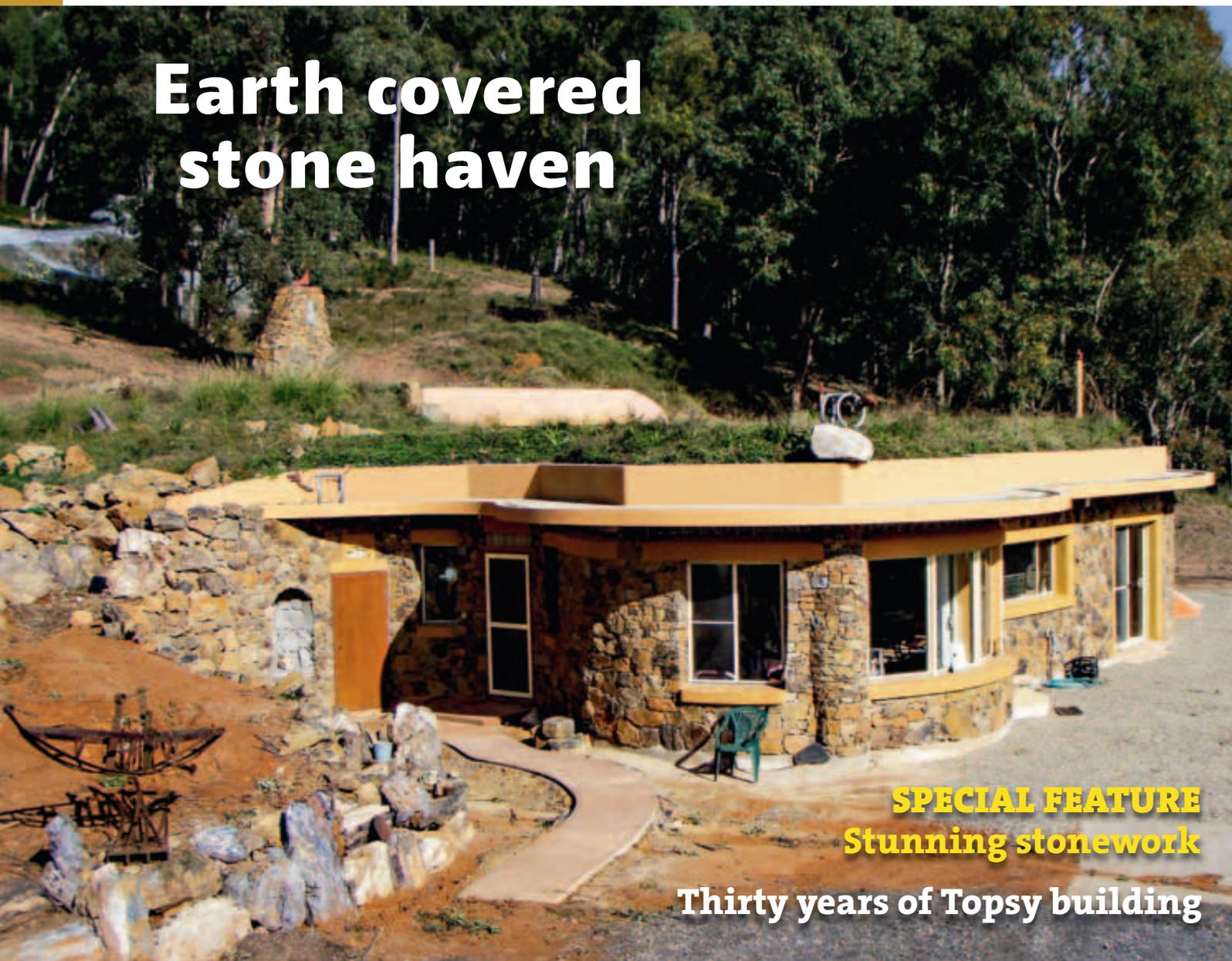


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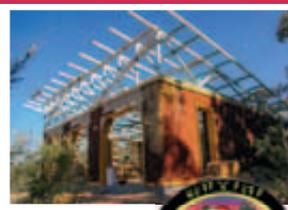
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78 STONE HAVEN

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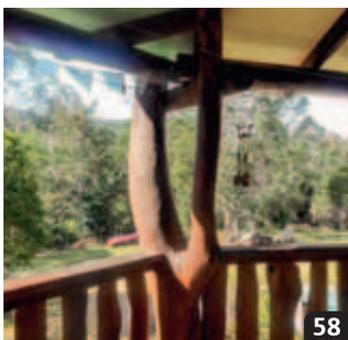
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Our details...

The Owner Builder is an independently published magazine – the first issue came out in 1981 – and it has been informing and inspiring owner builders ever since. Whilst it has changed in appearance over that time, it still remains true to its origins – to produce a unique publication that is of value to those who choose to be involved in creating their own shelter and to share and celebrate their creativity and hard work.

CONTACT US

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**See note opposite
page for changes to
posting during
25 March – 25 July 2014**

FRONT COVER PHOTOGRAPH

This earth-covered house gained stone walls for the front after a serendipitous windfall of 350 tonnes of free stone, courtesy of some local highway widening. *Story starts page 78.*



WHO'S WHO

Editor: Lynda Wilson

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DISCLAIMER

We thoroughly support the continued sharing of ideas amongst owner builders. However, you should be aware that any particular solution may not suit your situation or even be tolerated by your council. Always be aware of on-site safety; just because a photograph shows someone performing a task one way does not necessarily mean that it is safe or suggested best practice.

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The Owner Builder office is powered by a grid connected photovoltaic solar system, generating three times more power than is used.

DEADLINES:

N° 183 Jun/Jul 2014

Editorial – 1 April 2014

Advertising – 8 April 2014

N° 184 Aug/Sep 2014

Editorial – 3 June 2014

Advertising – 10 June 2014

In house...

Balancing work and leisure is a hard task for most of us, and especially for those owner builders trying to build a house while also working and raising a family. Somehow they just get on and do it – often a little (or a lot!) slower than if someone else was doing it. Socialising becomes a thing of the past, nights are spent pouring over books and diagrams, weekends and evenings on physical building work. At the end, the sense of satisfaction and amazement at what has been created outweighs most of the downsides, and life ‘as we knew it before’ can resume.

Here at *TOB*, we have been experiencing something of that. Workloads have increased and there is so much we’d still like to do e.g. build a better website, have online access for subscribers, host a forum, improve our online shop. You get the picture.

On top of all these other tasks, I have decided that I want to go travelling! This has not been a spur of the moment decision; in fact it has been nearly three years in planning. If I was employed elsewhere, I’d just put in the required unpaid leave form, hand over to someone else and go. Not so easy when you run the business AND you are also the only full time employee!

Luckily for me, I have the support of our indomitable art director Toni Lumsden. This has allowed my dream trip of four months walking across Spain to become a reality. Yes, the other team members will still be helping out as usual (Helen, Anna, Rob) but it is Toni who will be taking up the slack of the tasks that I do; posting, updating the database, chasing stories, dealing with advertisers, sweeping the floor, making tea...

During the next four months (25 March to 25 July) there will be no telephone ordering service – I just couldn’t expect anyone else to take that on as well! The postal and online ordering will still be functioning as normal, although a little slower due to the need to redirect post from NSW to Vic. However, there will be NO orders taken for books or hard copy back issues; PDF versions will be available and subscriptions (both hard copy and PDF) as usual.

I apologise if this makes things a little difficult for our readers over the next four months, but there really is no other way of tackling this – apart from me not going at all (which is not going to happen).

I will be keeping a keen lookout for building projects during my travels, and hope to be able to share a few gems with you all. Until next time, happy building!

NOTE

Lynda Wilson (publisher) is going on an extended European trip (keep an eye out for some travel photos over the next few issues).

As a result, **no posting of hard copy back issue or book orders** will take place between **25 March and 25 July 2014**.

Orders for PDF copies and subscriptions will still be processed as usual.

The phone will also not be operational during this time. However, emails and online shop orders will still be dealt with and replied to.

The wonders of modern technology, huh?

CONTRIBUTORS

There are a number of contributors to The Owner Builder, not only providing articles but also behind the scenes support. We will feature a few of them in each issue, introducing the faces behind the names.



SHARYN MUNRO is the author of three books and many award-winning short stories. Passionate about the environment, seeing sustainability as the only way forward, she lives in a solar-powered mud brick cabin on her remote NSW wildlife refuge. She loves writing OB stories ‘because owner builders are so creative and connected to place.’ *Photo courtesy Scott Hawkins and Notebook magazine.*



EUGENIE STOCKMANN is one of the initiators of The Green Swing: a small, inner city, sustainable development in Perth which aims to showcase an alternative to current medium density townhouse developments. In April 2013 The Green Swing became the Trustee of a second development, which will consist of two townhouses and five apartments.



TONI LUMSDEN made her first cubby house at age three and has been fascinated by owner building ever since. She produces *TOB* from the home she shares with Rob Hadden in central Victoria and appreciates the irony of using enough technology to put woman on the moon, located in a building that appears transplanted from the 15th century.

Errata

In the article ‘Double glazing revisited’ in *TOB 181 Feb/Mar 2014*, under Reducing noise (p.30) the ideal gap should have read 100mm instead of 10mm. 10mm is ideal for heat insulation, whereas 100mm is suggested for noise reduction. Each will still provide some of the other’s benefit, but not to the optimum. So when it comes to double glazing or retrofitting, be clear on the primary aim of the solution.



A

Australia's First Earthship

A designers perspective...

Earthships are finally surfacing across Australia and Earthship Australia, a recently established incorporated community association, was privileged to be able to attend and facilitate construction of the first Earthship to directly adapt designs from New Mexico in an Australian climate.

Earthships incorporate a mixture of biology and architecture, aiming to design buildings and community environments with consideration for

BY RACHEL GOLDLUST

environmental sustainability rather than relying on traditional carbon heavy building designs and materials. The resulting passive solar home uses thermal/solar dynamics for temperature stabilisation, incorporating renewable energy, food production, integrated water harvesting systems and in-house sewage treatment.

Recent Melbourne graduates of the Earthship Biotechure Academy (USA), David Auber and Rachel Goldlust, joined with a number of skilled tradespeople, plumbing and electrical specialists to begin construction of a 180m² modified survival-model Earthship vaulted greenhouse dome dwelling in Queensland. Design of the structure took place between David Auber (Duvvy) and the clients Bob and Shelley after a series of discussions about building on their property in Queensland.





The design was a close adaptation the Simple Survival Model of vaulted dome Earthship, with general plans supplied by Earthship Bioteecture. With the experience of Rachel and Duuvy on site, alongside other volunteers with a wide range of experiences, the project was able to be completed in a relatively short period of time while keeping the costs of the build down, using as much recycled and reclaimed material as possible.

The building of the dwelling took place in two stages, the first running for 5 weeks with around 50 volunteers, completing a majority of the work but failing to reach lock-up stage due to cyclonic weather conditions. The second stage, the finishes workshop, was run five months later and incorporated another 40 volunteers coming to learn and live together for two weeks, completing the final rendering, bottle wall construction and grey water planter finishing.

The project was run as a volunteer participation workshop, similar to the projects run in many countries overseas by Earthship Bioteecture, which involved a workshop program which provided a series of talks, films and discussions surrounding living self-sufficiently and engaging with the broader themes of Earthship Bioteecture, including a smaller-scale living mindset, community development and inclusion and thinking smarter in terms of resource consumption and use of materials.

Design considerations

The Earthship design was adapted to suit the slope of the site and NW orientation. Orienting the front face of the greenhouse to 45 degrees NE for mid-winter solstice was the motivation to

receive the greatest passive gain in winter months, which compared to south east winters are not as consistently cold but still have drops to below 10°C at night.

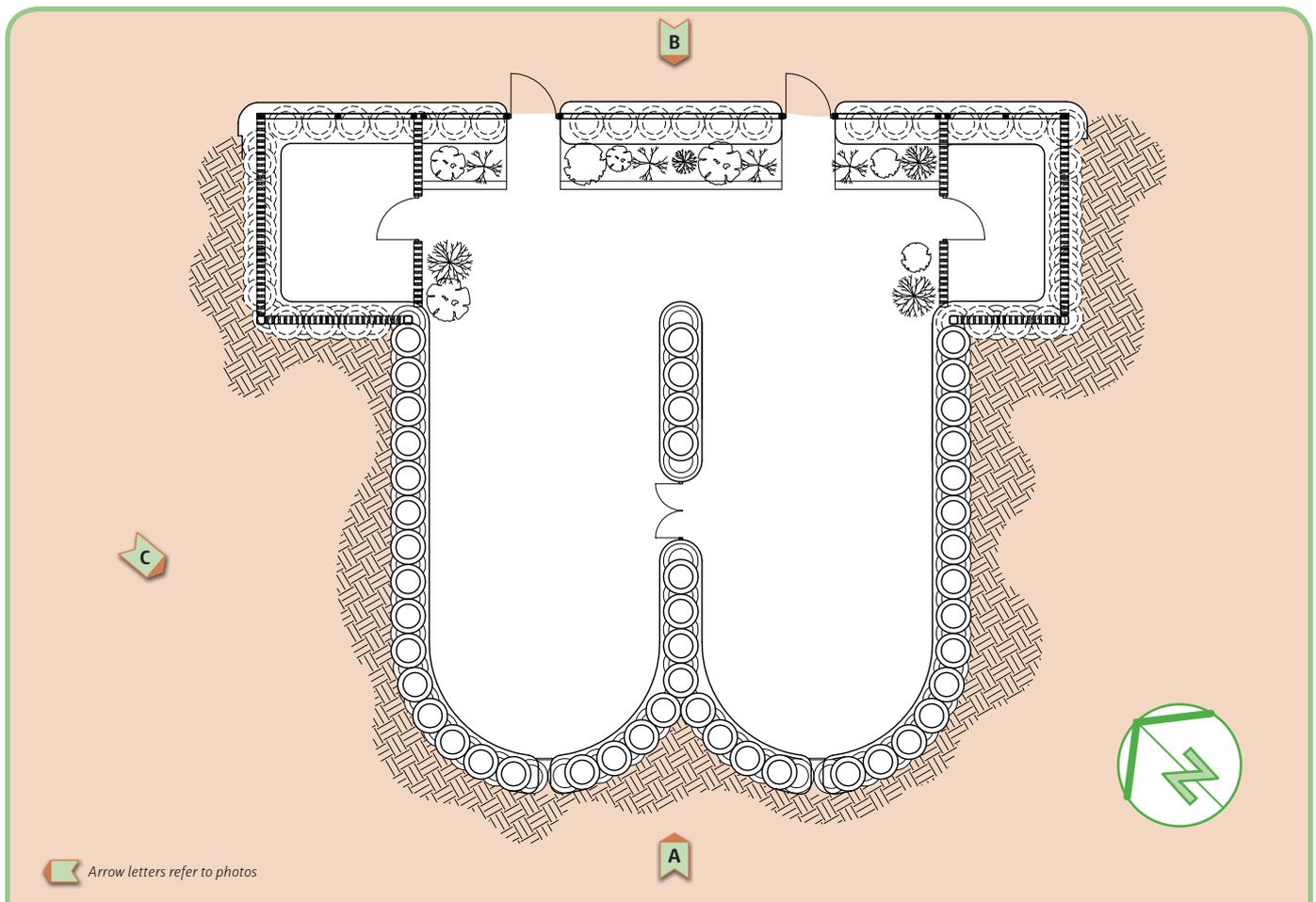
In terms of site constraints the building footprint was sizeable considering the amount of earthworks and access required through the various stages of Earthship building, from tyre pounding, to building and placing the vaults on site and then berm building to provide temperature storage and stability. As such the total footprint of the cleared site was at least double the house footprint as it was necessary to have total access to all sides of the building across the timeframe and staging of the project. If you do not have clear access to allow for excavation or trucks near to the build site then you need to make proper preparations for transporting materials,

and the labour and/or equipment and timing to compensate for lack of access. As Earthships are often encouraged to take advantage of sloped sites for their ease of providing a supportive berm, it is also important to think about having access for trucks of earth or materials close to the site or a way of transporting large amounts of sand, gravel, earth and other building materials to where it is needed.

Materials

A complete materials list for this particular job is fairly exhaustive but the project used somewhere around 750 tyres, 100m³ of earth, 3 pallets of cement, lots of water, a truckload of gravel, 2–3 truckloads of sand, 1000s of aluminium cans and 7000 bottles from the nearby





tavern. This build was also highly significant for its decision to experiment with *Hempcrete* as a masonry and roof material.

Although Earthships use mainly recycled materials as the basis of their structure, they also require a range of timber, plastic and steel materials, which can often be sourced cheaply or freely but requires dedication (and time) to really keeping the costs down. Much of the materials were found at the tip or scavenged, alongside some of the excavation and plumbing work being done as a trade or barter.

Managing the project

Financing of the project was problematic as, this being the first Earthship of its scale in Australia, there were few costing references to use and application from similar Earthships built in the USA were found to have quite different costings once completed on the ground in Australia. As in any home building project, the costs vary greatly

and often exceeds original estimates but the process was conducted in under 6 months, finishing about 85% of the structure.

Management of such large teams of people living in fairly rudimentary conditions was also a challenge; Shelley cooked and prepared most meals for the crew and volunteers over the two months, what a job!

Managing the multiple tasks and teams on site was a big challenge for the new Academy graduates, as was learning to work together in new circumstances with a range of trades and experiences. We have all learnt a great deal from this project and will hopefully take the lessons onto the next jobs as we endeavour to help facilitate Earthship dreams across Australia.

Earthship Australia in partnership with Earthship Biotechnology New Mexico are collaborating to build fully certified Earthships in Australia which will demonstrate successful alternative methods of green building, living and thinking for the community.



Earthship gratitude – an owner builder’s perspective...

I would like to share with you a story of my gratitude for the crew of Earthship Australia and the building adventures my partner and I have shared with these amazing people.

Last year I met Duuvy in Nimbin. He had just moved to the area after completing the Earthship Biotecture Academy course in Taos with Mike Reynolds. Duuvy is confident and adventurous and keen to spread the ‘how to’ sustainable lifestyle message by holding seminars and builds. After forming a friendship with Duuvy, I began envisioning such a build on our own bush block in the central Queensland coast.

I had been to Mike Reynolds presentation in Bangalow with my boyfriend Bob earlier in the year. So when I excitedly went through ideas Duuvy

BY SHELLEY CLEMENTS

and I had been discussing, Bob decided it was a good idea to take on the ground breaking build. Ground breaking because of the *Hempcrete* to be used in the roof and for being the first Earthship to be built in Australia through Earthship Biotecture students and run as a workshop.

