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SCOPE

NZ METAL ROOFING MANUFACTURERS INC.

SCOPE

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BIG SKY FARM

Employing Kiwi ingenuity is second nature to farmers so it's no surprise that a Ngatea couple were willing to think outside the square when it came to the design and build of their new home. Delwyn and Campbell Clayton-Greene wanted a striking design for the family home on their Hauraki Plains dairy farm but at an affordable cost.

They met both those criteria with the design input of architect Malcolm Taylor, of XSite Architects, and by using Metalcraft's ThermoSpan EPS panels for the house's walls and roof.

Malcolm explains his brief and his design solutions: "The house had to be fun and relaxed for a family who love to cook and entertain. This is a very active family that has four generations that connect to the local community.

"The house needed to be affordable and we discussed how to achieve this. They were open to new construction techniques, and commercial detailing allowed the design to move outside NZBC acceptable solutions and with the use of Metalcraft composite panels, the roof and walls become a key to meeting the budget. This allowed the construction program to be reduced through prefabrication. "This also has allowed the house to remain simple in form, warm and quiet - with double the insulation required - and also allowed us to become bold with a dark exterior cladding that recedes into the landscape and has no thermal bridging issues."

Delwyn says, "Rotary cow sheds are commonly built out of these panels because they go up quickly and they provide good insulation and sound proofing. We had just built a cow shed out of them so we were familiar with the material and it fitted with the vernacular of our home being on a dairy farm."

Malcolm Taylor says using the panels was a "very affordable solution" at a building cost of about $2000/sq m because the panels are easy to put up and don't require finishing externally or internally.

ThermoSpan EPS panels consist of a 0.59mm profiled roofing sheet bonded to a polystyrene core with a flat 0.59mm ceiling panel sheet bonded to the underside. The tongue and groove panels are slotted together easily and quickly, and sealed in place. The product is more commonly used in commercial and industrial applications.

The wall's of the Clayton-Greene's home are 'Ebony' coloured and in the Silkline profile, while the roof is 'Titania' in 5 Rib. The internal flat sheets on ceilings and walls, where visible, are in 'Cloud' to provide a neutral coloured backdrop.

Delwyn met Malcolm Taylor when he gave a presentation to her interior design class. She and Campbell called on him to design their new home using simple, robust materials.

"I like the modernist aesthetic so glass, concrete and steel was perfect," she says. "And Malcolm did a great job of making it all work."

Delwyn says the long, low and dark-coloured house hugs the land and is shielded from the wind and the road and any traffic noise by two mounds built up on its southern side. Malcolm says, "The owners liked the idea of the 'black stealth', a building that sits low in the landscape and doesn't say look at me. The two berms at the entrance to the house push the wind and the road noise up and over the house and you come in between these so that gives you a sense of protection and surprise as you arrive in the courtyard in front of the house."

The mono pitched roofline rises from south to north with the ceiling soaring over the dark-stained strand board walls in the living spaces.
"We wanted to show the roofline right through the house so the walls don't go up to the ceiling to show off that floating roof and that's part of its charm," says Malcolm. "And the strand board with its texture is quite a nice foil to the sleekness and coldness of the industrial materials."

He adds that strandboard is a cost-effective material and using it in walls that don't meet the ceiling – thereby eliminating the need for stopping - was a way of saving money as well as highlighting the roof.
It was the same sort of thinking that went into using the EPS panels, which cut labour costs.

"A third of the cost of building is labour so if you can half that, that's a huge saving," Malcolm says.
Inside, the home has an insulated polished concrete slab floor while acoustic panels have been placed overhead to cut down on noise. The panels also house downlights.

Double glazed aluminium joinery in addition to double the insulation required in the walls and ceilings creates a thermal envelope that means very little heating is needed. "We have one heat pump for the whole house and there is a panel heater down the kids' end of the house that we use when it gets really cold," says Delwyn. "We get quite a lot of sun on the concrete floor during winter because Malcolm has designed the house for passive solar gain and that heat gets released at night."

The house is laid out with a garage, laundry and mud room as an annexe at the rear of house, to one side of the forecourt.

Malcolm says the family did not want to waste space on hallways and corridors so the plan form lays out all the social spaces to the north and wraps the sleeping spaces at each end. The study to the east and the lounge to the west act as circulation spaces to serve the bedrooms.
The core of the home is open plan living that flows out to a north-facing, covered courtyard with open fire. A cedar feature wall extends out to provide shelter on the eastern side of the courtyard, while the fire is surrounded by CorTen steel for a rustic look.

Delwyn designed the kitchen, which was her "little pet project" as the family enjoy entertaining and she loves cooking. She placed the cooktop in the island bench so she could interact with guests while preparing food.

One of the unusual elements in the home is the bathtub in the bathroom that sits hard up against an external glass door that slides away to open the room up to the outside.
As Delwyn explains, "We are not spa people so we thought if we could have a bath that is kind of outside then that would be a great compromise."

She says the home, which picked up two NZIA regional awards last year, is a tribute to Malcolm Taylor's design and detailing, making something spectacular from humble materials.

"Most people don't realise what the house is made of and get quite a surprise when we tell them."

XSite Architects

An award-winning practice, XSite Architects is driven by the desire to design work that contributes to the natural and urban environment. It values the traditions of good architecture while aiming to produce work that challenges the client, the end users and the community as a whole. "We aspire to work within and compliment the existing landscape, be provocative and inspiring, and to create structures and spaces that continue to uplift us."
Founded in 1997 by Malcolm Taylor, XSite's expertise extends beyond architectural design to encompass a range of disciplines required in boat interiors, sound studios, space management, landscape design, lighting design, graphics, urban planning, retail, office interiors and refurbishments, commercial redevelopments, industrial buildings and residential projects.

Architect: XSite architects
Malcolm Taylor
Telephone: 09 585 1011
malcolm@xsite.net.nz
www.xsite.net.nz

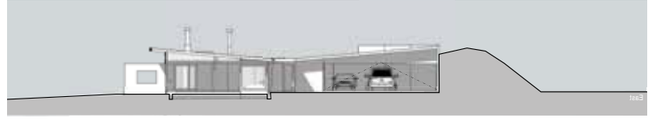
Roofing and cladding supplier and installer: Metalcraft Industries,
Telephone: 07 575 7032
Roofing: ThermoSpan EPS 5 Rib
Colour: Titania
Cladding: ThermoSpan EPS Silkline
Colour: Ebony

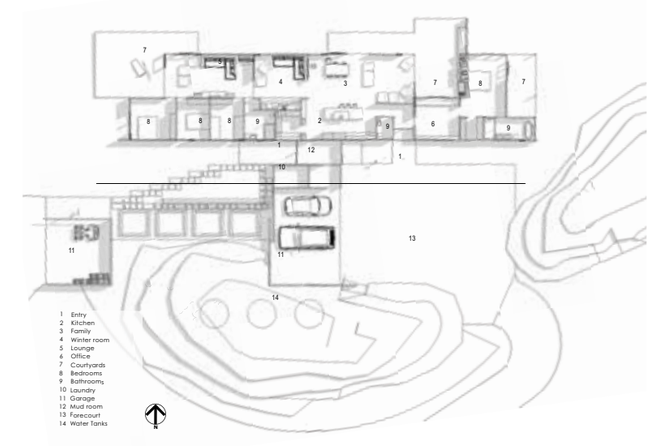
Builder: Matt Walker Builders,
Waihi, Telephone: 07 863 6305

Engineer: BSK Engineering,
Rotorua,
John Kronast,
Telephone: 07 315 4787

Concrete Floor: GDP Flooring Solutions, Tauranga,
Telephone: 07 571 8003

Acoustic Panels: XSite Architects.





TODAY'S METAL TILES ARE NOT "DECRAMASTIC"

For the older generation "decramastic tiles*" means a scallop-shaped metal tile roof coated with stone chip. The issues that were often attributed to the product have, by some, continued to be associated with the new generation of acrylic, stone chip, metal tiles manufactured today.

The reality is they are totally different products and processes.

The issue of stones coming off the Decramastic roof surface was brought to public attention in 1978 in the NZ program "Fair Go". What the public was not made aware of was the product in dispute was 15 years old and already superseded by a superior product. Nor were they generally aware that the manufacturer was successful in bringing a defamation claim against the broadcasters for misleading and incorrect statements.

