

# Childhood dream come true



**Diarmid Baird** drew up the plans for his future home when he was a young boy. Years later, with a family of his own, he made those sketches a reality

WORDS **JENNY MCBAIN** PHOTOS **MARGARET SORAYA**



**E**very self build project has its moment of conception. In the case of young farmer Diarmid Baird, who lives just outside Dundee, that moment came when he was 12 years old. "When we were young, my brothers and I were always outside building dens," he says. "One day I made a plan of the type of home I wanted to build when I grew up. Just about everything in the original drawing has been incorporated into this house."

That sketch is now framed and hangs on the wall at the foot of the stairs as a colourful reminder of the powerful potential of childhood imaginings. The house is even named after a den; it is called the Bivvi – which means a rough shelter. However, the name doesn't give a true description of the new property.

The contemporary house has been finely executed, the result of a potent mixture of intelligence, intuition and creativity. It has an open-plan living, dining and kitchen space downstairs, as well as two guest rooms, a bathroom, store room, utility and toilet. Cantilevered stairs lead to a mezzanine space, a large enclosed sitting room, two further bedrooms and a bathroom. Most of the rooms in the house feature large sliding doors that lead out onto





the ground and first floor terraces, and allow the house to open up to the surrounding landscape. "We like to entertain but it is difficult for people to get here on public transport and it is a long way out of town for a taxi ride, so it made sense to put in extra sleeping accommodation," explains Diarmid's wife, Aileen.

### Training and turbines

After completing a master's degree in engineering at Edinburgh University and working in Dorset with an aerospace company for a year, a place opened up on the 600-acre family farm for Diarmid to build a house (when his older brother moved to Australia). However, with three remaining brothers – each of whom had a wife and two of whom had children – and their parents, the farm had four families to support on a relatively small area of productive land.

Diarmid put his education to good use and invested six years putting together plans and funding for an 800kW wind turbine to produce electricity on a commercial scale, which will pay for itself within eight years. "I got an ethical loan for £1.25m from Triodos Renewables and managed to jump through all the bureaucratic hoops to get everything in place," he says. Having completed the paperwork, he erected the turbine almost single-handedly.

Diarmid and Aileen set about finding an architect to help them turn the childhood sketches into a real set of plans. "It was Diarmid's



Architect Peter Gunning's plan for the house was to set it into the steep-sided former stone quarry, hugging the landscape with a gentle bend. The living roof helps the building to further blend in with the surrounding farmland

### THE FILE

**NAMES** Diarmid & Aileen Baird  
**OCCUPATIONS** Farmer and PA  
**LOCATION** Dundee  
**TYPE OF BUILD** New build  
**STYLE** Contemporary  
**CONSTRUCTION METHOD** Timber frame  
**PLOT SIZE** 0.37 acres  
**HOUSE SIZE** 273m<sup>2</sup> (2,938ft<sup>2</sup>) including garage and store  
**LAND COST** Already owned  
**BUILD COST** £460,385  
**COST M<sup>2</sup>** £1,686 (£157 per ft<sup>2</sup>)  
**BUILDING WORK COMMENCED** May 2011  
**BUILDING WORK TOOK** 43 weeks

*"I am still like a kid and this place is like the ultimate den. Even the garage reminds me of a bat cave. We plan to stay here for a long, long time and bring up our children here"*



dream; it was all in his head and it was difficult for me to visualise," says Aileen. "But I trust him completely and I knew he would find a way to do it." The couple sent an outline of their ideas to a few different design firms. Peter Gunning of Archid Architects responded promptly to queries and ultimately shared the couple's vision. "Peter could see the build as clearly as I could, but he knew how to create a viable structure," says Diarmid.

