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# SCOPE

NZ METAL ROOFING MANUFACTURERS INC.

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## JANUARY 2019

Scope is the official publication of
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Published by ICG Limited.
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Below is a brief introduction to the 2019 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

*Pen-y-bryn Lodge is a Victorian mansion built in 1889 for John Bulleid,*

# RESTORING NEW ZEALAND HISTORY

A worldwide search for a B&B where they could enjoy semi-retirement brought James Glucksman and James Boussy to Oamaru.

During their search, the couple realised that they would be more suited to running a high-end lodge and they found that in the historic home Pen-y-bryn. James Glucksman said they looked online for places in Italy, France, South Africa and New Zealand.

“But out of the more than 30 agents we contacted, only one agent – whom we had contacted because of a listing of hers in Hanmer Springs – asked us what we wanted, which was a big garden for my partner and a big kitchen and dining room for me – and she suggested we look at Pen-y-bryn.”

Pen-y-bryn Lodge is a Victorian mansion built in 1889 for John Bulleid, a successful local businessman, and his family, and is reputedly the largest single-storey wooden dwelling in Australasia. “Pen-y-bryn” is Welsh for “top of the hill” and is an apt name as the lodge sits atop South Hill.

The home is unusual in Oamaru, where the absence of trees when the British settlers arrived meant most buildings used the local limestone. But the Bulleids were concerned about earthquakes, so wood for the frame of the building was brought over from the West Coast. They also wanted to keep with English tradition, so the interior is constructed of English oak that the Bulleids had shipped all the way from Britain.

In 2010, the two Jameses, as they are known, bought Pen-y-bryn, which Heritage NZ has granted Category One historic status.

They then set about renovating the historic home as the need and opportunity arose, while staying within Heritage NZ guidelines.

James said, “While it would be nice to say that we had a coherent plan for the execution of the projects, it’s fair to say that a good deal of it was approached in an ad hoc manner, taking advantage of opportunities when they presented themselves. “The installation of insulation above the ceiling and below the floors was, in our view, urgent, and was the first major improvement we made, since we couldn’t bear the idea of our money literally going up in smoke in an effort to buy enough fuel to operate the heating system.

“Once we installed the insulation and installed a zoned heating system – the old system was all on one zone, so you either heated the whole 920sq m house, plus the 350sqm annex, or you heated nothing – our heating bills were cut by about two-thirds.

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That insulation was installed in 2011, and this year that was followed up by the addition of blow-in insulation in the walls.

James said, “When we took over the house and invited locals up for an event, they were reluctant to give up their jackets when they came in but they are more willing to do that now because it is a lot more comfortable.”

After the first round of insulation upgrade, work began in the bathrooms to replace the linoleum floors with underfloor heating and period-appropriate tiles, which “was dictated by aesthetics more than anything, though the fact that the floors did not really suit a property like ours that was drawing international guests, who were paying for the privilege of staying here, played a very big role in the decision”.

In 2015, work began on expanding the annex. James said, “Because of the fire in the Annex in 1925, that building only bears a Category-Two heritage listing, so we were permitted to knock out the back wall as long as we didn’t alter the building’s footprint – and luckily, a ground-floor extension had been built sometime before, giving us enough space to do what we wanted. The result of this work is that the three rooms in the Annex went from being a bit on the cosy side to being our largest rooms, and allowed us to charge a premium for them. They are now by far our best-selling rooms.”

A year later they upgraded the home’s wiring and the following year the major task of replacing the ageing roof began.

James said, “The roof replacement was planned from the date we purchased the house —since the roof was original, we knew it was not long for this world, and in many spots it was far from waterproof. We made do with patches initially, but eventually that was no longer feasible so we began what was conceived of as a three-year project to replace it.”

James said the work was planned for the low season so as to minimise disruption to guests. The work was also done in stages due to the sheer size of the project “not to mention there not being enough money in the bank for us to pay for it all at once”.

Jessica Jones, of PlaceMakers Oamaru, coordinated the 795sq m roofing job, which was carried out by Josh Tulia of North Otago Roofing.

The roof replacement was planned from the date we purchased the house —since the roof was original, we knew it was not long for this world

She said, “Re-roofing began in May 2017 over the south end of the building, originally allowing two weeks to complete works. This was no mean feat for two roofers to complete in time after only looking at pictures of the roof, and working on my estimated allowances, which did not take into account the full extent of the work involved.

“Stage 2 started in May 2018 to coincide with the clients’ quieter times and have the least amount of impact on their business as possible – quite a hard feat when you have two roofers scrambling around the roof from morning to evening. The second stage took a more realistic four weeks to complete, including the dismantling, refurbishment and replacement of the ‘widow’s peak’ flat roof and decorative steel work.”

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*The recently completed patio/terrazzo offers guests an enchanting space to relax.*

James Boussy is a talented gardener, baker and home renovator and was given plenty of opportunity to use his skills at the lodge.

*The decor of the lodge is filled with antiques and furnishings that date back to the original owners.*

Stage 3 over the private area began in October 2018 and took a total of five weeks to complete – including replacement of the veranda and flat roof areas with a custom-made tray, which Josh designed to look as close to the existing roof as possible.

Jessica added, “Our contractor was able to complete some minor timber repairs to purlins himself, other details around the decorative barges and eave framing were a little more tricky, so we called in Ray from Kennard Construction to help out. The clients were very understanding and wanted to ensure the roof would look as good as it could, despite all of these unforeseen additional costs which kept arising.”

In keeping with the traditional look, Corrugate profile in ‘Scoria’ was used for the roofing.

More recent projects include installing a tiled terrazzo between the main building and Annex with a fire table and sound system, and restoring the leadlight doors and windows in the entry foyer.

*The lodge has gained an international reputation for its cuisine and luxury accommodation*

The couple have also focused on harmonising the decor of the lodge, which is filled with antiques and furnishings that date back to the original owners, who used a four-year trip to Europe during the construction of the house to source fittings and artworks to display in their new home.

James said, “These have been supplemented by pieces left to us by the second family to own the house, the McDiarmids, who were here from 1923 to 1994, including the competition-size billiards table, purchased from the New Zealand Government when they found that Parliament only had room for two such tables, rather than the three that they had commissioned.”

The restoration of Pen-y-bryn allows the two Jameses a grand backdrop to host and entertain guests.

Born in the United States, but now NZ citizens, the two Jameses have worked around the world and are renowned for their dinner parties.

Owning Pen-y-bryn allows James Glucksman to indulge his love of fine wine and food, cooking a range of exotic and classic dishes for guests. James Boussy is a talented gardener, baker and home renovator – given plenty of opportunity to use his skills at the lodge.

James Glucksman said of the restoration journey, “When we bought the property in 2010, I am not sure that we had that firm a grip on just how much work would be required to bring the house up to the standards we had set for ourselves, but once we got started it sort of took on a life of its own.

“My partner James had more of an idea of what was required but he has been very good at keeping

me ignorant of how much needed to be done because I would have got stressed out about how we could afford it.

“He has a good long-term view of what can be done and what should be done and is good at strategising.”

He added, “Fortunately, the popularity of Oamaru as a destination for overseas visitors, combined with the good reviews we have received from the many guests who have made their way to us over the years means that we have had the good fortune of being able to invest the funds needed to keep Pen-y-bryn alive and indeed to make her more likely to last another 130 years or more.”

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**Owners/Hosts:**
James Glucksman and James Boussy
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E-mail : Jamesg@ penybryn.co.nz
website: www.penybryn.co.nz
**Roofing**: Corrugate in ColorCote ZinaCore ‘Scoria’
**Roofing Manufacturer:** Dimond Roofing
Telephone: 0800 DIMOND
www.dimond.co.nz
**Roofing Coordinator:** Jessica Jones
PlaceMakers Oamaru,
Telephone: 03 433 0460
**Roofing installer:** Josh Tulia
North Otago Roofing
**Photography**: James Glucksman

# ROD NEWBOLD
# LIFE MEMBER, MRM

Roofing specialist, hunter, and tramper Rod Newbold was born on the Auckland's North Shore in 1953. He went to Rangitoto College, which was very new and small at the time — and so was he.