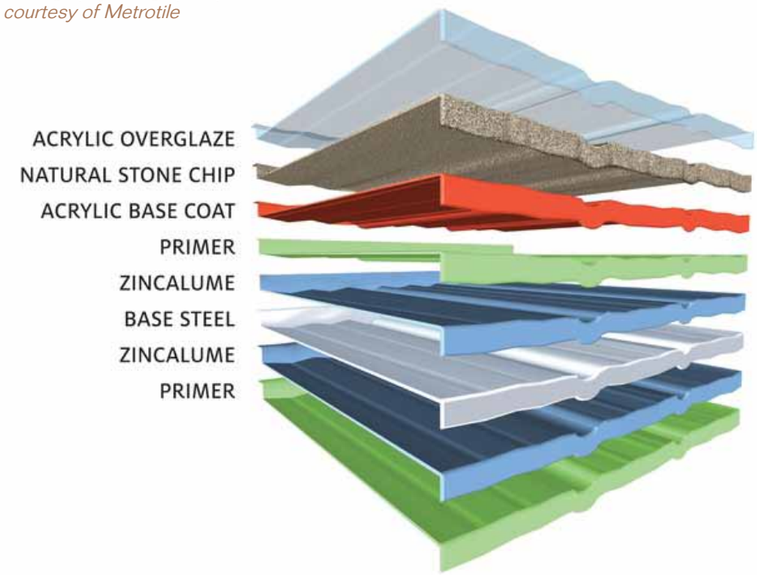
Unfortunately this television program meant the general population became concerned about chip loss on metal tile roofs. But in testimony to the protective nature of the product there are still many of these roofs in service today, 50 years later, that have or can be restored with modern technology.

The idea of the chip coating came from an Englishman, Ben Booth, who developed a process for coating steel sheet with Bitumen onto which sand or grit was applied to prevent the sheets sticking together when stacked. It has been suggested that this was also to reduce glare as a form of camouflage during the wartime period around 1940.

In the early 1950's Lou Fisher, an Auckland entrepreneur, met with Ben Booth and recognised the greater potential and acquired a licence for the process. It wasn't until 1962 that the company first produced a metal tile to replace the previously coated corrugated iron sheets being used.

** Note: No comparison can or should be made between the name decramastic and the internationally marketed Decra Brand.*

Photography and graphic provided courtesy of Metrotile



In 1976 AHI Roofing initiated a major research program with the then modern technology of acrylics. By 1980 the new acrylic based product had replaced the barrier system which used the old Bituminous emulsion. These metal tiles were marketed under the brand Decrabond and New Harveytile.

In 1989 the largest installers of steel roofing tiles in Auckland engaged an engineer and chemist to develop what was to become Metrotile.

Today there are numerous manufactures of pressed metal tiles; Gerard, Metrotile, Metalcraft and others. All use similar technology, with some variations in formulation, and none use bituminous products in their manufacture.

Today's pressed metal tiles use ZINCALUME® as a base with an acrylic coat over laid with natural stone chip with a second coat of acrylic overglaze.

The stone chips used today are similar to the originals with some synthetically coloured chip blended to offer a wider choice of colour combinations.

The range of tile profiles offered in today's market is extensive. From the traditional to low profile slate and shake products.

While there is some differences between the warranties offered by products and brands most offer a 50 year pro rata warranty.

SCOPE NEWS AND VIEWS

Prickles or flashings

In the days gone by when there was only galvanised coated product used and soldering was the tried and true method for sealing, this method provided a fully sealed joint suitable for use with prickles.

With the introduction and more extensive use of colour product on Zincalume coated steel silicone sealant has become the only recommended method to fully seal the surfaces together. If the sheet pan is accidentally cut, silicone once again is relied upon.

Architects today still want the look of prickles along the ridge line but with out the possible risk of leakage over the life time of the roof.

Dimond (and some other manufacturers) are not prepared to stand behind prickles when the system is so reliant on the sealant and workmanship on site to provide a leak free roof in excess of 15 years. The NZ Building code requires a 15 year durability period on materials which is difficult to achieve when silicone sealant is the main sealing component in the system.

Note: This technical information is supplied by Dimond. The MRM COP, other Manufacturers and NZ Councils do not necessarily share this point of view. Please check with your supplier.

Check out Dimond ridge details and change in pitch details on their website www.dimond.co.nz for an alternative solution to prickles.

Metalcraft Roofing presents Kahu®

Metalcraft Roofing's newest roofing and cladding profile, Kahu®, not only represents qualities of elegance, endurance and style but also features an innovative double capillary overlap to the side lap. This double capillary overlap allows for greater weather performance and provides an extra capillary barrier to the standard capillary groove. Another great feature of Kahu® is that it requires only a one-rib lap, this increases the cover width and speeds up installation time.

This means the cover sheet size is increased and installation time and costs are reduced, making Kahu® a cost-effective roofing and cladding solution.
Kahu® is designed for roofs to 4° minimum pitch. For wall cladding the extra capillary groove can be omitted for a smoother appearance.

Kahu® can be both horizontally and vertically laid.

Manufactured at Metalcraft Roofing's Christchurch branch using steel sourced from New Zealand Steel. Kahu® is available nationwide in COLORSTEEL® ENDURA® and COLORSTEEL® MAXX®.

Kahu™ specifications:
Sheet width: 950 mm
Cover Width: 875 mm
Minimum Pitch: 4°
(Minimum pitch will increase depending on sheet lengths)
Application: Residential, Commercial; Roofing and Cladding
Orientation: Roofing and both horizontally and vertically laid cladding

For further information contact
Metalcraft Roofing
Telephone: 09 274 0408
or visit their website
www.metalcraftgroup.co.nz

Metrotile launch the new Titania Colour in their Shake profile.

Platinum Homes have chosen a Titania roof to showcase their new Karaka Harbourside showhome.

Platinum Homes were looking for a roof tile featuring the wood grain appearance of a traditional shake that would create an eye-catching contrast with the dark cladding they propose for the home currently under construction.

Platinum Homes selected the Shake profile, which is renown for its strength, a quality that provides a much harder wearing roof surface for foot traffic as other trades complete the build. The Metrotile Shake satin finish tile features a deep ribbed profile designed to enhance shadow lines and create visual contrast. With Metrotile Shake home owners can enjoy the aesthetic appeal of the traditional shake profile combined with all the benefits and strengths of lightweight steel.

The contrast between the new Titania colour and dark cladding will accentuate the strong design lines which can be seen, even while under construction, on the gables where the Titania V-ridge barge caps stand out against the black timber fascia boards.

For further information on the new Metrotile Titania Shake contact
Ross Roofing Group
Takanini, Auckland
Telephone: 09 299 9498
or visit their website
www.metrotile.com

An apology to Cooper roofing

In Scope issue 40 we published an article on the Chrysalis Childcare Centre and omitted any reference to Cooper Roofing who were contacted to supply and fix the Dimond Rib 50 cladding.

The design of the building is unique and the continuous curve to the building proved to be a complex challenge as each of the junctions, between black panels, had to allow for thermal expansion to avoid buckling. The building also slopes from the high points of the crescent centre to the lowest point, closest to the ground, so each panel had to be ordered and tailor made to fit. Likewise the flashings were each unique and gave an excellent finish to the building.

" We were excited about the challenges the project posed and took considerable time to calculate the time and materials required" says Penny Alexander. "Cooper Roofing collaborated with the builder and architect to ensure the flashing and cladding design followed the design intent. The project is one we are very proud of as it did not fit the usual cladding specifications and our team, Wayne Holland and Richard Alexander, led by our skilled and experience supervisor Kevin Peri, did an amazing job."

For further information contact Penny Alexander, Cooper Roofing.
Telephone 09 478 5588. Email; cooperroofing@xtra.co.nz

BUILDING IN THE BUSH

Building a home takes huge amounts of optimism and fortitude, especially when you are working parents with two pre-schoolers to look after while overseeing and helping with the construction of a bespoke home.

That was the task facing Michele Powles and husband James after they sold their home, intended to buy a larger home for their young family but then decided to build on a sloping, south-facing site in West Auckland with views of the Manukau Harbour.

After they bought the section they had a false start with one architect before getting architect Glyn Bilkey on board for the project.

Michelle says they wanted to create a family home that was as sustainable and energy-efficient as they could afford. So they opted for a two-storey layout that captured the views to the south as well as bringing sun into the house from the other aspects.

They wanted a house designed for passive solar gain that was well insulated and well ventilated – and future-proofed as the family matured.

The layout of the home features the master bedroom, en suite and walk-in wardrobe on the western end of the ground floor with the eastern end of the house occupied by the garage. The staircase and laundry sits between the two wings.

Upstairs, there are three bedrooms and the main bathroom on the eastern side, with kitchen, dining and lounge at the western end. The lounge sits on the southern side and is warmed by a highly efficient firebox. The dining and kitchen area sit on the northern side with the dining space opening to a deck covered with Clearvue panels. Glyn says he arranged the layout of the home across the sloping section to optimise the views and sun.

"Because the views are to the south, we had to frame the views rather than just doing all glass on that side," he says. "They were keen on passive solar heating of their solid concrete floors so the windows have been placed to heat up the floors, including the clerestory windows, which can also be used as a heat stack for ventilation."

To accommodate those north-facing clerestory windows, Glyn had to design the home with two roof planes – a steeper south-facing roof and a lower-pitched north-facing roof. Due to the lower pitch of five degrees on the northern plane, standard corrugate couldn't be used so the couple opted for the strong profile of Dimond's Veedek.

In keeping with the couple wanting a low cost, low-maintenance home, they chose Dimond Corrugate in ColorCote MagnaFlow for the cladding with some cedar weatherboard accents.The Dimond Corrugate in ColorCote MagnaFlow was chosen for its resistance to sea spray off the harbour and the ease with which it can be washed down to maintain the pre-painted surface.

