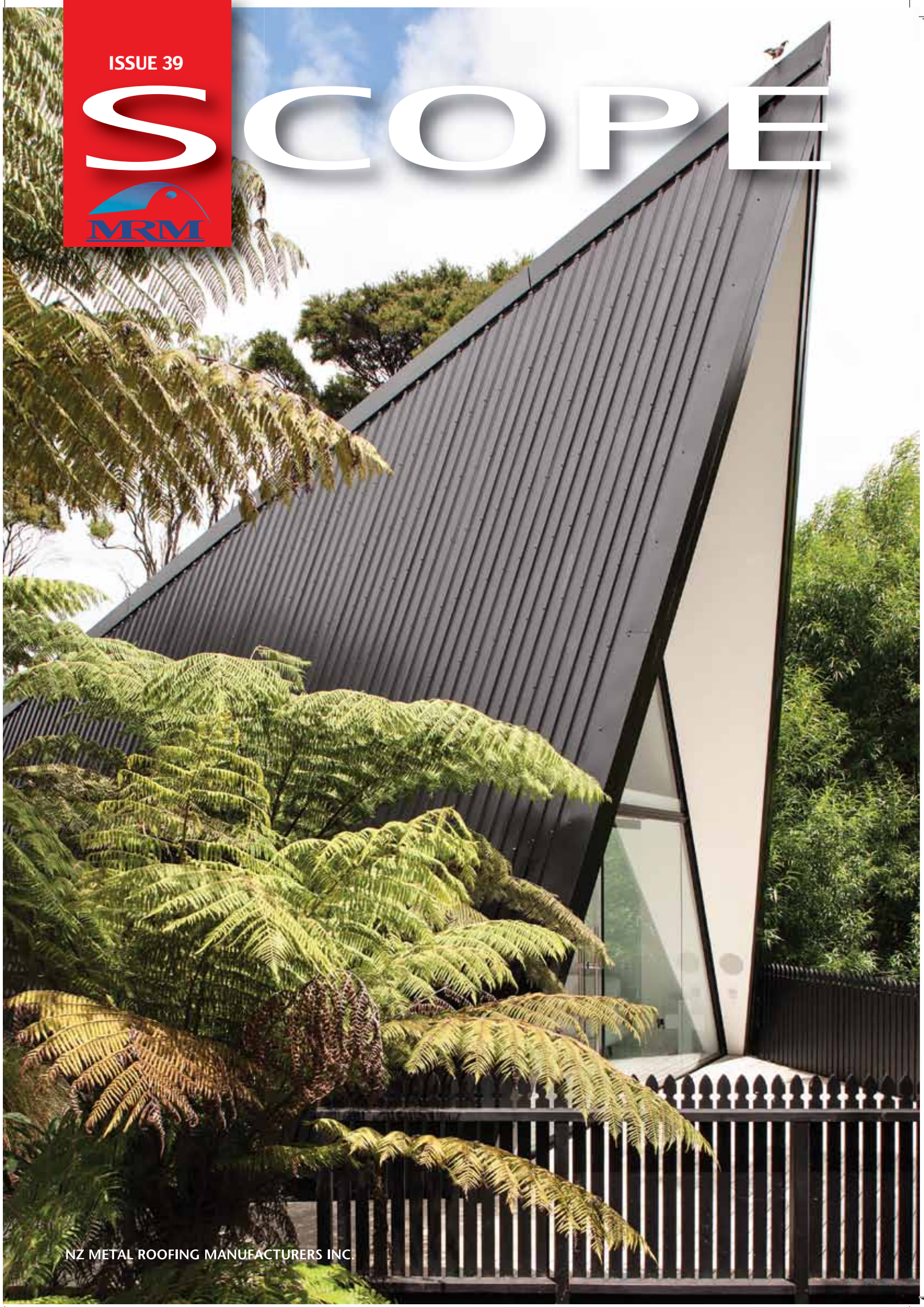
ISSUE 39

SCOPE



NZ METAL ROOFING MANUFACTURERS INC.

Below is a brief introduction to the 2015 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.

Opinions expressed in Scope do not necessarily reflect the views of the NZ Metal Roofing Manufacturers Inc., it's executive, committee members or publisher unless expressly stated.

SCOPE

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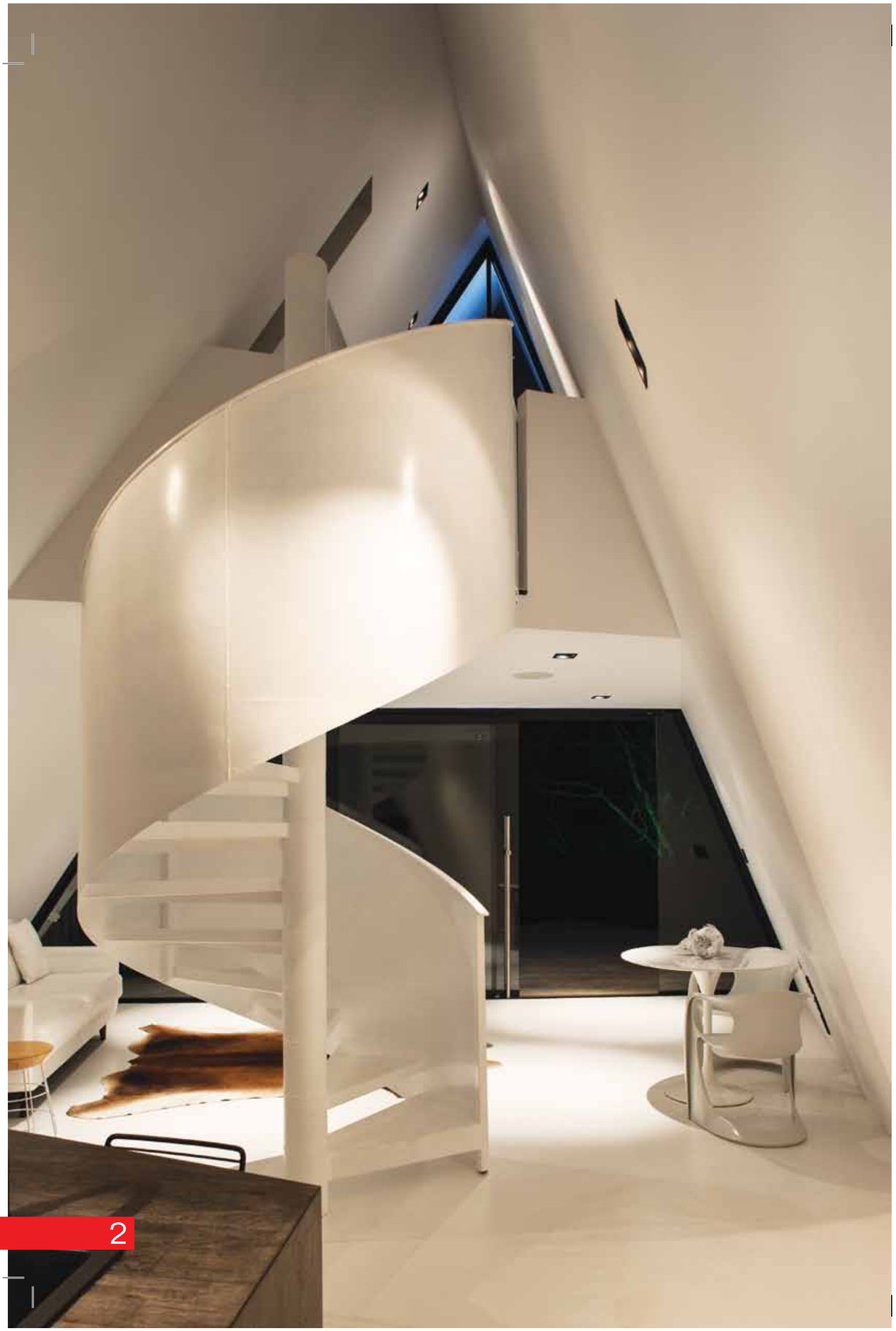
TATE MODERN IN NEW ZEALAND

At the turn of the century, a young Aucklander named Chris Tate was developing a passion for art, buildings and spaces, and for using unconventional materials to create unexpected relationships that surprised – and, sometimes, shocked. His penchant, then and now, for jet-black buildings with pure white interiors has become synonymous with his design style: creating soft, gentle interiors nestled within uninvitingly tough exteriors.

At around the same time, London's Tate Gallery was being transformed into a current-day 'federation' of art museums. The refurbished National Gallery of British Art was renamed Tate Britain and the Tate's collection of British and international modern and contemporary art from 1900 to the present day was moved downstream to the new Tate Modern.

Inspired by German architect Joseph Beuys (d. 1986) who believed architecture should be a 'gesamtkunstwerk' – a total work of art – Swiss architects Herzog & de Meuron were tasked with designing this new building on the site of the disused Thames-side power station at Bankside. Rather than demolishing it, they chose to phoenix that building, juxtapositing 4.2 million bricks and groups of thin vertical windows to create a dramatic light inside while externally maintaining the look of a 20th century factory.
This was precisely the sort of unexpected relationship that so attracts Chris Tate.