"I played rugby for Rangitoto 1st fifteen for over three years, and if you've seen me run, you'll know how bad our 1st fifteen was," says Rod.

Rod got his first job at Odlins, stacking timber for $1.44 an hour. He was so impressed with his new found wealth he filled the gas tank of his VW beach buggy for the first time in his life.

"Driving over the bridge afterwards, a $10 note flew into my windscreen, then another one and then a whole bunch…Yes, I left my wallet on the bonnet," says Rod with his trademark self-deprecating laugh. From stacking timber, he progressed (reluctantly) to an office position at Odlins and later worked a coordinator for a large concrete placing company, managing the movements of some of the county's first concrete pumps. AB Bricks owned the concrete company, and Rod ended up at the brickworks. There he worked in sales and the various production departments.

Getting into the rollforming industry happened almost despite himself.

"I was offered, and decided to turn down, a job at Fletcher Brownbuilt." While waiting to talk to the interviewer, I realised the jobs I enjoyed most were "…shit jobs but for an appreciative boss." By the time the interviewer came to the phone Rod realised he got on well with him and changed his mind.

At the age of 22, Rod ended up in the rollforming industry and he has been there ever since.

While working in production in Auckland, Rod was appointed sales representative when Fletcher Brownbuilt bought a rollformer in Tauranga. "On one of my first calls I timidly called into Tauranga Plumbing, because I knew they did a bit of roofing," says Rod. "They told me Fletcher reps come in one door and out that bastard (referring to the exit). I must have handled that okay because I did business with three generations of McCords."

Rod says, "I started a family at this time, and money was tight. Houses may have been cheap, but mortgages were hard to get, and interest, when you did, was over 12%.  I did a lot of extra jobs including waiting at Pizza Hut, commercial cleaning, roofing, possum trapping and painting. My mantra was, 'One income, two kids, three mortgages and four jobs.'

After ten years, eventually ending up as regional sales manager in Wellington, Rod accepted a role as branch manager for Balfours in Wellington. Balfours, a private company, was sold to McConnel Dowell, they sold it to BHP and finally Steel & Tube bought the company.

He filled various roles for Steel & Tube all over the country and ended his Steel & Tube days as Commercial Manager, Roofing.
In late 2017 Rod joined NZ Steel in his current role as Product Launch Manager.

Steel & Tube colleague Tony Rallis (Technical Manager, Roofing, Steel & Tube) says he has the highest regard for Rod, both professionally and personally. "I've known Rod for twenty years, and worked closely with him for ten of those," he says. "Rod is technically and commercially very astute. He is very customer focussed and concerned with doing the right thing. I remember years ago an elderly couple had been seriously let down by a roofer and they were suffering from illness and circumstances were not in their favour. Rod went around and arranged a roofer and materials from NZ Steel. He sorted out the whole mess at no cost to them," says Tony.

People who meet Rod remember him, says long-time friend Rex Harkin, retired owner of Harkin Roofing in Tauranga.  When I introduced him to my partner, she said: "where did you meet that delightful man?"

"We met over forty years ago when he was Tauranga Branch Manager of Fletcher Brownbuilt (now Dimond Industries) and I was one of his customers. One time, he had done a personal favour for a guy who paid him something like $500. Rod regarded it as a bit of a backhander. So, he insisted on buying all the beer and food for the night for a group of us and still had $50 left at the end of the night. He stuck it in a newspaper vending machine." Rod says: "It was the first $50 note I had ever seen, and no doubt the first one the paper boy had ever seen."

People who meet Rod remember him, says long-time friend Rex Harkin

In 2016 Rod took part in a volunteer trip to Khunde, Nepal, to help them rebuild after an earthquake which destroyed 95% of the village. The building was at an altitude of 3800 metres, 76 metres higher than Mt Cook. "We built and clad the roof on the new community centre and started work on the interior, leaving behind donated tools for them to continue the job," says Rod.

One the team got acute altitude sickness and had to be airlifted out, but Rod joined some other team members and climbed to Everest Base Camp at 5300 metres.

"I went again the following year. This time I was doing mortise and tenon window sashes with handsaw and chisel, using skills I was taught in Intermediate in 1965."

Rod is a longstanding member of the NZMRM Technical Committee and heads the team that is revising the MRM Code of Practice. He says, "as I grew more confident, I had many debates with Stuart Thomson, so it was an honour when he offered me the reins for revising the Code of

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Any day I learn something is a Good Day, and I have still got plenty to learn.

Practice.  Of course, with Stuart, I was never going to win any of those debates, but at least he knew I cared." The debates and showing he cared resulted in Rod spending uncountable hours with Stuart Thomson, while Stuart taught him and groomed him to be heir to Code of Practice.

Rod doesn't calculate his achievements in money and he isn't a clock watcher—the results count."My ethics can be condensed into work hard and be honest."

Rex Harkin agrees. "Rod is the most honest person I've ever met. He is not 99% honest; he is absolutely 100% honest," he says.

Rod continues, "My advice to workers is to find a job you enjoy and do it as well as you can. My advice to employers is to appreciate your workers' efforts and to keep them learning. Any day I learn something is a Good Day, and I have still got plenty to learn.

Throughout my time in the industry, I have met a lot of characters and learnt from many people. My current role as Product Launch Manager for NZ Steel allows me to interact with a broad range of people within the industry which is something I cherish.

When I was awarded Life Membership of the Association, I was shocked and honoured so much I was unable to give a coherent thanks to those present. Thanks again, guys."



# COP UPDATE

**COP Recommendation: Design for Natural Ventilation**
In the revised clause Internal Moisture, the COP requires designing and installing roof cladding to allow natural ventilation in residential buildings, including skillion, sarked, and low-pitched residential roofs.

It is a common misconception that roofing underlay acts as a drainage plain, channelling condensation from the underside of metal roof cladding to the gutter. Most condensation, however, form on the underside of the underlay.

Any condensation that does form on the underside of the roof and falls onto the underlay generally only tracks down the underlay as far as the next purlin, where it is trapped and is absorbed by the underlay, leading a prolonged time of wetness.

Underlay does not compensate for unreliable weatherproofing and ventilation design.
The COP suggests some basic design strategies to provide a clear path for air to enter, travel through and exit the roof-ceiling cavity.

Ensure that insulation does not impinge on the underside of the roof — especially at the eaves. Position insulation so there is a gap of at least 20 mm between the insulation and the underside of the roofing. Insulation that absorbs condensation from the roof become less effective as thermal insulation. Wet insulation also retains moisture, leading to typical issues with durability and mould.

Make the roof underlay discontinuous at the apex. Warm air naturally rises but doesn't move laterally much unless a strong wind blows into the roof vents. Providing an effective exit point for the rising hot air is much more effective under typical conditions than side-to-side ventilation.

**Use ventilated soft edges on ridging and apex flashings.**
Using ventilated soft edges on ridging and apex flashings with corrugate and low trapezoidal roofing, provides a weathertight exit for moist air in the roof cavity to balance fresh air entering at the eaves
The latest updates to the NZ Metal Roof and Wall Cladding Code Practice (COP), is effective 1 May 2019.

1. The main clause Roof Ventilation was renamed Internal Moisture and completely revised and updated.

2. The main clause Installation was extensively revised and updated.

3. Some clauses form Site Practice were moved to be included in the more relevant clause Installation. Site Practice now contains mainly Safety, and it will be revised and updated in accordance with Worksafe: Working at heights in New Zealand.

4. Some clauses in Testing were renamed and renumbered to fix broken links and reflect content more accurately.

**Summary of other changes in this update**
- Reformatting of extract from NZBC B2, for consistency.
- Some clauses from Internal Moisture were deleted and new clauses created to enhance clarity. Information contained in the deleted clauses are now discussed in other relevant clauses.
- Other changes are Category 1 updates, which fixed minor errata such as grammar, spelling, and layout.