Due to the "cost implications" of building on a sloping site, Glyn had to use his design nous to give the couple as much home as possible. He came up with a self-buttressing structure to form the base of the house. The ground floor is a solid concrete box with a concrete slab on the bottom, concrete block walls and a suspended solid concrete ceiling. These insulated concrete floors not only give the home its structural strength but also provide the thermal mass to keep the home warm.

Glyn's design also used thicker timber framing upstairs - 140mm versus the standard 90mm – which allowed for better insulation: R5.2 in the ceilings and R3.2 in the walls. The concrete walls downstairs were insulated inside and out, and the home has a weatherproofing and airtightness membrane system. With a heat exchanger and ventilation system installed, as well as hot water heat pumps, this makes for a comfortable and energy-efficient environment.

Michele says James, an industrial scientist, contributed a lot of technological expertise to the build on top of the couple rolling up their sleeves to keep labour costs down.

"He had just finished a big commercial laboratory build so he had done a lot of research for that." Michele says there were compromises along the way but she got what she wanted with a standalone bath downstairs with a view, and James insisted on having a garage/workshop that came in handy as a work room/storage area during the build, particularly when the rain pelted down as it is wont to do in the Waitakere Ranges.

She adds, "We were going to add a fourth bedroom at a later date but we were told it would be more expensive to do it that way so we included it and just had to make the top floor a bit smaller to fit our budget. "

That fourth bedroom has a fold-down bed so it can be used as a guest room or rumpus room. Michele, a writer, had hoped to have a third floor office but that idea was dropped in the face of the cost involved. Instead, a separate office of 10sqm was built in a similar style to the home with the same Dimond cladding and roofing.

Michele, who has written a column for the Stuff website on the build as well as a blog about it at www.buildingboxes.co.nz, says all the research, dramas and compromises have been well worth it. Although she is not sure she would want to do it again.

"The children are really enjoying having their own house and it was great to come back to when we went away over Christmas," she says. "It's a beautiful spot with bush views and sea views and you can see the weather roll in."

Architect Glyn Bilkey

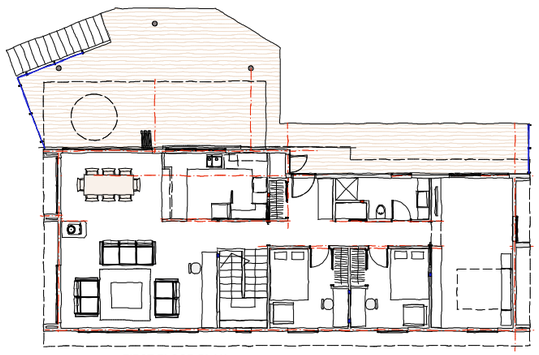
A sole practitioner for 36 years, Glyn Bilkey has experience in residential and commercial projects. A graduate of University of Auckland's School of Architecture, Glyn has designed homes and been involved in restoring historical ones, as well as being involved in design and build work with firms such as Canam Construction. He has also seen many of his designs for churches built over the years.

Architect: Glyn Bilkey
Telephone: 09 410 1604
bilk@ihug.co.nz

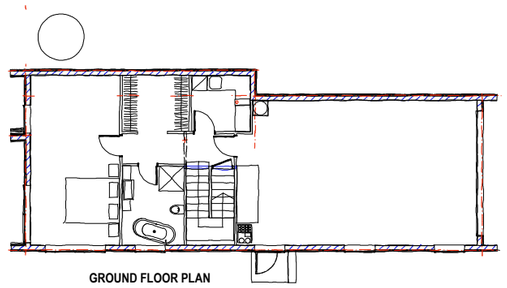
Roofing and cladding supplier:
Dimond
Telephone: 0800 DIMOND (346 663)
Roofing:
Black ColorCote MagnaFlow
Cladding: Dimond Corrugate in
Black ColorCote MagnaFlow

Roofing installer: Tin Tin Roofing
Marcus Bond
Telephone: 021 775 915

Builder: Xsite Construction
Mike Kennedy
Telephone: 021 887 622



FIRST FLOOR PLAN



GROUND FLOOR PLAN

NIKAU HOUSE

Like many downsizers, the owners of this Parnell townhouse wanted something that was more ‘lock up and leave’ after their children had left home and they sold the Remuera family home.

As they explain, “After we had sold in Remuera we ended up renting in Parnell. We didn’t know Parnell that well but we got to know it and decided it was a great place to live.
“The problem was we couldn’t find anything we wanted to buy.”
So when a site that had been subdivided into four lots came up, the couple purchased one to build on.

Before they bought the 500sq m site, they enlisted the help of SGA (Strachan Group Architects) to make sure it was suitable.

“We were interested in the sight lines and views of the harbour we would get if we built a two-storey home,” the couple says.

“We knew we wanted some very basic things like three bedrooms and downstairs living - upstairs has views of the harbour but we wanted downstairs living for the indoor-outdoor flow.”
They also wanted a warm, well-ventilated home that was inviting for themselves and guests.
“The emphasis was more on the feeling of the house; how you felt when you walked through the front door.”

Not only did the couple get the architects involved early but also their builder.

“In the design process there was a lot of to-ing and fro-ing but one of the pluses was having the builder involved as we finalised the design so we had buy-in from a lot of people and that helped with the design.”

The NZIA certainly agreed: giving the home two local awards in the Residential and Sustainable Architecture categories.
Lead designers Pat de Pont and Dave Strachan, of SGA, say the brief was to create “a light, airy, modernist design aesthetic in a house that could easily accommodate visitors and family when they come to stay.
The challenge lay in creating an innovative design within a tight urban context whilst still providing privacy, amenity and quality of indoor and outdoor space on a small site”.

The architects also had to “future proof” the home, giving it privacy from whatever might be built on the section closest to the street while providing bush and harbour views.
The architects say, “The trapezoidal roofing wraps around the structure to form the eastern wall - combined with slatted exterior timber screens to provide further privacy from future developments

“Considered placement of windows frame the views to the lush green bush gully, existing nikau palms and the Waitemata Harbour to the north.”

And they had to accommodate the couple’s desire for wall space to display art and to hold their book collection.

They did this by stepping the building down the site’s natural contour, “creating over-height spaces to the west, and allowing for the library’s tall shelving wall”
The architects were also required to fulfil the clients’ desire for a robust, sustainable home but with a pleasing aesthetic.

“An intrinsic approach to sustainable design is demonstrated in the garden and solar water systems, thermal mass and cross-ventilated spaces. Timber decking is used internally to create a floor that breathes, this combined with internal timber louvres in the upper level bedrooms creates convection airflow to passively heat and cool the home. The slatted screens also act as shading devices, helping to regulate the internal temperatures - casting patterns of shadow on the sunlit interior spaces,” the architects say.

"Materials have been selected for durability and a refined aesthetic. The timber and light colour palette reference Scandinavian design and provide a backdrop to emphasise the bold modern art collection. The result for the satisfied clients is a serene, quiet urban retreat with an understated luxury."

The couple say that using Roofing Industries Multidek 500 for roofing and cladding was a cost-effective solution but they also love the colour - 'Metallic Gunmetal' – and the profile, which give the home sharp, clean lines. That is shown to greatest effect where the roof folds down the side of the house in a waterfall effect with the junction between the two a Canterbury Prickle to continue the clean lines. "We liked the look of houses that used zinc so we tried to do something along similar lines but in a less expensive material," they say. "And we like the variations of shade and colour that the profile creates depending on the way the light hits it."

"Having a sharp look was really important to us," they add. "It was quite a tricky process but the roofers were convinced they could do it and they delivered."
Roofer Sean Thorburn, of Pacific Roofing, admits that trying to achieve that look had him worried and he spent weeks sweating on it. "I did try to talk the owners out of it because it would have been a lot easier for me to put a head barge on," Sean says. "But they were determined that was what they wanted so I had to go away and work out how to make it happen. "It was keeping me awake at night and then I actually had a dream about making a folding tool for it and woke up in the middle of the night and scribbled some things down for an engineer mate. We ended up making a custom tool for the job that slotted in the profile and clamped in there with big screws that we could use as a folding tool." Sean says they experimented with the tool on short sheets of Multidek 500 to make sure it would do the job.

"So when we got to the site it looked like we had done it 100 times before," Sean says. "But it was still a tricky process because we were working with 16 metre long sheets and I think the first day we managed to lay two sheets and from then on four or five a day."

Sean says the sheet measurements had to be precise and once cut they were folded to 90 degrees then straightened out a little so a team of up to five workers could manhandle them into place.

He says because architect Dave Strachan has a carpentry background, he was "very fussy about the detailing" of the cladding and roofing.

"Every screw had to line up and with the Canterbury Prickle he wanted the fixing through the tops and sides of the ribs rather than through the pan.

"He didn't like the idea of penetrating the pan even at the high point so all those things were detailed with him in the office. The holes were measured and marked and pre-drilled so that they were at points where the water is running off them rather than sitting on them."

