

Once a factory, now three homes

An old factory, and the contents of building site skip bins, have been recycled into sustainable community dwellings, writes Jacinta Cleary.

“I spent \$1200 on hinges, there's that many doors and windows in this place,” says David Murphy. I'm surprised at the expense, as it's the first time I've heard David mention buying materials when building his house; almost everything else has been salvaged from demolition sites (with a slab of beer for the work crew), bartered, or came from the factory that used to be on site.

It does confirm there's a lot of ventilation in this house, though.

If ever there was a project that television's Grand Designs team should have followed, it would be this three house development in Newport in Melbourne's inner west. As David's partner Penny Baron puts it: “Dave just kept so much in his head,” such as ideas, designs and plans for “just what to do with that piece found in a skip bin.” This unique project took eight years to complete, is largely constructed with recycled materials and leads the way when it comes to low impact living.

The original factory

It all started around ten years ago, at the time Melbourne's property prices rose 30 per cent in one year. Like many, David and Penny tried to buy a house, withdrew after a failure or two, and then returned to the market with new ideas. David stumbled across a 1980s brown brick factory and was lucky to buy it at a mid-week auction. The site runs east-west with a long, sunny northern frontage.

David and Penny found two other parties (already friends of theirs) to buy into the housing development and the property was split into three titles of 25 per cent, 20 per cent and 55 per cent of the total land size. While there is no com-



The front view shows all three houses benefit from a wide northern frontage.

monly-owned area, the three groups agreed that the development should encourage the sharing of resources and space. All three of the properties share a very edible front yard for instance. Underneath are two 10,000 litre concrete rainwater tanks, saving precious garden space, with the water directed to all three properties for toilet flushing, laundry and watering produce.

A Memorandum of Understanding was talked about between the three parties, although they are “so like-minded” that there has been little need to pursue it or other visioning exercises. Common goals include minimal use of resources, the sharing of resources and spaces, helping each other through life cycles such as child rearing, illness and ageing, and actively engaging with the local community. They're not oblivious to changes in circumstances; down the track they recognise that one party might want to sell their home, agreeing that the two other parties can take six

months to find a suitable purchaser before opening it to the market.

The house designs had to make best use of the factory site, so it was agreed to build all three dwellings against the southern back wall of the factory, providing a wide northern frontage for full solar access and healthy and abundant front yard food gardens.

From here, it was time for the housing design and planning stage, with two of the households engaging the same architect Paul Haar, along with Rohan French from Carm Constructions for the build. The third property was designed and largely built by owner David Murphy, bar some assistance with plastering, brickwork and the electrics.

Inspired recycled home

David describes himself as “a magpie by nature,” scavenging and finding new uses for discarded materials. He walks to a small deck off the rear of the kitchen and throws some compost scraps down

Photos: Nick Stephenson



Left: timber kitchen cabinets from an old medicine faculty; Middle: David Murphy with the worm farm made from a dishwasher; Right: Flynn with his pirate ship bed made from salvaged timbers.

a white PVC pipe that drops a few metres to a ground floor internal courtyard. At the base of the pipe is an old dishwasher; inside it's full of worms and rich compost for the garden.

David says he would lie awake at night working out what to do with pieces he had salvaged, contemplating which part of the house to use them, whether he had enough materials and importantly how to use them beautifully. “It was a constant struggle to use materials in the most efficient and aesthetic way.” The dishwasher worm farm might have come from one of those late night sessions; it’s novel but pragmatic at the same time, getting rid of the scraps at the source but making sure the worms are kept cool in the downstairs courtyard, rather than just putting the dishwasher on the top deck.

Before doing away with the factory completely, David worked in it for over a year prefabricating parts of the house such as the doors and windows, steel-work, staircase and the kitchen, as well as the kitchen for neighbour Kate’s house. David’s new workshop is an original part of the factory.

In David and Penny’s house an esti-

mate of 60 per cent of the new house was made up of recycled or reclaimed materials, with most of the roof structure of the old factory in use as joists, roof beams or structural steel. Metal cladding from the factory has been used to cover the back of the house, with David estimating it might have cost \$3000 with new materials. The only visible timber that was bought for the house was some hardwood and ply for the four downstairs internal doors that David made, adding some recycled merbau packing crate as beading.

