

ISSUE 40

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COPE





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.

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SCOPE

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MEET THE LOCALS

Meet the Locals He Tuku Aroha precinct, Wellington Zoo
As part of its redevelopment and rejuvenation, Wellington Zoo has created a precinct that it describes as "a love story to New Zealand".

Meet the Locals He Tuku Aroha occupies 7000sq m – more than a fifth of the zoo's footprint – and takes visitors through a series of zones simulating a journey from the sea to the mountains with stops along the way at farmland and native forest settings. The whole experience is designed to allow visitors to get up close and personal with an array of indigenous and introduced species including the likes of blue penguins, eels, lambs, pigs, free range chickens, and even kea.



unsuspecting visitors with water. Visitors begin by crossing into Penguin Point, a representation of our coastal landscape featuring recycled wharf timbers, boat houses and rocky landscaping with native planting that is home to the Little Blue Penguin.

Then it is on to Pohutukawa Farm, which celebrates our history of agriculture and what farming means today. There are community vegetable gardens, bees, kune kune pigs, sheep and eels as well as play activities.

The cornerstone of Pohutukawa Farm is the barn, which was supplied by Pukekohe-based Customkit Buildings.

Brought into the 'neighbourhood' by Isthmus, Customkit Building's natural abilities helped make the centrepiece building feel right at home in the overall environment. Isthmus principal landscape architect Dan Males says Customkit Buildings' style was perfect in creating a domain where visitors

could spend time learning more about the each individual species. "Their barn is the focus for a key interactive area called the Pohutukawa Farm," he says "The Zoo was keen to have a timber-framed building that matched a rural/farm aesthetic reminiscent of what you may find in the Wairarapa for example," says Dan of the bright red barn that has a classic COLORSTEEL® corrugate roof in 'Ironsand'.

Dan says, "The result is understated; the building is nestled into the landscape, creating an environment that doesn't feel as if it's imposed upon the land - rather part of it."

Customkit Buildings' managing director Michael Anselmi says he's proud to be part of any project that showcases the best of New Zealand and that also helps educate people about their environment.

"Wellington Zoo is to be congratulated on creating such an innovative and inspiring natural experience," says Michael.

"Selecting Isthmus as their design and building partner was also a stroke of genius. Both New Zealand and international visitors will learn a great deal about this country and, in the process, feel right at home."

Michael adds, "In some ways this is another 'feather' in our environmental protection 'cap' that complements our support of the Wingspan Bird of Prey Centre in Rotorua. Anything that helps New Zealanders appreciate the landscape, and lifestyle, that we have is important."

At a cost of \$5.9 million, the project was designed by innovative architecture and landscaping firm Isthmus and took 15 months to complete but was the subject of many years of planning. Hawkins Infrastructure was the main contractor on the job.

Interactivity is a key element of the precinct, which has features such as giant gumboot play structures and a secret 'blow hole' that blasts





As visitors leave the farm, they enter a native bush zone with an interactive conservation display. The precinct culminates in a kea enclosure that has a path winding through alpine rocks, and then links through to the area outside the zoo's tiger enclosure.

Dan Males says while redeveloping the area, they also tried to retain as much of the existing vegetation and infrastructure as possible.

He says, "The precinct is built within a sheltered valley within the zoo grounds that was once home to a number of aviaries and the old nocturnal house. The Pohutukawa Barn, and wider path network/ animal enclosures, are all positioned to provide maximum retention of existing vegetation and accessible paths for visitors. The solution fulfils the desire for the area to feel

remote and part of the wider town belt landscape."

Hawkins Infrastructure project manager Gordon Williamson says the job posed a variety of challenges.

"The requirement for numerous types of engineering techniques made it an interesting project for the Hawkins Infrastructure project team to deliver. Works included reinforced concrete beams and slabs, sprayed concrete, coloured concrete, grit blasting, piling, falsework design and installation of cable stay bridge construction, foul and surface water drainage, timber frame and truss construction, cladding, plumbing installation, electrical installation, coatings and structural steel erection."

Gordon says the creation of the precinct was a transformational project for the zoo, finalising a 10-year journey culminating in the creation of the interactive environment.

"As part of this highly collaborative journey and having worked on a number of previous projects at Wellington Zoo, Hawkins has developed a strong relationship with the zoo," he says. "We're proud of what has been achieved together for the greater benefit and enjoyment of the wider Wellington community."

Isthmus

Since 1988, Isthmus has been pioneering the design of culturally meaningful, enduring, healthy and inspiring environments. In that time, the practice has become one of New Zealand's leading design offices, well known for an ability to make a positive impact across a wide range of works, including coastal edge regeneration and rehabilitation, parks, playgrounds, significant buildings, masterplanned communities and major infrastructural projects. The firm's works of architecture, design planning, landscape architecture and urban design are interwoven with common threads of commitment - to the creation of vibrant new communities, healthy new ecologies, and built environments that are simple in their expression yet rich in authenticity, value and culture.



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Metalcraft Hamilton,
Telephone: 07 849 3807
www.metalcraftgroup.co.nz*

*Roofing: COLORSTEEL®
Corrugate 'Ironsand'*

NEW ZEALAND MRM PROPOSED SYSTEMS GUARANTEE PROGRAM

Who are NZMRM?

The New Zealand Metal Roofing Manufacturers (NZMRM) is an incorporated body representing the majority of metal roofing manufacturers in New Zealand. Metal roofs constitute over 95% of all Commercial roofs and around 75% of all Residential roofs in New Zealand. The NZMRM is a voluntary organisation and provides the metal roofing and cladding industry with a vehicle to lift standards, by addressing technical and regulatory issues at an Industry level, and to "increase the size of the pie", by targeting generic promotional opportunities.

What publications have NZMRM written?

2002 - launched SCOPE magazine, which promotes the benefits of steel roofing products to some 10,000 designers, builders and roofing companies throughout New Zealand.

2003 - published the Code of Practice, which has become the Industry guidance document for the selection, design and installation of metal roofing and wall cladding systems.

2011 - commenced work on an Industry Systems Guarantee Program. This work was undertaken in direct response to the Building Act Amendments, which came into effect on 01 January 2015, and which require Builders to offer "10 year regime" responsibilities for materials and workmanship. These



Systems Guarantee

NZ Metal Roofing Manufacturers

changes have created a "vacuum" opportunity in the market that are not covered by any of the existing Supplier component warranties.

Furthermore, the proposed Systems Guarantee product is complementary to the existing Builder Warranty & Guarantee products and its proposed cover extends beyond all of the existing guarantee products in the market.

What work has been done on the proposed Systems Guarantee Program?

During the last five years the NZMRM has been actively working on an Industry Systems Guarantee Program for Pre and Post Painted Longrun, Metal Tile and Rainwater products used in new and re-roof residential applications. The development of the proposed NZMRM Systems Guarantee program has been an organic journey involving Members, Suppliers and Industry Partners, including the Roofing Association of New Zealand. The NZMRM has also held introductory meetings with ADNZ, BOINZ, Certified Builders, Master Builders and

NZIA representatives in regards to the proposed program and it will soon meet with Building Supply Merchants and other Industry participants. It has also sent out a market wide update to all Architects, Builders and Specialist Trades in November last year. The NZMRM has provided its Members and Suppliers with a "beta" version of the proposed Systems Guarantee program which has recently been legally reviewed by Simpson Grierson, who have found that the proposal meets the various requirements of the Building Amendment Act, the Commerce Act, the Fair Trading Act and the Consumer Guarantees Act. The NZMRM is now in the process of developing the Systems Guarantee product to launch, the adoption of which would be dependent upon it being accepted by the NZMRM Members at a proposed Special General Meeting in March 2016. The NZMRM is currently targeting an April 2016 launch of the proposed Systems Guarantee program subject to it meeting its various "sign off" milestones and being accepted by the NZMRM Members at a March 2016 Special General Meeting.