Sean says the same attention to detail was focused on the flashings. "The set-out had to be perfect for the 100mm detail around the joinery and every single rivet on the flashing lines up because it was measured and marked."

Sean adds, "It pushed us to the limits but it's some of the best work we have done and we're very proud of it.

"It's a real detail of that house because as you come in that is what you see. The end result speaks for itself because it's a beautiful house."

The colour of the roof and cladding was matched with the architectural style of aluminium joinery used throughout the house to continue the theme of elegance and simplicity.

SGA

A multiple award-winning Auckland practice, SGA (Strachan Group Architects) is grounded in a specific and detailed first-hand knowledge of construction. The team brings a highly developed sense of craft to the task of creating sustainable buildings with precision and elegance.

The keen sense of attention that the practice brings to the interpretation of a client's brief is equalled by a rich and complex understanding of how to respond to the subtleties of site, the impacts of the natural environment and all the many contexts within which a building must operate. To these qualities SGA adds a precise understanding of the requirements of construction, with an advanced level of experience of prefabrication and the use of digitally controlled machinery in the fabrication of building elements under tightly controlled conditions.

SGA takes pride in its ability to communicate ideas about building as they develop in conversation with clients, consultants and contractors.

Inside, it's the same story with blonded timber creating a clean, timeless look, and the timber slats over the windows casting interesting shadows. Cleverly placed lighting makes the timber slats glow like lanterns at night.
As the couple say, "The challenge was to keep it simple, beautiful and elegant and that took good workmanship and attention to detail."

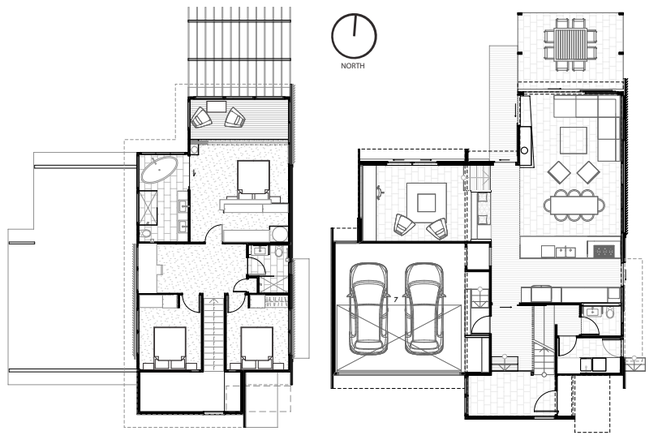
SGA (Strachan Group Architects)
Dave Strachan
Telephone: 09 638 6302
www.sgaltd.co.nz or

Building contractor:
David McGillivray Builders, Auckland
Telephone: 09 478 1858

Roofing Manufacturer:
Roofing Industries, Auckland
Telephone: 09 414 4585
Roofing and cladding:
Roofing Industries Multidek 500 'Metallic Gunmetal'

Roofer: Pacific Roofing Ltd Auckland,
Telephone: 0274 477 408
www.pacificroofing.co.nz

Engineer: Thorne Dwyer Structures, Auckland
Telephone: 307 2702



CASCADE HOUSE

This new 309 square meter cascading house is perched on a cliff, on the southern border of the of Seagrove Conservation Estate, in the Wellington suburb of Newlands. The site offers amazing, panoramic views of Wellington harbour and is less than couple of hundred meters from the shoreline. Clearly the primary reason the client's, Samir and Ketna Parekh, purchased this site was to take full advantage of the surrounding bush and seascape.

To create a home that was in harmony with the surrounding landscape, to take into account the slope, access, the neighbouring homes, planning requirements and limitations and to meet the clients brief and budget was not a simple task.

The site position and orientation is predominantly in a north/south direction with contour differences of over 11 meters from the top to the vehicle access at the bottom.

"We were fortunate," says architect Davor Mikulcic, " that our client worked with us and gave us the freedom to express our ideas. The family requirements were clear and we were able to reach agreement on key factors at an early stage in the design process."

The objective on such a sensitive site was to touch the ground gently, to avoid scaring the site with significant cuts and fills, and use the slope to the best advantage in creating indoor and outdoor living spaces.

During the initial concept stage activities were grouped into individual zones, which helped to

establish the design requirements further. The simple overlapping of individual blocks, dedicated to specific activities, that followed the sloping contour of the site provided many advantages and achieved some of the key goals. The final design is in essence a three storied building but rather

than simply stack the stories on top of each other, to reduce the cost and footprint, an interesting cascading form of platforms is created. This maximizes the best views, efficiently captures the sunlight and enables the creation of semi enclosed, open and sheltered courtyard spaces. The layering of the design avoids indoor and outdoor living spaces that simply float in the air.

Another very real consideration was the exposed nature of the site which is often buffered by strong southerly wind and rain and opposing this is the warmer, but strong westerly wind. The semi enclosed courtyard areas provide the best opportunity for sheltered outdoor activities.

To strategically take full advantage of the sloping site and to maximize the view, the decision was made to push the building, as much as practical, towards the back and towards the highest part of the property. This provided a large, flat front area for car access, turning and visitor car parking. One of the

very early decisions was to limit the buildings height so as not to obstruct the view of any of the neighbouring houses to the rear, This location also put the home a reasonable distance from the houses below.

“Our design research used a combination of free hand sketches, scale and computer models, investigation with manufacturers and installers.” says Davor,” Our goal was to assist our team in delivering the best results in innovative products and design solutions for the project, the site and client. The research encompasses every aspect of the project from landscaping, engineering, interiors and all other aspects of the building process.”

Studio MWA was given full freedom from their clients to choose the best and the most appropriate finishes for this project. When addressing the exterior finishes,

it was recognized that the chosen materials must be versatile, hardy and to emphasize the architectural composition and design intention.

The key factors which influenced the design and the choice of materials was the site location close to the sea, the tough climate conditions which will bombard the building and that the specific design came within the wind zone area of the building code. The clients required a tough low maintenance, cost effective solution for the exterior cladding.

A combination of concrete foundations and concrete block retaining walls helps to balance and minimize the quantity of cut and fill and to retain the majority of the soil on the site. The surrounding native bush was maintained and protected as much as possible. The elegant steel portal frames, posts and beams together with timber framing

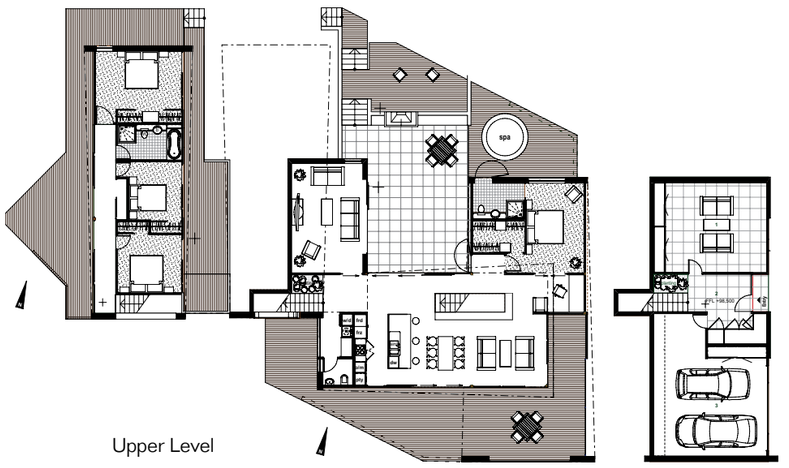
was chosen to be the main building structure in order to create the interesting folded cascading form.

Having experiencing similar demands on previous projects it was decided that the dominant material should be Colorsteel roofing and wall cladding. Hidden clip fastening was used to further eliminate many penetrations on both the roof and wall cladding.

Dimondek 400 – Colorsteel Maxx 0.55 BMT mm was specified. Colorsteel Maxx flashings matched the roofing/wall claddings.

Due to the extensive glazing, to capture the view and sun, there was a requirement to have top quality thermal insulation for the external walls and roof.

Natural materials were used to help blend with the environment and compliment the Colorsteel cladding. Hardwood decking, schist, cedar weatherboards, timber retaining walls and locally sourced exposed aggregate concrete for the driveway all added texture and softened the overall effect. Strategically located schist walls are inspired by the rocks from the local cliffs and the Colorsteel roof and wall cladding, grey tinted glass and the aluminium joinery also reflect the pallet of the indigenous the rocks and landscape in the



Upper Level

Central Floor

Entry/ground level

surrounding natural environment. The project brief required that the house be a four-bedroom home, with two living areas, a prayer nook, rumpus /studio area, double garage with storage area, an ensuite, main bathroom, separate toilet and laundry area with plenty of sheltered outdoor areas – opened and covered, including a BBQ area with an outdoor open fire and spa pool area accessible from the Master bedroom.

accommodates large storage cupboards and internal access from the garage. A straight flight of stairs, with an internal garden, leads to the central level featuring an open plan kitchen, living and dining area that provides easy access to the Master bedroom and prayer nook. All located towards the front of the house capturing the incredible views over the Wellington Harbour.

clothesline. Overall the central level occupies nearly 50 % of the home.