David used to live near Melbourne University, with any renovations there providing rich pickings for a man with an appreciation for fine building materials. He says the best parts come at the start of a demolition, for instance he was able to salvage whole timber cabinets from the medicine department which are now a feature in the kitchen. Over 100 metres of Kauri science benchtops from the old microbiology building have been used extensively throughout the house, especially for internal timber features, with David working around the sink holes. He also secured a lot of old cupboard doors from that

department, the inside of which were silky oak—they are now inside out and on full display in this new home.

The same demolition crew were working on a high-rise legal chamber in the city and gave David a “heads up” regarding some bookcases; they turned out to be hardwood, which he used for the inside of the steel framed doors and windows. The 42 metres of sills in the home are made from teak, salvaged from a skip during building works at the Melbourne University pool.

Other sources of materials include the Ponsford Stand seating (complete with numbers) from the MCG for handrails and old plywood boxes from the Warrnambool cheese factory, which are the perfect size for kitchen cabinets. Abalone shells were mixed into the concrete slabs, making the floors a piece of art with pearly-pink highlights; the shells had been sitting abandoned in a pile at a nearby industrial site for years.

Some of the external cladding is from second-hand timber yard Yarra Timber Salvage, and is somewhat preloved with holes created by the seawater Teredo borer—needless to say the timber was sourced from an old pier. Interestingly,

David doesn't think he saved much money by searching high and low for cut price or dumped materials, due to the extra time it takes and the increased labour costs involved, although the final result would have been impossible on his budget if he had had to buy the finished timbers that he has used.

DIY double glazing

David says the windows were the most ambitious part of the house. He found some crates of toughened glass in a second-hand yard in Campbellfield. The glass couldn't be cut so he had to design the house around the glass, sending it off to be double glazed once all the decisions had been made. The windows are a highlight though, especially the high operable windows that use auto gas struts and bespoke catches to open them.

The bedrooms are cleverly positioned downstairs so they stay cool in summer, and with full winter sun streaming inside in winter the living areas heat naturally. With high levels of insulation and loads of ventilation the house can adapt to any season. While the 1kW photovoltaic system is fully operational, future projects for David



Operable windows with the old pier external cladding in the background.



Recycled kitchen, featuring old science benches and cheese factory boxes.

include piecing together a solar hot water system, parts of which came from another Melbourne University skip.

Over at Cathy's

Next door, the size of Cathy Nixon and Jamie Crickmay's two-level home designed by Paul Haar is deceptive; being on the smaller block of the three it has a small footprint of roughly 10 metres by 10 metres, but with a light-filled

upstairs living area which opens on to a deck and a light well that illuminates an internal courtyard on the ground level, the home feels a lot larger.

The homes are designed to last and to adapt to the various stages of the owners' lives. Cathy and Jamie could move to the ground level if the stairs become difficult to negotiate when older, and lease the upper level. Some downstairs walls are even non-loadbearing to al-

low for removal.

Like neighbours David and Penny, Cathy and Jamie's home includes a large amount of recycled materials. By designing and building at the same time as their neighbour Kate, they saved on the cost of these materials. Starting with what was already available on site, the concrete from the factory demolition was delivered to Alex Fraser Group in nearby Spotswood for recycling. The mix for the new concrete slabs and footings included a coarse aggregate of 30 per cent recycled crushed concrete, a fine aggregate of recycled concrete crushing dust, and cement which contains 40 per cent fly ash and/or slag from steel foundry waste. Recycled truck and batch plant wash-down water was used to mix the concrete.

Careful timber selection

As well as recycling bricks from the fac-



Inside Cathy and Jamie's home with an array of recycled timbers on display.

tory and dry-pressed red bricks from elsewhere, Cathy and Jamie's home includes many carefully selected recycled timbers. Paul Haar says that ecological

impact when selecting timber was paramount, giving preference to recycled stock over salvaged tree wood, with native species plantation wood considered

Three different homes with similar sustainable features

WHILE two of the homes were designed by an accomplished sustainable architect and the third by an inspired sculptor and carpenter, there's a uniform approach to commonsense water and energy saving features.

Light and ventilation

All three homes have a considerable number of doors and double glazed windows, giving more connectivity to the outdoor spaces. "One of the most important things was to have light and a view," says Penny. Timber window framing has been used throughout, offering better insulation than aluminium frames. Looking up in all three homes are high operable windows, which assist summer ventilation.