Benefits of the proposed Systems Guarantee Program

- Applies when the Product, Supplier or Installer is no longer around
- Mitigates Builders Building Act Responsibilities

- Supports Roofers Building Act Responsibilities
 - Supports best practice design, products and systems (in conjunction with the NZMRM Code of Practice)
 - Becomes an inclusive "Quality Mark" for a published list of Approved Suppliers and Products
- In addition the proposed Systems Guarantee Program reduces Industry compliance costs, supports professional and ethical behaviour, via a Systems Guarantee Supplier Code of Conduct, inhibits the inappropriate substitution of customer specified Accredited products and provides the NZMRM with a financial vehicle to promote metal roofing growth opportunities. The Certified Builders and Master Builders Associations also clearly understand the benefits of the proposed Systems Guarantee Program and are supportive of it in principal, subject to viewing the final offer.



Accredited Supplier

NZ Metal Roofing Guarantee

How will the proposed Systems Guarantee Program help your business?

The primary intention behind the proposed Systems Guarantee Program is to make it more attractive for Designers, Builders, Roofers and Homeowners to specify Systems Guarantee approved products and suppliers by providing

them with a cost effective "minimum performance" backstop guarantee program that reflects the "fit for purpose" regime requirements of the Building Amendment Act. To achieve this the NZMRM had been actively working with Industry Suppliers to include a best practice design and performance requirements section within an updated version of the NZMRM Code of Practice, which will set the minimum standards required of the Systems Guarantee.

Under the proposed program Roofers, Builders and Homeowners would be able to choose from a "Warranty Continuum", ranging from the existing component Warranty options through to the proposed Supply & Install Systems Guarantee products, as best suits the needs of their individual requirements and the project opportunity. If specified the NZMRM members would lodge the individual Systems Guarantee applications from a published list of Accredited Suppliers and Code of Practice approved Products as a result of Designer, Builder, Roofer or Homeowner specification. As a result the proposed Systems Guarantee is an incremental value added offer to existing route to market and supply options.

Due to the "minimum performance" baseline requirements of the Systems Guarantee program it is highly likely that, in many instances, the component warranties offered by Individual Suppliers will offer additional cover to that of the proposed Systems Guarantee, and Suppliers will therefore be actively encouraged to promote their individual value propositions within the Systems Guarantee program.

Who will run the proposed Systems Guarantee Program?

The proposed Systems Guarantee Program will be run by a separate Guarantee company in order to mitigate potential liability issues. The Systems Guarantee Management Company will also provide Designer, Builder, Roofer and Homeowner customers with the protection of an independent platform to manage Warranty and performance issues, which is of particular value if a Supplier was no longer around. It is also intended that the Systems Guarantee Management Company will be a NZMRM financial vehicle to lift and maintain standards and to actively target metal roofing growth opportunities. It will also provide the Industry with a co-ordinated vehicle to communicate with the Homeowner in regards to their maintenance responsibilities.

Who is on the NZMRM Systems Guarantee Sub-Committee?

- Phil Prior - Roofing Industries and Sub-Committee Chairperson
- Shane Atherton - Freeman Roofing
- Chris Back - Taranaki Steel Formers
- Warren Oliver - Franklin Longrun
- David Welsh - Dimond
- Gary McNamara - Consultant

Please do not hesitate to contact Gary McNamara directly on 021 975 891 if you would like any further information on the proposed NZMRM Systems Guarantee Program.

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PUSHING THE BOUNDARIES



Faced with a steep, tight site in central Auckland, designer Hamish Stirrat knew he would have to literally push the boundaries to achieve his design brief for a four-bedroom family home.

As Hamish, of Fabricate Architecture, says, "It was clear from the outset that the project was going to be anything but straightforward. The client's parents had subdivided a section, which resulted in a 300sq m site with a very steep gradient. The couple was planning to start a family and wanted to be close to the family network, so the proximity of the site to the family home and the city was very attractive. If the couple were able to build a house on the difficult site and to budget then they could have the land. If not, they would sell the land to help finance a home further from the city and family support."

He says the brief for a four-bedroom, two-bathroom home with a large open living space and two off-street carports on the north-facing site in itself was not difficult. It was the small, steep section with heavily imposed council restrictions and a tight budget that provided the challenges.



"It was evident from the onset of the design process that a number of planning infringements were required to make any house work on the site," Hamish says. "So from the beginning of the design process the neighbours were consulted to create an open dialogue between the clients and their immediate community."

He says the cooperation of neighbours in signing off any infringements was vital and that meant he had to come up with a design that was sympathetic to the neighbourhood and not too imposing.

"In profile, the dwelling is conceived as a simple archetype pitched roof form that reflects the traditional villas, bungalows and state houses that surround the site," Hamish says. "To ensure the large mass did not dominate the site, it is split into two and relevelled to absorb the gradient of the site. This helps to articulate the house as well as reducing potential overshadowing and view restrictions from the neighbours' properties.

The home is arranged on the slope so that the upper two-storey wing is a level higher than the offset lower two-storey wing, creating a three level home with the wings joining at the middle level to create a large open plan living area, with two bedrooms and a bathroom on the top level and the same again on the bottom level. The roofline is gently gabled.

Hamish says apart from getting neighbours' buy-in, using longrun metal cladding and roofing was an important factor in meeting the budget constraints and achieving the design aesthetic.

He says, "Although there was inevitably going to be large earthworks costs for such a steep property, as a strategy to conserve the budget, complex engineering for the balance of the house was reduced to the bear minimum. The lightweight standard timber structure



perches comfortably on low cost timber pole foundations that anchor into the rock 6m below ground.

"Using light steel cladding was an integral part in 10-20% reduction in framing costs."

He says longrun was an ideal solution for a number of reasons:

"It allowed us to use the same sub-contractor and supplier for both the roofing and the cladding, which gave us both time and cost efficiencies. "It is a proven and robust cladding product that has a straightforward maintenance schedule that is easy for the client to undertake without too much fuss. Particularly as there are very some very hard to reach areas of the house, to say the least. "It has a handsome appearance that has a degree of elegant modernity to it."

Hamish says being Fabricate's third house with longrun material, they felt confident they could squeeze a bit more design detail out of it, beginning with arranging the cladding vertically.

"With this project we wanted to develop the standard supplier's details and spend a little more time working with the installer to create bespoke junction detailing. As the overall form of the house is relatively simple we needed to fine-tune the typical details to ensure that the overall appearance of the house retained a degree of effortlessness. Once we understood the principles of how to use profiled metal, we have found that there is a certain freedom to achieving different and unique details that is often not possible with other cladding products.

He adds, "As the overall form was boxy we really wanted the windows and doors to look like they were penetrations in a mass, rather than framed window openings. Traditional open head, sill and jamb details in vertical long run cladding require large overlaps to absorb the difference distances to the corrugates. Often this is too difficult to coordinate in the drawings as onsite tolerances can change from project to project. So we needed a flexible jamb detail so we could place a window or door anywhere along a wall regardless of where crest or trough is. To achieve this we reversed the detail so the flashing runs in behind the cladding. This detail essentially acknowledges that water is going to enter negative

detail and an internal soaker flashing deflects this and expels it at the bottom of the wall.

"Another example would be the external corner junctions when a window is located in close proximity. This becomes a complicated staging process as you start building up the composition of the corner. Previously this had been quite a laborious process that resulted in an unsightly number of fixings. With self-supporting flashings being made



of the same material and colour as the cladding we managed to fine-tune a fixing-less negative external corner that slides into position and is locked in place by top and bottom flashings.

"We find that the detailing is a constantly evolving process as we create highly tuned details out of necessity."

