SCOPE

NZ METAL ROOFING MANUFACTURERS INC.

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The NZ Metal Roofing Manufacturers Inc.

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Visit our website at: www.metalroofing.org.nz

Below is a brief introduction to the 2017 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.

PROJECTS

ARTICLES

RICHARD WILDEN: HOUSE IN A HILL

‘No house should ever be on a hill or on anything. It should be of the hill. Belonging to it. Hill and house should live together each the happier for the other.’
Frank Lloyd Wright

Architectural designer Richard Wilden has a fondness for the home that he conceived overlooking the Otago Harbour – and not just because it won him an award.

As he explains, the Broad Bay home that earned an ADNZ national award in the under 250sq m category helped to push his career in another direction.
“It was the first of the more modern style of buildings that I have done,” Richard says. “Before that I had been designing straw bale and earth homes that were more rustic. I could see the limitations of specialising in this niche market and this home was an opportunity to broaden my portfolio.”

His client wanted modern looks in a passive solar house that made the most of the views down the harbour.

Richards says, “She was reasonably specific about the number of bedrooms and utilities but open to my interpretation of the site and what might fit there.” While the elevated site was large, it was also sloping which made for a small building platform. The land was also exposed to the elements and became even more so when the only tree on it – a huge macrocarpa – was chopped down.

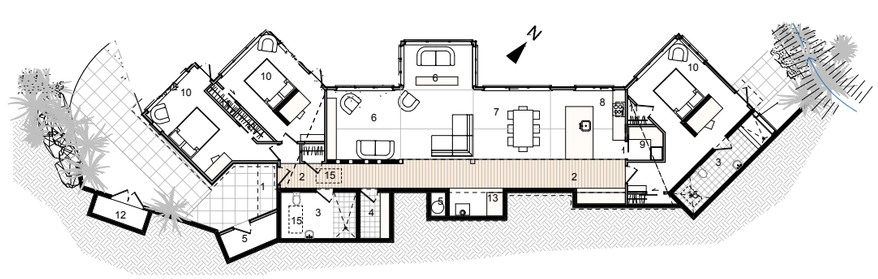
“It was a giant of a thing but it was sick and dying,” says Richard. “And when it was cut down it opened the site right up.”

To maximise the building platform, cut and fill was used and this also enabled Richard to fulfil several objectives: by using a block wall as a retaining wall and the back wall of the house, he was able to push the house right into the slope giving more area to work with and using the soil to insulate the southern side of the house.

“We backfilled the soil as high against the block wall as we could but we had to leave a bit of space beneath the gutter,” says Richard.
Backing the house into the slope also helped it to become part of the landscape – something that Richard says would have been approved of by renowned architect Frank Lloyd Wright, as exemplified by this quote:
‘No house should ever be on a hill or on anything. It should be of the hill. Belonging to it. Hill and house should live together each the happier for the other.’

The 2.4m-high insulated block wall at the rear also gives the house thermal mass along with the insulated concrete floors
.
“It’s the same principle as the earth and straw bale houses I was designing where the passive solar is all about incorporating mass in the house. With this one the mass is provided by the concrete slab and concrete block wall and that gives the house an even and consistent heat.”

"I place a strong emphasis on the environment, using materials and building systems that leave a small ecological footprint," Richard Wilden



And with the help of the other insulation in the house and the thermally broken double glazing, an even temperature can be maintained year-round.
"We had temperature sensors in there over autumn and winter to see the fluctuation of temperatures," says Richard. "The key measurement was at 7am after the night time cool down and it seldom got below 15 degrees."

Richard says his client was the one who came up with the Calder Stewart V8 profile cladding and roofing material, which she had seen used on Milton prison and liked its looks.
"It's a strong profile; you can see it from a long way away. It has pronounced ridges that are quite close together," says Richard. "The gunmetal fleck through it gives it an interesting colour – it changes as it reflects what the atmosphere is doing."

While aesthetics were important, so was durability in a tough climate. "It's quite a hostile environment. When you get the southwester blowing up the harbour you get a lot of salt spray so we needed roofing and cladding that was robust and easy to clean."

The layout of the home has been designed to maximise the views and sunlight entering the house, the latter complicated by the fact that there was a hill to the east that blocked the early winter sun.
"We rotated the rooms around a little so they would get sun in the morning and we also offset them so that they would protrude gathering more light and to take advantage of the view down the harbour."

The mono pitch roof slopes up from the back wall, and reaches its highest point where part of the lounge extends out from the house.

A strong linear layout has an open plan kitchen/dining/lounge area at its centre separating the master suite at the northern end, with two more bedrooms at the opposite end. This configuration allows all the living spaces and bedrooms to enjoy views and access to the outdoors. Bathrooms, laundry and utility rooms are to the south and have skylights because of the windowless retaining wall. And the macrocarpa has not gone to waste – it features in the internal posts, beams and joinery,

as well as some of the flooring and ceilings. There are also exposed concrete block walls, while the concrete floors are coloured, with expansion joints cut in symmetry with the house

Richard says the wooden elements help to give the home warmth in what is otherwise a neutral colour scheme. The hallway is defined by its macrocarpa floor and ceiling, and runs the length of the house and serves all the rooms.

"We had to rebate the concrete to accommodate the wooden floor but it was worth the effort because the transition between the two is beautiful." The leftover macrocarpa was also put to good use, firing the wood burner with wetback that helps to boost the solar hot water.

"The house also has LED lighting so with no water heating and no space heating the power bill is really low. The first power bill was $60 and it doesn't get much higher than that."

By modern standards, having a separate garage is unusual but that was a deliberate design decision so the house stood on its own.

"I think that is part of the success of this house," says Richard, "The garage is down below and you have to park and walk through a sea of tussock up the hill to the house and you see the house in a different light."

The owner removed gorse and planted tussock around and up to the house, which has a gravel apron that morphs into the grassland, giving the home a grounded, natural feel.

