

MODERN GREEN HOMES Sanctuary

INSIDE ISSUE 17 80+ green products & design tips; Retrofitting homes to 6-star; Ask our experts;
Design workshop: free advice on your home plans; books and apps reviewed

GREEN KITCHEN SPECIAL 17 INSPIRING KITCHENS PROFILED

Designers' tips

Top star appliances

Inside Jamie Oliver's Ministry of Food

Passivhaus comes to NZ



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WIN
A SCHOTT solar power
system worth \$10,000

MODERN GREEN HOMES Sanctuary

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Island Allure

An expansive, sheltered deck more than doubles the living area of this tiny Finnish summer retreat, and makes the most of rugged coastal views.

WORDS Sasha Shtargot
PHOTOGRAPHY Marko Huttunen

WALKING ALONG THE NORTHERN CAPE OF MUSTALUOTO ISLAND, IN THE Velkua archipelago off the coast of Finland, you could be forgiven for mistaking Villa Mecklin for just another rocky protrusion in the barren landscape. In colour, angular design and positioning, few homes could be said to have a more intimate relationship with the land around them.

Designed by architects Risto Huttunen, Santeri Lipasti and Pekka Pakkanen and built largely by owners Mika and Katja Mecklin, it's a compact holiday home informed by sustainability and the beauty of its stark and dramatic island environment.

The 73 square metre wooden house is on a rocky site of 1.5 hectares. Back in 2004 when the architects first inspected the site, they decided the best position for the home was in a dip in the terrain. The back would be sheltered by trees and a slope, and the front would make the most of sweeping sea views.

Santeri explains: "The site is fabulous – it's very rocky and sloping. We wanted to hide the building behind the trees so that it wouldn't be so visible from the sea. It was also a kind of leftover place that wasn't the nicest part of the site. We didn't want to sacrifice any of the best areas to the building, so it's peeking from behind the trees to catch the sea views and connecting to the nice rocky surroundings." Nearby, close to the water's edge, is a small sauna building (de rigueur in Finland) with a guest bedroom.

Level space was an immediately obvious necessity, hence the idea for the home's distinctive large wooden deck. With a stunning view of the sea, the deck is the ideal place for outdoor eating and entertaining, as well as a play area for the Mecklins' daughters Minea and Kaisla. A recessed fireplace accessed by a hatch was built in the middle of the deck.



Villa Mecklin grew slowly over three years, with the family building the sauna first and living in it while they worked on the main house with the help of two carpenters. The intention was to use as little material as possible as everything had to come several kilometres by boat; the design was made simple to minimise “the trouble of having to go to the mainland”, as Santeri puts it. The home’s characteristic feature is its wooden panelling, which is untreated and will turn grey over time, giving the buildings a kind of permanency among the landscape. The façade is Finnish spruce, while the painted panelling inside is local pine.

Continuing the theme of rugged simplicity, the roof that sweeps down on either side of the deck is made of corrugated, galvanised steel. An off-grid solar photovoltaic array powers the home’s lighting, refrigerator, radio and computer. Drinking water comes by boat from the mainland, but a 1000 litre onsite rainwater tank supplies the Mecklins with water for washing. There is also a composting toilet. Insulation in the roof, walls and floor is an environmentally friendly wood-based product called Vital, which can be recycled at the end of its lifecycle into new product.

The angular, dramatic exterior of Villa Mecklin belies the modest, clean-lined interior. Walking in from the ample deck, the visitor is met by an open plan kitchen-dining-living area. A simple fireplace is enough to keep the occupants warm on mild Finnish summer nights. A short set of stairs leads to the back entrance, with a bedroom on either side.

As they tell the story, when the three architects first visited the site on their scoping mission in the early spring of 2004, they had their ice fishing gear with them. It was only once they had caught enough fish that they went to work with their tape measures. This leisurely freewheeling spirit seems to have taken shape organically in Villa Mecklin, like a sea breeze blowing through the archipelago. “The living there is quite modest and simple,” Santeri says. “And the food is mostly fish from the sea.”

↶
The summer home's very modest interior living space is lined with local pine panelling. The central corridor leads to two bedrooms and the entry door, with a mezzanine gallery above.



↑
The villa nestles into the shelter of a narrow zone of trees, its sheltered terrace extending over the rocky coastal site with its low vegetation of moss, grasses, heather and juniper bushes.