Creating outdoor living spaces provided another challenge on the tight budget and small site. "When you have only 300sq m with a house and two-car carport there's not much left for outdoor entertaining," says Hamish. "And with the budget we certainly couldn't afford to have a deck protruding from the house."

"Anything outside the building line of the house became a luxury that could not be entertained within the budget," he says. "So opportunities for outdoor spaces were found as a result of the building process. Outdoor patios were formed from cuts of the retaining walls required to stabilise the house into the site. The sub floor decks would have otherwise been a disused and unattractive space. But due to the steepness of the site are now sheltered nooks that get the sun throughout the day."



Inside, the home has plywood floors with a clear matt finish, white painted gibbed walls and whitewashed plywood ceilings.

The main living area has a higher ceiling than the two bedroom levels. Hamish says he is pleased with the design of the home, which sits well in the neighbourhood.

"It looks like quite a small house from the street; it's very inconspicuous."

Fabricate Architecture

Fabricate Architecture is an emerging design-driven architecture studio focused on delivering unique, functional and affordable results. Fabricate was established by directors Hamish Stirrat and Richard Pearce in 2012 and has grown to a team of six. Hamish says, "When you are starting out you tend to work on smaller, budget-conscious jobs, so we have to work a bit harder to create exciting design solutions at low cost."

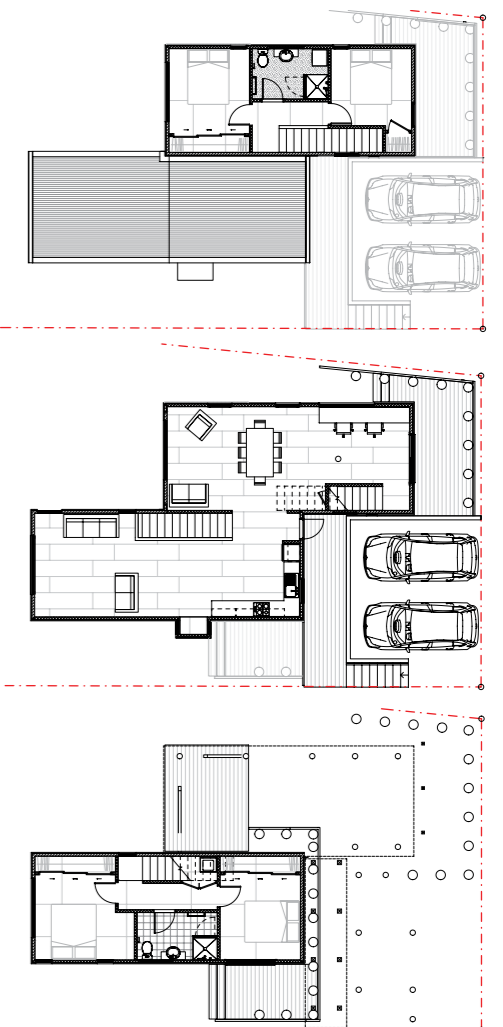
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RT7 'Slate Blue' (eastern wing) and
'Windsor Grey' (western wing)*

*Roofing Installer: Eden Roofing
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degree 'bend' in the home layout that replicates the curvature of the roadway and allows the front rooms to have direct views towards the roadside and beyond to the limestone deposits known as 'Black Rocks'.

The home faces north east, taking advantage of the site on the higher level of the hill in western corner of the subdivision. The hill behind provides a natural buffer to the southerly and south westerly winds creating a "micro" climatic resulting in warmer temperatures within the

development. Obvious examples of this show in the landscape planting which is barely a year old and has thrived on site with little adverse wind hindering it's progress.

Energy efficiency is addressed through the orientation of the building on site, with sunlight control through the eaves and verandahs. Earth wool insulation is installed and rated R 3.6 to ceilings and R2.6 to all internal walls. Double glazing incorporating green tint glass provides for maximum UV protection within all rooms.



ELLEN COMES TO TOWN.

Ellen's New Home was built in a newly developed, elevated subdivision with outstanding views to the end of the Coromandel Ranges. This view

clinched the choice of the section as Ellen had previously lived on their 5th generation dairy farm on the northern outskirts of Paeroa for 58 years. Ellen loved open spaces and the thoughts of continuing to look at those ranges had instant appeal.

The brief called for a contemporary styled home on a demanding site at the base of a rocky hill within the

Paeroa township. Future proofing the design was very important and would enable the home to be compatible with the owners need for many years to come. Single level living, with three generous sized bedrooms, and level entry access to all external doorways was requested.

The home is designed to maximise all the views, especially as the site borders the end of a cul-de-sac. The layout demanded a 30



The effectiveness of energy efficiency is largely due to the site orientation for maximum winter sun penetration and the heat gain into the home that is captured with insulation, minimising heat loss.

Ellen has commented that the backup heat pump was barely used over winter with minimal power accounts justifying the extensive measures implemented during the design and build process.

The layout includes tiled, accessible showers in the bathroom and ensuite, with no shower doors. Wider doorways to all rooms and a short 1200 wide hallway width. The laundry and double garage are in close proximity to the kitchen for convenience.

The 'timeless design' links with the gardens and provides easy access from the kwila hardwood decks to the entry, The living room and Master bedroom have covered verandahs that open to external courtyards. Here the contemporary, mono- pitched roof overhang allows maximum penetration of the sun through PSP Suntuff Corrugated Polycarbonate roofing. The waterproof surface and dressed Cedar slats to the underside, break the intensity of light penetration into these rooms. The result, in winter, is to allow more light into all rooms rather than restricting the light with the traditional solid overhang.

The exterior materials chosen provide for a low maintenance external finish. Austral bricks with Linea weatherboard cladding, Dimond Styleline trapezoidal roofing (in Ironsand) compliments the use



of Cedar timber slatting to the underside of the verandahs and the Kwila decking. The roofing also matched the colour of the Multifit fascia system with 1/4 round spouting. These products have all been designed to minimise painting and maintenance to the exterior of the home.

Integrated into the design and construction of the project was a fully accessible landscaping layout over the entire site. This provides easily accessible paths within a rockery styled garden using the indigenous rocks found on site. The rock and retaining walls built to the front and rear, blend in with the adjacent hillside. A small grassed area and a level terrace provides an the important touch of lush green on the property. Screen fences and garden art add another dimension and personalise the project. Ellen's overall choice of planting injects colour and texture over the various levels. All are with ease of maintenance in mind.



DRS Architecture - Paeroa.

John and Judith Munro established their Architectural Design business in 2007. John had spent the past 23 years working for the Lockwood Franchise on the Coromandel Peninsula, adding his touch to 'hundreds' of Design and Build homes from Waihi Beach northwards.



Over the last 8 years they have enjoyed working on many residential and commercial projects undertaken throughout the Coromandel, Hamilton City and surrounding Waikato areas as well as a Lodge near Lake Rotoiti and projects in the Bay of Plenty. Commercial Projects have included Office Refurbishments in Paeroa and Auckland.

John's early experience in Civil and Structural Engineering allows him to work closely with Professional engineers employed for the projects. This simplifies the linking of all parts of the project with overall supervision of the Design process controlled by John through to the issue of the Building Consent with the Local Authority.

Judith's experience is in Kitchen Design and integration of the colours through the projects. Together they coordinate and take pride in their projects. Judith's interests extend to gardening with she and Ellen working closely together to implement the planting on this project.