All homes have light wells close to the long southern boundary to deliver light to the rear of the lower levels, and in turn providing internal courtyards. The Paul Haar designed homes incorporate fan-assisted ventilation shafts and



Electrically controlled double glazed louvre highlight windows with a rooftop solar water heater, and a PV array in the distance on an adjoining house.

some electrically controlled louvre windows.

Wall and ceiling insulation

Paul Haar says that the external brick walls were constructed thicker to al-

low for thicker EPS foil board cavity insulation. In the roof, 160mm thick R3.5 polyester batts were used with sisalation. The upstairs floors are fitted with R2.5 polyester batts to reduce airborne noise and heat transfer between



From Cathy and Jamie's front door is a view to an internal courtyard at the southern end, helping to brighten a potentially dark part of the house.

next, then exotic species plantation wood, with native regrowth forest wood considered last. Australian old-growth or rainforest wood as well as any tree wood harvested overseas were not an option.

Timbers used in the homes include:

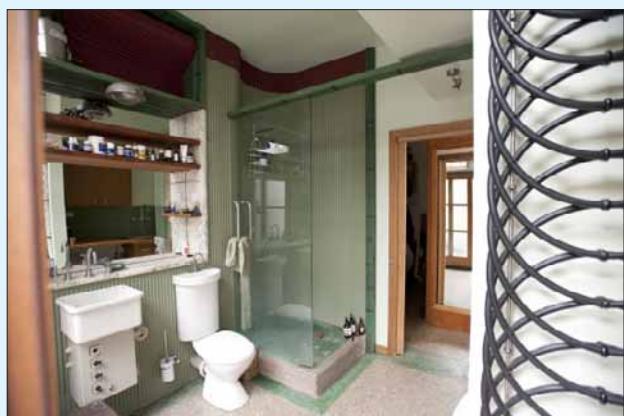
- Seasoned Radiata Pine from Victorian plantation forestry for most wall and roof framing
- Green Monterey Cypress salvaged from Gippsland farm properties for balcony posts, pergola beams, weatherboards and decking
- Tempered masonite hardboard made from sawmill waste and forest thinning, and press-formed with pressure and heat only (meaning no glues were added) was used for some external claddings and eaves linings
- LOSP treated finger-jointed Hoop Pine sourced from Queensland planta-

tions and select grade recycled Blackbutt were used for windows and external door frames

- Reclaimed Karri, Messmate and Kauri Pine were used for the floorboards
- Select grade recycled Victorian Ash was used for internal glazed doors and joinery
- Some external wall cladding, internal wall lining and cabinetry was done with Hoop Pine plywood.

At the moment Cathy and Jamie spend most of their time in the sun-drenched upstairs living area that opens on to a balcony hovering above one very healthy vegetable garden. The result is a modern sustainable home, nestled amongst other like-minded households. *

Thanks to Nick Stephenson for the photography



DIY hydronic heating pipes (right).

upstairs and downstairs.

In the other house there's R3 insulation in the walls and up to R5 in the roof, with David finding some recycled cotton batts made by Tontine, more commonly known for their pillows.

Thermal mass

Two of the homes have exposed concrete slab floors for thermal mass and all three have internally exposed brick walls.

Heating

High efficiency gas powered hydronic panel radiators are installed in living and sleeping areas. In David's house raised concrete platforms on the lower floor, a DIY wall-mounted system in the bathroom, along with a 50mm screed of polished concrete on top of a plywood floor upstairs are all heated hydraulically.

Solar hot water and electricity

In two of the homes water is pre-heated by rooftop solar water heaters and stored ready for boosting on demand by the same instantaneous gas water heater that fuels the hydronic space heating system. One house has a 3kW grid-interactive photovoltaic system consisting of 18 Schott Poly 170 24V panels and Fronius

IG30 inverter, another has all necessary rough-in wiring laid for future installation of a similar system, and another has a 1kW TXSR system with a 1100W Sunny Boy inverter. LEDs and CFLs have been used, with a focus on task lighting so that general room lighting can be minimised.

Water

The three houses share two 10,000 litre underground rainwater tanks and each household has its own greywater system in place. "In the gardens, as a general rule, residents draw from and deplete greywater supplies before rainwater supplies," says Paul Haar. Ideally they would have had one greywater system for the three homes. "The group was certainly challenged and frustrated by the technical complexities, many authority constraints and overwhelming costs associated with design and installation of a state-of-the-art collective water management system for the three dwellings," Paul comments. For further details on some of the problems involved visit www.renew.org.au