The decision was made; we were building an Earthship! So with my excited ‘do it now’ attitude I had Duuvy in the car with me the next morning for a 9 hour drive north for our first consultation. The site had the perfect aspect for passive solar design.

Collecting the materials was fun and crazy busy! A year probably would have

been more of an appropriate time frame; instead we took 10 weeks to collect what was needed, along with some materials we already had on site.

Stage One

The beginning of January saw the arrival of the first crew and Duuvy ‘the man with the plan.’ He had selected 30 out of about 300 applicants to join us and learn how to build and be empowered through knowledge of sustainable building and lifestyle. Attendees received lectures on the theory of the concept, hands on building experience, bush camping, nutritious eating, lectures on permaculture and fun Friday entertainment. They worked their butts off! They showed us what it means to be



community. It was hot and sweaty and there were biting insects and we got the tail end of a cyclone. Special songs were made and I would go to sleep at night listening to the camp chuckles. If you ever get the opportunity to join a build, do so! It will help shift your viewpoint by being surrounded by positive people. It will show you how many people from different walks of life can come together because they care for our earth and people. It reinforces the fact that when we work together we make incredible achievements happen.

Caroline and Ian Todd also arrived. Caroline is a passionate teacher of permaculture and is also a part of the Terraeden Biotecture team with her husband Ian and with Duuvy. Ian was the steel construction man and the concreter. They arrived with their car loaded with a more than generous amount of tools, luggage, a dog, a cat and chooks! Another key player was Paul Nimbley, a jack-of-all-trades and a patient and confident teacher. Georg and Bob added building skills too.

So mid January rolled around and between crew, attendees, friends and family we had around 45 people living on site. Our plans for a two-week build stretched out to two months. In that time we pounded 750 tyres, constructed a large greenhouse, and completed two dome roofs with layers of *Hempcrete*, steel,

styrofoam insulation, water proofing membrane and concrete final crust. We built tin can walls and installed plumbing and electrics. Impressive!! Everyone was worn out and our bank account depleted. We made a decision to have a break and do it all again in June.

In this first stage, there were a few people that need special thanks. Dani Wolf – Chambers for her dedication, architecture skills and lovely nature. Rachel Goldlust, a community planner, Earthship Biotecture Academy graduate and initiator of Earthship Australia.

Stage Two

June came around fast and with it a new crew. We had the return of Dani, Rachel and Paul and of course Bob – legends! But we also had two new amazing legends – Rosa Scarlet and Campbell Imray. Rosa has worked alongside Mike Reynolds for more than a year; she is so determined and driven it was an honour to have her on site. Campbell Imray is the humble man that would be first on site and last to leave. He has an amazing amount of natural building knowledge and he kept the energies high.

We felt a lot more organised for the finishes build stage, having learnt so much the first time around and being on the site getting it ready the week beforehand. The stage was set to teach bottle wall construction, clay render, botanical cell construction finishes, internal bottle walls and arches, bottle brick making and roof water proofing. We welcomed the arrival of the new crew of 30 including some who had returned.

The second workshop flowed nicely, with a motivated happy group of earthshippers buzzing around in teams, stomping mud for render, rendering domes, cutting glass bottles, bottle wall construction teams and installing plumbing and electrical.

We have achieved so much and have just had the biggest adventure this year. We started this build with the intention of building with love. In the words of Duuvy ‘If you make a lasagna with love it will taste amazing. If you make a lasagna with anger and frustration it will taste like crap,’ so we took that attitude to the job site and you could really feel it. I’ve

even had locals drop in and mention they noticed how good it felt and loved the vibe.

I want to finish my gratitude story with a massive thanks to every single one of the 120 plus people who have participated and added their personal touch. Incredible! I can’t thank you enough.

The facilitators of this project haven’t stopped building on different projects around the globe and here in Australia this year. More and more people are requesting to build an Earthship. It is really picking up momentum in Australia. ♦



Links & resources

◆ Earthship Australia

Working towards developing and fostering Earthship Biotecture in Australia. Rachel Goldlust.

rachelgoldlustearthshipaustralia.weebly.com

www.earthshipaustralia.org.au

www.facebook.com/groups/EarthshipAustralia

◆ Terraeden Biotecture

Designing habitats that operate on a closed cycle through integrated natural systems. David Aubor.

www.terraeden.org

◆ Earthship Biotecture

‘...the Earthship is the epitome of sustainable design and construction.

No part of sustainable living has been ignored in this ingenious building.’

www.earthship.com

◆ Earthship New Zealand

Working to facilitate the proliferation of Earthships in New Zealand.

www.earthship.co.nz

◆ YouTube

Two video documentaries – search for ‘Australia’s First Earthship.’

www.youtube.com

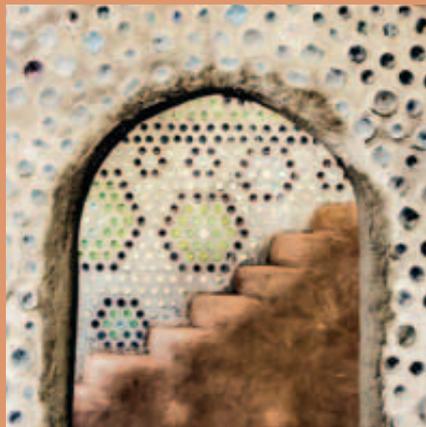
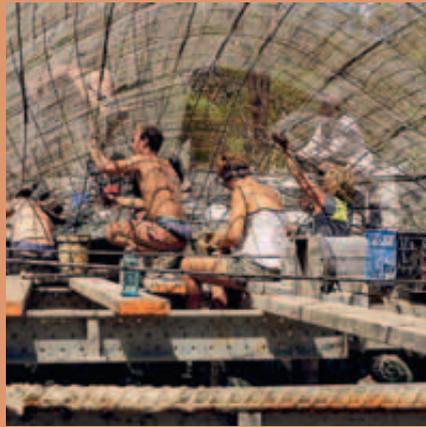
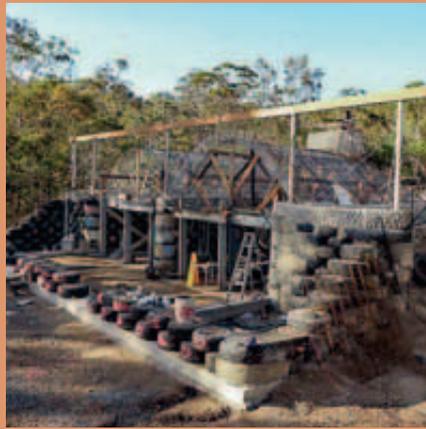
◆ Other Australian Earthships

Earthship Ironbank, SA

www.earthshipironbank.com.au

Ghost Gum Farm, Qld

www.ghostgumfarm.com.au



Coming events...

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Facebook: *Henderson Clayworks*

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Beginner's Stone Sculpture Course: Expressions of interest taken.

Open Studios Weekend: Dandenong Ranges: May 3-4.

Forest Edge Stone Art Gallery/Studio, 0412 812 144, www.forestedgestone.com.au

SA STRAW BALE WEEKEND CONFERENCE

SOUTH AUSTRALIA
SEPTEMBER

Full details will be published in later editions of *TOB*.

Contact *Lance Kairl (08 8555 4223)* or *Bohdan Dorniak (08 8344 8170)* for details.

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www.ecm.uwa.edu.au/icrec2015

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Line ads...

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Contact Carol 03 5435 3986.

THE LAST STRAW (TLS): The international journal of straw bale and natural building.
www.thelaststraw.org

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See photo below



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To protect and promote the mud brick building industry. www.mudbrick.org.au

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Render games

Fresco on lime render

Following on from 'Lime render on exterior straw bale walls' (TOB 180 Dec 13/Jan 14) and 'Clay render on internal straw bale walls' (TOB 181 Feb/Mar 14), I am now into the fun bit – the final coat!

Fresco for the final coat

That brings us to the final coat and the colour for the external walls. I was determined to take my time allowing me to achieve three things; cost savings, control and a low maintenance finish. My research pointed towards a colour either in the final render or applied on top of

BY KEN LONGSHAW

the still fresh render as the way for me. I settled on the second – a fresco technique.

For one reason, I believed it would save money because:

1. I was sure it would be cheaper than painting – have you priced a bucket of paint recently? If you think 20 litres of acrylic paint at the local hardware is expensive, wait until you start to talk about 'natural' paints, the sort that a straw bale wall needs to allow it to breathe. Plus, new render is very thirsty. The first coat

does not go far at all and, in total, the wall would need at least three coats. By my calculations I would not see much change from \$1000 to just complete the exterior, and that's doing the roller work myself.

2. Fresco would save on materials. Tinting the whole batch of render would consume a lot more oxides and pigments than the fresco technique with the same end. I wanted colour locked into the crystalline structure of the lime render. A small amount of colour applied to the surface of the fresh render should be sufficient.

3. It would save on time by applying the colour as the render went off,



1



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supposedly giving a permanent colour finish. I only had to do it once. Achieving 'fresco' colour could mean a low maintenance wall system, which equates to an even greater saving of time and money in the future. No paint, no turps, no cutting in, no drop sheets ever again. The Sistine Chapel was painted how many years ago and all it took was a wash to make it look brand spanking new again!

4. Finally, I figured that it might be fun to experiment with oxides and pigments to see what happens. So I purchased some books specifically on the technique of finishing lime render on straw bale. That kick started my creative juices.

My outlay so far: \$38.00 for the books.

Experimenting with oxides

My local hardware stocked a small range of oxides. So I started there to try and get a feel for working with colour in a fresh lime render. I purchased a low key red oxide, a rich yellow oxide and a black to add some weight. I mixed the oxides in micro amounts with water taking care to measure accurately and keep good notes. I used a section of the future garage wall to lay up some test areas using lime render and started to paint with my colours. Using the oxides individually and in combination I managed some dirty browns and greys and even some clean earthy tones in between the red desert colours through to rich ochres. However, none seemed to be quite what I was looking for.

Cost so far: \$75.42



3

1. *Mixing lime render is easy in the concrete mixer. A fatty mix was found most suitable as a base for the fresco.*
2. *Adding pigment directly the render was tried and rejected as too costly.*
- 3-4. *Making a lime fresco using oxides and pigments involved many tests and much careful mixing and recording of the results. The final colour chosen (after many experiments) was a cool taupe.*



4



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7



8

5. The garage wall was used to test colours – note test patches in background.
6. Painting on the fresco.
7. Mist spraying the render to dampen it prior to application of the fresco.
8. Cleaning up the drops.

GREEN?

While the colours were fun and thought provoking, none spoke clearly about the home and how we saw it fitting into our life and the local green patch we plan to create. 'What about greens?' came a suggestion.

I acquired a bucket of very promising green, though that started to get expensive at almost \$40 a tub. While the green gave some vibrant and some cool swatches, instead of blending with the environment, it felt stark by contrast.

Outlay so far: \$113.92

APPLYING THE COLOUR

So far the testing had shown that the hardest part is to get the colour consistent, especially as it takes time for the colour to 'settle' into its final state when the render has fully cured. I

tried various tools and techniques and eventually figured that I had to apply the pure colour dry-ish, with a soft brush then go over it while damp with a sponge float to get an even spread of tone. I also did some tests to get different surface textures. To give a smoother final finish I steel trowelled some of the swatches and used a damp sponge to get some very rough. All of this I am sure a competent plasterer could have told me in two minutes, but I had fun!

BLUE PERHAPS?

After the first round of swatches dried, a committee of the whole extended family arrived at the consensus that the home needed a dark grey/blue to fit in with the setting and to match the black windows and *Colorbond* Ironstone roof colour. I found out that blue oxide costs \$285 per kg – the most expensive colour oxide available! I went the pigment route for the test instead. Blue pigment could be purchased in 35 gram lots for \$16.

The experimenting and reading told me that the final colour would not become evident until the lime had dried and set, which takes a number of days.



9 It took at least seven days by my trials. First afternoon the colours were deep, as you would expect on 'wet' render. By the next morning they had gone chalky and that held on for a good four days. By the seventh day the colours had started to clarify and were surprisingly alike to my original intention (with blue as the notable exception). Some swatches kept changing for up to 10 days, getting lighter and brighter. For example, I got a baby blue instead of the deep cobalt I was aiming for. It was a lovely baby blue – just not on my home, thank you!

The result, where I used a single oxide, was clean open colours that set quite bright. Where I mixed oxides to reach a colour it was usually muddy. All the blues were a failure – too grey or too baby blue. The other discovery was that when you premixed a 'lime paint' (lime powder, water and colours) you got a much more consistent predictable result. It was easier to apply with a large brickies brush and needed no special trowelling to get a reasonable finish. Well, one we were pleased with, anyway.

Cost so far: \$130.04

HOW ABOUT TAUPE?

Back to the consulting team with the dismal failure of my 'blue period.' After a long discussion and the exclamation 'Oh I thought taupe was off the table,' we settled on a cool taupe. How do you make taupe paint? Purple brown was what Google said.

That sent me on a hunt for a better source of oxides and/or pigments. Depending on the quantity there are a lot



10 9–10. Tarps were needed to protect the western wall from the hot direct sun while applying the fresco and as it dried.

of sources. If you need a minimum of 100 tonne per month you can get any colour you want at a few cents a kilogram... everyone else seemed to cater to artists and sell in 6 gram lots. Some of the colour choices got me really excited – I saw a picture of a most beautiful 'box' of oxides and I wanted one! However, I stopped short of buying a set of 'French oxides' from the USA and was determined to find something closer to home.

A kind straw bale renderer in the UK (Ian Kozlowski, www.decor-bristol.co.uk) pointed me to a German pigment manufacturer (www.mixol.de) and their site yielded the contacts for a firm in South Australia (Alexander Weyermann, www.goldleaf.com.au) who imports their pigments. The gentleman there was most helpful and I soon had a collection of small bottles of pigment – lime safe – in my hands.

Total outlay so far: \$156.00.

Testing pigments

The tiny parcel arrived and I unpacked my suite of new colour pigments. Testing began on creating a taupe (I had also decided to use the lime paint with pigment application style) and I got a

variety of results – all bad – until my wife took over the colour mixing. She started with lime and water, then added pigments (violet and stone grey) followed by oxides (yellow and black). The first iteration was too yellow and dark. Take two and she nailed it – at least in the bucket.

I made up a new batch of render and used a fatter, simpler mix on recommendation from Jay C. White Cloud, a luminary among the USA green building movement who I met online via a forum on Green Building. The fat lime render went on to the well keyed wall very nicely and, as it approached the sort of dryness I judged to be right, we misted the surface and applied the colour. The colour goes on thickly and with heavy brush marks. I used a 200mm wide brickies brush and applied the mix liberally but carefully. It is easier to start from the top to avoid drip damage and runs.

Finally, to get an even finish (no paint brush marks – which was the finish we thought we wanted) I hit the surface with a sponge float after lightly misting the surface again. It looked fine but consumed a lot of effort for little gain so we removed that final step and stopped at the brush application, which gave a similar finish if we used a cross hatch method to apply the colour.

Seven days later we were very happy with the light soft taupe colour that leaned toward a cool grey/mauve in the



11



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late afternoon sun. We were so satisfied that I used the remaining mix as a lime paint and covered all the experimental swatches and started on the garage walls.

Last night a good friend asked me 'Why the fresco?' I had to admit the main reason was 'Fun!' This part of the project has been a lot of fun. It is amazing to me that in 2014, I can play with a technique that has been used to decorate the posh edifice and lowly hovel for thousands of years with very little change in technology. While I could have employed a professional to do it right the first time, the satisfaction of failure and success is heady.

Secondly, the real cost was very gratifying. To cover all the external rendered surfaces of the home we have used two bags of lime, 12 vials of purple, six of Stein Grau and a tablespoon of black and yellow oxides. Total cost, less

11. Freshly applied fresco is greyish.
12. Colour becomes stronger as it dries.
12. Final colour and texture.

the experimenting, was \$169.90 for more than 90 litres of 'paint' that gave a full colour result with a single (hopefully not to be repeated too often) application.

The render done and coloured, I can finally start on the decks!

Photographs, unfortunately, do not do the result justice but I have included a few. If you want to examine the result in person feel free call ahead to visit our humble straw bale home in the NSW Southern Highlands. ♦

Ken Longshaw is a registered builder and building designer (Eco Sense Building), who shares his owner builder experience with us.

What I have learned so far about rendering a straw bale home

1. Spraying the first two coats of external render is an excellent idea. The lime render or clay goes on fast, fire proofing the structure and you get good penetration into the straw – meaning you get less likelihood of delamination.
2. Allow a lot of time or labour to clean up and (VERY IMPORTANT) strip any window protection and clean the windows off ASAP if you have any indication that lime render got on the visible surfaces.
3. Hand rendering the final coat gives you a lot of control and allows you to do fun things like add colour as a fresco rather than having to tint the entire batch of render. However, like Rome, it won't get done in a day!
4. Clay plaster on the internal walls lends itself to individuality from straight and modern to organic and hand expressed. Spray the first slip coat and, if you want, the second. However, getting your hands in the clay is great.



Links & resources

♦ Eco Sense Building

We believe that any Australian home can be environmentally better without costing more, owner built included.

0418 230 912, www.esbuild.com

♦ Books I found useful:

- **Using Natural Finishes** by Adam Weismann & Katy Bryce. Green Books (2008). ISBN 9781900322164
- **The Straw Bale House** by Bainbridge, Swentzell Steen, Steen. Chelsea Green Publishing (1994). ISBN 9780930031718.
- **Practical Straw Bale Building** by Murray Hollis. CSIRO Publishing (2005). ISBN 9780643069770.
- **Building a Straw Bale House: The Red Feather Construction Handbook** by Nathaniel Corum. Princeton Architectural Press (2005). ISBN 9781568985145.

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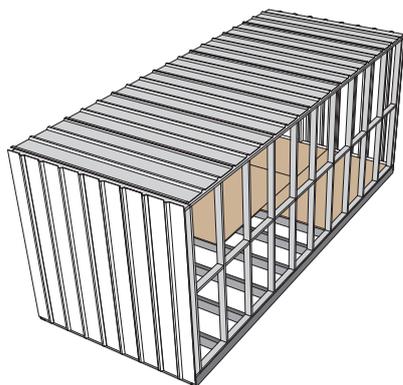
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Reusing shipping containers vs. DIY alternative construction



In TOB 180 Dec 2013 / Jan 2014, we published an article by Alan Gordon about a DIY alternative of building a space similar to that provided by a container. Some response from readers was expected, and here we have one from David Rogers. It is a privilege to have a chance to discuss and comment on articles published, and we welcome this sort of dialogue. Alan Gordon has been given the opportunity to reply.