With confidence in his own design principles, and unaware that they mirrored those of the great Beuys, Chris built his first house – for himself. Then he project-managed



a major Richard Priest house construction, learning techniques and disciplines from Richard who encouraged Chris to develop his passion for architecture and art.
Chris took a two-year draughting course, qualified, continued to design houses and, following widespread recognition of his black-and-white glass house set in the Waitakere bush, launched his architectural career, Chris Tate Architecture. Over the years that followed Chris has designed buildings that speak foremostly of his art focus. For him, functionality comes second.
His most recent project, on Waiheke, is his pad, a place to work, a shelter. Now affectionately known as 'The Tent', it resembles a giant cicada, hunched and ready to spring, although as buildings go, its footprint is small. Chris built it for himself so there was no pressure. "It simmered for five years in the design phase, took two to build and another one to do the finishing," he says.
While each project 'simmers' Chris keeps to the forefront the question: how is it going to look when it's finished? An essential point of design is the way the house is set into the landscape and, through the eyes of an artist, he considers this, along with the weather, competing elements, privacy and how it will relate to neighbours and to the environment. He also visualises the interior, the fittings and the furniture. He goes back repeatedly to his check list. "The conceptual process is simple but it's easy to go off track."
The Tent looks simple too, which is how Chris wanted it: stark; uninviting, even. Clad in an elegantly fine-ribbed Metalcraft Metrib roofing profile in black COLORSTEEL®, it squats low at the back, widening to thrust seven metres high at the front.
The build itself was challenging. Chris describes it as 'like a large sail under windload, requiring a lot of supporting structure'. He sees it as 'a sculpture rather than a house'; 'a 75m² prism with internally-inclined walls'; a personal project – and a lot of fun.

The complexities of this all-steel structure are cunningly hidden inside the stunningly white walls which, unencumbered, present a perfectly smooth, clean look and feel, complementing the minimalist interior and rendering it soft and beautiful, yet seemingly invisible. Even the internal staircase seems to float. There's no distraction: no artwork, no TV, no recesses, no wardrobes or storage nooks.
The building required steel purlins every 200mm and a steel spine supporting the two huge steel segments that served as both roof and walls. No two angles were the same, so maximising floor space and calculating wall pitch and head heights were challenging. With on-site engineering input from Team Builders 2000 craftsmen, Chris crafted his own steel materials to exact structural specifications.
That's why he uses only steel framing. "It allows flexibility of design. It's 100% reliable. It's stable. There's no variation. It's unaffected by weather." Chris especially likes being able to hide structure within the framing. "In this way I can create pockets, places to conceal the structure without it impacting on the interior." And as for price: "It's a cost-effective material, lightweight and easy to handle and so, less demanding of the builders and I can make my own customised pieces on site."
Over a dozen buildings now carry the distinctively Chris Tate trademark and his gallery of photos (www.christate.co.nz/projects) is further evidence that here in New Zealand we have our own Tate Modern.

Architect: Chris Tate
Telephone: 09 630 2514
E-mail: chris@christate.co.nz

Roofing Manufacturer:
Metalcraft
Telephone: 09 273 2820
www.metalcraftgroup.co.nz

Profile: Metrib 750
Colour: Ebony COLORSTEEL®
Endura

Roofing Installer: Clive Mathews

Builder: Andrew Sawley

ZINC TRENDS IN AUCKLAND WATERWAYS

IS ZINC SOURCE CONTROL FOR ROOFING JUSTIFIED?

Last year we advised that the Proposed Auckland Unitary Plan (PAUP) 2013 contained provisions not allowing the use of unpainted metal roof (or wall) cladding other than aluminium. We commented on the implications of this in Scope Issue 35 in May 2014.

Now that the first hearings for this issue (Topics 046 and 049) have been held, and we now have to wait until 2016 to discover the outcome, some thoughts on the validity of these provisions:-

Auckland Council's Position on Source Control for Roofing

Zinc in stormwater has been identified by Auckland Council as a priority contaminant of concern for Auckland harbours, estuaries and streams, evident in the source control measures specified in the Proposed Auckland Unitary Plan (PAUP). The PAUP restricts the installation of "high contaminant-yielding roofing, spouting, cladding material or architectural features" product to not exceed:

1) 25m² in urban environments, or rural environments where run off is piped directly to a watercourse; and

2) 250m² in rural environments where run-off is directed to vegetated drain/swale, wetland or similar. For roofing and cladding areas larger than the 25m2 (urban, roughly the size of a carport) or 250m2 (rural, roughly the size of a house), this becomes a controlled activity and the stormwater must be discharged through devices that will limit the concentration of total zinc to <30.0µg/l.

Auckland Council does not identify any environmental effects justifying the 30.0µg/l zinc target. The figure is derived from a median value performance of a range of best management practice zinc reduction

approaches (Auckland Council, 2013) and has not been linked to any data relating to environmental effects. Council bases its concerns on observations of temporal trends in contaminant concentrations for marine sediment, with Council claiming that some sites have shown increasing zinc levels.

What does the data tell us about zinc trends in Auckland waterways?

A more recent study identifies serious concerns with the reliability of Council's zinc trend claims (Shedden, 2014)*. In his study, Dr. Shedden reviewed Council's own monitoring data (derived from a range of sources including National Institute of Water and Atmospheric Research Ltd and Diffuse Sources Ltd) and concluded that "where statistically significant trends occur for zinc levels in streams, estuaries and harbours, they are mostly observed to be reducing". He found that zinc levels in the vast majority of marine sediment sites have not changed significantly during the monitoring period. In addition, his analysis of temporal trends for zinc in freshwater streams revealed that no sites are experiencing increasing levels of zinc. Dr. Shedden confirmed that freshwater streams, in particular, were consistently observed to have declining levels of zinc over the last two decades of monitoring, with almost half the monitoring stations showing significant decreasing trends between 1995 and 2013.

Dr. Shedden's findings are consistent with comprehensive stormwater contaminant modelling of the Upper Waitemata Harbour and South-eastern Manukau Harbour, which predicted a decreasing trend in zinc loads between 2001 and 2015-20 as existing galvanised roofs are replaced by zinc aluminium coated steel, followed by a slow increase as vehicles become the dominant source of zinc (Timperley and Reed, 2008).

The New Zealand roof and wall cladding market has been almost completely converted from heavy usage of galvanised steel following the introduction of zinc aluminium coated steel to New Zealand in 1994. As such, Shedden et al, 2007 predicted that the net zinc load from steel roofing in the urban Auckland region would be reduced by 95% for modern steel roofing (unpainted and prepainted zinc aluminium coated steel) compared with past usage of galvanised steel. From a national perspective, the Parliamentary Commissioner for the Environment (2012) has stated that heavy metal pollution is largely a legacy issue arising from old industry practices, and from a scientific perspective, the three key water quality contaminant issues for New Zealand are actually pathogens, sediments and nutrients. Consequently, instituting zinc source control for roofing is not justified as it would have no significant impact on environmental health. We note that nowhere in the PAUP relating to stormwater quality does there seem to be any reference to pathogens (i.e. sewage).

Worth reading, but technical (paste into your browser)
*https://12240 console.memberconnex.com/Folder?Action=View%20File&Folder_id=390&File= b_shedden.pdf

STUART THOMSON. "THOMO"
1929 -2015

NZMRM Life Member Stuart Thomson passed away in his sleep on 27th June 2015 after several years of ill-health. The executive of the NZMRM offer their sincere condolences to his family and close friends and wish to acknowledge the extraordinary contribution he has made to the MRM and to the roofing industry (and the wider building industry).

Virtually all members of the metal roll-forming industry in New Zealand, and their customers, will have had their technical and business activities influenced by Stuart Thomson, whether they are aware of it or not. This also applies to a lesser extent to Australia via his work on joint Standards.

Stuart was an early influence in the development of the metal cladding industry in NZ, starting with the introduction of long-run roll-forming, through development work with New Zealand Steel and testing of their products, to producing a series of books on technical aspects of metal roofing for the NZ Metal Roofing Manufacturers Inc. This culminated in the NZMRM Code of Practice for Metal Roof and Wall Cladding, first published in 2003 and since recognised as a definitive information source.

Although Stuart was able to critique and contribute to the upcoming internet-based Version 3 during its development, he will now not see the finished version, but we intend it to be in the spirit of the original, and it will be his enduring legacy to the industry in which he played such a formative rôle.

He also used his expertise to provide in-depth technical articles published in Scope as a voice and advocate for best practice in the building industry at large. He contributed to relevant NZ and AS/NZ Standards.

One of a kind, Stuart never hesitated to say what he thought about anything regardless of the consequences, including contradicting the "authorities". Generally he has been proved right in the end, if sometimes undiplomatically.