All these elements help to seat the house in its environment. "I go past the house occasionally and it gets better looking all the time," says Richard. "Now it is snugly sitting in the tussock and is part of the landscape."

■|||

Richard Wilden Design

A sole practitioner designing homes for more than 25 years, Richard Wilden first owned and ran a small design and build company for 10 years with three staff and hands on tools every day.
"This has given me a unique understanding of the construction process. From an idea through to contract documents and on to the built structure, I have a strong idea of building structure and how materials fit together."

Richard believes in using conventional and unconventional materials in an innovative way.
"I place a strong emphasis on the environment, using materials and building systems that leave a small ecological footprint. My buildings always exceed the building code minimum standard for thermal efficiency."

Richard has experience in building with conventional materials and the unconventional such as earth, straw bale and lightweight concrete.
"Emphasis is placed on your aesthetic instincts and needs of the chosen site, energy efficiency and indoor air quality – all within a cost-effective framework."

Architectural Designer:
Richard Wilden. ADNZ
Telephone: 03 4898757
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www.richardwildendesign.co.nz
Cladding and roofing:
Calder Stewart V8
Colour: 'Metallic Gunmetal".
Cladding and roofing supplier and installer:
Calder Stewart
Telephone: 0800 115 232
www.roofer.co.nz
Builder: Hugh Dunckley (now retired).
Photography: Graham Warman
Telephone: 027 4418 027
www.grahamwarman.co.nz

JACK’S POINT

Jack’s Point show home wins awards with Espan®

On a working farm 15 minutes from Queenstown, just past Kawarau Falls and Frankton and facing Lake Wakatipu, is the Jack’s Point residential and golf development. It’s been 15 years in the planning by international planning practice Darby Partners Limited, and is designed to visually blend into the landscape using environmentally sensitive design and technology.

The master plan ensures only five percent of the 1,200 hectares (3,000 acres) will be developed. As a result, over time developers expect to deliver 1,300 homes for up to 5,000 people including accommodation, retail and service outlets, a championship golf course and 35kms of outdoor trails.

Principal of Darby Partners is John Darby, a Kiwi with an international reputation for delivering spectacular and exclusive developments.

Approximately 30 years ago he established the Queenstown offices of environmental planning and the design consultancy Boffa Miskell, where he designed the golf and spa retreat Millbrook. Then in the late 1980s he established Darby Partners, creating Christchurch’s Clearwater golf and housing estate, followed by Jack’s Point.

Jack’s Point golf course is the sixth he’s designed, and it is already rated third best in the country according to US-based Links Magazine, and second of 40 by Australian Golf Digest. One admirer believes “he’s the most skilled developer of lifestyle resort properties in New Zealand.”

Espan® .The high ribs give strong shadow lines, and its concealed fixings mean it copes well with the Otago weather

The concealed fixings on Espan® not only deliver excellent weather performance, but often eliminate the need for expensive substrates

Houses at Jack's Point have to comply with 140 pages of design guidelines to ensure they "tread lightly on the land, [with] no disturbance to its intrinsic values," and the Stonewood show home is no exception, winning awards for the work they have done there. In 2016 the house won the 2016 Otago and Southland Registered Master Builders' Association GIB Show Home Gold Award, as well as category winner.

This approximately 240sqm, four bedroom home was constructed in 2015 on the 826sqm section. While it is owned by private individuals, Stonewood Homes Queenstown built it and has a 12-month renewable option to use it as their show home within this development.

It consists of four separate pavilions with 25 degree pitched roofs of differing heights, linked by three flat membrane roofs above connecting corridors. While the section has long north-south boundaries, the house is oriented east-west to maximise the impressive views. This orientation also allows for a large north-facing deck off the kitchen/dining and living pavilions, which are able to offer three aspects to ensure all-day light in every season – further adhering to the Jack's Point design vision. A sheltered east-facing courtyard accessed from the kitchen/dining pavilion opens to views of The Remarkables.

Stonewood Homes Queenstown architect Filiberto Rayon-Villela (ANZIA) is a big fan of Metalcraft's Espan® using New Zealand Steel components. "I like to play with materials," he explained, pointing out he used Espan® not only as the roofing but as a cladding material on this build, in addition to cedar weatherboards. "The high ribs give strong shadow lines, and its concealed fixings mean it copes well with the Otago weather," he says. The concealed fixings on Espan® not only deliver excellent weather performance, but often eliminate the need for expensive substrates - profiles simply lock onto the clips, which are fixed directly onto purlins at varying centres depending on thickness and wind loadings.

"This product is manufactured in Colorsteel® and available in 340 and 470mm widths. It comes in a wide range of Colorsteel ® colours, including "Ironsand" which is a great fit with Jack's Point design specifications."

Like visitors through the home, Rayon-Villela loves the sense of space this home offers. "It delivers a series of individual but linked spaces that connect with the outside and provide sheltered outdoor spaces to be enjoyed all year round," he says proudly.

Architect: Filiberto Rayon-Villela (ANZIA)
Stonewood Homes Queenstown Ltd.
Telephone: 03 409 0924
Email: Filiberto.Rayon-Villela@stonewood.co.nz
www.stonewood.co.nz
Manufacturer: Metalcraft Roofing
Roofing and Cladding:
Profile: Espan® COLORSTEEL® Endura®
Colour: Ironsand
Builder: Stonewood Homes
Queenstown
Telephone: 03 409 0924

REACHING NEW HEIGHTS

For South Island roofing installer Courtney McDowell, this was no ordinary job. His team were flown by helicopter to the building site each day, in a remote location in the Southern Alps, where they worked against the clock in sub-zero temperatures. And given that all materials were arriving by barge and helicopter – everything had to be pre-planned down to the millimeter.

The project was building four luxury guest chalets for Minaret Station Alpine Lodge, which is one of the world's most unique lodge experiences. There is no road access to the Lodge, which is located in a glacial valley, sitting at an elevation of 3,000 ft (830m).