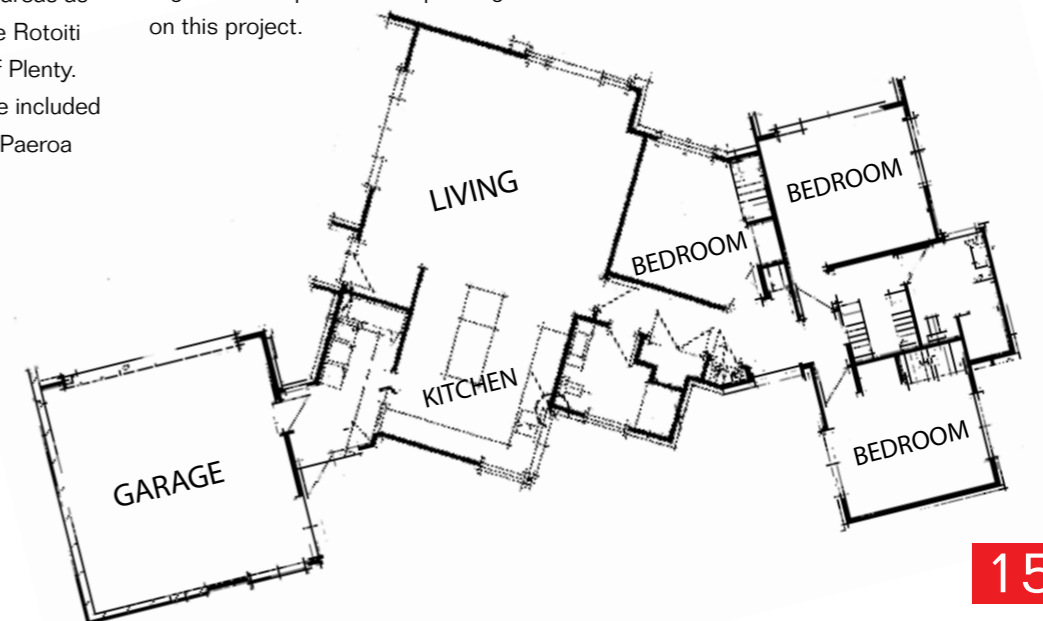
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SUSTAINABILITY AND COLOUR

Has architecture become part of the Fashion Industry and been cursed by mock sustainability (green-wash) and the absence of colour? A question perhaps we should all ask ourselves and to one very passionate architect, Daryl Cockburn, the answer is definitely yes!

Daryl writes:

Sadly architecture has become dominated by superficial fashion and thereby no longer a profession professing the wealth of successful precedence and international best practice for cost-effective, sustainable design and construction.

Often it would be more appropriate to give sustainability awards to the Mechanical Engineers who keep the buildings warm and cool in spite of the design. Many award-winning designs, including winners for sustainability, emphasise sustainability in terms of the visual environment which has become inappropriately dominant.

Vitruvius (1stC BC) got it right; "Nearly all good Architecture is commodious to fit its neighbours, not visually unusual or spectacular."

Complicated, high-cost, unsustainable, structural engineering is required to support cantilevers, leans and slopes in many of the buildings we are designing. They are often clad with glass which is one of the most unsustainable cladding materials. Even triple-glazing loses four times

the heat of 100mm batts, double glazing loses 700% more heat than 90mm batts and single glazing 1200%.

Structures should be simple in concept, having symmetrical plans, with short multi-spans, be as low-rise as possible and preferably using efficient sheet-bracing.

If District Plan height controls were measured to roof eaves, not roof ridges, it would encourage efficient roof trusses for simple pitched roofs, and cease the promotion of unsustainable heavy flat roofs, which are also more vulnerable to weather-tightness issues.

Controls should be defined in storeys to encourage tall stud heights, to permit tall windows, for the efficient gathering of daylight and sunlight. The old, beautiful districts of cities throughout the world are filled with tall windows, which is probably the easiest way of making cost-effective cubic buildings commodious, if not delightful.

The fashionable trend to colourless towns and cities, promoted by too many Architects, is a dull tragedy. Architecture is meant to be a profession whose members profess a body of learned skill gathered over centuries. It should comprise best practice based on precedence.

There is no city in the world which is black!

Aberdeen is probably the nearest with its indigenous dark grey granite, but it glistens in Aberdeen's soft daylight and frequent drizzle. Until the BNZ building Wellington had no black buildings and it should have remained on its own, unique. Since then several black, macabre, monsters have arisen and many Art Deco and Neo-classic landmark buildings have had their beautiful

modelling concealed by the removal of shadows and colour making them... black? Why? Is this an historical response to the horrors of war or the depression. Whatever the reason it is insensitive and ignorant of both history and heritage to paint them black. And what is the impact on the very young?

Traditionally black was only used on the trim of mock Tudor buildings and the like, or on shop-front glazing bars and doors, to allow the eye to easily pass to the products on display. We are one of the creatures evolution has blessed with coloured vision to enable us to select ripe fruit or nectar. We should celebrate the gift of colour whenever possible.

Worldwide the most attractive, commodious, cities are homogenous in materials and colours. The homogeneity often extends into the landscape and skyline. In Spain and Broken Hill the terracotta ground colour is the most sympathetic natural colour for buildings. In Wellington various shades of cream show sympathy to our clay, and green is sympathetic to our bush. Off-white cloud colours are appropriate and Inter-war buildings probably used pastels such as sky-blue to great effect, as did Plischke in the design of Massey House

White roofs which reflect heat but don't radiate heat, and are good for longevity, are by far the most sustainable for painted roofs but where they dominate views traditional Barn Red and Steelite Green have been an attractive part of our suburban scenery for perhaps a century.

And as for sustainability on roofs and buildings; Does black attract unwanted heat? Does it radiate unwanted heat? Does it have a long sunlit life? These are questions we all need answers to before we simply "follow fashion" as that would be completely irrational.

As a profession we, as architects and designers, have a real responsibility to guide our clients in the direction of good, logical and sustainable design. What we create now will have a lasting effect on future generations long after fashion trends have changed.

Following are example of colour used in sympathy to their location and design.

The Palazzo apartments are rarely on the market partly because they are very sustainable. Most windows were blocked-up to maximize the area of insulated building envelope and provide the minimum glass permitted by the code. The 3 storey roof-top houses have no structural steel and rely on sheet-bracing for wind and quakes.



The Palazzo

The windows without balconies are painted fakes. Painted in clay cream which is sympathetic to Wellington's natural environment combined with a white roof for sustainable, minimum radiation of wanted heat, and reflection of unwanted UV

St James

These 2 buildings in Newtown have metal roofs which can be seen and are therefore painted in a Wellington tradition; Barn Red or Red Oxide.

Council's planning rules required demolition for car access. It took 3 planning applications to convince them to conserve the old brick Sunday School (beside the church). It contains probably one of the best rows of narrow houses in NZ, each only 2.7m wide but 100sqm in floor area. Each has 3 double bedrooms and 2 bathrooms.

The west wall of the new "barn", which is above the car-parking, is close but gives the townhouses total privacy. The 2 barn houses face east



St James

sustainable with no excavations (except for piles), no car-parking & no cart-dock. It has the maximum area of insulated envelope permitted by the code and the minimum permitted glass. Painted sympathetic to Wellington bush green and white clouds.



Astelia Hotel

Astelia Hotel is architecturally (not mechanically) possibly one of the most sustainable high-rise buildings in NZ. Its floor plans are very efficient, and is structurally almost 100% symmetrical for perfect seismic response. Very



Il Casino.

Peddle Thorpe Montgomery made good choices for **Il Casino**. Another Wellington green on Wellington cream clay, with white trim and very dark brown for the shop-front frames.



IN THE BEGINNING . . . THERE WAS EARTH, RAIN AND SUN

“Earthship Te Timatanga’s first power bill: in credit!”

So declares Sarah Rowe, partner of Gus Anning, in a November 2015 entry on Facebook, marking yet another step toward the couple’s bid to be self-sustaining in their ‘Earthship’.

The concept was created and developed in the 1970s by American architect, Michael Reynolds who named the method ‘Biotope’ and the design ‘Earthship’ and defined Earthship as a building that conforms to principles of self-sustainability: a self-contained, impact-minimising, land-based ‘ship’ designed to work in harmony with the environment

– and a statement against mass consumerism.