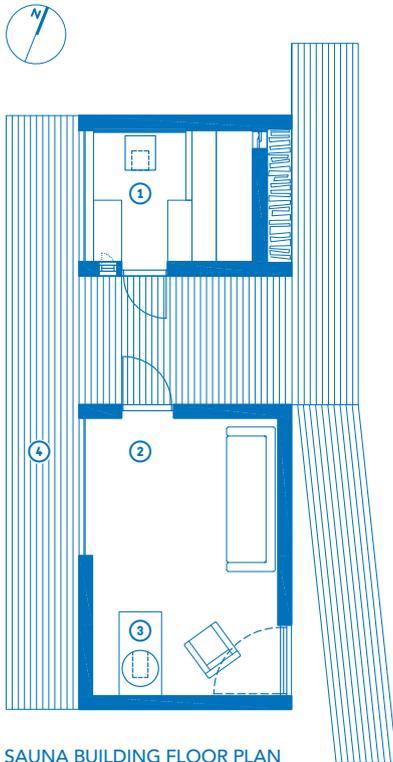
The intention was to use as little material as possible as everything had to come several kilometres by boat.



↶
The separate sauna building also houses a stove-heated, light-filled cabin for guests.



“Construction was made easier by designing all parts, from the frame to the details, to be as simple as possible,” says architect Santeri Lipasti.



SAUNA BUILDING FLOOR PLAN

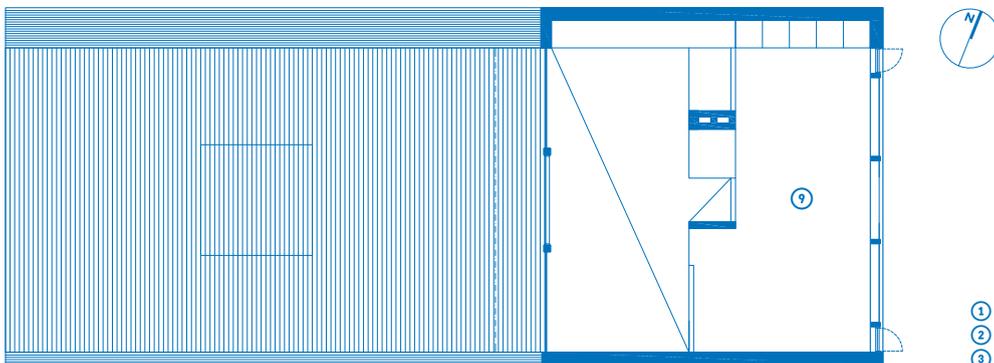
- ① Sauna
- ② Guestroom
- ③ Fireplace
- ④ Terrace



What would a Finnish summer house be without a sauna?

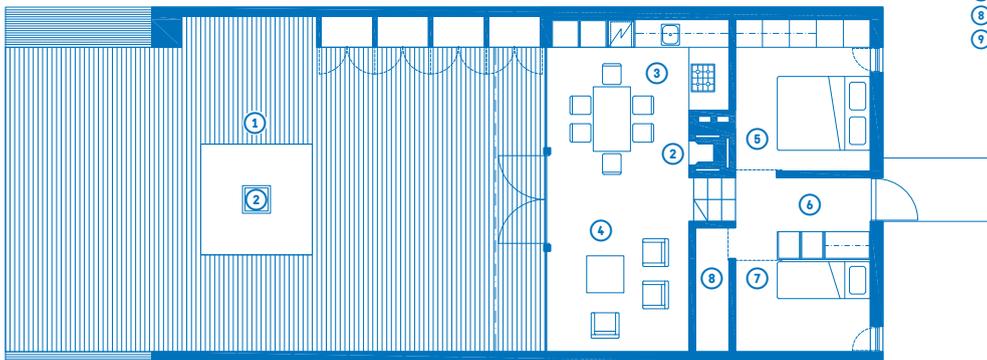


① When the central fireplace is not in use, "it is possible to use the whole deck as, for example, a dance floor," says Santeri.



VILLA UPPER FLOOR PLAN

- ① Terrace
- ② Fireplace
- ③ Kitchen
- ④ Living room
- ⑤ Bedroom
- ⑥ Entrance
- ⑦ Bedroom
- ⑧ Storage
- ⑨ Gallery



VILLA LOWER FLOOR PLAN

Mustaluoto Island residence

—Specifications

Credits

DESIGNER

Huttunen–Lipasti–Pakkanen
Architects
www.h-l-p.fi

COST

€150,000
(approx AU\$206,000)