One of many iconic shepherd's huts on Minaret Alpine Station provides a place to rest and enjoy the spectacular countryside

With no road access, and no hardware store around the corner, every detail had to be planned in advance

The roofing and cladding, in .40mm ZinaCore Corrugate, was supplied by Dimond Roofing. The project was a "really interesting challenge" for installer Courtney McDowell, of Attention to Detail Roofing, and his team Phil Hannah and Brenton Cook.

"We'd get dropped in at 8.30am and fly out at 3pm…and we'd go flat out, only stopping for a short break to get some food inside us," says Courtney. "It was actually really enjoyable – with the challenge of seeing how much work we could get through in a day."

It took the team a total of 35 days to roof and clad the four new chalets. And as Courtney explains, the logistical difficulties and lack of road access also required meticulous planning:

"There was a lot of pre-planning that went into it… I would spend a whole day in the office just working everything out. It's too expensive to make a special trip if something is left behind; so you have to think of every single item and little piece of flashing you're going to need."

Teamwork

Making sure the project ran smoothly required a lot of teamwork between Dimond and Courtney's team. Supply of the product was overseen by Dimond's Area Sales Manager, Chris Silcock, while Customer Services Representative Janelle Bryson liaised with Courtney to coordinate it all.

So the steel could be flown by Helicopter, it had to be pre-packaged to certain weights to the nearest kilo. It also had to be ready-to-go when needed; with a two-day lead time from the cutting list.

"Because we were meeting helicopters and barges, everything had to be scheduled to be in the right place at the right time," says Chris.

Dimond and Courtney have done business together for about 10 years – and there was one particular instance where their teamwork really came into play. "One pack of iron was damaged in transit on the way up to the site," recalls Courtney.

"I got a call about 4.30pm, saying we needed to get it replaced asap. Janelle from Dimond got things moving straight away, and we had the replacement iron shipped up the next day. That's the kind of relationship I have with Dimond; and it's what makes a challenging job like that work."

About the lodge

Nestled on the western shores of Lake Wanaka - and accessible only by boat or by helicopter – Minaret Station is a 50,000-acre property. It is owned and operated by four brothers in the Wallis family.

As well as providing the stunning location for the Alpine Lodge and tourism business, the station is also a working high country farm. Around 10,000 deer, 7,000 sheep and 1,000 cattle are raised for premium export and domestic markets. The Wallis family also run a helicopter operation.

It is a uniquely integrated business dating back to the early 1960s, when their father Sir Tim Wallis (known as 'Hurricane Tim'), first began introducing international guests to New Zealand's pristine wilderness.

First opened in 2010, Minaret Alpine Lodge now consists of four luxury chalets, the main lodge/ restaurant, and associated buildings such as staff quarters.

Guests can choose to either kick back at the lodge; or take part in adventure activities such as guided hiking, hunting, fishing, and heli-skiing.

Design principles

The use of corrugate in the design of the buildings was very deliberate. As well as its durability and performance, the colour-coated corrugate provided

The interior provides the luxury but the exterior was deliberately kept simple, reflecting the traditional values of the outback environment

the perfect aesthetic. The Lodge buildings were designed to reflect elements of the traditional high-country station homestead and shepherd's huts. As Jonathan Wallis explains: "Corrugate is quintessentially New Zealand…we wanted the look and feel of the Lodge buildings to be in keeping with our high country heritage."

The architectural designer for the project is Pete McGrath, of Gemrock Design in Bannockburn. He agrees that corrugate was always going to be the number one choice.

"Although the buildings are luxuriously appointed, we didn't want the design to be too pretentious. It

it always provides that interesting blend of colour. I like using Sandstone Grey, for instance, because it replicates the look of the old galvanised iron sheds."

The colour palette chosen for the Minaret Alpine Lodge chalets was designed to complement the landscape; with the roofs in Karaka Green, and the cladding in Lichen.

The durability of corrugate is another big advantage for the Alpine Lodge buildings, where repetitive maintenance or re-paints would mean considerable extra expense.

was about combining simple shapes and strong lines; with traditional features like rough-sawn timber, verandah decking and exposed rafters."

The build was also sympathetic to the land. Pete McGrath says the engineers, Batchelar McDougall Consulting, did an "awesome job" of designing the pile structure. As well as avoiding the difficulties of shipping in quantities of concrete, it also leaves a lighter and more sustainable footprint on the wild terrain.

The beauty of corrugate

Pete McGrath is a firm advocate when it comes to the use of corrugate – it even features in the design of his own home. "It's one of my favourite products. In most of my new-home designs, I would specify ColorCote over anything else."

He believes the texture of corrugate adds another dimension to both roofing and cladding. "I like the way that light interacts with it…and the textural shading you get with the corrugation. It's never flat;

"We all know how durable the modern corrugate products are," says Pete. "It's an awesome product – you can essentially put it up and forget about it, and nature will just look after it."

Architectural designer: Pete McGrath, Gemrock Design, Bannockburn
Roofing/cladding manufacturer: Dimond
Product:.40 ZinaCore Corrugate Roof & Cladding
Roofing installer: Courtney McDowell, Attention to Detail Roofing, Cromwell
Builder: Higgins Construction
Engineers: Batchelar McDougall Consulting, Wanaka

METROTILE OVERCOMES COMMON LEAKS FOUND WITH TYPICAL ROOF PENETRATIONS

For a variety of reasons leaks can be caused through the penetrations on roofs.

Experienced roofer Scott Harris from SH Roofing, a member of RANZ, attended a leak complaint at a 4-year-old metal tile roof in Pukekohe in February 2017. Heavy rain, leaking through a roof penetration, resulted in a wet patch forming on the home owners ceiling.

Investigations resulted in the discovery of a leaking terminal vent pipe penetration (see photo attached). As a roofer, Scott often deals with complaints from home owners that turn out to be related to penetrations made after the roof is installed.

