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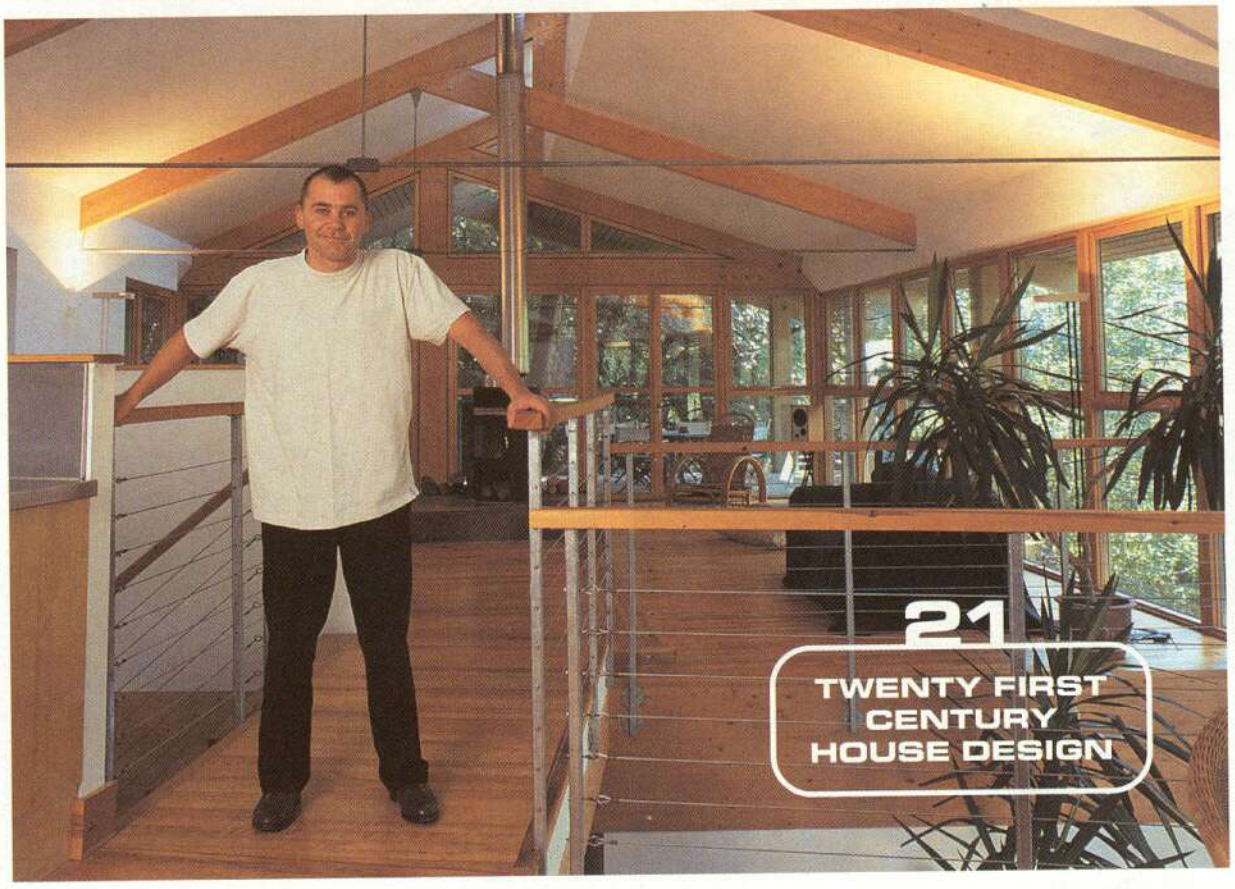
Below, Michael stands on the 'bridge' that links the open plan living area and kitchen/dining space at first floor level.



THE GREEN HOUSE IN THE WOODS

Michael Winter has designed and built a unique eco house on a heavily wooded site. **WORDS BY MARTYN HOCKING. PICTURES BY DAVID MARKSON.**

If you could choose to build your dream home anywhere, where would it be? How does the boundary of the prettiest county cricket ground in England sound? It sounded pretty good to Michael Winter and his wife Elizabeth Monk when they spotted it in an auction catalogue for a forthcoming sale of land and properties in Kent.

