful life.

In the case of building cladding, quite a lot can actually get reused (rather than recycled as material) although generally in a lower value role – e.g. steel roofing from an office might end up in a fence or a farm shed. The actual percentage of steel which is recycled obviously depends on the application, so that steel which can be reused when a building is taken down is different to steel in a crushed motorcar body or an old fridge, but overall it is very high. According to one source this is 60% of steel globally.

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A number of mills with EAF only use scrap steel as a raw material. About 30% of all steel comes from an EAF, limited by supply.

Steel manufacture and recycling

Today, steel is nearly all made by one of two processes world-wide.

The Basic Oxygen Furnace (BOF) is the main method for converting iron made from iron ore into steel. It needs to use some recycled steel for efficient running and will use from 10-25% of recycled material.

This may be in-plant scrap ("pre-consumer recycle" or "home scrap") or bought-in scrap metal that is derived from steel items past their usefulness ("post-consumer recycle"). Typically a BOF unit will use all its own in-house scrap and some bought-in material.

The Electric Arc Furnace (EAF) can also convert iron into steel but is the main way of consuming scrap steel materials (post-consumer), and the process requires a minimum level of at least 30% scrap to function. EAF units can run from 30 to 100% scrap. A number of mills with EAF only use scrap steel as a raw material. About 30% of all steel comes from an EAF, limited by supply.

Because steel is a durable material and is used mainly in quite long-life products (unlike packaging materials) and is also in increasing demand, the amount of scrap available (even at very high recycling rates) is not sufficient to feed the demand and so virgin steel continues to be made from iron ore (or ironsand). Many global steel companies have both types of furnace and are able to take in and reuse large amounts of scrap steel – typically as much as they can get, because reprocessing scrap steel requires less energy than making new steel.

Globally then, steel mills making all sorts of steel products use both recycled (pre- and post-consumer scrap) and virgin iron made from iron ore. The proportion varies from mill to mill; some only use scrap and others use smaller amounts of it in their mix. Overall a very high level of recycling is achieved (60% apparently).

The New Zealand scene

New Zealand Steel (now part of Bluescope Steel, an Australian manufacturer) started manufacturing steel at Glenbrook (approximately 60km south of Auckland, the biggest market) in 1963. After many decades of research, a process had been developed to process the local ironsand in a unique process that has a small ecological footprint compared with transporting rocks for sometimes thousands of kilometres, and the Glenbrook plant was built to use this process.

When this author first visited Glenbrook in 1984 they had two EAFs used to make steel from iron. After various changes in technology (and ownership) New Zealand Steel now uses the BOF process and makes all new steel from iron with only about 12% in-plant waste (pre-consumer scrap) added.

Now work is in hand to convert NZ Steel back to EAF for steel production, which will allow (indeed require) greater percentages of steel scrap from local external sources and allow significant reduction in export of scrap, which is a waste of a valuable resource.

Use of scrap steel in New Zealand

Home scrap (also known as circulating or internal scrap) is the residue left from the steelmaking, rolling and finishing operations and includes croppings, offcuts and material rejected by quality inspection procedures. This internal scrap usually accounts for about 10% of total crude steel production in an integrated steelworks. Currently NZ Steel uses the BOF process which can use a maximum 20% of scrap in its metallic charge. Thus NZ Steel uses only its own "home scrap" in its steelmaking process. No post-consumer recycle (PCR) is currently used at Glenbrook as is this not needed in the current steel-making process.

The Pacific Steel company was founded by what became the Fletcher Group about the same time as NZ Steel to produce steel reinforcing, wire, and other products primarily from steel scrap. In 2015 it was acquired by NZ Steel and started using virgin steel from NZ Steel to make higher quality products.

So from then on until now, no significant amount of scrap steel was processed in New Zealand, and all steel products were made from new steel made from ironsand, and all scrap was exported.

This will change (Back to the Future) when NZ Steel again uses an Electric Arc Furnace to produce steel from both ironsand and much of New Zealand's currently exported scrap steel. Our sustainable credentials will be greatly improved when this happens.