Scott commented “it’s a shame that we install a perfectly good roof, that we know will not leak, only for the trades behind us to start cutting holes in it!”. Unfortunately, the issue is relatively common.

Ross Roof group have the perfect answer for this in the form of their Metrotile one-piece moulded vent tiles that match the roof without the reliance on silicone to remain weather tight for the lifetime of the structure. Both the HV110 sanitary vent and the HV160 extraction vent tiles replace most of these common penetrations for toilet terminal vents and extraction venting such as range hoods.

Both options come with accessories that the plumber or extractor installer can easily join into in the roof space and underlay sleeves to retain the integrity of the roofing paper. These accessories are fitted by the roof installer so neither trade needs to gain access to the roof at all, which also lessens the Health & Safety risk to them.

This alternative has been well received by sub-trades when the usual penetration is replaced with the Metrotile moulded one piece vent, taking away a common area of risk.

Aside from the added piece of mind, they look significantly better as they are coated in the same colour or stone as the roof and blend in well.

The HV110 Sanitary vent tile and the HV160 Extraction Vent tile are available in profiles to match Metrotile’s Shake, Royal, Classic and Tudor profiles tiles.
More info can be found on the Metrotile website at http://www.metrotile.com

The Metrotile one piece moulded vent matches the roofing profile and solves the issues related to penetrations

If the vent is installed with the roof there is no need for sub-trades to access the exterior of the roof to connect ducting.

SOUTHLAND TAVERN, INVERCARGILL

Six-Line longrun roofing was chosen because of its cost effectiveness and simple, classic style

As a community-focused organisation, the Invercargill Licensing Trust knew that in the interests of its customers it was time to replace the Southland Tavern.

The old building, which had become outdated and exceeded its serviceable life, was demolished to make way for a more modern and customer friendly offering with sports bar, gaming machines, TAB and a separate lodge-style dining area.

For the design of the new building, the trust called on Bernie O'Fagan, of RM Designs, which has a long track record in the hospitality industry for redesigns, redevelopments or new builds.

Bernie O'Fagan says, "The Trust took us to the project site – the old building was in-situ poured concrete, very bunker-like and getting to be in poor shape. The only way they could see to give the community what it wanted was to demolish the old building and build again."

Bernie says the Trust wanted a sports bar but with a softer edge so it would appeal to female clientele, and the separate 40-seat restaurant was to have a sophisticated, lodge feel.

"Something with soft furnishings, a little bit more elegant and with a higher comfort level," he says of the Thar & Feather restaurant.

The gabled rooflines of the brick and weatherboard building were a logical choice, given that the Trust wanted a building with a homely, inviting feel.

"The architectural brief was really for a big house, a form that people were familiar with and that wouldn't estrange anyone. It had to suit its context," says Bernie. "Inside, there's an exposed truss detail to give it a bit more homeliness and warmth."

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The architectural brief was really for a big house, a form that people were familiar with.

Bernie says the Six-Line longrun roofing was chosen because of its cost effectiveness and simple, classic style in keeping with the building, which had a budget of $2.2 million.

“Using the longrun let us spend a bit more money on the theming of the bar and restaurant.”
He says because of its hospitality focus, the building was designed predominantly “from the inside out”.

“We work spacially with what sort of zones intersect with each other,” he says. “And we work out where the zones sit in relation to the predominant wind and sun, and where the sun impacts on the internal environment.”

The sports bar has warm timber tones and exposed trusses that give it a more open feel. The Thar & Feather has the same warm tones but a more enclosed, intimate feel that is complemented by the central fireplace. Both bar and restaurant open out to covered courtyards.

The tavern has an 18-machine gaming area, and also features a TAB with manned and self-service terminals.

Chris Ramsay, marketing and sales manage for the Trust, says, “The total rebuild was to ensure our offering to the south city suburbs was in keeping with our mission statement – the best quality hospitality business for the area.”

He says the Trust owns 26 different hospitality businesses, including accommodation, restaurants, bars, taverns, night clubs, bottle stores and liquor distribution.

“The profit from these businesses is returned to the community in the form of grants, donations and sponsorships; $8-$10 million per annum is returned to the community.”

RM Designs

Founded in Christchurch in 1998, RM Designs is an established face in the design industry.
The main principals are seasoned veterans in light commercial design specialising in hospitality and retail. Their resume includes brands such as DB Breweries, NZ Racing Board, Monteiths Brewing Company and Unichem. Spaces like Terrace Downs Resort, Yellow Cross and The Old Vicarage are part of the portfolio and represent a diverse clientele.

Alan Raine brings 30 years’ experience in design, and collaborates with his design team who provide a youthful, inquiring edge.

Bernie O’Fagan coordinates consultants and directs the company in a dynamic industry.

This award-winning company believes commercial returns and a ringing till are true indicators of successful design. And that the design process is a true partnership between client and designer – right down to theming, graphics and staff uniforms.

Architectural design: RM Designs
Christchurch
Telephone: (03) 354 6341
www.rmdesigns.co.nz
Roofing profile: Endura COLORSTEEL® .40mm Marshall Industries’ Six-Line profile.
Colour: ‘Ironsand’
Roofing supplier: Marshall Industries, Invercargill,
Telephone: 03 218 2579
www.marshalls.co.nz
Installer: Marshall Industries
subcontractor C J Turner Roofing
Telephone: 03 215 9512
Builder: Henderson Construction Ltd
Invercargill
Telephone: 03 216 9002

STANDARDS AND THE NZMRM

In the last issue, we had an update from Standards NZ about how the Standards development process works and how building industry Standards relate to the NZ Building Code (NZBC). In the introduction, it was indicated that we would discuss how Standards (and standards) affect the metal roofing (and rain water goods) manufacturing industry, and also what NZMRM's involvement in the development of Standards has been over the years.