**A complete list of changes is available at: https://www.metalroofing.org.nz/revision-history/2019-may**

Revisions are shown in three categories.
Category 1 – Minor Errata

Updates come in three levels/categories

**Category 1 - Minor Errata**
Correction to spelling, grammar or formatting that have no bearing on the substance of the clause. These changes will be recorded on the website only and not individually included in an emailed update.

**Category 2 - Editing and rearrangement**
A clause or section of clauses has been rewritten to some extent for better articulation of the existing recommendation. The substantial recommendations are not altered, although references may have been changed.
These changes will be recorded on the website and will be cited in an emailed update.

**Category 3 - Substantial change to recommendation**
A substantial change in a specific recommendation of the COP has taken place. A review of existing project documentation against the new clause is considered essential. These changes will be recorded on the website, and explained with detail in an emailed update.

**PDF version**
In response to requests for a downloadable PDF version, a new PDF document is created quarterly, with every update.
The online version of the NZMRM Code of Practice is always the most up-to-date version and prevails over any saved or printed version.



Following the success of the 2018 Roofing games the coordinators, Max Brough and Noel Sands, organised the 2019 Roofing Games and began the regional selections at New Plymouth on the 1st April 2019. The games have progressively moved through the regions running 25 regional competitions at a variety of member locations. The last location will be at Queenstown on the 24th May 2019.

From the regional competitions 2 contestants in the skilled and intermediate categories will be selected. From this selection they will compete for 8 available positions in the two categories, skilled and intermediate, 4 from the North Island and 4 from the South Island. The 8 finalists will compete at the RANZ conference in Queenstown for the over all winners.

The MRM are proud to support the Roofing Games initiative that encourages those competing to upskill and refine their roofing installation craft. The judging is carried out and measured against the recommendations of the NZ Metal Roofing Manufactures Inc. Code Of Practice (COP).

The Roofing Games, as well as providing significant rewards both regionally and overall, also gives those in the industry an opportunity to build relationships and share their knowledge base with fellow roofers.

The prize pool is divided into three categories: North Island, South Island and the Nationals for both Skilled and Intermediate entries.

**Intermediate North Island sponsors**
First prize Metalcraft $1000
Second prize Ampelite $500
**Intermediate South Island Sponsors**
First Prize Freeman Group $1000
Second prize Thermakraft $500
**Intermediate Nationals**
First prize COLORSTEEL® $2500 travel
Second prize Konnect $1250 Milwaukee tools
Third prize Roofing industries $500

**Skilled North Island sponsors**
First prize ColorCote $2500 Placemakers Voucher
Second prize Stratco $1000
**Skilled South Island Sponsors**
First Prize ColorCote $2500 Placemakers Voucher
Second prize Ampelite $1000
**Skilled Nationals**
First prize COLORSTEEL® $7500 travel voucher
Second prize Konnect $2500 Milwaukee tools
Third prize Ampelite $1000

In addition numerous prizes have been awarded during the competition. Special mention prizes awards from  Fribesco, Alsynite One, Bremick and RANZ.

## WYUNA BAY HOUSE

The 38 solar panels on the roof provide a 10kW system that supplies 300 per cent of the home's power usage on a sunny day

Having grown up spending his summers holidaying on the Coromandel Peninsula, Daniel Smith had been on the lookout in the area for a section to build on for a while. When his father spotted sections for sale in a subdivision at Wyuna Bay, Daniel and his wife Daisy took a closer look.

They initially made an offer on a flatter site but when that fell through, they managed to secure a neighbouring section on the ridge top.
The spectacular site has views to one side of Coromandel Harbour and to the other side – looking northwest – of Long Bay. While providing great views, the site also presented challenges with its steep terrain.

Daniel says that after speaking to the engineer who had done the geotech report for the subdivision, he was happy any issues could be overcome. The solution was to build a retaining wall with 12.5m deep piles to create a building platform.

When it came to the design of their home, Daniel and his wife Daisy liked the modern stylings of Queenstown-based Kerr Ritchie Architects. Between them, the couple produced a comprehensive brief for the architects aimed at creating a home that was sustainable without sacrificing comfort.

They also wanted a home that was in harmony with its environment and their family lifestyle. High-ceilinged, open plan living spaces that transitioned easily to outdoor entertaining were also part of the brief, and they wanted their two children to share a bathroom and have their own playspace.

Pete Ritchie, of Kerr Ritchie Architects, said a site visit set them up with ideas for various concepts and gave them an awareness of the challenges involved. "There were a few engineering issues with the site in terms of geotech and stabilising the site but nothing major. We wanted to put the house into the land as much as possible and that is where the wedge shape came into play."

Daniel said that once he and Daisy had settled on a concept, it was a matter of "tweaking and tweaking" until they had what they wanted.

"We were living in China at the time so a lot of it was done via Skype with the architects," said Daniel. "The plan was to get it built while we were in China and have it finished by the time we got back but that never happened."

Peter Ritchie said the layout of the home was configured to make the most of the sun and the views to the northwest, and a cut-out in the structure helped to create a sheltered outdoor space.

He said the dark colours of the cladding and roofing also helped to tie the home into the landscape. "We've done quite a lot of dark-stained buildings because they look recessive in the dark green native bush landscapes of New Zealand."

Daniel said he loves the shape of the home, with the wedge shape reminding him of a space shuttle landing. The 'nose' of the house forms an overhang to create a carport and tucked behind that is the garage, which Daniel has set up with gadgets such as a projector screen and a virtual reality headset. While Daniel loves his gadgets, he and Daisy were also determined to have a house as self-sufficient and sustainable as possible.

At the heart of that is a solar generation system that feeds into a Tesla Power Wall that the home can

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The couple opted for Trimrib® in ‘Ironsand’ to give them the modern look they were after.

draw on at night or during cloudy days. The home is hooked up to the grid so it can either draw power if needed or feed it with any extra solar generation.

Daniel says the 38 solar panels on the roof provide a 10kW system that supplies 300 per cent of the home’s power usage on a sunny day. The home has all electric appliances, including heaters. Once they had settled on their design, the couple employed local builder Steve Wilson to make their plans a reality.

“Steve has built about 40 houses along this road,” says Daniel. “He lives here and has a great reputation.” And it was Steve who suggested that Daniel and Daisy could “save a bunch of money on the roof” by going with long-run over other materials.

The couple opted for Trimrib® in ‘Ironsand’ to give them the modern look they were after.
“We wanted robust roofing with the solar panels up there because they might need cleaning so we wanted a roof you could walk around on,” says Daniel. “Plus that style of roofing has nice modern lines and goes well with the dark-stained vertical cedar cladding.”

While the roofing job itself was straightforward, getting the materials to site was a bit more problematic. At the time, the Thames coast was closed to trucks due to slips on the road so the Roofing Industries rep. had to meet the truck in Thames and offload the roofing onto a trailer and drive it up the coast to Coromandel from there.

Then on site there was a tight hairpin bend where sheets had to be offloaded by hand and walked up the hill the rest of the way to the site – about 300m. Daniel said the steel cages for the foundations also had to be assembled on site because of the same access issues.

When it came to the interiors, the couple wanted lots of storage and a simple layout and colour palette. The home has predominantly wooden floors in the main living areas with some wooden ceilings and walls. The bathrooms and bedrooms get more adventurous colour treatments. The kitchen’s glossy white cabinetry was made in China then shipped over here for assembly.

The couple’s bedroom, on the top level, has floor to ceiling windows to capture the views, with a standalone bath sitting in front of one of those windows.

Daniel says part of the sustainability plan was to have a Tesla electric car in the garage but there was no money left over after the house was finished.
“We might have been a bit optimistic about what it was going to cost us but we have no regrets.”

**Kerr Richie Architects**
Kerr Ritchie is a Queenstown-based, mixed-discipline studio focused on an integrated and collaborative design process. The studio has extensive experience in architecture, landscape architecture, and resource planning.

The architects say, “We respond to the parameters of site condition, brief and budget to develop designs that attempt to sculpt interior, exterior space and land form into a flexible and efficient whole. Our goal is to develop innovative solutions that achieve maximum design value for our client.