PROJECT TYPE

New build

SIZE

House 70 sqm; deck 76 sqm;
sauna building 20 sqm;
land 1.5 ha

PROJECT LOCATION

Mustaluoto Island,
Velkua, Finland

Sustainable Products

RENEWABLE ENERGY

Off-grid photovoltaic array

– Local pine interior panelling

– Corrugated galvanised
steel roofing

WATER SAVING

1000L water tank

– “Vital” wood-based

insulation to walls, floor
and ceiling

BUILDING MATERIALS

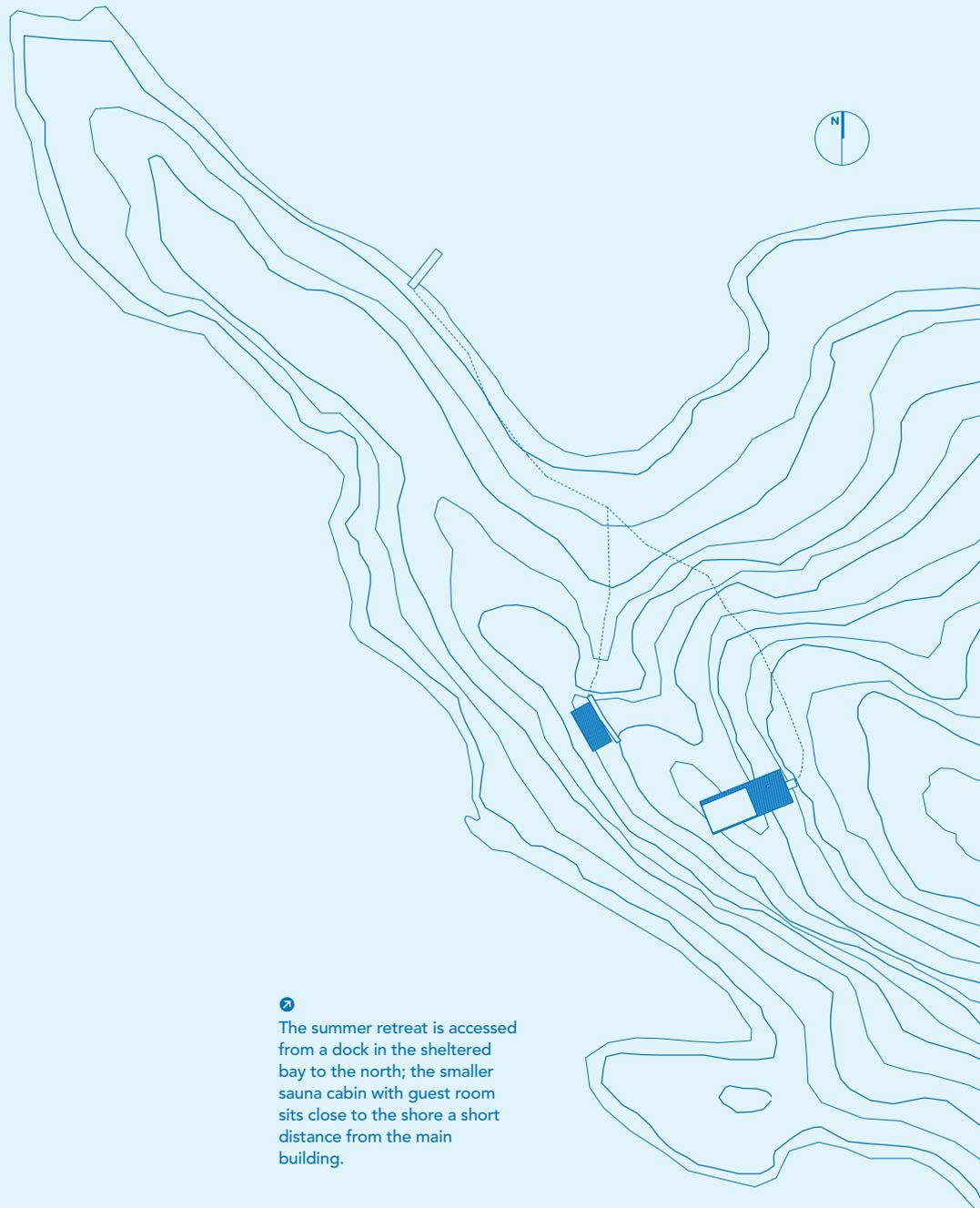
– Unfinished spruce decking
and external cladding

OTHER ESD FEATURES

Composting toilet



Villa Mecklin makes extensive use of untreated spruce for external cladding and decking; it turns grey naturally as it weathers.



The summer retreat is accessed from a dock in the sheltered bay to the north; the smaller sauna cabin with guest room sits close to the shore a short distance from the main building.