Note: in this discussion, "standard" means a prescribed level of composition or performance established by an organisation relating to items to be controlled; "Standard" means a standard developed, published and maintained by a Standards organisation, e.g. Standards New Zealand.

From this.....to this.

So, first, what Standards actually affect manufacture and installation of metal roofing?

Perhaps fortunately for NZMRM members, most of the Standards and requirements for compliance revolve around the materials we use, both in manufacture and in installation. This means we rely on the suppliers to ensure compliance with the appropriate Standards. The effect that conversion of these materials into finished metal roof and wall cladding has is not generally covered by Standards except those relating to physical performance.

Indeed, probably the primary consideration for manufacturers of finished roofing is the choice of raw material based on the end use of the product, provision of the correct material for the end use, and assurance by means of standards that these materials do what they are stated to do.

Standards

However, while most of the Standards that do affect the final performance of our products are involved before we get our raw materials, manufacturers and specifiers still need to understand what these are and how compliance with such Standards can provide the performance we require and expect, and that our customers rely on us to provide. Users of NZMRM made products should understand what Standards cover the products they are buying, use this information in product selection, and look for demonstration of compliance.

Unfortunately, virtually all of the physical properties we rely on in our raw materials are more or less invisible, and mostly not able to be determined just by handling the materials. So, as well as Standards to specify these properties and for test methods to assess the compliance of the materials with these properties, we need some assurance that the materials actually comply with the Standards.

Note that Standards for materials are usually separated into two or more areas – the product and performance requirements to one Standard using test methods described in different Standards. Keeping these aligned can be difficult.

Roof and wall cladding products.

There are basically four properties we are concerned about which are covered by Standards, either joint New Zealand/Australian or Australian. There are several European (EN) or ISO standards which cover the same properties and which are similar to AS or AS/NZS, but since metal roofing is such a major aspect of all types of building in New Zealand and Australia compared to Europe – and since we are in New Zealand not Europe – we only use Australasian Standards.

Inadequate quality of any of these properties can cause failure, either sooner or later. These properties are –

Physical performance provided by a combination of;

- Thickness of the base steel;
- Strength of the base steel; and

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Unfortunately, virtually all of the physical properties we rely on in our raw materials are more or less invisible

Durability performance provided by the base and any coatings ;

- Corrosion resistance/durability of the metallic base; and
- Durability of any paint coating either pre- or post-forming.

Physical performance

Thickness (and other dimensions) of the base steel In NZ for any kind of dwelling (i.e. other than sheds) the minimum thickness for use in roll-formed cladding is required by the NZBC to be 0.40 mm. In fact, currently 0.55 mm is more commonly used. The thickness determines the span possible and the ability to withstand imposed loads (and of course the cost). For metal tiles the minimum thickness is 0.39 mm.

The tolerances for this property are covered by AS/NZS 1365:1996 – Tolerances for flat-rolled steel products. This standard also specifies tolerances for width, length, flatness, edge-camber and out-of- square compliance with all of which properties is necessary to be able to roll-form cladding properly (or at all).

These properties for aluminium coil are covered by AS/NZS 1734:1997. Aluminium and aluminium alloys—Flat sheet, coiled sheet and plate.

Strength of the metallic coated steel

This property is assessed by tensile strength of the material expressed as minimum mPa (megaPascals) GXXX to failure, and is measured by methods described in AS 1391:2007 – Metallic materials – Tensile testing at ambient temperature. Steel-based products used for cladding in New Zealand are either nominally G300 or G550 (“high tensile”) mPa. G300 is used for forming tiles or curved roof sections or where greater ductility is required. Most steel used for roof and wall cladding in NZ is nominally G550 although this often has actual strength up to 700 mPa.
Aluminium coil is softer and has lower tensile strength, which is also covered in AS/NZS 1734:1997.

Thickness and strength go together in creating the actual physical performance of the cladding and not meeting both thickness and strength standards can lead to premature wind uplift failure of the roof cladding and/or installation and foot traffic damage. Typically, these are specified together e.g. 0.55mm G550 - “Product name”.

Physical properties of finished products are covered by AS 1562.1:1992 – Design and Installation of Sheet Roof and Wall cladding – Part 1 Metal. (Currently under revision). Actual performance testing of finished product for wind load resistance and traffic ability is provided by testing to AS 4040.1 (Concentrated load) and .2 (Wind load) and the NZMRM test laboratory can test products to these standards or other methods and provide performance outcomes.

Durability Performance

Corrosion resistance – for steel this is created by a metallic coating of the base metal (or use of metal with greater natural corrosion resistance e.g. aluminium).

The predominant material for roof and wall cladding, used in NZ and also made here is Zincalume ® which has a coating of aluminium and zinc and which is only legitimately produced by plants licensed to BIEC (the original developer). Product cannot legally be called Zincalume® if it is not coated in a licensed plant. Zincalume ® is made by NZ Steel and painted by both NZ Steel and Pacific Coil Coaters. The coating weight of Zincalume® made in NZ is 150 g/m² or 200 g/m².

The corrosion resistance of this coating is created by a combination of the inert oxide coating formed on the aluminium (which makes up nearly 80% of the metallic coating by volume), and the sacrificial protection provided by the zinc content.

In New Zealand, we also see galvanised steel (zinc coating) and a product called “ZAM” (zinc aluminium magnesium) which is also painted by Pacific Coil Coaters.

Metallic coatings and their properties are covered in AS 1397:2011 – Continuous hot-dip metallic coated steel sheet and strip – coatings of zinc and zinc alloyed with aluminium and magnesium. This designates steel that can be coated under the Standard and then lists six coatings with a one or two letter code, and specifies acceptable coating weights to be used for external exposure -

- Zinc (Z) – which is what we call “Galvanised” – not now used for roofing
- Zinc coating as a zinc/iron alloy (ZF) – also called Galvannealed
- Zinc/Aluminium (ZA) – also called “Galfan”, not used in New Zealand
- Zinc/Aluminium/Magnesium (ZM) – which is used in NZ under the name “ZAM”
- Aluminium/Zinc (AZ) – which we call in Australasia “Zincalume ®” (elsewhere “Galvalume or Aluzinc”)
- Aluminium/Zinc/Magnesium (AM) – launched in Australia recently

Of these the majority of roof and wall cladding and rainwater goods and tiles in New Zealand are made from Zincalume ®, either painted or unpainted.