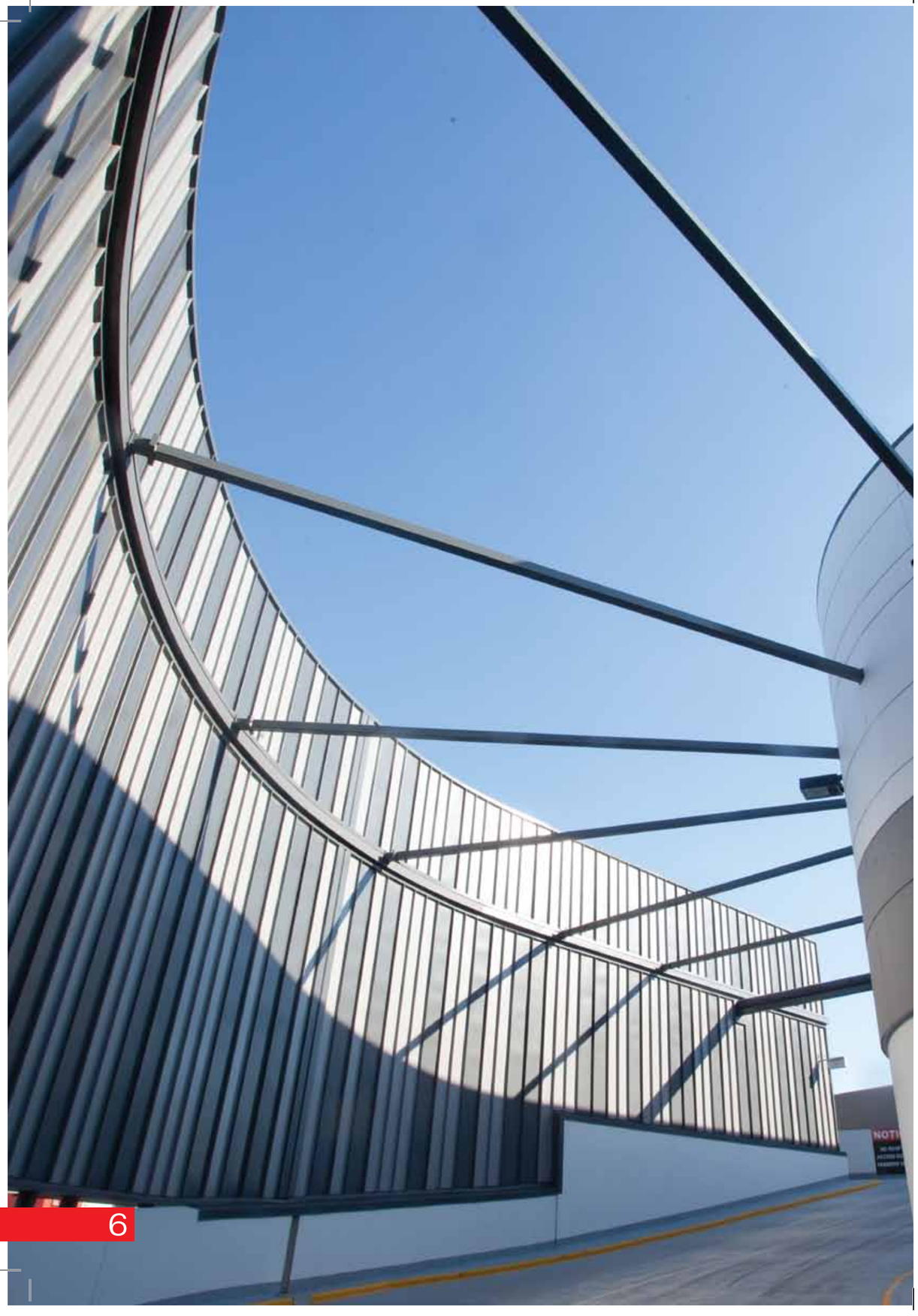
Not as well-known in the industry are Stuart's diverse other talents including sculptor, musician, artist and author. This extended to orchestrating most of his own funeral service! He was also involved in charity building work in Nepal with Sir Edmund Hillary and in the Pacific Islands with Rotary.

The breadth and depth of knowledge Stuart acquired was invaluable to our industry and his loss leaves a void that will be difficult to fill. His absence will be most felt by those of us who frequently relied on his knowledge and experience. We now owe it to him to continue on with his projects.

At a personal level those of us who worked closely with him on a regular basis will miss not only his unique technical knowledge of the industry but his willingness to share this knowledge with anyone who asked - if sometimes with a pinch of humour. It is difficult at this point to realise that he has gone.

His positive attitude and life is best summed up in his own words...
"I've had a wonderful life, with no regrets.
If I could live it over I'd do the same again."

Scope published an article on Stuart's achievements in issue 38. Stuart was a long-term stalwart of RANZ and Rooflink and has also published an assembly of personal memories.



THE HUB HORNBY MALL

Development is going full steam ahead in post-earthquake Christchurch and no more so than in Hornby, where shopping mall The Hub Hornby is undergoing a major expansion.

The mall, which serves Christchurch's western suburbs, is being subjected to a $65 million redevelopment by Shopping Centre Investments Ltd and when complete will have about 70 specialty stores – including two anchor tenants in PAK'nSAVE and Farmers – a new foodcourt and more than 800 carparks.

Daren Alderson, of architects The Buchan Group, says The Hub Hornby is the only shopping centre to receive Enviro-Mark Gold accreditation for its environmental initiatives, focused on electrical energy, waste and resource minimisation. These issues drove the design considerations for its major revamp, which includes predominantly LED lighting, rainwater harvesting for irrigation, and a new waste and recycling area. He says major works at the mall began in late 2012, when part of the older shopping centre was demolished, along with a number of buildings on adjacent Chalmers Street sites. A land swap with Christchurch City Council enabled the realignment of Chalmers Street to the northern boundary, providing a larger area for development.

"Following various design evolutions, the final concept was granted Resource Consent in August 2012, and subsequent demolition, structural systems and main building works building consents for the first stage of works were obtained," he says.

"Stage 1 comprised a two-storey 6000sq m Farmers anchor tenancy with a further 1030sq m of supporting specialty retail and 450sq m of circulation space. A new vehicle access ramp and car parking deck provides access to the level 1 Farmers tenancy. Lifts and escalators within the Farmers tenancy provide pedestrian circulation between levels.

"Additional to the first stage retail, new hands-free amenities were constructed comprising modern and spacious toilets and parents' room, providing over-code numbers to deal with the increased demand over busy periods.

"Stage 2, currently under construction, will complete the circular concourse connecting the existing PAK'nSAVE supermarket and the Farmers department store, providing additional speciality retail, a refurbished northern entry, a new central foodcourt and a new entrance from an expanded level 1 car park. The new car parking will link the existing rooftop parking above PAK'nSAVE, and the level 1 car parking in the stage 1 build.

This stage provides active frontage flanking the new entry which will enhance the connectivity with the bulky goods retailers to the north." Daren says because the new façade and upper level car deck would be a noticeable part of the streetscape from Carmen and Main South roads, the external architecture and material selections were an early consideration.

"Although that part of the building has largely a service and back of house function, it was possible to introduce the curved building form following the vehicle ramp, and introduce two building elements clad in perforated stainless steel to this corner.

"The vertical Espan cladding, which utilised two colours and two panel widths, worked well to provide interest to the larger areas of facade, on both the exterior and interior faces of the curved wall. Graphics panels, and the black composite aluminium ribbon trimming the facade, along with the stepped parapet and cladding selections provide the building with interest in scale and form, meeting with good urban design principles."
The high ribs of Espan's standing seam profile help to create strong defined shadow lines and combined with concealed fixings provide for superior weather performance.

Different pan options are available - either a flat pan for a defined look or one with swages in the pan creating extra shadow lines and also providing for extra profile strength.
Glen Milroy, of Graham Hill Roofing,

oversaw the cladding of both sides of the curved facade with Espan 340 and Espan 470 in COLORSTEEL® Endura 'Grey Friars' and 'Sandstone Grey'.

"The unique thing about the project is that we were given a specific set-out for the sheets of cladding so there were a lot of logistics in terms of ordering and planning," says Glen.

"With the big curved wall we clad the inside as well as the outside so there were lots of different angles and flashings to work with. There was a lot of work in the top and bottom flashings, which were annealed aluminium and had to be site-painted afterwards."

Glen says the façade was clad in about four stages over six months as work on the mall progressed. Daren Alderson says a natural grey/white/black palette of colours was selected for the new build, and that is being rolled out across the existing shopping centre to create an integrated, clean, modern look.

"Internally the concourse maintains the terrazite flooring traditional in this centre. The ceilings and bulkhead unify the tenancies, providing a 4250mm high shopfront allowing the tenants maximum individuality in their designs. The distinctive black ceiling recess and surface mounted black lights forms an internal ribbon running from the main north entrance around to the far side of the foodcourt and the lift, where the new construction joins the existing mall concourse, leading the eye along the retail frontage."

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."

Architects: The Buchan Group
Daren Alderson
Telephone: 03 377 2973
www.buchan.co.nz

Builder: Leighs Construction,
Telephone: 03 341 6905

Cladding supplier:
Metalcraft Roofing Christchurch,
Telephone: 03 349 7350

Cladding profile:
Espan 340 and Espan 470
COLORSTEEL® Endura 'Grey Friars' and 'Sandstone Grey'.

Cladding installer:
Graham Hill Roofing
Telephone: 03 343 1030

Photography: Murray Hedwig

MATAKANA BOTANICALS

As a premium bath and body products company, Matakana Botanicals is proud of its green credentials but even owner Danvers Devereux concedes there was “one missing piece in the jigsaw puzzle”.

“We occasionally have overseas distributors visit New Zealand and we drive them up to Matakana to show them our olive press and where we get our macadamias from, and fly them over to Great Barrier Island to see where we get our honey from,” says Danvers. “All beautiful places but then we would come back to our office and warehouse in East Tamaki.