Reviews

—Books, apps, websites and other interesting stuff

If you have recommendations for books, smart phone apps, blogs, websites or anything else you think would be of interest we'd love to hear from you. Email us at sanctuary@ata.org.au

BOOKS



OPEN DESIGN NOW: WHY DESIGN CANNOT REMAIN EXCLUSIVE

Bas Van Abel, Lucas Evers, Roel Klaasen and Peter Troxler
BIS Publishers: Creative Commons, 2011
€29.90 (approx \$41.50) plus postage

New technologies, Web 2.0 and climate change awareness are creating a brave new world in which people are designing, manufacturing and distributing products for themselves. It's a radical shift away from mass production towards a scenario in which an amateur with a modem and 3D printer can become a world player. *Open Design Now* is part manifesto and part travel guide to this new frontier, with articles from leading thinkers and doers like Bre Pettis, founder of Makerbot; case studies of co-working, design hacks and template culture; and an achingly contemporary graphic design. True to its spirit, the book itself is published under a Creative Commons License which allows readers to share, adapt and distribute its contents.



WARM HOUSE COOL HOUSE: INSPIRATIONAL DESIGNS FOR LOW-ENERGY HOUSING (Second edition)

Nick Hollo
Choice, 2011
\$44.95

Since the first edition in 1995, architect Nick Hollo has become a go-to man on how to keep homes cool in summer and warm in winter with little need for appliances. *Warm House Cool House* outlines the five principles of good design and usefully expands on these with case studies including photos, checklists and house plans. It's a user-friendly book and an asset to those wanting to build, to improve an existing house, or to design appropriately for their climactic zone. A valuable companion to *Your Home Technical Manual*.

? DID YOU KNOW?



Australia's eight million homes are responsible for approximately 10 per cent of the country's greenhouse gas emissions.

Buying GreenPower on top of your electricity bill guarantees investment in government-approved renewable energy sources, replacing electricity that would otherwise have been sourced from fossil fuels.

For those who want to do more than their bit, it's now possible to buy 200 per cent GreenPower.

All the renewable energy purchased for GreenPower comes from new renewables (generators built since 1997), which helps drive investment in the industry.

Sources: GreenPower; Department of Climate Change and Energy Efficiency. Photo by Richard Pocknee, Cathedral Rocks Wind Farm, SA

APPS



RIDERLOG (IPHONE)

www.bv.com.au/general/ride-to-work/91481; free

RiderLog records basic details of your bike trips and anonymously uploads them to the Bicycle Network (an Australian health promotion charity). The aggregated data is then given to governments to guide cycling investment and programs in the areas where people ride.



SMART-WAY

www.fraunhofer.de/en/press/research-news/2010-2011/19/mobile-guide.jsp; in development

Currently in development for Android, this app is designed to simplify route-planning on public transport. You key in your destination and the app plans your journey using the phone's GPS and real-time public transport travel information. (Photo: Fraunhofer IVI)

WEBSITES



TED: IDEAS WORTH SPREADING

www.ted.com/talks

Already a viral hit, TED Talks is a regularly-updated "clearing house" of knowledge and inspiration from the world's leading thinkers on technology, design, science, business, and global issues, captured in videos less than 20 minutes long. Together with its annual conferences and events, TED Talks aims to inspire, educate and amaze. Check out:

- Thomas Heatherwick's *Building the Seed Cathedral*
- Bjarke Ingels' *3 Warp Speed Architecture Tales*



AREA FINDER

www.mapdevelopers.com/area_finder.php

Area Finder is a simple and interactive Google Maps mash-up for calculating the size of a location. Whether your target is the Grand Canyon or your front yard, simply find it on Area Finder's embedded Google map, click around its perimeter, and let Area Finder do the maths. Useful for working out the square meterage of your roof for rainwater collection, or the approximate size of a tract of land.

In this *Sanctuary* special feature we showcase 17 inspiring green kitchens from around Australia and overseas. Green interior designers bring you their top kitchen design tips, and we take a look at the latest in energy efficient appliances including fridges, dishwashers and induction cooktops.



Australia's Greenest Kitchens

New lease on life

—Specifications

DESIGNER

Lifehouse Design

www.lifehousedesign.com.au

PROJECT TYPE

Kitchen built from recycled materials

LOCATION

Castlemaine, VIC

COST

Less than \$5000

PRODUCTS

- Secondhand cabinets, tapware, stove and sink
- New Laminex benchtop www.laminex.com.au
- New hardwood timber bar-tops to kitchen benches
- Secondhand light fittings



Photos by Rachel Pilgrim



Reclaimed materials from a partial house demolition in Melbourne ensured this home was built for under \$72,000; the kitchen was built for next to nothing.