From David Rogers...

In response to Alan Gordon's article 'DIY alternative to the shipping container,' whilst he has raised some considerations for owner builders he has missed the point of the shipping container 'movement' as such.

His breakdown of costs, for example, indicates to me a very optimistic appraisal and bargain basement budget only for both materials and labour. Getting somebody else to build one to such a specification as he indicates in 24 hours at \$25/hour... I don't think so!!! In any case that's not owner building.

The prospect of the shipping container as a viable shell for any kind of construction is a highly poignant one for many reasons:

1. There are many thousands of excess containers basically sitting about in Australia with no prospect of returning to the export country from which they came – this is due to a trade imbalance. Therefore the principle of using one in this country is firstly based on recycling and making do.

2. They are highly engineered and can support about 80 tonnes (plus), are easily loadable on purpose-built trucks, or with cranes, and can cross the land and sea cheaply by train and ship. The portability

is a fundamental advantage and certainly is streets ahead of a bulky extra-wide relocation requiring special permits, special services, restricted hours and very expensive specialised companies with specialised machinery.

His design does not appear to be modular nor liftable without specialised relocation. However, I agree that a modular shape to the same dimensions as a container should be cheap and easy to transport; anything oversize is going to be an expensive nightmare to ship. In addition, a self-fabricated box may not be liftable by crane or a side-loader for awkward sites.

3. They are weatherproof and need very little modification on the whole, bar insulation – unless one begins cutting multiple or large openings willy-nilly to such an extent it defies the purpose of a modular box for building in any case. There are multitude of ways in which they can be built with including stacking, cantilevering, part-burial, elevated etc. In many economically poor or housing-challenged countries they are proving over and over again to be a fantastic solution to accommodation and housing and to such an extent there is highly evolved architectural approach to making use of them, whether completely self-

contained or simply a component in a design. In one place in Europe there is a virtual town of container apartments, some 'blocks' standing as many as seven container 'apartments' high, each with private balconies.

4. They are cheap. I bought one including delivery with a crane, located to millimetre accuracy on prepared footings for a total of \$1600, which also had a beautiful hardwood floor which has since been restored and looks exquisite. Like wise, I use a standard container as a guest house, granny flat and office.

Moving/relocating a container with a number of readily available dedicated services can be as little as \$80/hour. I believe that an engineer certified double opening reconditioned A-grade container can be obtained for around \$4000.

I have consequently built my 'house' for an extra outlay of about \$1300, albeit many hours work – de-rusting, welding, fabricating, painting etc. but no more than with any construction undertaking.

There is no requirement for extra ceiling height in the standard height container – a doorway needs to have 2.1m clearance so 2.3m height is adequate.

I have spoken to various councils about such abodes and many are embracing of

them. You would still require engineering approval for the DIY cuboid construction suggested, whereas a standard decent grade shipping container does not as it's already far in excess of the minimum engineered strength. Only Certificate of Occupancy must be obtained through the usual channels.

It would seem Alan has never put his academic idea of the DIY container to the test (i.e. built one or lived in one) nor is he open to the overwhelming abundance of facts, ideas and support for the ever-growing shipping container 'movement,'

as part of an owner builder approach and sustainable ethic as well as an exciting design prospect and living solution. Why go out and buy more new materials at a cost to the environment?

I hope you are able to print my letter with a view towards the principles and aims of your publication. Having both architectural training and owner builder experience, I feel very strongly that the published article, despite the disclaimer, serves no real purpose in serving the awareness of the public of the distinct advantages of modular design and re-

using existing constructions. To have been truly fair, perhaps an article (such as this letter) might also have been published about the great prospect of shipping container housing.

Ed's notes:

1. A standard height container has an internal height of 2392mm. To allow for the required 2100mm clearance, this would mean 292mm is available for flooring, ceiling and insulation.

2. We have included container housing in previous issues (TOB 155 Oct/Nov 2009, TOB 176 Apr/May 2013).

Alan Gordon replies...

Readers who care to call their local steel and timber merchants will find my material prices are pretty accurate.

The time indicated to construct is based on my current professional experience and assumes an efficient semi-skilled worker with power tools. Without putting a dollar value on the labour the comparison would be unfair – the DIY module would be much cheaper than a dead container.

The DIY module illustrated in the article would not require 'special permits, special services, restricted hours and very expensive specialised companies with specialised machinery' to deliver. In fact, it could be up to 3.5m wide and 4.6m high (on the truck), and still wouldn't involve any of the above. Your State Transport Authority or a good local transport operator can confirm restrictions for your area. I shipped a similar unit (6.6m x 2.5m

x 2.7m) recently. A local tilt tray operator loaded and secured it in about 15 minutes. It was delivered safely and positioned accurately without difficulty. The 8m truck cost \$110 per hour.

While some councils may 'embrace' shipping containers as housing, in my experience they are usually negative about them. Check with your council first.

The Building Code of Australia is quite clear about permissible ceiling heights. Check these out thoroughly (taking in to account the *finished* internal height after floor and ceiling) before committing to the purchase of a standard container.

The bargain container described is a rare thing.

There is nothing academic about my commentary. As well as having built several similar modules over the years, I live comfortably in a custom designed and owner built module of similar

construction to the one in the case study.

The module on the truck in the accompanying photograph is part of a house – kitchen, bath/laundry and bedroom. While this particular module does not have external cladding it is of the same construction as the DIY module case study. It was shipped on 29th January 2014. The other picture shows my micro home during construction. Light, strong, demountable. ♦

*Alan Gordon is a Building Designer based in Ballina, northern NSW.
www.alangordon.com.au*

Ed's note: All the standard approvals for construction of a building (whether a brought in container or self constructed version) will still be required. Check with your local council and make sure everything is done to the Building Code of Australia.





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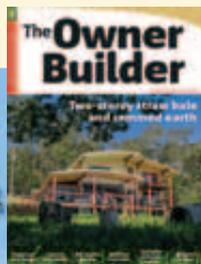


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Artisans Park early settler's bush hut

BY GLENN MC MASTER

This building was originally a storage shed in the backyard of a suburban Sydney house. It was constructed from pine framed walls clad in flat sheet fibro with a *Colorbond* roof making it a recent build; unfortunately for the new homeowners, the local council deemed it illegal and ordered its removal. The owners wanted to see as much of the building recycled as possible so contacted Artisans Park.

A professional removed the cladding before we started the disassembly process, which turned out to be quite simple and completed in just one day. The only item not recycled was the cladding; any steel nails, brackets and screws not needed were kept to be reused later.

Making new look old

Our intention was to reassemble the building and turn it into an extra guest accommodation within the park, using mainly recycled material already collected on site. We wanted to make the building resemble an early settler's hut, as if it had been on the property for many years. The inside design was to be one of an old building gently restored back to life.

The location chosen had large existing trees to help the building quickly settle into the landscape. Reassembling the

building frame and roof was a simple process requiring only two people for four days. Our first task was to clad the building; as we had collected a stack of standard timber fence palings, the cladding choice was to use these.

Wrap around verandahs

All old bush buildings had wrap around verandahs; these really add to the character of a building and help break up what is essentially a box design. Our verandah wraps around three sides having one side wide enough to park a tractor under. We sourced all our upright poles from the property, choosing to use stringy bark as they are normally the straightest and will regrow readily.



Left: Verandah flooring boards came with their own history and paint.

Below: Modern conveniences in the bathroom.





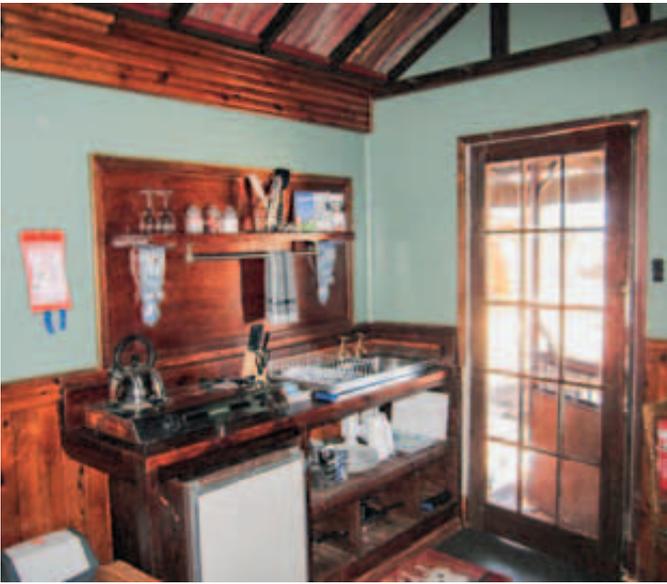
Above: Old fence palings were used for the external wall cladding and stringybark poles sourced from the property for the verandah, shown here still under construction.

Right: All huts need an outhouse!

The verandah floor is a random mix of old painted floorboards to give the effect that it had been painted many times over the years. We did not paint the floorboards; they are as we found them at various house demolitions. The roof uses any old iron we could find, complete with rust and dints and, in some sections, doubled up to stop leaks.

To make the building look older we added stone walls, an outback toilet, clothes line, fire pit and a fake power pole connected to the hut. The power line is just fencing wire. We scattered old items around in the garden beds, adding to the old settled look.







Self-contained design

Inside the building needed to be self-contained with a kitchenette, bathroom, a double bed and one bunk bed all in the space of 3,5 x 5m. The only way to achieve this was to move the bathroom out onto the verandah, freeing space up inside.

We lined inside with recycled cypress pine and MDF board left over from a local flower show. In between the rafters we inserted old roofing iron so that when looking up it appears to be the underside of an old roof. There is, in fact, insulation and a new *Colorbond* roof on top.

The bunk bed is a solid core door with stairs designed to hold everything in place. This design is extremely strong and gives the impression of a floating bunk bed.

We made the kitchen using recycled timber and an old sink, keeping it simple and functional. A gas hot plate and gas fridge complete the kitchenette.

The bathroom needed to be simple and functional. We managed to use all recycled fittings except the shower screen and base, as the one we had intended to use was far too big.

Living off the grid, we set up a very basic solar system for the hut using one 200 watt solar panel feeding into a 300Ah battery with a 2500 watt modified inverter. All lights are 12v DC LEDs running through the solar controller unit. ♦

For more information on Artisans Park, visit their website or Facebook page:
www.artisanspark.com.au,
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Costs Breakdown

Solar	\$995
Solar panel	\$180
Power inverter	\$200
Deep cycle battery	\$380
Solar controller	\$60
LED lights	\$75
Electrical cable	\$100
Plumbing (not including water tanks)	\$2010
Hot water unit	\$860
Shower screen and base	\$150
Taps	\$100
Plumbing fees and waste water pipe	\$900
Paint and finish	\$80
Paint (pre mixed colour that no one wanted)	\$20
Clear coat	\$60
Hardware	\$1000
TOTAL	\$3085



SPECIAL FEATURE

Stunning stonework

Bush rocks, quarried rocks, found rocks, created rocks. They all rock!

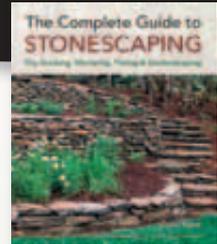
The Owner Builder is all about sharing the experience. One way to do this is through special features like this, where we concentrate on specific topics.

In this issue we showcase some of the fabulous and creative work done by owner builders who responded generously to our call for examples of their stunning examples of work created in stone.

We hope you find it inspirational as you contemplate, begin or continue with *your* owner building journey. Perhaps you will be tempted to share something you have done with us!

See p.69 for more details of upcoming features.

Featured ideas for this issue will receive a copy of **'The Complete Guide to Stonescaping'** by David Reed. Published by Lark Books. Kindly donated by **Capricorn Link**. (www.capricornlink.com.au)



Stonemason artist



BY PAUL SMITH

Located on the very edge of Sherbrooke Forest in the Dandenong Ranges, I am surrounded by inspiration.

These are some of the random walling of various styles we have done around Melbourne over the years.

The carved work piece is to show just what can be done with stone; this particular piece is set into a wall.

We also run basic courses in building stone walls, in case you are inspired to give it a go yourself!



Links & resources

◆ Forest Edge Stone

Experience the art of stone masonry and browse the many sculptures on display. Workshops and stone masonry demonstrations.

03 9752 0035,

www.forestedgestone.com.au

Bush rocks and crystals

BY LYN HEHER

My husband Stephen is a bricklayer and stone mason by trade, so becoming an owner builder and building with stone was not such a daunting task for him – just some more hard work.

We collected all the rocks from our property. We had the option of creek rocks or bush rocks. We chose the bush rock for their colours and because they were much easier to collect; we carried them downhill to the site whereas the creek rocks would need to be carried uphill.

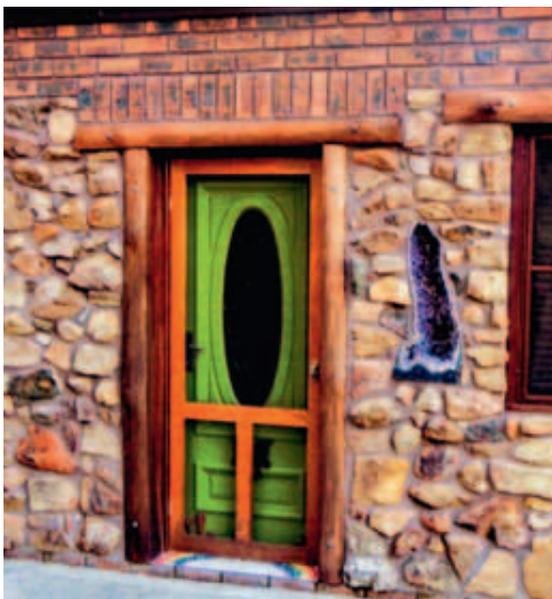
Stephen found the bush rocks hard to work with as they were so irregular in shape. Another challenge was finding the 90° rocks required for framing openings for windows and doors. With his patience and perseverance he managed to find them and the results look wonderful.

The walls also have a variety of crystals built in amongst the rocks; clear and rose quartz, tigers eye, malachite, labradorite, a beautiful ocean jasper and two large amethyst geodes, as well as others. I also collect love heart rocks and we have included two of my large ones in a rendered wall.

Our extension is gathering this beautiful energy about it as it progresses; I never get tired of just looking at the beautiful rock walls.

Stephen is glad all the hard rock work is now complete – the rest of the work is easy compared to the rock walls. But, Stephen says, it is all worth it. He is building us a unique and beautiful home.

There is soooo much more to share about our owner builder story, but that is for another time. ♦



Labyrinthine endeavours

BY DON FIRTH



When my load of 75mm gravel arrived for the grey water pit, Fiona pounced on all the big bits and announced with glee that she was commandeering them for her labyrinth. Layout was done by scribing concentric circles with a stick and string, tied to a centre pivot and laying complete circles of stones. The cardinal points were then established (at noon on mid-winters day to get true north) and radial pathways/turns then picked out. The 'dalek' guardians are giant electrical insulators from the Snowy Scheme.

Labyrinths have been in mans psyche for thousands of years. This one is the exact size and pattern of the one built into the middle of the nave floor of Chartres Cathedral in 1200AD. There are masses of mathematical formulae involved, but it is basically 12 concentric circles with the outer having a diameter of 12.455m. The length of the pathway is 261.5m this happens to be 888 Roman feet, which is also the Greek value for the name of Christ. Pilgrims who could not walk the medieval pilgrimage to Santiago could instead walk (or crawl) this path to gain salvation. The things you can learn from reading *The Owner Builder!*

Labyrinth or Maze

A labyrinth is a pattern of lines creating a single pathway to a central point, usually with axial symmetry. There is only one way 'in' and one way 'out.' There are no choices or dead ends.

A maze has a number of blind ends and one or more routes to a 'central' focus and is usually asymmetrical in plan. The delineation of the path is usually done with a material that conceals the rest of the pathways.

Why have a labyrinth?

Apart from being a fun landscape feature and potential tourist 'trap,' a labyrinth is very useful for spiritual and physical development. It provides a quiet contemplative pathway and the constantly changing left and right turns are good body posture, balance and coordination training for both young and old.

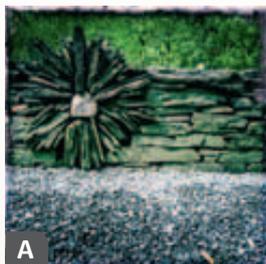
If only someone could explain this to our wombats – they don't seem to care that there might be a Minotaur in the middle, they just walk straight through! ♦

See www.mymaze.de/chartres_technisch_e.htm for more technical data



Capacity plus opportunity...

BY THEA ALVIN



Broad Circle

'Broad Circle' (C) resides in the back garden of a private doctor's residence in Vermont. The 'Wall Star' (A) also is a residential piece, built for the founder of the Yestermorrow Design/Build School, at which I teach during the summers.

When working with clients or when erecting sculpture in my own yard, I aim for fixtures (as well as evolving pieces) that are both enjoyable to live with and a pleasure to build, 'Broad Circle' being a prime example. When in his rocking chair, beside his wood fire, the man who commissioned this piece can look through it in to the forest, and walk beside it as he and his dog enjoy the day. I love the grace of heavy rocks, and their shout-out to freedom and effortlessness.

yestermorrow.org



Links & resources

◆ My Earthwork

Thea Alvin is a vibrant USA based artist, designer and stone mason, who has been learning from and working with stone for 30 years. By encouraging the conversation between journey and destination, Alvin builds flowing, twirling, free standing arches and ephemeral works as an expression of the energy she taps into. 'Capacity plus opportunity'

www.myearthwork.com



Tres Mariposas

'Tres Mariposas' (Three Butterflies) (B), was built in Canada from 45 tonnes of rubble as a demonstration piece at the non-profit Dry Stone Walling Association of Canada (DSWAC). This piece and the Bonnaroo Doublet (D) (installed on the grounds of Bonnaroo, in Manchester, Tennessee) were built to exist only temporarily. Both brought with them experience beyond the final sculpture. In the case of the Doublet, my crew and I were given what's called 'rib-rap rubble – trash stone' which is not at all fit for walling, yet the show would go on. We were there to install a performance piece, and performance it was: in the 46°C heat, the audience of nearly 5000 VIP gathered, questions swarmed, I began to sweat from more than just the heat. With the main arch standing, in about an hour I had worried the remaining stone together in a second arch form, it stood for the clapping crowd, torrential rain followed. After the four remaining days of the festival it stood strong, then we loaded it back into the bucket loader to retire as a heap at the back of the festival field. My theory is echoed in both of these temporary pieces: beauty should look simple yet be very complex.

www.dswa.ca



Smitten with stone

BY JULES COOK



I have been working on and off as a stone mason since I was 16. These are a few of the projects I have recently completed using bluestone and sandstone.