Flowing up from the entry hall and lower steps is a second straight flight of steps to a private, fully east orientated bedroom block which includes three double bedrooms with the main bathroom. A glazed hallway towards the west connects the bedrooms and bathroom. From this hallway there is easy access,

The ground level is occupied by a double garage with storage areas on the southern side and on the northern side a large rumpus room which could be used as a studio / office space or a fifth bedroom with walk-in wardrobe and ensuite.

The main entrance is centrally located and covered to offer protection from the elements.

One of the early design decisions was to create a central spine from the entry for easy communication and navigation through the building. It resulted in the entry hall which

Close to the top of these stairs is access to the sheltered North courtyard and on the opposite side another, semi covered and partially enclosed outdoor living area. On this level is a formal lounge that open towards the courtyard that enjoys the rising sun in the east. When required the lounge can be fully enclosed by large sliding glass panels and doubles as a home theatre.

Behind the kitchen is a separate service area which accommodates a toilet and laundry with access to the sheltered rear deck with a foldable

via large sliding glass doors, to the sheltered western deck. The top three bedrooms open onto the eastern terraces with the view towards Wellington harbour.

This flowing, cascading home blends and celebrates the natural environment both in its form, style and material choice. It is a hardy celebration of all that is New Zealand and sits comfortably into the local landscape.

Studio MWA

Environmentally sustainable design is one of the firm's main goals with a focus on thinking towards a better future. "Studio MWA strongly believe that a creative, functional and environmentally sensible approach, with a focus on each and every detail, are the key ingredients to produce quality design.

To Studio MWA the principles of orientation of buildings, use of natural light, natural ventilation, use of passive solar energy, use of natural, recyclable and environmentally friendly materials and finishes (preferable local), effective sun protection, reduction of energy consumption, providing living and working comfort without sacrificing spaces, use of energy, water efficient systems, recycling and waste management are the hallmark of excellence in design principles - Lifemark - are all an integral part of our design discipline.

Every project must have a very strong idea and the hands on approach and collaboration of the design team, from inception to completion, is essential in achieving the project vision.

The team is lead by principal and design director Davor Mikulcic whose design philosophy is simple. " Architecture is not fashion, it should be visionary and sustainable.

Only through hard work, collaboration, extensive discussion, research, consistent exploration and challenging ourselves, can we gain the freedom to express our ideas, visions and achieve extraordinary, quality design.

All our designs are site specific and we strongly believe that one of the main ingredients for good design is a result of a good understanding of the site and context."

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GREEN BUILDING

NZ Green Building Council updates the Steel Credit in Green Star NZ to something achievable.

If you build upmarket offices, commercial buildings or schools this should mean something to you. If it does read on to discover how we have finally made the steel credit applicable to NZ made steel. If this means nothing, read on to discover why you should know about it. You can now use steel made in New Zealand to obtain Green Star points.

Much of the general information about Green Star that follows is provided with much more detail, and more effusively, at the NZ Green Building Council website, www.nzgbc.org.nz., pages https://www.nzgbc.org.nz/Category?Action=View&Category_id=292 and connections, so this is just a summary with particular reference to the Steel Credit - MAT 8, and some of the lengthy history. I have taken some material from this website, thanks NZGBC.

Sustainable development

Back in the 1980s the UN, concerned about the even-then obvious diminution of natural resources appointed the Brundtland Commission to report on the issues. From this came the still valid definition of sustainable development as "development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs". Thus, sustainable development is the organizing principle for sustaining the finite resources necessary to provide for the needs of future generations of life on the planet.

Building Sustainability

In our modern landscape, even in rural New Zealand where agricultural activities have a significant effect on the overall sustainability of the country, one of the most important and long-lasting things affecting "development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs" is buildings, particularly non-residential buildings.

Hugely expensive in use of resources, energy gulping during life, and affecting the environment for many decades (at least as planned), how we build and inhabit buildings has a big effect on the overall sustainability of society. So does what happens to the buildings and their materials once their life is over.

Soon after this Commission reported, people started looking at ways to assess the design and construction of large buildings and developed ways of assessing their sustainability in a rational and repeatable way, so that standards could be set and individual designs created based on these standards, and able to be compared to the standards.

Green Rating schemes

Starting in the 1990s with BREEAM (1990) in the UK, LEED (2000) in the US, and others such as CASBEE in Japan, Australasia followed with the Green Star programme in Australia in 2003 and then Green Star in New Zealand in 2007.

ASB North Wharf: 5 Green Star Design. Office building

Use of Green building rating schemes

All of these rating schemes, or at least the ones we have looked at, are to do with the "greenness" or sustainability of the building during building and during the building's life. The sustainability of a building is created by considering various factors which contribute to the overall sustainability of the building during its creation and life. The building is what is rated, not the products. Products are only of note when they impact on the sustainability of the building.

Christchurch Civic Building – 6 Green Star.

Scope

Scope All of these schemes seem to have followed the same path. NZGBC started with Office Building Design, then Office Design and Build, then Interior Design and Build, and eventually they developed a version for Homes, NZ Homestar. NZ also has a specific tool for Educational and Industrial Buildings.

The term "Green Building" (or maybe "Building Green" is better) brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment and on human wellbeing. But, effective green buildings are more than just a random collection of environmentally friendly technologies. They require careful, systemic attention to the full life cycle impacts of the resources embodied in the building and to the resource consumption and pollution emissions over the building's existence. The aim of the rating process is to encourage the design and construction of sustainable buildings and improvement by innovation, and allow recognition of this by ranking.

Green Star NZ

Green Star NZ is a tool that rates and communicates the sustainability of New Zealand's commercial buildings. Green Star NZ was adapted for NZ from the Green Star programme developed by GBCA (Green Building Council of Australia). Green Star can apply to any non-residential building. There are specific tools to rate office, industrial and education buildings, as well as interior fit-out projects. Green Star can also be customised for other building types, such as hospitals and libraries.

A building can achieve a rating of:

- 4 Green Star - Best Practice
- 5 Green Star - New Zealand
- Excellence 6 Green Star - World Leadership

A Green Star assessment can be undertaken in both the Design and Built phases of a project. Design ratings occur earlier in the project, and are followed by Built ratings after completion to confirm the project has actually implemented the features that gained points for the Green Star Design rating.

Photography courtesy of Simon Devitt.

Te Mirumiru – 6 Green Star. NZ's first commercial earth-bank building. In 2014, the building won: the Leadership in Sustainable Design and Performance award at the World Green Building Council's (WorldGBC's) Asia Pacific Regional Network Leadership Awards; an EECA Award for Innovation; and an award for excellence at the Property Council NZ Rider Levett Bucknall Awards. The building was designed by Phil Smith of CASA Architects

To rate a building's overall environmental impact, the tool awards points across nine categories: energy, water, materials, indoor environment quality (IEQ), transport, land use & ecology, management, emissions, and innovation.

Materials

Products and Materials relate to Green Star in two different ways:

In the Green Star Materials category, which make up 10% of the points available in Green Star, credits set out criteria to address environmental issues with key building materials. Where these criteria are fulfilled points are awarded. This category tends to look at how the material itself has a reduced impact on the environment.

Steel

Globally the use of steel in a building (which includes reinforcing steel, structural steel and of course steel framing and wall and roof cladding), is covered in different ways. The allocation of possible points seems to depend on the steel industry in the country involved.

Green Star as originally developed in Australia concentrated on recycled content of the steel used in the building and the reuse of steel materials (e.g. steel beams).

In the first two versions of New Zealand's Green Star the steel credit read -

Mat-6 v1 or MAT-8 (v2/2009) Steel -,To encourage and recognise the reduction in embodied energy and resource depletion due to the use of recycled steel.

2008 Up to two points could be achieved by use of recycled steel at 2 levels

Green Star NZ - Office Design & Built v1

Credit Summary for:

Materials

Ref No.	Title	Aim of Credit	Credit Criteria Summary
Mat-6	Recycled Content of Steel	To encourage and recognise the reduction in embodied energy and resource depletion due to the use of recycled steel.	Up to two points are awarded where it can be demonstrated that the percentage of all steel in the design has a post-consumer recycled content greater than x %, as follows: • 1 point = 60 % by mass; • 2 points = 90 % by mass. If the material cost of steel represents less than 1% of the project's total contract value then this credit is 'Not Applicable'

2009 on Up to three points could be achieved by use of recycled steel at 3 levels (now includes a 30% level)

Green Star NZ - Industrial (Pilot)

Credit Summary for:

Materials

Ref No.	Title	Aim of Credit	Credit Criteria Summary
Mat-8	Steel	To encourage and recognise the reduction in embodied energy and resource depletion due to the use of recycled steel	Up to three points are awarded when a % of all steel, by mass, in the project either has a post-consumer recycled content greater than 50%, or is reused. Points are awarded as follows: • One point if 30% of the steel meets the criteria. • Two points if 60% of the steel meets the criteria. • Three points if 90% of the steel meets the criteria.