Six-star kitchen taps

—Best practice water efficiency right down to your kitchen sink

Some kitchen taps on the market boast a 4-star water efficiency rating, but 4-stars is 2-stars shy of the most efficient taps available: 6-star.

Kitchen taps can discharge as much as 15 litres of water per minute so if you're in the market for new tapware, the first thing you should look for is the Water Efficiency Labelling and Standards Scheme (WELS) rating of the tap. WELS is Australia's water efficiency labelling scheme and each tap has a star rating; the more stars the better. The WELS database at www.waterrating.gov.au allows you to search for registered products and see their water flow and 10-yearly water consumption.

The most water efficient – 6-star rated – taps use 4.5 litres per minute or less, and approximately 14 per cent of the kitchen tapware market fall into this category. This means they can be hard to find from plumbing supply outlets. We've done some of the work for you here by wading through the WELS database to find a selection of the country's top

6-star performers. If you can't buy them direct from the manufacturer ask your local plumbing supplier, such as Reece or Tradelink, to order them in.

What's the difference between a WELS 6-star rated tap and one of the more common 4-star taps? Using the WELS flow rates from Table 1, you'll see a 4-star rated tap set would use 118,000 litres over 10 years compared with 63,000 litres for a 6-star rated tap – that's almost double the water use.

Another thing worth considering is how you'll use your tap. 6-star taps obviously have a reduced water flow, which means you'll have to wait a little longer to fill the sink or a large pot. But with most kitchen taps used for a variety of applications, from rinsing vegetables to getting a glass of water, 6-star – best practice water efficiency – is usually preferable.



01

HANSA

Prado Green

4.5 litres per minute

82.12 kilolitres over 10 years

6 star

\$406

www.starionaust.com.au

TABLE 1

WELS RATING	0 STAR	1 STAR	2 STAR	3 STAR	4 STAR	5 STAR	6 STAR
Tapware	More than 16 litres per minute. Fails performance requirements.	Between 12 and 16 litres per minute	Between 9 and 12 litres per minute	Between 7.5 and 9 litres per minute	Between 6 and 7.5 litres per minute	Between 4.5 and 6 litres per minute	Not more than 4.5 litres per minute
Approximate number of products WELS rated (%)	1	-	1	21	38	25	14
Tap set water use over 10 years in litres*			173,000 (per 9.5 L/minute tap)	155,000 (per 8.5 L/minute tap)	118,000 (per 6.5 L/minute tap)	100,000 (per 5.5 L/minute tap)	63,000 (per 3.5 L/minute tap)
Tap set water use over 10 years in \$**			\$368	\$325	\$248	\$210	\$132

* Figures from WELS database

** Based on Sydney Water charges of \$2.103 (usage charge per kL)

A 4-star tap set uses 118,000 litres over 10 years compared with 63,000 litres for a 6-star tap – that's almost double the water use.



02
PORCHER
 Saga Sink Mixer
 4 litres per minute
 73 kilolitres over 10 years
 6 star
 \$199
www.reece.com.au



03
RAM
 Yeva Sink Mixer
 4 litres per minute
 73 kilolitres over 10 years
 6 star
 \$249
www.reece.com.au



04
METHVEN
 Curved Gooseneck Sink Mixer
 4.5 litres per minute
 82.12 kilolitres over 10 years
 6 star
 \$354
www.methven.com/au/



05
PACIFIC
 Parade Twin Mixer
 4.5 litres per minute
 82.12 kilolitres over 10 years
 6 star
 \$199
www.pacific-products-int.com



06
PACIFIC
 Broadway G90 Side Operation Sink Mixer
 4.5 litres per minute
 82.12 kilolitres over 10 years
 6 star
 \$153
www.pacific-products-int.com



07
ABEY
 Solo Armando Vicario Kitchen Mixer
 4.5 litres per minute
 82.12 kilolitres over 10 years
 6 star
 \$478
www.abey.com.au

Country style

—Specifications

ARCHITECT

Brett Lowe

MANUFACTURE &

INSTALLATION

Select Custom Joinery

www.selectcustomjoinery.com.au

PROJECT TYPE

New kitchen built from eco materials

LOCATION

Canberra, ACT

PRODUCTS

- Cabinetry and doors made of super E0 Australian plantation Hoop Pine Plywood.
- Recycled Tasmanian oak drawer fronts. The drawers have been cut-down for easy access to contents.
- Drawers lined with marmoleum, which is easy to clean and has anti-bacterial properties.
- Recycled blackbutt timber benchtop with hardwax finish provides a durable preparation surface. Should the benchtop finish need maintenance, the owners will be able to give the benchtop a spot sand and apply the finish only where it is needed.
- Kitchen includes soft-close drawer runners, dove tailed drawers and premium fittings and fixtures to ensure durability.