Sandstone stairs

200mm high sandstone blocks were laid as the riser for steps and then sandstone crazy pavers as the tread. I had a few Bombay Sapphire gin bottles that I broke, tumbled in the mixer so they looked like they had come out of the sea, then used as feature highlights in conjunction with the crazy pavers.



Grange black brick steps

It is important when laying old bricks to soak them in water before putting them on a mortar bed as they are so porous that they dry the mortar out and it falls apart.

Sandstone fireplace

This is the fireplace in our house, built using sandstone blocks. I faced each block with a bolster to create straight and level edges, then laid them. We chose this stone from Toowoomba because of the iron in it and all the other beautiful colours. A word of warning, I had a stone with a leaf fossil that was going to be the keystone in the fire place, but unfortunately as materials were delivered on site, that stone disappeared before it was laid... keep your 'treasures' hidden.

I was enthused to send in some photos and share my work after I saw a whale-shaped fishpond in your latest edition that reminded me of one I worked on 20 years ago!

Editor's note: the whale-shaped fish pond was featured in TOB 126 Dec 2004/Jan 2005.



A good pizza (oven) starts with a good base

BY KAYLEE SWIFT



All abilities playground

Stone beehive using 40mm bluestone crazy pavers. I made a template out of timber and used it to lay each ring of the beehive. Each stone was cut with a pitching chisel into a curve before being laid.

The beehive is 2m high, 2m in diameter at the base and 200mm round at the top. All the stone chips and old bricks from site were thrown into the beehive, together with a 9 sand:1 cement mix, to create a solid structure for kids to climb on.

Eight-sided pyramid using 100mm bluestone blocks. A brick saw was used to cut the blocks, along with lots of math from loving partner Ag to work out the angles. Once I had the base layer right, the rest fell into place pretty well. This was also filled with offcuts from the job and a 9 sand: 1 cement mix.

Each job took approximately two weeks to complete. ♦

Jules can be contacted on 0427 825 925.



This was my first foray into stonework. It is incredible how many stones are needed to build something, you collect barrowfulls and think it is enough but end up collecting ten times more. The oven was inspired by instructions from the book **'Your Brick Oven: Building it & baking in it'** by Russell Jeavons.

We have had neighbourhood pizza nights and I have cooked the Christmas roast in it, as well as mince pies, banana bread and a pavlova!

Footings were dug and poured with concrete. I built columns of concrete blocks to be able to support the brick floor of the oven. The blocks were covered with stone, mortared together. I built a dome with cardboard templates and polystyrene foam for the arch of the doorway and carefully created a dome of bricks over this. The oven was then covered in several coats of vermiculite and cement mortar rendering. ♦

Ed's note: We'll be seeing more of Kaylee's amazing rock work in the next issue's Special Feature – 'Animal Housing.'



Inspired

BY STEFAN NECHWATAL

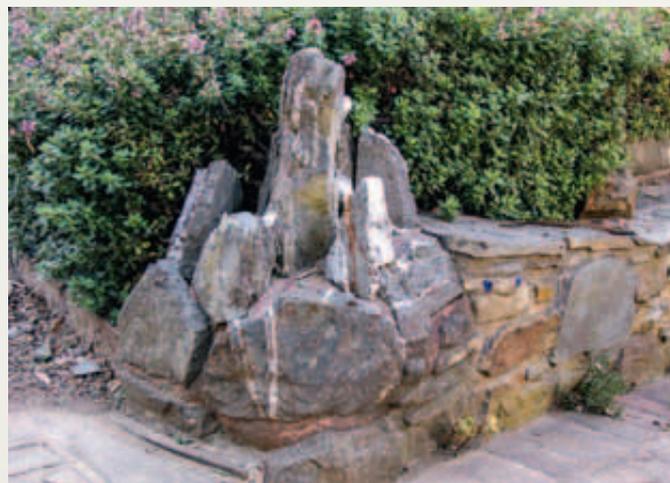


Left: Mortared stone wall/bench using a wide variety of stone including slate, sandstone and basalt, offset with a hedge of miniature *Escallonia* and New Zealand flax.



Left: Originally a slabbed bush fence post was concreted in ground, with a collar above ground to shed moisture. After many years the post rotted away and the whole concrete surround was dug out intact with a crowbar. I thought, 'What an amazing rustic pot/container.'

I partly reburied it, covered the 'collar' with mosaics and applied a cement wash oxide to the exposed base. It was then planted out with miniature *Liriope*. Stepping pavers were constructed from old car wheel rims filled with tinted concrete and pebbles were then pressed into the wet surface. The pavers are set into a packing sand base, with the tops at ground level.

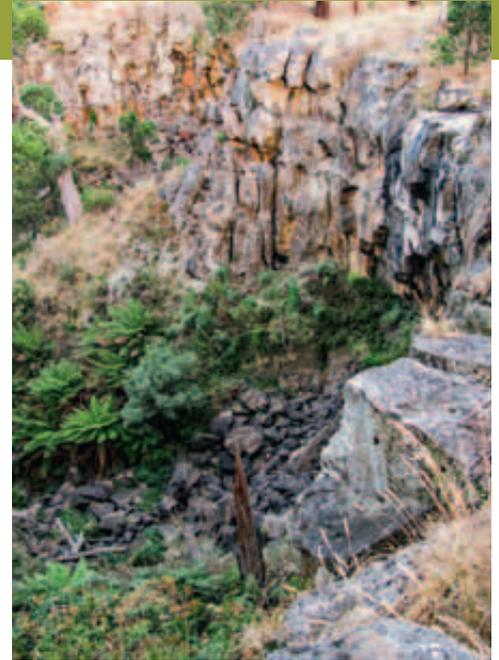


Above: This is the corner detail 'pillar' of a stone bench. To enhance this pillar beside the confluence of 3 pathways, I wanted to create some drama and height and specially chose feature rocks naturally shaped like pinnacles. I mortared these in vertically to simulate a mountain range; the Matterhorn was the inspiration. Rocks chosen were mostly slate with interesting coloured quartz seams. Miniature dinosaurs in pewter hide in the dark crevices to surprise!

...by nature



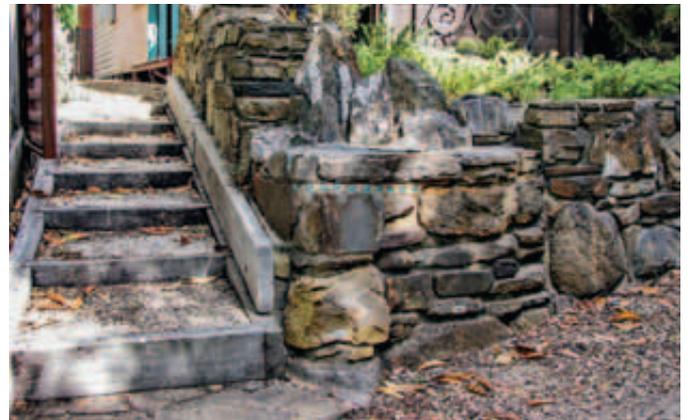
Above: One of a series of carved bowls in sandstone used as water features, this one has a lifelike rubber frog awaiting unsuspecting insects.



Above right: This is nature's stonework, with all its colour and texture, and has inspired me to travel beyond the norm for my work in stone. The main Sailors Falls waterfall, on the southern end of the original basalt lava flow, drops away to a deep temperate rainforest gorge. Pillars have faulted vertically and many lie broken at the base. The grassy slope is the mullock heap dumped from the original wooden trestle platform that carried hand trucks on a rail line from the mineshaft opening, now blocked by these pillars.



Above: The wall adjoining the driveway was constructed to replace a steep grassy bank that was difficult to mow. It is a mix of mortared stone; I always like an interesting medley of colour and texture and deeply raked mortar joints to create light and shade. My aim in the finished stonework is to keep the viewers' eyes 'dancing.' This was a deep structural wall built on a 150mm reinforced concrete footing and mortared concrete block work at the rear to make an extremely strong embankment to contain the avenue of Spartan junipers.



Above right: A corner pillar links the steps to front door with the driveway wall, again using a mix of stone types and vertical pinnacles and also some blue glass beads for fun. The stepped stone wall alongside the stairs is topped with a large pathway lamp. The red gum staircase was fabricated in the workshop, the slope excavated of soil and the unit set into this cavity. The open tread spaces were filled with tinted concrete with a raised aggregate finish for foot traffic. A staircase similar in construction was featured in *TOB 115 Feb/Mar 2003*, titled 'Those dam steps.' ♦



Links & resources

♦ **Paradiso Arts**

Gallery, workshop and garden.
Sculptural metal furniture made in Daylesford.

03 5348 6600

www.paradisoarts.com.au

Stone turtle pond



BY EDDY BAKKER

I built this pond for our turtles, using the local limestone collected from around our hobby farm. I built it freehand using string lines and I'm chuffed at how it has turned out.

The pond itself has a hard, strong black plastic liner. I was considering building the pond with chicken wire and concrete. However, its proximity to the house footings made me a bit nervous. Once the hole was dug I put the liner in place and surrounded it with a concrete edge. Then I put the stones on top of the concrete edge and mortared them into place.

The mortar I used had 9 parts yellow plastering sand, 2 parts lime and ½ part Brighton Lite cement. My father-in-law, who is a builder, has always used a mix of 9:2:1. The stone mason that did some work for us doesn't use any cement in the mix at all. I decided to use some cement (½ part) because the wall is exposed to the elements and the mortar goes off a bit quicker with cement.

To build the walls I would mortar the stones into position, then use a small tool to do the pointing. Finally, I used a rough sponge to smooth the joints in between the stones. Traditionally a hessian bag was used for this. The size of the footings for the wall was 600mm deep by 350mm wide, with reinforced rods.

I worked out it is very important to keep the stones clean as you go, but I still needed to use an acid wash to get rid of the 'cement haze' at the end. Using the acid wash brought out the colours in the stone.

Building in stone is immensely satisfying and I can't wait to start the next project. We would like to surround our pergola with a 900mm high wall, build a pizza oven and charcoal BBQ. We'll keep you posted! ♦

Cornish herringbone

'A Cornish Hedge is a style of hedge built of stone and earth found in Cornwall, south-west England.

The hedge is slightly wider at the bottom than at the top, because of the large 'grounder' stones at the base. The structure is very stable and will stand for a hundred years or more. The hedge has two stone faces with soil between the two walls. Bushes such as gorse may grow on the top, rooted in the soil between the walls. It is called a hedge because of its living component. A professional hedger can build about a metre of double-sided hedge in a day.

The materials used for the hedge vary in different parts of the county because of the underlying rocks. Building methods with slate are different from those with granite since the sides of each stone are relatively flat. In building with slate if the stones are small they will be laid 'cursy-wavy' or herringbone fashion, each course being inclined either to right or left alternately. There would be a foundation of larger stones and a row of coping stones (larger than the rest) standing on edge to complete the top.'

From en.wikipedia.org



Garden wall in Morteheo, Devon

PHOTO: CHARLES CUTHBERT

Cornish herringbone is a style of walling known locally as 'curzy way' or 'Jack and Jill,' and is unique to North Cornwall's heritage, possibly introduced as far back as the Romans.

A herringbone design is created as the slates are stacked in the stone. These boundary walls sometimes have 'sheep

creeps' built into them – an opening big enough for a sure-footed sheep to pass through to graze on the steep cliffs, but too small to allow the less nimble cattle through.

This style of hedge is particularly noticeable around the village of Tintagel.

Cornish Hedges – www.cornishhedges.co.uk

Coming soon...

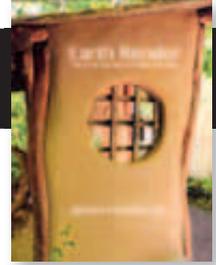
Look out for these features in upcoming issues of *The Owner Builder* magazine

- Steel framed straw bale
- Hybrid home
- Earth covered stone home
- An update on window terminology
- Renovating a 1920s brick bungalow



Issue N° 183 (June / July 2014) will be on sale from 1 June 2014

Book extract...



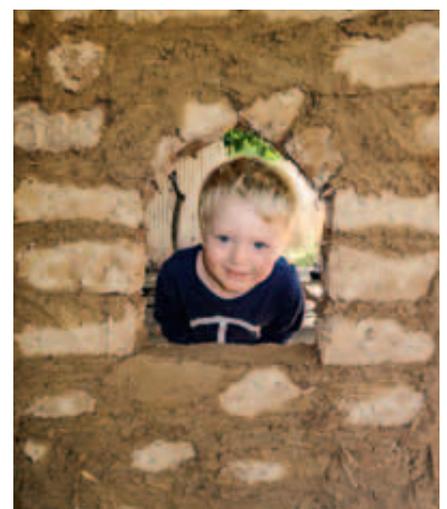
Earth Render Preparation, Application and Mixes

This is an extract from 'Earth Render: The art of clay plaster, render and paints' by James Henderson, as reviewed in TOB 181 February/March 2014. ISBN 9780975778203, RRP \$33. Published by Python Press (2013) (www.pythonpress.com)



Wall preparation

When deciding to render a wall with earth based materials the surface of the wall may or may not need some work before we can begin. Wall surfaces generally fall into two categories. The first is smooth walls. These walls already have the shape that we want and are ready for render. The second is rough walls. These walls need shaping, detailing and flattening. To achieve this the rough walls need a coat of straw clay render to shape them into the desired form. This coat should be at least 25mm thick to give strength and stability to the wall. Straw clay render is also often used to fill in depressions and to shape window reveals, even if the whole wall does not get covered with it. Once rough walls have



'EARTH RENDER – the art of clay plaster, render and paints'

received a coat of straw clay render they become smooth walls. Rough walls include straw bale, light earth and earth bag walls. Smooth walls include plasterboard, previously rendered walls and rammed earth walls. Smooth walls may or may not need some extra preparation before receiving a sand clay render.

The wall type itself asks for different strategies to ensure a good long lasting bond. Below is my experience to date, I suggest you try the methods and proceed with caution. Always test things before committing and constantly ask yourself what am I trying to achieve?

All walls to be rendered must be treated properly to ensure a good bond. Any loose or flaking material should be scraped off. Cracks, holes and depressions should be filled, covered with gutter guard or mesh and allowed to dry. The entire wall should be solid and stable.

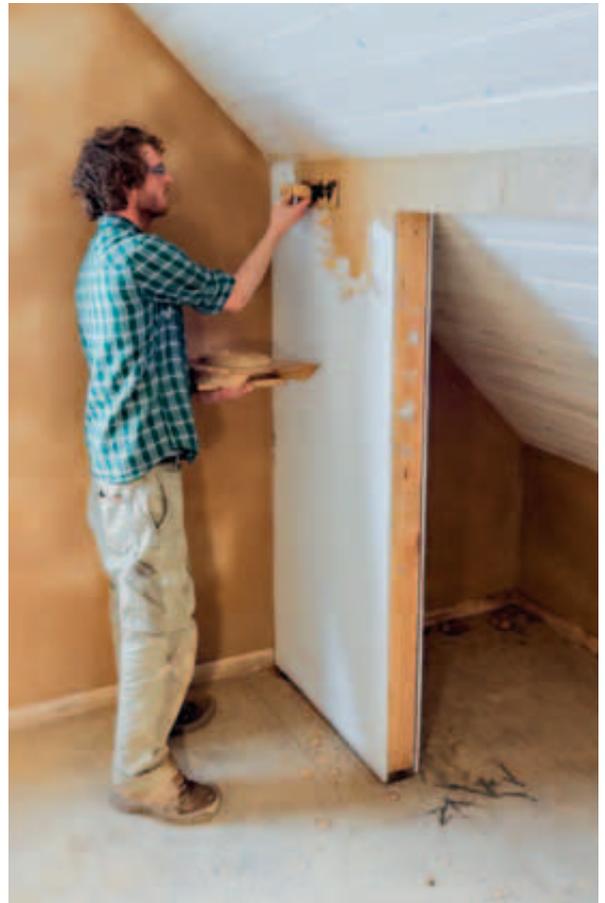
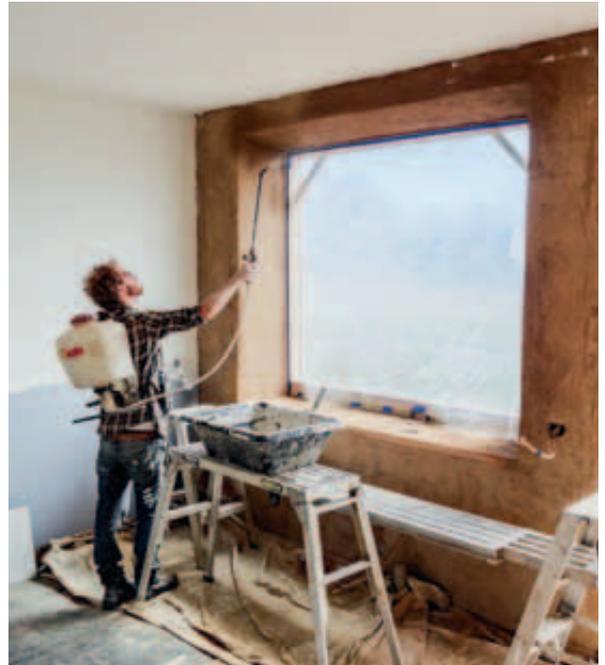
Depending on the substrate, different materials are used to treat prepare the wall. The three choices I use are water, clay slip and glue. Unsealed raw earth walls have clay on them already so they only need to be misted with water to reactivate the existing clay before rendering. Unsealed wall not created out of raw earth, like straw bale and earthbag walls need to be sprayed with clay slip first to create a good bond. Previously sealed, painted or other really smooth walls need to be treated with glue. In this case the glue is mixed with sand, applied to the wall and allowed to dry.

Rendering onto previously painted walls or other really smooth surfaces

When you find yourself faced with rendering previously painted walls or other really smooth surfaces an adhesion coat should be used. An adhesion coat is a thick paintlike glue with some sand in it. This is brushed or rolled onto the wall to provide a physical key or grip to the smooth surface. Once dry a coat of render that contains a little of the same glue in it is applied. Either wheat paste or casein glue can be used as the glue in the adhesion coat. Follow the recipe in the glue section and add some sand screened down to 1mm. It is important to keep stirring the mix while applying to the wall as the sand always tries to drop out of suspension. We want a consistent spread of sand over the wall.