“We are committed to making buildings and landscapes that maximise the experience of place and improve the quality of life of the people who use them.”

**Architects:** Kerr Richie Architects
Telephone: 03-441 4513
www.kerrritchie.com
**Roofing:** Trimrib® TS .55 COLORSTEEL® MAXX® in ‘Ironsand’
**Roofing installer:** Peninsular Roofing and Scaffolding
Mobile: 027 443 0934
**Roofing supplier:** Roofing Industries (Waikato) Ltd,
Telephone: 07 849 5115
**Builder:** Steve Wilson Design and Build
Mobile: 027 488 7688

# CORROSION TEST SITE PROJECT UPDATE

*Stuart Hayman: Technical adviser to MRM*

Once upon a time all metal roofs were made of 10-foot galvanised steel and fixed with lead-headed nails. Then we had longrun metal roofing while over the late 1980s and 1990s we have seen quite significant changes in both substrates and fasteners. This includes the introduction of COLORSTEEL® then Zincalume® and ZAM type products and from lead-head to galvanised nails, and then screws.

By 2000 we were seeing issues with the fastener/substrate interface in marine environments. Early exposure trials indicated the need for better fasteners and better understanding of the reaction between substrate and fastener. NZMRM, with the substrate and fastener suppliers' involvement, carried out the extensive trial reported on here. Having learned a lot from this we now have better products for new trials.

NZMRM's Corrosion Project, which began in 2012, is the first initiative of its kind in New Zealand and the first to not be conducted by the manufacturers of any of the products and materials involved. The objective of the project is to determine the best combination of metal roofing systems (cladding, fasteners, underlay and flashing materials) for corrosion resistance and how the various components interact.

Given that roughly 80 per cent of housing in New Zealand is clad with roofs of longrun and its wide use on farm, industrial and commercial buildings, MRM's considerable investment and on-going commitment to the project is directed to learning the causes of the deterioration that can occur when metal claddings are used in generally severe environmental conditions – mostly by the sea – and to determine how this can be avoided.

**Valuable feedback**

This research, started in 2012, has already provided valuable information for the industry by showing not only the best ways to carry out product exposure testing but to give guidance to the fastener and substrate manufacturers on what works and what doesn't. And in the progress of this Corrosion Project, some additional and different objectives have emerged while developing the systems to be tested. These include fastener/substrate systems where neither corrodes; the effect of paint systems on metallic substrate and the effect of underlay and spacing/ventilation on the underside of corrosion.

More recently the project has benefitted from being able to involve new substrates and new, improved fasteners. Of most significance has been the emergence of new class five, coated steel fasteners for use in very severe environments – screws that should last 10 years or more in a Category 5 environment.

MRM's considerable investment in the Corrosion Project, solutions from which are in tandem with on-going revision of the NZMRM Code of Practice, has recently been substantially reviewed. As with all research projects, over time the original concept for investigating corrosion of roofing materials has changed markedly. Some of the products assessed early on are no longer in use, or more importantly, have been superseded by improved versions that are considerably more robust – many as a result of early test results where the products did not fare so well.

In 2019 the trials are looking "potentially very good"; the testing is generating outcomes for corrosion that are better than in earlier trials. Factors need to be assessed or measured by using various standards and test methods, namely:

- Corrosivity of sites using several methods
- Quantifying the conditions under which a set of material exposure is subjected to over the period of the exposure
- Determining the effect of the exposure – visually and by other means
- Relating accelerated exposure at extreme sites to realistic conditions

A common problem in the roofing/fastener exposure projects is how to quantitatively assess corrosion of both components and the effects they have on each other. We developed a somewhat subjective method in 2017 on one test roof and this is being used for the remaining roofs as they are dismantled which we are progressively doing – the latest being Muriwai.

**Test sites**

The locations for the early trials were: Muriwai Golf Club (west coast) flat site 100m from the shore; Taharoa Ironsand Mine (west coast) elevated site 100m from breaking surf and adjacent to the NIWA weather station; Invercargill (south coast) gun club, sheltered site but close to the sea; Nelson (northern south island) Cawthron Institute, marine laboratory


The objective of the project is to determine the best combination of metal roofing systems for corrosion resistance, and how the various components interact.

just behind Boulder Bank – exposed and severe; Waipu Golf Club (east coast) close to the sea next to a rusted shed. In addition, an aluminium roof site in New Plymouth was assessed up to 2015 but there were no test materials taken. Exposure sites are rated C1 – C5 – extended now to CX in accordance with ISO 9223.

The research team has ceased to monitor all except two West Coast sites; it having been demonstrated early on that east coast exposure, even when close to the sea, was far less severe than on the west coast. The exposure locations have been reviewed and while Taharoa remains as a location to assess corrosivity, a site at Limestone Downs farm is now the permanent exposure site. South of Port Waikato, Limestone Downs is owned by the Alma Baker Charitable Trust and the site is difficult to access with visits only possible between November and April each year. This extremely exposed and often inaccessible site at Limestone Downs has been assessed by using mild steel plates as CX screw of ISO 9223 (the most severe category and which is double the severity C5). This will enable the assessment of the NZMRM-suggested Class 5 screw much more quickly.

To ensure its suitability mild steel coupons were placed at Limestone Downs and also in parallel at New Zealand Steel's Waikato North Head mine site and both sets of LD and NH coupons have now been replaced and will continue to be on-going, aligning with exposure of various materials.

**How was the testing carried out?**

All metal substrates and fasteners – painted and unpainted – currently available, have been assembled on plywood panels using several different underlays and with some different eave flashings. The intention was to create all possible combinations of materials to assess the effect of such combinations, not just the materials alone but how they react with one another.

The panels comprised 12 different substrates -painted and unpainted, some new materials then in development and unpainted galvanised steel as a control. Four materials are mounted on each ply

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The data from TOW and chloride levels are used in a formula to determine the C rating of the site.

The West Coast sites are more corrosive and Limestone Downs is by far the most corrosive of any of the previous test sites.

sheet and there are horizontal sections with normal at the base; inverted to expose the underside; then normal but protected by clear sheet to create an unwashed area at the top.

Four fastener manufacturers supplied four types of painted and unpainted screws in coated steel, aluminium and stainless steel which were arrayed across the roof panels in a staggered manner so that all screws have been installed on substrates in different order. No load spreading washers have been included in the latest trials.

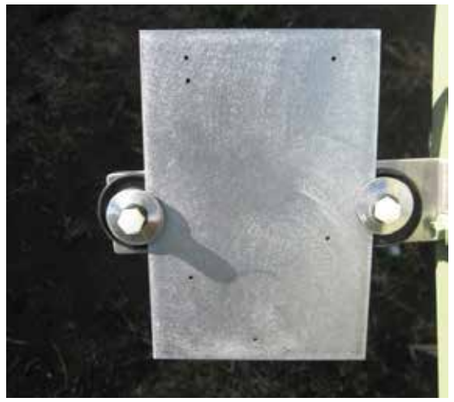
So, the test roof (see image) has three horizontal layers of 12 different claddings with 16 types of screws arrayed over them. The roofs are mounted on steel-framed sheds specifically designed for the purpose and some of the newer test sites have individually designed racks or stands, such as at Taharoa, where three free-standing racks with current screws and some other materials are being investigated. At Limestone Downs there are also stands/racks specific to what is being exposed for the trials.

Much could be written about site corrosivity assessment but this is another article in itself as it is a very complex subject – suffice to say MRM has used both ISO 9223 and AS 3566.2 testing methods to see how the two (corrosivity assessment and assessment during exposure) are aligned. We now use just MS coupons, having determined this aligns with environmental assessment and is the most consistent method.

Site corrosivity can be measured by two methods – corrosivity of the atmosphere and the actual corrosion level of metal coupons. Both provide a ranking for the site where C1 is indoors and CX is extra severe.

**Atmospheric assessment by Time of Wetness and Salt Levels**
Time of Wetness (TOW) is assessed by the amount of time where humidity is over 80% and temperature is lower than 10 degrees. It is measured with a data logger at intervals of five hours to move around the clock. The project also uses NIWA weather station data.