“As one of our distributors said, ‘You’ve got a beautiful picture with your business but one missing piece’.”

And that was the moment that spurred Danvers to “do something big picture” and move the firm’s base to a rural setting in Matakana.

Photo courtesy of Life and Leisure Magazine

So just over three years ago he bought a 1.82ha piece of land where the company could not only have its warehouse, offices, shop and a cafe but also grow some of the plants that go into Matakana Botanicals’ products.

Danvers says that the site he bought, however, resembled the car wreckers’ yard from the Kiwi movie ‘Smash Palace’.

“On the property was a classic old rundown bungalow but everything was overgrown with long grass and because the guy that lived there was a hoarder there was machinery and car wrecks all around,” says Danvers. “In the first year we were tidying up the property, cutting out privet and removing scrap metal.” Then the bungalow was renovated and used as a temporary office, and he began planning the buildings he wanted on the property as part of the Matakana Botanicals operation.

“I always liked barn-style architecture so I began looking around to see who did the board and batten barns and that’s how I came to work with Customkit Buildings.

“I wanted the barns to be wooden buildings and I liked the fact that the timber comes from regenerating forest,” he says.

"I also liked the portal structure that they use which creates big open spaces and allows you to total freedom with internal layouts and spacial design. Being able to adapt and add your own touches is especially rewarding. One example is our heavy natural wood pergolas with the egg chairs hanging off it."

The first of four barn-style buildings to go up was the warehouse

Danvers Devereux (right) and builder, Gus McKergow

followed by the café/showroom then the lavender distillery and candle making building and lastly the "man cave/honey house". Danvers says he worked closely with Customkit on the buildings' designs so they could be fit for purpose, and he positioned the buildings so they sat well on the land and were optimised for passive solar gain and the installation of solar panels. Danvers says he and authorised local builder Gus McKergow have become great friends during the course of creating the village of "contemporary rural buildings".

Danvers says, "We have had so many compliments from local people because it is very visually appealing from the road."

Part of those smart looks is the COLORSTEEL® roofing, which is also in keeping with the barn aesthetic of Customkit, who have been supplying high quality wooden buildings since 1994.
Kevin Taylor, of Customkit, says using corrugated metal roofing is a traditional look although the materials have improved: longrun pre-painted roofing replacing corrugate sheets, just as ply and batten has replaced board and batten.

"Using those materials goes back to where Customkit started with farm buildings and we've stayed with that look even as we've moved into bigger and more distinctive forms," Kevin says.
"But it's not just the aesthetics of the longrun roofing that we like; it's the lightweight nature, the spanning properties, the durability and the simplicity of fixing that all work for us."

Kevin says that with Danvers' project, care was taken with the setting out of the laminated veneer lumber (LVL) portals to allow for maximised pallet racking systems and such like.

"We also wanted to make sure the buildings related to each other," he says. "It was a collaboration between him and us, and it's nice to have that interaction with the client."

While the buildings have similar forms, the colour scheme Danvers employed also ties them together.

Building regulations meant he couldn't stain the timber; it had to be painted. He chose Resene's 'All Black' for the timber cladding, which contrasts with the lighter COLORSTEEL® Endura 'Sandstone Grey' roofing. The paint is one of Resene's CoolColour range, specially formulated for dark paints so that they don't absorb as much heat, which can cause the paint to fail and lead to cracking and cupping of timber.

Because Matakana Botanicals not only draws inspiration from nature but also aims to respect it, Danvers was determined that his business would have a light environmental footprint. Solar panels provide the bulk of the electricity for the business, which uses LED lighting and has a worm farm system that converts waste into fertiliser. Skylights have been incorporated into the barns to reduce the need for electrical lighting, while doors, windows and louvres have been placed for efficient natural ventilation as opposed to airconditioning.

Water is drawn from an artesian bore and Danvers has created a unique irrigation system that is infused with nutrients from seaweed gathered at the beach.

An outdoor bath is another part of the magical rural setting but is also a piece of company history. Danvers' mother Colyn Devereux-Kay used that bath when she began making pot pourri in 1988 in the basement of the family's Remuera home when she started Les Floralies. That company then branched out into upmarket bath and body products. Danvers took over the business eventually and renamed it Matakana Botanicals when he shifted the business north.

Danvers, who has a background in horticulture, says the Matakana property allows them to grow lavender and herbs for their products and will enable him to explore an interest in other New Zealand native botanicals.
And next year the public will be able to have a look at the final piece in the company's jigsaw when the shop and café opens around springtime.

Building Design:
Customkit/Ecospan,
Telephone: 09 238 6518
www.customkit.co.nz
www.ecospan.co.nz

Builder: McKergow Builders
Telephone: 021 406 180.

Roofing Manufacturer:
Franklin Long Roofing
Telephone: 09 238 9249

Roofing: COLORSTEEL® Endura®
Colour: Sandstone Grey

Roofing installer:
McKergow Builders
Telephone: 021 406 180

ROBYN'S VISION

By Graham Hepburn

Wanting a home that would see her into her golden years, Robyn stipulated level entries for her new two-storey home, which also has a lift.

"With level entries everywhere, hopefully I can stay here as I get old and not have to shift," she says.

Apart from mobility issues, easy indoor-outdoor flow was important to Robyn because there are courtyards spread around the house and, as a keen gardener, she has focused a lot of energy on getting the grounds landscaped and planted beautifully.

Robyn employed architect Colin Campbell to realise her vision for a three-bedroom home with classic looks on the 1700sq m section.

"I didn't want something that was ultra-modern and that would date," she says.

Colin Campbell says, "The brief developed over the many months of design and discussion, but the factors which were unchanged from the start were:

"The house was to be homely, to have a comfortable and familiar feel to it.

"The garden is particularly important to the owner.

"Sun and the position of courtyards. Terraces etc had to take advantage of the sun at different times of day and for different occasions.

"The site, positioned as it is at the end of an avenue of plane trees and with the expanse of garden that was to be developed, brought about the feel for the image of a homestead. From the drive, multiple roof forms give distinction between house and garage and a suggestion of the courtyards and the character of the house behind the walls.

"Once inside the house, all rooms open to the gardens and courtyards with transitions through different verandas. There are courtyards to take advantage of the sun at all times of the day and throughout the year.

"While each room opens to the gardens it was important that each maintained its own character. The balance of wall space to glass gives places for furniture and artworks, and maintains a cosy feel especially on winter evenings.

"The combination of plaster, dark stained timber and grey metal roofing was chosen early in the design. Each gives distinction to that area of the house but the overall scheme remains neutral to allow different areas of the garden to feature at different times of year."

Robyn says, "Colin was brilliant. I had a great rapport with him and he listened to what I said. There is nothing I would change now."

Because the home is quite visible, despite its fences and walls for privacy, Robyn wanted a home with street presence.

With the differing rooflines on display from different aspects, she was keen to have a roof that was as aesthetically pleasing as it was practical.

"I have a friend who is a roofer in Wellington and he took me around and showed me some roofs," says Robyn.

She saw an architects' home with a roofing profile and colour she admired and achieved the same effect by opting for Roofing Industries' Eurostyle Snaplock in 'Sandstone Grey'.

"When you drive up to the house, the roofline looks nice and crisp," says Robyn. "And when you step outside the house it looks different again."

The ease of transition from inside to out is emphasised by the fact that concrete floor tiles run from outside the front door, down the wide hallway and outside again.

Robyn says the house feels roomy because she specified a high stud with high doors, and there are nice touches such as American oak joinery throughout.

She was living next door during the build, which helped her to keep an eye on progress but says builder Alan Chard and his team were "wonderful and really pedantic about getting things right".

With the help of landscape designer Lyndsey Chadwick, Robyn has framed the house and its courtyards with garden beds and water features. Your eye is drawn from the front entry to the rill in the lawn showcasing a Terry Stringer sculpture. And there are formal features such as a square of pleached lime trees.

"I couldn't live without a garden but I wanted it easy-care," says Robyn. There are lots of massed plantings with plants like buxus, hydrangeas, red cornus and rhododendrons."
With the house finished and the garden being developed, Robyn is settling in for the long haul.
"I think what I have got now is a timeless house and I am really pleased with it."

Colin adds, "On this project we were blessed with an enthusiastic client, appreciative of good design, and an exceptional team of contractors who proudly took ownership of their work. There was an open dialogue throughout the project with regular discussion on methods and materials. Rewarding for everyone."

Campbell Architects

Colin Campbell has worked as a "local practitioner" in Palmerston North for 30 years, doing a wide range of work in residential, commercial and civic projects.
"I find the whole design process addictive; resolving the client's brief, design, detailing and working with the builders and subcontractors to see the design brought to fruition."

Campbell Architects
Colin Campbell
Telephone: 06 3567452

Roofing supplier:
Roofing Industries (Central) Ltd.
Palmerston North
Telephone: 06 353 8480

Roof profile:
Eurostyle Snaplock

Roof Colour: Sandstone Grey

Roofing installer: Lance Berry
Telephone: 0274 432 450

Builder:
Alan Chard Building Contractor
Palmerston North
Telephone: 027 5484 401

WATERBASED COIL COATINGS UTILISED 'DOWN UNDER'

At the 2007 NZMRM conference Dr. Lou Gommans made a presentation on the increasing use of waterbased paint coatings on the coil used by NZMRM members for converting into roof and wall cladding products. He subsequently elaborated on this in an article for Scope Issue 17.
Both of these discussed and emphasised the environmental and sustainable benefits of use of waterbased products to replace solvent-borne and also the improved finished product performance in New Zealand's harsh exposure environments.
As the development and use of waterbased coatings increases, as does the need for these properties, we thought it useful to update and re-issue this article, both to remind those who read it the first time, and as new and useful information for those who didn't.
Here it is. Note that the illustrations are from the original!