The couple wanted the house to be as eco-friendly and energy efficient as possible, so Peter suggested that they build to Passivhaus standards – meaning the property would be both airtight and well insulated. "My mother is a former Green MSP and there has always been an eco theme in the family," says Diarmid. "As an engineer, I was





## WE LEARNED...

**IF YOU HAVE** a design in mind, but are not a professional in the field, don't be afraid to convey your plans to an architect. They should be able to tell you what will and won't work, as well as give you an idea of the best materials and methods with which to build your style of home. Search for a professional you get on well with and who you feel comfortable spending time with, because they will be with you throughout the project

**IF YOU WANT** an easy life, try to select low-maintenance materials wherever possible. By opting for things that you know are durable, you'll have fewer repairs to do over the years. For example, instead of solid timber decking, I chose a laminate product that will better resist the weather

**THE BEST** way to reduce household running costs in terms of heating is to specify as much insulation as possible. Our home was designed with Passivhaus standards in mind, so it's extremely thermally efficient

keen to see where the extremes of thermal capacity of a house lie. The question of how much you have to insulate before no heating is required fascinates me. Someone had obviously thought it all through before, but it is a very site-specific ambition."

The site for the new house was made during excavation works for the turbine access road. During the process of quarrying stone for building materials, a cliff was created. Peter wanted to incorporate this steep side of the former quarry into the design, using it as an earth sheltered wall. This meant additional cost, but it would also result in a house that would have an unusually close relationship with its surrounding landscape. Peter's plans also included a turf roof that would be used to visually link the home with the surrounding field.

### Piecing together the puzzle

The finished house shows true fidelity to the original vision, with a few tweaks here and there. In terms of design, Diarmid wanted to incorporate a mixture of old and new elements – for example, he planned to use some traditional materials such as stone and timber and mix this with modern, low-maintenance items. "After a whole day working on the farm, I didn't want to have to worry about home repairs, so millboard (a composite material) was used for the decking instead of wood. Trespa cladding (a decorative high-pressure compact laminate) has been used alongside the stone. The whole building process was like putting together a jigsaw puzzle," he says.

Above: The cantilevered staircase is a favourite feature in the house, thanks to its delicate floating appearance. A two-storey stone wall makes a visual connection between inside and out, and it also absorbs and retains the heat



When it came to designing the internal spaces, a pragmatic approach was taken. "We like to entertain so we knew we wanted a dining table large enough to sit 12 people," says Diarmid. "The size of the table drove the size of the living space, which in turn drove the configuration of the whole building. It had to be tall and narrow so that heat from solar gain could permeate the entire house."

Work started on the physical build in May 2011. The foundations had to be very accurate (within 1mm) to suit the timber frame. Diarmid decided on a bespoke closed-panel system, which was

This page: Space for socialising was an important factor, and the U-shaped kitchen, with space to perch on the end, is a great configuration for entertaining





prefabricated locally by Scotframe, and naturally the structure uses only sustainably sourced wood.

Fortunately, the majority of the process was trouble-free, thanks in no small part to Diarmid's flair for project management. "There was a good feeling amongst the workforce, and we all trusted each other. Because I had never done this sort of project before, I asked people to keep me on the right track and to tell me what to do," he says. And he has high praise for his architect, too: "If I ever needed Peter's help, he was on site within an hour! This really helped when I needed him to talk through fine details with the builder."

### Conception to construction

One of the only challenging aspects of the build process was getting all of the glazing in place, and Diarmid approached this with his characteristic ingenuity. "The contractor told me it was going to cost a lot of money to get appropriate lifting machinery in place so I just invented a fixture which goes on the front of a forklift truck and is perfectly adequate for the job," he explains. "Inside, the house has a double-height living space with a mezzanine floor, and a massive internal stone wall, which serves to mitigate some of the effects of solar gain."