Salt levels are measured with a salt candle which absorbs salt from the air onto a wet wick and the liquid is titrated for chloride. Titration is quite simple but the candles need changing and analysing monthly which is quite labour intensive along with doing the titration itself. The humidity and temperature are measured continuously by a data logger mounted near the candle and this measures how much time the site would be damp on a daily basis. The data from TOW and chloride levels are used in a formula to determine the C rating of the site.



**Coupon exposure method**
ISO also provides for assessing corrosivity by exposing metal coupons for various periods of time. The amount of metal lost by conversion into corrosion products (e.g. rust) over a period of time determines the corrosiveness of the site.

**MRM sites**
Both methods of testing – atmospheric or coupon corrosion – form part of how MRM assesses its sites. Whereas initially zinc coupons were used, wide variations in the composition were discovered and currently the trial uses 3mm or thicker mild steel coupons which are changed annually. They corrode rapidly and are less subject to alloy variation and are generally showing the sites as slightly more severe. The West Coast sites are more corrosive and Limestone Downs is by far the most corrosive of any of the previous test sites. The mild steel coupons are replaced periodically with the corrosive products on the coupons being removed to gauge the amount of corrosion that has occurred during exposure.

Finally, it has been shown that the corrosion ratings for all methods is quite wide and this means that two different locations can both be for Category 4, where the loss in one may be 400 gm/m2 loss and the other 650 gm/m2 loss – a difference of 160%. Category 5 can be from 651 to 2500 – a 230% difference. MRM has created decimal steps so that for example Category 4 sites might be 4.1 and 4.9 and be quite different. This method of assessment has been retrospectively applied when processing the latest data.

**Outcomes after 5 – 6 years of the MRM Corrosion Project**

| LOCATION | COUPON | C RATING |
|---|---|---|
| New Plymouth | PZ + 83 | 4.2 |
| Invercargill | 83 | 3.4 |
| Nelson | 83 | 3.1 |
| Waipu | 83 | 3.2 |
| Taharoa | MS (1) | 5.9 |
| Muriwai - roof | PZ + 83 | 4.3 |
| Muriwai - multi | All Zn | 3.7 |
| Muriwai - multi | MS (1) | 5 |
| Limestone Downs | MS (1) | CX 2 |
| North Head | MS | 5 |
| Farm | | 3 |

When it came time to inspect the Nelson roof recently, every screw and substrate set became the subject of a very complex report which was subsequently broken down for each supplier and reported to them. It transpired that even when the appearance from the outside was OK the underside always showed some degree of haloing. Painted screws and washers were universally worse in this respect than unpainted of the same type. We have just repeated this exercise for the more severe Muriwai site with similar outcomes – still to be reported.

**What this means**
Such is the geography of New Zealand that many Kiwis choose to live close to the sea – areas classified as “marine” but this desirable setting falls into the category of a severe environment. The on-going research by MRM is revealing valuable information on what materials work best in these sought-after environments.

Although some of the fasteners supplied in the early days of the trials performed poorly, many improvements have been made and from this year onwards these assessments are expected to show vastly improved performance.

## OUR LADY OF VICTORIES CATHOLIC CHURCH

For architect Charles Thomas, designing the Our Lady of Victories Catholic Church was a dream commission.

He had started up his own practice in 1960 and then in 1965 he was approached by a member of the parish who said they wanted to build a church to replace the old one in the Christchurch suburb of Sockburn. Charles said he was told that the church had 36,000 pounds to spend on the new building, which was to accommodate a congregation of 400.

“I sat down and worked out something for 36,000 pounds that would accommodate 400 people and for that sort of money it had to be a simple structure, a rectangular building,” he said. “In those days I would also build a model of a building so when I finished that, they said, ‘Let’s go see the bishop’.

When he showed Bishop Brian Ashby the model, he said, ‘Mr Thomas, if you had a free hand to design the building, what would you do?’

“I said I wouldn’t have a rectangular space; instead I would have people sitting around the altar and the sanctuary, which would mean a diamond shape. “I sketched it out for him on the back of the drawing that I had taken down to show him, and he liked it that much that he told me to go ahead with it.”

From there, Charles developed plans for the church with the belief that the design of a building should reflect the purpose for which it was built.

The plan of the church developed from the principle that the congregation should group around the sanctuary to hear the priest as they would if Jesus was speaking in his place. All the seating is arranged so that the entire congregation has eye contact with the Priest and feel as if he is speaking to each

and every one of them as an individual, but also to create a feeling of community.

A curved roof was designed to appear as if God’s hands were reaching out into the community and bringing his hands together around his believers to bring them in communion while leaving his hands slightly apart to let in his light and love.

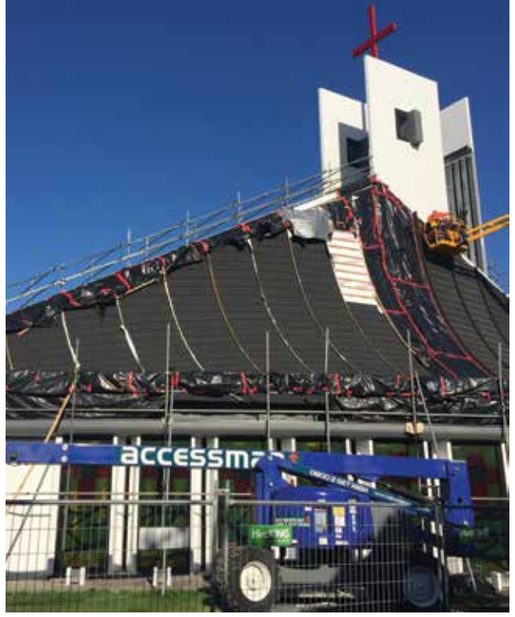
To create that effect, a hyperbolic paraboloid roof construction was used and was formed by using three layers of cross-laid timber.

“That was just one of the symbols that I used in the building,” says Charles. “The four supporting structural walls represent the four evangelists Matthew, Mark, Luke and John.

Where the “hands” are separated, a series of skylights allow light into the church and ascend like stairs to the cross, contained in a spire of three walls representing the Holy Trinity.

Charles said Bishop Ashby was so enthusiastic about the architectural vision that he allowed tenders to be called for the building straight away. “All the elements in the drawings were realised in the building,” said Charles.

To maintain the original look, Metrotile's CF Shake in 'Charcoal Blend' was used as the roof replacement.



The building won the New Zealand Institute of Architects (NZIA) Canterbury branch design award in 1968, then the NZIA national award for excellence of design in 1970. In 2004 it won the NZIA branch enduring architecture award, and in 2005 the NZIA national enduring architecture award.

The church's spire also appeared on a 1970 postage stamp.

Last year, when the church underwent refurbishment and seismic strengthening, the original metal roof tiles were replaced with similar profile and colour metal roof tiles to retain the integrity of the design.

Naturally, Thomas Associates Architects were brought in to consult on the job, and Charles was pleased to be involved again with one of his favourite projects.

Kevin Crawford, of Canterbury Roofing, said the 650sq m of roof area was replaced in stages with the job managed by Farrell Construction, and the roofers being Alan Faust and his son Noah.

He said, "As both the existing roof and the underlay contained asbestos, this was removed by specialist crews. We had to maintain a separation between the removal areas and the newly installed areas. "The job had 16 bays on each side of the building and so we were able to work on different areas to the removal crews. The job was done using knuckle booms, with four booms on site at once. We used hand rails around the perimeter of the building as our edge protection."

Kevin said while no repair work was required to the roof structure, the lower part of the roof was well below minimum pitch, and actually fell backwards at the lowest point.

"The battens were packed and planed by Alan Faust to create fall. Butynol was then installed over cavity battens underneath the roof to allow a drainage path for any water that may leak through the tiles on the lower pitched section."

To maintain the original look, Metrotile's CF SHAKE in 'Charcoal Blend' was used as the roof replacement.

Kevin said this roofing material was chosen because of its robustness and clean look.