TE NGAU O HOROTIU — DOWNTOWN FERRY TERMINAL

Te Ngau o Horotiu is the biggest upgrade to Auckland's ferry infrastructure and passenger services in more than 100 years. The Ferry Landing together with Te Wananga (the Downtown Public Space) forms the Downtown Ferry Basin Redevelopment project; Auckland's most significant urban waterfront development where visitors arrive and are welcomed to Tamaki. The project responds to sea level rise and is designed to promote mode shift to more sustainable travel choices.

Located at the foot of Queen Street and bounded by Quay Street and Queens Wharf, the ferry basin is Auckland's busiest stretch of waterfront. Over the next 10 years it is projected that there will be 8 times as many people using the area every day. The number of people travelling through the Ferry Terminal is expected to increase by up to 50% from the 6 million people a year that currently travel through it.

As the point of landing and leaving, the design explores the interface between land and sea, and has a uniquely Aotearoa response driven by kaupapa Maori principles of manaakitanga (hospitality), miharo (extraordinary), and transformation from "Auckland to Tamaki Makaurau".

Attached to the western edge of Queens Wharf the new Ferry Terminal is designed to meet Auckland's growing transport needs; the six additional berths will transform the way ferry services operate on the Waitemata Harbour. The architecture and infrastructure of the Ferry Terminal make a confident statement about Tamaki Makaurau and offer an enhanced user experience of arrival and departure.

With a mandate to create a future-proofed ferry network the new and upgraded infrastructure provides a dynamic place of arrival, departure and connection.

The design team worked collaboratively with Auckland Council, Auckland Transport, mana whenua partners and key stakeholders to create a destination rather than a thoroughfare; a place that offers improved accessibility and greater operational flexibility to accommodate increased passenger numbers.

The name Te Ngau o Horotiu was gifted by mana whenua and is derived from a number of kaupapa— "the Te wai o Horotiu is the awa that streams from

a puna out of Myers park that flowed down queen street and into the Waitemata, the pier structure that is being built looks like the teeth of a Taniwha and this in turn lead to the name being suggested as “Te Ngau o Horotiu”. This also gives mana to the Awa and how it previously ran on top of the land and cut through the landscape to flow into the harbour. Although now it flows underground and is not known to many but this name will bring it back to life.”
—Zaelene Maxwell-Butler, Ngai Tai ki Tamaki

The existing piers 3 & 4 have been replaced by six new berths stretching along the western edge of Queens Wharf. People can now arrive and depart with ease via three spacious 6m wide gangways, which are sheltered from the weather by a cantilevered canopy structure. The gangways connect to six near identical floating pontoons that move with the tide.

To accommodate tidal fluctuations the Ferry Terminal rises and falls with the tide varying from a 4.4m clearance for the gangway at max high tide to an impressive 10m at max low tide. The 4m tall glass enclosure creates a space that is light, airy, and spacious. Custom details such as the manaia on the breakwater capping beam detail, the kaitiaki pile pattern and the etched pattern on the canopy soffit have been designed and developed by mana whenua appointed artists.

One of the project’s key design challenges was to deliver a civic response to the infrastructure requirements within a highly valued and congested public space. The design has delicately negotiated a balance between the existing and future requirements of various users, operators, owners, asset managers and stakeholders, in an environment that encompasses the environmental complexities of a coastal location, climate change, sea level rise, changes in weather patterns, and water quality. Important design considerations ranged from the pragmatics of vessel size, loading and manoeuvring, the art of passenger flow and management, the specifics of material selection in a marine environment, the scale of an appropriately civic response, a sensitivity to heritage.

This ambitious project was undertaken in a fast-tracked process to deliver to a hard deadline. To achieve these milestones, the team ran multiple work teams concurrently; these were coordinated through a leadership group that provided design management, client relationship management and tested the design back against key success criteria. Bringing a team of contractors on board early in the project to advise on technical, cost and programme matters ensured the project was reality checked against the real world and is completed on budget.