Stuart Hayman

Abstract

This paper will describe and detail some information relating to the long term use of waterbased coil coatings as used in the New Zealand market since the late 1980's. Some common misconceptions about the use of waterbased coatings for coil coating will be dispelled. The performance requirements of waterbased topcoats designed predominantly for the residential roofing and wall cladding markets will be benchmarked against the recently revised AS/NZS 2728 Standard. Sustainability, Environmental and Consumer expectations for coil coated product will be discussed making reference to waterbased coil solutions. Current global paint technology trends will be detailed.

Key Words: Coil Coating, Waterbased Coatings.

Introduction

A schematic of a typical coil coating process is detailed in Figure 1. Coil coating is a process whereby paint is applied to a coiled metallic substrate (usually by roller application) although other application techniques such as spray or hot melt have also been utilised. The coil strip is chemically cleaned prior to stepwise application of chemical pre-treatment followed by a primer then a topcoat application. All coatings are thermally baked at peak metal temperatures of about 230°C prior to the recoiled coils being 'consumed' for packaging, automotive, appliance, and roofing, siding or furniture applications. Roofing and wall cladding is the predominant market for coil coated product in Australasia.
The versatility of the coil coating process becomes clear when one considers that many substrates (CRS, HDG, Zincalume® and aluminium) and many differing paint systems (polyester, vinyl, PVC, fluorocarbon etc) can be utilised to provide technical solutions for the variety of coil 'end-users'.

The Coil Coating Process. An Environmental Perspective

Resin suppliers and paint manufacturers are constantly striving to supply products which will ultimately reduce the release of volatile organic compounds (VOC) into the atmosphere. The subject of air quality and the control of air pollutants from industrial processes is a very comprehensive and complicated area of research.

Significant legislative efforts are underway to limit climate change by promoting the reduction of pollutant emissions to the environment. The development of policies to protect human health and safeguard sensitive ecosystems is just as high on government agendas. The Solvent Emissions Directive (SED) (1999/13/EC) and the Paint Products Directive (PPD) (2004/42/EC) are two pieces of recently enacted legislation which target the direct and indirect effects of emissions of VOC into the environment.

The legal framework concerning industrial emissions in the European Union has been reinforced with the introduction of the Industrial Emissions Directive (IED) (2010/75/EU). This legislation incorporates the SED (1999/13/EC), but also embraces other directives including the IPPC Directive (2008/1/EC), Large Combustion Plants Directive (2001/80/EC), Waste Incineration Directive (2000/76/EC) and Directives relating to the titanium dioxide (used as a pigment in many paints) industry. The legislative purpose of the IED is to ensure that;

- All installations generating industrial emissions must be controlled by permits
- Permit conditions must include ELV (emission limit values) for all pollutants
- Best Achievable Techniques (BAT's) will be utilised to prevent pollution, and if this is not possible, to reduce it.

BAT techniques can be described under the following headings

Best - most effective in achieving a high general level of pollution abatement for the European Community
Achievable - solutions are developed on an economical and technically viable basis
Techniques - a term describing the technology used and the way installations are designed, built, maintained, operated and finally decommissioned.

These pieces of legislation are directed at removing the human health and environmental burdens that fugitive VOC emission pollutants generate when released into the environment. The European Environment Agency (EEA) is focusing upon reducing air emissions of ozone precursors – predominantly nitrogen oxides, non-methane VOC's, acidifying pollutants (SO-) and fine particulate matter (PMD). Emissions of NMVOC (non-methane VOC), oxides of nitrogen, carbon monoxide and methane contribute to the formation of low level ozone (tropospheric ozone) and the adverse effects on human health and ecosystems (crops, forest, and vegetation) are well documented.

More recently, the China National Coatings Industry Association (CNCIA) has mandated that coatings manufacturers will pay a consumption tax (at a rate of 4%) for all coatings manufactured and sold with a VOC of greater than 420 g/l. China is thus implementing sweeping Environmental Protection changes in the Industrial Coatings Market Sector. The systematic identification of sources of VOC, environmental hazards, policy control systems and standards are currently being implemented in the Chinese Paint Industry.

Coil coating processes traditionally use gas fired ovens with after burner incineration/thermal oxidizers to ensure that noxious emissions to the environment are controlled and minimised. Stringent legislative controls (i.e. Resource consent controls) are placed upon the released combustion products (other than carbon dioxide and water). Typically key emissions of VOC, carbon monoxide, oxides of nitrogen, isocyanates and ozone are monitored (ozone is monitored when UV processes are used). In addition the limitation of fugitive VOC emissions i.e. solvents which escape to the environment during the handling, loading, and mixing of thinners/paint, and of contaminated solvent is also the subject of controls. All emissions must be free from droplets, persistent fumes or mist and must be free from offensive odour (boundary condition).

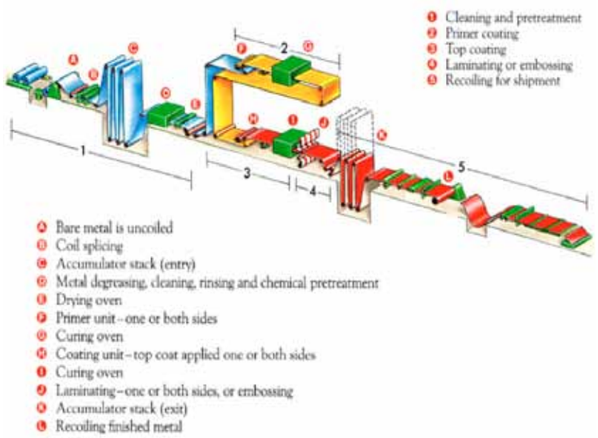


Figure 1 - Typical coil coating installation

These global requirements align closely with the typical resource consent conditions for coil processing in NZ with the proviso that specific detailed resource consent condition requirements vary with local district authority practices.
Coil Coating can be considered as a 'closed' process – 'closed' meaning that all solvents and gas i.e. 'fuel' are consumed in the combustion process and that all by-products are efficiently incinerated or oxidised prior to discharge to the environment.
A survey of the predominant coatings technologies, currently utilized by the NCCA/ECCA Coil Communities (Europe/USA) is conspicuous by the absence of low VOC waterbased technology (Refer Table 1).

Table 1 – Summary of Global Coil Paint type statistics

USA		EUROPE	
Polyester	41%	Polyester	36%
Epoxy	28%	Plastisol	19%
Plastisol	15%	SMP	3%
Fluoropolymer	6%	PVF-	3%
Waterborne	6%	Acrylic (solvent)	1%
Other	4%	Waterborne	1%
		Primer (Polyester)	17%
		Miscellaneous	8%

In essence most of the technology summarised in Table 1 (excluding PVC Plastisol) is based upon medium solids, medium VOC (ca. 500g/l) solvent based technology. The exception being PVC Plastisol – PVC Plastisol is a rapidly diminishing technology, because of expressed environmental concerns relating to the use of PVC and PVC Plasticiser technology. In addition Plastisol technology has a poor exposure performance record in Australasia's severe UV/Thermal exposure environments.
Why then do medium solids' solvent rich technologies continue to be used in the Coil Coating Process? The answer lies in the following bullet point summary.

- All paint technology products have 100% paint transfer (nil paint waste from overspray or pot-life issues) - when roller coated
- Economics/ease of use/ durability/warranty considerations
- The solvents in the paint are used as 'fuel' to cure the thermoset coating i.e. most ovens are gas fired
- All combustion products (from gas fired ovens, polymer related split off volatiles) are 'sanitised' via afterburner incineration/thermal oxidizers/catalytic oxidisers
- Waste containers are efficiently recycled i.e. 200ml drums, MBC or tanker supply
- The coil process is highly efficient in terms of energy consumption per area of paint applied
- The coil process uses water sparingly (predominantly coil quenching processes prior to recoiling)

Other Considerations - Environmental and Sustainability Issues

The UK Government has published key themes for sustainable construction. These can be summarized as follows:

- Design for minimal waste
- LEAN Construction and minimize waste (i.e. use light, strong materials)
- Minimize energy in construction and use
- Do not pollute the environment
- Preserve and enhance biodiversity (i.e. ensure no impact on biological communities)
- Conserve water resources
- Respect people and the local environment
- Monitor and report (i.e. use benchmarks)

The environmental 'friendliness' of the coil coating process, coil recyclability, long span in service, easy maintenance, excellent aesthetics and appearance make coil coating a strong 'environmental choice'. The alternative to coil coating processes are labour intensive spray applied processes; clearly these are not the preferred cost effective options nor are they environmentally friendly ones.