They had been looking for land in the counties that ring London for two and a half years without much success, and had begun to think that they would have to change their plans and convert an old agricultural building rather than building a new home from scratch.

While auctions may be the best way to establish the true market value of an unusual property or plot of land, they are a potential nightmare for self builders. This is likely to be the biggest investment of your life and you may have only a couple of weeks to visit a site, talk to the planners - and get your solicitor to carry out the necessary checks to ensure that the site lives up to its billing.

The initial site visit certainly lived up to expectations (Michael walked back to the car thinking 'this is it!'), but time was not on their side. The auction was being organised by a firm of local estate agents, but Michael also noticed a second estate agent's board on the land, so he decided to approach them directly to put in an offer ahead of the auction. To his immense frustration, it turned out that he had made his offer - £72,500 - just half an hour too late, as another would-be self builder had made an identical offer earlier in the day and this had already been accepted by the vendors. ►

Below, the exterior of the house has been timber-clad, the cladding having been stained black using a high-performance coating.

It was a case of 'back to the drawing board' for Michael and Elizabeth, but six months later they got a call from the estate agent who had handled the plot sale. The agent was ringing to inform them that the sale had fallen through and to ask whether they would still be interested in making an offer.

Delighted to get a second bite at the cherry, Michael and Elizabeth said that they would be interested but they wanted enough time to check the plot out properly and talk to the local council about the site's potential. The plot was half an acre in size but was heavily wooded, making the siting of a new house on the land more awkward than would normally be the case. The land was being sold with detailed planning permission in place (granted on appeal) for a Victorian style house, but Michael and Elizabeth wanted to build something more unusual.

READERS' PROFILE

NAMES	Michael Winter and Elizabeth Monk
REGION	Kent
STYLE OF PROPERTY	Contemporary
SIZE	3,250sq ft
PLOT SIZE	Half an acre
METHOD OF CONSTRUCTION	Timber frame
LAND COST	£65,000
BUILD COST	£235,000
TOTAL COST	£300,000
COST PER SQ. FT.	£72
BUILD TIME	Nine months
CURRENT VALUATION	£750,000

Before they could explore the design possibilities, though, it became apparent that the site posed a rather more serious problem - a question of access. Michael and Elizabeth's solicitor discovered that the land, which was on a private road, was being sold with a question mark hanging over the right of way to the site. The ownership was not definitive and a fight took place between the council and the historical land owner of the area. Eventually the matter was settled at a cost to the plot vendors of £17,500. Michael said: "It was something that we would not have spotted had we bought the land at the original auction so we were grateful we had gone down the traditional buying route. At auctions, I feel that it is a case of 'buyer beware'."

After considerable negotiation, the vendors secured a satisfactory right of way to the site and agreed to sell the land to the Winters at a reduced price of £65,000.

The next problem was the imminent expiry of the existing planning permission. This was solved by digging trenches and installing drains to the keep the planning permission 'alive'. Detailed planning permission is valid for five years and needs to be renewed at the end of this period if building work has not commenced, so this is not an uncommon practice.

However, what you consider to be a 'meaningful start' on the build may not satisfy the council's planning department, so it is important to clarify this point. Once a letter had been obtained from the council to confirm that a start had indeed been made, the land sale was agreed and completed.

As soon as their ownership was confirmed, Michael and Elizabeth submitted an application to renew the existing detailed planning permission on the site. (They had no desire to build this house but feared that if they allowed planning permission to lapse for too long on the site while they applied to build their real 'dream home' they might end up with a site that could not be built on at all).

The house they really wanted to build would be radically different. It would be a modern looking 'eco-friendly' house and would have both a timber frame and timber external cladding. The interior would be open plan and the accommodation would be 'upside down', with the main living rooms on the first floor and the bedrooms on the ground floor.