Note that the title was "Recycled content of steel" up to 2009. Then it changes to "Steel" but the content is the same.

Those who understand the NZ steel process will immediately see that any steel made by New Zealand Steel will not qualify. If you do know why, skip the next bit.

Steel making and recycled content

Steel is made by one of two processes - Basic Oxygen Furnace (BOF) or Electric Arc Furnace (EAF). These use different amounts of recycled steel (as opposed to virgin iron) as the raw material for the process. There are limits to the amount of recycled material that BOF can use but EAF can use up to 100% and relies on a minimum (30%) in order to even start the arc.

Until 2014 we had two steel makers in New Zealand and the system had evolved where NZ Steel (BOF) used up to 10% pre-consumer recycle (i.e. internal scrap), and no post-consumer recycled. Pacific Steel (EAF) used scrap exclusively. This meant that structural steel and coil steel for cladding and framing made in New Zealand could not get any Materials credits. Reinforcing steel did get credits for recycled content.

This situation did nothing to reward sustainable production of steel in spite of a sustainable manufacturing process (as reported in Scope). In fact the recycled credit just rewards the status quo and does not really encourage sustainable behaviour, which is an important part of the rating system concept.

Since 2014 there has been only one steel manufacturer - New Zealand Steel, owned by Bluescope Steel, which makes steel (including reinforcing steel previously made by Pacific Steel) only from ironsand at Glenbrook. So there were now no credits at all for NZ made steel. But you could import used corrugate from Asia, of any quality, and receive a credit for it.

Sustainable Steel Council

Not surprisingly manufacturers and downstream processors of NZ made steel (basically NZ Steel and NZMRM and NASH) were not happy with this situation. And building designers were not encouraged to use NZ made steel and get Green Star points for doing so. While 3 points out of 24 to a total of 10% may not seem a big deal, it would still be possible to get an extra point or two in a green building in order to move up a star rating. In any case we were offended that our very sustainably manufactured and sustainably processed steel was accorded no recognition while any recycled rubbish was.

In 2009 we formed the Sustainable Steel Council (now a part of Metals NZ Inc) at http://www.sustainablesteel.org.nz/ to promote the sustainable properties of our products (e.g. fully recyclable) and primarily to try and persuade the NZ Green Building Council to recognise our industry by providing achievable Green Star credits.

The process has consisted of repeated lobbying NZGBC about the sustainability of NZ steel production and downstream processing. We have had various proposals discussed, and during this time GBCA has changed the Australian steel credit to recognise sustainable manufacturing and remove recycled content. We contributed to the Christchurch specific rating tool (BASE). At all times we have been conscious of the need for the rating/credit to drive improvement and innovation not just to recognise the status quo (as some proposed changes would have).

Finally after Pacific Steel closed its scrap-using plant and now all NZ steel scrap is exported and all steel production is at Glenbrook using ironsand with no external scrap used, we have had some success.

Finally! The 2015 Green Star v3 Steel credit

MAT-8 Steel now has as its aim:
"To encourage responsible sourcing and the reduction of environmental impacts of steel building materials" and has as a Prerequisite Criteria (sic): "Responsible Sourcing It is a prerequisite to the achievement of any points in this credit that at least 90% of the steel used in the building is sourced from a Responsible Steel Maker".

Those of you who have stuck with me so far will see this is very different to the original versions (quoted above).

This, now published, has been through a number of similar but different versions during 2014 and 2015 and it is thanks largely to the persistence of SSC chairman Dr Stephen Hicks from HERA that we have the version we now have.
You can download the MAT-8 v3-0-0 credit from the NZMRM website.

Ceres Organics: 5 Green Star Industrial. A two-level office building attached to a large precast concrete warehouse. First food warehouse in country to achieve a Green Star rating.

Basically the steel credit requirements have changed from requiring recycled content at high levels to;

a) "responsible sourcing" (a prerequisite) - defined as;
"To be considered a 'Responsible Steel Maker' the steel making facilities from where the steel for the project is sourced must:
- *Hold a valid ISO 14001 Environmental Management System (EMS) certification or Enviro-Mark NZ Diamond level certification AND*
- *Be a member of the World Steel Association's (WSA) Climate Action Programme (CAP)*
- *Where Stainless Steel is used, the stainless steel manufacturer must be a member of the International Stainless Steel Forum's (ISSF) Sustainable Stainless Charter."*

And then

b) 'Product Sustainability' which comes from;
- *Reused products*
- *Third Party Certification*
- *Stewardship Programmes*
- *CarboNZero*
- *Declare*
- *CEMARS product certification (EPD was in this list at one point, but has been moved to "Innovation" which has somewhat different rules)*

And

c) 'Responsible Industry' which is defined as;
To be considered a 'Responsible Steel Fabricator/Processor' the steel supplier must:
- *Hold a valid ISO 14001 Environmental Management System (EMS) certification or Enviro-Mark NZ Diamond level certification.*
- *Enviromark Gold and Platinum will be recognised with a 75% weighting.*
- *Points are calculated by completion of the Green Star Materials Calculator.*

And

d) finally we have Innovation;
"The Innovation category aims to encourage and reward innovative and sustainability initiatives within the construction industry . Generally this recognises innovation and achievements that are not covered by the scope of Green Star or beyond the requirements of Green Star"

Summary

The Green Star building rating system aims to recognise sustainable building by awarding Stars. A small number of points towards this come from Material selection. Although this is not the case in some systems, Green Star in Australia and then in New Zealand awarded points for steel only for use of recycled content. Because of the manufacturing processes used in New Zealand this meant that steel made by NZ Steel at Glenbrook was not eligible for any points, although reinforcing steel made by Pacific Steel was. The Sustainable Steel Council spent many years lobbying against this, and suggesting that the scheme should aim to reward sustainable sourcing. GBCA changed the Australian Green Star rating to recognise sustainable manufacture and removed recycled content, in 2012.

Eventually, shortly after all steel production in New Zealand was located at New Zealand Steel and no scrap steel was recycled in NZ, the change was recognised by NZGBC to be needed and after over 12 months of discussion and a number of widely varying versions we have MAT-8 v3-0-0 which removed the need for recycled content and recognises both sustainable steel production and sustainable use of the steel in production processes.

The author, Stuart Haymen, was once a Green Star Accredited Professional (GSAP) to learn all about this slightly esoteric stuff.

Note that the very nice looking Green Star rated buildings shown here, although using steel, would have gained no points for using NZ-made steel. Now they and similar buildings can.

HAMILTON HELIPORT

When HeliCorp owner Brent Glover decided he wanted to take his business to the next level, new premises had to be part of the equation.

For about 15 years, HeliCorp had been providing a wide range of helicopter flight services including scenic charter flights, corporate aviation services and transfers, as well as aerial photography/ filming, surveying, lifting and frost protection.

But operating out of an old yellow hangar on the far side of the airfield at Hamilton Airport was not going to impress corporate clients or more affluent customers who wanted to use its services to access exclusive lodges or beautiful spots around the country for pursuits such as fishing or golf.

So the company commissioned Daniel Cullen, of Cullen Keiser Architecture, to create a multipurpose building of about 1000sqm floor area that would be big enough to house its four helicopters, with adjoining space for offices, a meeting room and passenger lounge.

Situated adjacent to the Hamilton airport terminal building, Hamilton Heliport would also provide a base for flight training operation Helitrain NZ.

Daniel Cullen says huge open spaces were required to house the helicopters.
"The hangars were split into 20m x 18m clear span bays, which stored two helicopters per bay. This required a clear span bi-fold hanger door of 18m wide and minimum 4.5m height. A hangar corner has been glazed to give all visitors to the airport a closer look at these magnificent machines. HeliCorp's fleet includes a Eurocopter EC 120, Bell Jetranger, Robinson R44 and a Eurocopter EC 130."

Essential to the design of the building was Coresteel's Bracketless Portal System. Joint director of Coresteel Waikato, Gary White, says, "With no supporting brackets or braces, the Bracketless Portal System is ideal for hangars, as it allows for the best utilisation of the floor and ceiling space – a vital element when storing aircraft."

During the Heliport project Coresteel managed the process from start to finish with their in-house design, engineering, manufacturing and construction teams.

Gary says, "Daniel Cullen also worked with us during the design process quite intensely so we could work out what things would cost, and the design did change a little bit during that process."

Daniel says a key part of his design was grounding the buildings in the day-to-day business going on in and around them, while making sure the spaces could operate independently.

"The office brief was to have a visual link to the building entry, air strip and hangars linking the environment into the work place. This was achieved by the full height glass in to the hangars and to the airstrip. The offices are of high quality and seem like a separate building from the hangars."

This seeming separation was created by cladding the hangars, which feature some exposed concrete tilt slab walls, in Zincalume Corrugate, while the two-storey office block is clad in Styleline and Nu-Wall Mono for a clean, modern look.

Daniel says, "The materials were used to link the surrounding area and to create a contemporary look.

The hangars were clad in horizontal corrugated Zincalume and exposed aggregate tilt panels with glazing on one corner for views into the hanger. Translucent roofing to the hangar bays and glass to the hanger doors provided natural lighting into the hangars.