Located near Tairua in the Coromandel, New Zealand’s most recently constructed ‘Earthship’, Te Timatanga (‘the beginning’) qualifies in all respects. Made from recycled materials (notably mud bricks, 7000 glass bottles and 1300 recycled

tyres rammed full of earth), this off-the-grid Earthship collects and recycles its own water, contains its own sewage, grows much of the family’s food and, through a combination of active solar heating and thermal mass construction, also generates its own energy. A low-slung, single-storeyed building consisting of four



bedrooms, a bathroom, and an open-plan kitchen and living room, Earthship Te Timatanga is imbedded in the hillside behind it while its north-facing wall, which fronts an atrium, is entirely of glass and so maximises the sun's warmth while also reflecting the ever-changing images of the sky.

During the day the sun's energy is absorbed into the tyre walls and stored within a thermal capacitor created by the shawl of banked earth wrapped round three sides of the building. As the air cools, the thermal energy is released, thus naturally maintaining a consistent temperature. Whilst the atrium 'super-heats' in the sun to create a power source for storing within the rammed-mud tyre walls, strategically positioned natural ventilation circulates air and ensures comfortable room temperatures throughout the home through all

seasons regardless of weather conditions.

Plants not only thrive within the atrium, they provide both food and shade for this Earthship family. Interior walls are constructed of mudbricks and light earth building techniques. Gus and Sarah have also utilised glass bottles to harness natural light into the house. The walls light up like jewels in the evening sun.

Huge logs support the roof which, according to Earthship specifications, can be covered in any material that is suitable for capturing water. The water drains into cisterns from where it is filtered and stored, to be used for drinking, cooking and cleaning. After first use it becomes 'grey water' and is filtered and fed to the plants. Surplus grey water goes to the toilet cistern from which the 'black water' is flushed into a natural-

flow wormorator. Eventually, when sufficiently broken down, it gravity-feeds through a drainage field to fertilise the stone fruit orchard beyond.

For their roofing, Gus and Sarah chose Insulated panel longrun COLORSTEEL®, 'thunder grey' in colour to blend with the distant, sometimes hazy Coromandel mountains and the dusky manuka bush surrounding their valley – and they chose Metalcraft Roofing Ltd to supply and install it.

"We particularly liked that Metalcraft is a 'one-stop shop'," says Gus. "They installed their insulated sandwich panel system on the roof, fitted the appropriate flashings and also supplied the PV solar panels." (In this case, a 4.25kW array consisting of 17 x 2.5KW solar panels, each with its own micro-inverter). Interspersed with the adjustable ventilation apertures, the



panels are attached to the strip of north-facing roof running the length of the house.

"Coupled with the design's thermal efficiency, the insulated roofing panels and energy generated by the solar panels, Earthship Te Timatanga works fantastically, with little fluctuation in the temperature of around 17- 20 C. Despite having three frosts shortly after we moved in, in early October, we enjoyed a comfortable 15° inside while outside it was -1° C and the glazing was iced up.

"We generate more power than we use and expect a daily export to the national grid of between 2.5 and 3.2 kWh (kilowatt hours) , amounting to a serious credit over the years – hence Sarah's jubilant announcement."

Roofing and cladding supplier:
Metalcraft Insulated Panel Systems
139 Roscommon Road, Wiri,
Auckland
Telephone: 09 277 8844

Roofing:
Thermospan EPS COLORSTEEL®
Colour: 'Thunder Grey

Roof and cladding installer:
Metalcraft Insulated Panel Systems
139 Roscommon Road, Wiri,
Auckland
Telephone: 09 277 8844

Metalcraft Roofing - Hamilton.
25 Sheffield Street, Hamilton
Telephone: 07 849 3807

Gutter & Downpipes:
Metalcraft roofing - Hamilton.
25 Sheffield Street, Hamilton
Telephone: 07 849 3807

Profile: 175mm Box gutter
Colour: Thunder Grey

Solar supplier and installer:
Metalcraft Solar
Telephone: 09 2723373

As seen on Grand Designs
New Zealand, with thanks to TV3



CHRYSALIS CHILDCARE CENTRE

Two large trees on a commercial site had proved a problem for development but architect Phil Smith decided to make them part of the solution.

Phil, of Collingridge and Smith Architects (UK) Ltd, says the mature protected trees – a pohutukawa and an oak – stand side by side on the site and had driplines that could not be built beneath. As he says, “This makes the site uneconomic for most commercial uses but actually presents a unique and beautiful opportunity for a childcare centre.

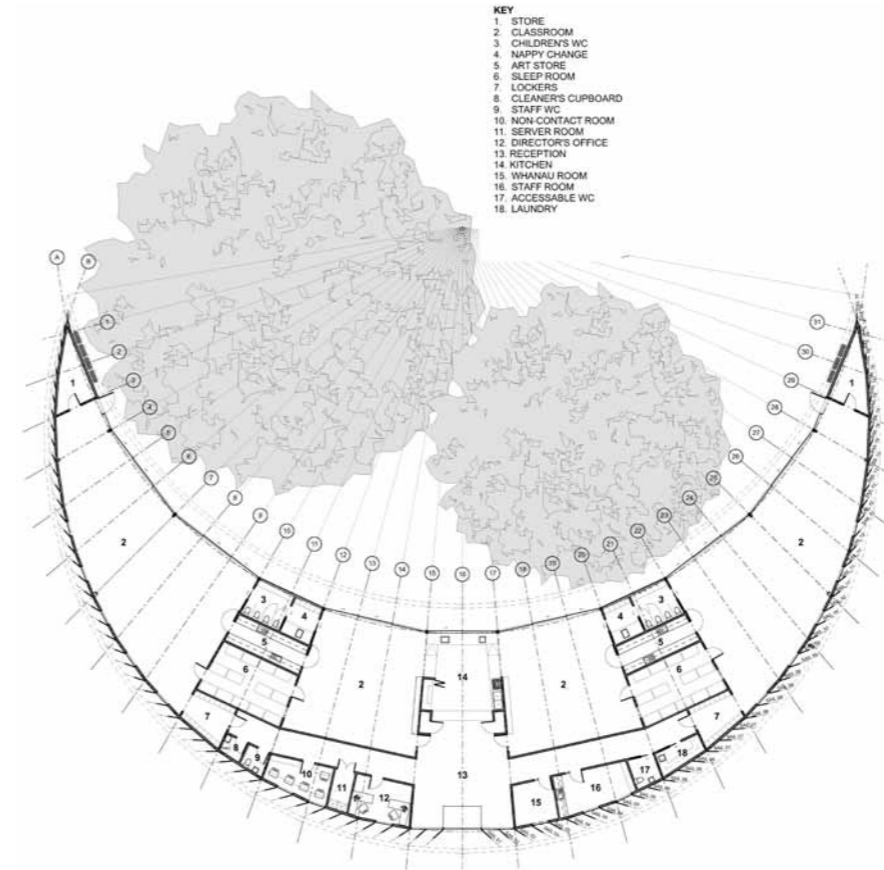
“For most developers the trees have been a big problem, but for early childhood they provide a beautiful and symbolic solution. One is an English oak tree, the other a native pohutukawa, both of equal size and stature, standing side by side, their branches touching at the

heart of the site. This symbolism forms the basis for the whakapapa of the site and its new use: a bi-cultural - and multicultural - childcare centre.

