

## **A self-build home - Cedar House, Ditchheat.**

We began the planning application process in 2008, to develop some business premises to incorporate residential use, to provide us a new home for retirement in the village I have spent all my life. The design process began when outline planning consent was obtained. I designed Cedar House myself with advice from professionals, suppliers, internet research and visit to BuildStore's National Self Build & Renovation Centre in Swindon.

The design criteria were:

- To have a home that would need minimal maintenance and energy cost
- To provide a two bedroom house of 140 mx2 with rooms of generous size, that would be appropriate for our lifetime occupation.
- The house to face due south and have sunlight in the principal rooms all day.
- A pleasant space for Sally's craft work.

The criteria for Lifetime and Code 5 & 6 homes feature in the design, but accreditation to the standards was considered not worth the effort and cost to comply.

A rectangular shape was chosen to be the most economical to build, a "cat slide" roof was incorporated as the ground floor area would be larger than the first floor. This resulted in two benefits, there was a crawl space along the length of the first floor which is used for access to installed services. The front door and vehicular access was on the north side and has much less shade than if the north wall was two storeys.

I was committed to build our new home in ICF from meeting Denstone Construction at an exhibition some 5 years ago, where I could see the benefit of external insulation in reducing cold bridging. Later, I came to the conclusion to make full benefit, we needed to apply the same principal to both floor & roof construction, by specifying an insulated concrete raft and a SIP roof. Combining these three methods of construction, excellent air tightness was achieved, there were no special air tightness measures for the construction other than attention to detail and tape around all apertures. The air test result at 0.59 would be a pass for a Passive House.

Ecofirst Consult prepared energy calculations at design stage, and the design then evolved around achieving U values for Walls, Roof & Floor at 0.11 W m<sup>-2</sup> K<sup>-1</sup>

Planning permission was obtained in December 2011, the construction drawings were then prepared by Della Valle Architects, and to incorporate the IsoQuick insulated concrete raft, Logix ICF walls and a Unilin SIP roof. Denstone Construction Ltd were contracted to build the shell from foundation to SIP roof, I then procured and managed local and specialist suppliers to complete the build. The exterior works still in progress directly by myself and my son, Tom Yeoman.

A decision taken during the build was not to install a heating system, it was anticipated the need for heating would be minimal, the installation cost for gas heating and the subsequent annual servicing cost and boiler amortization could be avoided. Although, as insurance for extended periods of sub-zero temperatures, electric heat mats are installed throughout the ceramic tiled ground floor.

The house is "all electric" and has 3.68kW photovoltaic panels installed facing due south. Domestic hot water is from a 250 litre unvented direct solar single coil duplex cylinder, the 20 tube solar panel was installed on the garage roof for ease of maintenance and proximity to the tank, but faces due

west. The excess electricity generated from PV is diverted to the immersion heaters and supplied all the DHW required until October.

LED lighting is installed throughout the house which including nine external lights is 360watts in total.

Rainwater harvesting with an underground 6500 litre capacity is supplying all the water for toilet flushes, washing machine and vegetable garden which has a large poly tunnel. The water softener is recording an average daily mains water consumption of 165 litres for three adults.

MVHR was designed by supplier, Villavent, installed by myself.

Features designed for lifetime occupation are 1200mm wide staircase, of 14 steps where step rise is 190mm and going 230mm. Space at bottom and top of staircase is provided to park a stair lift carriage and not restrict the stairway passage. The cloakroom is a full wet room and adjacent to the sitting room which could be used as a bedroom if reduced mobility prevented access upstairs. The kitchen dining room is large enough to provide adequate day living space.

There is only one step on the ground floor and external space, required by building regulations at back door leading to garage.

There is an attached 3 bay green oak framed building to accommodate two open fronted parking bays with back door to third bay which is boot room. The boot room is "unheated space" and separated from the main house by an external upvc double glazed door. This gives an entry route to the house during inclement weather without using the front door and losing warm air. The letter box and pet entry door are also incorporated in the boot room.

The oak frame was made by a local oak framer, but I designed for the posts and beams to be joined by metal plates and stainless steel bolts, and with metal feet to raise the oak posts off the ground.

The cladding materials, western red cedar and Tata Urban steel roof were chosen to give the house individuality and be sympathetic to the surroundings, on one side an industrial building and on two sides, cider orchards.

Windows are triple glazed insulated upvc, aluminium clad installed by Internorm partner EcoHaus

A central vacuum cleaner is installed, and facility installed to hook up stand by generator, if "the lights go out"

The house is designed specifically for our lifetime needs and lifestyle, we did not need to consider the future occupiers and features for resale.

Roger Yeoman  
October 2014