Lack of corrosion resistance can be caused by inadequate weight or inferior quality of coating or coating not being what it is claimed to be, and any of these can cause premature corrosion failure even within the modest life of 15 years required by the NZBC, and well below market expectations. Some BIEC licensed overseas plants make lower metallic coating weight materials for less demanding applications, and such products should not be used for external application even if the actual coating material is correct.

The coating weight of metallic coatings can be measured relatively easily by methods described in AS 1397, and this is a measure of the likely corrosion resistance but the actual corrosion resistance of coated product can also be confirmed by exposure to a corrosive environment either natural or accelerated described in AS/NZS 2728:2013, below.

Paint durability

The final property is paint quality. Much of the product used for roof and wall cladding and rainwater goods is coated with paint or other coatings which provide enhanced appearance, and which may be purchased specifically for appearance. This property is the most difficult to measure, but the quickest to fail and the most noticeable when it does. The vast majority of failures attributed to painted steel products are paint failure leading to very quick visible fading, chalking and colour change, and complaints, sometimes within as little as 12 months.

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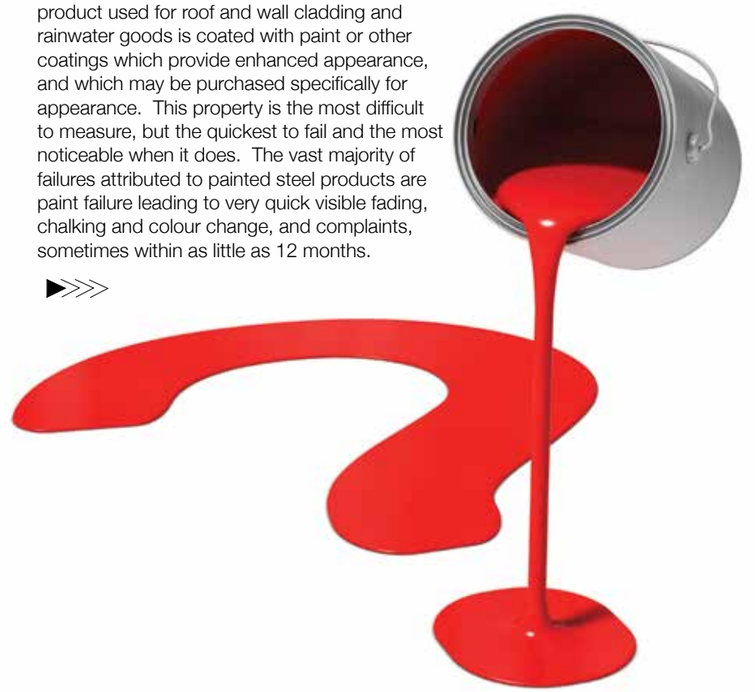


To simplify all of this the NZMRM has produced industry specifications covering metallic coated steel, and pre- and post- painted metallic coated steel.

The joint standard for coating performance is AS/NZS 2728:2013 - Pre-finished/pre-painted products for internal/external building applications – Performance requirements. It has a number of performance requirements but for paint colour durability this only specifies 4 years' exposure at nominated sites and then assessment of colour change. This is in any case only an informative test in 2728 and there is no accelerated test detailed, although these do exist as ASTMs.

There are two ways to assess paint performance – real life exposure at a severe site (normally the commercial site at Allunga near Townsville or others listed in 2728) or accelerated UV exposure using one of the accepted standard methods e.g. a QUV cabinet and one of several test protocols.

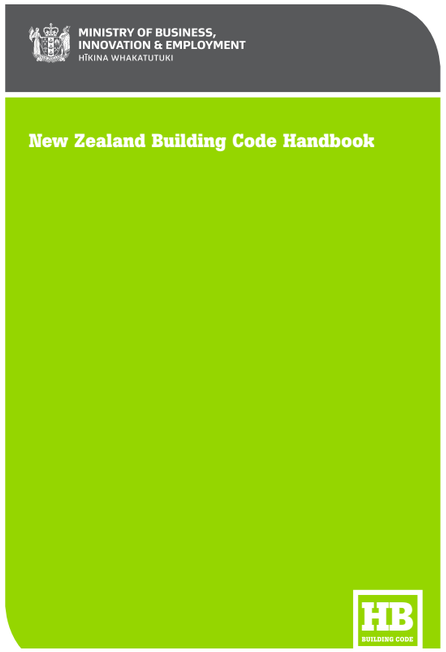
AS/NZS 2728 also includes normative corrosion testing of painted products, in real or accelerated environments.

Other standards

In addition to Standards published by Standards organisations there are other published composition or performance requirements. Unlike Standards which need to be purchased these other standards are usually free to download.

NZ Building Code

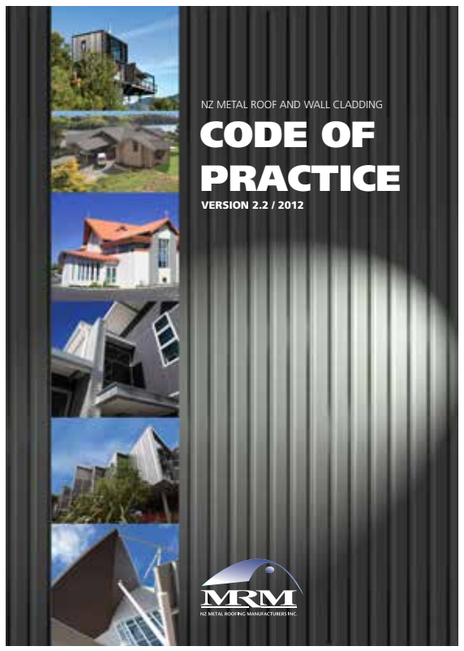
While adoption of Standards may not be mandatory, compliance with the NZBC is for most buildings. The controlling entity, MBIE (Ministry of Business, Innovation and Employment) – which now covers Building controls and Standards New Zealand, issues methods of compliance called Acceptable Solutions, aligning with which is deemed to comply with the NZBC. Clause E2 of the NZBC which covers the external envelope, including roof and wall cladding, has a massive AS, E2/AS1 which effectively is a set of standards. Some of these call up actual Standards, some don't. The NZBC and Acceptable Solutions are available as free downloads from the MBIE website.