Michael is a qualified architect but had not designed such an environmentally-friendly house before, so he spent considerable time talking to suppliers and academics who had researched the effectiveness of the many and varied products which carry the 'green' tag. He had expected considerable opposition to the scheme from the local council's planning office but to his surprise this proved not to be the case. The linear house design he developed showed that it would be possible to build a house on the site at the cost of just three trees. Many more would have been lost had the more conventional Victorian house been built on the site. The planners were also impressed by the many other measures that Michael had taken to minimise the impact the house would have on its environment (see below) and were willing to approve the new house design using their 'delegated powers'. These powers allow the planning officer to approve amendments to an existing planning permission without reference back to the council planning committee. Michael says that it was most unusual for such radically different proposals to be approved in this way.

Once his design got the green light from the planners, the 3,250sq ft house took nine months to build. To minimise damage to tree roots Michael had decided to use 16 1m x 1m concrete pad foundations (1-2m deep) to support the timber frame, in preference to trench, raft, or piled foundations, which would have put at risk a large number of trees.

Michael designed the timber frame himself in conjunction with TRADA (the Timber Research and Development Association). It is based on the traditional post and beam building system employed by the likes of Border ▶

Above, the house layout is 'upside down', with the main living room, kitchen and dining areas on the first floor, and the bedrooms on the ground floor. The living room floor was covered using recycled timber boards which were salvaged from an old squash court.

Oak and Potton, but uses glue laminated (commonly referred to as 'glulam') timber posts and beams in preference to solid timber, and stainless steel bolts in preference to timber joints.

The added strength of the glulam posts and beams allows for greater spans, and therefore more open plan living space, and this is a feature of Michael's interior design. In all, 16 giant glulam posts were erected, each 8m tall, with 27 horizontal glulam beams being bolted between them to create the two floors and the roof structure. Steel rods have also been used to tie the framework together and, like the rest of the frame, these have been left exposed as a feature of the interior design.

The walls and floors between the glulam beams were constructed using timber 'I' beams. These were made from laminated wood in Canada by Trus Joint Macmillan and fixed at 600mm intervals. They are favoured by 'green' house designers (as are glulam beams) because they use less timber than conventional beams. They are also extremely strong and dimensionally stable.

The walls, roof and floors were insulated using Warmcel cellulose fibre (made from recycled material such as old newspaper) to achieve high levels of energy efficiency. The walls and floors were given a 250mm thick layer of the insulation, producing a U value of just 0.139 in the walls and 0.14 in the floor. There is 400-450mm of insulation in the roof (more was packed into the cooler north-facing portion). This gave a remarkably low U value of around 0.08.

Energy efficiency is a feature of the windows too, which are a prominent feature of the design. Michael had orientated the house on the site to maximise solar gain and natural light, with floor to ceiling glazing at first floor level

on the south-facing front elevation. The windows he and Elizabeth chose were triple-glazed, with a low 'E' coating, and filled with argon gas to minimise heat loss. These were supplied by the Swedish Window Company. The trees that surround the house ensure that there is enough natural shade to prevent overheating in summer, whilst allowing the maximum amount of light through in winter when they have shed their leaves. On the northern elevation, there are relatively few windows, both to minimise heat loss and to screen the house from a railway line and footpath.

The exterior of the house is clad in softwood timber boarding imported from Scandinavia, which Michael stained black using Ostermann and Scheiwe wood stain.

The proximity of the railway line - and Michael's desire to minimise heat loss - led him to specify a mechanical ventilation system, which expels moisture, cooking smells and so on, draws fresh air in and heats it with the expelled air via a heat exchanger (with additional support from a heat pump) before circulating it around the house - all without the need to open windows.