He adds: “In the traditional Maori view, the trees also represent Tane

who separated Rangi and Papa to create the world (of light). The design draws on this by creating a ‘void’ or space around the trees, which separates out the various elements of the new centre and provides a protective enclosure around the root zone. The building represents Papa (Earth Mother) who was locked in a tight embrace with Rangi (Sky Father), and so the graceful curve of the building appears like two arms reaching out to the sky. The elevation form further enhances this effect by keeping a respectful height below the trees, allowing good views of them from the wider environment.” Sanjesh Lal, of main contractor Keola, says: “The solution to the problem of the trees was to build the childcare centre in a crescent shape with 31 radiating gridlines – the apex is a point between the two trees. This means that there are no right-angled walls in the building; everything points towards the trees. The shape of the building protects the roots of the trees, and the glass is oriented north to allow it to collect as much winter sun as possible under the lowest branches. Overheating in summer will be avoided because the oak tree will be in leaf.”

Phil Smith says further symbolism can be found throughout the design, the most striking being the sail forms around the outer curve of the building. These are based on traditional Maori sail forms but honour all the cultures of New Zealand, all of whom originally made the journey by sailing boats.



"We could not use metal profile for the roof as the facets could not be flashed (the whole roof consists of facets of 2 degree pitches, set out at a common height from the canopy facing the trees. Also a membrane allows us to fully seal the roof, which is useful due to the extensive leaf fall from the oak tree. The metal profile takes the place of plywood and allows much greater spans to be achieved for the membrane – the metal profile can then be supported on DHS purlins at 1200 centres (instead of timber rafters at 400 centres for ply) yielding a considerable saving in structure and cost.

"The reason for using the warm roof idea was simple – once we knew we had to use membrane, we only ever design them as warm roofs, which is standard practice in the UK as the dew point is moved to the outside of the build so condensation risk is designed out. There is also no need for venting to the roof space, which is also a leak risk due to the amount of penetrations - with butynol every 25-40m2 needs venting."

Sanjesh Lal says because the roof is both curved and sloping it presented a challenge when it came to the gutters, in terms of the direction of the rainwater flow on a flat roof. He says the design maximised the rainwater flow to extremely wide gutters, large outlets and overflow systems.

He says with the large trees dropping a lot of leaves, especially the oak in autumn, it was an issue for the concealed gutters.



"The layered effect of the overlapping sails also recalls traditional carving patterns whilst the curve of the building represents the Koru or unfurled fern frond. They also give a dynamic form to

the building when viewed from the road, a constantly changing experience as the viewer moves around the building. The Dimond Rib 50 cladding and the sails subtly interact; the smooth sails,



contrasting with the rib of the cladding, to give a layering effect which again recalls Maori carving patterns."

While the Dimond Rib 50 is on display, the more innovative use of metal roofing is not. Longrun was used to create a "warm roof" system for the centre.

As Phil Smith explains, "The warm roof system utilises metal profile roofing to support rigid PIR insulation onto which the membrane is fixed.



"If the gutters were to block, there's the risk that water could go inside the building," Sanjesh says. "Collingridge and Smith designed the gutters so that they were slightly lower at the front than at the building side. This means that any overflow goes over the side of the gutter onto the ground, rather than inside the building."

Sanjesh says the building is very much in synch with nature: it has solar panels, rainwater is re-used, there is LED lighting, and low VOC materials, paints and adhesives were used during construction. The design makes the most of natural light and ventilation as well as solar gain. During construction, about 70 per cent of waste materials were recycled, and there is an ongoing recycling programme within the childcare centre.

The cladding was pre-cut off site. This meant that there was minimal



wastage, the off-cuts could be directly recycled and it saved time on site.

The circular nature of the site creates a circular driveway around the building. This makes drop-off and collection of children safer, thanks to a one-way traffic flow around the building.

Sanjesh says the centre features Pacific motifs due to the fact that 68 per cent of school children in the surrounding schools are of Pacific ethnicity. There's a replica of a traditional Pacific village in the garden, complete with Maori wharenuis, Fijian bures, and Samoan fales. The nature theme continues, with an edible garden, to teach children about food and nature.

Inside, the centre is symmetrically laid out with a central reception area, with kitchen behind. On either side are almost identical mirror image layouts of classrooms, sleep rooms, toilets and changing facilities, with storerooms at the tips of the tapering arms so there is no dead space.

The reception area is designed to resemble the inside of a chrysalis – and there are also floor to ceiling cocoon walk-in play structures. The chrysalis theme is important; not only is it the name of the childcare

centre, but it also represents the owners' approach to childcare. They say: "A chrysalis is a protected stage of development, where care is first and foremost, followed by development and transformations that are calm and unhurried, yet filled with wonder and amazement."

Collingridge and Smith Architects (UK) Ltd

An award winning international architectural practice, founded by Graham Collingridge and Phil Smith, Collingridge and Smith Architects

(UK) delivers unique, innovative and sustainable architecture. With offices in the United Kingdom and New Zealand, Collingridge and Smith Architects (UK) design and deliver projects that range from refurbishments to new-builds; from domestic scale to urban master plans; from conception to completion. Phil and Graham's experience covers a broad range of typologies – masterplans, mixed-use schemes, residential; offices; cultural; educational; healthcare and childcare.



Architects: Collingridge and Smith Architects (UK) Ltd
28 Spencer St, Remuera, Auckland,
Telephone: 09 529 0403
www.casa-uk.com

Main contractor: Keola Homes Ltd,
Telephone: 09 627 7124

Cladding: Dimond Rib 50 'Black'
Cladding supplier: Dimond,
Telephone: 09 634 0575

Roofing: RoofLogic Base Deck
Designed as a substrate for warm roofing systems, the RoofLogic Base Deck is a 0.75mm zinc aluminium coated trapezoidal base deck. It can be installed over timber or steel purlins.

Roofing supplier: Roofing Industries, Telephone: 09 414 4585

Roofing Installer: SWP Commercial, Telephone: 09 307 5851

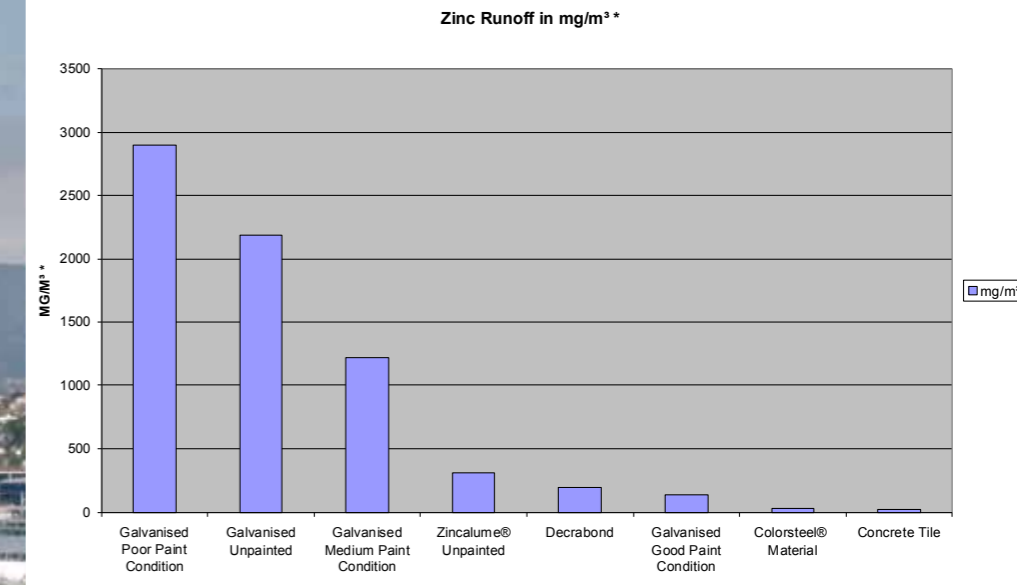


THE PROPOSED AUCKLAND UNITARY PLAN

In Scope 39 we discussed the upcoming issue of the Proposed Auckland Unitary Plan (PAUP) 2013 containing provisions not allowing the use of unpainted metal roof (or wall) cladding. This includes ZINCALUME® which has a surface 80% of aluminium, and ignored the large number of galvanised roofs dating back up to 100 years. The NZMRM/NZ Steel position has been that in the 20+ years that Zincalume® has been the predominant roof cladding, the zinc run-off levels (certainly those from metal roofs) have been steadily decreasing as galvanised/zinc roofing has been steadily replaced with ZINCALUME®.