This kitchen was designed to be a contemporary kitchen with a touch of country. Simple and practical, the warmth of the timber helps to create the feel of a welcoming home.



 Photo by John Tucker

Simple lines

—Specifications

DESIGNER

Sunpower Design

www.sunpowerdesign.com.au

KITCHEN CONSTRUCTION

Henry Bongers

PROJECT TYPE

New kitchen built from eco materials

LOCATION

Birregurra, VIC

COST

Approx \$20,000, excluding appliances

PRODUCTS

– Wattyl Interior Design i.d paint. GECA endorsed low VOC paint with less than 1 gram per litre tinted or untinted.

www.wattyl.com.au

– Franke Sorter kitchen waste management bins

www.franke.com

– Austral Plywood Hoop pine veneer doors to cabinets

www.australply.com.au

– Caesarstone reconstituted stone benchtop. According to Judy from Sunpower, “[In the selection of materials] we are leaning more towards looking at the longevity of the material versus the

embodied energy in the manufacture. The life span of a stone benchtop or a stainless one for that matter way exceeds a material like laminate or timber. They can be recycled and are utilising waste product from the quarry process, the offcuts and chips to make the benchtop.”

www.caesarstone.com.au

– Fisher & Paykel 5-star fridge

www.fisherpaykel.com.au

– Miele slimline dishwasher suitable for small family. Current model equivalent G4570 SCVi retails for RRP\$1899. 3-star energy

rating; 3-star WELS water rating. www.miele.com.au

– Ilve freestanding gas oven

www.ilve.com.au

– Ecoblend cement slab with 30% flyash or ground slag.

www.independentcement.com.au



Hidden in a cupboard, the Franke Sorter helps to manage kitchen waste efficiently.



Photo by Rhiannon Slatter



Tips from the experts



Alena

ALENA'S DESIGN TIPS

In our kitchen design process “green” solutions are integrated in the design from the beginning.

DESIGN & PLANNING

In an existing kitchen, does the layout work? The triangle between the sink, the cook top and the fridge should allow for great circulation and respond to the adjacent rooms such as dining or living areas. A recent client had a good kitchen plan that simply needed upgrading. This meant we were able to reuse the carcasses, electrical and plumbing positions, as well as some appliances. We not only saved landfill, but thousands of dollars!

Encourage eco friendly behaviour by providing plenty of storage. Make sure there is space for garbage, including glass and cardboard recycling bins, an organics bin for worm farm or chicken scraps, or a Bokashi bin. Dedicate spaces for green shopping bags, do large bulk buys of staples such as flour and rice (reducing packaging), and grow herb or salad gardens if possible.

MATERIALS

Are any of the materials able to be reused? A kitchen we updated last year had a yellowed parquet design that did not complete the new look. Instead of replacing the floor, we gave it a new lease on life by staining it darker with a non-toxic staining product.

Joinery materials such as carcasses and door fronts can be a minefield for formaldehyde heavy products. Look for low VOC paint finishes (be aware that most joiners can't use low VOC paint in their spray equipment when specifying polyurethane finishes). Instead, embrace a painted finish or prefabricated eco products such as E0 and the GreenFirst range by Laminex or X-Board by Xanita. Ensure your joiner uses

top quality hinges and runners so they don't have to be replaced at a later date.

APPLIANCES & TAPWARE

Reassess your use of appliances – do you really need a second oven? How often do you use the microwave?

Ensure that appliances such as the fridge have enough airspace circulation around them. Their efficiency is greatly reduced if the airspace retains heat.

LIGHTING & ELECTRICAL

Simplify the lighting layout from the outset. A kitchen needs different layers of lighting: ambient and task oriented lighting, as well as feature lights if the design allows.

CONSTRUCTION & MAINTENANCE

Make sure your designer and your builder share your values; the last thing you want is to go to all the effort in the design stage and not have it carried through to completion!

Look at the manufacturer's recommendation on all products – many will say not to clean with acid or bleach based products. A good pH neutral cleaner is enough for most surfaces, and if you're keen, you can easily make one from baking soda.