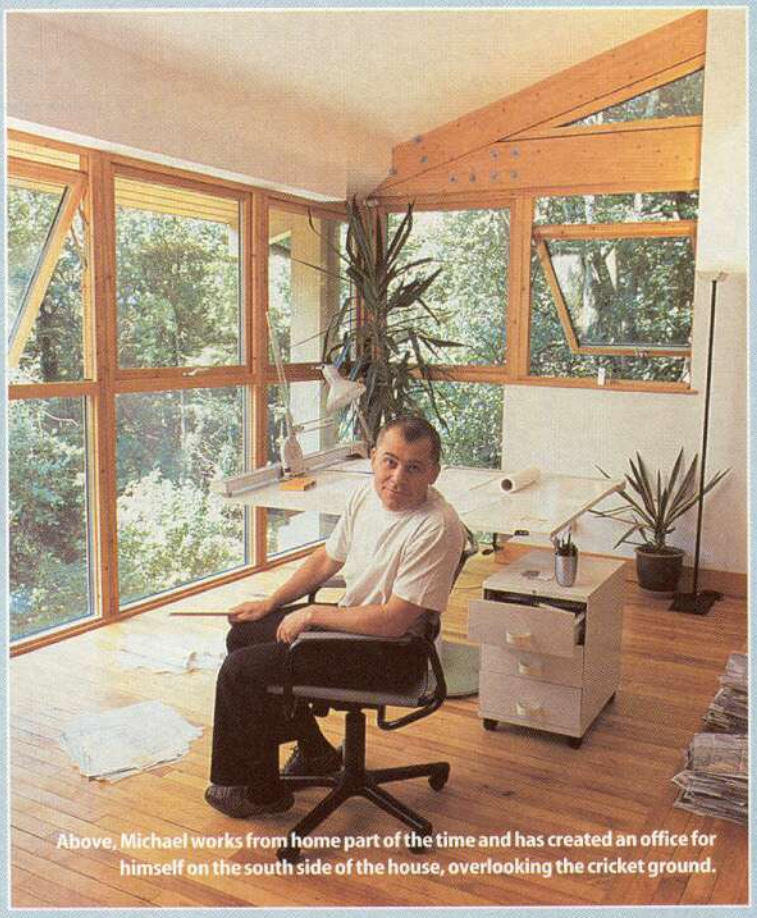
There is no conventional central heating system - the house is so well insulated that it doesn't really need one - but there are three more heat sources in addition to the mechanical ventilation system. The first is solar gain through the extensive glazing to the south elevation; the second is a wood burning stove in the main living space and the third a set of electric towel rails - one for each of the three bathrooms. While the combination of these four elements is sufficient to heat the house for the majority of the year, Michael has found the mechanical ventilation system less effective in terms of its heating capability than he had hoped. He has found the stove to be too small to keep a log fire burning overnight, so the house can be a little cool on winter mornings. A larger stove, and either a more efficient ventilation system or some form of central heating should have been specified, Michael now feels. Nonetheless, the heating bills are remarkably low for a house of this size (see box).

Hot water heating is by solar panels installed on the roof using 40 evacuated tubes. These provide about a third of heating needs with an electric immersion providing back-up. A rain water collection system has been installed and uses a huge tank under the garage. Michael says that the garage area was the only area that required conventional foundations and these had to do down nearly two metres. "Instead of trenches ►

designing your own home

MICHAEL HAS CLEAR VIEWS ON HOW TO APPROACH THE DESIGN OF YOUR OWN HOME.

- His golden rule (and one we would strongly endorse) is to let the plot guide your hand when designing your home, rather than trying to impose a pre-determined design on your plot. Michael's own design is a perfect example of this - he had to literally bend the house to fit around the trees on the site.
- Designing the house to fit the plot doesn't mean compromising on your principles - Michael and Elizabeth knew from the outset that they wanted to build an 'eco-friendly' house and that's what they did.
- Whilst you might employ a professional to draw up the detailed plans for your house, you will want to a have the major say in what it looks like. Michael recommends that every would-be self builder should assemble a folder of pictures, magazine articles, brochures and so on to illustrate different aspects of the type of house you want to build. If you do employ an architect to then draw up the plans for you, this folder will serve as the perfect starting point for your discussion with them.
- Michael is also a firm believer in visiting other peoples houses to gain inspiration. Architecture events such as 'Open House' (an annual one week event organised by the RIBA) allow you to tour a whole host of interesting properties in a short space of time. However, you can, of course, achieve the same result simply by knocking on doors of houses that appeal to you, talking to local architects about their projects, visiting developers' show homes and so on.
- Michael believes that the Royal Institute of British Architects (RIBA) is the best starting point to contact suitably qualified architects. The RIBA has regional offices across the UK and they should be able to put you in touch with three or four potential candidates. They should be willing to come to see you and inspect your site free of charge, but if you want sketch schemes these will need to be paid for. "You must trust your architect," Michael says. "A good working relationship is essential because there will inevitably be problems along the way. It's how you solve those problems together that really counts."