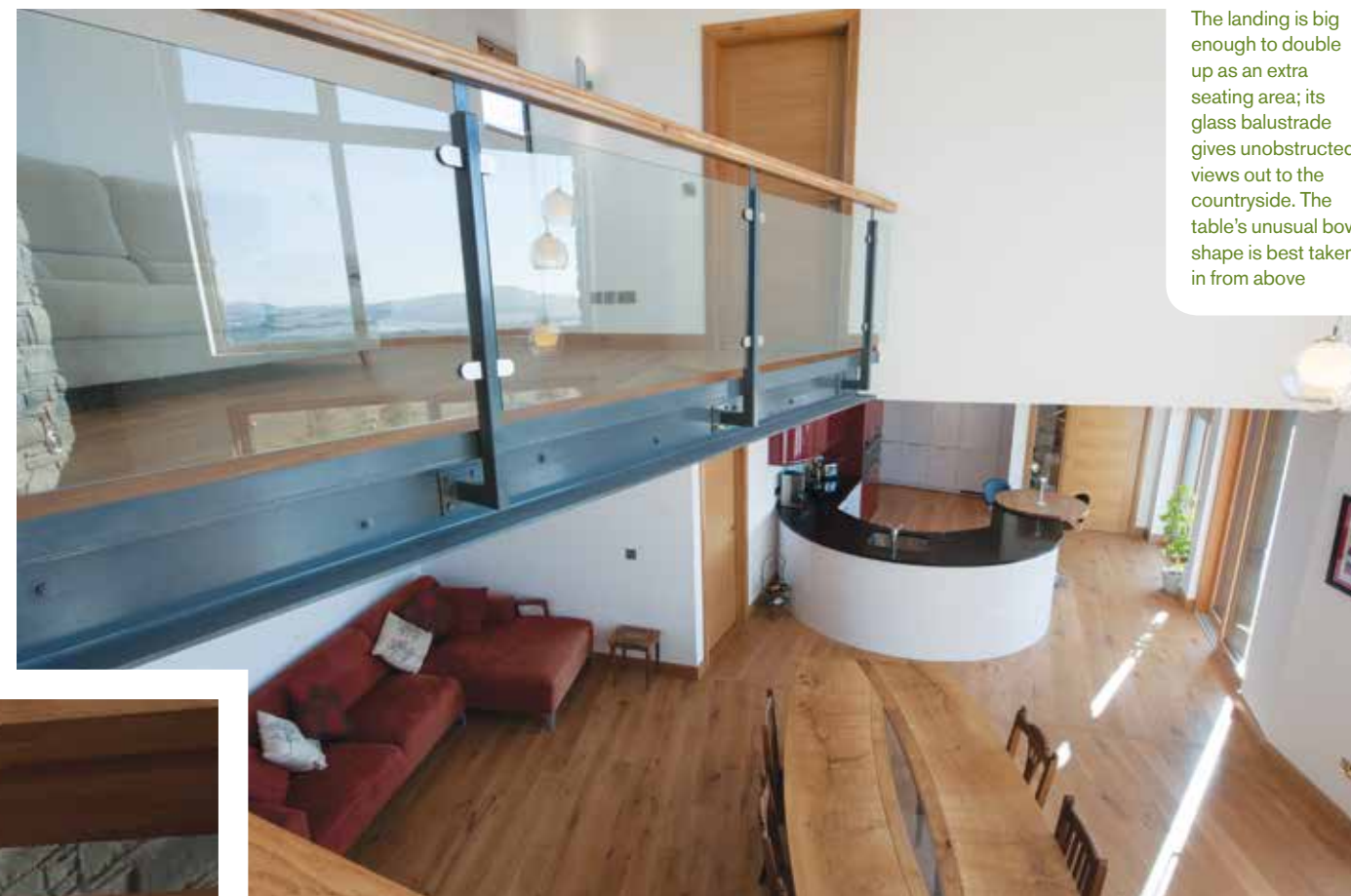
The house is highly insulated with floor, wall and roof U-values of 0.13 W/m<sup>2</sup>K, 0.14 and 0.09 respectively, while the triple-glazed windows have a U-value of 0.72. Careful attention has been paid to air tightness and avoiding cold bridges, in order to ensure the rigorous requirements of Passivhaus design are met (these being a heating demand of no more than 15kW/m<sup>2</sup> per year and air tightness of less than 0.6 air changes/hour at 50pa). A very efficient whole-house MVHR (mechanical ventilation with heat recovery) system takes the heat out of extracted air and imparts it into incoming air.

By March 2012, the Bairds had finally moved into the house, and from the first moment they loved it. "We're inhabiting a building into which years of careful thought have been incorporated," says Aileen. "Our number one favourite feature is the cantilevered staircase; it's been carefully engineered to be safe and robust, but it looks ultra-delicate."

So how does the finished house measure up to the childhood vision that inspired it? "The whole house opens up to the outside and it's got really comfortable guest rooms for folk to stay over," says Diarmid. "I am still like a kid, and this place is like the ultimate den. Even the garage reminds me of a bat cave. We plan to stay here for a long, long time and bring up our children here."