"The roof, once on, is not able to be easily accessed for maintenance or repairs so needs to be tough. And the roof tile chosen uses concealed fixings. This means no external fixings, producing a better-looking finish and no penetrations through the tile. "The tile is also installed from the bottom up, which sped up the process. We could work up the roof installing tiles and the ridge caps as we went. This was a big advantage as the curvature of the roof meant manoeuvring the boom lift was very difficult so this reduced the amount of time we had to get access to an area."

Kevin said there were several other challenges to deal with on this job.

"The biggest factors were ensuring weather tightness during the job, and working in conjunction with the asbestos removal crew to ensure no cross-contamination or exposure. Air monitoring equipment was in place to ensure this." He said that because metal tiles are generally used on residential type dwellings, the roofers were not experienced using the access equipment required to do the job, especially having to manoeuvre in so close.

"We are always focused on using the best materials along with the best workmanship."

"Because of this, we had experienced operators driving for Alan and Noah. The guys worked every day they could, only stopping while church services were in progress or if the weather was bad. Some days they were not finishing until very late at night." Because the church is an award-winning piece of architecture, a lot of thought had to be given to flashing details to keep the original look while ensuring its weather tightness and making it vermin-proof.

Charles said the original roof had ribs to create gutters to direct water off its face, which slopes sideways as well as down. They had a practical as well as an aesthetic purpose and he was glad they were retained.

"We were very pleased with how the new roof went," he said. "Any building that we do we talk directly to the people who supply and install the materials because we are always focused on using the best materials along with the best workmanship, which is what we got here."

**Thomas Associates Architects**
Thomas Associates architects is a medium-sized architectural practice based in Christchurch. Established in 1960 by Charles Thomas, the practice has been successfully involved in a large portfolio of projects including churches, schools, university buildings, community centres, office buildings, clubs, houses, apartment buildings, hotels and industrial buildings.

The practice aims to design and detail buildings that are connected to context and function.

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**Roofing:** CF Shake 'Charcoal Blend'
**Roofing Contractor:**
Canterbury Roofing
Telephone: 027 444 2346
www.canterburyroofing.co.nz
**Roofing supplier:**
Metrotile Roofing Systems
www.metrotile.com
**Main Contractor:**
Farrell Construction
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## METALCRAFT'S NEW HAMILTON FACILITY

The existing Hamilton factory was sold and Metalcraft stayed on as a tenant until the new factory was built.

Metalcraft Hamilton needed a bigger factory to deal with increased demand and provide them with an increased ability to produce longrun cladding, including Metalcraft's new Kāhu® and Metcom 965 profiles.

"We grew to the point where we could not manufacture and store stock safely," says Robert McLennan, Branch manager – Metalcraft Roofing Hamilton.
Parent company UIL (United Industries Limited) purchased new vacant industrial land and engaged John Latimer from Code Design to prepare plans for the new roofing factory with an option for future development.

The existing Hamilton factory was sold and Metalcraft stayed on as a tenant until the new factory was built.
John Latimer from Code Design, Manukau, was appointed engineer for the contract. He provided technical assistance throughout and controlled the build process format under NZS3910 Condition of Contract.

This was not John's first project for UIL. He previously designed the Auckland factory for Metalcraft Insulated Panels in Roscommon road, Wiri, and is working on further design projects for the company.

"With the sale of the old factory, it became urgent to provide design sketches for the replacement facility," said John Latimer. "The initial brief was to increase the production line by having the widest practical factory, allowing for future development on the remaining site. "Site conditions in early 2018 delayed the build. It required some structural design, but once it was approved the build went ahead as planned, adding small variations as requested by UIL.
"During the design it became quite apparent that Arthur Porter drive is a very narrow drive and it has a massive swale right through the centre of it." No 14 m flatbed truck would be able to turn into any property off Arthur Porter drive.
John says the back road, which is now Earthmover Crescent, was unformed and unnamed. "We presumed it would be almost a cul-de-sac." Now it has become the main thoroughfare; it is a very wide road that gives access to all the industrial properties.


The roading forced the team to redesign the layout. There was no point in having the office complex at the front, in Arthur Porter drive, where nobody would see it. Putting it at the rear was not an option because that is the location and access for despatch. The solution was to locate the office on the side of the building.

"We increased the size of the site to accommodate the future development of a second factory.
The office building was designed and built to accommodate both the roofing factory and any future development. The group company (UIL) has a number of compatible businesses and building supply manufacturers who could occupy the space.
Hamilton manager Robert says, "[the larger factory] allowed us to put in a new rollforming machine, which will allow us to get involved in larger commercial projects."

The new rollforming machine enables Metalcraft, Hamilton, to manufacture Metcom 965 and Kāhu® roofing and cladding. "With the introduction of these two profiles we expect a significant increase in output. We will now be able to run maximum transportable lengths of longrun products from this facility,"

The brief from UIL required the office to be separated from the factory to mitigate vibration from the two gantry cranes. The double story office building is sandwiched to the side of the factory with nothing structurally connecting them. All the staffing facilities such as admin and management were put on the ground floor. It also serves as the main office entry, with a product display in the foyer.
The mezzanine floor accommodates the kitchen, cafeteria, toilets, social area, a boardroom, training room, and meeting room.

Robert and his staff are already at home in the new office building. "People are an important asset in roofing manufacturing. We work on short time frames, orders come in and customers expect a fast response. The new set-up allows administrative staff to be in close contact with the production line," he says. "And being able to do so while being removed from the factory noise is a luxury."

The office space takes up about 1000 m².
"My intension was to showcase Metalcraft's products with this particular build, and for that reason, I selected the Thermopanel for the wall cladding and Thermospan for the roofing," John Latimer said.

Thermopanel EPS 200mm thick in Grey Friars silkline exterior with Titania flat used on the interior of the building and the panel lining was left exposed. Thermospan EPS 150mm thick Titania was used on the roof of the office building with an IGU curtain wall glazing along the office side wall. It achieved R5.25 wall and R3.95 roof insulation ratings.

Metalcraft Insulated Panels occupy an office and dedicated insulated panel showroom out of the same Hamilton building run by Terry Stevenson, who has been in building related industries for over 40 years.

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The brief from UIL required the office to be separated from the factory to mitigate vibration from the two gantry cranes.


As a proven building product insulated panels offer a realistic building alternative to a wide range of applications. Thermopanel is used in a host of applications including commercial coolrooms and freezers, but also the likes of factories, transportable homes, enclosed transport trailers, commercial kennels, portacom buildings, machinery rooms, clean rooms, wineries, honey extraction rooms, extra office space, small and large sheds, to entire Codemark accredited houses and even Rocketlab buildings. The uses are vast and varied.

Thermospan insulated roof panels are a very popular commercial and residential Codemark accredited roof alternative where architect designs require purlin spans to 6.0 metres or more, which of course depend on the thickness of the insulated panels and local wind zones. Residential builders are always impressed by the speed of roof construction as each panel (roof, insulation and ceiling) is laid compared to traditional methods encompassing many elements. 50mm to 250mm thick Thermopanel and Thermospan insulated panels use a fire retardant expanded polystyrene (EPS) inner covered with 0.59mm COLORSTEEL® on each side.
Another popular alternative Metalcraft Insulated Panels offer are PIR insulated flat and roof panels which provide a higher R value and greater fire resistance.

Architects and specifiers will do well to include these building products in their tool kit where large spans, high R values or speedy build times are required. John says, “It offered the opportunity to demonstrate the use of insulated panels as an interesting option for industrial building cladding and roofing, with the added advantage of thermal and some acoustic insulating properties. It is a good, versatile product.”

Both the factory and office buildings were designed for energy efficiency. Robert says the lighting comes from high-quality LED lights and the centralised air conditioning helps to create a comfortable interior atmosphere. ”We are working towards getting solar panels approved to power the daytime lighting and air conditioning.”

The structural engineer achieved fire separation between the factory and other buildings by designing a full height pre-cast concrete panel wall for the factory boundary wall, with seismic separation between the factory and the office building. The ends and other side wall were designed for a 2.5 m pre-cast base wall with metal cladding above. The structural engineers designed the steel portal to clear span 30 metres and accommodate two 5-ton gantry cranes for the full 97-metre shop length.