The clear focus of sustainable development is to "improve the quality of life for all without increasing the use of natural resources beyond the capacity of the environment to supply them indefinitely "– this thinking is now mainstream thinking. Considerable attention is being placed upon coating vehicles which can be seen as being carbon neutral through life cycle analysis studies. Research into sustainable acrylic technology is, not surprisingly, well advanced and well researched. Considerable effort is being focused upon generating sustainable acrylic raw materials via a number of novel processes (plant based production and /or generation from renewable feedstocks).

Acrylic technology is a very dominant global technology used for surface coatings and is estimated to be 80% plus of the USA topcoat market.

In addition the use of waterbased coatings with low VOC content is recognized as a preferred method of minimising VOC emissions along with other options such as higher solids, powder, organic free coatings and radiation cure technology. The advantage of water based systems becomes clearer when we look at "other compliance matters" and refer to the requirements contained in AS/NZS 2728.

Other Compliance Matters

The awareness of sustainable materials has already been touched upon but other issues have become strong drivers for 'change'. Indeed the issues listed below were considered as key drivers for change away from solvent borne technologies (PVF, SMP) in the NZ market as early as the late 1980's.

- Elimination of odour and toxicity associated with HAPS's (Hazardous Air Pollutants) e.g. isophorone in PVF2
- Reduction of fire risks and associated ease of storage of large quantities of coil paint product in close proximity to hazardous, non-flash-proof equipment (e.g. ovens, electrical appliances)
- Nil capital investment to switch from solvent-borne to waterbased technology
- Removal of high vapour pressure HAP's which constitute a risk to human health creating a bioaccumulation hazard in coater room environments (solvent-borne products containing lower boiling point solvent cocktails with higher TWA/TLV thresholds compared to waterbased technology)
- Waterborne technology having proven durability advantages in the finished product compared with solvent-borne technologies
- Regulatory compliance with Dangerous Goods Storage and HASNO product labelling requirements
- Waste disposal regulations for waterbased product much less demanding than for solvent rich technology
- Air resource consent requirements for fugitive emissions are minimised when water based options are exercised

Table 2 summarises some compliance points of difference when a waterbased coating is compared with a solvent borne equivalent technology. These are quite compelling.

Summary of AS/NZS 2728:2013 – Prefinished/ prepainted sheet metal products for interior/ exterior building applications – Performance Requirements.

To quote from the Standard –

"This Standard specifies performance requirements for prepainted and organic film/metal laminate products in sheet and strip form that are coated on one or both sides, and that are intended for fabrication into products for use in the construction or finishing of buildings."
The "Standard classifies prefinished/prepainted metal products into six types according to their performance, in respect to durability and aesthetics, in environments varying severity."
The coil-coated product types are

Attribute	Solvent Based Polyester	Waterborne Topcoat
Flashpoint	24°C	Typically >93°C
UN number (marking labelling)	UN1263 (flashpoint <61°C)	N/A
Hazchem Code	3Y (firefighting code)	N/A
Packing Group	III (based on flashpoint 23-61°C)	N/A
DG Class	3b (Class 3 – flammable liquid – 23-61°C)	Non hazardous
HMIS Code	230H	100C
Flammability Limits	0.9-11.2% by volume in air	N/A
Ecological Info	HASNO Ecotoxic in aquatic environment	No HASNO risk phrases required
VOC g/l	ca. 500 g/l	50-80 g/l

Table 2 - Compliance points of difference between water-borne and solvent-borne technologies.

aligned with ISO 9223 Corrosion Categories and with AS/NZS 2312 Atmospheric Corrosivity Categories. The corrosivity environment is correlated with corrosion rates of mild steel (µm/y) as a benchmark to measure corrosion rates.

The performance requirements for prefinished metal products cover standard aesthetic requirements as well as standard mechanical test property attributes i.e. appearance, specular gloss, dry film thickness, reverse impact, scratch resistance. In addition and most importantly, the Standard covers key performance attributes for coil coated product types. These key performance product types being related to the;

- Durability of the organic film reflected in gloss loss, checking, chalking, colour change, cracking, flaking and peeling related to four year durability requirements of the organic coating at sunshine test sites. These sites have quantified solar weathering index requirements.

- Humidity resistance and corrosion resistance (Cyclic corrosion testing salt spray resistance, humidity testing and four year corrosion resistance tests at ISO 9223 ranked corrosion exposure sites).

Performance of Waterborne

Coatings in accordance with AS/NZS2728 requirements
The waterborne topcoats supplied to the NZ market (from PPG) all meet with the four year durability requirements of AS/NZS2728.

Figure 2. PPG's Muriwai Exposure site located on the West Coast of NZ

Figure 3. Photo of a high profile building demonstrating the aesthetic beauty of buildings clad with waterbased coil coated product.

Figure 4. Photo of a high profile building demonstrating the aesthetic beauty of a - building clad with waterbased coil coated product

All new technologies are subject to assessment to AS/NZS2728 requirements prior to release into the market place.

Figure 2 illustrates PPG's Muriwai exposure site (showing the severe corrosion resistance testing that these coatings need to endure prior to market release). This site is extremely aggressive, is classified as a C5 site (under ISO9223 nomenclature) being located 80 metres from the breaking surf. The AS/NZS 2728 benchmarks all corrosivity requirements for this site such that all test data from this site can be correlated with other C5 sites on a global basis. This location is also currently under study by the NZMRM Corrosion Project.

As an old saying goes "the proof of the pudding is in the eating". Figures 3 and 4 illustrate some long term exposure building case histories for high profile coil clad structures. The aesthetic appearance, longevity and enduring beauty of these coated finished buildings demonstrates that waterbased coating solutions indeed can perform and are performing well in the real world. In short the colour, gloss and chalking requirements easily meet with AS/NZS 2728 requirements as well as customer warranty expectations.

All of these attributes – flow, mar/resilience, in-tray skinning, coating solvent boil at fast line speeds, durability optimisation and corrosion enhancement – are all getting lots of attention from coatings suppliers with some exciting research outcomes being close to commercialisation.

Coil Perspectives on Coatings for the Future

The performance of Coil Coating Systems for today and expectations for tomorrow is an important consideration (of course!)

Attribute	Typical Performance Requirements	Performance observed with current products
Skinning/set up of waterbased coating in tray	Non skin >24 hours continuous coil line running	Pass OK
Poor mar/scratch resistance of waterbased topcoat	Capable of being processed in the range of NZ rollforming profiles.	Pass OK
Poor flow/appearance in roller application	Pass Customer requirements	Pass visually – very good flow/appearance
Solvent boil at high dry film thickness	May be processed at customer line at standard film thickness	Pass at fast line speed
Corrosion resistance with compatible primer technology	Pass AS/NZS 2728 4 year requirements	Pass/exceeds expectation
Durability Requirements	Pass AS/NZS 2728 4 year requirements	Pass/exceeds expectation
Ovens 'rust out' because of continuous use of waterborne products	Ovens perform as per solvent borne coatings	Pass expectation

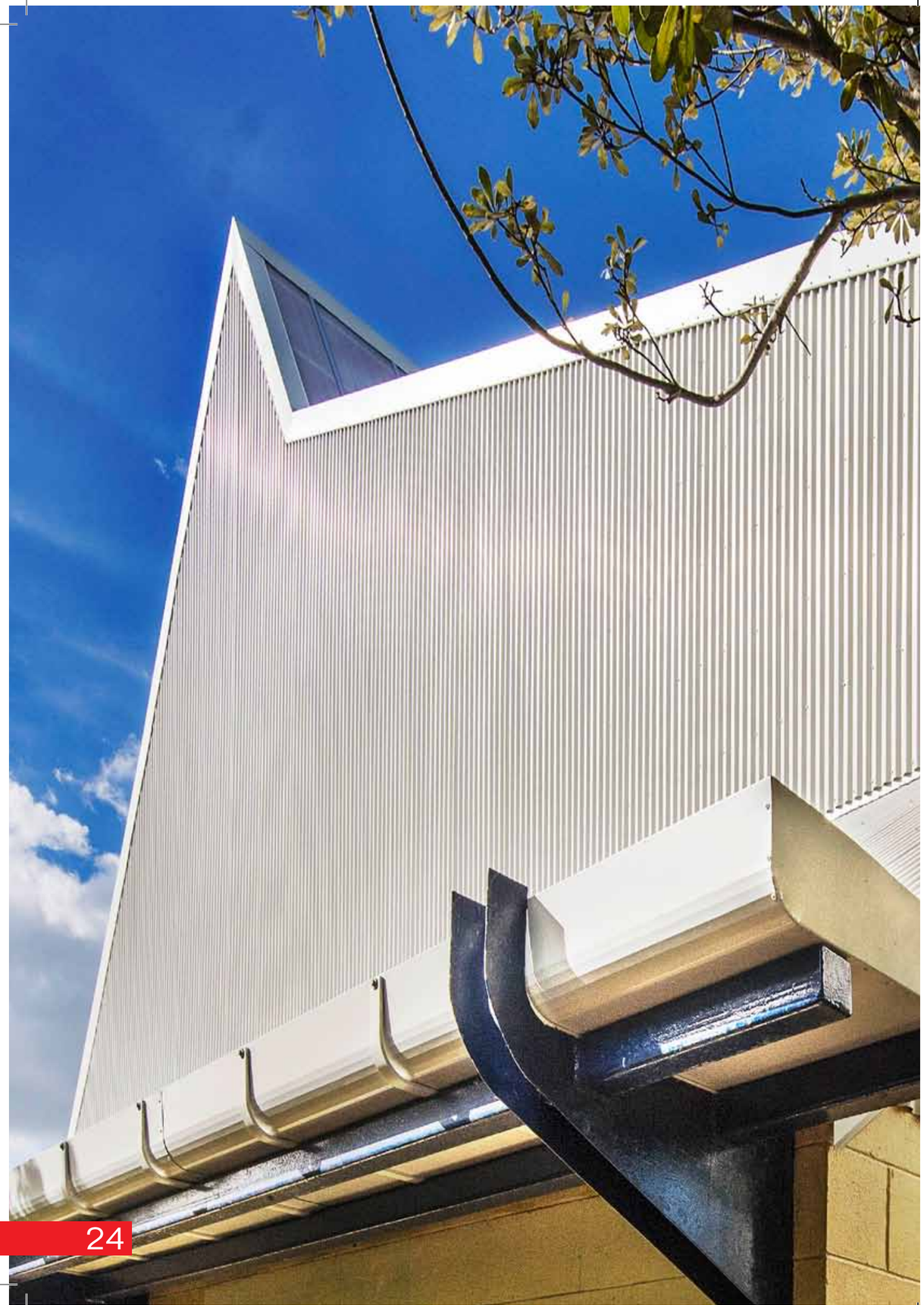
Table 3 - Perceived Inadequacies of the use of waterbased coil coatings