Off-site prefabrication of the pontoon and canopy elements enabled construction to progress on and off site in parallel speeding up the process and avoiding issues on a very constrained site. This has enabled the team to satisfy the client requirement to keep ferry services operations throughout the design, delivery and commissioning of the project.

The new Ferry Terminal represents a comprehensive revitalisation of the city centre’s land and water interface that seamlessly knits into the wider vision for Tamaki Makaurau that sees the transformation of the waterfront into an attractive, people friendly environment. Te Ngau o Horotiu was completed in July 2021.

Product:
Eurostyle Spanlok

Manufacturer:
Roofing Industries

Installer:
Paton Roofing

Designer:
Isthmus

SCANDINAVIAN STYLE PASSIVE HOUSE

Featured on Grand Designs NZ, this stunning Passive House in Featherston brings together Scandinavian form with NZ-made metal roofing and cladding from Roofing Industries.

This eye-catching home in Featherston, which featured on Grand Designs NZ, was designed by Swedish-born designer Josefine Watterson with the objective of creating a Passive House for her own family with ample inspiration from her Scandinavian upbringing. Roofing Industries Multidek was used for both roofing and cladding, alongside traditional timber, adding a contemporary twist to the home's classic Scandinavian look.

The form of the house was inspired by Scandinavian homes which typically have a high roof pitch to allow winter snow to fall off, and the benefit of an additional mezzanine-like space within the home. "Growing up in those kinds of houses, I loved it," explains Josefine. "It creates an interesting space internally and an interesting expression on the outside. I wanted to do that but a modernised version."

For the external façade, Josefine wanted a material palette which would tie in nicely with the surrounding nature, but also add interest to the design. "I liked the idea of timber as it could bring a lot of warmth to the house façade but I also wanted to contrast that with something stronger and more masculine."

It was this idea of creating contrast and playing with form that influenced her choice to use the Multidek profile from Roofing Industries. "For the roof, I wanted to simplify the form into an A, and then have black cladding that would wrap over the wall, up onto the roof and then down again," she says. "I chose the profile, because it has the strong linear lines that I wanted to wrap around the house. It has a good scale — not too wide or commercial, and not too narrow. It had the perfect balance for creating a nice strong line without feeling too cluttered."

The 500mm profile of Multidek features striking 50mm ribs with wide flutes, providing excellent water carrying capacity and definition, while the

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"The Multidek material is locally made, it doesn’t have a huge amount of embodied carbon, and it’s also recyclable"

ColorCote ZinaCore substrate in Windsor Grey ensures a consistent colour with no risk of oil canning.

The Passive House design of the home, with all windows set back into the insulation line, meant there were no standard flashings and all details around the windows had to be customised. Roofing Industries’ key account representative was available during this process to review Josefine’s customised designs. “I found that super helpful having someone to talk through and peer review the detailing,” says Josefine. “They were really helpful with giving advice on things like fixing centres and thickness required. It was a really positive experience.”

Installation was straightforward thanks to Multidek’s concealed clip fastening system which is simple to install and eliminates the need to penetrate roofing materials. “The concealed fixings were another of the main drivers as you can create beautiful modern simple details without it looking cluttered,” says Josefine. “Also the speed — it went up really quickly.”

And with sustainability so close to the heart of the project, the fact the roofing is manufactured here in New Zealand by Roofing Industries was another key factor for specification. “There were some similar products at a similar price that could be shipped from Europe, but it didn’t feel quite right to do that,” explains Josefine. “The Multidek material is locally made, it doesn’t have a huge amount of embodied carbon, and it’s also recyclable, so if it needs replacing — not in my lifetime but perhaps my children’s, it can be recycled.”

The end result is a stunning home that reflects Josefine’s Scandinavian heritage, with the Multidek cladding and roofing bringing contrast and a contemporary twist to the design. “I love the contrast of the warm timber against black, and also how the greenery of the trees really pops against the black,” says Josefine.

Having now lived in the home for nine months, Josefine says she wouldn’t change a thing. “I’m really happy with it — I can’t think of anything that I would have wanted to do differently.”

SCOPE

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