The factory needed to have sufficient steel coil storage and the Arthur Porter drive-end and product flow through the rollforming machines to sorting and stacking at the other end. Despatch, also at the other end needed 3 — 5 m wide doors under a cantilevered roof canopy.

All the purlins and girts were from the Metalcraft Super Span (MSS) range, and UIL specified the Metalcraft Kāhu®-profile for the factory cladding. Kāhu®, a new symmetrical trapezoidal profile, is designed for roofs with a minimum pitch of 3° and can be used for either roof or wall cladding. It features a double capillary overlap which provides good weather performance.

Latimer specified COLORSTEEL® Titania in the Kāhu® profile for the wall cladding and Metcom 930 0.55 BMT COLORSTEEL® ENDURA® for the roofing. The main factory floor had an anti-dust additive mixed with the concrete and an internal drain channel across the despatch end. “Foster Construction secured the contract, and their performance allowed the contract to be completed on time which allowed Metalcraft Hamilton to occupy the building over 2018/2019 Christmas period,” says John.

John Latimer specified COLORSTEEL® Titania in the Kāhu® profile for the wall cladding and Metcom 930 0.55 BMT COLORSTEEL® ENDURA® for the roofing.

**Code Design**
Code Design is an Architectural Design and Draughting Consultancy with multi discipline skills offering over 40 years industry knowledge in residential and multi-level residential apartments, commercial, industrial, retirement living, geriatric and palliative care, early childhood educational facilities including traditional and modern, large and small design projects.
“We also provide general draughting services for alteration and modification to residential, commercial and industrial premises.”

**Architectural Designer:**
Code Design
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Telephone: 021 908 625
**Cladding and Roofing Manufacturer:**
Metalcraft Roofing
Nationwide
www.metalcraftgroup.co.nz
**Cladding:**
Office walls: Thermopanel EPS 200mm thick in Grey Friars silkline exterior
Office roof: Thermospan EPS 150mm thick Titania
Factory walls: Kāhu® in COLORSTEEL® Titania.
Factory roof: Metcom 930 0.55 BMT COLORSTEEL® ENDURA®
**Metalcraft Insulated Panels**
Terry Stevenson, Hamilton office
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terry.stevenson@metpanels.co.nz
**Contractor:**
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## A SERIES OF PAVILIONS REFLECT THE OWNER'S LOVE OF ANGLES AND RELAXING NOOKS

A series of pavilions provide seamless extensions of the living areas with linkways to different viewpoints of the rural setting and sheltered courtyards for quiet contemplation.

When Gerald and Lorraine McCormack briefed their architect, it was to have the scale of their expansive 300m2 home broken up with several mono-pitched pavilions – each one providing outdoor entertainment spaces.

This was to be their forever home, so retired farmers Gerald and Lorraine spent months scrap booking ideas and sketches for what might work best, with help from son-in-law Lew Sarten, a senior technician with New Plymouth-based Ardern Peters Architects Ltd (APA).

What also contributed to the mix was the return from an OE in London of son Shane, a qualified builder keen to be in on the project from the get-go. It was really going to be a family affair. Shane and another builder brought the home to the framing stage, but completing the rest of the home was completed by Shane and Dad, Gerald.

Eventually all the ideas were exchanged with architect, Jeff Salisbury of APA whose idea it was to create an assembly of rural inspired shed-like shelters within the main plan to give different aspects for sun and weather protection and to allow for landscaped courtyards in each pavilion. The McCormack's home is on a ten-acre lifestyle block at Lepperton, north of New Plymouth and has a simple palette of naturally sourced cedar and a profiled metal exterior. Interior finishes include concrete, oak and white wall and ceiling surfaces.

Says Gerald McCormack: "We had no preconceived idea of what we wanted except the need for plenty of angles. Lorraine loves to cook and entertain so the kitchen needed to be a feature and we didn't want the home to look out of place in our rural setting.

"We were inspired by what we saw on a visit to Queenstown and came back with some ideas but the architect's modular concept gave us lots of choices for outdoor living so depending on the weather we have desirable places to sit".

The home is designed with three bedrooms, deliberately located so guests can be accommodated at one end of the home and the master and ensuite at the other. Jeff's emphasis on the kitchen has included a larger than normal scullery (Lorraine just loves this) and there is easy flow to the dining and living areas, with the series of pavilions providing seamless extensions of the living areas with linkways to different viewpoints of the rural setting and sheltered courtyards for quiet contemplation.

The living space is flexible so as to reduce the building footprint and achieve more function from less. The external materials are a combination of shiplap cedar and mono pitch Dimondek 400 trapezoidal roofing, manipulated to accentuate the views and to capture energy within the exposed concrete floor.

A unique feature of the roof was the owner's requirement for Canterbury prickles along wall to roof junctions to emphasise the beauty of the cladding profile. From the outset Farnsworth Roofing worked with Jeff Salisbury on ways to ensure these junctions would be watertight and the skill of the roofer is seen in the execution of the Canterbury prickle detail and around openings and junctions. The Dimondek 400 sheets (203mm wide pan and 46mm rib height) run up to the apex of the roof sections and are then cut and folded down to become the wall cladding. The solution was to measure each one individually and to install folded and welded aluminium caps, powder-coated to match the Lancewood shaded sheets of the Dimondek 400. Farnsworth foreman, Matthew Bailey oversaw the whole job and many thousands of "prickles" were in the mix and homeowner Lorraine McCormack loves to have this effect which she'd viewed on another property and wanted to include.

Separating functions with pavilions provides opportunities between for outdoor living and entertaining environments

The NZIA judges selected the McCormack House, in Lepperton, which “references a ‘rural vernacular’ through simple forms and material selections.

As 30- year-old builder, Shane McCormack recalled: “Dad and I worked together on what was not always a straight-forward build and it took a longer time but we have a great sense of achievement. I love the contrast between the cedar and black metal cladding, and also the oak screens against the polished concrete floors. I think my favourite feature is the fully rebated full height window in the master ensuite which is a direct view to the rural landscape and makes one feel you are already outside”.

Says Darin Vooght, director of Farnsworth Roofing 2018 Ltd (he took over the business in April last year), the efforts to ensure perfection with the Canterbury prickles was a lengthy process but time had to be taken to achieve what the owners wanted. The roof on the home is divided into three simple sections with a fourth, on the main living area of the home, having two planes intersecting with one large valley. All three pavilions have intricate angles – fulfilling the owner’s brief.

Architect Jeff Salisbury’s idea for a series of pavilions to match the homeowners’ passion for the outdoors and entertaining means this home views well from many different vantage points. The aspects most liked by Jeff for this build include. -

- The contrast created between vertical cedar and the strong colour of the profiled metal cladding

- A rural vernacular with folded roof planes to each pavilion, (of a scale appropriate to the context): - not dissimilar to local hay sheds

- Sharp lines of the exterior are matched inside with flush skirtings, negative detailing and square finished junctions

- Separating functions with pavilions provides opportunities between for outdoor living and entertaining environments, something the client sought as they created a new home base for their adult family

- The folded roof panels are reflected in the ceiling of the main living pavilion

- The expansive windows in the bathroom and ensuite shower connect occupants with the outside world

**Ardern Peters Architects**
Ardern Peters Architects Ltd is an award winning, medium sized, architect-based practice in New Plymouth. Their primary objective is to create buildings of simplicity, style and merit that fully meet the requirements of their clients by implementing sound and effective design methodology.

With 20 years of experience, Ardern Peters Architects is an NZIA practice which has grown to become one of the largest in Taranaki – reflecting the high level of service provided and customer satisfaction. Four hands-on directors, supported by a talented staff of architects, interior designers and technicians, undertake work across New Zealand in the commercial, education, child-care, aged-care and residential sectors.