(The Australian Building Codes Board – ABCB – also has non-Standard compliance requirements).

NZMRM Standards

To simplify all of the above NZMRM has produced industry specifications covering metallic coated steel, and pre- and post- painted metallic coated steel. These generally incorporate reference to the Standards listed above in one package.
In particular, the UV levels in New Zealand and Australia cause paint which performs well elsewhere to fail quickly, and coupled with the high use level of coil-coated steel products the use of painted coil which has not actually been tested and proved adequate has serious market implications for all such product.



The NZMRM specification for pre-painted coil has modified AS/NZS 2728:2013 by, among other things, requiring the UV exposure test to be Normative Not Informative.
The NZMRM Code of Practice discusses all of these properties in detail.
These specifications and the CoP are available as free downloads on the NZMRM website.

Quality Assurance

It's all very well having Standards for product performance and testing, but unless compliance is regularly assessed and certified, users have no idea if their actual supply complies as specified. This is particularly true for the materials used for roof and wall cladding. Samples may comply with the Standard, but production may not. Fortunately, this was recognised as needing attention back in the 1990s and the ISO 9000 family of standards - Quality Management Systems was the result. Suppliers should be able to offer certification of their quality systems to ISO 9001, which means their production is covered by an approved and inspected quality management system. Purchasers should ensure suppliers can offer this.

Summary

In spite of many specifiers and users being unaware of it, the products of NZMRM members are covered by Standards, and demanding and ensuring compliance with these Standards and proper specification of the correct product for the location will provide assurance of maximum performance. MBIE and the New Zealand building industry is currently expressing concern over the import and use of sub-standard (or actually no-standard) building materials potentially leading to the sort of catastrophic and very costly failures that have been experienced in Australia. Demanding verified compliance with Standards is part of avoiding such issues.

Next time we will discuss Standards which NZMRM representatives have been and are working on and NZMRM's long-term contribution to the Standards development process.

Stuart Hayman

SIMPLE FORM, IMPECCABLE DETAILING

The reputation of a good product is only as worthy as the tradesmen who install it

When Dravitzki Brown Architecture was approached to design a family home near Queenstown, the brief was straightforward: “A simple form, with impeccable detailing”.

The owners wanted something that sat elegantly and easily on the land – a flat site with a northwest aspect at Speargrass Flat, part of what is known locally as “the Golden Triangle”, with views of Coronet Peak.

As Alister Brown, of Dravitzki Brown Architecture, explains, “The Ebbinge House is an uncomplicated gable pavilion with attached garage, and true to the client’s brief maintains clean, elegant lines and simplistic form.

The wow factor comes from clever detailing, impeccable workmanship and smart cladding choices.”

With that in mind, Alister chose to wrap a large proportion of the house in Calder Stewart’s Euro-Tray Angle Seam profile.

“We chose Euro-Tray due to its durability, low maintenance and because it can be seamlessly transitioned from roof to walls to give the look of a single, pure form”.

That philosophy is best illustrated on the northern face of the home, where the roof flows down to the walls with the seams of the Euro-Tray lining up beautifully with the frames of the recessed windows and doors.

“It’s incredibly difficult to do and requires huge attention to detail when you are setting it out,” says Alister. “You can make different cuts of sheet so that not every sheet has to be exactly the same so you do have a bit of tolerance in a material that might seem inflexible.”

Alister says selecting a Calder Stewart architectural profile came with the assurance that they also had certified installers with a high degree of training capable of achieving flawless detailing.

He says, “The reputation of a good product is only as worthy as the tradesmen who install it. On this occasion, the Roofing Smiths Queenstown were awarded the task of bringing the intricate detailing to life. To ensure everything lines up with the building, from windows to corners; and to ensure the look is symmetrical and balanced from every angle means a lot of thought, measuring and setting out before the job can even begin.”

Jeremy Harrison, project manager at Roofing Smiths Queenstown, says, “One of the beauties of the Euro-Tray is it is such a flexible product; you can cut the sheets to fit so what you end up with is a custom-made roof.”

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“Great design, product selection and craftsmen can bring a vision to life.”

He says the roof/wall junction is crimped together with a little bit of overhang to create a knee that allows water to drip from the roof to the ground. To maintain the uncluttered look, internal membrane gutters have been employed – the only evidence of which is a narrow slot towards the bottom of the roof along almost its entire length. The flashings were made slightly bigger so as to conceal the membrane from view and minimise the visual impact of the gutter.

To the south, a concrete clad punchout that houses the kitchen and scullery breaks up the form of the house as does the use of dark-stained vertical cedar cladding. An attached cedar and concrete garage helps to shelter the entry beside the kitchen and has access to the house through the laundry. The in situ concrete is softened by being board-formed so it picks up the irregularities and grain of the Oregon timber used in the boxing.

The thermally efficient home sits on a double concrete slab and its perimeter is cantilevered so that it appears to float above the ground. Large, offset concrete slabs are used as steps front and rear and also appear to float.

Alister says, “We have used steps like that at our house and the owners saw them and liked them.” There are other detailing touches such as vertical LED strip lighting that sits between the textured concrete and the vertical cedar cladding.