Perceived Inadequacies of Waterbased Coatings

Table 3 details a list of perceived inadequacies of waterbased coil coatings. In reality none of these perceived inadequacies stack up with the coil processes operating in NZ.

In essence:
Performance expectations from the consumer (and the coil applicator) are increasing NOT decreasing.

- Compliance expectations are becoming more stringent as one would expect as Environmental and Environmental Health and Safety expectations continue to be driven hard through regulatory channels Waterbased coatings continue to develop and evolve at a great pace – companies such as PPG already have next generation technologies under development not only for topcoats but for primers and backing coat applications as well. The combination of good in-plant operational performance (long considered a considerable drawback of waterbased coatings), excellent durability and good corrosion performance make waterbased coil coating technologies of interest to all coil lines. The additional Environmental Health and Safety benefits realised in room environments, product storage, safety considerations, ease of transportation and lack of hazard ID protocol make waterbased coil an interesting option – no question about that……!



EAST COAST BAYS LEISURE CENTRE

Specialized safety clothing and techniques were required to ensure asbestos fibres were not released during the roof removal process

20m aerial work platform was purchased specifically to work on the 80% roof pitch

When you have an asbestos roof over a community gym and kindy with a playground outside, it's best not to take risks with it.

That was the view of Auckland Council when it became apparent that lichen could be degrading the asbestos roof on the East Coast Bays Leisure Centre in Browns Bay.

A combination of the True Oak® profile with custom made gutters was used to match the aesthetics of the original building.

As Rob Anderson, of Metro Roofing explains, "As soon as lichen starts growing on an asbestos roof it can release fibre because lichen can remove the top layer. The roof on the gym wasn't in poor condition but it was prudent to replace it. Because it was Auckland Council they jumped in and did it before it became hazardous."
Rob estimates the asbestos-cement Super Six roofing was about 35 years old and needed to be carefully handled as it was removed.

As James Cosslett, site manager for Cape Ltd explains: "The thing about asbestos is that if it is left alone then it is not a problem but if people are walking around on the roof without due care and creating cracks and breaks then that's when it becomes a problem and starts releasing fibres and becomes dangerous."

"This roof looked pretty well worn but when we lifted the sheets off the underside looked as new as the day they were laid.

"James adds, "We worked very carefully and methodically to make sure we never broke a sheet.
We took all the screws out of the sheets then sprayed the outside with PVA glue to seal it. Then the sheets were turned over and the other side sprayed with PVA glue.

We used a dye in the glue so that we could be sure that the sheets were totally covered and sealed." Specialised vacuum cleaners were used as the screws and sheets were removed and in the ceiling space to make sure no asbestos dust escaped. The leisure centre and attached kindergarten were closed down for about two months, and the basketball court and gym equipment covered in plastic. Surfaces were washed down and wiped after the job.

James adds, "We did a lot of high level cleaning such as light fixtures and basketball hoops to get rid of any asbestos dust."

He says once the sheets were off, other remedial work had to be done before the new True Oak® Corrugate could be installed.

"When we pulled the roof sheets off it became apparent there was some structural damage to the steel so we had to rustproof the steel," says James. "And there had been some water damage in certain areas so we had to replace some timbers as well."

While removing the asbestos was no easy task, replacing it was not that simple either. About 2000sq m of Roofing Industries' True Oak® Corrugate in 'Titania' was used on the job. True Oak® Corrugate was chosen for its strength and durability, and because it mimicked the look of the asbestos with its profile and 'Titania' hue.

Rob Anderson says he had to buy some new machinery especially for the tricky job.

"One of the faces was 80 degrees so we couldn't scaffold it so we bought a 20m Manitou [aerial work platform] to do the job," he says. "And there were other challenges like building twin wall systems for skylights 13m in the air. We also had the gutters custom-made to resemble the old asbestos gutters."

Rob says while the job was challenging, one of the most pleasing aspects was the way any asbestos danger was contained.

"We all wore monitors on the job and they came back clean," he says. "And there was testing done around the centre, including the kids' playground, and that came back at zero."

James Cosslett adds that asbestos testing was done before and after the job – with none detected – and photographs were taken as work progressed and paperwork signed off to show that safe work practices were being followed.

"The council was delighted with the job and we were three weeks ahead of schedule so they could open the centre up again and start getting children to come back to the kindy."

Main Contractor: Cape Ltd,
Telephone: 09 374 4204

Roofing supplier:
Roofing Industries
Telephone: 09 414 4585

Roofing Profile: True Oak® Corrugate
Colour: 'Titania'
Colorcote ZRX .55BMT

Roofing installer:
Metro Roofing
Telephone: 09 415 0863

SCOPE NEWS AND VIEWS

Credit due.

In Issue 36 of Scope magazine we ran an article on the Avantidrome in Cambridge. The excellent photography of this project was provided by one of our members, Ray Lienbenberg. It is only through the co-operation of members such are Ray that we are able to share images of some projects and the publisher offers an apology for not having acknowledged this in issue 36.

Do architects and designers get CPD (Continuous Professional Development) points from Scope?

A question often asked. The answer is yes. Both NZIA and ADNZ recognise and have listed Scope as a "Professional Journal". Each organisation has a different method of calculation and of awarding points.

Members of NZIA are each allocated 20 points per year. Individual magazines are not awarded a specific number of points.

Members of ADNZ are allocated a total of 8 points per year. Each issue read accrues a percentage of points. For Scope the allocation is .25 per issue

MANGAWHAI HOLIDAY HOME

The great Kiwi bach is a focus for memorable family gatherings, although the get-togethers usually happen after it is built. In the case of the Malcolm family's Mangawhai Heads bach, it brought mother, father and daughter together in the design and build process long before the project was finished.

Karen Malcolm, architectural designer from Malcolm Architectural Design and her daughter Jessica Malcolm, an architectural graduate now working for SGA, collaborated on the design while Master Builder John Malcolm, put together a team to build the 116sq m holiday home.

The family design and build team longed for a beach house that could accommodate immediate family, and overflow of extended family and friends during the holidays. The team agreed on an aesthetic that would stand modest in its surrounds yet felt light and airy inside, particularly on an overcast day. Karen's love for skylights came in handy in achieving this 'airy feel', and they were sprinkled throughout the beach house accordingly.

The traditional 'bach' lean-to form was a concept explored for its cost-effective yet elegant form, and by taking inspiration from the 'bach' and sticking to a basic plan the team was able to achieve a design with a cost of under $300,000. A small budget and constraints from a difficult site inevitably resulted in a small compact plan on a narrow, undulating 1400sq m site provided with views of the Brynderwyn Hills. As the Malcolm family entertain large groups on occasion and often have visitors drop in during the weekend, the small plan had to be flexible enough to cater for these extra numbers as well as accommodate all the beach equipment used by the outdoorsy family.

The bach consists of open plan living spaces, three-bedrooms, two-bathrooms and is complemented by a shed like sleep-out, built and used by John while he constructed the beach house over a short period. The house is equipped with a 32sq m tandem garage to suit the narrow site, as well as 77sq m of partially covered decking. Karen says circulation space in the house was reduced so other spaces could be enlarged, "We stretched the plan to its limit so that all living spaces are flooded with all day sun, every room in the house has plenty of light and has a framed view; even the bathroom has a view of the sky." The beach house feels a lot larger than its compact 116sq m size due to its high ceilings and much valued covered outdoor deck area – the design team initially intended it becoming an 'in-between' indoor and outdoor room with moveable walls.

A range of natural materials and colours were selected to keep within the aesthetic of the surrounding area. The chosen 6 Rib COLORSTEEL® cladding in 'Ebony' achieved this modest bach aesthetic, and Trimline COLORSTEEL® roofing, also in 'Ebony", was used for the mono pitch roof. Six skylights were placed over the bathroom, deck, bedroom, dining and kitchen areas, this created areas within the house with lots of light, as well as providing privacy to the main bathroom and a view of the sky from one of the bedrooms.