Alena Smith
Smith Design Studio
www.smithdesignstudio.com.au



Jessica & Timoli

JESSICA & TIMOLI'S DESIGN TIPS

We always try to design kitchens that are going to be functional and beautiful for a very long time. We favour a neutral and natural palette of finishes and streamline the design by undermounting sinks and avoiding the use of handles.

We love the look of reclaimed timber for cabinetry and we're always on the lookout for interesting pieces to upcycle, such as laboratory sinks, butcher's slabs, industrial shelving and workbenches – these are great examples of how to add texture and story to a new kitchen.

LED strip lights neatly flush mounted in overhead cupboards as task lighting are great and they work really well with a decorative pendant fitting as a more ambient and general light source.

Jessica & Timoli
okologi sustainable interiors
www.okologi.com.au



Clare

CLARE'S DESIGN TIPS

As cabinet makers, we consider where the product has been sourced from, and how the kitchen is going to impact on the internal environment of your home over the long term.

The range of eco materials and products available to the kitchen industry is ever increasing, and finding practical ways to apply these products is the key to a great kitchen.

We always consider longevity: there is no advantage to building a sustainable kitchen which has to be removed in five years and built all over again because the design was incorrect or has dated quickly.

Clare Maynard
Hatch Designs
www.hatchdesigns.com.au

Old school, new life

—Specifications



Photo by Emma Cross

ARCHITECT

Multiplicity
www.multiplicity.com.au

MANUFACTURE & INSTALLATION

Cantilever
www.cantileverinteriors.com

PROJECT TYPE

New kitchen made from eco and reclaimed materials

LOCATION

WestWyck ecovillage, West Brunswick, Melbourne, VIC
www.westwyck.com

PRODUCTS

- Plantation grown Hoop Pine Plywood cupboard carcasses and Hoop Pine Plywood and translucent white perspex faces. Timber, including the original Mountain Ash floor, all finished with a water based low-VOC lacquer.
- Blum hinges www.blum.com
- Stainless steel benchtops
- Ilve gas oven www.ilve.com.au
- Miele 1243 SCU dishwasher www.miele.com.au
- Electrolux ETM5207SC-L 520L fridge, with 3.5 star rating (5 stars under the old system; see p72 for more information) and 402kWh per year energy consumption, about half that of their old fridge! An air vent in the floor improves ventilation and energy efficiency. www.electrolux.com.au

This kitchen, built during “stage one” of WestWyck’s development, is part of co-founders Mike Hill and Lorna Pitt’s apartment in the former infant drill hall of this one-time primary school. Mike and Lorna put in a brief for a kitchen that made the most of the expansive space tucked under the mezzanine-level bedroom, using low-emission materials and where possible, reusing items connected with the old school. A central feature is the school’s original art room table raised to bench height on custom-made metal brackets.

“We selected all appliances for a mix of energy and water performance,” says Mike, “including a dishwasher that could use our solar heated water, sourced from a communal evacuated-tube system that uses rain water harvested on site.”

Lorna particularly loves the storage under the big table: cuphooks for hanging pots and pans and a low shelf that’s handy for oven trays, boards and cake racks. Her top kitchen design tip is to ensure the plumbing is designed to take up as little of your cupboard space as possible.



Turning an inside-out world right way around again



WORDS

Dick Clarke

When it comes to thermal efficiency, reversing traditional brick veneer construction and putting the brick on the inside makes so much more sense. Dick Clarke explains why.

REVERSE BRICK VENEER (RBV) IS A TERM

which, although self-explanatory when we think about it, has often caused people to do a double take: “Yes, that’s right, the bricks are on the inside of the wall... No, the plasterboard doesn’t get wet – it’s clad with... (whatever).”

In an RBV building, the brick layer is located within a protective external insulated skin. That skin can be made of pretty much anything that takes your fancy – but it must be well insulated to allow the thermal mass of the brick to do its job of regulating internal temperatures. (The brick layer can also be blocks, mud brick, rammed earth, or recycled concrete – so RBV is actually more correctly called Insulated Masonry Construction, but that name is nowhere near so well recognised or so much fun!)

We have to use the “reverse” in RBV because in the late 1950s somebody had the not-very-bright idea of replacing weatherboards and fibro on timber framed houses with a veneer of bricks (BV). “Brick veneer disease” has since become the dominant building method in southern Australia, with people in the tropics generally avoiding its contagion. Many among us have come to assume that BV is normal brick, such that double-brick construction has come to be called “full brick”. This implies that brick veneer is “half brick”, perhaps “half as good”. This isn’t far off the money. It may save a coat of paint every 15 years or so, but costs a whole lot more than that.