He adds, "The training facility upstairs has a visual link to the air strip and the hangars below. The space is also available for hire and general team meetings. There is a specific separate entry for training seminars so surrounding businesses are not disrupted."

"The waiting lounge downstairs accommodates passengers awaiting flights or who have just arrived. The lounge has projecting views down the hanger and out into the air field. The visitor bathroom is catered for visitors before or after flights. The lounge also plans to be used for the occasional national and international flights from alternative airlines which require a facility to process customs for a more private terminal."

A feature of the building is the cedar slats around the top. Daniel says, "Cedar battens were used for sun protection to the north and setting sun to the west and provided a break in materials and colour." Polished concrete floors gave a natural look through the main entry and lounge, with carpet to the offices. The visitor bathroom is tiled floor and walls with high quality fittings.

Daniel says that at the time of the build the air strip was being re-sealed, so some of the asphalt removed from the strip was re-used and compacted as hard fill for the helicopter apron.
And to future proof the building for future expansion, the building consent was lodged with an extra two hangers.

Cullen Keiser Architecture

A small architectural firm based in Tauranga, Cullen Keiser Architecture has two fulltime staff, 1 part time and also contract work out. Daniel Cullen has just over 15 years experience in New Zealand and abroad. Cullen Keiser Architecture is a newly Tauranga based practice working nationally and internationally. Their passion is contemporary architecture using the latest materials and styles for commercial and top end residential buildings. They design places and spaces that perform with leading edge design and environmental responsibility.
"Our biggest marketing tool is the consultants and clients we work for. Their referral is where the majority of our future work comes from. It is important we keep good relationships to further increase our profile."

Cullen Keiser Architecture
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Roofing and cladding supplier:
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Cladding: Horizontal Corrugate ZINCALUME® and concrete tilt panel
Roofing: COLORSTEEL® Styleline

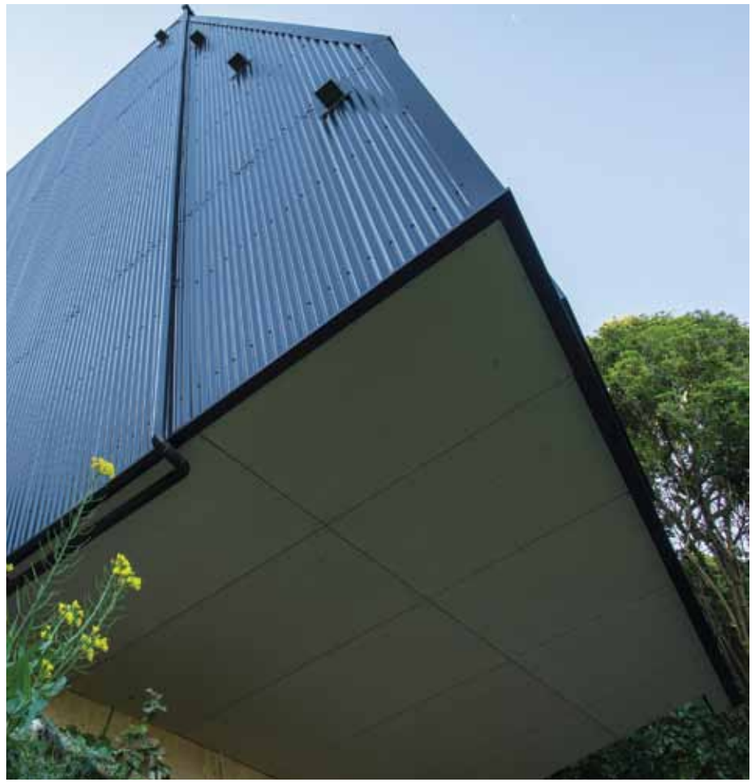
Cladding and roofing installer:
Coresteel Buildings Waikato
Telephone: 07-871 3077
Email: gary.white@coresteel.co.nz
www.coresteel.co.nz

Builder: Coresteel Buildings Waikato
Engineering: Waikato Construction Management Limited

REVOLUTIONARY BUILD

NZ Steel an integral part of ground-breaking home

Most people didn't think it was possible to build on a 20-degree slope until pole houses were proven viable in the 1970s. But building on "insane" slopes of 45-degrees-plus had defied all safe construction efforts until Nic Ballara of Ballara Bulman Chin Architects built his own house on just that.



Sections this steep are not uncommon in Wellington, but building sites are normally achieved by terracing or excavating a single building platform and connecting with the street via stairs or a small cable car.

"I wanted to try something different, and in so doing create a prototype for Wellington. I wanted to prove it's possible to turn an inhospitable site into an effective and efficient building site," explains Nic. "No known housing typology was going to work here, so the brief became to invent one – then wait for consents." It was a revolutionary build that also attracted the attention of the "Grand Designs New Zealand" television programme in late 2015.

The simplicity of the external design belies the many engineering and technical challenges the site presented.

Engineers, architects and builders all collaborated on a design that ultimately turned traditional construction methods on their side.

A suspended Hibond tray and concrete slab for the garage faces the road at the top of the cliff, and joins a 12-metre vertical concrete slab which drops down the cliff face. This bears the bulk of the house's weight and is secured with 11 steel ties spread over the area and anchored deep into bedrock within the cliff itself. It stops at the small foundation which is grounded 17 metres below the road.

It's as seismically safe as it's possible to be.

The build exceeds all current maximum Standards, and the house is engineered to withstand stresses in excess of 10 times its own 30-tonne weight. "It's probably the safest house on the street," says Nic, "despite looking as if it just hangs off the cliff."

His innovative design means the house stretches in two different directions and is wider at the bottom than the top. 3D CAD modelling was absolutely vital to ensure materials were cut precisely before being delivered to site – "Something that's possible when working with the precision of manufactured steel," explains Nic. "As well, we could demonstrate to Council how geotechnical questions would be answered, the house constructed and services be delivered safely."

Once completed, Council found there was less than 20mm difference from plan over the whole build. "We couldn't have interacted as successfully with suppliers and Council without that CAD program," he says. "It saved a lot of time!"

NZ Steel products were specified because of their relatively light

weight and inherent strength and rigidity – important considerations to help ensure maximum stability on the slope. COLORSTEEL® Flaxpod in Metalcraft profile was specified for the roofing and cladding, with Axxis steel framing for the house supplied by Frametek and with Speedfloor steel floor joists manufactured by Rollforming Services Ltd.

"Steel not only provided a rigid frame but allowed us to build upwards confidently (there is only one square corner in the whole building), have a glass wall that stretches over four levels, and use interesting angles throughout the structure without unnecessary strengthening," he explains.

"Weight had to be a constant consideration as well."
The downhill wall is effectively wrapped in the COLORSTEEL® roof which folds from 15 to 77-degrees, giving the opportunity for the architecture to follow. Windows form the bulk of the north-facing wall and large "skylights" celebrate the eastern view across Wellington to the harbour.
Living in such a differently-constructed house challenges occupants and visitors in different ways too.

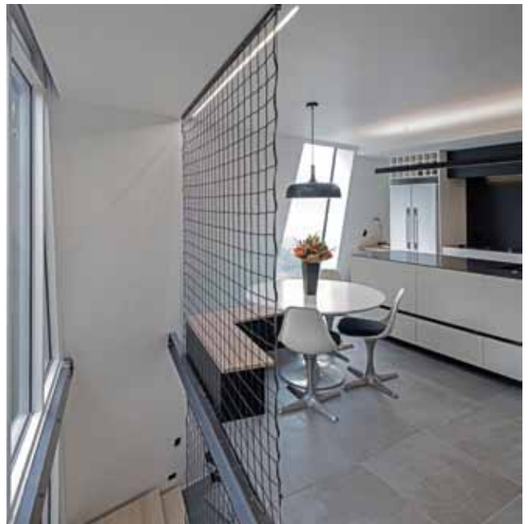
A glass elevator acts as a hallway from the road level at the garage, and internal stairs additionally provide connections between levels within the house. The rooms necessarily connect vertically, ie. down the cliff face, instead of horizontally - which allows the magnificent views across Wellington to be enjoyed from almost every room. Bed- and bathrooms are situated on the upper and lower floors, with the two middle floors open and devoted to living and kitchen areas, serving the same function as more traditional kitchen/dining/living areas in a horizontally-aligned house.

Because a regenerating forest area fringes the site, the family are able to see from canopy to undergrowth as they move down through the building, routinely seeing (and hearing) kereru, tui, kaka and other native birds from their northern-facing glass wall.

A wooden deck extends north from the living area, giving optimal light and privacy for barbeques and other outdoor functions.

The myriad technical challenges are celebrated inside the house with exposed steel members, a simple monochrome colour scheme throughout, asymmetrical windows, and internal mesh walls and glass balustrades separating areas without compromising light flows across the two middle, living levels.
"Actually, the rooms on the lowest level feel like they're the highest above ground," says Nic. "This is because the cantilever is most obvious at this level."