Diarmid wanted to mix old and new in the house, and reinvent traditional rustic materials such as timber and stone in a contemporary way. In good weather, the sliding doors can be pulled open to bring the outside in



The landing is big enough to double up as an extra seating area; its glass balustrade gives unobstructed views out to the countryside. The table's unusual bow shape is best taken in from above



## closer look

## Design elements of this house...

The Bairds' family farm sits in 600 acres of land near Dundee, and supports a range of farming activities including organic laying hens, cereals and livestock as well as being home to four families.

They decided they wanted to secure an alternative income to smooth out the financial peaks and troughs that come with farming. Renewable energy seemed to offer the answer. Diarmid's father investigated installing a wind turbine on the land in the early 1990s, but at that time finance had proved difficult to secure. However, in recent years access to funds has become easier, while the Feed-In Tariff (FIT) also strengthened the business case for an investment.

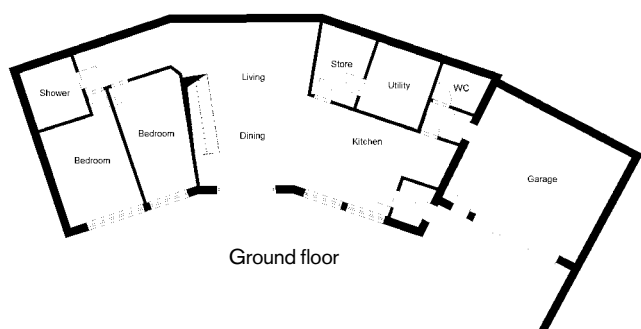
Diarmid managed the project to erect a single Enercon E48 turbine. All the turbine's output is for export although in effect up to 30% of the output will be used on the farm. Furthermore, the four houses use electricity for heating to reduce the families' running costs



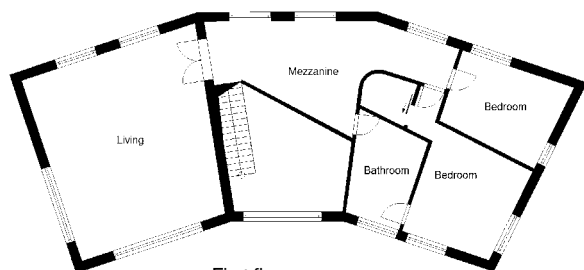
The wind turbine



### Floor plans



Ground floor



First floor



House plans re-created using ARCON 3D Home Design Software. [www.3darchitect.co.uk](http://www.3darchitect.co.uk)  
Tel: 01252 267788 Email: [arconsales@eleco.com](mailto:arconsales@eleco.com)



### TOTAL BUILD COST BREAKDOWN

| Elements              | Cost % | Cost m <sup>2</sup> | Total cost      |
|-----------------------|--------|---------------------|-----------------|
| Timber frame & steel  | 16%    | £269                | £73,390         |
| Roof                  | 6%     | £98                 | £26,665         |
| Windows               | 8%     | £136                | £37,000         |
| MHVR                  | 1%     | £23                 | £6,375          |
| Garage door           | 1%     | £9                  | £2,500          |
| Kitchen               | 5%     | £79                 | £21,500         |
| Bathrooms             | 2%     | £27                 | £7,500          |
| Stairs                | 1%     | £18                 | £5,000          |
| Stove                 | 1%     | £9                  | £2,500          |
| Builder               | 31%    | £531                | £145,000        |
| Electrics & lighting  | 3%     | £53                 | £14,500         |
| Tanking               | 1%     | £8                  | £2,200          |
| Joiner                | 9%     | £159                | £43,460         |
| Plumbing              | 4%     | £72                 | £19,595         |
| Decorating            | 1%     | £13                 | £3,500          |
| Flooring & wall tiles | 2%     | £39                 | £10,700         |
| Consultants           | 8%     | £143                | £39,000         |
| <b>Grand total</b>    |        |                     | <b>£460,385</b> |

### Useful contacts



**ARCHITECT** Archid Architects 01382 542883 [www.archidarchitects.co.uk](http://www.archidarchitects.co.uk)  
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