Rendering onto fresh plasterboard

In new construction it is easier to add the sand to the plasterboard priming paint and use that as a combination sealer and adhesion coat. As the joint compound used with plasterboard is water sensitive, it is important to paint it with



Book extract...

something that makes the joint compound water resistant. This is so that all the water in the render we apply does not reactivate the joint compound, possibly leading to failure. Conventional plasterboard primer with sand works. Casein glue with sand will also do the job well. Wheat paste is not water resistant enough to trust to use over new plasterboard.

Thick render on smooth walls

When a smooth wall wants a thick coat of straw clay render a better key or grip is needed than just an adhesion coat. This is to provide a physical key to make sure that the new render bonds to the wall. To provide the key a lath or mesh is needed. The use of earth based materials dictates staying away from metal lath or mesh as they can rust and cause failure. Reed mats are a good alternative that can be stapled to a wall. An adhesion coat should be painted on first. While still wet the reed mats should be stapled onto the wall with 18 gauge galvanised staples. Make sure the staples are going into the wood framing. Coat the reed mat with more of the adhesion



coat and apply a straw clay render that has some glue in it straight away. Working the render hard as it goes off will ensure a good bond. A top coat of straw clay or sand clay render can be easily applied once dry.

Rendering onto rammed earth and compressed earth bricks

Some raw earth walls are really smooth and hard. Rammed earth and compressed earth brick walls need to be scratched up if you want to render them. Depending on the density of the wall this can be a tiring task. The idea is to create little 1mm to 3mm grooves every 50mm to 100mm horizontally on the wall. These little shelves give the backside of the new render little fins or keys that stick into the existing wall. An old flat head screwdriver or the point of a brickies trowel can be used to make the grooves. Sometimes the wall is so hard that a shovel or crowbar is needed. A clay slip coat should be used when rendering. A sand clay render, with or without straw is all that is needed on these smooth hard walls. Most people may question why you would render them at all.

Rendering onto light earth

Light-earth or straw-clay is a combination of straw with just enough clay to stick the straw together. This material has been stuffed into the walls of houses for over 1000 years. To create a light earth building a structural timber frame is first constructed and the light-earth is tamped between temporary plywood forms. The forms are removed straight away and the walls are allowed to dry. Once dry they are rendered inside and out.

A light earth wall needs a nice thick layer of straw clay render to provide strength and shape to the walls. Water or clay slip is used to wet the walls prior to rendering. I tend to spray clay slip on to ensure a good bond. This is followed by 20mm of straw clay render and once dry 5mm of sand clay render. It is possible to apply 25mm of straw clay render and finish it off in one go if your mix is good.

Rendering onto mud brick

The use of mud bricks in Australia is well known and loved. Unfortunately there has been a steady decline in their use with increasing energy standards. Most mud brick walls in Australia are finished by a process known as 'bagging.' Bagging is the application of a thickish

'EARTH RENDER – the art of clay plaster, render and paints'

paint with a paint brush or dustpan brush. Once slightly dry the paint is rubbed with a bag traditionally, a sponge or a wet brush to smooth it out. Really old mud brick houses in Australia are rendered inside and out so that they look like any other masonry building. I have seen two examples from the late 1800's. These were mostly rendered with river silt. As time and environmental ethics progressed the use of river silts has subsided. It is still possible to render a mud brick building with earthen render using clay subsoils, rather than river silt. Water is sprayed onto the wall to wet it down and either a sand clay or straw clay render goes straight on. Sand clay is used if the look of the bricks is to be maintained. Straw clay render is used to flatten the walls and shape window reveals if so desired.



Rendering onto cob

Cob walls are built by hand without the use of formwork. Cob is really an earthen concrete with some long straw for reinforcement. The large amount of aggregate it contains means it does not shrink much on drying. This gives cob amazing sculptural possibilities. When the walls are drying they are trimmed back with a shovel to the exact shape desired. This creates a perfect surface for render. Water is used to wet the walls and then a coat of sand clay render is applied. Straw clay render is often used to shape window reveals and create the other decorative details that cob homes are famous for.

Rendering onto straw bales

With the steady increase of energy efficiency standards in Australia over the last few decades the use of straw bales in the construction of homes has been on the increase. Straw bale homes have many advantages and certain idiosyncrasies. The use of clay renders on straw bale homes (at least internally) is critical to their longevity. Clay is so much more

moisture loving than the straw that it constantly pulls moisture out of the inside of the walls and keeps the straw preserved. The straw is wet with a clay slip coat just prior to applying a coat of straw clay render. How much render is needed depends on the amount of preparation done to the straw bales prior to rendering. I would not like less than 25mm of straw clay render over the bales. As the straw clay render is so thick it will not go off too quickly so we can keep topping up bits here and there for the next day or two. The straw clay render can be finished off if your mix is really good or a coat of sand clay render can go over the top. Most straw bale houses are rendered externally in Australia with a lime sand render for ease of maintenance. ▲





Thirty years of Topsy building

As the Woman prepares to leave her Mountain

BY SHARYN MUNRO





Having confessed all my owner builder and self-sufficiency foibles and failures to the readers of my first books, *The Woman on the Mountain* (Exisle, 2007) and *Mountain Tails* (Exisle, 2009), I continue that candour in my blog (www.sharynmunro.com).

I also celebrate the solace and pleasure of living amidst nature on my Wildlife Refuge here – and chart my education as I adapted to living with certain fellow residents, like the snakes.

From the 15 months of tent life with two small children in 1978, while we built our little mud brick cabin, to the present civilised, multiple building, self-sufficient set up, it has been mostly unplanned, stop-start – and slow. Like Topsy, my remote little ‘village’ here has ‘just growed.’

Unfortunately I have also ‘growed’ too old to manage the self-sufficient life on my own. I am blessed with unlimited water from my springs and unlimited wood for my cooking and heating and hotwater, and ample sunshine for my solar power system. However, unlike sunshine, the wood and the water require some effort. So does digging for growing trees and food. My knees and my wrists have decreed that it’s time to pass on my beloved sanctuary to someone else.

The magic of mud

One of the things I will miss most is living in a home made of natural materials, like mud and timber and stone – unless I am lucky and find another such. As I spruce up my cabin to its Sunday best for sale, I have been reminded how much I love mud walls: their uneven texture, both inside, painted white (with natural paint of course), making the most of sunlight or lamp glow, and outside, simply bagged in its natural colour. I love that mud is so forgiving, so easy to work with: patchable, drillable, rasplable, blendable.



Above left: Quaint diamond-paned timber windows above rock walls in bedrooms.

Above: Dining and kitchen space.

I still think mud is a magical building material; bricks rendered so solidly dense by some alchemy that is more than the muck of dirt and water and straw that I pressed into the moulds. When I first began to write for *The Owner Builder*, it was at the invitation of then-editor, the late and much-missed Russell Andrews, a passionate champion of mud brick building. I’d sent him a reader ‘Back Porch’ contribution about not having a back porch but a back excavation and various other excavations for projects-to-be, whose tongue-in-cheek style he liked so much that he asked me to write articles for him!!

Under current editor, Lynda Wilson, I continued to write regularly for *TOB* until my last book, *Rich Land, Wasteland* (Pan Macmillan/Exisle, 2012) overwhelmed my life, giving the impacts of unbridled coal and gas extraction first call on my time. I resumed writing articles from late 2011, but erratically, as giving over 110 talks in four states drew me away. Lynda was understanding – and patient!

I hope 2014 will give me back a more balanced life and let me resume regular owner builder stories, as I love doing them. But I am not withdrawing from the battle for sanity until our mining and petroleum laws are changed so that people and the planet are valued as much as profit. I owe it to my five grandchildren.

The joys of a verandah

The first Topsy act was adding a 3.6m wide verandah to the northern front of the original 8m x 5m mud brick cabin. That is a delight in all seasons.

In spring the white wisteria briefly hangs its flower clusters, like geishas’ hair ornaments, for me to marvel at through the window in front of my desk. In summer it is transformed by the living green blinds of the wisteria and glory vine that protect from sun and summer storms. The green is punctuated by the white perfumed trumpets of the lilliums that rise above the railings each year, the delicate twinings of the Chilean jasmine’s furled white bells, and the ragged apricot blossoms of the climbing Crepuscule rose at the eastern end.

I watch the greens change to the fantastically vivid yellows and cyclamen pinks and burgundy reds of autumn. Then as the leaves fall for winter and leave an open tracery of twisting stems, I can see the forest beyond once more and the lower sunbeams reach across the verandah.

Out there we park things like tubs of firewood and kindling, the laundry basket and my old kerosene fridge containing tools; out there we dine, work, take flop-down quick breaks, have coffee, read, sleep – and spy on the wildlife’s carry-ons. I had to erect a lattice gate at the top of the steps because the wallabies wanted to come up too and I was worried they’d break one of those long legs leaping back down; the wallabies do like to go under there for shade, and don’t mind me clumping about above them.



All that for a few poles, some second-hand decking and corrugated iron! The smoked polycarbonate sheeting in the roof sections in front of the windows and the door, for light, was the only new material.

Years later, my son Sam installed a fibreglass shower bay at the eastern end; as it replaced the outdoor shower, I thought that was pretty posh. But years after that, a visiting friend, Geoff, helped it grow its own wind-proof enclosure, made from café blind clear heavy plastic, around itself and the dressing area. It is very welcome in a westerly, and doesn't block the view.

Lesson 1: a verandah can be another living area, so make it wide enough!

Life at eye level

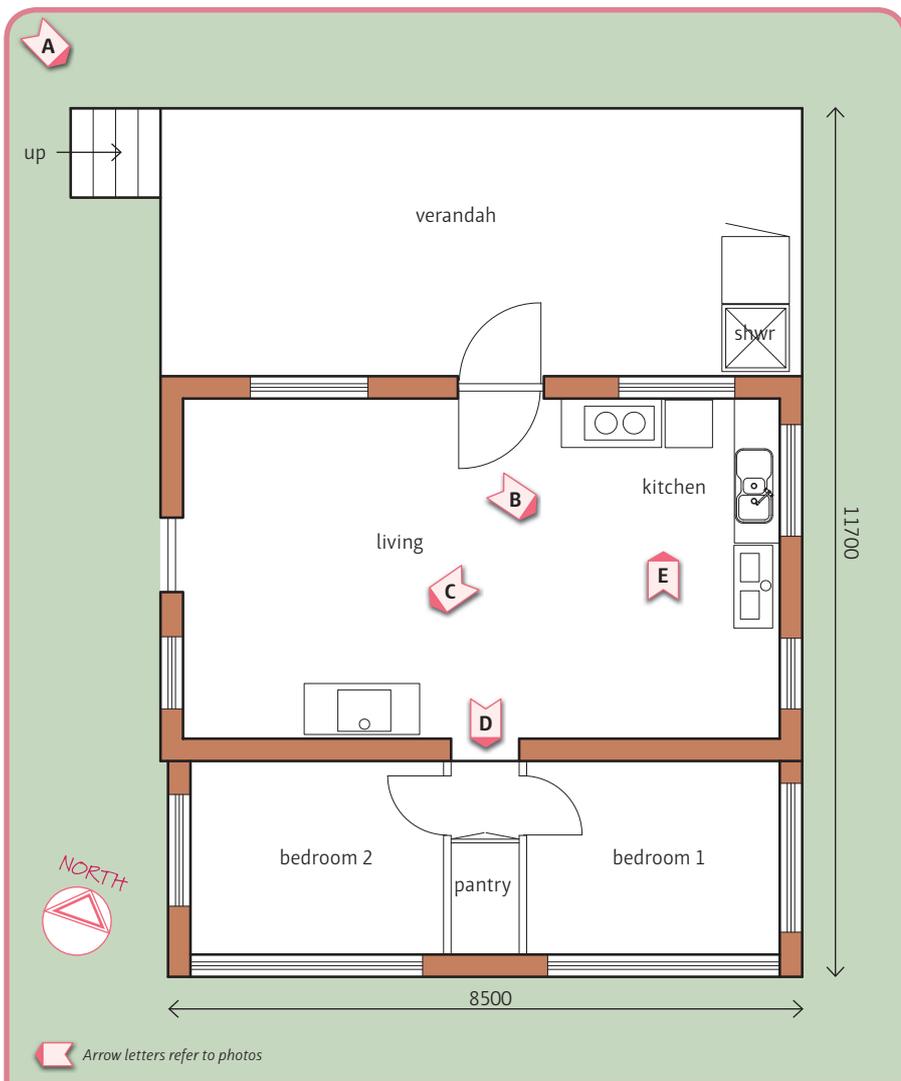
As circumstances changed we needed some private sleeping arrangements and so excavated into the bank at the rear of the cabin, poured a slab and built well-sealed rock walls against the cutting, with walls of windows above them. I commissioned an original leadlight from my sister, Colleen Munro, to grace the western wall where there would be minimal windows; for me leadlights and coloured glass add invaluable charm to a room.

The big day was when we sliced through the cabin rear mud wall with a bush saw – even re-using the bricks and the dust. What a terrific recyclable material!

These small (2.6m wide) light-filled rooms are a treat to be in. The bank was planted with prostrate grevillea and rosemary, which birds love, and room occupants can spy on them at eye level through the diamond-paned window wall – second-hand sashes used as casements.

We even managed to fit a walk-in pantry between the two sleeping areas. Their tall doors being blank painted faces, I later felt called to daringly decorate them with a vaguely tree of life design.

Years later the fibreglass ceiling insulation in those rooms became occupied by some of my wild neighbours, namely the antechinus, small carnivorous marsupials – cute, but messy and noisy. I'd made hessian 'ceilings,' and everything had to be removed by my long-suffering handyman, Steve Brown. It





Clockwise from above: Roos on the track; Crepuscule rose climbs to avoid the roos; my bookbound bedroom; indulgent pantry doors.



was not a pleasant task. We hadn't picked wool insulation because we thought it would be too tempting!

I then bought corrugated foam eave-filler strips to block all the roof edges, including fire-retardant ones for the ridge capping. While we were mucking about there, I also replaced the gutter, which was now over 30 years old, with half-round guttering topped with *Leafguard*, and installed a first flush diverter for my drinking water tank.

Lesson 2: seal and critter-proof edges, especially where different materials meet, right at the start!

There's a lot more insulation choices now, like *Air-Cell* or *Foilboard* or similar. This time I used *StyReflex*, light and rigid polystyrene sheets with foil both sides, easy to retrofit. Or they would have been if enough battens had been put in originally...

Then I got Steve back to use the 100 year old lining boards given to me years ago by my friend and fellow owner builder, Inge Jensen. Masked and ear-muffled, Steve roughly sanded their lead paint layers and cleaned out the grooves. The worst of the broken tongues were cut off and the boards were screwed up from beneath, through the insulation sheets, to live again.

Because of the shortage of fixing points – and the slight waviness of mud

walls – cove beading served to do more than cover edges. The rooms look totally charming now, the ceilings painted with off-white *Bio Paint* to blend the half-sanded pinks and blues, mint greens and creams of that era into a soft blur.

Lesson 3: don't skimp on battens or frame timbers; someone may later want to fix something you can't imagine to them!

My creeping shed

My ex-partner's hurriedly-built workshop, added to the western end of the shed, was of tin insulated with fibreglass and foil, and lined with sheets of coated masonite where essential. It was intended to be temporary, but...

Now it's my 'guest accommodation wing.' Naturally I wanted to complete the lining. Each wall's timber frame had been constructed on the ground and stood in place on the yellow tongue floor to be joined to the other; they were fine for attaching the tin but not quite enough for lining. Glue was much employed.

Still, after screening the sliding windows (second-hand sashes on their sides), painting the interior and furnishing it with enough beds for 5-6, a fan, gas camp stove, wood heater, desk, provisions for making tea and coffee, playing music or simply lolling... it's a nice room for visitors to have as their own space. They can smell the climbing





David Austen yellow rose or the Chinese jasmine below the window, wander outside under the jasmine-covered walkway, or sit under the dense shade of the big Nashi trees – if there's room, as the wallabies claim that spot.

Lesson 4: re-read lesson 3!

The shed kept growing to accommodate the collection of free building materials and odd things that people offer me, and which I never refuse because it's handy to have stuff to rummage through to make do when you're a long way from a hardware store. My Dad's sheds were always like that – and in fact I have a fair bit of his collection here – and my Uncle Brian's. They were both carpenters, and when they died, I felt obliged to rescue the leftover scraps of timber they'd been hoarding under their houses... and I do mean scraps.

For years a spotted-tailed quoll nested in the horizontal pile of old doors in my shed; I haven't been game to dismantle that pile, as the carnivorous quolls also use their nest as larder and loo. And besides, I keep hoping one will move back in – to keep the rose-eating possums away. Quolls eat possums.

Apart from the 'guest wing,' the shed has now crept sideways across the hill in the other direction to have three sections: the lockable workshop end, the weatherproof but not lockable middle, and a carport. The latter was erected in a day by my son and son-in-law when I finally got a vehicle that deserved to be under cover. You can't do that sort of thing on a whim unless you have piles of second-hand materials on hand.

After a swap deal with owner builder friends who were moving and trying to rationalise their hoard, we replaced some of the iron on the workshop walls with old fibreglass sheets to improve the light.

Then there's the separate power shed that bears the panels on top and the mechanics inside. It's built with the tin from a Sydney friend's demolished garden shed. Painted green, you'd never know. The cute five-sided tin laundry

From top: 1979, first mud bricks laid; many more later, halfway up the walls; the roof timbers at last; about 15 years later, extending out back; me using a bush saw to cut through the rear mud wall into the extension.

was later tacked on to the back of this. Painted green, they make a unit. Like the workshop and the shed, it's hard to go past an existing wall; then you only have to build three.

Lesson 5: if you have storage room, never refuse free building materials ... you never know when they'll come handy or for what. If you haven't got enough storage, use some of your earlier hoard to make more!

The smallest sheds

In the case of the toilet, I never intended more than three walls. Having grown up with an outdoor toilet, of the pan variety, with the tiny fibro room dark and spidery, I wanted a light filled loo with a view here – and I have it in my pit toilet up the hill. I'd expected that to be temporary, after which I'd build a composting loo closer to the cabin, but the deposited material just keeps decomposing in that 1.2m cube painfully excavated from the clay.

A full width polished kauri timber seat/box from the old Minmi courthouse, which makes it close to 120 years old, allows bird and bush and wallaby watching – and sunlight on bare knees if you choose your time right. I top up ceramic drinking water containers in the nearby rockery to bring the birds for me to watch. They in turn bring digested seeds of new rainforest plants to grow there!

And I mustn't forget the glasshouse. With its automatic watering system (cheap as chips, self-installed) it's enabled me to go away as much as I need, without fear of losing tree or vegetable seedlings or hopefully rooted cuttings, or my ginger and turmeric plants, which I grow in tubs in the warmth, and harvest the roots to eat.