The family enjoys living in such a different house, and with so many stairs it can be great for personal fitness. "Mind you, the lift is great if you've left something in the car," laughs Nic. Then he gets serious. "As an architect I see a lot of cut-and-paste projects, where ideas are gathered from here and there and pulled together. That's not architecture," he declares. Certainly no one can accuse this house of being a cut-and-paste project.



bbc architects

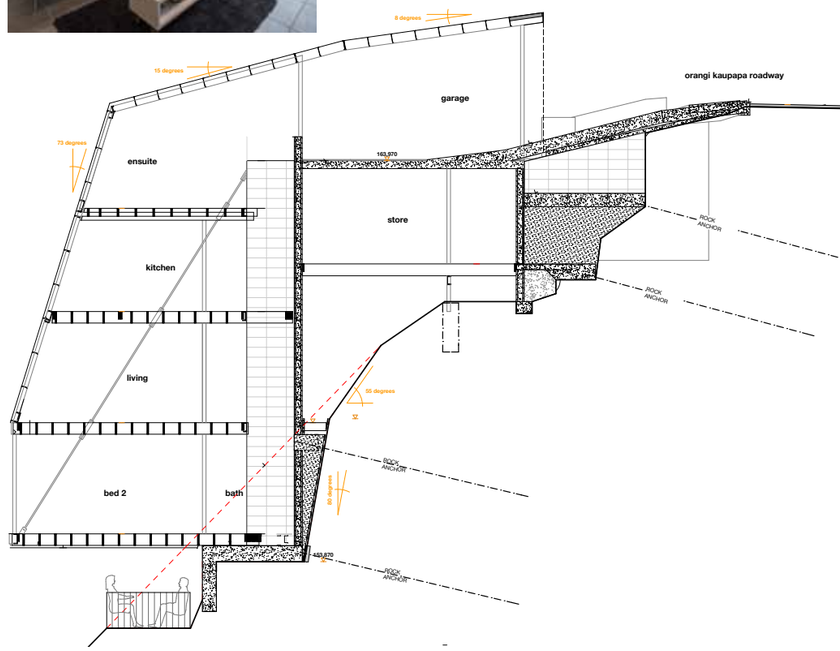
Nic Ballara, Amanda Bulman and Denis Chin are the directors of bbc architects, and have been practising together since 2001. We are all are registered with the New Zealand Institute of Architects and have a diverse team of architects and technicians working with us out of the historic 'Shed 21' building on the Wellington waterfront.

We have undertaken a wide range of projects, with residential and community projects forming two distinct types of work we tend to do most. We enjoy the challenge of responding to specific individual needs of a residential client, and improving their life through improving their environment. Similarly we enjoy the challenge of working with a community organisation, where we are able to engage with a wider group of people who work with a common goal, allowing us to reach those who might not otherwise have access to architecture.

As our project types are diverse they also vary widely in terms of scale. We have completed many new houses and renovations, both small and large, as well as multi-unit residential and commercial projects. Each project offers its own challenges and opportunities, and we enjoy finding those and responding to them. Each project also provides potential for excellence in design and in building. As a part of our own endeavours to constantly improve our practices we also complete weather-tightness remedial work, and have found that this provides a technical challenge and knowledge about how buildings in New Zealand must respond to their environment.

We are a Wellington practise, we are adept at working with small and steep sites, however we have worked on projects from Northland to Otago. We enjoy the diversity of landscape New Zealand offers, and working in different conditions challenges our design responses, and allows us to be creative.

Mostly, we enjoy working with people, the idiosyncrasies they bring, the collaborative process, and the joy of working in architecture where the creative process is realised into a real, inhabitable place.



Architects: bbc architects
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Roofing and Cladding
Manufacturer: MetalCraft
Profile: COLORSTEEL® Flaxpod

Framing: Axxis supplied by Frametek.

Flooring joists: Speedfloor Manufactured by Rollfrming services.

For an animated explanation of how the house was constructed, see http://www.tv3.co.nz/GRAND-DESIGNS-NZ-Technical-Drawing---45-degree-house/tabid/5262/articleID/120383/MCat/4757/Default.aspx

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

PROPOSED NZMRM SYSTEMS GUARANTEE. SCOPE UPDATE

Strategic Background

Recent and signalled changes in Law, around Builder liability, Council liability and Risk based consenting, have created a legal environment that is conducive to the development of an extended range of builder guarantees.

On the back of its work with the New Zealand Metal Roofing Manufacturers (MRM), and in response to the new legal environment, Master Build Services (MBS) has commenced discussions with the various Trade Associations in regards to the development of a suite of Industry Systems Guarantee programs. The key value proposition of these voluntary offers is that they will support Builders and HomeOwners, by offering an "alternative remedy", when a supplier is no longer around.

In holding these discussions MBS are capitalizing on their expertise, and 20 year plus history, in managing builder guarantee programs.

MRM Systems Guarantee Opportunity

The MRM's development of an exclusive relationship with MBS provides it with a unique Sales & Marketing opportunity to introduce a Standards based Systems Guarantee program (MRG), that sits alongside the existing component warranties, and which will differentiate MRM Members and Suppliers over competitors that are not supported by an independent third party program.

The proposed MRG program has been developed on the basis that;

- Builder guarantees are an established and accepted part of the market
- It covers all metal roofing products used in residential new and re-roof applications
- It provides both materials and supply & install cover
- It can be sold to all Builders and HomeOwners.
- It meets the requirements of the Building Amendment Act, the Commerce Act, the Fair Trading Act and the Consumer Guarantees Act

Specialist Trade Systems Guarantee Programs

The Master Painters Association (MPA) have advised that they intend to undertake a "soft launch" of their Systems Guarantee program in April 2016.

MBS will commence follow-up discussions with the 6 other Specialist Trades following the MRM's Special General Meeting and the launch of the MPA Systems Guarantee program.

Operational Roll Out and Budget

The MRM are holding a Special General Meeting on Friday 15 April 2016 to vote on the adoption of the proposed MRG program. If adopted, the MRM Systems Guarantee Sub-Committee (Sub-Committee) are targeting a Friday 01 August 2016 "soft launch" of the MRG offer to targeted "early adopters". The soft launch would progressively gain momentum during 2016, and would cumulate in the Industry wide launch of the program at the ADNZ, BOINZ, Certified Builders, Master Builders, NZIA, and RANZ Conferences in 2017.

If adopted by the MRM Members, New Zealand Steel and Pacific Coil Coaters have committed to providing "seed funding" Sponsorship support to MRS through until June 2018. This funding support, along with other funding sources, covers Contractor Expenses, Promotional Material, Trade Conference Participation, Director Fees and the MRS equity contribution.

Once the business is producing a profit the MRM can review a wide range of initiatives including using MRS as a financial vehicle to achieve its various strategic objectives, which include the development & maintenance of standards, the promotion of the COP and the establishment of the MRM as a Quality Mark.

Supplier Discussions

The Systems Guarantee Sub-Committee are currently in communication with the following Suppliers as a result of Member feedback;

- Pre Painted Steel:
New Zealand Steel and Pacific Coil Coaters

- Post Painted Steel:
Gerard Roofs, Metrotile and Metalcraft

- Fasteners:
Bremick, EDL, Fortress, Konnect, Nuts Bolts & Screws and Ramset

- Underlay:
Paul Industries, Tasman Insulation, TCL, Thermakraft and Weather Barrier Systems

- Clear Sheet:
Alsynite, Ampelite and PSP

- Soft Edge Flashings:
DLM and Edging Systems

This list is non-exclusive and any further Suppliers expressing interest in the program will be welcomed.

Systems Guarantee Sub-Committee Contact Details

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

Please contact Gary McNamara directly on 021 975 891 if the Systems Guarantee Sub-Committee should be in communication with any other Suppliers to the Industry, or if you would like any further feedback on the proposed NZMRM Systems Guarantee Program.

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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www.azko.co.nz

B J Moss Ltd
PO Box 1007
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Contact: Roger Moss
www.bjmoss.co.nz

B R Roofing & Walling Co Ltd
Ford Road
Onekawa, Napier
Telephone: 06 843 6968
Contact: Phillip Fendall

Calder Stewart Industries Limited
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Contact: John D'Arcy
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PO Box 151
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Contact: Nick Claridge
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Telephone: 03 546 4260
Contact: Dave Freeman
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PO Box 13546
Otahuhu, Auckland 1643
Telephone: 09 622 4625
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E.R. Freeman Ltd
Freeman Roofing, Nelson
Roofline Marlborough, Blenheim
Canterbury Long Run Roofing, Timaru
Canterbury Long Run Roofing, Ashburton
www.roofing.co.nz
Roofing Solutions, Dunedin.
P.O. Box 2317
Stoke, Nelson
Telephone: 03 5443108
Contact: Shane Atherton
www.roofing.co.nz

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HB Longrun Ltd
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Napier
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Contact: Chris Patheyjohns

Marshall Industries Ltd
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Metal Design Solutions
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Queenstown Roofing Ltd
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King Country Longrun
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www.steelformers.co.nz

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www.trayroofing.co.nz/

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