The practice works in a highly collaborative manner, drawing on the expertise and experience of the entire team. It is only fitting that this approach to design extends beyond the practice to all project participants. They strive to complete quality projects and find themselves critiquing and questioning design decisions to ensure their vision, and more importantly, their client’s vision is captured and delivered. Ardern Peters Architect’s focus is to produce smart, high quality, cost effective architecture.

**NZIA Western Architecture Awards.**
Ardern Peters Architects won a NZIA Western Branch award in the housing category. The judges selected the McCormack House, in Lepperton, which “references a ‘rural vernacular’ through simple forms and material selections”.

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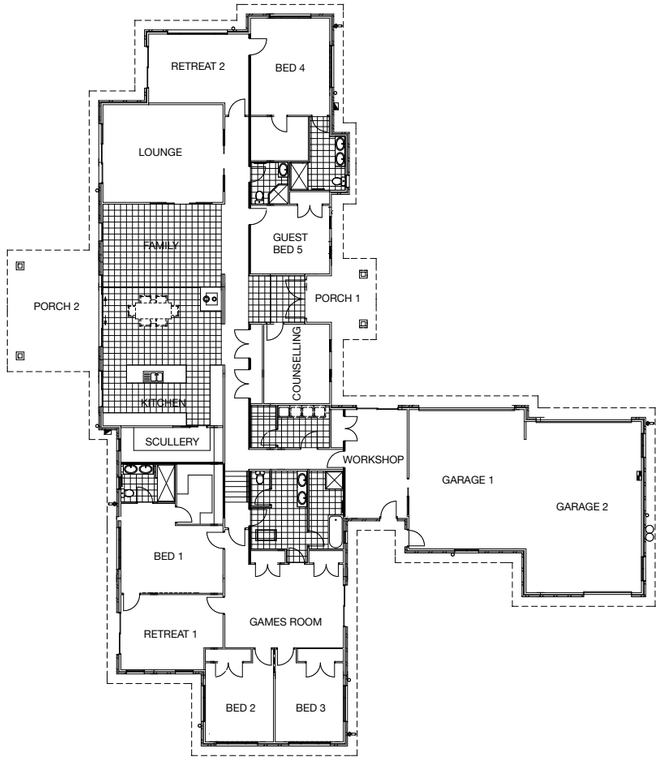
Email: Jeff@ap-architects.co.nz
Telephone: 06 759 2190
**Builder:** Shane McCormack Building
Telephone: 027 6308205
**Roofing Manufacturer:** Dimond Roofing
Telephone: 0800 DIMOND
www.dimond.co.nz
Profile: Dimondek 400
Colour: Lancewood
**Roofing & Cladding Installer:**
Farnsworth Roofing Ltd
Telephone: 06 758 1445

## GERARD CORONA ROOFING: LOVE AT FIRST SIGHT

One of 19 lots in the subdivision, the Welch's 3.9 hectare site is arguably the pick of the bunch, and a reward for them being among the first to commit to the development




As Auckland couple Allen and Marilyn Welch approached retirement, their daughter and son-in-law suggested that they look at the possibility of designing and building a single house, enabling them to live together under one roof, and provide care in the future. Thanks to an enviable rural location, spacious design, and a Gerard pressed roof supporting a solar power system, they're living that future vision in a sustainable way.

**Rural Whitford setting…**

One of 19 lots in the subdivision bounded by Whitford Park Road to the west, and Polo Lane to the north, the Welch's 3.9 hectare site is arguably the pick of the bunch, and a reward for them being among the first to commit to the development. Elevated and open – yet private, with enough distance from the main road to cancel out noise, the space gets all day sun and enjoys a stunning vista towards undulating green hills and a few recently acquired neighbours off in the distance. The sight of the occasional stray Canadian goose using the sealed access road as a thoroughfare between lush garden areas and the large duck pond at the foot of the Welch's section only adds to the rural charm.

Marilyn explains their journey to the country: "Twenty eight years ago I was appointed Vicar of Whitford and we always had a desire to live in this rural community. After other subsequent appointments we had a yearning to return to Whitford for our retirement. We heard this area opened up and I guess we sensed an opportunity. Our hearts became set on building here."

**Large, expansive design…**

With two families to be living under one roof, the Welch's desired a well-thought, functional space, so together with daughter Andrea and son-in-law Brice they approached the team at GJ Gardner Manukau: "We needed an expansive home that could handle both families and visitors, give us spaces for being together as well as space for each family member to retain a sense of separation and privacy. We love having our family around, though it can be intense at times especially when we've had as many as ten living in the house."

The 518m2 home they've achieved as a result fits the bill perfectly, and includes 5 bedrooms and 4 bathrooms. It's orientation and lateral layout takes full advantage of the location, with an open plan kitchen and indoor/outdoor living area, master bedroom and a second lounge all taking in the north facing view.

The central living area is flanked on both sides by more private guest areas. To the west, the master bedroom backs on to the kitchen and scullery,

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Marilyn admits that their satin finish Gerard Corona roof was more of a case of love at first sight, versus a choice based on performance

and is joined by the main bathroom, two smaller bedrooms, a games room and a “retreat” area.

To the east, the dining room and lounge are joined by a second retreat space, two additional bedrooms and a second bathroom. The exterior style is traditional, clad mainly in brick but also featuring a weatherboard cavity at the rear entranceway, and a weatherboard façade at the front.

**Roof & solar aspect…**
Despite the fact their location is in a wind zone classified as ‘very high’, Marilyn admits that their satin finish Gerard Corona roof was more of a case of love at first sight, versus a choice based on performance: “Part of the reason for me in choosing Gerard was that, when we went into our (GJ Gardner) builder’s office, they had a picture up on the wall and I said ‘Wow – I like that!’ and they said ‘well that’s Gerard’ – so I thought that’s the roof I want for my home. If anyone said to me that they were considering Gerard, I’d say ‘go for it’. We’ve been completely satisfied.”

The 21 degree roof pitch shows roofs profile and distinctive Ocean Blue tone off nicely, while the complex networks of ridges and hips in the design is also visually striking.

The Welch’s have anticipated the impact of large numbers of family on resources like water and power, and Allen explains the installation of a section of solar panels on the roof’s north face was a sensible option: “The first thing is obviously the design, but collectively we decided we needed a cheaper source of power to run the house. We put fourteen panels on the roof which run things like our freezer, our fridges, washing machines, and those types of high consumption appliances. There are times where we wish we’d installed a few more panels if anything, but most of the time when there’s a few of us here in the house it serves us well.”

The decision to go solar is backed up by Marilyn: “We’ve tried to do things so that we were environmentally friendly. We’re aware of sustainability and of natural resources, so knowing that we’re contributing in some way has been really good”.

**Leaving the city behind…**
Connected yet separate is also how you could describe the relationship between the Welch’s and their new rural neighbours. With the nearest properties easily within sight, yet a couple of hundred metres away, Allen explains it’s the best of both worlds: “We can see what’s going on at the other houses, and we all look out for each other. We’ve got good relationships and get along, but I suppose the whole idea of living here is the space, really. If the neighbours have a party, we’ll probably hear it but only just, and we don’t need to worry about our noise or activities impacting them.”

Despite being less than an hour from Auckland CBD, the city feels a long way away, and Marilyn’s been happy to trade alarm clocks for a more soothing start to her day: “I’m a bird lover, and being able to wake up to natural bird song is delightful. We’ve got a variety here - there’s tui, fantails, pukeko, kingfishers, pheasants, paradise ducks, Canadian geese and magpies. They all have their own really distinctive voices. It’s beautiful.”

Two other houses on the subdivision have the same arrangement as the Welch family.

■|||

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www.gjgardner.co.nz
**Roofing installer:**
Harvey Roofing Centre
Telephone: 0800 244 766
Alan.Wilson@harveyroofing.co.nz
**Roofing manufacturer:**
Gerard Roofs
Profile: Gerard Corona
Colour: Ocean Blue (satin)
Trim: Angle Trim
Telephone: 0800 244 737
www.gerardroofs.co.nz
**Solar supplier:** Harrison’s Energy Solutions
Telephone: 0800 003 354
www.harrisonsenergy.co.nz

# SCOPE

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