The saga of building – and rebuilding – that glasshouse was told in *TOB 88 Aug/Sep 98*. It's had a few glass panel replacements after a major hailstorm, but is still working well. I leave the shadecloth cover on all year now, wary of hailstones.

Weaning off owner building

I also dread the move for the inevitable rationalisation/sorting out process. Even though I say I won't actually be building again, what about small projects? I mean, I never did build that bottle wall bathroom but I've saved all those lovely



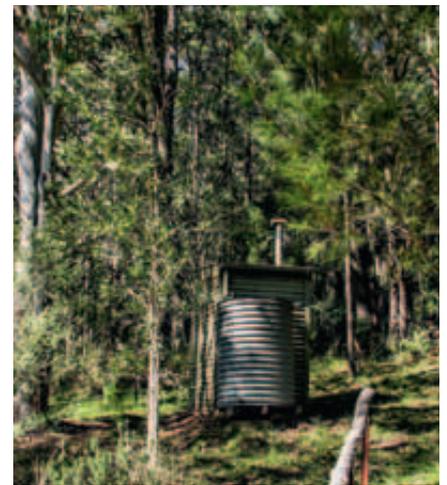
green wine bottles; or what about that pile of old fence palings? They sand to a beautiful rich red like blue gum, and they might do for a rustic dado over a plasterboard wall where I end up...

I've seen owner builder friends move to ready built places that didn't need any work. This pleased them at first; there'd be time for leisure, gardening, travel – but somehow there's always a project on the go, an add-on to house or shed, or a summerhouse or...? My friend Inge is a good example; about my age, she's just put in a new second-hand kitchen herself.

No, the self-reliant strain, the sustainability and frugality on which I was raised, is worth keeping, as is enough of my hoard to permit its continuation... in a smaller way. And I'll get vicarious pleasure from writing about others' bigger projects for *The Owner Builder*.

Owner builders are collectors and can-do-ers, recyclers and rethinkers; what an admirable species! ♦

Ed's note: See advert p.22 for sale details.



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E



The Green Swing shed

BY EUGENIE STOCKMANN

It is an Australian icon: The Shed. Found in backyards across the nation, they come in a range of sizes, colours, shapes and styles. From humble metal boxes to elaborate masterpieces. Many men and women across the nation smile when they think of their shed; I smile when I think of our Green Swing shed. I think she is a beauty.

Why is building a shed urgent...

The construction of the two apartments was completed by the builder, but nobody was allowed to move into these until we received a Certificate of Occupancy. We were told that amongst the things we needed to complete to get the desired bit of paper was the shed, because it provided the legally required storage space for both apartments.

Our preference was for the shed to provide shared storage space for all four dwellings, however the planning codes require that a certain amount of storage space is provided for the *exclusive* use of a dwelling. To comply, our only option was to allocate the shed to the apartments.

The easy way out would have been propping up a flat-pack tin shed. It was a very tempting option. We briefly flirted with the idea, even thinking it could be a temporary solution to deal with the red tape and replace it later on. We knew though that it was highly likely that this temporary solution would become a permanent one, and that we would never end up building our cute garden cottage. That simply did not feel right.

She's got the look

We always knew what sort of shed we wanted. We all had a similar vision of a rustic looking shed, our own traditional Swedish style cottage. One that fitted in with *The Green Swing* philosophy of low embodied energy, and using recycled materials where possible. Cycling around our local area we had spotted a great little cottage in

No time to relax

Many owner builders start with building the shed. For us it was the other way around; it was one of the last things we did. We are in an urban area and due to site constraints the space was needed to store building materials and move equipment around.

We always knew that our project *The Green Swing* would not be easy, however we underestimated the time it would take. After two long years of getting the necessary approvals and another year for construction we very much

looked forward to moving into our new homes around Christmas 2012. Everyone was exhausted and looking forward to putting their feet up and relaxing during the hot summer months.

It wasn't to be...

Not long after our move we realised that the list of jobs was still very long and some of them needed to be completed with some sense of urgency if we wanted to be able to rent out or sell the two apartments that were part of our small development. High on the to-do list was building the shed.





someone's backyard and all agreed we wanted to build something similar.

We had collected a lot of the materials we needed from a house demolition project we had done a few years prior – stumps, bearers, floor joists, studs, weatherboards and roof tiles – even three little leadlight windows that used to be part of the overhead cupboards in the old kitchen.

The final design took into account legal requirements in relation to size of storage areas and building codes.

Getting started

It must have been late February 2013 when we decided to get started. I thought we could get straight into it, but of course we had to spend an entire day clearing the space: stacks of leftover recycled bricks, roof sheeting and other bits and pieces that we had been unable to throw out during the construction process (you never know when they may come in handy...).

We used the traditional way of building a wood framed house on stumps.

Above: The shed looks great with its newly applied coat of sunny yellow paint.

Right and below right: The site first had to be cleared before the stumps could be put in.

For six long weekends, during the heat of summer, we toiled towards the finish line. The job was broken down into stages. The first weekend we cleared and levelled the site and put in the stumps. We then continued with the bearers, floor joists, and walls. The roof and roof tiles completed the building. The kids enjoyed watching the progress and cheered us on from the balcony.

The finishing touch

The shed was finished, be it with old paint still peeling off the recycled weatherboards. It took a while before we picked up sandpaper and paintbrush. We simply could not decide on the colour; half the team preferred Swedish red, the other half was thinking of some shade of green.





Having fulfilled our legal obligation and with plenty of other jobs on the list still, we parked the subject, until one Saturday afternoon in May. Family from Europe were visiting and very keen to paint the shed before returning home. Over a cuppa we pulled out the colour charts yet again and within 5–10 minutes all agreed on this sunny yellow. It was a real transformation, but it is like it has always been this way. We are all very happy with the end result.

Planter boxes with strawberries underneath the windows now complete the picture!

Compliments

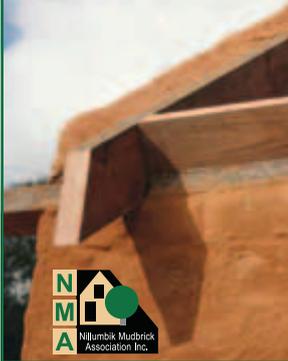
The shed gets a lot of compliments from visitors; how good she looks and how attractive she is. I smile when some people ask where we bought it or wonder how we wheeled her into the backyard. Maybe it is because she reminds them a bit of the site offices that you see on construction sites in Northern Europe.

Our shared gardens are not very big and the shed is a prominent feature. Every day I enjoy looking at her from my living room window or patio. The hard work has been worth it! ♦

The Green Swing is a small scale inner city living environment in Perth, comprising 2 townhouses and 2 apartments on 839m², constructed using straw bale, reverse brick veneer and double brick and achieving 8–10 star ratings.

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Owner/Builders and Experts

This section features the writers, builders and websites that describe cordwood construction in all its many forms. This portion also includes builders who have assisted others by writing of their progress or giving help on cordwood building sites. (Ed's note: We feature two of the profiles included in this section).

See opposite page for a review of this book.

Olle Hagman

Sweden

Olle Hagman's cordwood cabin in Sweden

Olle used a clay based mortar for his cabin. This is how the early Swedish cordwood homes in the 1800's were built and Olle is trying to meld the old with the new. Olle is a professor at Göteborg University in Sweden and authored two articles for the Cordwood Conference Papers 2011. He also attended the Conference in Winnipeg and did a fantastic job in presenting his papers documenting the 130 cordwood buildings in Sweden and the many cordwood barns in Norway. His papers are entitled:

A Social History of Cordwood Houses in Sweden
Norwegian Cordwood Wall Technique

www.kubbus.se



John Meilahn

Copper Harbor, Michigan, USA

John Meilahn's Cordwood in the Keweenaw

This handsome cordwood home is in the heart of the Lake Superior snowbelt. The builder John Meilahn is of proud, strong Finnish heritage. His creations shows his affinity with wood. The railing for the spiral staircase is made of ONE piece of ash (boiled and bent). The kitchen counter tops have "fall" leaves floating in a clear epoxy sealant. The shelf on the right is left open as a cat perch (and quite a good one it is).

John is a builder by trade and runs North Shore Builders in Copper Harbor with Steve Peters. He builds traditional homes and alternative construction. If you are interested in contacting John his information is available in the Copper Harbor, Michigan phone book.





Reviews...

REVIEW BY ROB ROY



Cordwood Construction Best Practices

Richard Flatau

ISBN 9780615592701

Published by Cordwood Construction Resources, LLC (2012)

196 pages

Richard Flatau's new book ***Cordwood Construction: Best Practices*** is a visual feast and a celebration of cordwood masonry. That is why it's so much fun to browse through – and be inspired by – its 196 large pages, almost all of which are in full colour.

But that's just the beginning. True to his book's subtitle, Richard has gathered together a great deal of 'best practices' information from projects he has worked on, as well as from colleagues who have presented authoritative papers at the two most recent Continental Cordwood Conferences: 2005 in Wisconsin (which the author co-hosted with his wife, Becky) and 2011 in Manitoba, where Richard was a major player and organiser.

The building of cordwood walls themselves is, of course, covered in detail, including various mortar options (Portland cement mixes, lime putty mortar, cob and paper-enhanced mortar – just to name a few) and insulation choices (sawdust and lime, cellulose, various foams, and more). But the text also tells how cordwood masonry relates to other ancillary building systems, such as footing options, timber framing, window and door installation, electricity and plumbing. Always, Richard is careful to show time-tested methods that will meet code. His more than 30 years of experience in building, writing about, and teaching cordwood masonry quietly permeates the entire book.

With regard to best practices, two instructional and inspirational sections stand out. The author details two recent highly successful – and code approved – structures with which



he and Becky have been personally involved in recent years: the Cordwood Education Center in Merrill, Wisconsin, and the White Earth Reservation Cordwood Home in Naytahwaush, Minnesota. In these comprehensive addendums, we see the projects progress from conceptualisation to – beautiful! – actualisation and learn how the best practices described earlier are integrated for structural integrity, longevity, energy-efficiency, design creativity, and compliance. The Cordwood Education Center Addendum has a thorough two-page checklist of how to organise a group to work together to complete a building project. If you have a community project in mind, these two pages alone are worth the price of the book. ♦

Available from www.cordwoodconstruction.org (US\$25 hard copy plus postage, US\$20 eBook).

This review first appeared in BackHome Magazine July/August 2012 (www.backhomemagazine.com).

Reviewer Rob Roy is director of Earthwood Building School in West Chazy, New York (www.cordwoodmasonry.com), teaching cordwood masonry and earth-sheltered housing since 1981.





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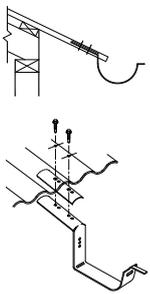
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The Wedge-Tail Eagle House

This pole framed timber beauty simply flies...

BY HERO NELSON

Twenty-two years ago, four friends of German origin joined their resources and bought a property in the secluded green Orara Valley on the Mid North Coast of NSW. Nestled in the hills, protected from high winds and with their own running stream, it is a haven for fauna and flora, with sunlight streaming through the trees to the gardens. Peter Duwe and his friends allocated two hectares for each of their own house sites, after the council granted the land the status for multiple occupancy. Since then, the property has finally developed into six occupier shares.

Orientation

Peter's house site is north facing. Having camped out on the land for the first 10 years as a young man, he developed an intimate knowledge of the seasonal changes, prevailing winds, frost and rains that dictate life in the valley. He began his dream, a self-imposed journey, roughing it in a lean-to and gradually

acquiring the skills of building in stone and salvaged wood.

This allowed him the time and patience to gain valuable knowledge of the site and develop his skills while cutting, stripping and drying the wood, as well as to fully appreciate the qualities of local naturally sourced materials. He began the many labour intensive tasks, also using traditional hand tools, cleaning bark from fallen trees with a draw-knife and then an adze for shaping the logs into uprights, beams and struts.

Time passed and he became known not only for his skills in building, but also his generous attitude in helping many others achieve their dream of building a house. In those days, by using the official fire wood collection license (\$30) it meant he could use '50 big pieces of timber'

that had been felled and left by previous forestry clearing for his own house. These already seasoned hardwoods were transported, after being cut to size with a chainsaw, and then dragged to the house site with the aid of an ancient tractor.

Planning and building

Peter's dream had begun but it would take him a further 12 years to complete from initial planning, through the approval stage, then to a finished building, with a few other house calls on the way to bring in the income to buy the necessary recycled building materials he would need to fit-out his own home.

The plan for the house took the shape of a great wedge-tail eagle gliding over the valley, with fully extended wings. The body became the central living/kitchen areas, with French doors connecting both spread wings, creating a sizeable dwelling, fanning out on either side. One

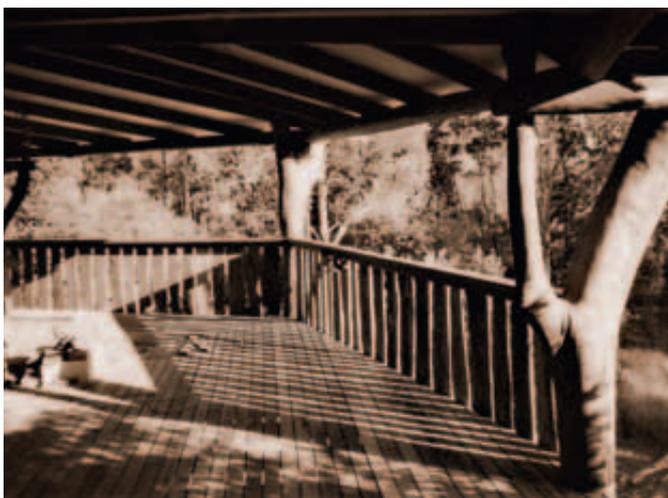




PHOTO: PETRA KLUGE

A

wing became the bedroom/ensuite and the other wing a grand entertaining/dining verandah with hardwood floors and natural balustrade, which nearly doubles the area of the house.

In the kitchen, two old recycled hardwood doors connect the kitchen to the outside, with easy access that flows to a covered stone floor rear patio. This stone was all collected from the property and set into concrete. Above the door,

the large solid wall frame supports the full expanse of the eagle tail that fans out, with the skeletal rafters, fully supported on a curved bough. It is also held in place by posts and rockwork. The impact of this bone like wood structure is beauty personified. The tail-like structure covering this rear outside patio, an open air setting, embraces the garden under a glorious expanse of creative workmanship at its best.

Solid footings

The footings began with a retaining wall built into the sloping site. These were excavated and constructed with drainage pipe and gravel to allow for good drainage. The walls are loadbearing for the upper structures while also housing a garage and workshop. Pole frames complete the main frame to support the floor joists and continue up to a height





PHOTO: MAX KRIPP

B



of 8.5 metres at the centre for the atrium and upper loft overlooking the central living area.

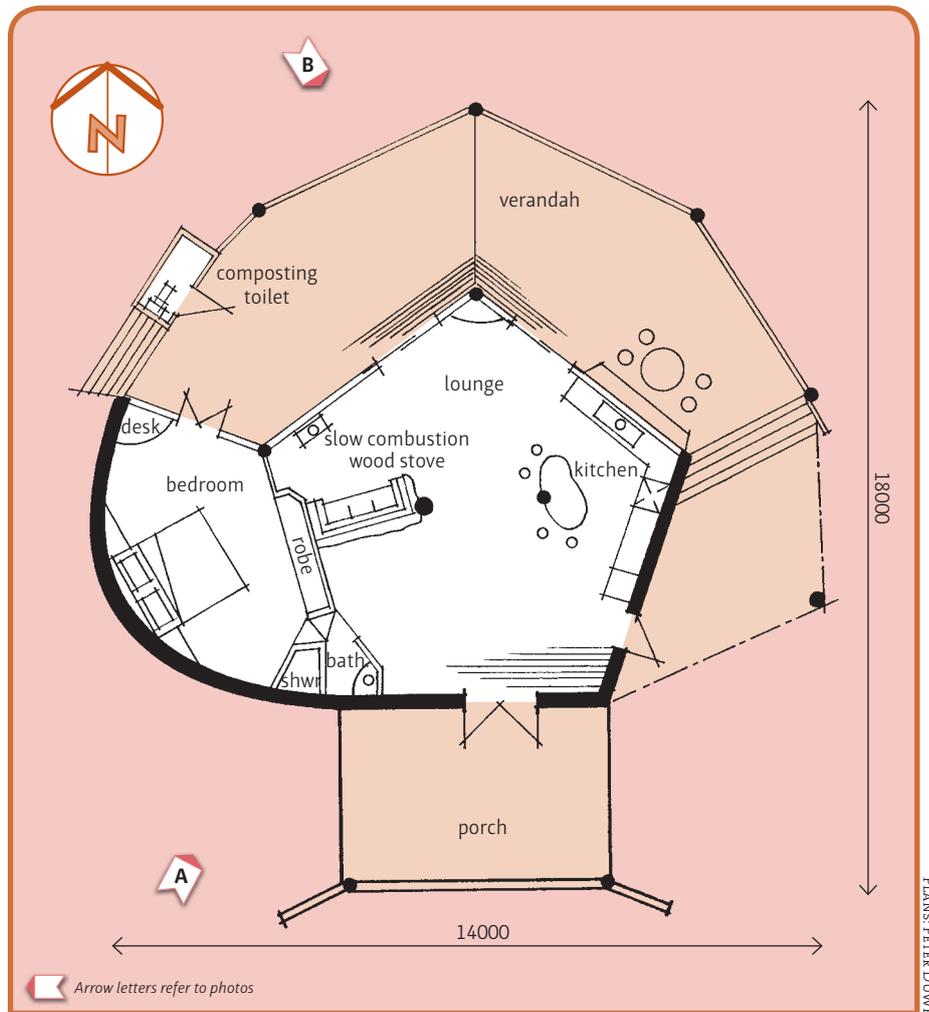
The internal wall frames are formed from locally sourced bush poles and branches that have been stripped of bark, shaped, shaved, sanded and oiled. Many have naturally occurring bracing that is slotted into the floor joists, with dressed recycled timber used to form the walls. These have been infilled with various recycled timbers, weather boards, mud brick, rammed earth, bottles and stained glass.

The structure is held down with the poles being fixed to large, rounded shaped concrete footings, that were set directly into the ground, with custom made 152 x 152 x 152mm stirrups for the poles to be attached. These poles are set at 3.5 metres at the back, 8.5 metres at the centre (kitchen, living area and mezzanine) and 5.5 metres at the front to accommodate the three levels of the house.