We also had this discussion with the previous ARC in 2005/6. At that time Dr. Bryan Shedden of Bluescope Australia made a presentation to the Auckland District Councils based on work done by NZ Steel and NZMRM which showed that the level of zinc run-off from Zincalume® was minimal.

At the time this was accepted as clearly showing that from roofing alone by far the greatest level of zinc run-off came from galvanised (100% zinc coating) roofs of various ages. These of course constituted at the time (pre-ZINCALUME®) the majority of Auckland (and NZ) roof cladding. A report by the then Auckland City Council at about the same time showed that a significant and steadily increasing contribution to zinc in stormwater in fact came from motor vehicle tyres which



* Kingett Mitchell Average Results

contain zinc oxide, and which of course increases steadily as does the traffic. In September 2014 in a technical paper to the Water New Zealand Conference in Hamilton, Dr. Shedden delivered a thorough critique in great and technical detail on the theory that zinc run-off from metal roofing is actually harming aquatic biota, and demonstrated that it is not.

This is far too long and complicated to publish here in its entirety although as a published document it is available, on the Water NZ website - https://12240-console.memberconnex.com/Folder?Action=View%20File&Folder_id=390&File=b_shedden.pdf

In September Dr. Shedden and various expert witnesses presented at the PAUP hearings on Topics 046 and 049, and we now have to wait until next year for the outcome. However, it is important to grasp the basics of what could significantly increase roofing costs across New Zealand if accepted.

Here Dr Troy Coyle of New Zealand Steel summarises the key findings from this important presentation, as well as other relevant publications.

ZINC TRENDS IN AUCKLAND WATERWAYS: IS ZINC SOURCE CONTROL FOR ROOFING JUSTIFIED?

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)¹ 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)². In his study, 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. 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.

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)³.

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, 2007⁴ 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)⁵ 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.

What other data exists to support Auckland Council's position?

To determine the impact that zinc might have on an environment, we would need to know four key things:

1. the baseline levels of zinc that are naturally present in that environment;
2. the zinc levels that the environment can tolerate without any more than minor adverse effects;
3. any trends in zinc concentration levels, which, as discussed above, Shedden (2014) has shown to be predominantly decreasing in Auckland waterways; and
4. the bioavailability of the zinc present in that system, which the literature suggests reduces when the zinc binds with organic matter in soil/sediment and reduces as stormwater travels downstream.

Baseline Levels of Zinc

Data relating to baseline zinc levels in the Auckland region are not extensive. This is important data to have because some

systems have what might at first seem relatively high naturally occurring zinc levels, e.g. due to the chemistries associated with local geological features. For example, measurements on an uncontaminated river (the "Kleine Nete" in Belgium) show that a high quality ecosystem has an average total zinc concentration of 60.0 µg/l, with concentrations ranging from <20.0 µg/l to 140.0 µg/l (Van Assche, van Tilborg and Waeterschoot, 1996⁶). It is worth noting that these ranges are consistent with total zinc concentrations measured in Auckland waterways and reported in Shedden (2014). It is also worth noting that soils in the Auckland region are often volcanic in nature, and are therefore naturally rich in metals that would be considered contaminants in other environments.

Zinc levels that the Auckland Environment could tolerate without any more than minor adverse effects

Zinc at environmental levels (i.e. indirect exposure via the environment) does not create human health problems (Bodar, Pronk and Sijm, 2005⁷). In fact, the World Health Organisation considers zinc deficiency to be a widespread human health issue with around thirty-one percent of the global population having a deficiency in zinc, contributing to almost one million deaths per annum (Caulfield and Black, 2004⁸).

Since zinc is an essential element for life, any given ecological community will have an optimal

range of zinc concentrations. This limit has not been defined for Auckland waterways. The amount of metal added to natural waters that is required to produce a given biological response, such as a reduction of growth, is different for different waters (Allen, 1996⁹). While no studies have been identified that specifically review optimal zinc concentrations for Auckland waterways, it has been reported that optimal zinc concentrations range between 1.0-50.0 µg/l for European alluvial lowland river habitat (Van Assche, van Tilborg and Waeterschoot, 1996) and that a zinc benchmark (though it is not defined if this is an upper threshold) of 120.0 µg/l is considered protective to marine and freshwater life (State of Oregon Department of Environmental Quality, 2014)¹⁰.

Van Sprang et al. (2009) predicted a "no effect concentration" for zinc to be between 22.1 µg/l and 46.1 µg/l in European river basins. Median total zinc in fresh water streams in Auckland ranges from 1.0 µg/l to 44.0 µg/l, with only one site at 110.0 µg/l (Shedden, 2014). Thus, the reported zinc concentrations in Auckland waterways and the predominant trend towards declining levels of zinc in those waterways (Shedden, 2014), combined with the lack of reported cases of zinc toxicity and Auckland zinc concentrations being predominantly within the optimal zinc levels reported in the literature, suggest that there is not a high risk of any more than minor adverse effects from zinc in surface water.

Auckland Council has undertaken

benthic health analyses to investigate benthic health in coastal sediments, specifically focusing on concentrations of total lead, copper and zinc (Anderson, Hewitt, Ford, and Thrush, 2006; Hewitt and Ellis, 2010; Lohrer, Hewitt and Townsend, 2012). What has not been shown is that measures designed specifically to reduce zinc (and only zinc) runoff into stormwater will improve benthic health. The individual effect of zinc in the system, differentiated from the effects of other contaminants and sedimentation has not been determined. This is important as contaminant levels will tend to be higher when sedimentation rates are elevated. When compared against international sediment quality guidelines (such as ANZECC, 2000), it appears that the vast majority of sediments tested in the Auckland region have only low levels of zinc contamination, "thereby offering a high level of protection for sediment-dwelling species" (Shedden, 2014).

Bioavailability of Zinc in Auckland Waterways

Bioavailability refers to the rate and extent to which a particular form of zinc might be taken up by an organism (Wallinder et al., 2001). When determining environmental effect, the bioavailability of the zinc needs to be considered (Van Assche, van Tilborg and Waeterschoot, 1996). This is because not all forms of zinc are bioavailable. Most zinc in runoff is likely to be present as hydrated Zn²⁺ ions, which is the most bioavailable zinc form (Heijerick, et al., 2002; Wallinder, et al., 2001). However, in marine

sediment, zinc is no longer likely to be in a bioavailable form due to the availability of complexing organic and inorganic compounds.

There was no evidence in the literature reviewed to demonstrate that zinc in sediment is readily available to benthic organisms. Since several papers report that soil will remove the majority of zinc in runoff, including the bio-available form (Bertling et al., 2002), it does seem reasonable to assume that zinc in sediment is not bioavailable to benthic organisms. Therefore, any conclusions regarding environmental effects that have been based on marine sediment zinc studies are unlikely to be reliable.

Zinc concentration in runoff and its bioavailability will decrease by "several orders of magnitude" after it is released to surface water (Heijerick, et al., 2002). The presence of organic matter and suspended solids can also lead to a major decrease of metal bioavailability (Heijerick, et al., 2002). Therefore, any risk of environmental effect is rapidly attenuated by removal, dilution and reduction in bioavailability as stormwater travels downstream (Brix et al., 2010). Further, Brix et al. (2010) warned that "collection of stormwater samples directly from rooftops results in samples that are in considerable disequilibrium with the environment" and this contributes to "overestimation of impacts from stormwater runoff when the default assumptions used to assess point source discharges are applied".