Once you move past the detailing, the other part of the equation – the simple form – becomes apparent. The layout of the home is straightforward, moving from the living, dining and kitchen area on the western side through to the snug/media room then three bedrooms culminating in the eastern side with the master bedroom and en suite.

Stacking sliders open the living space to the north where there is a patio. Minimal landscaping means the form of the house is prominent from every aspect.

Alister says his clients loved the finished product, and Roofing Smiths Queenstown have since been commissioned to do work on other Dravitzki Brown Architecture projects, a credit to the exacting standard of their workmanship and attention to detail.

He says, “The Ebbinge house is an outstanding example of what can be achieved with great design and product selection, as well as craftsmen who can bring the vision to life.”

Dravitzki Brown

A boutique architectural firm, Dravitzki Brown is committed to designing beautiful buildings with functional spaces that enhance everyday living. While working closely with their clients, they provide a blend of professionalism and creative flair, paired with a ‘down to earth’ approach.

Based in Queenstown since 2008, the Architecture Graduate Members of the New Zealand Institute of Architects are well versed in the design challenges presented by the wild and harsh yet breathtaking landscapes of New Zealand. The firm is noted for their South Island designs, carving a strong foothold in the Queenstown and Wanaka region, while delivering unique architectural solutions throughout the country.

Extensive knowledge in complex detailing brings designs to life, aided by photo-realistic renderings that enable clients to view and understand the vision well before construction begins.

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Roofing Profile:
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Colour: Slate
Roofing installer: Roofing Smiths Queenstown
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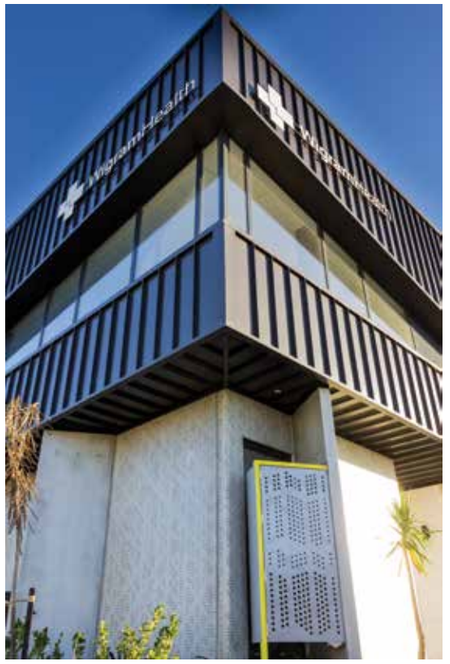
Building Contractor: Erskine Construction
Queenstown
Telephone: 0272 495 412

NEW MEDICAL CENTRE AT THE LANDING WIGRAM SKIES TOWN CENTRE

The south west of Christchurch is one of the South Island's largest urban growth areas, with 10,000 new homes either built or permitted since 2010. Wigram Skies is a recent and popular major development in the area, with new retail development The Landing at its heart. Its design references the aeronautical history of the site (formerly the Wigram Aerodrome) as well as Maori motifs from developers Ngai Tahu Property Limited.

The Buchan Group-designed The Landing area's retail and office hub. This multi-disciplinary design group has delivered a low-rise, pedestrian friendly complex around a palazzo-style town square.

Aligning with the covered south-west walkway of The Landing but separate to it is Wigram Health a 1,100sqm, two-storey medical complex, also designed by the Buchan Group and reflecting a design in keeping with the rest of The Landing. CEO of Wigram Health Brian Dong-Hwan Ko wanted to ensure it became a patient-centric, multi-disciplinary practice looking at "innovative ways to improve a patient's experience." It opened its doors to the public late last year.



The building now houses Wigram Health Limited GP as the building owner and largest tenant, with Pacific Radiology, Muscle People, One Chinese Medical Clinic and Pro Podiatry also on site.

"Subtle angles and folded, cantilevered canopies, glazing, and external Espan® walls from Metalcraft Roofing all reflect the site's aviation past," explained Gavin Gillson, an Associate at Buchans who project managed the build. "The large canopy is supported on a steel V-column and gives a covered drop-off point that's visible from the high street."

Espan® cladding provides elegant lines along the building's profile

The vertical Espan® cladding provides elegant lines along the building's profile until mid-span, when it's interrupted by an angled feature window and solar shade before continuing to the structure's peak.

Outside the ground floor GP consulting rooms, angled precast concrete panels support the Level One overhang and allow in both natural light and views to the greenery outside – one of Ko's prerequisites. Perforated metal screens provide additional privacy while admitting changing shadow patterns. The overhang itself is clad in Espan, broken by a continuous angled window which wraps around the corner of the building.

Internally, the building is designed to allow for changes in the internal suite arrangements and features an ever-changing palette of light in the two-storey lobby and entry. Level One glazing is set back in a deep reveal, screened by more perforated metal panels to match the GP consultant rooms and patterned graphic concrete.

From the Level One lobby is a spectacular view to the Southern Alps.

Buchan Group is well known for their commitment to sustainability and whole-of-life planning for any structure they design. "Metalcraft's Espan®, concrete, fibre cement board and cedar are all recyclable materials used in this build," says Gillson proudly. He's also full of praise for the service provided by Metalcraft not only for this project, but for all projects that they use Metalcraft products on, such as Hornby Mall and the new Good Home bar currently under construction at The Landing.

The Buchan Group

A global architectural group, with a staff of almost 400 professionals, The Buchan Group has seven offices in Australia and New Zealand (Christchurch and Auckland) as well as branches in London, Shanghai and Dubai. A multi-disciplinary design practice with expertise in architecture, master planning, interior design, graphic design and 3D visualisation, the Buchan Group's founding principles are excellence in design and delivery, and an abiding commitment to sustainability. "We believe that creativity and vision, blended with analysis and pragmatism, are the essence of good design."

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Colour: Flaxpod
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