Above, Michael works from home part of the time and has created an office for himself on the south side of the house, overlooking the cricket ground.

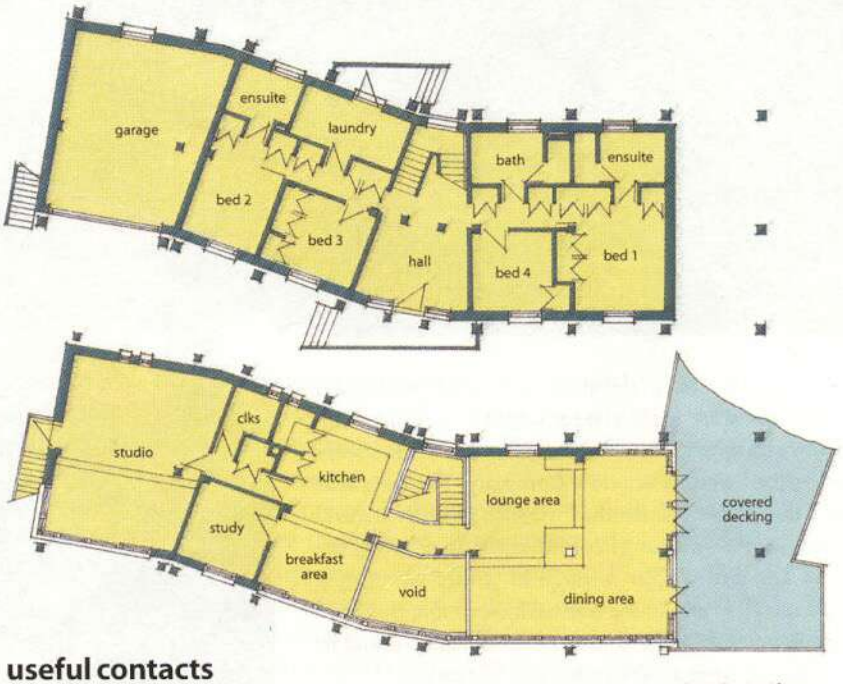
running along the outline of the garage we decided to dig out the whole area and form a tank as the foundation. People thought it was going to be a swimming pool and really it is very similar. the tank takes rainwater from the roof and this is then pumped to the rest of the house on demand using a pressure vessel to avoid the pumps running every time someone turns on a tap."

The water is used throughout the house for washing and bathing, and runs through a fine mesh filter and then a UV filter so is safe to drink, though there is a single mains tap in the kitchen for drinking and cooking. ★

eco house running costs

The following running costs were recorded over a six month period (Jan-August) when the house was constructed four years ago.

ELECTRICITY:		
Economy 7 heating 1770.3 units	@ 2.70p	£47.80
Standard tariff 3958.5 units	@ 7.30p	£288.97
GAS:		
5.92 units	@ 44.00p	£2.60
WATER:		
4.936 units	water @ 84.03p	£4.15
4.936 units	waste @ 80.30p	£3.96
OVERALL TOTAL		£347.48
(£43.43 a month)		



useful contacts

Ostermann and Scheiwe Tel: 01296 481220.

Swedish Window Company, Milbank Industries, Earls Colne Business Park, Earls Colne, Essex CO6 2NS. Tel: 01787 223931.

TRADA Technology Ltd, Stocking Lane, Hughenden Valley, High Wycombe, Buckinghamshire HP14 4ND. T: 01494 569600.

Warmcel Tel: 01495 350655.

The Winters' house
Bedrooms: Four
Bathrooms: Three
Total area: 3,250sq ft
Size: 60ft x 15ft