Conclusions

Where statistically significant trends in zinc levels in Auckland waterways occur, they are mostly observed to be declining, particularly in freshwater systems. The market's move away from galvanised steel roofing to bare zinc aluminium coated steel roofing, which has only 10-15% of the zinc runoff levels of galvanised steel, is likely to significantly reduce zinc runoff from roofing. There have been no reported cases of zinc toxicity in Auckland waterways and zinc concentrations reported for Auckland waterways appear to be consistent with zinc concentrations reported elsewhere in the literature, and trending downwards. Therefore, given the evidence base for declining zinc levels, the lack of demonstrable environmental effects and the consistency with optimal zinc levels reported in the literature, Auckland Council's stringent regulatory approach to zinc source control via control of bare zinc aluminium coated steel roofing and cladding is unjustified.

¹ Auckland Council. (2013). *Auckland Unitary Plan Stormwater Management Provisions: Technical Basis of Contaminant and Volume Management Requirements*. Auckland Council Technical Report 2013/035.

² Shedden, B. (2014). *Critical Review of Zinc Trends in Auckland Streams, Estuaries and Harbours*. Water NZ Conference, (p. 17). Hamilton.

³ Timperley, M., and Reed, J. (2008). *Central Waitemata Harbour Contaminant Study. Development of the Contaminant Load Model*. Prepared by NIWA Ltd for Auckland Regional Council. Auckland Regional Council Technical Report 2008/038.

⁴ Shedden, B., Batchelor, J., and Chizmar, J. (2007). *Roof Runoff Study by New Zealand Metal Roofing Manufacturers*.

⁵ Parliamentary Commissioner for the Environment (2012) *Water Quality in New Zealand: Understanding the Science*. Parliament New Zealand, 93 pp.

⁶ Van Assche, F., van Tilborg, W., and Waeterschoot, H. (1996). *Environmental Risk Assessment for Essential Elements Case Study: Zinc*. International Workshop on Risk Assessment of Metals and their Inorganic Compounds (pp. 171-180). International Council on Metals and the Environment.

⁷ Bodar, C. W., Pronk, M. E., and Sijm, D. T. (2005). *The European Union Risk Assessment of Zinc and Zinc Compounds: The Process and the Facts*. Integrated Environmental Assessment and Management, 301-319.

⁸ Caulfield, L. E., and Black, R. E. (2004). *Zinc Deficiency*. In *Comparative Quantification of Health Risks: Global and Regional Burden of Diseases Attributable to Selected Major Risks* (pp. 257-279). World Health Organisation.

⁹ Allen, H. (1996). *Importance of Speciation of Metals in Natural Waters and Soils to Risk Assessment*. Report of the International Workshop on Risk Assessment of Metals and their Inorganic Compounds, (pp. 141-157).

¹⁰ State of Oregon Department of Environmental Quality. (2014). *Reducing Zinc in Industrial Stormwater Fact Sheet*. State of Oregon Department of Environmental Quality.

SCOPE NEWS AND VIEWS



David (left) received his award from RANZ president Mark Tinning, who, following the AGM, was succeeded by Graham Moor, with Mark remaining on the RANZ Executive.

2015 RANZ Roofing Excellence Award

Wanaka-based David Strudwick is the winner of the 2015 Roofing Association of New Zealand's Roofing Excellence Award, recognising high achievement in the industry.

David received this prestigious award at the Roofing Association's annual conference, held in Wellington at Te Papa in June. His 21 year journey in roofing began in Napier as a 19 year - old, from where he progressed to Australia for a few years before settling in Wanaka, joining Calder Stewart Roofing to work on more complex contracts, learning much from visiting European craftsmen. "My aim is always to stand back at the end of a job and make people wonder how it was done," says David, commenting on some of the difficult and challenging roofing installations his company has performed.

David, who is 39, co-owns About Roofing Ltd, formed in 2007, and is proud of the company's reputation for the quality roofing they perform – predominantly in the high-end residential market.

"I really enjoy learning and am always trying to improve my skills", says David whose prize included the unique Stuart Thomson created trophy with a framed Roofing Excellence Award Certificate along with a prize package valued at \$3500.

His innovative approach has proved important when it comes to solving intricate details and David has worked hard to pass his knowledge onto his employees including seven specialist tradesmen and four apprentices.

Barry Condon, of Sarah Scott Architects Ltd worked with David on the new \$1.9m Holy Family Church in Wanaka, a complex design with significant challenges for any roofing contractor. He said David provided excellent advice on the complex roofs which were a vital part of the design and this project received a Regional Award from the NZIA for Public Architecture, About Roofing's workmanship, quality and finish playing a large part in this.

Unusually this year, there was such a close finish between two of the entries for the Excellence Award that a runner-up prize was required and was awarded to Mike Burgess, project manager for Architectural Metalformers Ltd, Auckland.

For further information:
Jenny Bain, Roofing Association of New Zealand
Email: rooflink@roofingassn.org.nz
Phone: 09 415 0278



Dave Washer (left) receiving his award from Metrotile NZ's Siva Muldaly

Tauranga company wins roofing award

A 680m2 metal tile roof covering two dwellings won top honours in this year's Roofing Association of New Zealand's Professionalism in Metal Tile Roof Installation Award. Dave Washer of Roofing Systems Ltd installed the roof which the judges said was a pleasure to look at with the straight lines of this expansive roof.

Sponsored by Metrotile NZ, the award was presented at this year's Roofing Association conference in Wellington.

Features of the design included multiple angles and dormers, sloping soffits, valley flash points, Dutch gable returns, valley exits and hip gable junctions – all installed to a very high standard.

With seven roofing installers in the company Dave's approach to training apprentices is to be positive while insisting on high standards. He feels the greatest challenge for the roofing contracting industry is finding people with the right attitude.

Dave and wife Dominique, both keen on paragliding and kite surfing, will head to the Gold Coast for the \$1500 prize for winning the RANZ Professionalism in Metal Tile Roof Installation Award.



FOWLER HOMES WATER FRONT GOLD



Building a waterfront home requires robust but sympathetic materials. The owners of this home in Mapua, west of Nelson, fulfilled the first requirement by choosing ColorSteel® roofing and cladding, and the second one by opting for the material in New Denim Blue to mirror the colour of the sea just metres away.

As well as providing a visual link with the water, the colour of the cladding and roofing also helps the home to fit in with its setting. The New Denim Blue cladding wraps around the bedroom wings at either end of the house, with the central living spaces clad in cedar to provide contrast and break up the volume of the building.

Designed and built by Fowler Homes, the seaside dwelling won a Gold Award at the Nelson-Tasman Registered Master Builders House of the Year Awards last year. It replaced an older house that was deemed beyond renovation and had to sit mostly within the original footprint.

Part of the design brief was to maximise the spectacular views across to Rabbit Island and to provide extensive decking so the owners could relax outdoors during different times of the day and under various weather conditions.

The central living area opens to decks on both sides. If an onshore breeze is blowing, the owners can use the sheltered deck at the rear that wraps around the swimming pool. Large glass sliders front and back provide a sightline through the house so that even while on the back deck the owners can still enjoy the water views. Glass balustrades have been used around the pool to create a sense of space and unobstructed views.



The interior has been designed with easy, relaxed living in mind. The flooring is American oak, chosen for its knots and graining as part of a laid-back, rustic look echoed by the stone-look feature wall in the living room that has a recycled beam embedded in it to provide a mantelpiece over the wood burner.

The kitchen has a spacious island that doubles as works pace and breakfast bar, and there is also a seaward-facing breakfast nook in the kitchen with views out to the water. Large picture windows in the master bedroom also frame the sea views.



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