There are two connected problems with BV. The main one is that there is a lot of wasted thermal mass – it’s on the outside where the weather and temperature changes happen, not on the inside where people live. Thermal mass is a simple measure of a material’s capacity to absorb, store, and redistribute enthalpy – warmth. While BV houses can be made to perform reasonably well, even beyond 7 Stars, it is not so easy to make them work really well. It gets down to how thermal mass works to regulate the internal, or core, temperature of a home. In much the same way as our body uses physiological mechanisms to maintain a constant 36.9°C core temperature, internal

thermal mass in lower latitudes (generally) will work to regulate house temperatures as part of a good passive design strategy. On the outside of the building, as cladding, its inherent thermal benefit is wasted.

And that leads to the next problem – good use of embodied energy. This is a measure of what it takes to make the material in the first place, and if properly considered, also measures through its whole useful life and through the demolition and reuse or recycling stage. The most common high thermal mass materials such as brick and concrete have quite high embodied energy. If this is used well, so the house gains a benefit every day of its operating life, the embodied energy is a good investment. For instance, if internal walls are brick as in RBV and the passive design provides solar gain in winter (once again, not in the tropics) but is shaded in summer, then the embodied energy investment will be repaid by reduced heating and cooling energy – with a payback time as short as three years. This would clearly be a good investment, with a smaller impact on the planet. But if the brick is used only as a skin to keep the rain off, there is virtually no return on that investment through thermal performance gains.

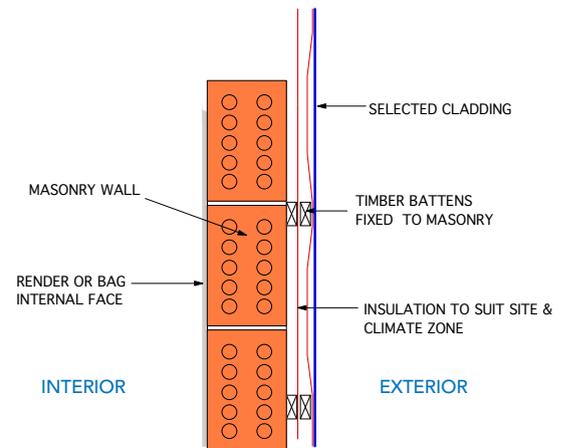
So much for the theory – does it work? Our experience with RBV goes back about 20 years, so we have long known anecdotally that it works very well. But it is only recently that we have had more powerful modelling software and accurate data logging to make more scientific pronouncements. We can produce RBV houses that compete cost-wise against the more expensive project homes and emphatically outperform even brand new BV homes. Days of 45°C yielding internal temperatures in the high 20s, nights of below zero with internal minimums of 17°C – this can be achieved without a single kilowatt of artificial heating or cooling. Good passive design works!

But is RBV more difficult to build? Simply put, no. It is subtly different to BV and timber frame, being more closely aligned to traditional cavity brick construction – just changing the external skin of bricks for another cladding,

“Brick veneer disease” has become the dominant building method in southern Australia.



📌 The reverse brick veneer construction of this home in Keinbah, NSW, helps it achieve its 7.9 star rating. The external cladding is Colorbond steel over a well-insulated brick wall. Photo by John Harrison



📌 Typical reverse brick veneer wall construction. The masonry layer can be brick, rammed earth, concrete block or another material with good thermal mass; its internal surface can be rendered or painted if exposed brick is not your thing.

with insulation between. It is not usually most cost effective to literally swap sides in a timber framed BV wall, as the timber frame becomes superfluous as a load bearing device – use the bricks or block work instead. The external skin is best insulated with a high performance foil and foam composite board, as long as the appropriate R value is attained (depending on site conditions and climate zone). It’s worth noting that Insulated Cavity Brick is actually RBV with a brick veneer skin.

A lower-cost alternative that still gives great thermal comfort is a variation on the theme whereby the external walls are timber framed and strategic internal walls are high thermal mass. This actually allows traditional BV project building processes to be used with no retraining or head scratching. The core is still temperature regulated and the construction is fast and straightforward. I can’t understand why more project builders aren’t offering this as a way to

exceed minimum performance compliance.

Of course, the usual disclaimers apply here – all building types must be appropriate to site and climate. Homes in Darwin should never look like homes in Hobart.

Dick Clarke is the principal of Sydney-based Envirotecture. It provides design and consulting services for people and organisations who want buildings that work well, feel good, are culturally appropriate – and reduce their ecological cost toward zero. Dick is a contributing author to the *Your Home Technical Manual*.

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