The various techniques used form a harmonious whole, as the tree-formed, bird-like frame shapes this dwelling. Standing in the centre of the living area, looking up to the atrium filled with bespoke triangular window frames for ventilation, the light floods in under the expansive roofline. In this living room area, the central pole frame forms the body of the bird, yet also reflects Peter's heritage, like a great Viking longboat that has been upended to form the interior.

Flooring

Recycling is taken to a new level here, with the brush box polished floors bought in one lot and cut into 10m squared sections (including the joists). These were pushed into place and secured onto the first level platform with a tractor and two men. The tractor and chain blocks were used to raise many of the posts and beams. But as Peter suggests, 'cleaning up the timber was the biggest job,' putting it together 'was simple.'



Heating and cooling

As a passive solar dwelling, the *Colorbond* roof keeps the building cool in summer with its wide eaves (wings) and the central mud walls act as a heat store, to radiate the wood heater warmth in winter and in summer act as a cold store mass, to keep the interior cool. The doors and verandah allow for cross ventilation in summer with the cooler breezes up the valley, while the adjustable high windows in the atrium allow for the air to be drawn up for heating the loft from the wood fire in winter, or opened to extract the heat updraft in summer, controlling the airflow.

Peter keeps the property well maintained, keeping a 30–40 metre buffer between the house and the bush and continually slashing the long grass and re-growth. Filled with a passion for sustainable living and the joys of owner building, he has now embarked on an additional studio at the back of his property



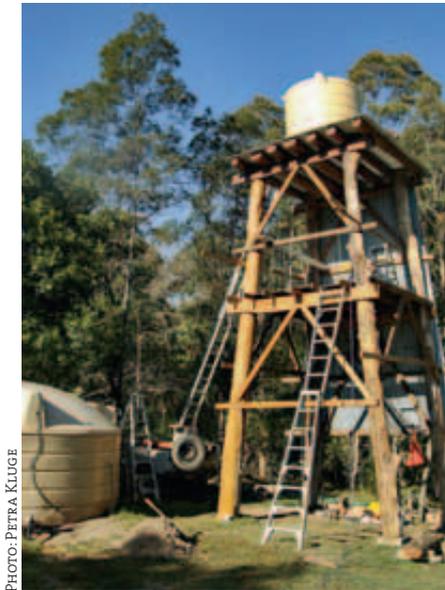


PHOTO: PETRA KLUGE



Anticlockwise from above: bottle pattern in wall; the highest point – 8.5m; the new water tower now delivers water under gravity pressure; twilight view of the north-west aspect; interior view of the loft at night.

for a friend and has also built a 7 metre high pole stand for the new water tank to be fitted, to allow it to be gravity fed. Then there is the rock wall for the garden.

There is a saying along the lines of ‘a man can build a house, but it takes a woman to turn it into a home.’ In this sense, Peter is very grateful for the arrival of his partner Petra Kluge four years ago, who has invested much love and energy to help in this process of transformation. Her computer skills have been instrumental with photos and plans.

This whole endeavour is an ambitious project that simply soars above the rest, in its intrinsic beauty and harmony with the land, a testimony to one man’s dream. ♦



Links & resources

♦ Peter Duwe

Licensed carpenter and craftsman with 25 years experience in bush pole construction. In his work he combines passive solar aspects with practicality and creativity. He is available to help with design and plans for council or general advice on how to get started (by arrangement).

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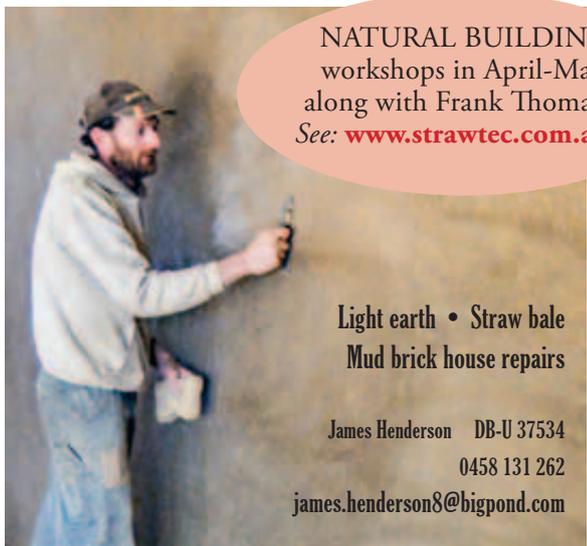
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• Blog bytes

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www.pinterest.com/cbriedis/geodesic-domes

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HOME: TIMBER FRAME, POST & BEAM

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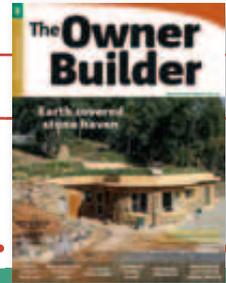
Here's how: www.buildnaturally.blogspot.com/2013/06/build-clay-cob-oven-in-your-yard.html



This bench was built by Patrick Hennebery of www.cobworks.com/photo-gallery on Mayne Island

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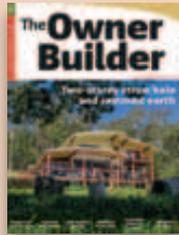
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▶▶▶▶ The cover and contents page for all back issues are being loaded onto our website. Currently all issues from #79 are there and the rest will be added when available.

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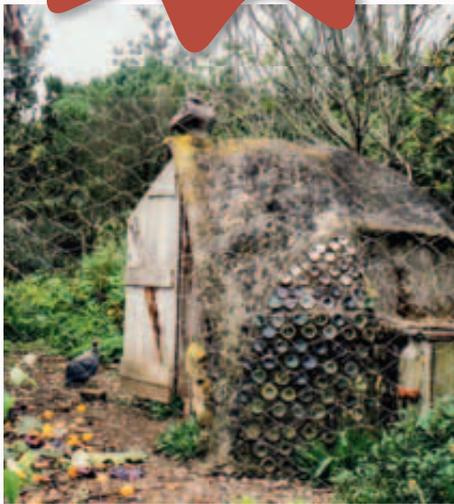
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TOB 183 Jun/Jul 2014

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TOB 184 Aug/Sep 2014

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A

White Earth Reservation Cordwood Home

In September of 2008 the MMCDC (Midwest Minnesota Community Development Corporation) contacted us with regard to the possibility of building a cordwood home on the White Earth Reservation in north-west Minnesota. The idea was to provide attractive, affordable, energy efficient housing on the reservation, while offering employment opportunities for the training of tribal cordwood masons.

The plan to work with the White Earth Tribal Land Office allowed the home to be constructed on Tribal Trust Land. The local contractor and members of the

BY RICHARD & BECKY FLATAU

tribe were enthusiastic about building a home that would be in harmony with the natural surroundings, be energy efficient and use locally available resources. It would be designed and built with wood from the area and in accordance with Ojibwa home traditions. That is, the house would be a multi-generational home, it would incorporate a large family gathering area, the entrance would face east, and it would be comprised mostly of

renewable materials. These factors were taken into account whenever possible.

Interviews were conducted with Ojibwa Tribal members in 2008 by Design Coalition of Madison, Wisconsin to explore different living space possibilities. An architectural firm was hired to coordinate and include energy efficient and best practice construction methods with this home. Initial plans were drawn and after many discussions and consultations they were modified to meet the specific needs of the owner. Included in the plan was an energy 'heel' attic truss, which added 74m² of

living space as upstairs rooms. The plans produced a three bedroom, two bath, 170m² home. A large open plan kitchen, dining, living area was incorporated in the final floor plan.

Vision

This article will undertake to describe the processes and unique attributes of this very successful home building project. They are:

- Efficient design with owner input (Ojibwa Tribal member) leading to functional space usage.
- 12:12 pitch roof (steep slope) provided an additional 74m², adding two bedrooms and a bath upstairs.
- Insulated sand bed with radiant in-floor heating (coupled with off-peak power usage).
- Northern white cedar post and beam framework (a sacred tree in Ojibwa culture).
- 400mm northern white cedar cordwood log ends.
- High R-value foam insulation in centre cavity.
- Cold weather mortaring techniques.
- Ojibwa design features mortared into the cordwood walls.
- Ojibwa mortaring crews hired.

We were fortunate to work with two very capable builders: Robert Zahorski, the general contractor and Bill Paulson, a tribal member who was the project coordinator. Each dovetailed into the other's strengths and the result was a building that evokes Ojibwa traditions, built with 21st century construction techniques.

Footings and frame

In the fall of 2009 the footing was built, consisting of an insulated sand bed beneath a concrete slab. This sand bed will store heat during off-peak energy hours and then radiate it throughout the house during the high energy rate use in daylight hours. This is similar to radiant in-floor heat, except the large sand bed under the foundation is insulated and provides heat energy storage for the home.

The post and beam framework was erected by a local contractor. Cedar posts gathered from near the reservation

'This was not a 'spec house' but one that has a unique personality and footprint. The purposes of this undertaking were to produce a natural, attractive home, provide labour opportunities on the reservation and instil pride of ownership within a community directed operation.'

Richard Flatau



were milled on the two sides that would abutt the cordwood infill. They were left rounded on the interior and exterior.

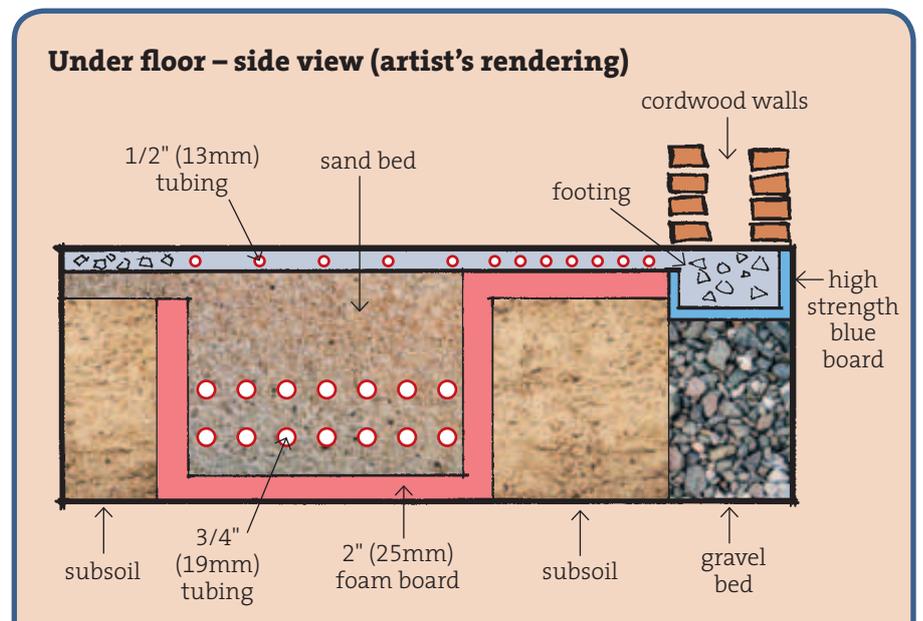
After the footings and slab were complete, the cedar post and beam framework was erected and braced. The bracing is very important to maintain structural integrity and prevent sections from going out of square. The braces are only removed after the cordwood walls approach the 1.2 metre mark. The roof was completed and shingled; having the roof finished before cordwood construction begins means that the cordwood mortaring can take place, for the most part, out of the elements. If a section is not finished in time, it can be 'boarded up' for the winter and work can continue on the inside of the building. Attaching tarpaulins to the fascia boards is helpful when it is necessary to protect the mortar and the workers from the drying rays of the sun.

Electrical

There are many code compliant ways to run electrical wiring in a cordwood building. In general for wiring jobs we recommend that you follow your local building codes. In this particular instance the electrical contractor chose to run flexible, plastic tubes (also called flexible PVC conduit). In accordance with the blueprint, the 'blue smurf' wiring tubes were then installed throughout the building. The hanging blue tubes (with metal receptacles) were very irritating to work around during construction. The masons were constantly bumping into them while mortaring.

Cedar log ends

The window boxes (made of double 50 x 200mm) were hung, using the sturdy top plates as fastening points. The two





Above: Back wall under construction – note foam above log ends.

Left: South wall gradually rises.

Below left: A happy foamer!



exterior door frames were 'roughed in.' Later these would have doors with beautiful etched glass panels installed for both privacy and beauty.

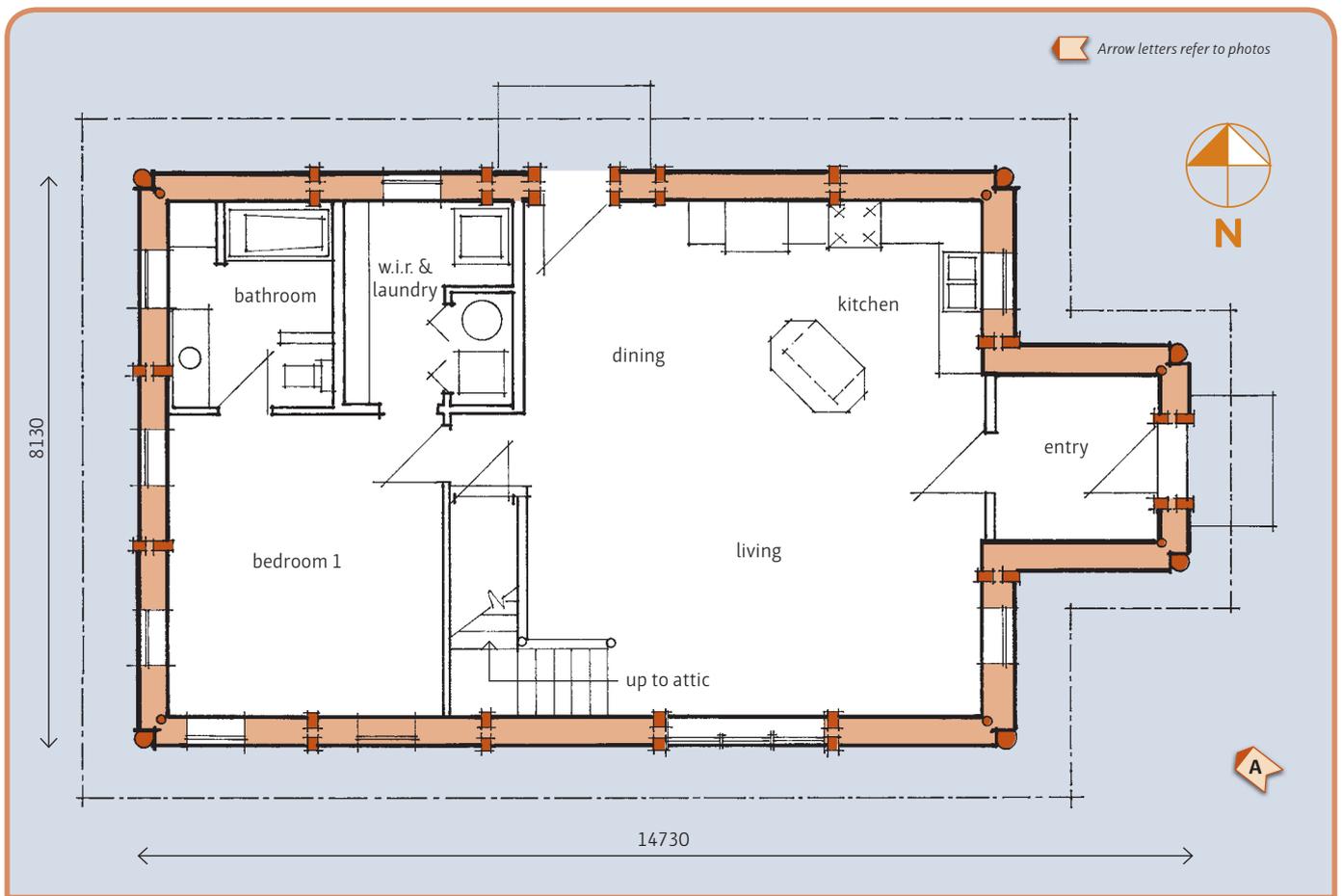
Early in the process, the decision was made to use 400mm cedar log ends for the cordwood infill. This length would provide an insulation value of approx. R4. The logs had been cut and dried for four years in 2.5 metre lengths. After that they were cut into 400mm lengths and 70% of the logs were split to assure faster drying.

On the way to being stacked the logs were dipped in a borate solution (four cups of borax to four litres of water). Finally, the logs were stacked in single rows for drying. While stacked, the exterior ends of the log ends were brushed with a UV blocker so that the faces of the exterior log ends would maintain their colour. The interior log end faces were left natural.

Mortar mixing

A mortar mixer was purchased and three different individuals were trained on mixing proper cordwood 'mud.' It was very helpful to have an alternate 'mortar mixer' when someone had a scheduling conflict.

The mortar mixture used was our favourite mix of:



- 1 part Portland cement
- 1 part hydrated lime Type S
- 2 parts soaked softwood sawdust (coarse)
- 3 parts washed, coarse sand

The overall feel of the mortar is an adobe style texture, which is easily tuck-pointed with a spoon.

Injecting foam insulation

For insulation, the initial strategy was to use regular coarse softwood sawdust mixed with hydrated lime in the centre cavity (between inner and outer mortar), but a dearth of coarse, softwood sawdust in the area led to another decision. It was determined that injected closed cell foam was going to be used. The main advantages of injected foam are: high R-value (R1.2 per 25mm), it bonds well with the wood and tends to fill every nook and cranny. Cordwood builder Sandy Clidas of Quebec has been a pioneer in using closed cell foam in single wall cordwood and so we consulted him for advice. Sandy generously gave of his time and information.

Convinced of the foam's merits, we ordered eight kits of foam insulation.

When using injected closed cell foam the cordwood wall is first built in two-foot-high sections. Half-inch tubes are inserted in the centre cavity as the wall is being built. The mortar is left to harden for at least 24 hours (any sooner and the wall may be lifted by the pressure of the expanding foam). The foam is then injected into the tubes. The foam comes in two canisters, which must be warmed before being used and then shaken while injecting (this makes certain all the foam is used). You also need to wear protective gear.

Bill Paulson devised an ingenious method of making sure foam got in every crack and crevice. He was the 'main-man foamer' and if he detected a cavity was not completely filled he would drill a hole in the longitudinal middle of a log end, place a 10mm tubing hose into the log end until it reached the bottom and then inject foam into the unfilled cavity. Bill developed a method of slowly pulling out the tube, as he injected the foam (one hand on the nozzle trigger and

one hand on the tube). He became quite accomplished at stopping the flow of the foam before it erupted over the top. It was helpful to have a 'foam watcher' telling the 'foamer' how close the expanding foam was to the top. After completion of the home, an infrared scan showed no 'cold spots' in the cordwood walls.