Powder coated aluminium louvres were introduced to the living areas and glass louvres to the master bedroom, to give a secure cross ventilation opening while the family are out at the beach and provide plenty of ventilation on the hot summer nights.

Karen adds, "To keep costs down the need for an engineer was eliminated by selecting glulam and HySpan engineered beams for the house." Building, landscaping, and painting were done by our daughter Roxanna and other family members and friends."

From a design perspective Karen says it was important to get the COLORSTEEL® cladding right and ensure all the facings were an even width around all the windows. "Often with COLORSTEEL® cladding the finished facings can become uneven around the windows depending on where the ribs of the cladding end. With long walls it is not always possible to work out exactly where these ribs will be due to the natural creep of the product while fixing, so planning exact window placement didn't solve this issue. John suggested forming an opening 200mm larger than the windows, so this led to a solution where the window could then be moved slightly on site, to ensure the facings were an even width around the window.

"It's the little details that we often notice and we wanted to get right, as this can make a huge difference in the quality and aesthetic of a building."

"This idea was experimented with on a trial run on the shed that was to become an informal bunkroom, and was a success."

Karen says, "The project was a bit unconventional in terms that John was involved early in the design process and Jessica was involved in the build, so they both had a bit to learn from each other".

And they have produced a home that belies its tight budget "Friends and family absolutely love coming up to our bach, it always feels like a holiday when we are here".

"Considering this was a low cost house it packs in a lot of higher spec features, including skylights, oak flooring, full tiled showers, and plywood soffits" says Karen. "We have had a lot of people drive past, stop and take photos as it's a bit different and unexpected for its location."

Malcolm Architectural Design Ltd

M.A.D is a small architectural firm located in Silverdale. Director Karen Malcolm is as an Architectural Designer who has had 30 years experience in projects ranging from new housing, renovations to reclads in the wider Auckland region. Karen has worked closely with John Malcolm on previous projects and has worked at Auckland Council in the reclad team in the past, giving her the expertise and experience to produce houses that are low risk in terms of weathertightness and exceed clients' expectations.

Ph 027 675 5428 or (09) 427 9005

Malcolm Building Services Ltd: Master builder and Director John Malcolm and his small team of in-house qualified builders are highly skilled craftsmen who appreciate and understand the unique aspects of each project and take pride in their craftsmanship.

"We know that the process of building a home requires not only years of experience but also thoughtful attention to detail, safety and schedule, because of this we do not subcontract any of our building work, which helps us ensure that our work reaches our high standards. We can help you whether you're looking for a simple recladding or high-end residential design."

Architectural designer:
Malcolm Architectural Design Ltd.
Karen Malcolm & Jessica Malcolm
Telephone: 09 427 9005
Mobile 027 675 5429

Roofing and Cladding manufacturer:
Verticlal cladding :Steel and Tube
6 Rib COLORSTEEL®
Colour: Ebony supplied by Steel
Telephone 09)415 3490

Cladding installer:
Malcolm Building Services.

Roofing:
Trimline COLORSTEEL® '
Colour: Ebony

Roofing supplier and installer:
Hibiscus Roofing Ltd,
Telephone: 09 424 0568 or
09 488 0807

ONE OF A TEAM

Jonathan Walker architect – ‘Purpose-built yet elegant’ is how Jonathan Walker describes IBM’s Highbrook facility. Purpose-built and elegant’ better describes the many JWA-designed buildings in Auckland.

While the team at this well-established architectural practice have undertaken design work ranging from industrial, health care, apartments and intensive housing to infra-structure projects, their focus remains the same, regardless of the nature or scale of the project.

Their aim is to raise the standard of commercial design.

Their commitment to sound design, and to providing smart solutions to implement their design, is complemented by timely project delivery. Their speciality is designing commercial buildings that are both fit-for-purpose and pleasing to the eye; their concept: that the warehouse and office together work together as a composition of strong forms, colours and textures.

They achieve this by cladding and roofing the large steel frameworks with a combination of variously profiled steel and glass – a functional necessity – which identifies the administration areas.

The glass brings a kinetic element to the form by yielding glimpses within while also reflecting its surrounding and its ever-changing skyscape.

In collaboration with JWA colleague Joanne Cheng, Jonathan’s first project was to design a factory and office. The client just wanted a standard warehouse – and quickly.

Compared with Europe where the process can take years, in New Zealand a simple warehouse can be developed from concept to built completion within a year.

IBM Warehouse
Roll former: Steel & Tube
COLORSTEEL® Endura
Colour: TItania
Profile: HiRib
Roofing Installer: KIwi Roofing
Telephone: 263 9988

Mainstream Warehouse
Roll former: Steel & Tube
COLORSTEEL® Endura
Colour: Corporate Mainstream green double sided Titania
Profile: ST 963
Roofing Installer: Klwi Roofing
Telephone: 263 9988

JWA recognised that Auckland's need for new warehouses and to replace old unwanted stock was strong and that therefore there'd always be a steady demand for commercial buildings. However, he also wanted these buildings to have a high standard of architecture.

A site-specific project, like Mainstream's hub in Otahuhu, posed challenges, not least of which were how to blend character with functionality on a site accessed across a railway track – a siding of which was to feed into the complex. In a mainly industrial area with little evidence of architectural input, Jonathan's brief was to create a handsome facility to accommodate the integrating of and interchange between road and rail freight – and to provide for long-term storage.

With access to the main 6428m2 warehouse, a 3700m2 open warehouse accommodates the new rail siding and truck loading and unloading and is where the main interchange of freight occurs. To the east a canopy-covered 2806m2 container yard allows all-weather access to the warehouse. Glass and charcoal-coloured precast panels precisely identify the office building to approaching vehicles while within, a natural light well between the warehouse and the open-plan office with desk-high spandrels create a pleasant, heat-controlled work environment for office staff.

While Mainstream's facility was relatively straight forward, JWA's involvement with IBM's 'leading edge' data centre in the Highbrook Business Park was anything but. Defined in the original IBM brief, the design philosophy required that seismic issues be addressed by creating a separation between the structure and rooms built within rooms. Balancing innovation with international standards was a further integral element of the brief.

JWA could take nothing for granted as they worked their way through the design requirements: every aspect was discussed and questioned. As a result, not only does IBM have a state-of-the-art data centre, its building, with its understated concrete-and-glass exterior and semi-rural aspect, achieves a high standard of commercial design.

In designing Stanley Black & Decker's 3,000m² custom-built distribution centre at Highbrook, JWA's brief was again to integrate the warehouse and the administration area.

Covering the vast expanse of glass is a sculptural form of aluminium screening which follows the sun and creates a sense of movement while also screening the entry to the trade store from the street. The glass reflects the arresting landscape, the sky and the movement of clouds – and ever-changing vista that adds to the sense of movement and gives the building that 'wow' factor.

Stanley Black & Decker Warehouse
Roll former: Steel & Tube
COLORSTEEL® Endura
Colour: Metallic Silver
Roofing Installer: Steel Roofing

Steel & Tube's warehouse also carries that JWA hallmark: a combination of long run steel, this time broken with recessed downpipes, precast panels, expansive glass and boldly contrasting colour. No matter what they are working on, colour and character count considerably in JWA's designs.

JWA's projects don't have to be huge to be challenging. One task was to design a hospital to be built off site and when ready, the existing 'cottage hospital' was to be removed and replaced by the new structure – all within a five-week timeframe in which time the new hospital had to be functioning. JWA have also completed terrace housing projects and a 41-apartment block in Albany Village. Much of JWA's design work is for owners who are building to the requirements of their tenants. Nowadays, while time is always of the essence, creating an attractive environment for their tenants and their employees is as important as the bricks-and-mortar structure.

So how does JWA achieve this? Jonathan explains: "It's important for us to maintain a strong design ethic. We strive to be attentive and apply a thoughtful, logical approach to our clients' needs. We respect the wishes of our clients and of their tenants. In fact we aim to create a workplace environment where consideration for others prevails. It's important to us to maintain a healthy relationship, not only with our clients, but also with the Councils we deal with, with project managers, with sub-contractors and tradesmen and with surrounding neighbours.
"As architects, we always need to negotiate and compromise. Practicality and external factors have to be integrated with the design concept. We believe a good design process balances competing requirements."

Steel and Tube Warehouse
Roll former: Steel &Tube
COLORSTEEL® Endura
Colour: Titania double sided
Roof Profile: Multispan Cladding STC 900
Roofing Installer: Kiwi Roofing
Telephone: 263 9988

So what is compromised when it comes to sustainability issues? "We aim to create sustainable environments but we do what we can within budget and site constraints." Jonathan advocates persuasion: "We explain our preference for 800cm-high spandrels over floor-to-ceiling glass which for a smaller office floor plate is both practical for desks and provides insulation to the exterior envelope."

JWA-designed buildings win accolades because people have not in the past expected to come across such attractive establishments within industrial environments. Today, that's changing.
Says Jonathan: "Our buildings please, both in design and in functionality, and we're proud of that, reflecting architectural taste in Auckland's industrial regions."

For further information on Metal Roofing or Cladding or details of any of the articles which appear in this publication please contact any of the members listed below.

If you would like to submit material please contact any member of the executive or the publisher. Visit our website at: www.metalroofing.org.nz

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