Cold weather mortaring

When we left to conduct another workshop in North Carolina the cordwood mortaring crew was about one third finished. Little did we know at the time that the fall of 2009 in north-western Minnesota would turn into one of the coldest on record. Finishing the cordwood infill in October meant tarping the house, covering the cordwood walls with blankets and 'firing-up' a propane heater. Starting a little later in the morning allowed the temperatures to rise a bit.

If at all possible, cold weather mortaring is something to avoid. If the water in the mortar mix freezes it can cause the mortar to flake and crumble. Since this home was built within a post



*Above: A very enthusiastic and happy crew!
Bottom L-R: All buttoned up for winter; cold weather mortaring.*

and beam framework there was no worry about structural integrity, but to have to re-mortar a complete wall or part of a wall would become a very labour intensive operation, especially since the mortar flaking may not be immediately apparent.

If you must mortar in cold weather, it is imperative to finish all mortaring before freezing temperatures occur. If this becomes impossible, then precautions need to be taken to assure the mortar will not freeze:

- The freshly mortared cordwood wall must be covered with blankets or tarps and secured, so it is protected from freezing cold and wind.

- If there is a crew working on different sections (as was the case on this project) wrap the entire building with tarps to cover the work.
- Even though there is a little heat generated from the chemical reaction of the Portland cement and the water, it is not enough to prevent it from freezing when the temperatures plummet.
- On this project, not only did we tarp the entire house, but we placed a propane

heater in the middle of the house to keep the mortar from freezing.

- It is very important to keep the walls covered, except when mortaring, for at least seven days. According to masonry experts, masonry mortar takes seven days to dry and fourteen days to cure.

There are ingredients that can be added to the mortar mix to retard freezing (calcium chloride), but with the soaked sawdust in this mix, no one can adequately be certain that these non-freeze agents will work properly. So it is best to cover, seal and provide a source of heat if the temperature is going below -7°C degrees. Diminishing the amount of sawdust as temperatures drop can be helpful, as the retarding feature of the sawdust is less important.

On this project we were properly prepared to prevent the masonry from freezing during the very cold month of October 2009. While the precautions kept the cordwood walls from freezing, it added to labour costs by requiring time consuming 'take-down' every morning and 'button-up' in the evening. The cordwood masonry was finished by late October and the inside work commenced. The entire cordwood infill was accomplished in less than six weeks.

Native cordwood masons

One of the highlights of this project was meeting and teaching the cordwood mortaring group which had been assembled for this task. The crew was paid a good wage and learned valuable





Above: Finished house in summer.

Right: Becky and the crew tuckpointing.

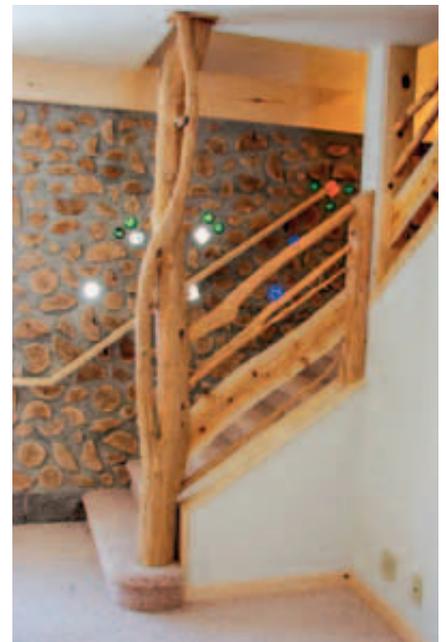
masonry and construction skills in the process. They were enthusiastic and learned quickly. As the project went along, some of the guys started talking about building an Ojibwa Ceremonial Lodge and personal homes, using the abundant tamarack (*Larix laricina*, a deciduous conifer) on the edges of the surrounding wild rice lakes.

One of the many side benefits of being involved in this project was receiving gifts of hand harvested and processed wild rice. Even though the project was open to women applicants, there were no takers. Becky ended up being the only woman on the crew and enjoyed working with the guys.





Clockwise from above: Bill Paulson's bear paw is a focal point; his feather blends into the entrance wall; stairs to upper level; porch in winter.



Special effects

Bill and Robert were instrumental in making some of the artistic Ojibwa motifs in the White Earth Home. The owner of the home was a member of the Bear Clan, so Bill decided he would put a bear paw in the cordwood wall. It became one of the focal points of the house.

The Ojibwa medicine wheel is prominently displayed on the front wall. The feather blends attractively into the entrance wall. The cordwood home has been occupied for nearly two years and the owner, a school teacher on the reservation, raves about the naturally beautiful cordwood home.

We visited the home a year after completion to do any weatherising that might be required. We applied chinking around a few log ends that had loosened and stuffed a few round log ends that had cracked (cracked) with white fibreglass. This well constructed home is easy to heat and blends beautifully into the surrounding woodland.

The home has caused quite a stir in the surrounding area, and there are plans for building a commercial law office, a ceremonial lodge and more cordwood homes. We are proud of our involvement, and grateful for the friendships made, but we are also thankful to the tribal members who welcomed us and provided insight and assistance in making this home come to fruition. Being involved in a project of this magnitude was certainly a peak experience for us. ♦



*Richard Flatau's latest book **Cordwood Construction Best Practices** (2012) is a complete, detailed work (with colour photographs) on cordwood construction. It is available as an eBook, as are all of his other books including **Cordwood Shed Plans**, **Cordwood House Plans**, **Cordwood Conference Papers 2011** and **Cordwood and the Code: A Building Permit Guide**.*

His website is:

www.cordwoodconstruction.org

He also has a blog at: cordwoodconstruction.wordpress.com



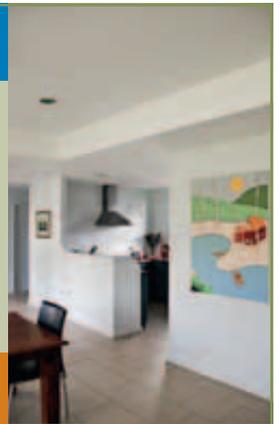


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Stone Haven

... or how I became a disabled pensioner

BY DON FIRTH

When Fiona and I were about to build our dream retirement home, the local state highway authority decided to widen the Princes Highway, which runs through our property. They bought a thin sliver of our land and started carting it away. Out of the magnanimity of our hearts we helped them speed the process and 'allowed' them to dump something like 350 tonnes of rock on our hillside. Thus was born the idea of something built with stone.

Hybrid approach

We bought a copy of 'Stone House: A Guide To Self-Building with Slipforms' by Tomm Stanley (reviewed in *TOB* 128 Apr/May 2005) and 'Stone Primer' by Charles McRaven (reviewed in *TOB* 148 Aug/Sep 2008) to start us on the way.

Editor's note: Book reviews featured in back issues of TOB are also available on our website. www.theownerbuilder.com.au

By the time we got to the front of the house, it had become a complex

series of different radius curves and not really suited to formwork construction. Additionally we preferred the warm feeling of mud brick and lime render interior finishes, and most importantly no longer had the budgetary constraint of using the cheapest technique. Combined with now employing a stonemason skilled in the 'half' dry stone outer skin technique the choice became clear. We first built the inner walls with concrete blocks or mud bricks and built the windows and doors into this layer. This got the building to lock up stage quicker and meant the building could be occupied sooner.

Below left: 350 tonnes of stone for free!

Below right: Complex curves were achieved with a 'half' drystone wall technique.

Top: This sculpture was made by a friend.

The dry stone look stonework is actually concreted with a back layer of coarse gravel mortar, using old broccoli boxes as a spacer to create a cavity thermal break in the wall. The stonework is 300mm thick and self supporting over the 2.8m height. The 'air' gap and slab step down gives a watertight finish and the outer spaces between the stone provides habitat for all manner of beasties.

The complex shapes needed for the window trim and lintels were formed from *Hebel* blocks, rendered with *Liquid Terracotta* by Megatreat. *Hebel* is much easier to shape than concrete block.

This was a case of a solution waiting for a problem to fix! I had over ordered a whole pallet of *Hebel* for another part of the project. After this, I ended with two still left over, which I have since used as temporary plugs for my fire bunker air vents!

Compared to form filling with rock and concrete, the method of stone construction we used is very time consuming and much more expensive





A

Above: View of the house from the front with the green roof already growing well.

Right: Beautiful stonework – worth the effort!

with paid labour. It is also not as structurally loadbearing and might not get engineering certification if it must support the roof. For our house it was infill with the concrete roof supported on concrete filled columns.

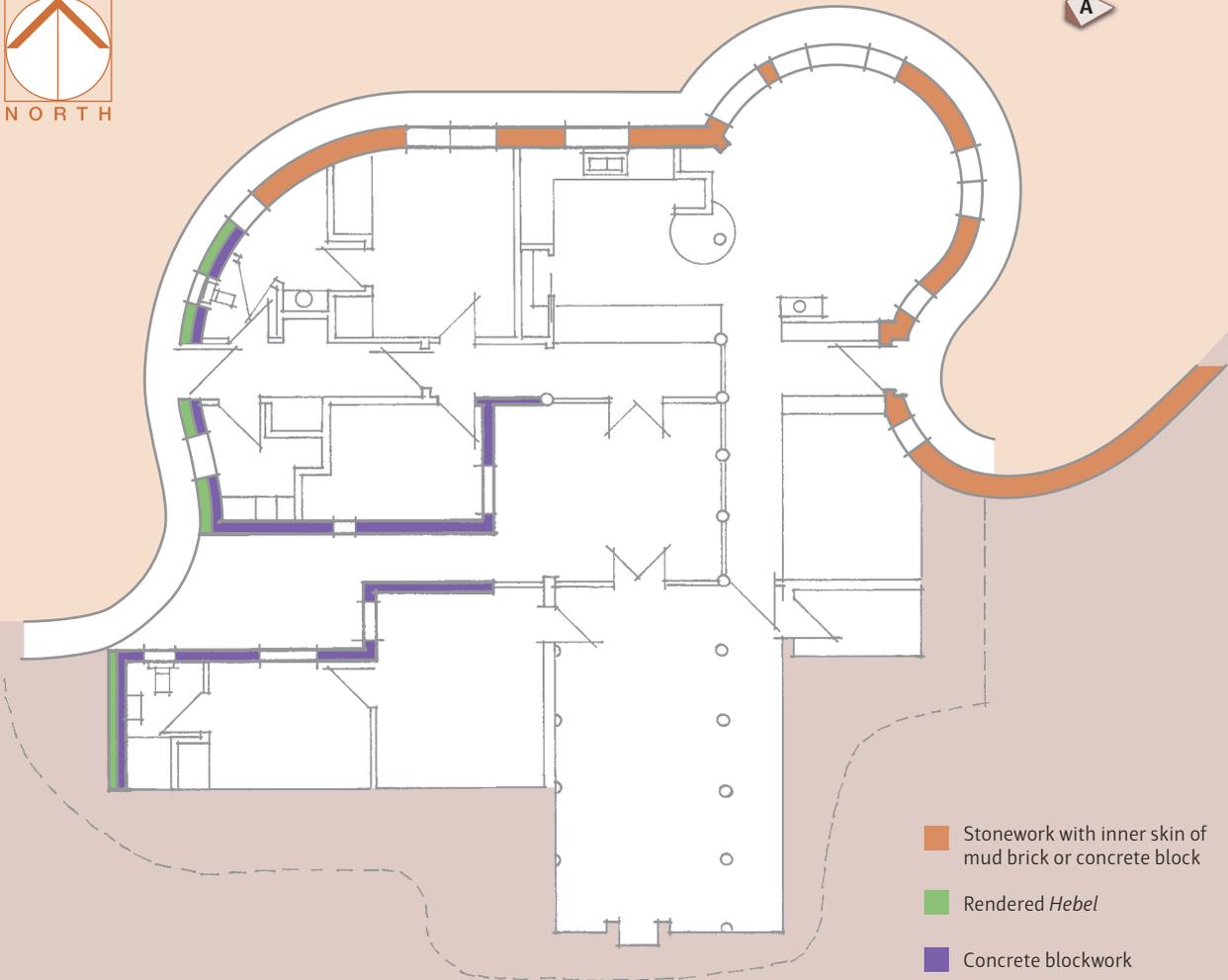
In addition our Silurian schist stone had almost no bedding planes, is brittle and very hard, almost impossible to chisel to shape and agonizingly fiddly to create more than one face at a time – as is needed around door and window openings. Most days saw no more than 1 square metre of surface completed, but the results speak for themselves.

The engaged column is a reminder of a trip to South America taken part way through the project. Unintentionally we recreated the Inca practice of sloping masonry to protect buildings from earthquakes. The Conquistadors thought they knew better and built vertical palace walls on Inca foundations. Many have since collapsed!





A



Arrow letters refer to photos

- Stonework with inner skin of mud brick or concrete block
- Rendered Hebel
- Concrete blockwork



Because one can

In keeping with the ancient influence on the house design, there seemed room for a niche adjacent to the front entrance. To give a 'grotto' effect, I chose to line the inside with light coloured granite as a contrast to the main outside face stone – this represents an inner skin.

The actual construction of the niche made use of a drum to form the main barrel shape, surmounted by a ply form to assist with creating the arch. As the feature is next to the cellar door it, appropriately houses representations of Demeter (goddess of the corn and harvest) and Bacchus (or Dionysus, god of the grape harvest, winemaking and wine).

Progress on the stonework was a very slow process due to the characteristics of the stone.



Chimney

At the back of our 'underground' house we have an open fire, thus creating this freestanding stack. I built it ship funnel shape to make it less boxy. The original cowling sent smoke down the chimney so for now it has my old BBQ plate on top, but when I find that ideal flat stone...

This is all that shows of a south elevation of the house.

*Above left: Niche adjacent to front entrance.
Above right: Sloping 'Incan' masonry.
Right: Work around windows was agonisingly fiddly getting more than one face right.
Below: Open fire chimney takes shape.*

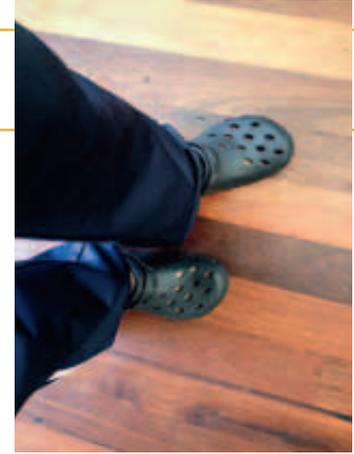
Once you have built something with stone, you will never walk past a rock again without thinking, 'That would make a great...'. That is how the large rock above the niche found its place – it was exactly what I needed for that spot. ♦



From the back porch...

Are you earthed?

BY PENNY BRIGHTON



I'm more than willing to admit that I flit from new idea to next new idea at an alarming pace, a bit like a butterfly from flower to flower. However, I like to think that unless I keep my mind open and try things out, I'm never going to learn anything new.

Over the past few months I've read and seen mention of earthing in a number of sources, both printed and online. Earthing is a way of conducting the energy of the earth into your body. In a nutshell, as I understand it, that means connecting physically to the earth, without any barriers. I'm not one for walking around barefoot much, I'm far too delicate for that... but doing so on the beach is great and has become part of my regular morning routine. Now I can't honestly say I've noticed any massive change, but it is a little ritual that I look forward to each day. I also sometimes sit down at the end of my walk and do a little meditation (or sea watching, which is more my style).

A growing body of research is indicating that there are benefits to being earthed, including reducing inflammation in the body, improving sleep and digestion, speeding up injury recovery and reducing stress. The simplest way is to walk on earth, grass or sand with bare feet (preferably a bit wet to increase conductivity), or to take a swim in the sea. In the past, we were naturally more connected to the earth, walking, gardening or tilling fields. Recently we have become more domesticated, living in insulated houses and wearing rubber soled shoes. Of course, as with all these ideas, you can take it to a whole new level – with a range of earthing sheets, mats, bands and patches available, even earthing footwear.

Being the type of person who really likes to 'keep it simple stupid,' I started thinking about how we could design our houses so that the floors were naturally earthed anyway, meaning that even walking around barefoot indoors would provide some benefit.

According to Earthing Oz (www.earthingoz.com.au), even walking on a tile floor can have some benefit. *'It depends on whether the tile floor sits on a concrete slab or on the ground. If so, the energy could come through. If the tile sits on plywood or some other kind of wood, plastic, or vinyl understructure, you are not likely to get any conductivity. It also depends on what kind of tile; ceramic tile with a glazed finish on the surface will, like*

glass, probably prevent the Earth's energy from coming through.'

A search for 'earthing' on YouTube brings up a huge number of interesting videos. There is also talk of adding dedicated earthing systems to the plans for new buildings and even retrofitting to existing buildings, but I've so far not been able to find too much information about this.

So, my timber floors on timber bearers and joists on brick piers are just not going to do it for me. Back to the beach I go! ♦

Ed's note: Do you have any experience with earthing? Can you explain how it could be applied to buildings? We'd love to hear from you.





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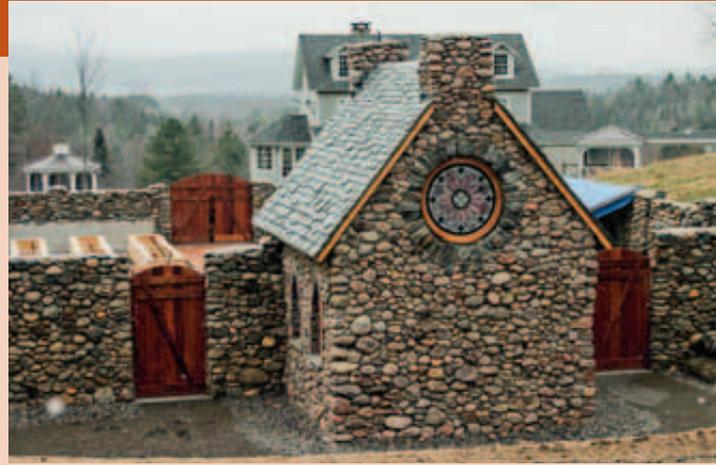
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Chapel Gardens



‘Several summers spent working in English countryside estates mixed their memory with my imagination as I drew the initial drawings of this walled garden and private chapel. Stone by stone, with the support of assistants and gathered trades (wo)men, I built until all 350 tonnes were used.

The walls of the enclosed 23 x 15m garden reach 2.5m in height, with the chapel drawing visitors through to the back. This project is the embodiment of an undertaking, a once in a lifetime opportunity: one that I hold in highest regard.’

...Thea Alvin

www.myeearthwork.com



See more of Thea's work and other stunning stonework in our special feature this issue, starting page 28.